MATANUSKA-SUSITNA BOROUGH
PLANNING COMMISSION AGENDA

Edna DeVries, Mayor

PLANNING COMMISSION
Doug Glenn, District 1
Richard Allen, District 2
C. J. Koan, District 3 - Chair
Andrew Shane, District 4 – Vice-Chair
Linn McCabe, District 5
Wilfred Fernandez, District 6
Curt Scoggin, District 7

Michael Brown, Borough Manager

PLANNING & LAND USE DEPARTMENT
Alex Strawn, Planning & Land Use Director
Maija DiSalvo, Planning Services Manager
Jason Ortiz, Development Services Manager
Fred Wagner, Platting Officer
Lacie Olivieri, Planning Clerk

Assembly Chambers of the
Dorothy Swanda Jones Building
350 E. Dahlia Avenue, Palmer

October 21, 2024
REGULAR MEETING
6:00 p.m.

Ways to participate in the meeting:

IN PERSON: You will have 3 minutes to state your oral comment.

IN WRITING: You can submit written comments to the Planning Commission Clerk at msb.planning.commission@matsugov.us.

Written comments are due at noon on the Friday prior to the meeting.

TELEPHONIC TESTIMONY:

- Dial 1-855-290-3803; you will hear "joining conference" when you are admitted to the meeting.
- You will be automatically muted and able to listen to the meeting.
- When the Chair announces audience participation or a public hearing you would like to speak to, press *3; you will hear, "Your hand has been raised."
- When it is your turn to testify, you will hear, "Your line has been unmuted."
- State your name for the record, spell your last name, and provide your testimony.

OBSERVE: observe the meeting via the live stream video at:

- https://www.facebook.com/MatSuBorough
- Matanuska-Susitna Borough - YouTube

I. CALL TO ORDER, ROLL CALL, AND DETERMINATION OF QUORUM

II. APPROVAL OF AGENDA

III. PLEDGE OF ALLEGIANCE

IV. CONSENT AGENDA

A. MINUTES
Regular Meeting Minutes: October 7, 2024

B. INTRODUCTION FOR PUBLIC HEARING: QUASI-JUDICIAL MATTERS

Resolution 24-31 A Conditional Use Permit In Accordance With MSB 17.30 — Conditional Use Permit For Earth Material Extraction Activities, For The Extraction Of Approximately 7,500,000 Cubic Yards Of Earth Material From An Extraction Site Of 153 Acres Within Three Parcels Totaling 235 Acres On 7955 E. Bogard Road, 3182 N. Trunk Road, 7801 E. Glade Court, Tax ID#S 18N01E27A002, 18N01E27D001, 18N01E27D002. (Applicant: Dan Steiner, P.E. For Central Gravel Products; Staff: Peggy Horton, Current Planner)

C. INTRODUCTION FOR PUBLIC HEARING: LEGISLATIVE MATTERS

V. COMMITTEE REPORTS

VI. AGENCY/STAFF REPORTS

VII. LAND USE CLASSIFICATIONS

VIII. AUDIENCE PARTICIPATION (*Three minutes per person, for items not scheduled for public hearing*)

IX. PUBLIC HEARING: QUASI-JUDICIAL MATTERS
Commission members may not receive or engage in ex-parte contact with the applicant, other parties interested in the application, or members of the public concerning the application or issues presented in the application.

Resolution 24-30 A Conditional Use Permit In Accordance With MSB 17.67 — Tall Structures Including Telecommunications Facilities, Wind Energy Conversion Systems, And Other Tall Structures, For Six Meteorological Towers Up To 197 Feet Tall, Located On Little Mount Susitna, Within Township 15 North, Range 9 West, Section 5, Township 16 North, Range 9 West, Sections 16, 29, 32 And 33, And Township 16 North, Range 10 West, Section 13, Seward Meridian. (Applicant: Chad Allen For Little Mount Susitna Wind, LLC; Staff: Rick Benedict, Current Planner)

X. PUBLIC HEARING: LEGISLATIVE MATTERS

Resolution 24-29 A Resolution Of The Matanuska-Susitna Borough Planning Commission Recommending Approval Of An Ordinance Amending

MSB 17.73 To Clarify That Mobile Home Parks Are Not Permitted In The Matanuska-Susitna Borough. (Staff: Alex Strawn, Planning And Land Use Director)

XI. CORRESPONDENCE & INFORMATION

XII. UNFINISHED BUSINESS

XIII. NEW BUSINESS

XIV. COMMISSION BUSINESS

A. Upcoming Planning Commission Agenda Items

XV. DIRECTOR AND COMMISSIONER COMMENTS

XVI. ADJOURNMENT (*Mandatory Midnight*)

Disabled persons needing reasonable accommodation in order to participate at a Planning Commission Meeting should contact the Borough ADA Coordinator at 861-8432 at least one week in advance of the meeting.

MINUTES

October 7, 2024

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MINUTES

MATANUSKA-SUSITNA BOROUGH **REGULAR MEETING**
PLANNING COMMISSION MINUTES **October 7, 2024**

The Matanuska-Susitna Borough Planning Commission's regular meeting was held on October 7, 2024, at the Matanuska-Susitna Borough Assembly Chambers, 350 E. Dahlia Avenue, Palmer, Alaska. Chair CJ Koan called the meeting to order at 6:00 p.m.

I. CALL TO ORDER, ROLL CALL, AND DETERMINATION OF QUORUM

Planning Commission members present and establishing a quorum:
Mr. Doug Glenn, Assembly District #1
Mr. Richard Allen, Assembly District #2
Ms. C. J. Koan, Assembly District #3
Mr. Andrew Shane, Assembly District #4
Ms. Linn McCabe, Assembly District #5
Mr. Curt Scoggin, Assembly District #7

Planning Commission members absent and excused were:
Mr. Wilfred Fernandez, Assembly District #6

Staff in attendance:
Mr. Alex Strawn, Planning and Land Use Director
Ms. Lacie Olivieri, Planning Department Admin. Specialist/ Planning Commission Clerk

*Indicates that the individual attended telephonically.

II. APPROVAL OF AGENDA

Chair Koan inquired if there were any changes to the agenda.
The agenda was approved as written without objection.

III. PLEDGE OF ALLEGIANCE

The pledge of allegiance was led by Commissioner Shane.

IV. CONSENT AGENDA

A. Minutes Regular Meeting Minutes: September 16, 2024

B. INTRODUCTION FOR PUBLIC HEARING: QUASI-JUDICIAL MATTERS

Resolution 24-30 A Conditional Use Permit In Accordance With MSB 17.67 — Tall Structures Including Telecommunications Facilities, Wind Energy Conversion Systems, And Other Tall Structures, For Six Meteorological Towers Up To 197 Feet Tall, Located On Little Mount Susitna, Within Township 15 North, Range 9 West, Section 5, Township 16 North, Range 9 West, Sections 16, 29, 32 And 33, And Township 16 North, Range 10 West, Section 13, Seward Meridian. (Applicant: Chad Allen For Little Mount Susitna Wind, LLC; Staff: Rick Benedict, Current Planner)

C. INTRODUCTION FOR PUBLIC HEARING: LEGISLATIVE MATTERS

D.

Resolution 24-29 A Resolution Of The Matanuska-Susitna Brough Planning Commission Recommending Approval Of An Ordinance Amending MSB 17.73 To Clarify That Mobile Home Parks Are Not Permitted In The Matanuska-Susitna Borough. (Staff: Alex Strawn, Planning And Land Use Director)

GENERAL CONSENT: The consent agenda was approved without objection.

V. COMMITTEE REPORTS - *(There were no committee reports.)*

VI. AGENCY/STAFF REPORTS - *(There were no Agency/Staff Reports.)*

VII. LAND USE CLASSIFICATIONS - *(There were no land use classifications.)*

VIII. AUDIENCE PARTICIPATION (Three minutes per person.)

The following persons spoke: Rod Hanson, North Lakes Community Council, regarding Mobile Home Parks.

Audience participation was closed without objection.

IX. PUBLIC HEARING: QUASI-JUDICIAL MATTERS

X. PUBLIC HEARING LEGISLATIVE MATTERS

Resolution 24-28 A Resolution Of The Matanuska-Susitna Borough Planning Commission Recommending Adoption Of The Fiscal Year (FY) 2026 Capital Improvement Program (CIP). (Staff: Alex Strawn, Planning And Land Use Director)

Chair Koan read the resolution title into the record.

Mr. Strawn provided a staff report.

Chair Koan opened the public hearing.

The following persons spoke regarding Planning Commission Resolution 24-28:
Lorinda Moss, Ashley Staller, Rod Hanson

Chair Koan invited staff to respond to questions and statements from the audience.

Mr. Strawn stated he is able to answer any questions anyone might have.

Discussion ensued.

There being no one else to be heard, Chair Koan closed the public hearing and discussion moved to the Planning Commission.

MOTION: Commissioner Mccabe moved to approve Planning Commission Resolution 24-28. The motion was seconded. by Commissioner Shane.

Discussion ensued

MOTION: Commissioner Shane moved a primary amendment to move 7th Summit Shooting Range from number 19 to number 9 on the CIP list. The motion was seconded by Commissioner Glenn.

Commissioner Allen objected.

VOTE: The primary amendment passed with Commissioner Allen opposed.

VOTE: The main motion passed without objection.

XI. CORRESPONDENCE AND INFORMATION

(There was no correspondence and information.)

XII. UNFINISHED BUSINESS - *(There was no unfinished business.)*

XIII. NEW BUSINESS

XIV. COMMISSION BUSINESS

A. Upcoming Planning Commission Agenda Items (*Staff: Alex Strawn*)
(Commission Business was presented, and no comments were noted.)

XV. DIRECTOR AND COMMISSIONER COMMENTS

Commissioner Glenn: Good to see everyone.

Commissioner Mccabe: See you all tomorrow.

Commissioner Scoggin: No comment

Commissioner Shane: Thanks, everyone, for participating. Getting cold

Commissioner Allen: See you all tomorrow night.

Mr. Alex Strawn: Thanks to the community councils for participating and for everything they do.

Commissioner Koan: Another great meeting. Thanks, everyone.

XVI. ADJOURNMENT

The regular meeting adjourned at 6:51 p.m.

C.J. KOAN
Planning Commission Chair

ATTEST:

LACIE OLIVIERI
Planning Commission Clerk

Minutes approved: _____

INTRODUCTION FOR PUBLICHEARING

QUASI-JUDICIAL

Resolution No. 24-31

Central Gravel Products

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INTRODUCTION FOR PUBLIC HEARING

MATANUSKA-SUSITNA BOROUGH
Planning and Land Use Department
Development Services Division
350 East Dahlia Avenue • Palmer, AK 99645
Phone (907) 861-7822
Email: permitcenter@matsugov.us

APPLICATION FOR A CONDITIONAL USE PERMIT FOR EARTH MATERIALS EXTRACTION – MSB 17.30

NOTE: *Carefully read instructions and applicable borough code. Fill out forms completely. Attach information as needed. Borough staff will not process incomplete applications.*

Application fee must be attached, check one:

____ $1000 for Administrative Permit (Less than two years ***or*** less than 7,000cy annually)

X $1,500 for Conditional Use Permit (More than two years ***and*** more than 7,000cy annually)

Required Attachments:

X Site plan as detailed on Page 2

X Narrative with operational details and all information required on Page 2

X Reclamation Plan

Subject Property:

MSB Tax Account ID#(s): 118N01E27D002, 118N01E27D001, 118N01E27A002

Street Address: 7955 E Bogard Rd., 3182 N. Trunk Rd., 7801 E Glade Ct., Palmer, AK

Facility/Business Name: Central Gravel Products

Name of Property Owner
See Owner's Document (attached)

Mailing: _____

_____

Phone: Cell _____

Wk _____ Hm _____

E-mail: _____

Name of Agent / Contact for application
Dan Steiner, PE

Mailing: 5900 W. Dewberry Dr.
Wasilla, AK 99623

Phone: Cell 907-715-7704

Wk 907-357-5609 Hm _____

E-mail: dsteiner@mtaonline.net

Attach a narrative describing the proposed extraction activities.	**Attached**
Describe the types of material being extracted.	✔
Provide total acreage of all parcels on which the activity will occur.	✔
Provide total acreage of earth material extraction activity.	✔
Provide total cubic yards to be extracted.	✔
Provide the estimated final year extraction will occur.	✔
Provide seasonal start and end dates.	✔
Provide hours of operation.	✔
Provide days of the week operations will take place.	✔
Provide proposed peak hour and traffic volume at the peak hour	✔
Provide estimated end date of extraction.	✔
Provide estimated end date of reclamation.	✔
Describe all other uses occurring on the site.	✔
Describe methods used to prevent problems on adjacent properties, such as lateral support (steep slopes), water quality, drainage, flooding, dust control, and maintenance of roads.	✔
Describe how the operation will monitor the seasonal high water table.	✔
Provide quantity estimates and topographical information such as cross section drawings depicting depth of excavation, slopes, and estimated final grade.	✔
Provide Reclamation Plan in accordance with MSB 17.28.063 and 17.28.067.	✔

Submit a detailed site plan, *drawn to scale*. Drawings under the seal of an engineer or surveyor are recommended but not required.	**Attached**
Identify location of permanent and semi-permanent structures on the site for verification of setback requirements. Include wells and septic systems.	✔
Depict buffer areas, driveways, dedicated public access easements, noise buffers (such as fences, berms or retained vegetated areas), and drainage control such as ditches, settling ponds, etc.	✔
Identify the entire area intended for gravel/material extraction activity.	✔
Identify the property boundary containing the operation.	✔
Identify ADEC Drinking Water Protection Areas wherever proposed project area boundaries fall within drinking water protection area buffer zones.	✔ See Narrative
Identify areas used for past and future phases of the activity.	✔
Provide road and access plan that includes anticipated vehicle routes and traffic volumes. If the level of activity exceeds the minimum levels specified in MSB 17.61.090, Traffic Standards, a traffic control plan consistent with state regulations may be required.	✔
Provide detailed description of the proposed visual screening.	✔ See Narrative
Provide measures to mitigate or lessen noise impacts on surrounding properties.	✔ See Narrative
Provide proposed lighting plan.	✔ See Narrative

Submit documentation showing compliance with borough, state, and federal laws.	**Applied for (list file #)**	**Attached (list file #) or N/A**
Submit mining permit as required by the Alaska State Department of Natural Resources (ADNR) if extraction activities are to take place on state land.		N/A
Provide reclamation plan as required by ADNR, pursuant to AS 27.19. Provide copy of reclamation financial assurance filed with the State of Alaska (If exempt, provide qualifying documents for exemption).	A reclamation plan has been submitted to ADNR. It is included with this submittal. Also included is the financial assurance information.	
Provide Notice of Intent (NOI) for construction general permit or multi-sector general permit and storm water pollution prevention plan, and other associated permits or plans required by the Environmental Protection Agency (EPA) pursuant to the National Pollutant Discharge Elimination System (NPDES) requirements.	SWPPP has been prepared and is included with this submittal. An NOI will be filed once the project is approved.	
Provide United States Army Corps of Engineers permit pursuant to Section 404 of the Clean Water Act, 33 U.S.C. 1344, if material extraction activity is to take place within wetlands, lakes, and streams.	See Narrative	N/A - See narrative.
Provide any other applicable permits, such as driveway/access permits; list as appropriate.	See narrative.	

Prior to the public hearing, the applicant must also pay the mailing and advertising fees associated with the application. Staff will provide applicant with a statement of advertising and mailing charges. Payment must be made **prior** to the application presentation at the public hearing.

OWNER'S STATEMENT: I am owner or authorized agent of the following property:

MSB Tax Account ID #(s)_____ and, I hereby apply for approval of conditional use permit for earth material extraction activities on the property as described in this application.

I understand all activity must be conducted in compliance with all applicable standards of MSB 17.28, MSB 17.30, and with all other applicable borough, state, and federal laws, including but not limited to, air quality, water quality, and use and storage of hazardous materials, waste and explosives, per MSB 17.30.055.

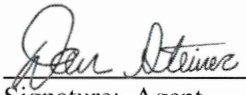
I understand that other rules such as local, state, and federal regulations, covenants, plat notes, and deed restrictions may be applicable and other permits or authorizations may be required. I understand that the borough may also impose conditions and safeguards designed to protect the public's health, safety, and welfare, and ensure the compatibility of the use with other adjacent uses.

I understand that it is my responsibility to identify and comply with all applicable rules and conditions, covenants, plat notes, and deed restrictions, including changes that may occur in such requirements.

I understand that this permit may transfer to subsequent owners of this land and that it is my responsibility to disclose the requirements of this status to operators on this property, and to the buyer when I sell the land. Additionally, I agree to comply with MSB 17.30.120, Transfer of Conditional Use Permit, in the event this permit is transferred to a subsequent property owner.

I grant permission for borough staff members to enter onto the property as needed to process this application and monitor compliance. Such access will at a minimum, be allowed when the activity is occurring and, with prior notice, and at other times necessary to monitor compliance.

The information submitted in this application is accurate and complete to the best of my knowledge.

See Attached		
Signature: Property Owner	Printed Name	Date
	Dan Steiner	5/10/2024
Signature: Agent	Printed Name	Date

MATANUSKA-SUSITNA BOROUGH
Planning and Land Use Department
Development Services Division

APPLICATION FOR A CONDITIONAL USE PERMIT FOR EARTH MATERIALS EXTRACTION – MSB 17.30

Facility/Business Name: Central Gravel Products

NAME OF PROPERTY OWNER:

Lot A2 and Lot D2, Section 27 T18N, R1E Seward Meridian

Name: Bob Havemeister

Address: P.O. Box 467 Palmer, AK 99645

Phone Number: 907-232-0628

Email: Havemeistertrucking@gmail.com

OWNER'S STATEMENT: I am owner or authorized agent of the following property:

MSB Tax Account ID #(s) Lot A2 and Lot D2, Section 27 T18N, R1E Seward Meridian and, I hereby apply for approval of conditional use permit for earth material extraction activities on the property as described in this application.

I understand all activity must be conducted in compliance with all applicable standards of MSB 17.28, MSB 17.30, and with all other applicable borough, state, and federal laws, including but not limited to, air quality, water quality, and use and storage of hazardous materials, waste and explosives, per MSB 17.30.055.

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I grant permission for borough staff members to enter onto the property as needed to process this application and monitor compliance. Such access will at a minimum, be allowed when the activity is occurring and, with prior notice, and at other times necessary to monitor compliance. The information submitted in this application is accurate and complete to the best of my knowledge.

Signature: Property Owner	Printed Name	Date
[signature]	Bob Havemeister	5/2/24

MATANUSKA-SUSITNA BOROUGH

Planning and Land Use Department
Development Services Division

APPLICATION FOR A CONDITIONAL USE PERMIT FOR EARTH MATERIALS EXTRACTION – MSB 17.30

Facility/Business Name: Central Gravel Products

NAME OF PROPERTY OWNER:

Lot D1, Section 27, T18N, R1E, Seward Meridian

Name: Ralph Kircher

Address: 3182 N. Trunk Road Palmer, AK 99645

Phone Number: 253-850-9570

Email: preciousralph@AOL.com

OWNER'S STATEMENT: I am owner or authorized agent of the following property:

MSB Tax Account ID #(s) Lot D1, Section 27, T18N, R1E, Seward Meridian and, I hereby apply for approval of conditional use permit for earth material extraction activities on the property as described in this application.

I understand all activity must be conducted in compliance with all applicable standards of MSB 17.28, MSB 17.30, and with all other applicable borough, state, and federal laws, including but not limited to, air quality, water quality, and use and storage of hazardous materials, waste and explosives, per MSB 17.30.055.

I understand that other rules such as local, state, and federal regulations, covenants, plat notes, and deed restrictions may be applicable and other permits or authorizations may be required. I understand that the borough may also impose conditions and safeguards designed to protect the public's health, safety, and welfare, and ensure the compatibility of the use with other adjacent uses.

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I grant permission for borough staff members to enter onto the property as needed to process this application and monitor compliance. Such access will at a minimum, be allowed when the activity is occurring and, with prior notice, and at other times necessary to monitor compliance. The information submitted in this application is accurate and complete to the best of my knowledge.

Ralph O. Kircher	RALPH O. KIRCHER	5/2/2024
Signature: Property Owner	Printed	Name Date

5900 W. Dewberry Dr
Wasilla, AK 99623

SDCS, LLC
STEINER DESIGN & CONSTRUCTION SERVICES, LLC

Phone: (907) 357-5609
Fax: (907) 357-5608

August 9, 2024

Peggy Horton
Planning and Land Use Department
Development Services Division
Matanuska-Susitna Borough (MSB)
350 E. Dahlia Ave.
Palmer, AK 99645-6488

Re: Conditional Use Permit Application – Request for Additional Information
SDCS Responses

Ms. Horton,

Thank you for your review comments. Below are your comments with my responses in red.

1. The southeast corner of the property boundary is shown incorrectly on the index sheet and sheets C0.1 and C0.2.
   Corrected. Updated sheet included with this letter.
2. The site plan contains some misspellings that could be confusing.
   a. On sheet C1.0, Note 2, line 1, replace "being" with begin.
   b. On sheet C1.2, Note 1, remove the first instance of "are."
   c. On sheet C1.2, Note 3, replace "ares" with areas and "move" with more.
   Typos corrected.
3. The site plan, Sheet C1.0, has an extra internal line that clutters the sheet; please remove it. I've attached a redlined copy.
   The extra line has been removed. Updated sheet included with this letter.
4. In the narrative section titled Site Access, Bogard Road should replace Trunk Road within this section. Within the Demand for Gravel Pits, first paragraph, last line, gravel is missing the r.
   Corrected. Updated narrative is included with this submittal.
5. On the site plan, there is a proposed driveway off of E Bogard Road. However, the 10-foot-high visual screening soil berm may be blocking the entrance to the extraction area. Clarify how vehicles will enter the gravel extraction area using this driveway.
   Soil berm changed to show there is room for access. Updated sheet included with this letter.

6. Will the extraction area be visible from Bogard or Engstrom during any of the phases? If so, visual berms may be required to meet MSB 17.28.060(A)(4).

   If it is determined that the existing buildings, existing vegetation, and the proposed screening berms do not meet the MSB requirements, additional screening berms will be constructed

7. The site plan, Sheet C1.0, is missing the symbols for the cross-section lines A and B.

   Corrected. Updated sheet included with this letter.

8. Please verify with the operator whether water trucks will be used to remove tracked soil from adjacent roadways. Most earth material excavation applications include this.

   Water trucks and sweepers will be used as needed.

9. Where is the water obtained for filling the water trucks?

   If water trucks are needed, a filling pit will be excavated and groundwater near the surface will be pumped to fill the trucks. If this is needed, the appropriate AK-DNR permits will be obtained.

10. Provide quantity estimates; annual extraction amounts will suffice for this.

    The estimated volume of material extracted per year is 230,000 cubic yards or less.

11. Provide a separate reclamation plan meeting the standards of MSB 17.28.063 & 17.28.067. Staff will not extract the information from the DNR reclamation application material. Address each item under MSB 17.28.063 and 17.28.067.

    Notes have been added to the reclamation plan that addresses the items in the sections referenced. See Sheet C3.0

12. Permanent and semi-permanent structures include screening plants, wash plants, crushers, conveyor belt operations, etc. The site plan should show where these types of processing equipment will be on the property to ensure MSB 17.55 setback requirements are met.

    All the processing equipment will be moved as areas are reclaimed and additional areas developed for extraction. The following note has been added to the site plan, Sheet C1.0: ALL PROCESSING EQUIPMENT (SCREENING PLANTS, CRUSHERS, CONVEYOR BELTS, ETC.), PERMANENT AND TEMPORARY STRUCTURES, AND MATERIAL PILES ARE TO BE PLACE +40' AT ALL TIMES FROM ALL PERIMETER PROPERTY LINES.

13. Often, the operation keeps the processing equipment in the same location for all the phases. Is this the case for this operation?

    The plan is to have 10 acres disturbed at a time. Once the 10 acres is done, an additional 10 acres will be developed, and the previous 10 acres will be reclaimed. The processing equipment will be moved to the new 10 acres each time.

14. Are there any ditches, settling ponds, wash pit ponds, etc. proposed?

    No. There will be no washed products at this pit. No ditches, ponds, etc. will be needed.

15. Have you written confirmation from DEC regarding your discussions with them about the Drinking Water Protection Areas?
    No. It was all verbal. ADEC did not want us to submit anything and so there is nothing for them to respond to in writing.
16. The expectation for asking about anticipated vehicle routes is the route trucks will take after leaving the site and the route the trucks will take coming back to the site.
    There will be two access points into the gravel pit. An "in only" driveway off Engstrom Road and one off Bogard Road. Vehicles can only exit from the Bogard Road driveway. Currently, the Bogard Road driveway is both left and right out.
    Of course, the gravel pit has no control over the route that the trucks of their customers take, but they anticipate that most trucks will travel along Bogard Road and Trunk Road to and from the gravel pit. Some traffic will be from Engstrom Road, but it is anticipated that this will be minimal traffic. Trucks will be encouraged to avoid residential areas as much as possible. Central Gravel Products has three vehicles that it uses to deliver gravel products. They always have their drivers use main roads to their destination and will not send trucks along Engstrom later than 4:00 PM. With the location of this gravel pit, most traffic should be able to use the higher volume roads to get close to their destinations (Bogard, Trunk, Palmer Fishhook, Wasilla-Fishhook, Palmer-Wasilla Highway).
    With a peak hourly traffic volume of 12 trucks per hour (12 in, 12 out), no other mitigation is needed to provide access to and from the proposed gravel pit.
    Please note that the start and stop movements through residential areas discourage large trucks from traveling through residential areas. The starts and stops take a lot longer and even if that route is a shorter distance, is usually much better for trucks to take the main roads.
17. In our previous meetings, Mr. Laughlin mentioned additional voluntary traffic restrictions that he currently follows, such as avoiding operation during morning rush hours or when school buses are running. Will this information be included in the application?
    It is planned that the proposed gravel pit will be operated in the same manner as the current gravel pit. The hours of operation are 8:00 AM to 5:30 PM, Monday through Saturday. They don't open before 8:00 AM to avoid rush hour traffic and traffic associated with Colony High School and Middle School starting in the morning. The plan is to have the same hours of operation at the new gravel pit.
18. How was the peak hour and traffic volume at the peak hour determined?
    Central Gravel Products has kept detailed records of how many trucks per day they serve for the life of their current pit. They plan on operating the proposed gravel pit in the same manner. This information was used to determine the peak hour traffic volume. The number that was submitted (12 in and 12 out) is from the busiest days they have recorded.

19. Lighting Plan. MSB 17.28.060(A)(6) requires exterior lights to be directed downward and shielded to mitigate light spillage. Include this in your narrative.

    Done. Attached is an updated narrative. See page 3.

20. This property is located in the Core Planning Area of the Borough. The SWPPP indicates the possible presence of a fuel tank on site. Can you provide information on the size of the fuel tank? Please note that a Core Area Conditional Use Permit is necessary for the processing, manufacturing, or storage of hazardous materials weighing 10,000 lbs. or more (MSB 17.61.100).

    The on-site fuel tank will 500 gallons or less than

21. Provide a proposed timetable for the phases.

    Each phase will be approximately 2 years.

22. What is the proposed end use of the property, after extraction is completed?

    The use of the property after extraction has not been finalized. It may be developed as a residential subdivision.

23. On page 2 of the SWPPP, you list Jade Laughlin as the owner. Is this correct since he is not the owner of the property?

    It will work for the SWPPP since he is the one developing the lot and will be implementing the SWPPP.

24. Provide evidence of ADNR's acceptance of the reclamation plan and payment of financial assurance. If payment will be made after permit approval, we can list this as a condition of approval prior to operating.

    Pending. Please make payment a condition of approval.

25. Staff will recommend a condition of approval that the NOI be received prior to operating the earth material excavation operation.

    Noted.

26. Since the USACE has not issued the jurisdictional determination yet, can you include in your narrative that earth materials excavation will not occur within 100 linear feet of a lake, river, stream, or other water body, including wetlands, to comply with MSB 17.28.060(A)(7)?

    Since this submittal, the USACE has issued the jurisdictional determination. The USACE has determined that they do not have jurisdiction over the wetlands. A copy of the jurisdictional determination is included with this submittal.

27. Provide the driveway permit issued by ADOT&PF for access to E. Bogard Road. The permit may include conditions inconsistent with the current application responses.

    I am still working on this.

28. Provide the driveway permit issued by MSB for access onto N. Engstrom Road.

    I am still working on this.

Please let us know if you have any questions or need additional information. Thank you for your help with this project.

Sincerely,

Dan Steiner, P.E.
Manager

des
encl.

5900 W. Dewberry Dr
Wasilla, AK 99623

SDCS, LLC
STEINER DESIGN & CONSTRUCTION SERVICES, LLC

Phone: (907) 357-5609
Fax: (907) 357-5608

August 12, 2024

Planning and Land Use Department
Development Services Division
Matanuska-Susitna Borough (MSB)
350 E. Dahlia Ave.
Palmer, AK 99645-6488

Re: Central Gravel Products – Gravel Pit - Application for Condition Use
T18N, R1E, Section 27, Lots D1, D2, and A2
Engineering Narrative

To Whom it May Concern,

As part of the MSB "Earth Materials Extraction" application, the following information is provided as required on the **"APPLICATION FOR A CONDITIONAL USE PERMIT FOR EARTH MATERIALS EXTRACTION – MSB 17.30"**:

Narrative Describing the Proposed Extraction Activities

- Types of material being extracted: This gravel pit will extract sand and gravel material to be used in construction. Some of the material will be processed and/or crushed to be used as sewer rock and road section material. Also, stockpile of soil, processing topsoil.
- Total acreage of gravel pit (all three parcels): 235 acres.
- Total acreage of earth material extraction activity: 153 acres.
- Total cubic yards to be extracted: 7,500,000 CY (This volume can change based on where groundwater is detected.)
- Estimated final year extraction will occur: 2054
- Seasonal Start and End dates: Start on May 1 and end on November 1.
- Hours of operation: 8:00 am – 5:30 pm.
- Days of operation: Monday – Saturday

- Proposed peak hour and traffic volume at the peak hour: Peak hour – 11:00 AM 24 (12 trips in, 12 trips out).

- Estimated End Date of Extraction: November 1, 2054

- Estimated End Date of Reclamation: November 1, 2055

- Other uses occurring on site: There are areas of the three parcels that will not be developed for material extraction. There are existing residential structures on the site. These structures will remain and the areas around them will be unchanged.

- Problem prevention:

  Lateral Support: Final slopes will be 3h:1v or flatter.

  Water Quality: A SWPPP will be implemented as part of this project.

  Drainage: This action will create a low spot on the site. No runoff is anticipated to leave the site.

  Dust Control: Dealt with the site vegetative buffer. Water truck to sprinkle site if needed.

  Maintenance of Road: Site operator has needed equipment to maintain on site roads.

  Flooding: No part of the soil extraction area is within the 100-year flood zone. No flooding is anticipated.

- Monitoring of the Seasonal High Water Table: Monitoring wells be will installed in the areas where material extraction is taking place. The wells will be lowered as the soil is extracted to insure that extraction is not closer than 4' to groundwater. See detail for well on sheet C1.0.

Detailed Site Plan

- Identify ADEC Drinking Water Protection Areas: There is one drinking water protection area. It is for a site that obtains its drinking water adjacent to Wasilla Creek. This site is approximately one mile southwest of this site.

I have discussed this project with ADEC. The only contaminate that they were concerned with was turbidity. Since the project will maintain a large vegetative buffer along the creek and the existing and finish topography of the developed areas drain away from the creek, ADEC is not concerned and said that no action is required.

- Visual Screening: Visual screening will be provided by either a 10' high soil berm, existing vegetation, or topography. See the included plans for locations of all the visual screening.

- Noise Mitigation: Noice mitigation will be provide by the hours of operation and maintaining equipment used on site. All the heavy equipment (excavators, loaders, etc.) and processing/crushing equipment will maintain all required mufflers and noise dampeners. Material extraction will also start near the middle of the site and at a lower elevation from the surrounding property. As work progresses, the extraction will continue to be at a lower elevation. Also, this type of production has strict OSHA regulations for noise that are strictly followed.

- Lighting Plan: The only exterior lights will be mounted on the proposed shop and scale house. These lights will be directed downward and will include shields, as needed, to prevent light spillage on to adjacent properties.

Borough, State, and Federal Laws

- ADNR Reclamation Plan: A reclamation plan has been submitted to the ADNR. A copy of the plan has been included with this submittal.

- Reclamation Financial Assurance: A copy of the reclamation financial assurance that was filed with the State of Alaska will be delivered to the MSB as soon as DNR determines what the fee will be and it has been paid.

- United States Army Corps of Engineers: There is a small area that has been identified as a wetland within the project parcels (see Sheet C0.2). No material extraction will take place in or near this area and the wetland will not be disturbed. As a precaution, a Jurisdictional Determination (JD) has been requested from the United States Army Corps of Engineers. Their response is that these wetlands do not require are Department of Army (DA) permit. The entire response is included with this submittal.

Additional Information

Drifting Snow Along Engstrom Road

In our discussion with the MSB, the MSB expressed concern about drifting snow along Engstrom Road and the increase in drifting that a 10' high soil berm would cause. With the existing topography and the plan to begin material extraction at the lower elevations of the site, a 10' high soil berm along Engstrom Road will not be needed. See section D/C2.1 for visual explanation.

As a result, this project should not increase drifting snow and should, as the gravel pit is developed, reduce the volume of snow that drifts onto Engstrom Road.

Site Access

Access to the proposed gravel pit will be at two locations. Refer to Sheet C1.0 for the access points. The primary access will be off of Bogard Road adjacent to the common property line of Lot D1 and D2. Bogard Road is State of Alaska right-of-way. SDCS is in the process of applying for a driveway permit from ADOT.

A secondary access is located off of Engstrom Road, across from Sebastian Drive. This will be an "in only" access. Engstrom Road is MSB right-of-way. SDCS is in the process of applying for a driveway permit from the MSB.

Demand for Gravel Pits

Central Gravel Products is anxious for this new gravel pit to be developed. There is a high demand for the soil products that will be produced. Central Gravel Products is concerned about the depletion of gravel pits in the Matanuska-Susitna Valley and knows that this proposed gravel pit will help meet the demand for gravel for many years to come.

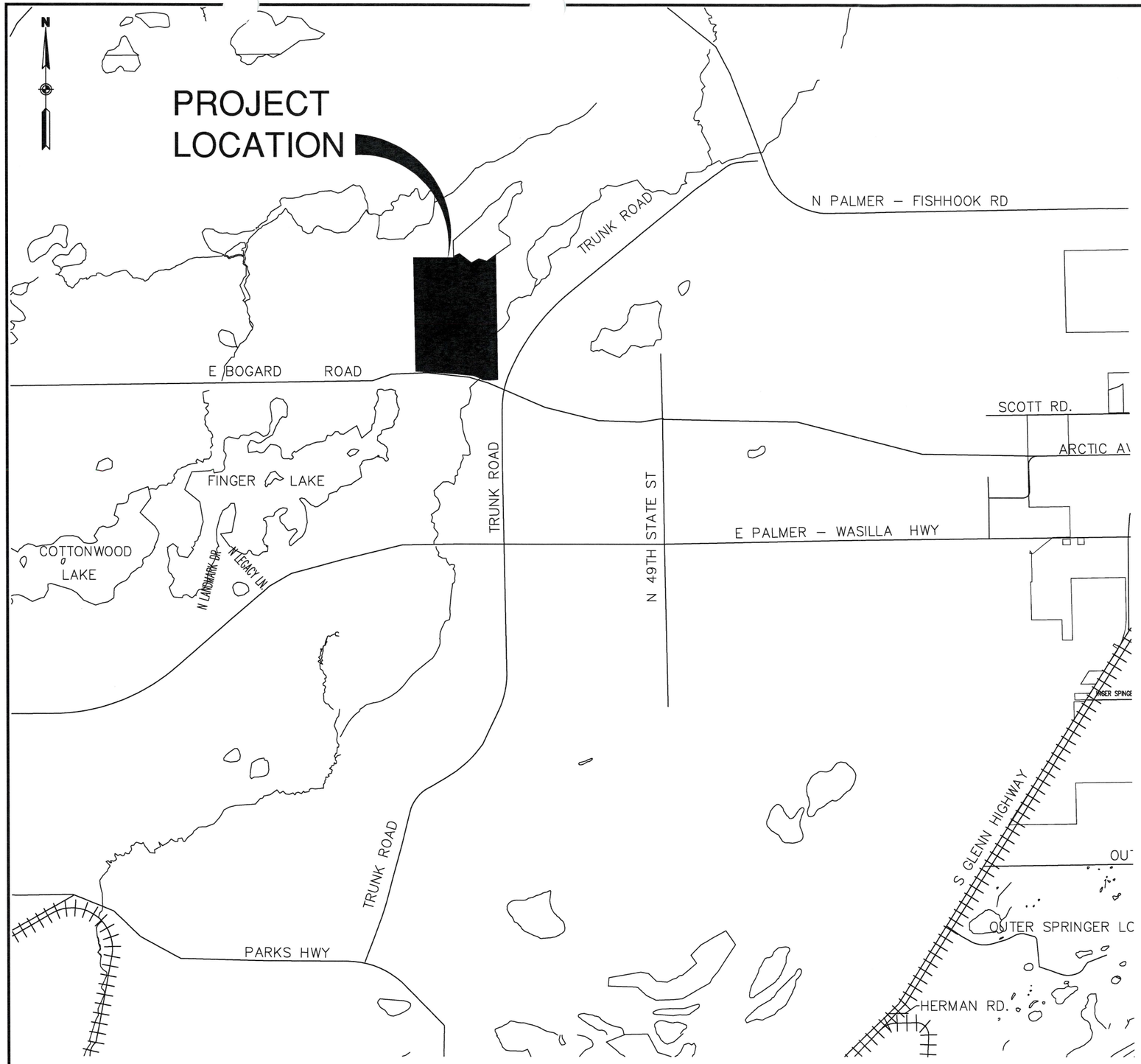
Please let us know if you have any questions or need additional information. Thank you for your help with this project.

Sincerely,

Dan Steiner

Dan Steiner, P.E.
Manager

des
encl.



VICINITY MAP

CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT

LOTS A2, D1, D2,
TOWNSHIP 18N RANGE 1E SECTION 27
PALMER, AK

SHEET INDEX

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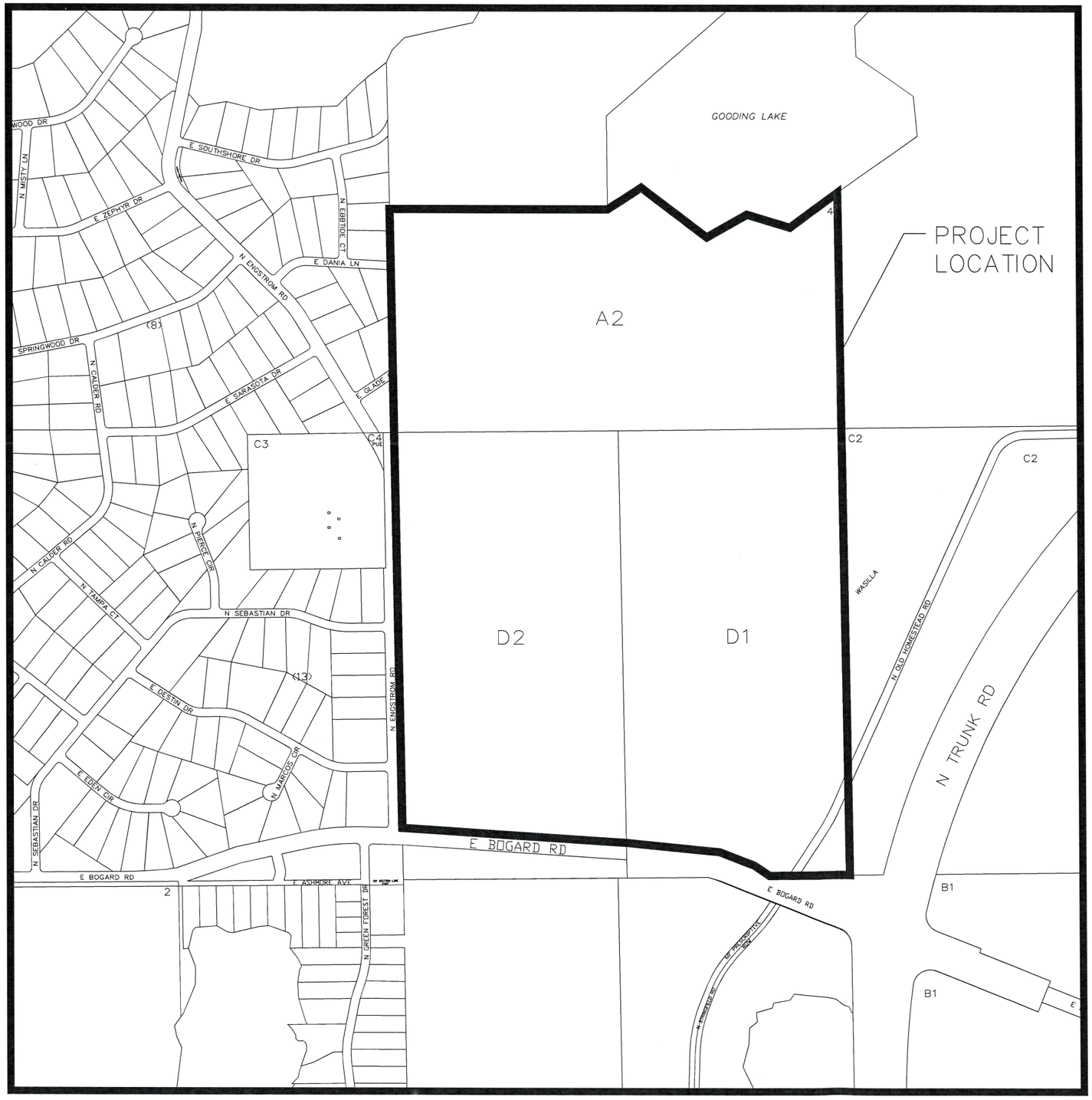
SDCS, LLC
STEINER DESIGN & CONSTRUCTION SERVICES, LLC
5900 W. DEWBERRY DR. PH: (907) 357-5609
WASILLA, AK 99623 FAX: (907) 357-5608

PLAN SET DATE: 8/9/2024



LOCATION MAP

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- EDGE OF VEGETATION
- EDGE OF GRAVEL DRIVEWAY
- EDGE OF PAVED DRIVEWAY
- CMP CULVERT WITH END SECTIONS
- AREA TO REMAIN UNDEVELOPED
- 10' HIGH SOIL BERM
- AREA WHERE 10' HIGH SOIL BERM IS NOT NEEDED

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SURVEY NOTES

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE POSITION OF THE HORIZONTAL AND VERTICAL CONTROL USED.
2. SURVEY PERFORMED BY KEYSTONE SURVEYING.

CALL BEFORE YOU DIG

The Contractor shall notify all area utility companies prior to commencement of excavation. The following is a partial list:

ALASKA DIG LINE (907) 278-3121, (800) 478-3121

STATE OF ALASKA
49TH
DAN E. STEINER
No. CE 9505
8/9/24
REGISTERED PROFESSIONAL ENGINEER

SDCS, LLC
STEINER DESIGN & CONSTRUCTION SERVICES, LLC
5900 W. DEWBERRY DR. PH: (907) 357-5609
WASILLA, AK 99623 FAX: (907) 357-5608

CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
LOTS A2, D1, D2, TOWNSHIP 18N RANGE 1E SECTION 27

BY	DATE	REVISIONS

JOB NO.: 23-016
DATE: 8/9/2024
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REVIEWED: DES

SHEET TITLE
LOCATIONS MAP
LEGEND
CONSTRUCTION NOTES

SHEET
C0.1

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

STATE OF ALASKA
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CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
LOTS A2, D1, D2, TOWNSHIP 18N RANGE 1E SECTION 27

BY	DATE	REVISIONS

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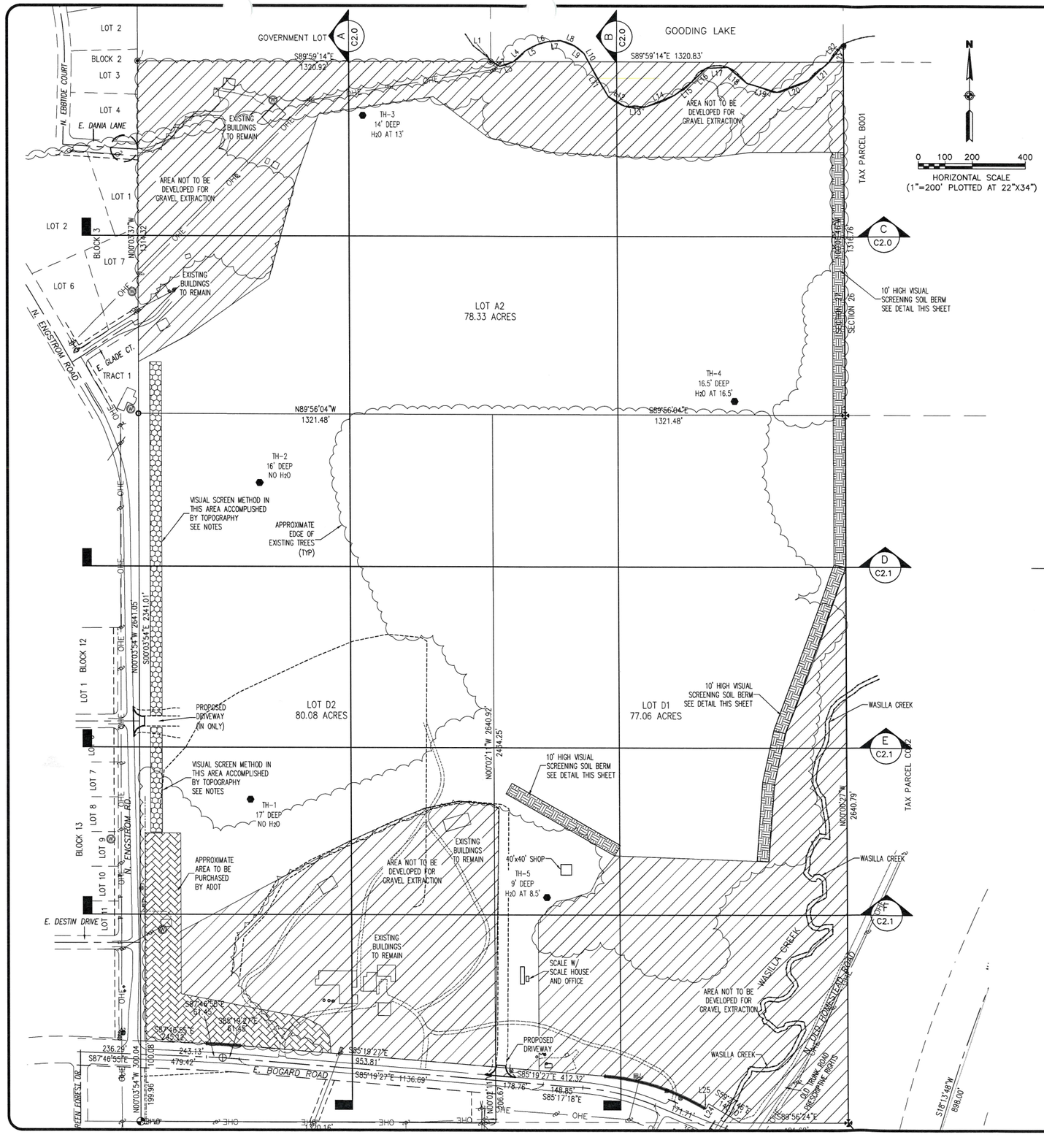
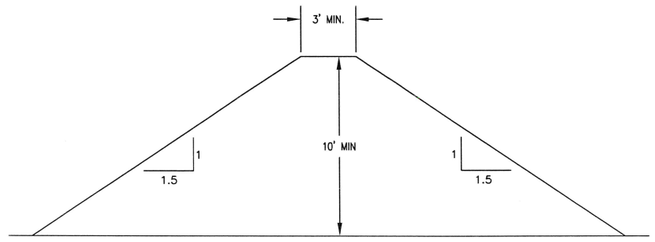
SHEET TITLE
WATERBODIES AND WETLANDS

SHEET
C0.2

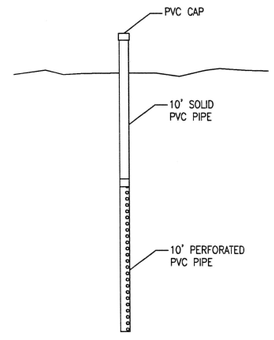


NOTES

1. LOCATION OF 10' HIGH VISUAL SCREENING BERM TO BE ADJUSTED AS NEEDED.
2. MATERIAL EXTRACTION TO BEGIN IN THE LOWER ELEVATION AREAS AND MOVE OUT FROM THERE. AS A RESULT, THE FINISH GRADE TOPOGRAPHY ALONG ENGSTROM ROAD WILL ALWAYS BE AT LEAST 10' LOWER THAN THE PROPERTY LINE. THIS WILL ACT AS VISUAL SCREENING AND NO ADDITIONAL BERM WILL BE NEEDED. SEE SECTION D/C2.1.
3. ALL PROCESSING EQUIPMENT (SCREENING PLANTS, CRUSHERS, CONVEYOR BELTS, ETC.), PERMANENT AND TEMPORARY STRUCTURES, AND MATERIAL PILES ARE TO BE PLACED +40' AT ALL TIMES FROM ALL PROPERTY LINES.



1 C1.0 10' HIGH SOIL BERM
SCALE: NOT TO SCALE



NOTES

1. INSTALL MONITORING WELLS AT THE PERIMETER OF THE AREA WHERE MATERIAL IS BEING EXTRACTED.
2. WHEN SOIL IS EXTRACTED TO TOP OF PERFORATED PIPE, REMOVE WELL AND RELOCATE IT AT A DEEPER ELEVATION.

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2 C1.0 GROUND WATER MONITORING WELL
SCALE: NOT TO SCALE

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CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
LOTS A2, D1, D2, TOWNSHIP 18N RANGE 1E SECTION 27

BY	DATE	REVISIONS

JOB NO.: 23-016
DATE: 8/12/2024
DRAWN: DES
REVIEWED: DES

SHEET TITLE
SITE PLAN

SHEET
C1.0

N

0 100 200 400
HORIZONTAL SCALE
(1"=200' PLOTTED AT 22"X34")

NOTES

1. FINISH GRADE IS SHOWN WITH FINAL CONTOURS. FINAL FINISH GRADE MAY CHANGE DEPENDING ON WHAT SOILS AND GROUNDWATER IS ENCOUNTERED AS MATERIAL EXTRACTION TAKES PLACE.

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CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
LOTS A2, D1, D2, TOWNSHIP 18N RANGE 1E SECTION 27

BY	DATE	REVISIONS

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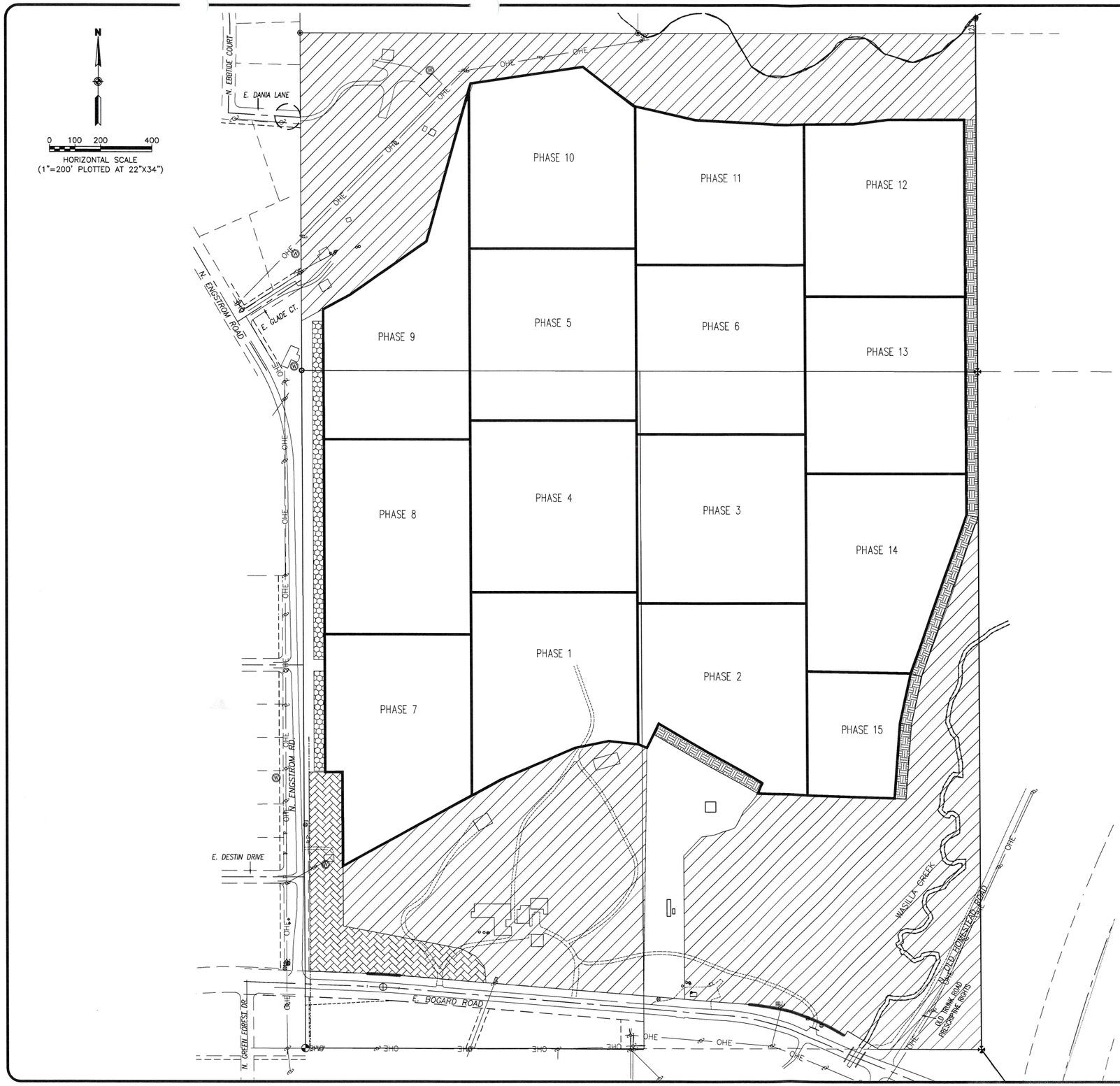
REVIEWED: DES

SHEET TITLE
TOPO PLAN

SHEET
C1.1



NOTES

1. THE PHASES SHOWN ARE 10 ACRES OR LESS.
2. NO MORE THAN 10 ACRES ARE DEVELOPED AT ONE TIME FOR MATERIAL EXTRACTION.
3. AS MORE ADDITIONAL AREA IS DEVELOPED, PREVIOUS DEVELOPED AREAS WILL BE RECLAIMED SO THAT NO MORE THAN 10 ACRES AT A TIME ARE DEVELOPED.
4. PHASES SHOWN ARE AN ESTIMATE. FUTURE EVENTS WILL IMPACT THE PHASING, BUT THE AREA DEVELOPED WILL ALWAYS BE 10 ACRES OR LESS.

STATE OF ALASKA
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CENTRAL GRAVEL PRODUCTS

GRAVEL PIT DEVELOPMENT

LOTS A2, D1, D2, TOWNSHIP 18N RANGE 1E SECTION 27

BY	DATE	REVISIONS

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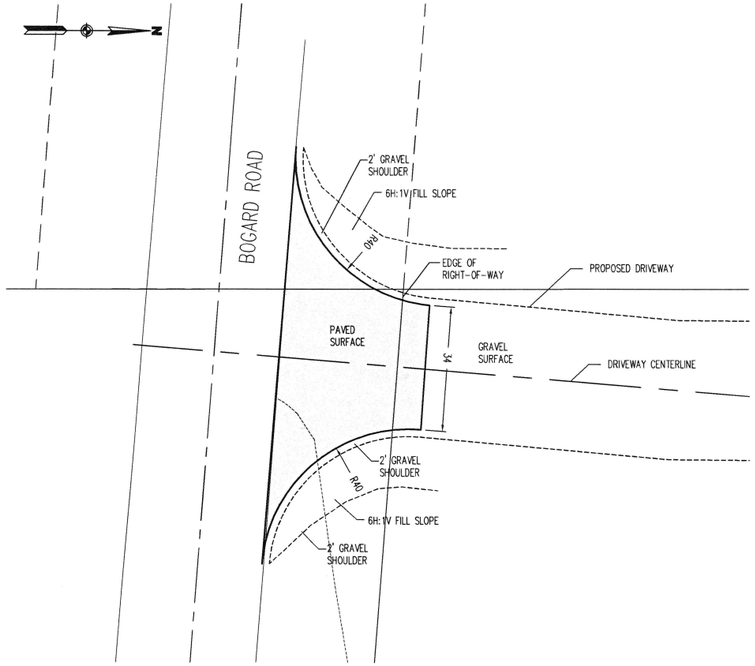
REVIEWED: DES

SHEET TITLE
PHASING PLAN

SHEET
C1.2

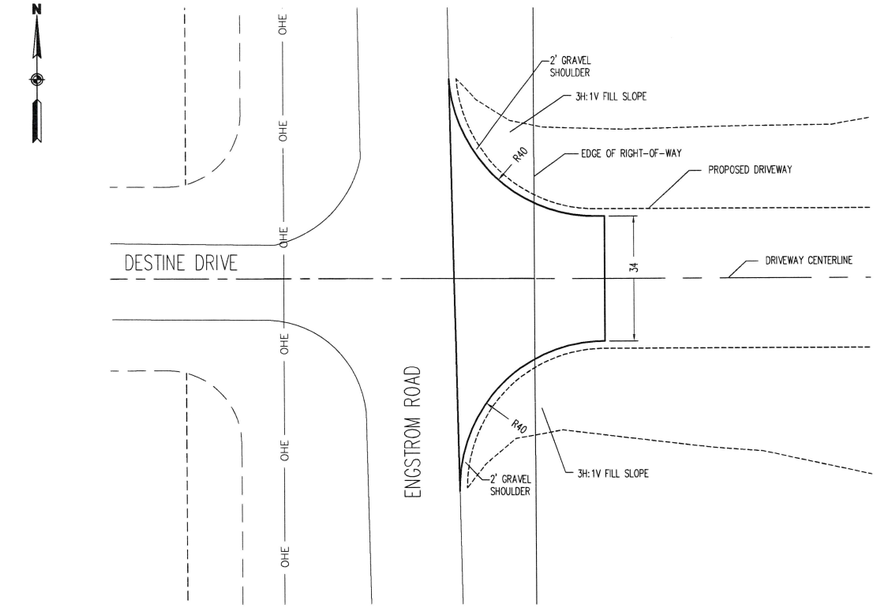


PLAN VIEW
BOGARD ROAD DRIVEWAY
(STATE OF ALASKA)

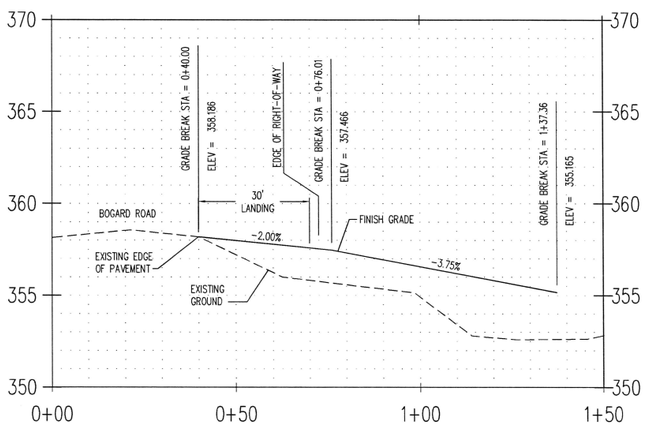
0 10 20 40
HORIZONTAL SCALE
(1"=20' PLOTTED AT 22"X34")
0 2 4 8
VERTICAL SCALE
(1"=4' PLOTTED AT 22"X34")

NOTES

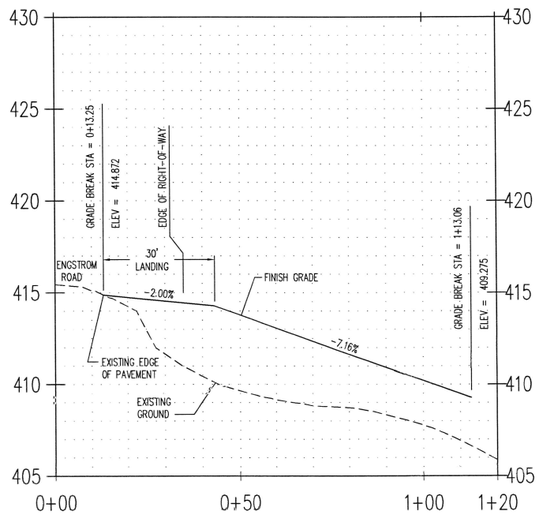
1. ALL WORK IN STATE OF ALASKA RIGHT-OF-WAY TO CONFORM TO THE ADOT DRIVEWAY PERMIT.
2. ALL WORK IN MSB RIGHT-OF-WAY TO CONFORM TO THE MSB DRIVEWAY PERMIT. .
3. ALL DRIVEWAYS TO BE PAVED WITHIN PUBLIC RIGHT-OF-WAY.
4. ENGSTROM ROAD DRIVEWAY TO BE IN ONLY.
5. DUE TO EXISTING TOPOGRAPHY, NO CULVERTS ARE NEEDED IN EITHER DRIVEWAY.



PLAN VIEW
ENGSTROM ROAD DRIVEWAY
(MSB)



PROFILE VIEW
BOGARD ROAD DRIVEWAY
(STATE OF ALASKA)



PROFILE VIEW
ENGSTROM ROAD DRIVEWAY
(MSB)

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49TH
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CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
LOTS A2, D1, D2, TOWNSHIP 18N RANGE 1E SECTION 27

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DATE: 8/12/2024
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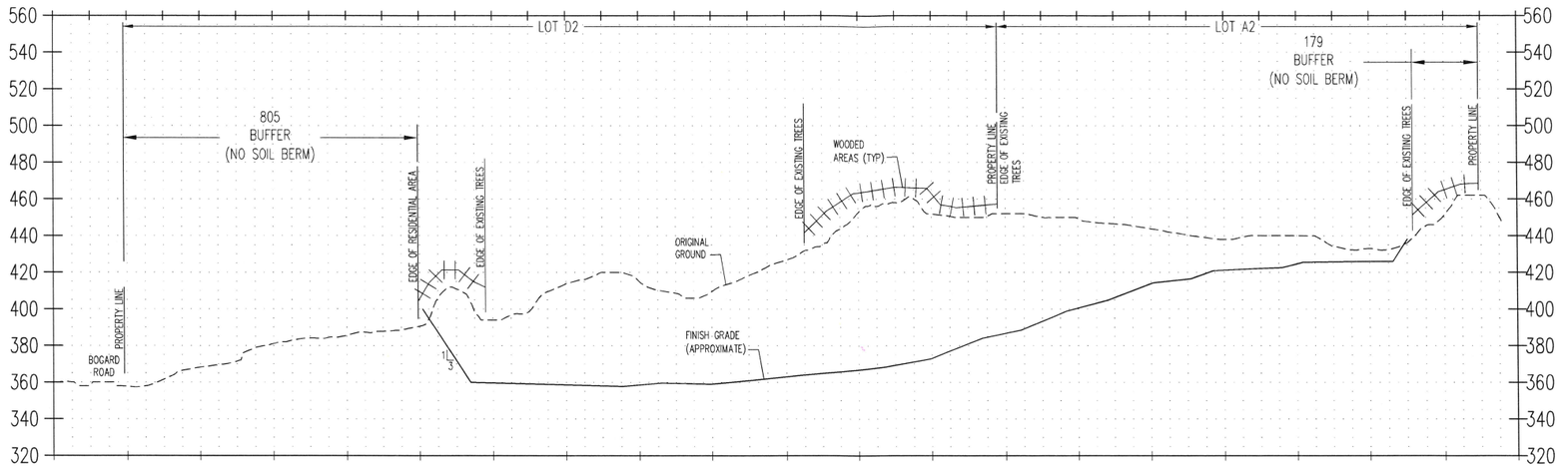
SHEET TITLE
DRIVEWAY PLAN & PROFILE

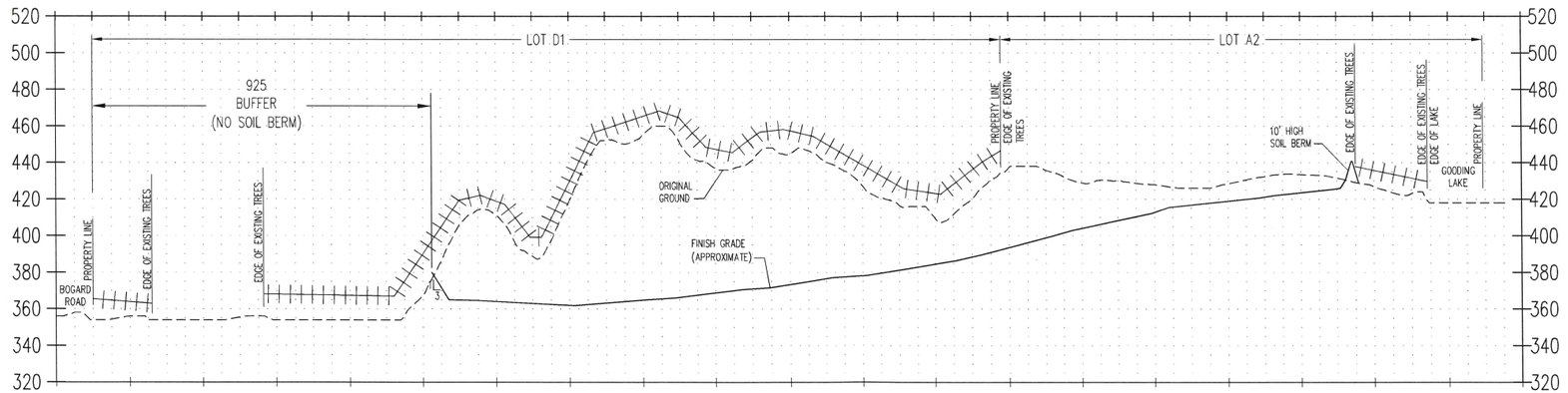
SHEET
C1.3

0 100 200 400
HORIZONTAL SCALE
(1"=200' PLOTTED AT 22"X34")

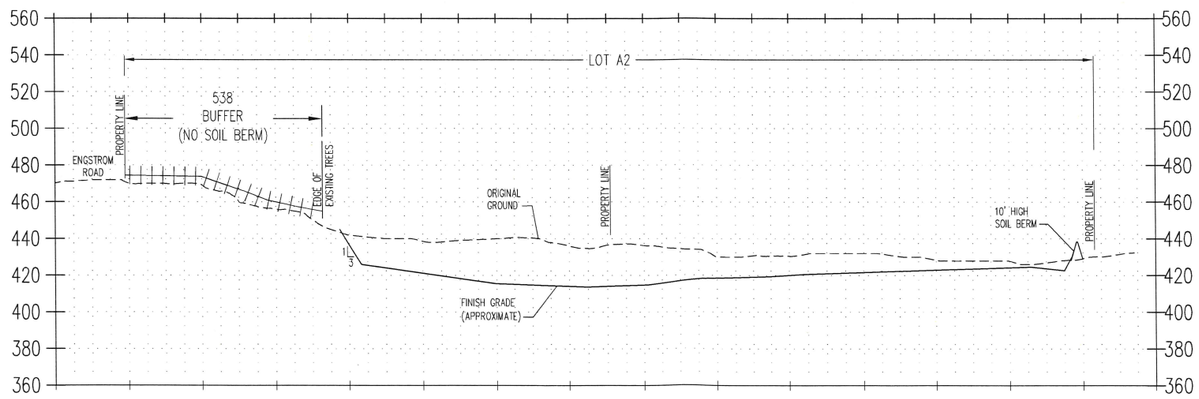
0 20 40 80
VERTICAL SCALE
(1"=40' PLOTTED AT 22"X34")



SECTION A



SECTION B



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CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
LOTS A2, D1, D2, TOWNSHIP 18N RANGE 1E SECTION 27

BY	DATE	REVISIONS

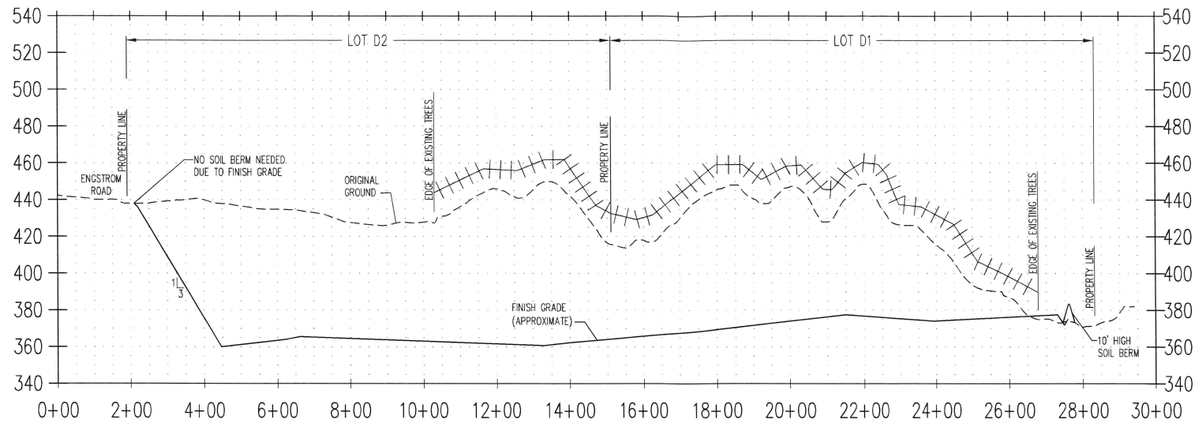
JOB NO.: 23-016
DATE: 8/9/2024
DRAWN: DES
REVIEWED: DES

SHEET TITLE
SITE SECTIONS
A, B, C

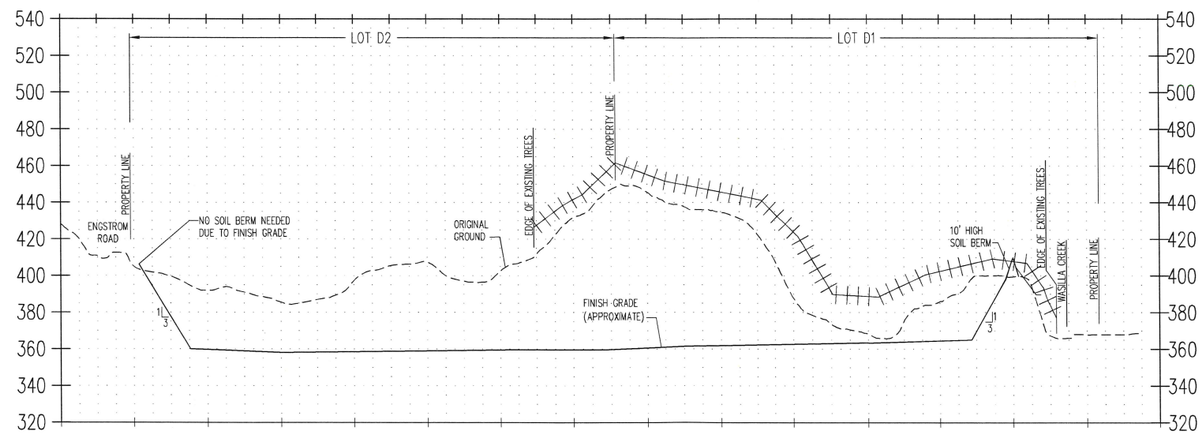
SHEET
C2.0

0 100 200 400
HORIZONTAL SCALE
(1"=200' PLOTTED AT 22"X34")

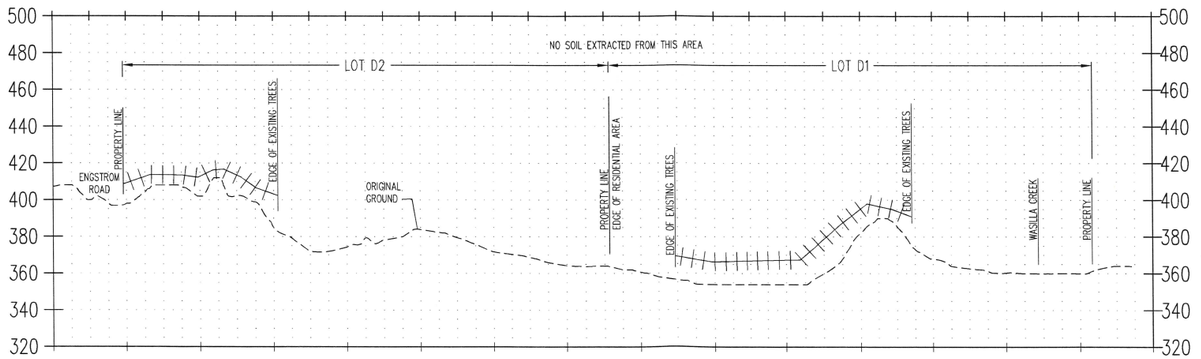
0 20 40 80
VERTICAL SCALE
(1"=40' PLOTTED AT 22"X34")



SECTION D



SECTION E



SECTION F

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STATE OF ALASKA
49TH
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No. CE 9505
8/9/24
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CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
LOTS A2, D1, D2, TOWNSHIP 18N RANGE 1E SECTION 27

BY	DATE	REVISIONS

JOB NO.: 23-016
DATE: 8/9/2024
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REVIEWED: DES

SHEET TITLE
SITE SECTIONS
D, E, F

SHEET
C2.1

N

0 100 200 400
HORIZONTAL SCALE
(1"=200' PLOTTED AT 22"X34")

NOTES

1. THE PLAN IS TO HAVE APPROXIMATELY 10 ACRES BEING WORKED AT ONE TIME. AS MORE AREA IS OPENED FOR MATERIAL EXTRACTION, THE PREVIOUSLY OPENED AREAS WILL BE RECLAIMED.
2. FINISH SLOPES WILL BE TRACK WALKED WITH TRACK EQUIPMENT AND COVERED WITH 4" OF TOPSOIL AND SEEDED.
3. ROOT/ORGANIC DEBRIS WILL EITHER BE BURNED, BURIED, OR LEVELED AND COVERED WITH TOPSOIL.
4. RECLAMATION PLAN MAY CHANGE AS OTHER DEVELOPMENT OPPORTUNITIES BECOME AVAILABLE. THE OWNER WILL UPDATE THE RECLAMATION PLAN AS NEEDED TO REPRESENT ANY CHANGES TO THE PLAN.
5. JUNK VEHICLES, JUNK VEHICLE PARTS, AND TRASH SHALL BE REMOVED IN ACCORDANCE WITH MSB 8.50.
6. SLOPES SHALL NOT BE STEEPER THAN 2H:1V OR THE NATURAL STABILIZED ANGLE OF REPOSE OF THE EXISTING EARTH MATERIAL.
7. SITE SOILS MORE SUSCEPTIBLE TO EROSION OR LIQUEFACTION REQUIRE A SLOPE ADEQUATE TO ENSURE STABILIZATION.
8. SLOPES SHALL BE GRADED TO BLEND WITH THE SURROUNDING UNDISTURBED TOPOGRAPHY.
9. SURFACE WATER QUALITY SHALL BE PROTECTED BY IMPLEMENTING APPLICABLE BEST MANAGEMENT PRACTICES DESCRIBED IN THE CURRENT PUBLICATION OF THE STATE OF ALASKA'S USER MANUAL BEST MANAGEMENT PRACTICES FOR GRAVEL PITS.
10. ALL DISTURBED AREAS SHALL BE COVERED WITH A MINIMUM COMPACTION DEPTH OF FOUR INCHES OF TOPSOIL STRIPPED AND STOCKPILED DURING INITIAL DEVELOPMENT ACTIVITIES. IN CASES WHERE THERE IS INSUFFICIENT TOPSOIL ON SITE TO PROVIDE THIS MINIMUM COVERAGE, ALL AVAILABLE TOPSOIL SHALL BE RETAINED FOR RECLAMATION.
11. NATURAL SUBSTANCES AND ORGANIC MATERIALS THAT HAVE WATER AND NUTRIENT HOLDING CAPACITY CONDUCIVE TO PLANT GROWTH MAY BEUSED AS A SUBSTITUTE FOR TOPSOIL.
12. ALL SURFACE AREAS SHALL BE STABILIZED AND PROTECTED AGAINST EROSION.
13. A VEGETATIVE COVER SHALL BE ESTABLISHED AND MAINTAINED OVER ALL DISTURBED AREAS ON THE MATERIAL EXTRACTION SITE IN CONFORMANCEWITH THE CURRENT ALASKA STATE DEPARTMENT OF NATURAL RESOURCES, DIVISION OF AGRICULTURE, REVEGETATION MANUAL FOR ALASKA.
14. SIXTY PERCENT LIVE PLANT COVER OF THE ENTIRE RESTORED AREA SHALL BE ACHIEVED BY THE END OF THE FOURTH GROWING SEASON AFTER THEPHASE IS COMPLETED.
15. RESEEDING OF RECLAIMED AREAS SHALL UTILIZE CERTIFIED SEED SUITABLE FOR ALASKA CONDITIONS THAT IS FREE OF NOXIOUS WEEDS OR UNDESIRABLEPLANT SPEGIES IDENTIFIED IN 11 AAC 34.020, PROHIBITED AND RESTRICTED NOXIOUS WEEDS.
16. AREAS COVERED BY BUILDINGS, PAVED DRIVEWAYS, PAVED ROADS, AND PAVED PARKING LOTS AND AREAS WHERE FUTURE UTILITY EASEMENTS AND SEPTIC SYSTEMS WILL EXIST ARE EXEMPT FROM THE RECLAMATION STANDARDS OUTLINED IN SUBSECTIONS (F) THROUGH (H) OF THIS SECTION.

STATE OF ALASKA
49TH
DAN E. STEINER
No. CE 9505
9/12/24
REGISTERED PROFESSIONAL ENGINEER

SDCS, LLC
STEINER DESIGN & CONSTRUCTION SERVICES, LLC
5900 W. DEWBERRY DR. PH:(907) 357-5609
WASILLA,AK 99623 FAX:(907) 357-5608

CENTRAL GRAVEL PRODUCTS

GRAVEL PIT DEVELOPMENT

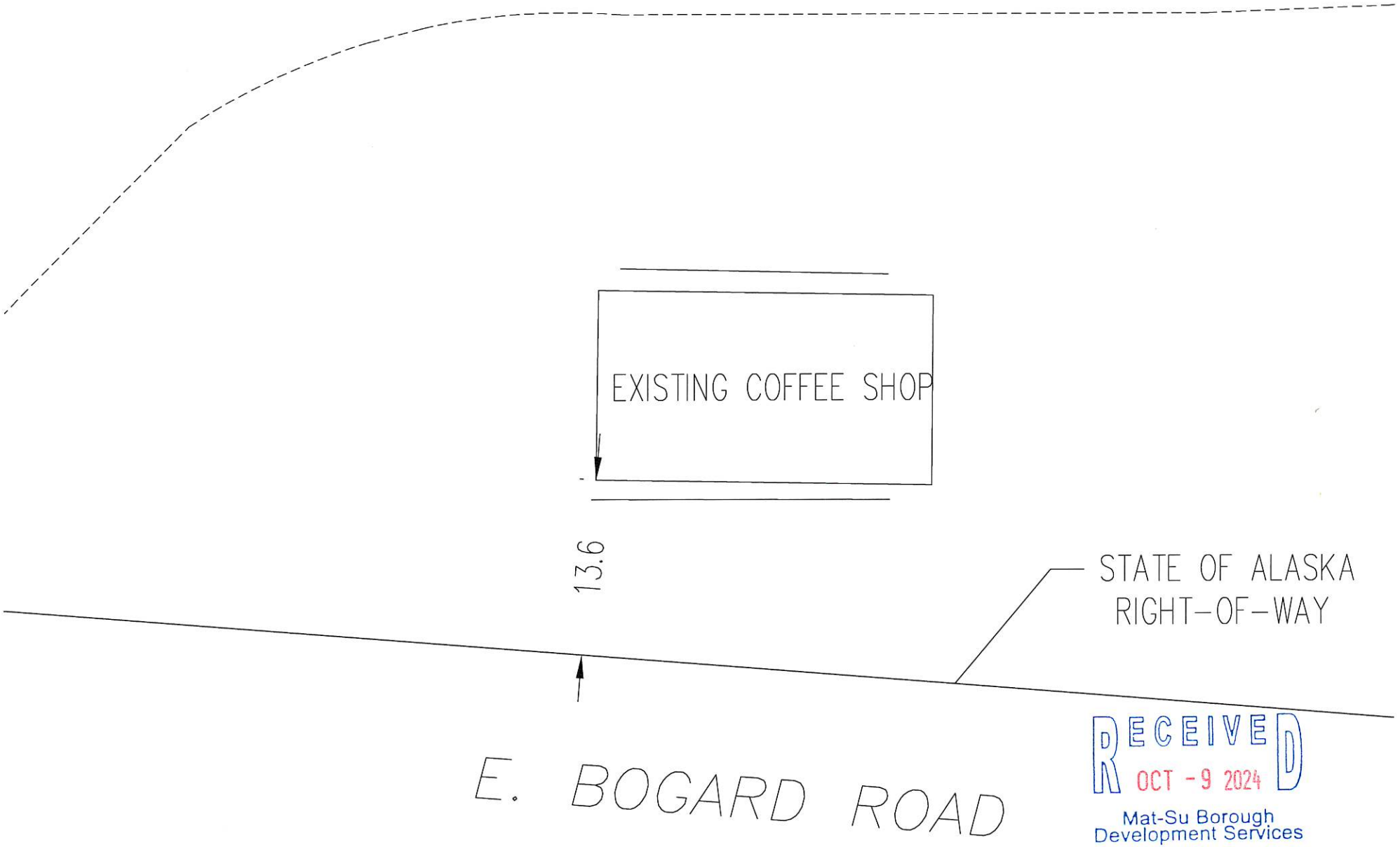
LOTS A2, D1, D2, TOWNSHIP 18N RANGE 1E SECTION 27

BY	DATE	REVISIONS

JOB NO.: 23-016
DATE: 8/12/2024
DRAWN: DES
REVIEWED: DES

SHEET TITLE
RECLAMATION PLAN

SHEET
C3.0



Peggy Horton

From: dsteiner@mtaonline.net
Sent: Thursday, September 12, 2024 12:46 PM
To: Peggy Horton
Subject: FW: LAS35179 Reclamation Bond/Application

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
Peggy,

This is to let you know that they have completed the DNR stuff for the gravel pit.

Dan Steiner, PE
SDCS, LLC
(wk) 907-357-5609
(cell) 907-715-7704

From: Newcomb, Grace R (DNR) <grace.newcomb@alaska.gov>
Sent: Thursday, September 12, 2024 12:32 PM
To: Central Gravel <centralgravelproducts@hotmail.com>
Cc: 'Dan Steiner (dsteiner@mtaonline.net)' <dsteiner@mtaonline.net>; Micelotta, Cinnamon A (DNR) <cinnamon.micelotta@alaska.gov>
Subject: RE: LAS35179 Reclamation Bond/Application

Hello,

Thank you, we have received your signed bond document, and your letter of approval is now under review.

Best,

Grace Newcomb
Natural Resource Specialist

Department of Natural Resources
Division of Mining, Land, and Water
Material Sales Program
550 W 7th Ave Ste 900c
Anchorage, AK 99501-3577

Ph: (907) 269-8560
F: (907) 269-8913

From: Central Gravel <centralgravelproducts@hotmail.com>
Sent: Wednesday, September 11, 2024 12:27 PM
To: Newcomb, Grace R (DNR) <grace.newcomb@alaska.gov>
Cc: 'Dan Steiner (dsteiner@mtaonline.net)' <dsteiner@mtaonline.net>; Micelotta, Cinnamon A (DNR) <cinnamon.micelotta@alaska.gov>
Subject: LAS35179 Reclamation Bond/Application

Grace,

I just spoke with Lyncoln regarding payment.

Attached please find the bond paperwork and most recent Bienniel Report confirming my status as 50/50 member of the LLC that owns our gravel pit business.

If you have any questions please don't hesitate to contact me via email or on my cell (907) 223-5306.

Central Gravel Products
(907) 745-4044
https://www.facebook.com/Central-Gravel-Products-1399354943638372/

5900 W. Dewberry Dr
Wasilla, AK 99623

SDCS, LLC
STEINER DESIGN & CONSTRUCTION SERVICES, LLC

Phone: (907) 357-5609
Fax: (907) 357-5608

May 10, 2024

Colleen Lowe
State of Alaska Department of Natural Resources
Division of Mining, Land, and Water
550 West 7th Ave., Suite 900C
Anchorage, AK 99501-3577

Re: Central Gravel Products – Gravel Pit – Reclamation Plan for a New Gravel Pit
T18N, R1E, Section 27, Lots D1, D2, and A2
Reclamation Plan Narrative

Ms. Lowe,

Central Gravel Products is developing portions of the above referenced lots into a gravel pit. This gravel pit will produce pit run material and some processed soil (leveling course, sewer rock, etc.). The total acreage of these lots is 230 acres. There are some existing residential structures on these lots. These areas will not be developed as part of the gravel pit. The area that will be used for soil extraction is approximately 150 acres.

This letter is to serve as supplement information to the Material Site Reclamation Plan. The sections where the following information applies will be listed.

4. Description of the Reclamation Operation

a. The current plan is to develop 10 acres at a time. When additional areas are opened up for material extraction, previous areas will be reclaimed.

b. The following type of equipment will be used on site and as part of the reclamation process:

- Track type excavator.
- Large rubber wheeled loader.
- Skid-steer type loader.
- Track type dozer.
- Motor grader.
- Rock Truck
- Dump Truck

Time Schedule for Reclamation Measures - The initial 10 acres will be developed for soil extraction. When these 10 acres near depletion, a portion of the area will be reclaimed and additional area developed so that no more than 10 acres is disturbed at one time.

There will not be a stream channel diversion as part of this project.

No part of this development is in a flood plain.

6. Attachments

Central Gravel Products is leasing the land from the owners. They are:

Lot A2, Section 27, T18N, R1E, Seward Meridian
Name: Bob and Franci Havemeister
Address: P.O. Box 467 Palmer, AK 99645
Phone Number: 907-232-0628

Lot D1, Section 27, T18N, R1E, Seward Meridian
Name: Ralph Kircher
Address: 3182 N. Trunk Road Palmer, AK 99645
Phone Number:

Lot D1, Section 27, T18N, R1E, Seward Meridian
Name: Bob and Jean Havemeister
Address: P.O. Box 2349 Palmer, AK 99645
Phone Number:

Attached are maps showing the location of the parcels to be developed. They are not USGS maps but have more detail than the USGS maps would have.

Attached are plans for the development, however, it is us unknown right now where stockpiles, overburden disposal sites, etc. will be located.

The following equipment will be used for reclamation:

- Track type excavators. (1)
- Large rubber wheeled loader. (1)
- Skid-steer type loader. (1)
- Track type dozer. (1)
- Motor grader. (1)
- Rock Truck. (1)
- Dump Truck. (1)

- The exact dates for reclamation are not yet known.

- Included with this submittal are notarized letters from the owners authorizing developer (Central Gravel Products) to proceed with this work.

- An annual reclamation statement will be provided each year.

- The reclamation measures listed will be used.

Please let me know if you have any questions or need additional information. Thank you for your help with this project.

Sincerely,

Dan Steiner, P.E.
Manager

des
encl.

Storm Water Pollution Prevention Plan

for:

Central Gravel Products
7955 E. Bogard Road
Palmer, AK 99645
907-745-4044

SWPPP Contact(s):

Jade Laughlin
7955 E. Bogard Road
Palmer, AK 99645
907-745-4044
centralgravelproducts@hotmail.com

SWPPP Preparation Date:

05/11/2024

APDES Permit Tracking Number: AKR_____

Contents

SECTION 1: FACILITY DESCRIPTION AND CONTACT INFORMATION

1.1 Facility Information

Facility Information

Name of Facility: Central Gravel Products

Street: 7955 E. Bogard Road

City: Palmer State: AK ZIP Code: 99645

Borough or Similar Government Subdivision: Matanuska Susitna Borough

Permit Tracking Number: No previous permit (if covered under a previous permit)

Latitude/Longitude (Use one of three possible formats, and specify method)

Latitude: Longitude:

3. 61.61629° N (decimal) 3. 149.24632° W (decimal)

Method for determining latitude/longitude (check one):

___USGS topographic map (specify scale:_____) ___ EPA Web site ___ GPS

X Other (please specify): Mat-Su Borough Parcel Viewer

Is the facility located in Indian Country? ___ Yes X No

If yes, name of Reservation, or if not part of a Reservation, indicate "not applicable." N/A

Is this facility considered a Federal Facility? ___ Yes X No

Estimated area of industrial activity at site exposed to storm water: 230 (acres)*

*Approximately 10 acres or less at a time will be disturbed.

Discharge Information

Does this facility discharge storm water into an MS4? ___ Yes X No

If yes, name of MS4 operator: N/A

Name(s) of water(s) that receive storm water from your facility: Wasilla Creek

Are any of your discharges directly into any segment of an "impaired" water? ___ Yes X No

If Yes, identify name of the impaired water (and segment, if applicable): N/A

Identify the pollutant(s) causing the impairment: N/A

For pollutants identified, which do you have reason to believe will be present in your discharge? N/A

For pollutants identified, which have a completed TMDL? N/A

Are any of your storm water discharges subject to effluent guidelines? ____ Yes X No

If Yes, which guidelines apply? N/A

Primary SIC Code or 2-letter Activity Code (refer to Appendix D of the 2020 MSGP): 1311

Identify your applicable sector and subsector: Sector J, Subsector J1

1.2 Contact Information/Responsible Parties

Facility Operator (s):

Name: Jade Laughlin
Title: Owner
Address: 7955 E. Bogard Road
City, State, Zip Code: Palmer , AK 99645
Telephone Number: 907-745-4044
Email address: centralgravelproducts@hotmail.com

Facility Owner (s):

Name: Jade Laughlin
Title: Owner
Address: 7955 E. Bogard Road
City, State, Zip Code: Palmer , AK 99645
Telephone Number: 907-745-4044
Email address: centralgravelproducts@hotmail.com

SWPPP Contact:
Name: Jade Laughlin
Telephone number: 907-745-4044
Email address: centralgravelproducts@hotmail.com

1.3 Storm Water Pollution Prevention Team

Staff Names	Individual Responsibilities
	Assisting the facility manager in developing and revising the facility's SWPPP.
	Implementing and maintaining control measures/BMPs, and taking corrective actions where required.
	Inspection and completing inspection reports.

1.4 Activities at the Facility

This facility will produce sand and gravel products for sale. This includes excavation of existing soil, sorting materials, and processing materials into usable sand and gravel products.

1.5 General Location Map

A copy of the general location map for this facility is in Appendix A.

1.6 Site Map(s)

A copy of the site map for this facility is in Appendix B.

SECTION 2: POTENTIAL POLLUTANT SOURCES

2.1 Industrial Activity and Associated Pollutants

Industrial Activity	Associated Pollutants
Fueling equipment.	Diesel and gasoline.
Processing Sand and Gravel	Hydraulic Fluid from machinery.
Servicing equipment.	Fuel, motor oil, antifreeze, other lubricants, grease.

2.2 Spills and Leaks

Areas of Site Where Potential Spills/Leaks Could Occur

Location	Outfalls
Fuel tanks (see site map)	None *
Maintenance Shop (fuel, motor oil, antifreeze, other lubricants, grease)	None*
*Wasilla Creek is at the southeast corner of this site. However, due to the vegetative buffer and the topography at the site, it would be virtually impossible for runoff from the site to reach the creek.	

Description of Past Spills/Leaks

This is a new facility. There are no past spills or leaks.

2.3 Non-Storm Water Discharges Documentation

This is a new facility. This section is not applicable.

2.4 Salt Storage

None.

2.5 Sampling Data Summary

N/A

SECTION 3: STORM WATER CONTROL MEASURES

3.1 Minimize Exposure

Though this site is 230 acres, approximately only ten acres at a time will be disturbed. As material extraction is completed in an area, the land will be reclaimed as additional area is opened for extraction. This will minimize the total area that is disturbed and exposed at one time.

3.2 Good Housekeeping

Due to the type of activities at this site, there will be very little chance for the accumulation of waste on the site. A visual inspection of the site will take place every two working days to see if there is garbage that needs to be collected and placed in garbage cans. Garbage cans will be emptied as needed. Garbage cans will have lids to prevent waste from being blown out of the cans.

Any fuel / oil containers will be visually inspected daily to check for any leaks.

3.3 Maintenance

The equipment that will be on site includes loader(s), excavator(s), screening and crushing equipment, other earth moving equipment, and trucks. All equipment will be inspected weekly to make sure there are no leaking fluids and is in operational condition.

3.4 Spill Prevention and Response

The only "tanks" that are anticipated to be on site will be a fuel tank(s) storing fuel for the equipment. However, if there are any other storage tanks on site, it is anticipated that all tanks will be property labeled and appropriately protected.

In the case of a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 Code of Federal Regulations (CFR) Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period:

- The CONTRACTOR will call 911 and provide notice to the ADEC (269-3063) and the National Response Center at 800–424–8802 in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117, and 40 CFR Part 302 as soon as site staff have knowledge of the discharge.

3.5 Erosion and Sediment Controls

With the topography of the site, runoff will not leave the areas where soil extraction is taking place. There will also be a vegetative buffer consisting of existing vegetation and / or a 10' high soil berm surrounding the site. This buffer will remain in place during the life of the gravel pit and prevent erosion from leaving the site or entering water bodies.

3.6 Management of Runoff

With the topography of the site, runoff will not leave the areas where soil extraction is taking place. The existing soils are very permeable gravely sand. All rain, runoff, and snow melt will be absorbed into the ground.

3.7 Salt Storage Piles or Piles Containing Salt

No salt will be stored on site.

3.8 MSGP Sector-Specific Non-Numeric Effluent Limits

This project is a "Sector J" activity. There are no Sector-specific effluent limits that apply to Sector J activities.

3.9 Employee Training

All full-time employees will be trained on this SWPPP and their role in fulfilling the SWPPP requirements. This will take place at the time of hiring.

A review of the SWPPP and any changes will take place with full-time employees at least annually. An employee training log is located in the appendix.

3.10 Non-Storm Water Discharges

With the topography of the site, runoff will not leave the areas where soil extraction is taking place. As a result, there will be no non-storm water discharges as part of this project.

3.11 Waste, Garbage and Floatable Debris

There will be a garbage can on site that is maintained by the site owner. A portable toilet may also be on site and will be maintained by the company who provides the toilet. There is no control point for these items.

3.12 Dust Generation and Vehicle Tracking of Industrial Materials

If needed, dust will be controlled on the site by use of a water truck sprinkling the area. Any vehicle tracking soil onto the adjacent road will be cleaned with hand brooms or street sweeper.

SECTION 4: SCHEDULES AND PROCEDURES FOR MONITORING

Wasilla Creek is at the southeast corner of this site. However, due to the vegetative buffer and the topography at the site, it would be virtually impossible for runoff from the site to reach the creek. As a result, no monitoring will be needed.

SECTION 5: INSPECTIONS

For the routine facility inspection and the comprehensive site inspection to be performed at your site:

- The names of the person(s), or the positions of the person(s), responsible for inspection: Jade Laughlin or an appointed representative (add name here) .
- The schedule to be used for conducting the inspections. A comprehensive site inspection will take place on May 20, o each year.
-
- Specific areas of the facility to be inspected, including schedules for specific outfalls: No outfalls are anticipated. No inspection schedule is needed.

For the quarterly visual assessments to be performed at this site:

- The names of the person(s), or the positions of the person(s), responsible for inspection: Jade Laughlin or an appointed representative = .
- The schedules to be used for conducting inspections. Include here any tentative schedule that will be used for facilities in climates with irregular storm water runoff discharges (2020 MSGP, Part 6.2.3): No outfalls are anticipated. No inspection schedule is needed.

- Specific areas of the facility to be inspected, including schedules for specific outfalls: No outfalls are anticipated. No inspection schedule is needed.

Inactive and Unstaffed sites exception

This site will closed from November 2 to April 30. The site will have no one on site. No material will be excavated or processed during this time. No inspections will be needed during this time.

SECTION 6: SWPPP CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ Title: _____

Signature: _____ Date: _____

SECTION 7: SWPPP MODIFICATIONS

- This SWPPP is a "living" document and is required to be modified and updated, as necessary, in response to corrective actions.
    - If you need to modify the SWPPP in response to a corrective action the certification statement in section 7 of this SWPPP

For any other SWPPP modification, you should keep a log with a description of the modification, the name of the person making it, and the date and signature of that person.

RECORD OF SWPPP AMENDMENTS

Date of Revision	Section	Description

RECORD OF SWPPP AMENDMENTS

Date of Revision	Section	Description

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A: General Location Map

Appendix B: Site Map

Appendix C: 2020 MSGP

Appendix D: NOI and Acknowledgement Letter from EPA/State

Appendix E: Corrective Action Log

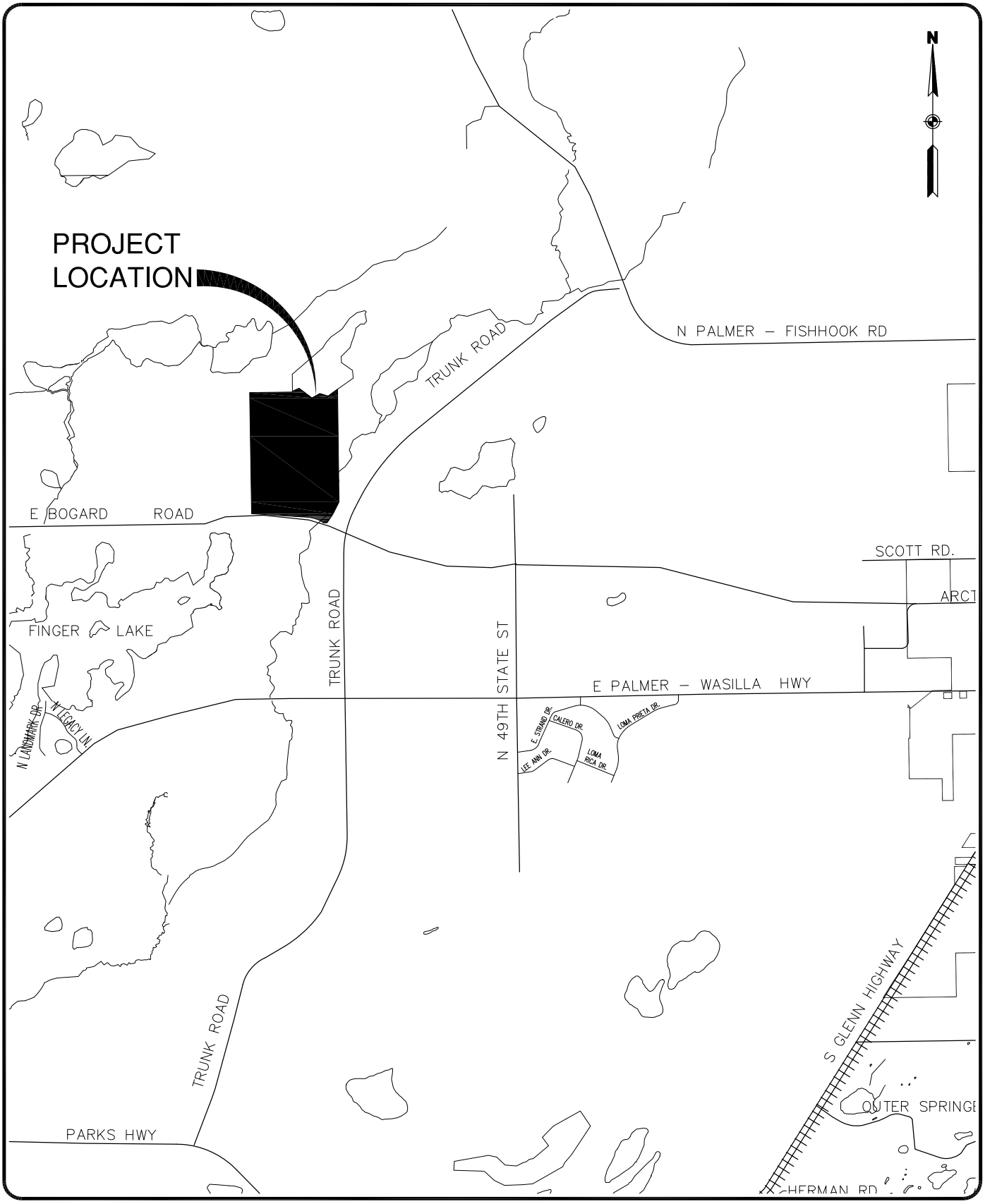
Appendix F: Employee Training Log

Appendix G: Stormwater Industrial Routine Facility Inspection Report

Appendix H: Quarterly Visual Assessment Reports

Appendix I: eNOI Instructions

Appendix A:
General Location Map



SDCS, LLC
STEINER DESIGN & CONSTRUCTION SERVICES, LLC
5900 W. DEWBERRY DR. PH: (907) 357-5609
WASILLA, AK 99623 FAX: (907) 357-5608

CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
MSGP – STORM WATER POLLUTION PREVENTION PLAN

VICINITY MAP

FIGURE 1A

SDCS, LLC
STEINER DESIGN & CONSTRUCTION SERVICES, LLC
5900 W. DEWBERRY DR. PH: (907) 357-5609
WASILLA, AK 99623 FAX: (907) 357-5608

CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
MSGP – STORM WATER POLLUTION PREVENTION PLAN

LOCATION MAP

FIGURE 1B

Appendix B:
Site Map

CENTRAL GRAVEL PRODUCTS
GRAVEL PIT DEVELOPMENT
MSGP - SWPPP

SHEET TITLE
SITE PLAN

SHEET
2

Appendix C:
2020 MSGP

ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

MULTI-SECTOR GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY (MSGP)

Permit Number: AKR060000 – **Final**

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

In compliance with the provisions of the Clean Water Act (CWA), 33 U.S.C. §1251 *et seq*., as amended by the Water Quality Act of 1987, P.L. 100-4, this permit is issued under provisions of Alaska Statutes (AS) 46.03; the Alaska Administrative Code (AAC) as amended; and other applicable State laws and regulations. Operators of storm water discharges associated with industrial activity located in an area identified in Part 1.1 where the Alaska Department of Environmental Conservation (DEC) is the permitting authority are authorized to discharge to waters of the United States in accordance with the eligibility and Notice of Intent (NOI) requirements, effluent limitations, inspection requirements, and other conditions set forth in this permit. This permit is structured as follows:

- General requirements that apply to all facilities are found in Parts 1 through 10, and
- Industry sector-specific requirements are found in Part 11.

The Appendices (A through F) contain additional permit conditions that apply to all operators covered under this permit.

This permit becomes effective on April 1, 2020.

This permit and the authorization to discharge expire at midnight, March 31, 2025.

Signature	February 20, 2020 Date
Gene McCabe Printed Name	Program Manager Title

APDES MULTI-SECTOR GENERAL PERMITS FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY

TABLE OF CONTENTS

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Appendix A – Standard Conditions
Appendix B – Abbreviations and Acronyms
Appendix C – Definitions
Appendix D – Facilities and Activities Covered
Appendix E – Calculating Hardness in Receiving Waters for Hardness Dependent Metals
Appendix F – MSGP Forms

SCHEDULE OF SUBMISSIONS

The Schedule of Submissions summarizes some of the required submissions and activities the permittee must complete and/or submit to the Alaska Department of Environmental Conservation (DEC) during the term of this permit. The permittee is responsible for all submissions and activities even if they are not summarized below.

Table: Schedule of Submissions

Permit Part	Submittal or Completion	Frequency	Due Date	Submit to [a]
1.3	No Exposure Certification	Once, depending on facility status	Once every five years	Permitting Program
2.1.3, 5.2	Storm Water Pollution Prevention Plan (SWPPP)	Once at beginning of coverage	At filing of NOI	Permitting Program
2.1.5, 2.2	Notice of Intent (NOI)	Once at beginning of coverage	Once per permit cycle	Permitting Program
2.7	NOI Modification	As needed	As needed	Permitting Program
7.2.1.2, 7.2.2.1	Monitoring	Quarterly during first year	the 15th day of the following month	Compliance and Enforcement Program
9.3	Noncompliance Notification Form	Upon exceedance of effluent limit	the 15th day of the following month	Compliance and Enforcement Program
8.4	Corrective Action Report	Upon exceedance (See Part 8.1 and 8.2)	Submit with Annual Report	Compliance and Enforcement Program
9.2	Annual Report	Annually	By Feb 15th of the year following the reporting year	Compliance and Enforcement Program
9.4	Additional Reporting	See Section for details	See Section for details	Compliance and Enforcement Program
10.1	Notice of Termination	Once	At end of permit coverage	Permitting Program

Notes:
a. See Part 9.6 Addresses for Reports

Summary of Permit Required On-Site Documentation

Permit Part	Document Name or Title	Frequency	Purpose of Document
1.3	No Exposure Certification	Once every five years	To demonstrate facility has reviewed the permit and facility to determine they do not need to file for permit coverage
2.1.3, 5.2	SWPPP	Developed prior to submitting the NOI. Updated as necessary	To describe the project and the control measures to minimize the discharge of pollutants into waters of the U.S. Documents installation, maintenance, inspections, corrective actions, and reporting.
2.1.5, 2.2	NOI	Once at start of coverage	Applicant request for authorization to discharge under permit coverage
2.4	DEC NOI Reply Letter	Once at start of coverage	To provide permittee with DEC permit tracking number indicating project is covered by MSGP
2.7	NOI Modification	As needed	To modify the original NOI if facility conditions or lead personnel change
5.8.3	Copy of Permit Part 1-10 and Sector specific section	Include in SWPPP	To provide reference during permit period
6.1, 6.3.2	Inspection Reports	Conducted at frequency specified in MSGP and SWPPP	To monitor compliance with SWPPP and MSGP
7.2, 7.2.2.1 7.2.1.2	Monitoring Reports	Conducted at frequency specified in MSGP	To monitor compliance with MSGP
7.2.2.3, 9.3	Noncompliance Notification	As needed	To report any exceedances found during monitoring
8.4	Corrective Action Report	As needed	To report the corrective actions taken at the facility
9.2	Annual Report	Annually	To report annual results of inspections
9.4	Additional Reporting	As required	To provide additional information
10.1	Notice of Termination	Once	To close coverage by the permit.

1. Coverage under this Permit.

1.1 Permit Area.

This general permit covers waters of the United States (U.S.) located in the State of Alaska, except the Indian Reservation of Metlakatla and the Denali National Park and Preserve.

1.2 Eligibility.

1.2.1 **Facilities Covered**. To be eligible to discharge under this permit, a permittee must (1) have a storm water discharge associated with industrial activity from the permittee's primary industrial activity, as defined in Appendix C, provided their primary industrial activity is included in Appendix D, or (2) be notified by DEC that the permittee is eligible for coverage under Sector AD of this permit.

1.2.2 **Allowable Storm Water Discharges**. Unless otherwise made ineligible under Part 1.2.4, the following discharges are eligible for coverage under this permit:

1.2.2.1 Storm water discharges associated with industrial activity for any primary industrial activities and co-located industrial activities, as defined in Appendix C;

1.2.2.2 Discharges designated by DEC as needing a storm water permit as provided in Sector AD;

1.2.2.3 Discharges that are not otherwise required to obtain APDES permit authorization but are commingled with discharges that are authorized under this permit (i.e., allowable non-storm water discharges commingled with allowable storm water discharges); and

1.2.2.4 Discharges subject to any of the national storm water-specific effluent limitations guidelines listed in Table 1-1.

(Table 1-1: Storm Water-Specific Effluent Limitations Guidelines located on following page.)

Table 1-1: Storm Water-Specific Effluent Limitations Guidelines

Regulated Discharge	40 CFR Section	MSGP Sector	New Source Performance Standard (NSPS)	New Source Date
Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas	Part 429, Subpart I	A	Yes	1/26/81
Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished product, by-products or waste products (SIC 2874)	Part 418, Subpart A	C	Yes	4/8/74
Runoff from asphalt emulsion facilities	Part 443, Subpart A	D	Yes	7/28/75
Runoff from material storage piles at cement manufacturing facilities	Part 411, Subpart C	E	Yes	2/20/74
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	Part 436, Subparts B, C, and D	J	No	N/A
Runoff from hazardous waste and non-hazardous waste landfills	Part 445, Subparts A and B	K, L	Yes	2/2/00
Runoff from coal storage piles at steam electric generating facilities	Part 423	O	Yes	11/19/82 (10/8/74)[1]
Existing and new primary airports with 1,000 or more annual jet departures that discharge wastewater associated with airfield pavement deicing that contains urea commingled with stormwater	Part 449, Subpart A	S	Yes	6/15/12

1.2.3 **Allowable Non-Storm Water Discharges**. The following are the non-storm water discharges authorized under this permit, provided the non-storm water component of the permittees discharge is in compliance with Part 4.2.10:

- Discharges from emergency/unplanned fire-fighting activities;
- Fire hydrant flushings;
- Potable water, including water line flushings;
- Uncontaminated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids;
- Irrigation drainage;
- Landscape watering provided all pesticides, herbicides, and fertilizer have been applied in accordance with the approved labeling;

[1] NSPS promulgated in 1974 were not removed via the 1982 regulation; therefore wastewaters generated by Part 423-applicable sources that were New Sources under the 1974 regulations are subject to the 1974 NSPS.

- Pavement wash waters where no detergents or hazardous cleaning products are used (e.g., bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols), and the wash waters do not come into contact with oil and grease deposits or any other toxic or hazardous materials (unless cleaned up using dry clean-up methods). The permittee is prohibited from directing any authorized pavement wash waters directly into any surface water or storm drain inlet unless the permittee has implemented appropriate control measures that meet the non-numeric effluent limits in Part 4.2. Where appropriate control measures are not in place, wash water runoff must first undergo treatment prior to discharge such as filtration, detention, or settlement;

- Routine external building washdown / power washwater that does not remove significant amount of building paint or use detergents or hazardous cleaning products, (such as those containing bleach, hydrofluoric acid, muriatic acid, sodium hydroxide, nonylphenols);

- Uncontaminated ground water or spring water;

- Foundation or footing drains where flows are not contaminated with process materials;

- Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility, but not intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains);

- Discharges from the spray down of lumber and wood product storage yards where no chemical additives are used in the spray-down waters and no chemicals are applied to the wood during storage (applicable only to Sector A facilities provided the non-stormwater component of the discharge is in compliance with the non-numeric effluent limits requirements in Part 4.2).

- Other uncontaminated discharges meeting water quality criteria that the Department approves on a case-by-case basis.

1.2.3.1 Also allowed for all sectors are discharges of stormwater listed above in Parts 1.2.2 or authorized non-stormwater discharges in Part 1.2.3, mixed with a discharge authorized by a different APDES permit and/or a discharge that does not require APDES permit authorization. All other non-stormwater discharges requiring APDES permit coverage except those specifically listed in Part 1.2.3 are not authorized by this permit. If non-stormwater discharges requiring APDES permit coverage other than those specifically authorized in Part 1.2.3, including sector-specific non-stormwater discharges that are listed in Part 11 as prohibited (a non-exclusive list provided to raise awareness of contaminants or sources of contaminants characteristic of certain sectors), will be discharged, such non-stormwater discharges are not authorized by this permit and must either be eliminated or covered under another APDES permit.

1.2.4 **Limitations on Coverage**.

1.2.4.1 **Discharges Mixed with Non-Storm Water.** Storm water discharges that are mixed with non-storm water, other than those non-storm water discharges listed in Part 1.2.3, are not eligible for coverage under this permit.

1.2.4.2 **Discharges Associated with Construction Activity**. Storm water discharges associated with construction activity disturbing one acre or more, or that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb one acre or more, are not eligible for coverage under this permit, unless in conjunction with mining activities or certain oil and gas extraction activities as specified in Sectors G, H, I, and J of this permit.

1.2.4.3 **Discharges Currently or Previously Covered by another Permit.** Unless the permittee received written notification from DEC specifically allowing these discharges to be covered under this permit, the permittee is not eligible for coverage under this permit for any of the following:

- Storm water discharges associated with industrial activity that are currently covered under an individual APDES permit or an alternative APDES general permit;
- Discharges covered within five years prior to the effective date of this permit by an individual permit or alternative general permit where that permit established site-specific numeric water quality-based limitations developed for the storm water component of the discharge; or
- Discharges from facilities where any APDES permit has been or is in the process of being denied, terminated, or revoked by EPA (this does not apply to the routine reissuance of permits every five years).

1.2.4.4 **Discharges Subject to Effluent Limitations Guidelines.** For discharges subject to storm water effluent limitation guidelines under 40 CFR, Subchapter N, only those storm water discharges identified in Table 1-1 are eligible for coverage under this permit.

1.2.4.5 **Eligibility for New Dischargers: Based on Water Quality Standards**. A new discharger (as defined in Appendix C), is not eligible for coverage under this permit for discharges that DEC, prior to authorization under this permit, determines will not meet WQS. Where such a determination is made prior to authorization, DEC may notify the applicant that an individual or other general permit APDES application is necessary in accordance with Part 2.8. However, DEC may authorize coverage under this permit after the applicant has included appropriate controls and implementation procedures designed to ensure the discharge meets WQS. In the absence of information demonstrating otherwise, DEC expects that compliance with the storm water control requirements of this permit, including the requirements applicable to such discharges in Part 4, will meet WQS.

1.2.4.6 **New Discharges to Water Quality Impaired Waters**.[2] If the permittee is a new discharger they are not eligible for coverage under this permit to discharge to an "impaired water", as defined in Appendix C unless they:

- Prevent all exposure to storm water of the pollutant(s) for which the waterbody is impaired, and retain documentation of procedures taken to prevent exposure onsite with the SWPPP; or

- Prior to submitting the permittee's NOI, provide to the Department technical information or other documentation that the pollutant(s) for which the waterbody is impaired is not present at the site, and retain documentation of this finding with their SWPPP; or

- Prior to submitting the permittee's NOI, provide to the Department data or other technical documentation to support a conclusion that the discharge is not expected to cause or contribute to an exceedance of a water quality standard (WQS), and retain such data onsite with the SWPPP. To do this, the permittee must provide data and other technical information to the Department sufficient to demonstrate:

  - For discharges to waters without an EPA approved or established Total Maximum Daily Load (TMDL), that the discharge of the pollutant for which the water is impaired will meet in-stream water quality criteria at the point of discharge to the waterbody; or

  - For discharges to waters with an EPA approved or established TMDL, that there are sufficient remaining wasteload allocations in an EPA approved or established TMDL to allow the permittees discharge and that existing dischargers to the waterbody are subject to compliance schedules designed to bring the waterbody into attainment with WQS. The permittee must also evaluate the recommendations in the Implementation Section of the EPA approved or established TMDL and incorporate applicable measures into their operations.

A permittee is eligible under Part 1.2.4.6 if they receive an affirmative determination from the Department that their discharge will not contribute to the existing impairment, in which case the permittee must maintain such determination onsite with the SWPPP, or if the Department fails to respond within 30 days of submission of data to the Department.

[2] The project will be considered to discharge to an impaired water if the first water of the U.S. to which the discharge enters is identified by the Department pursuant to Section 303(d) of the CWA as not meeting a WQS, or is included in an EPA-approved or established total maximum daily load (TMDL). For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which the discharge is the waterbody that receives the stormwater discharge from the storm sewer system.

1.3 Conditional Exclusion for No Exposure.

If the permittee is covered by this permit, and becomes eligible for a no exposure exclusion from permitting under 40 CFR 122.26(g), the permittee may file a No Exposure Certification. The permittee is no longer required to have a permit upon submission of a complete and accurate no exposure certification to DEC. If the permittee is no longer required to have permit coverage because of a no exposure exclusion and has submitted a No Exposure Certification form to DEC, they are required to submit a Notice of Termination (NOT) to terminate permit coverage before being covered by the No Exposure Certification. The permittee must submit a No Exposure Certification to DEC once every five years from the initial date of filing.

Facilities which have multiple industrial sectors covered under one permit can not use the No Exposure Certification form to remove those individual sectors from permit coverage. Upon a thorough evaluation to determine some sectors have no exposure to storm water, those areas must be noted in the facility wide SWPPP and inspected annually during the comprehensive site inspections to ensure no exposure exists. If inspections reveal those individual sectors eligible for coverage under this permit have exposure, the SWPPP must be updated to include those sectors and all permit requirements applied to those areas. The No Exposure Certification for Exclusion applies to an entire facility and not individual outfalls or areas located within the facility covered under a single permit.

2. Authorization under this Permit.

2.1 How to Obtain Authorization.

To obtain authorization under this permit, the permittee must:

2.1.1 Be located in the area where DEC is the permitting authority;

2.1.2 Meet the Part 1.2 eligibility requirements;

2.1.3 Develop a SWPPP according to the requirements in Part 5 of this permit. The permittee must submit a copy of the SWPPP to DEC as specified in Part 9.6;

2.1.4 Select, design, install, and implement control measures in accordance with Part 4.2 to meet numeric and non-numeric effluent limits;

2.1.5 Submit a complete and accurate Notice of Intent (NOI) either using DEC's electronic Notice of Intent (eNOI) system (accessible at http://dec.alaska.gov/water/wastewater/stormwater/apdesenoi/ or using a paper form (included in Appendix F of this permit) and then submitting that paper form to the address listed in Part 2.2.2; and

2.1.6 Pay the general permit authorization fee in accordance with 18 AAC 72. Existing permittees when renewing permit coverage do not need to pay two permit authorization fees in one calendar year;

2.1.7 DEC will post on the Internet, at http://dec.alaska.gov/Applications/Water/WaterPermitSearch/Search.aspx, all authorizations issued. Late NOIs will be accepted but authorization to discharge will not be retroactive.

2.1.8 If the information on the NOI is incorrect or is missing, the NOI will be deemed incomplete and permit authorization will not be granted. A complete NOI shall include the following information, at a minimum:

2.1.8.1 The operator information includes: Organization name, contact person, complete mailing address, telephone number and fax number and email address if available;

2.1.8.2 The billing contact information includes: organization name, contact person, complete mailing address, telephone number and fax number and email address if available. If the billing contact information is the same as the operator information, check the box on the NOI indicating that it is the same;

2.1.8.3 The industrial facility information includes: facility name, physical location, the city and zip code, the borough, latitude and longitude, how the latitude and longitude were determined, an estimate of the area of industrial activity exposed to storm water, if the facility storm water discharges have been previously permitted under an APDES permit, a brief description of activity(ies) carried out on-site;

2.1.8.4 The discharge information includes: does the facility discharge to a municipal separate storm sewer system (MS4), and if so the name of the MS4 operator, outfall(s) location (latitude/longitude), the name(s) of the water bodies to which the facility discharges, does the facility discharge to a water body that is impaired or have a TMDL, if it is the discharge is consistent with the assumptions and requirements of the TMDL, and is any storm water discharge subject to federal effluent limitation guideline and sector-specific requirements, and if so which affected MSGP Sector;

2.1.8.5 The additional information includes: the four-digit Standard Industrial Classification (SIC) code or two-letter Activity Code that best represents the products or services rendered by the facility in which it is primarily engaged in and applicable sector and subsectors of industry activity, including co-located industrial activity for which coverage is requested, and is the facility presently inactive or unstaffed and if so for how long;

2.1.8.6 The SWPPP information includes: SWPPP contact name, phone, email, and URL for SWPPP (if applicable) (the SWPPP does not need to be reposted on the internet each time it is updated);

2.1.8.7 The signatory information in compliance with Appendix A, Part 1.12

2.2 How to Submit an NOI.

2.2.1 Electronically (strongly encouraged) at http://dec.alaska.gov/water/wastewater/stormwater/apdesenoi/ . Operators who submit an eNOI must pay the general permit authorization fee during a step in the eNOI process where payment is required.

2.2.2 Through use of a paper form (available at the above web site) and then submit that paper form to Permitting Program address in Appendix A, Part 1.1.1.

2.2.3 Each operator submitting the NOI via paper form[3] must include a check payable to the "State of Alaska" for the amount of the General Permit Authorization Fee, in accordance with 18 AAC 72.

(Submission Deadlines continued on next page.)

[3] Note: Electronic submittal of an NOI will likely be processed more quickly and result in faster receipt of an authorization to discharge.

2.3 Submission Deadlines.

Timeframes for discharge authorization are contained in Table 2-1.

Table 2-1: NOI Submittal Deadlines/Discharge Authorization Dates

Category	NOI Submission Deadline	Discharge Authorization Date[1]	Fee
Existing Dischargers – in operation as of March 31, 2020 and authorized for coverage under 2015 MSGP.	Existing Dischargers must submit new NOI and SWPPP no later than one hundred twenty (120) calendar days after the effective date of this permit.	The date specified in the DEC authorization letter. The permittees authorization under the 2015 MSGP is automatically continued until they have been granted coverage under this permit or an alternative permit, or coverage is otherwise terminated.	Existing Dischargers pay annual fee based on invoice from DEC
New Dischargers or New Sources - who commence discharging one hundred twenty (120) calendar days after the effective date of this permit.	A minimum of thirty (30) calendar days prior to commencing discharge.	The date specified in the DEC authorization letter.	New Discharges pay fee at time of submitting NOI
New Owner/Operator of Existing Discharger - transfer of ownership and/or operation of a facility whose discharge is authorized under this permit	New Owner shall submit a new NOI no later than thirty (30) calendar days after the date that the transfer will take place to the new owner/operator.	The date specified in the DEC authorization letter.	New Owner pays fee upon reciept of invoice from DEC
Other Eligible Dischargers - in operation prior to March 31, 2020, but not covered under the 2015 MSGP or another APDES permit.	Immediately, to minimize the time discharges from the facility will continue to be unauthorized.	The date specified in the DEC authorization letter.	New Discharges pay fee at time of submitting NOI

Note:
1. Based on a review of the permittees NOI or other information, DEC may delay their authorization for further review, notify the permittee that additional effluent limitations or control measures are necessary, or may deny coverage under this permit and require submission of an application for an individual or other APDES general permit, as detailed in Part 2.8. In these instances, DEC will notify the permittee in writing of the delay, of the need for additional effluent limits or control measures, or of the request for submission of an individual APDES permit application.
2. If the permittee has missed the deadline to submit the NOI, any and all discharges from the industrial activities will continue to be unauthorized under the CWA until they are covered by this or a different APDES permit. DEC may take enforcement action for any unpermitted discharges that occur between the commencement of discharging and discharge authorization.
3. Discharges are not authorized if the NOI is incomplete or inaccurate or if the permittee was never eligible for permit coverage.

2.4 Date of Authorization to Begin Discharge.

An operator is authorized to discharge industrial storm water under the terms and conditions of this permit upon the date specified in the issuance of the DEC authorization letter, which is posted to the DEC's website (http://dec.alaska.gov/Applications/Water/WaterPermitSearch/Search.aspx). Once the authorization is granted by the Department the applicant is then considered a permittee covered by this permit.

2.5 Continuation of Expired General Permit.

2.5.1 If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 18 AAC 83.155 and remain in force and effect for discharges that were covered prior to expiration. The permittee is required to abide by all limitations, monitoring, and reporting included herein if the permit enters administrative extension until such time a permit is reissued authorizing the discharge or an NOT is submitted by the permittee. If a permittee is authorized to discharge under this permit prior to the expiration date, any discharges authorized under this permit will automatically remain covered by this permit until the earliest of:

2.5.1.1 Authorization for coverage under a reissued permit or a replacement of this permit following a permittee's timely and appropriate submittal of a complete NOI requesting authorization to discharge under the new permit and compliance with the requirements of the new permit;

2.5.1.2 Submittal of a NOT;

2.5.1.3 Issuance or denial of an individual permit for the facility's discharges; or

2.5.1.4 A formal decision by DEC not to reissue this general permit or not cover a particular discharger previously covered by the general permit, at which time DEC will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will cease at the end of this time period.

2.5.2 Any permittee with a discharge covered under the 2015 MSGP that the Department determines shall transition to a different APDES permit for that discharge that filed a timely and complete NOI and was granted administrative extension of the 2015 MSGP, the administrative extension (i.e., continued permit coverage) from the 2015 MSGP survives the effective date of the 2020 MSGP until the facility receives coverage under the new APDES permit.

2.6 Permit Compliance.

Any noncompliance with any of the requirements of this permit constitutes a violation of the CWA. As detailed in Part 8 (Corrective Actions) of this permit, failure to take any required corrective actions constitute an independent, additional violation of this permit and the CWA. Any actions and time periods specified for remedying noncompliance do not absolve parties of the initial underlying noncompliance. Where corrective action is triggered by an event that does not itself constitute permit noncompliance, such as an exceedance of an applicable benchmark, there is no permit violation provided the permittee takes the required corrective action within the relevant deadlines established in Part 8.3.

2.7 Submittal of Modification to Original NOI.

2.7.1 For an existing permittee, if any of the information supplied on the NOI form changes such as name of receiving waterbody, acreage of industrial area exposed to storm water, addition or deletion of industrial sectors, and facility contact information, the permittee must submit an NOI Modification form within thirty (30) calendar days after the change. See Appendix F for the modification form.

2.7.2 At facilities where there is a transfer of ownership and/or a new operator takes over operational control at an existing facility the new operator shall submit an NOI no later than thirty (30) calendar days after a change in owner/operator. The previous owner/operator must submit a NOT no later than thirty (30) calendar days after DEC authorization of the new operator. The new operator does not need to pay a permit authorization fee if the facility has paid for the year in which the transfer occurs.

2.8 Alternative Permits.

2.8.1 **DEC Requiring Coverage under an Alternative Permit**.
DEC may require a permittee to apply for and/or obtain authorization to discharge under an alternative permit, i.e., either an individual APDES permit or an alternative APDES general permit in accordance with 40 CFR 122.64 and 124.5. Any interested person may petition DEC to take action under this paragraph. If DEC requires the permittee to apply for an alternative APDES permit, DEC will notify the permittee in writing that a permit application is required. This notification will include a brief statement of the reasons for this decision and will contain alternative permit application requirements, including deadlines for completing the application.

In addition, if the permittee is an existing discharger authorized to discharge under this permit, the notice will set a deadline to file the permit application, and will include a statement that on the effective date of the individual APDES permit, or the alternative general permit as it applies to the permittee, coverage under this general permit will terminate. DEC may grant additional time to submit the application if the permittee requests it. If the permittee is covered under this permit and fails to submit an alternative APDES permit application as required by DEC, then the applicability of this permit to the permittee is terminated at the end of the day specified by DEC as the deadline for application submittal. DEC may take appropriate enforcement action for any unpermitted discharge.

2.8.2 **Permittee Requesting Coverage under an Alternative Permit**.
A permittee may request to be excluded from coverage under this general permit by applying for an individual permit. In such a case, the permittee must submit an individual permit application in accordance with the requirements of 18 AAC 83.305 – 83.385 with reasons supporting the request, to DEC at the address listed in Part 9.6 of this permit. The request may be granted by issuance of an individual permit or authorization of coverage under an alternative general permit if the permittees reasons are adequate to support the request.

When an individual APDES permit is issued to a permittee or a permittee is authorized to discharge under an alternative APDES general permit, the permittees authorization to discharge under this permit is terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit.

3. Compliance with Standards and Limits.

3.1 Requirements for all Facilities.

3.1.1 A permittee must select, install, implement, and maintain control measures (described in Part 4) at the facility that minimize pollutants in the discharge as necessary to meet WQS (18 AAC 70). A permittee must comply with all permit conditions with respect to installation and maintenance of control measures, inspections, monitoring, corrective actions, reporting, and recordkeeping.

3.1.2 In general, except in situations explained in part 3.1.3, the storm water controls planned, developed, implemented, maintained, and updated by the permittee that are consistent with the provisions of Parts 3 through 9 and Part 11 are considered to meet the requirements of this permit to ensure that the discharges do not cause or contribute to an excursion above any WQS (18 AAC 70).

3.1.3 At any time after authorization, upon a DEC determination that the permittee's storm water discharges will cause, have a reasonable potential to cause, or contribute to an excursion above any WQS, DEC may require the permittee to:

3.1.3.1 Take corrective actions and modify storm water controls in accordance with Part 8 to adequately address the identified water quality concerns;

3.1.3.2 Submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining WQS; or

3.1.3.3 Minimize discharges of storm water from the facility or activity, implement corrective actions, and submit an individual permit application in accordance with Part 2.8.

3.1.4 All written responses required under Part 3.1 must include a signed certification consistent with Appendix A, Part 1.12.

3.2 Water Quality-Based Effluent Limitations.

3.2.1 **Water Quality Standards (WQS).**

3.2.1.1 A permittee's discharge must be controlled as necessary to meet a WQS (18 AAC 70) in relation to the pollutants of concern.

3.2.1.2 DEC expects that compliance with the other conditions in this permit will control discharges as necessary to meet a WQS. If at any time the permittee becomes aware, or DEC determines, that the permittee's discharge causes or contributes to an exceedance of a WQS in the receiving water, the permittee must:

- Take corrective action as required in Part 8.1;
- Document the corrective actions as required in Parts 8.4 and 5.8; and
- Report the corrective actions to DEC as required in Part 9.2.

3.2.1.3 Additionally, DEC may impose additional permit stipulations on a site-specific basis, or require the permittee to obtain coverage under an individual permit, if information in a permittees NOI, required reports, or from other sources indicates that their discharges are not controlled as necessary to meet a WQS in the receiving water.

3.2.2 **Discharges to Water Quality Impaired Waters**.[4]

3.2.2.1 ***Existing Discharge to an Impaired Water with an EPA Approved or Established TMDL.*** If the permittee discharges to an impaired water with an EPA approved or established TMDL, DEC will inform the permittee if any additional limits or controls are necessary for their discharge to be consistent with the assumptions of any available wasteload allocation in the TMDL, or if coverage under an individual permit is necessary in accordance with Part 2.8.1.

3.2.2.2 ***Existing Discharge to an Impaired Water without an EPA Approved or Established TMDL***. If the permittee discharges to an impaired water without an EPA approved or established TMDL, they are required to comply with Part 3.2.1 and the monitoring requirement of Part 7.2.3. Note that this provision also applies to situations where DEC determines that the permittees discharge is not controlled as necessary to meet WQS in a downstream water segment, even if their discharge is to a receiving water that is not specifically identified on a Section 303(d) list.

3.2.2.3 ***New Discharge to an Impaired Water***. If a permittees authorization to discharge under this permit relied on Part 1.2.4.6 for a new discharge to an impaired water, the permittee must implement and maintain any control measures or conditions at the facility that enabled the permittee to become eligible under Part 1.2.4.6, and modify such measures or conditions as necessary pursuant to any Part 5 corrective actions. The permittee is also required to comply with Part 3.2.1 and the monitoring requirements of Parts 7.2.3.

[4] The project will be considered to discharge to an impaired water if the first water of the U.S. to which the discharge enters is identified by the Department pursuant to Section 303(d) of the CWA as not meeting an WQS, or is included in an EPA-approved or established total maximum daily load (TMDL). For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which the discharge is the waterbody that receives the stormwater discharge from the storm sewer system.

4. Control Measures.

A permittee must select, design, install, and implement control measures (including best management practices) to address the selection and design considerations in Part 4.1, meet the non-numeric effluent limits in Part 4.2, and meet limits contained in applicable effluent limitations guidelines in Part 4.3. The selection, design, installation, and implementation of these control measures must be in accordance with good engineering practices and manufacturer's specifications. Note that the permittee may deviate from such manufacturer's specifications where the permittee provides justification for such deviation and includes documentation of their rationale in the part of the SWPPP that describes the permittees control measures, consistent with Part 5.2.5. If the permittee finds that their control measures are not achieving their intended effect of minimizing pollutant discharges, the permittee must modify these control measures in accordance with the corrective action requirements set forth in Part 8. Regulated storm water discharges from the permittees facility include storm water run-on that commingles with storm water discharges associated with industrial activity at the permittees facility.

In the technology-based limits included in Part 4.2 and in Part 11, the term "minimize" means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice.

4.1 Control Measure Selection and Design Considerations.

A permittee must use the following considerations when selecting and designing control measures:

- Preventing storm water from coming into contact with polluting materials is generally more effective, and less costly, than trying to remove pollutants from storm water;
- Using control measures in combination is more effective than using control measures in isolation for minimizing pollutants in the storm water discharge;
- Using technologically available and economically practicable and achievable in light of best industry practice;
- Assessing the type and quantity of pollutants, including their potential to impact receiving water quality, is critical to designing effective control measures that will achieve the limits in this permit;
- Minimizing impervious areas at the permittees facility and infiltrating runoff onsite (including bioretention cells, green roofs, and pervious pavement, among other approaches) can reduce runoff and improve groundwater recharge and stream base flows in local streams, although care must be taken to avoid ground water contamination;
- Attenuating flow using open vegetated swales and natural depressions can reduce in-stream impacts of erosive flows;

- Conserving and/or restoring of riparian buffers will help protect streams from storm water runoff and improve water quality; and
- Using treatment interceptors (e.g., swirl separators and sand filters) may be appropriate in some instances to minimize the discharge of pollutants.

4.2 Non-Numeric Technology-Based Effluent Limits.

In addition to complying with the non-numeric technology-based effluent limits in Part 11, the permittee must also:

4.2.1 **Minimize Exposure**.

A permittee must evaluate the facility regarding exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff and minimize exposure by either locating these industrial materials and activities inside or protecting them with storm resistant coverings (although significant enlargement of impervious surface area is not recommended). In minimizing exposure, the permittee should pay particular attention to the following:

- Use grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from these areas;
- Locate materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas);
- Clean up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants;
- Use drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible;
- Use spill/overflow protection equipment;
- Drain fluids from equipment and vehicles that will be decommissioned or will remain unused for extended periods of time;
- Perform all cleaning operations indoors, under cover, or in bermed areas that prevent runoff and run-on and also that capture any overspray; and
- Ensure that all washwater, with the exception of discharges from pavement wash water and routine building washdown described in Part 1.2.3 drains to a sanitary sewer, sump, or other proper collection system (i.e., not the storm water drainage system).

The discharge of vehicle and equipment washwater, including tank cleaning operations, is not authorized by this permit. These wastewaters must be covered under a separate APDES permit, discharged to a sanitary sewer in accordance with applicable industrial pretreatment requirements, or disposed of otherwise in accordance with applicable law.

4.2.2 **Good Housekeeping**. A permittee must keep clean all exposed areas that are potential sources of pollutants, including but not limited to: using such measures as sweeping at regular intervals, keeping materials orderly and labeled, keeping all dumpster lids closed when not in use, and storing materials in appropriate containers.

4.2.3 **Maintenance**. A permittee must regularly inspect, test, maintain, and repair all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in storm water discharged to receiving waters. This includes performing inspections and preventive maintainance of storm water control measures and cleaning catch basins when the depth of debris reaches one-half (1/2) of the sump depth and keeping the debris surface at least six inches below the lowest outlet pipe. The permittee must maintain all control measures that are used to achieve the effluent limits required by this permit in effective operating condition. Record of routine maintainance to be kept onsite and made available upon request (it does not need to be stored with the SWPPP). Nonstructural control measures must also be diligently maintained (e.g., spill response supplies available, personnel appropriately trained). If the permittee finds that their control measures need to be replaced or repaired, the permittee must make the necessary repairs or modifications within 14 days or as expeditiously as practicable.

4.2.4 **Spill Prevention and Response Procedures**. A permittee must minimize the potential for leaks, spills and other releases that may be exposed to storm water and develop plans for effective response to such spills if or when they occur. At a minimum, the permittee must implement:

4.2.4.1 Procedures for plainly labeling containers (e.g., “Used Oil,” “Spent Solvents,” “Fertilizers and Pesticides,” etc.) that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur;

4.2.4.2 Procedures for material storage and handling, including the use of secondary containment and barriers between material storage and traffic areas, or a similarly effective means designed to prevent the discharge of pollutants from these areas;

4.2.4.3 Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect, or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of the permittees storm water pollution prevention team (see Part 5.1.1); and

4.2.4.4 Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, 40 CFR Part 302, AS 75.300 and 18 AAC 75 Article 3 occurs, the permittee must notify the National Response Center (NRC) at (800) 424-8802. During normal business hours call the nearest DEC Area Response Team Office – Southeast (Juneau) 465-5340; Central (Anchorage) 269-3063; or Northern (Fairbanks) 451-2121. Outside of normal business hours, the permittee must call (800) 478-9300 as soon as the permittee has knowledge of the discharge. State or local requirements may necessitate reporting spills or discharges to local emergency response, public health, or drinking water supply agencies. Contact information must be posted, where practicable, in locations that are readily accessible and available.

4.2.4.5 The permittee must provide a description of the release, the circumstances leading to the release, and the date of the release to the nearest DEC Area Response Team Office, in accordance to AS 75.300 (See Part 4.2.4.4). The permittee must also implement measures to prevent the reoccurrence of such releases and to respond to such releases.

4.2.5 **Erosion and Sediment Controls**. A permittee must stabilize exposed areas and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants. Among other actions the permittee must take to meet this limit, the permittee must place flow velocity dissipation devices at discharge locations and within outfall channels where necessary to reduce erosion and/or settle out pollutants. In selecting, designing, installing, and implementing appropriate control measures, the permittee is encouraged to consult with EPA's internet-based resources relating to BMPs for erosion and sedimentation, including the sector-specific Industrial Stormwater Fact Sheet Series, (https://www.epa.gov/npdes/final-2015-msgp-documents), National Menu of Stormwater BMPs (https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu), and National Management Measures to Control Nonpoint Source Pollution from Urban Areas (https://www.epa.gov/nps/urban-runoff-national-management-measures), and any similar State or Tribal publications such as the Alaska Storm Water guide (http://dec.alaska.gov/water/wastewater/stormwater/guidance/) and the Best Management Practices Manual for Gravel Quarries found at http://dec.alaska.gov/water/wastewater/stormwater/gravel/ .

4.2.6 **Management of Runoff**. A permittee must divert, infiltrate, reuse, contain, or otherwise reduce storm water runoff, to minimize pollutants in their discharges. In selecting, designing, installing, and implementing appropriate control measures, permittees are encouraged to consult with EPA's internet-based resources relating to runoff management, including the sector-specific Industrial Storm Water Fact Sheet Series, (https://www.epa.gov/npdes/stormwater-discharges-industrial-activities#factsheet), National Menu of Storm Water BMPs (https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu), and National Management Measures to Control Nonpoint Source Pollution from Urban Areas (https://www.epa.gov/nps/urban-runoff-national-management-measures), and any similar State or Tribal publications.

4.2.7 **Salt Storage Piles or Piles Containing Salt**. A permittee must enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. A permittee must also implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile.

4.2.8 **Sector Specific Technology-Based Effluent Limits**. A permittee must achieve any additional non-numeric limits stipulated in the relevant sector-specific section(s) of Part 11.

4.2.9 **Employee Training**. A permittee must train all employees who work in areas where industrial materials or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of the permitttee's Pollution Prevention Team. Training must cover both the specific control measures used to achieve the effluent limits in this Part, and monitoring, inspection, planning, reporting, and documentation requirements in other parts of this permit. Training shall be conducted at least annually (or more often if employee turnover is high) and documented in the SWPPP (See Part 5.8.5).

4.2.10 **Non-Storm Water Discharges**. A permittee must eliminate non-storm water discharges not authorized by an APDES permit. See Part 1.2.3 for a list of non-storm water discharges authorized by this permit.

4.2.11 **Waste, Garbage and Floatable Debris**. A permittee must ensure that waste, garbage, and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged.

4.2.12 **Dust Generation and Vehicle Tracking of Industrial Materials**. A permittee must minimize generation of dust and off-site tracking of raw, final, or waste materials. Appropriate BMPs to minimize tracking include the establishment of stabilized access and exit points.

4.3 Numeric Effluent Limitations Based on Effluent Limitations Guidelines.

If the permittee is in an industrial category subject to one of the effluent limitations guidelines identified in Table 7-1 (see Part 7.2.2.1), the permittee must meet the effluent limits referenced in Table 4-1 below:

Table 4-1: Applicable Effluent Limitations Guidelines

Regulated Activity	40 CFR Part/Subpart	Effluent Limit
Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas	Part 429, Subpart I	See Part 11.A.7
Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished product, by-products or waste products (SIC 2874)	Part 418, Subpart A	See Part 11.C.4
Runoff from asphalt emulsion facilities	Part 443, Subpart A	See Part 11.D.4
Runoff from material storage piles at cement manufacturing facilities	Part 411, Subpart C	See Part 11.E.5
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	Part 436, Subparts B, C, or D	See Part 11.J.9
Runoff from hazardous waste landfills	Part 445, Subpart A	See Part 11.K.6
Runoff from non-hazardous waste landfills	Part 445, Subpart B	See Part 11.L.10
Runoff from coal storage piles at steam electric generating facilities	Part 423	See Part 11.O.8
Existing and new primary airports with 1,000 or more annual jet departures that discharge wastewater associated with airfield pavement deicing that contains urea commingled with stormwater	Part 449	See Part 11.S.9

4.4 Plan Approval for Nondomestic Wastewater Treatment Works.

For all new facilities operators who construct, install or operate any part of a nondomestic wastewater treatment works shall submit a copy of the engineering plans to DEC for review at the address in Part 9.6, and pay an engineering plan review fee (see 18 AAC 72.600 and 18 AAC 72.955). Engineering plan approval must be obtained from DEC prior to construction. Nondomestic wastewater includes storm water runoff. All permanent storm water treatment devices shall receive engineering plan approval per 18 AAC 72.600. (For the purposes of Part 4.4 "permanent storm water treatment device" means a treatment device with a design life longer than two years.)

4.5 Projects near a Public Water System (PWS)

4.5.1 Where the facility intersects a PWS drinking water protection area (DWPA) (see Part 5.2.3.3), notify the PWS contact. PWS contact information can be obtained using the online application, Drinking Water Watch, http://dec.alaska.gov:8080/DWW by entering the appropriate 6-digit PWS ID (e.g., 225025).

4.5.2 Within the identified DWPA, restrict project activities that could significantly change the natural surface water drainage or groundwater gradient.

4.5.3 Immediately notify the nearby PWS of any identified potential contamination, such as reportable spills or excess erosion that intersects their PWS drinking water protection area.

5. Storm Water Pollution Prevention Plan (SWPPP).

A permittee must prepare a SWPPP for their facility before submitting their Notice of Intent (NOI) for permit coverage. If a permittee prepared a SWPPP for coverage under a previous APDES permit, the permittee must review and update the SWPPP to implement all provisions of this permit prior to submitting their NOI. The SWPPP does not contain effluent limitations; the limitations are contained in Part 4 of the permit, and for some sectors, Parts 11 of the permit. The SWPPP is intended to document the selection, design, and installation of control measures. As distinct from the SWPPP, the additional documentation requirements (see Part 5.8) are intended to document the implementation (including inspection, maintenance, monitoring, and corrective action) of the permit requirements.

5.1 Storm Water Pollution Prevention Plan (SWPPP).

For coverage under this permit, the SWPPP must contain all of the following elements:

5.1.1 Storm water pollution prevention team (see Part 5.2.2);

5.1.2 Site description (see Part 5.2.3);

5.1.3 Summary of potential pollutant sources (see Part 5.2.4);

5.1.4 Description of control measures (see Part 5.2.5);

5.1.5 Schedules and procedures (see Part 5.2.6); and

5.1.6 Signature requirements (see Part 5.2.7).

Where the SWPPP refers to procedures in other facility documents, such as a Spill Prevention, Control and Countermeasure (SPCC) Plan or an Environmental Management System (EMS) developed for a National Environmental Performance Track facility, copies of the relevant portions of those documents must be kept with the SWPPP.

5.2 Contents of the SWPPP.

5.2.1 **Permittee.**
Identify the permittee for the facility.

5.2.2 **Storm Water Pollution Prevention Team**.
Identify the staff members (by name or title) that comprise the facility's storm water pollution prevention team as well as their individual responsibilities. The storm water pollution prevention team is responsible for assisting the facility manager in developing and revising the facility's SWPPP as well as maintaining control measures and taking corrective actions where required. Each member of the storm water pollution prevention team must have ready

access to either an electronic or paper copy of applicable portions of this permit and the SWPPP.

5.2.3 **Site Description**.
The SWPPP must include the following:

5.2.3.1 **Activities at the Facility**. Provide a description of the nature of the industrial activities at the facility.

5.2.3.2 **General location map**. Provide a general location map (e.g., U.S. Geological Survey (USGS) quadrangle map) with enough detail to identify the location of the facility and all receiving waters for the storm water discharges.

5.2.3.3 **Site map**. Provide a map showing:

- the size of the property in acres;
- the boundaries of the facility or activity;
- the location and extent of significant structures and impervious surfaces;
- directions of storm water flow (use arrows);
- locations of all existing structural control measures;
- locations of all receiving waters (including wetlands) in the immediate vicinity of the permittees facility, indicating if any of the waters are impaired and, if so, whether the waters have TMDLs established for them;
- locations of all storm water conveyances including ditches, pipes, and swales;
- locations of potential pollutant sources identified under Part 5.2.4.2;
- locations where significant spills or leaks identified under Part 5.2.4.3 have occurred;
- locations of all storm water monitoring points;
- locations of storm water inlets and outfalls, with a unique identification code for each outfall (e.g., Outfall No. 1, No. 2, etc), indicating if permittees are treating one or more outfalls as “substantially identical” under Parts 6.2.3, 5.2.6.2, and 7.1.1, and an approximate outline of the areas draining to each outfall;
- areas of designated critical habitat for endangered or threatened species located within 2,000 feet, if applicable;
- municipal separate storm sewer systems, where the facilities storm water discharges to them;
- locations and descriptions of all non-storm water discharges identified under Part 4.2.10;
- Location of existing public water system (PWS) drinking water protection areas (DWPA) for PWS sources (e.g. springs, wells, or surface water intakes) that intersect the boundary of the proposed project/permit area. The DWPAs can be found using the

interactive web map application, "*Alaska DEC Drinking Water Protection Areas*", located at http://dec.alaska.gov/das/GIS/apps.htm ;

- locations of the following activities where such activities are exposed to precipitation:
  - fueling stations;
  - vehicle and equipment maintenance and/or cleaning areas;
  - loading/unloading areas;
  - locations used for the treatment, storage, or disposal of wastes;
  - liquid storage tanks;
  - processing and storage areas;
  - immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility;
  - transfer areas for substances in bulk; and
  - machinery; and
- locations and sources of run-on to the facility from adjacent property that contains significant quantities of pollutants.

5.2.4 **Summary of Potential Pollutant Sources**.

A permittee must document areas at their facility where industrial materials or activities are exposed to storm water and from which allowable non-storm water discharges are released. Industrial materials or activities include, but are not limited to: material handling equipment or activities; industrial machinery; raw materials; industrial production and processes; and intermediate products, by-products, final products, and waste products. Material handling activities include, but are not limited to: the storage, loading and unloading, transportation, disposal, or conveyance of any raw material, intermediate product, final product or waste product. For each area identified, the description must include:

5.2.4.1 Activities in the Area. A list of the industrial activities exposed to storm water (e.g., material storage; equipment fueling, maintenance, and cleaning; cutting steel beams).

5.2.4.2 Pollutants. A list of the pollutant(s) or pollutant constituents (e.g., crankcase oil, zinc, sulfuric acid, and cleaning solvents) associated with each identified activity, which could be exposed to rainfall or snowmelt and could be discharged from the facility. The pollutant list must include all significant materials that have been handled, treated, stored, or disposed, and that have been exposed to storm water in the three years prior to the date the permittee prepared or amended the SWPPP.

5.2.4.3 ***Spills and Leaks.*** A permittee must document where potential spills and leaks could occur that could contribute pollutants to storm water discharges, and the corresponding outfall(s) that would be affected by such spills and leaks. The permittee must document all significant spills and leaks[5] of oil or toxic or hazardous pollutants that occurred in the three years prior to the date the permittee prepared the SWPPP for this permit term. Specifically, include spills or leaks that occurred in areas exposed to storm water or that drained to a storm water conveyance. The spill or leak history must be maintained in the SWPPP throughout this permit term. The permit term goes from the permit effective date to the permit expiration date.

5.2.4.4 ***Non-Storm Water Discharges.*** A permittee must document that they have evaluated for the presence of non-storm water discharges and that all unauthorized discharges have been eliminated. Documentation of the evaluation must include:

- The date of any evaluation;
- A description of the evaluation criteria used;
- A list of the outfalls or onsite drainage points that were directly observed during the evaluation;
- The different types of non-storm water discharge(s) and source locations; and
- The action(s) taken, such as a list of control measures used to eliminate unauthorized discharge(s), if any were identified. For example, a floor drain was sealed, a sink drain was re-routed to sanitary, or an APDES permit application was submitted for an unauthorized cooling water discharge.

5.2.4.5 ***Salt Storage***. A permittee must document the location of any storage piles containing salt used for deicing or other commercial or industrial purposes.

5.2.4.6 ***Sampling Data***. A permittee must summarize all storm water discharge sampling data collected at their facility during the previous permit term. The summary shall include a narrative description (and may include data tables/figures) that adequately summarizes the collected sampling data to support identification of potential pollution sources at the facility.

[5] Significant spills and leaks include, but are not limited to, releases of oil or hazardous substances in excess of quantities that are reportable under CWA Section 311 (see 40 CFR 110.6 and 40 CFR 117.21) or Section 102 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 USC §9602. This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117, 40 CFR 302, Alaska Statute 46.04 and Section 18 AAC Chapter 75 (i.e. 18 AAC 75.300) relating to spills or other releases of oils or hazardous substances. (See 4.2.4)

5.2.5 **Description of Control Measures**.

5.2.5.1 ***Control Measures to Meet Technology-Based and Water Quality-Based Effluent Limits***. A permittee must document the location and type of control measures installed and implemented at the facility to achieve the non-numeric effluent limits in Part 4.2, and where applicable in Part 11, the effluent limitations guidelines-based limits in Part 4.3, the water quality-based effluent limits in Part 3.2, and describe how the permittee addressed the control measure selection and design considerations in Part 4.1. This documentation must describe how the control measures at the facility address both the pollutant sources identified in Part 5.2.4, and any storm water run-on that commingles with any discharges covered under this permit.

5.2.6 **Schedules and Procedures.**

5.2.6.1 ***Pertaining to Control Measures Used to Comply with the Effluent Limits in Part 4***. The following must be documented in the SWPPP:

- *Good Housekeeping* (See Part 4.2.2) – A schedule for regular pickup and disposal of waste materials, along with routine inspections for leaks and conditions of drums, tanks and containers;

- *Maintenance* (See Part 4.2.3) – Preventative maintenance procedures, including regular inspections, testing, maintenance, and repair of all industrial equipment and systems, and control measures, to avoid situations that may result in leaks, spills, and other releases, and any back-up practices in place should a runoff event occur while a control measure is off-line. The SWPPP shall include the schedule or frequency for maintaining all control measures used to comply with the effluent limits in Part 4;

- *Spill Prevention and Response Procedures* (See Part 4.2.4) – Procedures for preventing and responding to spills and leaks. The permittee may reference the existence of other plans for Spill Prevention Control and Countermeasure (SPCC) developed for the facility under Section 311 of the CWA or BMP programs otherwise required by an APDES permit for the facility, provided that the permittee keeps a copy of that other plan onsite and makes it available for review consistent with Part 5.7; and

- *Employee Training* (Part 4.2.9) – The elements of the employee training plan shall include, but not be limited to, the requirements set forth in Part 4.2.9 and also the following:

    - The content of the training to include site, facility and sector-specifc details;

- The frequency/schedule of training for employees who work in areas where industrial materials or activities are exposed to storm water, or who are responsible for implementing activities necessary to meet the conditions of this permit; and
- A log of the dates on which specific employees received training (to be maintained in the SWPPP)

5.2.6.2 ***Pertaining to Monitoring and Inspection***. A permittee must document in the SWPPP procedures for conducting the four types of analytical monitoring specified by this permit, where applicable to the facility, including:

- Benchmark monitoring (see Part 7.2.1);
- Effluent limitations guidelines monitoring (see Part 7.2.2);
- Impaired waters monitoring (see Part 7.2.3); and
- Other monitoring as required by DEC (see Part 7.2.4).

For each type of monitoring, the SWPPP must document:

- Locations where samples are collected, including any determination that two or more outfalls are substantially identical;
- Parameters for sampling and the frequency of sampling for each parameter;
- Schedules for monitoring at the facility, including schedule for alternate monitoring periods for climates with irregular storm water runoff (see Part 7.1.6);
- Any numeric control values (benchmarks, effluent limitations guidelines, TMDL-related requirements, or other requirements) applicable to discharges from each outfall; and
- Procedures (e.g., responsible staff, logistics, laboratory to be used, etc.) for gathering storm event data, as specified in Part 7.1.
- If a permittee is invoking the exception for inactive and unstaffed sites for benchmark monitoring, the permittee must include in the SWPPP the information to support this claim as required by Part 7.2.1.6.

A permittee must document the following in the SWPPP if they plan to use the substantially identical outfall exception for quarterly visual assessment requirements in Part 6.2 or benchmark monitoring requirements in Part 7.2.1:

- Location of each of the substantially identical outfalls;
- Description of the general industrial activities conducted in the drainage area of each outfall;
- Description of the control measures implemented in the drainage area of each outfall;
- Description of the exposed materials located in the drainage area of each outfall that are likely to be significant contributors of pollutants to storm water discharges;
- An estimate of the runoff coefficient of the drainage areas (low = under 40%; medium = 40 to 65%; high = above 65%); and
- Why the outfalls are expected to discharge substantially identical effluents.

A permittee must document in the SWPPP their procedures for performing, as appropriate, the three types of inspections specified by this permit, including:

- Routine facility inspections (see Part 6.1);
- Quarterly visual assessment of storm water discharges (see Part 6.2); and
- Comprehensive site inspections (see Part 6.3).

For each type of inspection performed, the SWPPP must identify:

- Person(s) or positions of person(s) responsible for inspection;
- Schedules for conducting inspections, including tentative schedule for facilities in climates with irregular storm water runoff discharges (see Part 6.2.3); and
- Specific items to be covered by the inspection, including schedules for specific outfalls.

If the permittee is invoking the exception for inactive and unstaffed sites relating to routine facility inspections and quarterly visual assessments, the permittee must include in the SWPPP the information to support this claim as required by Parts 6.1.3and 6.2.3.

5.2.7 **Signature Requirements.**
A permittee must sign and date the SWPPP in accordance with Appendix A, Subsection 1.12, including the date of signature.

5.3 Inspections.

5.3.1 The SWPPP must document the procedures for performing facility inspections specified by this permit in Part 6, and where necessary, taking corrective actions, in accordance with Part 8. At a minimum the SWPPP must document the following:

5.3.1.1 Person(s) or position of person(s) responsible for conducting facility inspections;

5.3.1.2 Schedules to be followed for conducting inspections;

5.3.1.3 Any inspection checklist or form that will be used; and

5.3.1.4 How conditions that require corrective action will be addressed.

5.3.2 A record of each inspection and of any corrective actions taken in accordance with Parts 6 and 8 must be retained with the SWPPP for at least three (3) years from the date permit coverage expires or is terminated.

5.3.3 If a permittee is invoking the exception for inactive and unstaffed sites relating to routine facility inspections and quarterly visual assessments, the permittee must include in the SWPPP the information to support this claim as required by Parts 6.1.3 and 6.2.3.

5.4 Monitoring.

5.4.1 The SWPPP must document the procedures for performing facility monitoring specified by this permit in Part 7, and where necessary, taking corrective actions, in accordance with Part 8. At a minimum, the SWPPP must document the following:

5.4.1.1 Person(s) or position of person(s) responsible for conducting facility monitoring;

5.4.1.2 Schedules to be followed for conducting monitoring;

5.4.1.3 Any monitoring checklist or form that will be used; and

5.4.1.4 How conditions that require corrective action will be addressed.

5.4.2 A record of each monitoring event and of any corrective actions taken in accordance with Parts 7 and 8 must be retained with the SWPPP for at least three (3) years from the date permit coverage expires or is terminated.

5.5 Documentation of Permit Eligibility Related to a Total Maximum Daily Load.

The SWPPP must include documentation supporting determination of permit eligibility with regards to waters that have an EPA-established or approved TMDL. See Part 3.2.2 for additional information to determine permit eligibility related to a TMDL. The SWPPP must include the following:

5.5.1 Identification of whether the discharge is identified, either specifically or generally, in an EPA – established or approved TMDL and any associated allocations, requirements, and assumptions identified for the discharge;

5.5.2 Summaries of consultation with state or federal TMDL authorities on consistency of SWPPP conditions with the approved TMDL; and

5.5.3 Measures taken by the permittee to ensure that the discharge of pollutants from the facility is consistent with the assumptions and requirements of the EPA – established or approved TMDL, including any specific wasteload or load allocation that has been established that would apply to the discharge.

5.6 Maintaining and Updated SWPPP.

5.6.1 A permittee must modify the SWPPP whenever necessary to address any of the triggering conditions for corrective action in Part 8.1 and to ensure that they do not reoccur, or to reflect changes implemented when a review following the triggering conditions in Part 8.2 indicates that changes to the control measures are necessary to meet the effluent limits in this permit. Changes to the SWPPP document must be made in accordance with the corrective action deadlines in Parts 8.3 and 8.4, and must be signed and dated in accordance with Appendix A, Subsection 1.12.

5.6.2 A permittee must modify the SWPPP if inspections or investigations by facility staff or by state, federal, local or tribal officials determine that SWPPP modifications are necessary for compliance with this permit.

5.6.3 A permittee must modify the SWPPP to reflect any revisions to applicable state, federal, local or tribal law or regulations that affect the control measures implemented at the facility.

5.6.4 A permittee must keep a log showing dates, name of person authorizing the change, and a brief summary of changes for all significant SWPPP modifications (e.g. adding a new control measure, changes in facility layout or design, or significant storm events that cause for replacement of control measures).

5.6.5 A permittee must amend the SWPPP within thirty (30) calendar days whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to waters of the U.S., or if the SWPPP proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified in the SWPPP, or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. The SWPPP must be updated at least annually.

5.7 SWPPP Availability.

A permittee must retain a copy of the current complete SWPPP required by this permit at the facility, and it must be immediately available to DEC or EPA at the time of an onsite inspection or upon request.

If the facility is inactive the SWPPP must be retained at a readily available location or the office of the operator. DEC may provide access to portions of the SWPPP to a member of the public upon request. Confidential Business Information (CBI) may be withheld from the public, but may not be withheld from those staff cleared for CBI review within DEC, EPA, USFWS, or NMFS.

DEC will allow electronic storage and accessibility of the SWPPP and all documents (inspection reports, training records, DMRs, and all additional documentation required by Part 5.8) where facility infrastructure supports immediate access, as long as the following conditions are met:

5.7.1 All permit required signatures must be signed by the appropriate official in accordance with Appendix A, Part 1.12. If an electronic signature is used it must be a certified electronic signature;

5.7.2 Modifications to the SWPPP must be documented with dated revision pages;

5.7.3 ALL supporting documents (required by Part 5.8) must meet permit requirements; and

5.7.4 The electronic SWPPP and all supporting documents must be available for review by a DEC or EPA inspector during a facility Inspection.

DEC encourages permittees to post their SWPPP online and provide the website address on the NOI (the SWPPP does not need to be reposted on the internet each time it is updated).

5.8 Additional Documentation Requirements.

A permittee is required to keep up-to-date copies of the following inspection, monitoring, corrective action, additional documentation, and certification records with the SWPPP:

5.8.1 A copy of the NOI submitted to DEC along with any correspondence exchanged between the permittee and DEC specific to coverage under this permit;

5.8.2 A copy of the acknowledgment letter the permittee receives from DEC or eNOI system assigning the permittees permit tracking number;

5.8.3 A copy of this permit (an electronic copy easily available to SWPPP personnel is also acceptable);

5.8.4 Descriptions and dates of any incidences of significant spills, leaks, or other releases that resulted in discharges of pollutants to waters of the U.S., through storm water or otherwise; the circumstances leading to the release and actions taken in response to the release; and measures taken to prevent the recurrence of such releases (see Part 4.2.4);

5.8.5 Records of employee training, including date training received (see Part 4.2.9);

5.8.6 Documentation of maintenance and repairs of control measures, including the date(s) of regular maintenance, date(s) of discovery of areas in need of repair/replacement, and for repairs, date(s) that the control measure(s) returned to full function, and the justification for any extended maintenance/repair schedules (see Part 4.2.3);

5.8.7 Log of SWPPP modifications;

5.8.8 All inspection reports, including the Routine Facility Inspection Reports (see Part 6.1), the Quarterly Visual Assessment Reports (see Part 6.2), and the Comprehensive Site Inspection Reports (see Part 6.3);

5.8.9 Description of any deviations from the schedule for visual assessments and/or monitoring, and the reason for the deviations (e.g., adverse weather or it was impracticable to collect samples within the first 30 minutes of discharge from a measurable storm event) (see Parts 6.2.1, 7.1.4, and 7.2.1.2);

5.8.10 Description of any corrective action taken at the permittees site shall be listed in a corrective action log, including triggering event and dates when problems were discovered and modifications occurred (see Part 8.4);

5.8.11 Documentation of any benchmark exceedances and how they were responded to, including either (1) corrective action taken, (2) a finding that the exceedence was due to natural background pollutant levels, or (3) a finding that no further pollutant reductions were technologically available and economically practicable and achievable in light of best industry practice consistent with Part 7.2.1.2;

5.8.12 Documentation of any effluent limitation exceedances and how they were responded to, including any corrective action;

5.8.13 Documentation to support any determination that pollutants of concern are not expected to be present above natural background levels if the permittee discharges directly to impaired waters, and that such pollutants were not detected in their discharge or were solely attributable to natural background sources (see Part 7.2.3.2); and

5.8.14 Documentation to support the permittees claim that the permittees facility has changed its status from active to inactive and unstaffed with respect to the requirements to conduct routine facility inspections (see Part 6.1.3), quarterly visual assessments (see Part 6.2.3), and/or benchmark monitoring (see Part 7.2.1.6).

6. Inspections.

A permittee must conduct the inspections in Parts 6.1, 6.2, and 6.3 at their facility.

6.1 Routine Facility Inspections.

6.1.1 **Routine Facility Inspection Procedures**.
During normal facility operating hours, the permittee must conduct inspections of areas of the facility covered by the requirements in this permit, including the following:

- Areas where industrial materials or activities are exposed to storm water.
- Areas identified in the SWPPP and those that are potential pollutant sources (see Part 5.1.3).
- Areas where spills and leaks have occurred in the past 3 years.
- Discharge points.
- Control measures used to comply with the effluent limits contained in this permit.

Inspections must be conducted at least quarterly (i.e., once each permit quarter), or in some instances more frequently (e.g., monthlyfor facilities that operate seasonally), as appropriate. Increased frequency may be appropriate for some types of equipment, processes, and stormwater control measures, or areas of the facility with significant activities and materials exposed to stormwater. At least one of the routine inspections must be conducted during a period when a stormwater discharge is occurring (in arid areas of the state this requirement is to be met as practicable). The permittee must specify the relevant inspection schedules in their SWPPP document as required in Part 5.2.6.

Inspections must be performed by qualified personnel (as defined in Appendix C) with at least one member of the permittee's stormwater pollution prevention team participating. Inspector(s) must consider the results of visual and analytical monitoring (if any) for the past year when planning and conducting inspections.

During the inspection the inspectors must examine or look out for the following:

- Industrial materials, residue or trash that may have or could come into contact with stormwater.
- Leaks or spills from industrial equipment, drums, tanks, and other containers.
- Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site.
- Tracking or blowing of raw, final or waste materials from areas of no exposure to exposed areas.
- Control measures needing replacement, maintenance, or repair.

During an inspection occurring during a stormwater discharge, control measures implemented to comply with effluent limits must be observed to ensure they are functioning correctly. Discharge points must also be observed during this inspection. If such discharge locations are inaccessible, nearby downstream locations must be inspected.

6.1.2 **Routine Facility Inspection Documentation**.

A permittee must document the findings of each routine facility inspection performed and maintain this documentation onsite with the SWPPP as required in Part 5.8. The permittee is not required to submit their routine facility inspection findings to DEC, unless specifically requested to do so. At a minimum, the permittees documentation of each routine facility inspection must include:

- The inspection date and time;
- The name(s) and signature(s) of the inspector(s);
- Weather information;
- All observations relating to the implementation of control measures at the facility, including:
  - A description of any discharges occurring at the time of the inspection;
  - Any previously unidentified discharges of pollutants from the site;
  - Any evidence of, or the potential for, pollutants entering the drainage system;
  - Observations regarding the physical condition of and around all outfalls including any flow dissipation devices, and evidence of pollutants in discharges and/or the receiving water;
  - Any control measures needing maintenance, repairs; or replacement;
- Any additional control measures needed to comply with the permit requirements; and
- Any incidents of noncompliance observed.

The inspection report must be signed and certified in accordance with Appendix A, Subsection 1.12 of the permit.

Any corrective action required as a result of a routine facility inspection must be performed consistent with Part 8 of this permit.

6.1.3 **Exceptions to Routine Facility Inspections**.

Inactive and Unstaffed Sites: The requirement to conduct routine facility inspections on a quarterly basis does not apply at a facility that is inactive and unstaffed, as long as there are no industrial materials or activities exposed to storm water. Such a facility is only required to conduct an annual comprehensive site inspection in accordance with the requirements of Part 6.3. To invoke this exception, the permittee must maintain a statement in the SWPPP pursuant to Part 5.2.6.2 indicating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to precipitation, in accordance with the substantive requirements in 40 CFR 122.26(g)(4)(iii). The statement must be signed and certified in accordance with Appendix A, Subsection 1.12. If circumstances change and industrial materials or activities become exposed to storm water or the facility becomes active and/or staffed, this exception no longer applies and the permittee must immediately resume quarterly facility inspections. If the permittee is not qualified for this exception at the time of authorization under this permit, but during the permit term becomes qualified because their facility is inactive and unstaffed, and there are no industrial materials or activities that are

exposed to storm water, then the permittee must include the same signed and certified statement as above and retain it with the facility records pursuant to Part 5.8.

Inactive and unstaffed facilities or those undergoing winter shutdown covered under Sectors G (Metal Mining), H (Coal Mines and Coal Mining-Related Facilities), and J (Non-Metallic Mineral Mining and Dressing), are not required to meet the "no industrial materials or activities exposed to storm water" standard to be eligible for this exception from routine inspections, consistent with the requirements established in Parts 11.G.8.4, 11.H.8.1, and 11.J.8.1.

6.2 Quarterly Visual Assessment of Storm Water Discharges.

6.2.1 **Quarterly Visual Assessment Procedures**.

Once each calendar quarter for the entire permit term, the permittee must collect a storm water sample from each outfall (except as noted in Part 6.2.3) and conduct a visual assessment of each of these samples. These samples are not required to be collected consistent with 40 CFR Part 136 procedures but should be collected in such a manner that the samples are representative of the storm water discharge. If no discharge occurs during the quarterly visual assessment period, the permittee must still report no discharge for this monitoring period and follow the requirements of Part 7.1.6.

The visual assessment must be made:

- Of a sample in a clean, clear glass, or plastic container, and examined in a well-lit area;
- On samples collected within the first 30 minutes of an actual discharge from a measurable storm event. If it is not possible to collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes. The permittee must document in the SWPPP why it was not possible to take samples within the first 30 minutes and document in the SWPPP their alternative method/order for collecting samples. In the case of snowmelt, samples must be taken during a period with a measurable discharge from the permittees site; and
- For storm events, on discharges that occur at least 72 hours (3 days) from the previous discharge. The 72-hour (3-day) storm interval does not apply if the permittee documents that less than a 72-hour (3-day) interval is representative for local storm events during the sampling period.

A permittee must visually inspect the sample for the following water quality characteristics:

- Color;
- Odor;
- Clarity (dimished);
- Floating solids;

- Settled solids;
- Suspended solids;
- Foam;
- Oil sheen; and
- Other obvious indicators of storm water pollution.

6.2.2 **Quarterly Visual Assessment Documentation**.
A permittee must document the results of their visual assessments and maintain this documentation onsite with the SWPPP as required in Part 6.2.3. The permittee is not required to submit their visual assessment findings to DEC, unless specifically requested to do so. At a minimum, the permittees documentation of the visual assessment must include:

- Sample location(s)
- Sample collection date and time, and visual assessment date and time for each sample;
- Personnel collecting the sample and performing visual assessment, and their signatures;
- Nature of the discharge (i.e., runoff or snowmelt);
- Results of observations of the storm water discharge;
- Photographs of sample and sample location;
- Probable sources of any observed storm water contamination, and
- If applicable, why it was not possible to take samples within the first 30 minutes.
- Quarterly Visual Assessment Documentation must be signed and certified in accordance with Appendix A, Subsection 1.12 of the permit.

Any corrective action required as a result of a quarterly visual assessment must be performed consistent with Part 8 of this permit.

6.2.3 **Exceptions to Quarterly Visual Assessments**.
Adverse Weather Conditions: When adverse weather conditions prevent the collection of samples during the quarter, the permittee must take a substitute sample during the next qualifying storm event. Documentation of the rationale for no visual assessment for the quarter must be included with the SWPPP records as described in Part 5.8. Adverse conditions are those that are dangerous or create inaccessibility for personnel, such as local flooding, high winds, or electrical storms, or situations that otherwise make sampling impractical, such as drought or extended frozen conditions.

Climates with Irregular Storm Water Runoff: If the facility is located in an area where limited rainfall occurs during many parts of the year (e.g., arid or semi-arid climate) or in an area where freezing conditions exist that prevent runoff from occurring for extended periods, then the samples for the quarterly visual assessments may be distributed during seasons when precipitation runoff occurs. (See Part 7.1.6)

Areas Subject to Snow: In areas subject to snow, at least one quarterly visual assessment must capture snowmelt discharge, as described in Part 7.1.3, taking into account the exception described above for climates with irregular storm water runoff.

Inactive and Unstaffed Sites: The requirement for a quarterly visual assessment does not apply at a facility that is inactive and unstaffed, as long as there are no industrial materials or activities exposed to storm water. To invoke this exception, the permittee must maintain a statement in the SWPPP as required in Part 5.2.6.2 indicating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to precipitation, in accordance with the substantive requirements in 40 CFR 122.26(g)(4)(iii). The statement must be signed and certified in accordance with Appendix A, Subsection 1.12. If circumstances change and industrial materials or activities become exposed to storm water or the facility becomes active and/or staffed, this exception no longer applies and the permittee must immediately resume quarterly visual assessments. If the permittee is not qualified for this exception at the time they are authorized under this permit, but during the permit term they become qualified because their facility is inactive and unstaffed, and there are no industrial materials or activities that are exposed to storm water, then the permittee must include the same signed and certified statement as above and retain it with their records pursuant to Part 5.8.

Inactive and unstaffed facilities covered under Sectors G (Metal Mining), H (Coal Mines and Coal Mining-Related Facilities), and J (Non-Metallic Mineral Mining and Dressing), are not required to meet the "no industrial materials or activities exposed to storm water" standard to be eligible for this exception from quarterly visual assessment, consistent with the requirements established in Parts 11.G.8.4, 11.H.8.1, and 11.J.8.1.

Substantially Identical Outfalls: If a permittees facility has two or more outfalls that discharge substantially identical effluents, as documented in Part 5.2.6.2, the permittee may conduct quarterly visual assessments of the discharge at just one of the outfalls and report that the results also apply to the substantially identical outfall(s) provided that the permittee performs visual assessments on a rotating basis of each substantially identical outfall throughout the period of coverage under this permit.

If storm water contamination is identified through visual assessment performed at a substantially identical outfall, the permittee must assess and modify their control measures as appropriate for each outfall represented by the monitored outfall.

6.3 Comprehensive Site Inspections.

6.3.1 **Comprehensive Site Inspection Procedures**.

A permittee must conduct annual comprehensive site inspections while covered under this permit. Annual, as defined in this Part, means once during each of the following inspection periods beginning with the period the permittee is authorized to discharge under this permit:

Year 1:	Permit Effective Date	–	December 31, 2020
Year 2:	January 1, 2021	–	December 31, 2021
Year 3:	January 1, 2022	–	December 31, 2022
Year 4:	January 1, 2023	–	December 31, 2023
Year 5:	January 1, 2024	–	December 31, 2024

A permittee is waived from having to perform a comprehensive site inspection for an inspection period, as defined above, if authorization to discharge is obtained less than three months before the end of that inspection period.

Should a permittees coverage be administratively continued after the expiration date of this permit, the permittee must continue to perform these inspections annually until they are no longer covered.

Comprehensive site inspections must be conducted by qualified personnel with at least one member of the storm water pollution prevention team participating in the comprehensive site inspections.

The comprehensive site inspections must cover all areas of the facility affected by the requirements in this permit, including the areas identified in the SWPPP as potential pollutant sources (see Part 5.2.4) where industrial materials or activities are exposed to storm water, any areas where control measures are used to comply with the effluent limits in Part 3, and areas where spills and leaks have occurred in the past 3 years. If the permittee has documented in the SWPPP that some industrial sector sites within the facility have no exposure to storm water the comprehensive site inspection should include those sector areas as well to verify no exposure still exists. The inspections must also include a review of monitoring data collected in accordance with Part 7.2. Inspectors must use the results of the past year's visual and analytical monitoring when planning and conducting inspections. Inspectors must examine the following:

- Industrial materials, residue, or trash that may have or could come into contact with storm water;
- Leaks or spills from industrial equipment, drums, tanks, and other containers;
- Offsite tracking of industrial or waste materials, or sediment where vehicles enter or exit the site;
- Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas; and
- Control measures needing replacement, maintenance, or repair.

Storm water control measures required by this permit must be observed to ensure that they are functioning correctly. If discharge locations are inaccessible, nearby downstream locations must be inspected.

The annual comprehensive site inspection may also be used as one of the routine inspections, as long as all components of both types of inspections are included.

6.3.2 **Comprehensive Site Inspection Documentation**.
A permittee must document the findings of each comprehensive site inspection and maintain this documentation onsite with the SWPPP as required in Part 5.8. In addition, the permittee must submit this documentation in an annual report as required in Part 9.2. At a minimum, the permittees documentation of the comprehensive site inspection must include (see the Annual Reporting Form included in Appendix F):

- The date of the inspection;
- The name(s) and title(s) of the personnel making the inspection;
- Findings from the examination of areas of the facility identified in Part 6.3.1 including inspections of the individual industrial sectors within a facility under a single permit which have been noted as having no exposure in the SWPPP;
- All observations relating to the implementation of the permittees control measures including:
    - previously unidentified discharges from the site,
    - previously unidentified pollutants in existing discharges,
    - evidence of, or the potential for, pollutants entering the drainage system;
    - evidence of pollutants discharging to receiving waters at all facility outfall(s), and the condition of and around the outfall, including flow dissipation measures to prevent scouring, and
    - additional control measures needed to address any conditions requiring corrective action identified during the inspection.
- Any required revisions to the SWPPP resulting from the inspection;
- Any incidents of noncompliance observed or a certification stating the facility is in compliance with this permit (if there is no noncompliance); and
- A statement, signed and certified in accordance with Appendix A, Subsection 1.12 of the permit.

Any corrective action required as a result of the comprehensive site inspection must be performed consistent with Part 8 of this permit.

7. Monitoring.

A permittee must collect and analyze storm water samples and document monitoring activities consistent with the procedures described in Part 7 and Appendix A, Subsections 3.0, and any additional sector-specific requirements in Part 11. Refer to Part 9 for reporting and recordkeeping requirements.

7.1 Monitoring Procedures.

7.1.1 **Monitored Outfalls**.
Applicable monitoring requirements apply to each outfall authorized by this permit, except as otherwise exempt from monitoring as a "substantially identical outfall." If the permittees facility has two or more outfalls that they believe discharge substantially identical effluents, based on the similarities of the general industrial activities and control measures, exposed materials that may significantly contribute pollutants to storm water, and runoff coefficients of their drainage areas, they may monitor the effluent of just one of the outfalls and report that the results also apply to the substantially identical outfall(s). As required in Part 5.2.6.2, the SWPPP must identify each outfall authorized by this permit and describe the rationale for any substantially identical outfall determinations. The allowance for monitoring only one of the substantially identical outfalls is not applicable to any outfalls with numeric effluent limitations. The permittee is required to monitor each outfall covered by a numeric effluent limit as identified in Part 7.2.2.

7.1.2 **Commingled Discharges**.
If discharges authorized by this permit commingle with discharges not authorized under this permit, any required sampling of the authorized discharges must be performed at a point before they mix with other waste streams.

7.1.3 **Measurable Storm Events**.
All required monitoring must be performed on a storm event that results in an actual discharge from the facility ("measurable storm event") that follows the preceding measurable storm event by at least 72 hours (three days). The 72-hour (three-day) storm interval does not apply if the permittee is able to document that less than a 72-hour (three-day) interval is representative for local storm events during the sampling period. In the case of snowmelt, the monitoring must be performed at a time when a measurable discharge occurs at the facility.

For each monitoring event, except snowmelt monitoring, the permittee must identify the date and duration (in hours) of the rainfall event, rainfall total (in inches) for that rainfall event, and time (in days) since the previous measurable storm event. For snowmelt monitoring, the permittee must identify the date of the sampling event.

7.1.4 **Sample Type**.
A permittee must take a minimum of one grab sample from a discharge resulting from a measurable storm event as described in Part 7.1.3. Samples must be collected within the first 30 minutes of a discharge produced from a measurable storm event. If it is not possible to

collect the sample within the first 30 minutes of discharge, the sample must be collected as soon as practicable after the first 30 minutes and documentation must be kept with the SWPPP explaining why it was not possible to take samples within the first 30 minutes. In the case of snowmelt, samples must be taken during a period with a measurable discharge.

For facilities covered by Subparts 11.G, 11.H, and 11.J, they are exempt from the 30 minute requirement. These facilities must sample as soon as practical after a storm event. The SWPPP must contain a list and map of the monitoring locations and the order in which sample collection occurs.

7.1.5 **Adverse Weather Conditions**.
When adverse weather conditions as described in Part 6.2.3 prevent the collection of samples according to the relevant monitoring schedule, the permittee must take a substitute sample during the next qualifying storm event. Adverse weather does not exempt a permittee from having to file a benchmark monitoring report in accordance with their sampling schedule. The permittee must report any failure to monitor as specified in Part 9.1 indicating the basis for not sampling during the usual reporting period.

7.1.6 **Climates with Irregular Storm Water Runoff**.
If a permittees facility is located in areas where limited rainfall occurs during parts of the year (e.g., arid or semi-arid climates) or in areas where freezing conditions exist that prevent runoff from occurring for extended periods, required monitoring events may be distributed during seasons when precipitation occurs, or when snowmelt results in a measurable discharge from the facility. The permittee must still collect the required number of samples.

7.1.7 **Monitoring Periods**.
Monitoring requirements in this permit begin in the first full quarter following either April 1, 2020 or the permittees date of discharge authorization, whichever date comes later. If the permittees monitoring is required on a quarterly basis (e.g., benchmark monitoring), the permittee must monitor at least once in each of the following three-month intervals:

- **Quarter 1**: January 1 - March 31;
- **Quarter 2**: April 1 – June 30;
- **Quarter 3**: July 1 – September 30;
- **Quarter 4**: October 1 – December 31.

For example, if permit coverage was obtained on June 2, 2020, then the permittees first monitoring quarter is July 1 - September 30, 2020. This monitoring schedule may be modified in accordance with Part 7.1.6 if the revised schedule is documented with the SWPPP and provided to DEC with the first monitoring report.

7.1.8 **Monitoring for Allowable Non-Storm Water Discharges.**
The permittee is only required to monitor allowable non-storm water discharges (as delineated in Part 1.2.3) when they are commingled with storm water discharges associated with industrial activity.

7.2 Required Monitoring.

This permit includes four types of required analytical monitoring, one or more of which may apply to the permittees discharge:

- Quarterly benchmark monitoring (see Part 7.2.1)
- Annual effluent limitations guidelines monitoring (see Part 7.2.2);
- Impaired waters monitoring (see Part 7.2.3); and
- Other monitoring as required by DEC (see Part 7.2.4).

When more than one type of monitoring for the same parameter at the same outfall applies (e.g., total suspended solids once per year for an effluent limit and once per quarter for benchmark monitoring at a given outfall), the permittee may use a single sample to satisfy both monitoring requirements (i.e., one sample satisfying both the annual effluent limit sample and one of the four quarterly benchmark monitoring samples).

All required monitoring must be conducted in accordance with the procedures described in Appendix A, Subsection 3.0.

7.2.1 **Benchmark Monitoring**.
This permit stipulates pollutant benchmark concentrations that may be applicable to certain sectors / subsectors. Benchmark monitoring data are primarily for the permittees use to determine the overall effectiveness of the permittees control measures and to assist the permittee in knowing when additional corrective action(s) may be necessary to comply with the effluent limitations in Part 4.

The benchmark concentrations are not effluent limitations; a benchmark exceedance, therefore, is not a permit violation. However, if corrective action is required as a result of a benchmark exceedance, failure to conduct required corrective action is a permit violation.

At the permittee's discretion, more than four samples may be taken during separate runoff events and used to determine the average benchmark parameter concentration for facility discharges. These extra samples may be taken in any quarter of the permittees' choice.

7.2.1.1 ***Applicability of Benchmark Monitoring***. A permittee must monitor for any benchmark parameters specified for the industrial sector(s), both primary industrial activity and any co-located industrial activities, applicable to the permittees discharge. The industry-specific benchmark concentrations are listed in the sector-specific sections of Part 11. If the facility is in one of the industrial sectors subject to benchmark concentrations that are hardness-dependent, the permittee is required to submit to DEC with their first benchmark report a hardness value, established consistent with the procedures in Appendix E, which is representative of the receiving water.

Samples must be analyzed consistent with 40 CFR Part 136 analytical methods and using test procedures with quantitation limits at or below benchmark values for all benchmark parameters for which the permittee is required to sample.

7.2.1.2 ***Benchmark Monitoring Schedule***. Benchmark monitoring must be conducted quarterly, as identified in Part 7.1.7, for the permittees first four full consecutive quarters of permit coverage commencing no earlier than April 1, 2020. Facilities in climates with irregular storm water runoff, as described in Part 7.1.6, may modify this quarterly schedule provided that this revised schedule is reported to DEC when the first benchmark sample is collected and reported, and that this revised schedule is kept with the facility's SWPPP as specified in Part 5.2.6. When conditions prevent the obtaining of four samples in four consecutive quarters, continue monitoring until achieving the four samples required for calculating the benchmark monitoring average.

7.2.1.3 ***Data Not Exceeding Benchmarks.*** After collection of four quarterly samples, if the average of the four monitoring values for any parameter does not exceed the benchmark, the permittee has fulfilled their monitoring requirements for that parameter for the permit term. For averaging purposes, use a value of zero for any individual sample parameter, analyzed using procedures consistent with Part 7.2.1.1, which is determined to be less than the method detection limit. For sample values that fall between the method detection level and the quantitation limit (i.e., a confirmed detection but below the level that can be reliably quantified), use a value halfway between zero and the quantitation limit.

7.2.1.4 ***Data Exceeding Benchmarks.*** After collection of four quarterly samples, if the average of the four monitoring values for any parameter exceeds the benchmark, the permittee must, in accordance with Part 8.2, review the selection, design, installation, and implementation of their control measures to determine if modifications are necessary to meet the benchmarks in this permit, and either:

- Make the necessary modifications and continue quarterly monitoring until the permittee has completed four additional quarters of monitoring for which the average does not exceed the benchmark; or

- Make a determination that no further pollutant reductions are technologically available and economically practicable and achievable in light of best industry

practice to meet the technology-based effluent limits or are necessary to meet the water-quality-based effluent limitations in Part 3 of this permit, in which case the permittee must continue monitoring once per year. The permittee must also document their rationale for concluding that no further pollutant reductions are achievable, and retain all records related to this documentation with their SWPPP. The permittee must also notify DEC of this determination in their next benchmark monitoring report.

In accordance with Part 8.2, the permittee must review its control measures and perform any required corrective action immediately (or document why no corrective action is required), without waiting for the full four quarters of monitoring data, if an exceedance of the four quarter average is mathematically certain. If after modifying the permittees control measures and conducting four additional quarters of monitoring, their average still exceeds the benchmark (or if an exceedance of the benchmark by the four quarter average is mathematically certain prior to conducting the full four additional quarters of monitoring), the permittee must again review its control measures and take one of the two actions above.

7.2.1.5 ***Natural Background Pollutant Levels.*** Following the first four quarters of benchmark monitoring (or sooner if the exceedance is triggered by less than four quarters of data, see above), if the average concentration of a pollutant exceeds a benchmark value, and the permittee determines that exceedance of the benchmark is attributable solely to the presence of that pollutant in the natural background, the permittee is not required to perform corrective action or additional benchmark monitoring provided that:

- The average concentration of the permittees benchmark monitoring results is less than or equal to the concentration of that pollutant in the natural background;
- The permittee must document and maintain with the SWPPP, as required in Part 5.8, the supporting rationale for concluding that benchmark exceedances are in fact attributable solely to natural background pollutant levels. The permittee must include in their supporting rationale any data previously collected by the permittee or others (including literature studies) that describe the levels of natural background pollutants in their storm water discharge; and
- The permittee must notify DEC on their final quarterly benchmark monitoring report that the benchmark exceedances are attributable solely to natural background pollutant levels.

Natural background pollutants include those substances that are naturally occurring in soils or groundwater. Natural background pollutants do not include legacy pollutants from earlier activity at the facility, or pollutants in run-on from neighboring sources which are not naturally occurring.

7.2.1.6 ***Exception for Inactive and Unstaffed Sites***[6]. The requirement for benchmark monitoring does not apply at a facility that is inactive and unstaffed, as long as there are no industrial materials or activities exposed to storm water. To invoke this exception, the permittee must do the following:

- Maintain a statement onsite with the SWPPP stating that the site is inactive and unstaffed, and that there are no industrial materials or activities exposed to storm water in accordance with the substantive requirements in 40 CFR 122.26(g) and sign and certify the statement in accordance with Appendix A, Subsection 1.12; and

- If circumstances change and industrial materials or activities become exposed to storm water or the facility becomes active and/or staffed, this exception no longer applies and the permittee must immediately begin complying with the applicable benchmark monitoring requirements under Part 7.2 as if they were in their first year of permit coverage. The permittee must indicate in their first benchmark monitoring report that their facility has materials or activities exposed to storm water or has become active and/or staffed.

- If the permittee is not qualified for this exception at the time they are authorized under this permit, but during the permit term they become qualified because their facility is inactive and unstaffed, and there are no industrial materials or activities that are exposed to storm water, then the permittee must notify DEC of this change in their next benchmark monitoring report. A permittee may discontinue benchmark monitoring once they have notified DEC, and prepared and signed the certification statement described above concerning their facility's qualification for this special exception.

7.2.2 **Effluent Limitations Monitoring**.

7.2.2.1 ***Monitoring Based on Effluent Limitations Guidelines***. Table 7-1 identifies the storm water discharges subject to effluent limitation guidelines that are authorized for coverage under this permit. Beginning in the first full quarter following April 1, 2020 or the permittees date of discharge authorization, whichever date comes later, the permittee must monitor once per year at each outfall containing the discharges identified in Table 7-1 for the parameters specified in the sector-specific section of Part 11.

[6] This exception has different requirements for Sectors G, H, and J (see Part 11).

Table 7-1: Required Monitoring for Effluent Limits Based on Effluent Limitations Guidelines

Regulated Activity	Effluent Limit	Monitoring Frequency	Sample Type
Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas	See Part 11.A.7	1/year	Grab
Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished product, by-products or waste products (SIC 2874)	See Part 11.C.4	1/year	Grab
Runoff from asphalt emulsion facilities	See Part 11.D.4	1/year	Grab
Runoff from material storage piles at cement manufacturing facilities	See Part 11.E.5	1/year	Grab
Mine dewatering discharges at crushed stone, construction sand and gravel, or industrial sand mining facilities	See Part 11.J.9	1/year	Grab
Runoff from hazardous waste landfills	See Part 11.K.6	1/year	Grab
Runoff from non-hazardous waste landfills	See Part 11.L.10	1/year	Grab
Runoff from coal storage piles at steam electric generating facilities	See Part 11.O.8	1/year	Grab
Existing and new primary airports with 1,000 or more annual jet departures that discharge wastewater associated with airfield pavement deicing that contains urea commingled with stormwater	See Part 11.S.8	1/year	Grab

7.2.2.2 ***Substantially Identical Outfalls***. A permittee must monitor each outfall discharging runoff from any regulated activity identified in Table 7-1. The substantially identical outfall monitoring provisions are not available for numeric effluent limits monitoring.

7.2.2.3 **Follow-up Actions if Discharge Exceeds Numeric Effluent Limit**. The permittee must follow-up monitoring within 30 calendar days (or during the next qualifying runoff event, should none occur within 30 days) of implementing corrective action(s) taken pursuant to Part 8 in response to exceedance of a numeric effluent limit contained in this permit. Monitoring must be performed for any pollutant(s) that exceeds the effluent limit. If this follow-up monitoring exceeds the applicable effluent limitation, you must:

- **Submit a Noncompliance Notification Form**: The permittee must submit an Noncompliance Notification Form no later than the 15th day of the following month after they have received all the lab results; and

- **Continue to Monitor**: the permittee must monitor, at least quarterly, until the discharge is in compliance with the effluent limit or until DEC waives the requirement for additional monitoring.

7.2.3 **Discharges to Impaired Waters Monitoring**.

7.2.3.1 ***Permittees Required to Monitor Discharges to Impaired Waters***. If a permittee discharges to an impaired water, the permittee must monitor for all pollutants for which the waterbody is impaired and for which a standard analytical method exists (see 40 CFR Part 136).

If the pollutant for which the waterbody is impaired is suspended solids, turbidity or sediment/sedimentation, the permittee must monitor for Total Suspended Solids (TSS) and turbidity. If the pollutant for which the waterbody is impaired is expressed in the

form of an indicator or surrogate pollutant, the permittee must monitor for that indicator or surrogate pollutant. No monitoring is required when a waterbody's biological communities are impaired but no pollutant, including indicator or surrogate pollutants, is specified as causing the impairment, or when a waterbody's impairment is related to hydrologic modifications, impaired hydrology, or other pollutant.

7.2.3.2 ***Impaired Waters Monitoring Schedule***.

Discharges to impaired waters without an EPA approved or established TMDL: Beginning in the first full calendar quarter following April 1, 2020 or the permittees date of discharge authorization, whichever date comes later, the permittee must monitor once per year at each outfall (except substantially identical outfalls) discharging storm water to impaired waters without an EPA approved or established TMDL. This monitoring requirement does not apply after one year if the pollutant for which the waterbody is impaired is not detected above natural background levels in their storm water discharge, and the permittee must document, as required in Part 5.8 (Additional Documentation Requirements), that this pollutant is not expected to be present above natural background levels in the permittees discharge.

If the pollutant for which the water is impaired is not present and not expected to be present in the permittee's discharge, or it is present but the permittee has determined that its presence is caused solely by natural background sources, they should include a notification to this effect in their first monitoring report, after which they may discontinue annual monitoring. To support a determination that the pollutant's presence is caused solely by natural background sources, the permittee must keep the following documentation with their SWPPP records:

- An explanation of why the permittee believes that the presence of the pollutant causing the impairment in their discharge is not related to the activities at their facility; and
- Data and/or studies that tie the presence of the pollutant causing the impairment in their discharge to natural background sources in the watershed.

Natural background pollutants include those substances that are naturally occurring as a result of native soils, vegetation, wildlife, or groundwater. Natural background pollutants do not include legacy pollutants from earlier activity on the site, or pollutants in run-on from neighboring sources which are not naturally occurring.

Discharges to impaired waters with an EPA approved or established TMDL WLA: For storm water discharges to waters for which there is an EPA approved or established TMDL waste load allocation (WLA), the permittee is not required to monitor for the pollutant for which the TMDL was written unless DEC informs the permittee, upon examination of the applicable TMDL and/or WLA, that they are subject to such a requirement consistent with the assumptions of the applicable TMDL and/or WLA.

DEC's notice will include specifications on which pollutant to monitor and the required monitoring frequency during the first year of permit coverage. Following the first year of monitoring:

- If the TMDL pollutant is not detected in any of the permittees first year samples, they may discontinue further sampling, unless the TMDL has specific instructions to the contrary, in which case the permittee must follow those instructions. The permittee must keep records of this finding onsite with their SWPPP.
- If the permittee detects the presence (above background levels) of the pollutant causing the impairment in their storm water discharge for any of the samples collected in the first year, the permittee must continue monitoring annually throughout the term of this permit, unless the TMDL specifies more frequent monitoring, in which case the permittee must follow the TMDL requirements.

7.2.4 **Additional Monitoring Required by DEC**.
DEC may notify the permittee of additional discharge monitoring requirements. Any such notice will briefly state the reasons for the monitoring, locations, and parameters to be monitored, frequency and period of monitoring, sample types, and reporting requirements.

8. Corrective Actions.

8.1 Conditions Requiring Review and Revision to Eliminate Problem.

If any of the following conditions occur, the permittee must review and revise the selection, design, installation, and implementation of their control measures to ensure that the condition is eliminated and will not be repeated in the future:

8.1.1 An unauthorized release or discharge (e.g., spill, leak, or discharge of non-storm water not authorized by this or another APDES permit) occurs at the permittees facility;

8.1.2 A discharge violates a numeric effluent limit;

8.1.3 The permittee becomes aware, or DEC determines, that the permittee's control measures are not stringent enough for the discharge to meet a WQS in the receiving water;

8.1.4 An inspection or evaluation of the permittees facility by an DEC or EPA official determines that modifications to the control measures are necessary to meet the non-numeric effluent limits in this permit; or

8.1.5 The permittee finds in their routine operation, facility inspection, quarterly visual assessment, or comprehensive site inspection that their control measures are not being properly installed, operated and maintained.

8.2 Conditions Requiring Review to Determine if Modifications Are Necessary.

If any of the following conditions occur, the permittee must review the selection, design, installation, and implementation of their control measures to determine if modifications are necessary to meet the effluent limits in this permit:

8.2.1 Construction or a change in design, operation, or maintenance at a permittees facility significantly changes the nature of pollutants discharged in storm water from their facility, or significantly increases the quantity of pollutants discharged; or

8.2.2 The average of four quarterly sampling results exceeds an applicable benchmark. If less than four benchmark samples have been taken, but the results are such that an exceedence of the four quarter average is mathematically certain (i.e., if the sum of quarterly sample results to date is more than four times the benchmark level) this is considered a benchmark exceedence, triggering this review.

8.3 Corrective Action Deadlines.

A permittee must document their discovery of any of the conditions listed in Parts 8.1 and 8.2 within 24 hours of making such discovery. Subsequently, the permittee must comply with Appendix A Part 3.4 to document any corrective action(s) to be taken to eliminate or further investigate the deficiency, or if no corrective action is needed, the basis for that determination. Specific documentation required is detailed in Part 8.4. If a permittee determines that changes are necessary following their review, any modifications to their control measures must be made before the next storm event if possible, or as soon as practicable following that storm event. These time intervals are not grace periods, but are schedules considered reasonable for documenting a permittees findings and for making repairs and improvements. They are included in this permit to ensure that the conditions prompting the need for these repairs and improvements are not allowed to persist indefinitely.

8.4 Corrective Action Report.

8.4.1 Comply with Appendix A Part 3.4 upon discovery of any condition listed in Parts 8.1 and 8.2, the permittee must document the following information (i.e., questions 3-5 of the Corrective Actions section in the Annual Reporting Form, provided in Appendix F):

8.4.1.1 Identification of the condition triggering the need for corrective action review;

8.4.1.2 Description of the problem identified; and

8.4.1.3 Date the problem was identified.

8.4.2 Comply with Appendix A Part 3.4 upon discovery of any condition listed in Parts 8.1 and 8.2, the permittee must document the following information (i.e., questions 7-11 of the Corrective Actions section in the Annual Reporting Form, provided in Appendix F):

8.4.2.1 Summary of corrective action taken or to be taken (or, for triggering events identified in Part 8.2 where the permittee determines that corrective action is not necessary, the basis for this determination);

8.4.2.2 Notice of whether SWPPP modifications are required as a result of this discovery or corrective action;

8.4.2.3 Date corrective action initiated; and

8.4.2.4 Date corrective action completed or expected to be completed.

8.4.3 A permittee must submit this documentation in an annual report as required in Part 9.2 and retain a copy onsite with the SWPPP as required in Part 5.8.

8.5 Effect of Corrective Action.

If the event triggering the review is a permit violation (e.g., non-compliance with an effluent limit), it must be documented using the Noncompliance Notification Form (see http://dec.alaska.gov/water/compliance/permittee/). Furthermore, correcting it does not remove the original violation. Additionally, failing to take corrective action in accordance with this section is an additional permit violation.

8.6 Substantially Identical Outfalls.

If the event triggering corrective action is linked to an outfall that represents other substantially identical outfalls, the permittees review must assess the need for corrective action for each outfall represented by the outfall that triggered the review. Any necessary changes to control measures that affect these other outfalls must also be made before the next storm event if possible, or as soon as practicable following that storm event.

9. Reporting and Recordkeeping.

9.1 Reporting Monitoring Data to DEC.

All monitoring data collected pursuant to Parts 7.2 must be submitted to DEC using the NetDMR system (Part 9.8.1 E-Reporting Rule for DMR (Phase I)) (unless a waiver from electronic reporting has been granted, in which case you may submit a paper DMR form) no later than the 15th day of the following month after the permittee has received the complete laboratory results for all monitored outfalls for the reporting period. If a waiver from electronic reporting has been granted, paper reporting forms (DMR as provided in Appendix F) must be submitted by the deadline to the appropriate address identified in Part 9.6.

For benchmark monitoring, note that the permittee is required to submit sampling results to DEC no later than the 15th day of the following month after receiving all laboratory results for each quarter that are required to collect benchmark samples, in accordance with Part 7.2.1.2. If a permittee collects multiple samples in a single quarter (e.g., due to adverse weather conditions, climates with irregular storm water runoff, or areas subject to snow), they are required to submit all sampling results to DEC no

later than the 15th day of the following month after receiving all the laboratory results. If no discharge occurs during the benchmark monitoring period, the permittee must still report no discharge for this monitoring period.

9.2 Annual Report.

A permittee must submit an annual report to DEC that includes the findings from their Part 6.3 comprehensive site inspection and any corrective action documentation as required in Part 8.4. If corrective action is not yet completed at the time of submission of this annual report, the permittee must describe the status of any outstanding corrective action(s). In addition to the information required in Parts 8.4 (Corrective Action Report) and 6.3.2 (Comprehensive Site Inspection Documentation), the permittee must include the following information with their annual report:

- Facility name;
- APDES permit tracking number;
- Facility physical address; and
- Contact person name, title, and phone number.

DEC requires the permittee submit this report using the Annual Report provided as Appendix F. The Annual Report may be submited electronically through the DEC Online Application System (OASys) located at http://www.dec.alaska.gov/water/oasys/index.html. By February 15th of the year following the reporting year, the permittee must submit the annual report to DEC to the address identified in Part 9.6 or via OASys.

9.3 Noncompliance Notification for Numeric Effluent Limits.

If follow-up monitoring pursuant to Part 7.2.2.3 exceeds a numeric effluent limit, the permittee must submit a Noncompliance Notification Form (see http://dec.alaska.gov/water/compliance/permittee/) to DEC no later than the 15th day of the following month after they have received all their lab results. The permittees report must include the following:

- APDES permit tracking number;
- Facility name, physical address and location;
- Name of receiving water;
- Monitoring data from this and the preceding monitoring event(s);
- An explanation of the situation; what the permittee has done and intend to do (should their corrective actions not yet be complete) to correct the violation; and
- An appropriate contact name and phone number.

9.4 Additional Reporting.

9.4.1 A permittee is subject to the standard permit reporting provisions of Appendix A, Subsection 3.0.

9.4.2 Where applicable, the permittee must submit, and DEC must receive, the following reports at the appropriate address in Part 9.6. If the facility discharges through an MS4, the permittee must also submit these reports to the MS4 operator (identified pursuant to Part 5.2.3).

9.4.2.1 24-hour reporting (see Appendix A, Subsection 3.4) - A permittee must report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours from the time the permittee becomes aware of the circumstances;

9.4.2.2 Five (5)-day follow-up reporting to the 24 hour reporting (see Appendix A, Subsection 3.4) - A written submission must also be provided within five days of the time the permittee becomes aware of the circumstances;

9.4.2.3 Reportable quantity spills (see Part 4.2.4) - A permittee must provide notification, as required under Part 4.2.4, as soon as they have knowledge of a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity.

9.4.3 Where applicable, the permittee must submit, and DEC must receive, the following reports at the appropriate address in Part 9.6:

9.4.3.1 Planned changes (see Appendix A, Subsection 2.1) – A Permittee must give notice to DEC as soon as possible of any planned physical alterations or additions to the permitted facility that qualify the facility as a new source or that could significantly change the nature or significantly increase the quantity of pollutants discharged;

9.4.3.2 Anticipated noncompliance (see Appendix A, Subsection 2.2) – A Permittee must give advance notice to DEC of any planned changes in the permitted facility or activity which they anticipate will result in noncompliance with permit requirements;

9.4.3.3 Transfer of ownership and/or operation – The new permittee must submit a complete and accurate NOI in accordance with the requirements of Appendix F of this permit and by the deadlines specified in Table 2-1;

9.4.3.4 Compliance schedules (see Appendix A, Subsection 2.4) – Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date;

9.4.3.5 Other noncompliance (see Appendix A, Subsection 3.5) - A permittee must report all instances of noncompliance not reported in their monitoring report (pursuant to Part 9.1), compliance schedule report, or 24-hour report at the time monitoring reports are submitted; and

9.4.3.6 Other information (see Appendix A, Subsection 2.5) – A permittee must promptly submit facts or information if they become aware that they failed to submit relevant facts in their NOI, or that they submitted incorrect information in their NOI or in any report.

9.5 Recordkeeping.

A permittee must retain copies of their SWPPP (including any modifications made during the term of this permit), additional documentation requirements pursuant to Part 5.8 (including documentation related to corrective actions taken pursuant to Part 5), all reports and certifications required by this permit, monitoring data, and records of all data used to complete the NOI to be covered by this permit, for a period of at least 3 years from the date that the permittees coverage under this permit expires or is terminated.

9.6 Addresses for Reports.

Notice of Intent, Notice of Intent modification, Notice of Termination, No Exposure Certificate, and SWPPP's should be submitted using DEC's eNOI system (http://dec.alaska.gov/water/wastewater/stormwater/apdesenoi/) or sent to the Permitting Program address in Appendix A, Part 1.1.1.

Paper copies of any reports required in Parts 7 through 9, not otherwise submitted electronically via DEC's eNOI system (http://dec.alaska.gov/water/wastewater/stormwater/apdesenoi/) must be sent to the Compliance and Enforcement Program address in Appendix A, Part 1.1.2.

9.7 Request for Submittal of Records.

The Department may request copies of all or a portion of the information collected and maintained in the SWPPP. A permittee must provide a response to written request for records to the Department within thirty (30) calendar days of receipt of a written request.

9.8 Electronic Reporting (E-Reporting) Rule

9.8.1 E-Reporting Rule for DMR (Phase I)

The Permittee must submit DMR data electronically through Network Discharge Monitoring Report (NetDMR) per Phase I of the E-Reporting Rule (40 CFR §127) upon the effective date of the Permit. Authorized persons may access permit information by logging into the NetDMR Portal (cdxnodengn.epa.gov/oeca-netdmr-web/action/login). DMRs submitted in compliance with the E-Reporting Rule are not required to be submitted as described in Appendix – A-Standard Conditions unless requested or approved by the Department. Any DMR data required by the Permit that cannot be reported in a NetDMR field (e.g., mixing zone receiving water data, etc.), shall be included as an attachment to the NetDMR submittal. DEC has established a website at dec.alaska.gov/water/compliance/electronic-reporting-rule/ that contains general information about this new reporting format. Training materials and webinars for NetDMR can be found at netdmr.zendesk.com/home/.

9.8.2 E-Reporting Rule for Other Reports (Phase II).

Phase II of the E-Reporting rule will integrate electronic reporting for all other reports required by the Permit (e.g., Annual Reports and Certifications) and implementation is expected to begin December 2020. Permittees should monitor DEC's E-Reporting Information website (dec.alaska.gov/water/compliance/electronic-reporting-rule) for updates on Phase II of the E-Reporting Rule and will be notified when they must begin submitting all other reports electronically. Until such time, other reports required by the Permit may be submitted in accordance with Appendix A – Standard Conditions.

9.9 Standard Conditions Applicable to Recording and Reporting

9.9.1 The permittee must comply with the following recording and reporting requirements, as described in Appendix A, Standard Conditions unless specified in the body of the permit:

9.9.1.1 Retention of Records, Part 1.11.2;

9.9.1.2 Records Contents, Part 1.11.3;

9.9.1.3 Special Reporting Obligations, Part 2.0; and

9.9.1.4 Monitoring, Recording, and Reporting Requirements, Part 3.0.

10. Terminating Coverage.

10.1 Submitting a Notice of Termination (NOT).

10.1.1 To terminate permit coverage, a permittee must submit a complete and accurate NOT (see Appendix F) to the Permitting Program address listed in Part 9.6. *(If a permittee submits a NOT without meeting one or more of the conditions identified in Part 10.1.2, then a permitttees NOT is not valid.)* The permittee is responsible for meeting the terms of this permit until their authorization is terminated.

10.1.2 A permittee must submit a NOT within 30 calendar days after one or more of the following conditions have been met:

10.1.2.1 A new owner or operator has taken over responsibility for the facility;

10.1.2.2 The permittee has ceased operations at the facility, there are not or no longer will be discharges of storm water associated with industrial activity from the facility, and has already implemented necessary sediment and erosion controls as required by Part 4.2.5;

10.1.2.3 The permittee is a Sector G, H, or J facility and has met the applicable termination requirements; or

10.1.2.4 The permittee has obtained coverage under an individual or alternative general permit for all discharges required to be covered by an APDES permit, unless DEC has required that they obtain such coverage under authority of Part 2.8.1, in which case coverage under this permit will terminate automatically.

10.1.3 All required reports (including DMR if applicable) and certifications have been submitted to DEC.

10.1.4 Termination is effective upon receiving written notification from the Department.

11. Sector-Specific Requirements for Industrial Activity.

11. Subpart A – Sector A – Timber Products.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.A.1 Covered Storm Water Discharges.

The requirements in Subpart A apply to storm water discharges associated with industrial activity from Timber Products facilities as identified by the SIC Codes specified under Sector A in Table D-1 of Appendix D of the permit.

11.A.2 Limitation on Coverage.

11.A.2.1 *Prohibition of Discharges.* (See also Part 1.2.4) Not covered by this permit: storm water discharges from areas where there may be contact with the chemical formulations sprayed to provide surface protection. These discharges must be covered by a separate APDES permit.

11.A.2.2 *Authorized Non-Storm Water Discharges.* (See also Part 1.2.3) Also authorized by this permit, provided the non-storm water component of the discharge is in compliance with the requirements in Part 4.2 (Non-Numeric Effluent Limits): discharges from the spray down of lumber and wood product storage yards where no chemical additives are used in the spray-down waters and no chemicals are applied to the wood during storage.

11.A.3 Additional Technology-Based Effluent Limits.

11.A.3.1 *Good Housekeeping.* (See also Part 4.2.2) In areas where storage, loading and unloading, and material handling occur, perform good housekeeping to limit the discharge of wood debris, minimize the leachate generated from decaying wood materials, and minimize the generation of dust.

11.A.4 Additional SWPPP Requirements.

11.A.4.1 *Drainage Area Site Map.* (See also Part 5.2.3) The permittee must document in their SWPPP where any of the following may be exposed to precipitation or surface runoff: processing areas, treatment chemical storage areas, treated wood and residue storage areas, wet decking areas, dry decking areas, untreated wood and residue storage areas, and treatment equipment storage areas.

11.A.4.2 Inventory of Exposed Materials. (See also Part 5.2.4.2) Document in the SWPPP areas where contaminated soils, treatment equipment, and stored materials still remain and the management practices employed to minimize the contact of these materials with storm water runoff if the facility has used chlorophenolic, creosote, or chromium-copper-arsenic formulations for wood surface protection or preserving

11.A.4.3 Description of Storm Water Management Controls. (See also Part 5.2.5) Document measures implemented to address the following activities and sources: log, lumber, and wood product storage areas; residue storage areas; loading and unloading areas; material handling areas; chemical storage areas; and equipment and vehicle maintenance, storage, and repair areas. If the permittees facility performs wood surface protection and preservation activities, address the specific control measures, including any BMPs, for these activities.

11.A.5 Additional Inspection Requirements.

See also Part 6.1. If the permittees facility performs wood surface protection and preservation activities, inspect processing areas, transport areas, and treated wood storage areas monthly to assess the usefulness of practices to minimize the deposit of treatment chemicals on unprotected soils and in areas that will come in contact with storm water discharges.

11.A.6 Sector-Specific Benchmarks.

Table 11.A.6-1 identifies benchmarks that apply to the specific subsectors of Sector A. These benchmarks apply to both the permittees primary industrial activity and any co-located industrial activities.

(Table 11.A.6-1: Sector – Specific Benchmarks – Sector A located on following page.)

Table 11.A.6-1: Sector – Specific Benchmarks – Sector A

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector A1. General Sawmills and Planing Mills (SIC 2421)	Chemical Oxygen Demand (COD)	120.0 mg/L
	Total Suspended Solids (TSS)	100 mg/L
	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent
Subsector A2. Wood Preserving (SIC 2491)	Total Arsenic (saltwater)[1] Total Arsenic (freshwater)[2]	0.069 mg/L 0.15 mg/L
	Total Copper (saltwater)[1] Total Copper (freshwater)[2]	0.0048 mg/L Hardness Dependent
Subsector A3. Log Storage and Handling (SIC 2411)	Total Suspended Solids (TSS)	100 mg/L
Subsector A4. Hardwood Dimension and Flooring Mills; Special Products Sawmills, not elsewhere classified; Millwork, Veneer, Plywood, and Structural Wood; Wood Pallets and Skids; Wood Containers, not elsewhere classified; Wood Buildings and Mobile Homes; Reconstituted Wood Products; and Wood Products Facilities not elsewhere classified (SIC 2426, 2429, 2431-2439 (except 2434), 2441, 2448, 2449, 2451, 2452, 2493, and 2499)	Chemical Oxygen Demand (COD)	120.0 mg/L
	Total Suspended Solids (TSS)	100.0 mg/L

Note:

1. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
2. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Copper (mg/L)	Zinc (mg/L)
0 – < 25	0.0038	0.04
25 – < 50	0.0056	0.05
50 – < 75	0.0090	0.08
75 – < 100	0.0123	0.11
100 – < 125	0.0156	0.13
125 – < 150	0.0189	0.16
150 – < 175	0.0221	0.18
175 – < 200	0.0253	0.20
200 – < 225	0.0285	0.23
225 – < 250	0.0316	0.25
250+	0.0332	0.26

11.A.7 Effluent Limitations Based on Effluent Limitations Guidelines. (See also Part 7.2.2.1 of the permit.)

Table 11.A.7-1 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table 11.A.7-1: **Effluent Limitations Based on Effluent Limitations Guidelines**[1]

Industrial Activity	Parameter	Effluent Limit
Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas	pH	6.5 - 8.5 standard pH (s.u.)
	Debris (woody material such as bark, twigs, branches, heartwood, or sapwood)	No discharge of debris that will not pass through a 2.54-cm (1-in.) diameter round opening

Note:
1. Monitor annually.

11. Subpart B – Sector B – Paper and Allied Products.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.B.1 Covered Storm Water Discharges.

The requirements in Subpart B apply to storm water discharges associated with industrial activity from Paper and Allied Products Manufacturing facilities, as identified by the SIC Codes specified under Sector B in Table D-1 of Appendix D of the permit.

11.B.2 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

Table 11.B.2-1: Sector – Specific Benchmarks – Sector B

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector B1. Paperboard Mills (SIC Code 2631)	Chemical Oxygen Demand (COD)	120 mg/L

11. Subpart C – Sector C – Chemical and Allied Products Manufacturing, and Refining.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.C.1 Covered Storm Water Discharges.

The requirements in Subpart C apply to storm water discharges associated with industrial activity from Chemical and Allied Products Manufacturing, and Refining facilities, as identified by the SIC Codes specified under Sector C in Table D-1 of Appendix D of the permit.

11.C.2 Limitations on Coverage.

11.C.2.1 Prohibition of Non-Storm Water Discharges. (See also Part 1.2.4) The following are not covered by this permit: non-storm water discharges containing inks, paints, or substances (hazardous, nonhazardous, etc.) resulting from an onsite spill, including materials collected in drip pans; washwater from material handling and processing areas; and washwater from drum, tank, or container rinsing and cleaning.

11.C.3 Sector-Specific Benchmarks.

Table 11.C.3-1 identifies benchmarks that apply to the specific subsectors of Sector C. These benchmarks apply to both the permittees primary industrial activity and any co-located industrial activities.

(Table 11.C.3-1: Sector – Specific Benchmarks – Sector C located on following page.)

Table 11.C.3-1: Sector – Specific Benchmarks – Sector C		
Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector C1. Agricultural Chemicals (SIC 2873-2879)	Nitrate plus Nitrite Nitrogen	0.68 mg/L
	Total Lead (saltwater)[1] Total Lead (freshwater)[2]	0.21 mg/L Hardness Dependent
	Total Iron	1.0 mg/L
	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent
	Phosphorus	2.0 mg/L
Subsector C2. Industrial Inorganic Chemicals (SIC 2812-2819)	Total Aluminum	0.75 mg/ L
	Total Iron	1.0 mg/L
	Nitrate plus Nitrite Nitrogen	0.68 mg/L
Subsector C3. Soaps, Detergents, Cosmetics, and Perfumes (SIC 2841-2844)	Nitrate plus Nitrite Nitrogen	0.68 mg/L
	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent
Subsector C4. Plastics, Synthetics, and Resins (SIC 2821-2824)	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent

Notes:

1. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
2. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Lead (mg/L)	Zinc (mg/L)
0 – < 25	0.014	0.04
25 – < 50	0.023	0.05
50 – < 75	0.045	0.08
75 – < 100	0.069	0.11
100 – < 125	0.095	0.13
125 – < 150	0.122	0.16
150 – < 175	0.151	0.18
175 – < 200	0.182	0.20
200 – < 225	0.213	0.23
225 – < 250	0.246	0.25
250+	0.262	0.26

11.C.4 Effluent Limitations Based on Effluent Limitations Guidelines. (See also Part 7.2.2.1 of the permit.)

Table 11.C.4-1 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table 11.C.4-1: **Effluent Limitations Based on Effluent Limitations Guidelines**[1]

Industrial Activity	Parameter	Effluent Limit
Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished product, by-products or waste products (SIC 2874)	Total Phosphorus (as P)	105.0 mg/L, daily maximum
		35 mg/L, 30-day avg.
	Fluoride	75.0 mg/L, daily maximum
		25.0 mg/L, 30-day avg.

1 Monitor annually.

11. Subpart D – Sector D – Asphalt Paving and Roofing Materials and Lubricant Manufacturing.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.D.1 Covered Storm Water Discharges.

The requirements in Subpart D apply to storm water discharges associated with industrial activity from Asphalt Paving and Roofing Materials and Lubricant Manufacturing facilities, as identified by the SIC Codes specified under Sector D in Table D-1 of Appendix D of the permit.

11.D.2 Limitations on Coverage.

The following storm water discharges associated with industrial activity are not authorized by this permit (See also Part 1.2.4)

11.D.2.1 *Discharges from petroleum refining facilities*, including those that manufacture asphalt or asphalt products, that are subject to nationally established effluent limitation guidelines found in 40 CFR Part 419 (Petroleum Refining); or

11.D.2.2 *Discharges from oil recycling facilities;* or

11.D.2.3 *Discharges associated with fats and oils rendering.*

11.D.3 Sector-Specific Benchmarks.

Table 11.D.3-1 identifies benchmarks that apply to the specific subsectors of Sector D. These benchmarks apply to both the permittees primary industrial activity and any co-located industrial activities, which describe their facility activities.

Table 11.D.3-1: Sector – Specific Benchmarks – Sector D

Subsector	Parameter	Benchmark Monitoring Concentration
Subsector D1. Asphalt Paving and Roofing Materials (SIC 2951, 2952)	Total Suspended Solids (TSS)	100 mg/L

11.D.4 Effluent Limitations Based on Effluent Limitations Guidelines. (See also Part 7.2.2.1 of the permit.)

Table 11.D.4-1 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table 11.D.4-1:**Effluent Limitations Based on Effluent Limitations Guidelines**[1]

Industrial Activity	Parameter	Effluent Limit
Discharges from asphalt emulsion facilities.	Total Suspended Solids (TSS)	23.0 mg/L, daily maximum 15.0 mg/L, 30-day avg.
	pH	6.5 - 8.5 s.u.
	Oil and Grease	15.0 mg/L, daily maximum
		10 mg/L, 30-day avg.

1. Monitor annually.

11. Subpart E – Sector E – Glass, Clay, Cement, Concrete, and Gypsum Products.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.E.1 Covered Storm Water Discharges.

The requirements in Subpart E apply to storm water discharges associated with industrial activity from Glass, Clay, Cement, Concrete, and Gypsum Products facilities, as identified by the SIC Codes specified under Sector E in Table D-1 of Appendix D of the permit.

11.E.2 Additional Technology-Based Effluent Limits.

11.E.2.1 *Good Housekeeping Measures.* (See also Part 4.2.2) With good housekeeping, prevent or minimize the discharge of spilled cement, aggregate (including sand or gravel), kiln dust, fly ash, settled dust, or other significant material in storm water from paved portions of the site that are exposed to storm water. Sweep regularly or use other equivalent measures to minimize the presence of these materials. Indicate in the SWPPP the frequency of sweeping or equivalent measures. Determine the frequency based on the amount of industrial activity occurring in the area and the frequency of precipitation, but it must be performed at least once a week if cement, aggregate, kiln dust, fly ash, or settled dust are being handled or processed. Permittee must also prevent the exposure of fine granular solids (cement, fly ash, kiln dust, etc.) to storm water, where practicable, by storing these materials in enclosed silos, hoppers, buildings, or under other covering.

11.E.3 Additional SWPPP Requirements.

11.E.3.1 *Drainage Area Site Map.* (See also Part 5.2.3) Document in the SWPPP the locations of the following, as applicable: bag house or other dust control device; recycle/sedimentation pond, clarifier, or other device used for the treatment of process wastewater; and the areas that drain to the treatment device.

11.E.3.2 *Certification.* (See also Part 5.2.4.4) For facilities producing ready-mix concrete, concrete block, brick, or similar products, include in the non-storm water discharge certification a description of measures that ensure that process waste waters resulting from washing trucks, mixers, transport buckets, forms, or other equipment are discharged in accordance with APDES requirements or are recycled.

11.E.4 Sector-Specific Benchmarks.

Table 11.E.4-1 identifies benchmarks that apply to the specific subsectors of Sector E. These benchmarks apply to both the permittees primary industrial activity and any co-located industrial activities, which describe their facility activities.

Table 11.E.4-1: Sector – Specific Benchmarks – Sector E

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Cutoff Concentration
Subsector E1. Clay Product Manufacturers (SIC 3251-3259, 3261-3269)	Total Aluminum	0.75 mg/L
Subsector E2. Concrete and Gypsum Product Manufacturers (SIC 3271-3275)	Total Suspended Solids (TSS)	100 mg/L
	Total Iron	1.0 mg/L

11.E.5 Effluent Limitations Based on Effluent Limitations Guidelines. (See also Part 7.2.2.1 of the permit.)

Table 11.E.5-1 identifies effluent limits that apply to the industrial activities described below. Compliance with these limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table 11.E.5-1:Effluent Limitations Based on Effluent Limitations Guidelines[1]

Industrial Activity	Parameter	Effluent Limit
Discharges from material storage piles at cement manufacturing facilities	Total Suspended Solids (TSS)	50 mg/L, daily maximum
	pH	6.5 - 8.5 s.u.

1. Monitor annually.

11. Subpart F – Sector F – Primary Metals.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.F.1 Covered Storm Water Discharges.

The requirements in Subpart F apply to storm water discharges associated with industrial activity from Primary Metals facilities, as identified by the SIC Codes specified under Sector F in Table D-1 of Appendix D of the permit.

11.F.2 Additional Technology-Based Effluent Limits.

11.F.2.1 *Good Housekeeping Measures.* (See also Part 4.2.2) As part of the permittees good housekeeping program, include a cleaning and maintenance program for all impervious areas of the facility where particulate matter, dust, or debris may accumulate, especially areas where material loading and unloading, storage, handling, and processing occur; and, where practicable, the paving of areas where vehicle traffic or material storage occur but where vegetative or other stabilization methods are not practicable (institute a sweeping program in these areas too). For unstabilized areas where sweeping is not practicable, use storm water management devices such as sediment traps, vegetative buffer strips, filter fabric fence, sediment filtering boom, gravel outlet protection, or other equivalent measures that effectively trap or remove sediment and debris.

11.F.3 Additional SWPPP Requirements.

11.F.3.1 *Drainage Area Site Map.* (See also Part 5.2.3) Identify in the SWPPP where any of the following activities may be exposed to precipitation or surface runoff: storage or disposal of wastes such as spent solvents and baths, sand, slag and dross; liquid storage tanks and drums; processing areas including pollution control equipment (e.g., baghouses); and storage areas of raw material such as coal, coke, scrap, sand, fluxes, refractories, or metal in any form. In addition, indicate where an accumulation of significant amounts of particulate matter could occur from such sources as furnace or oven emissions, pollution control devices, losses from coal and coke handling operations, etc., and could result in a discharge of pollutants to waters of the United States.

11.F.3.2 *Inventory of Exposed Material.* (See also Part 5.2.4.2) Include in the inventory of materials handled at the site that potentially may be exposed to precipitation or runoff, areas where deposition of particulate matter from process air emissions or losses during material-handling activities are possible

11.F.4 Additional Inspection Requirements. (See also Part 6.1) As part of conducting the permittees quarterly routine facility inspections (Part 6.1), address all potential sources of pollutants, including (if applicable) air pollution control equipment (e.g., baghouses, electrostatic precipitators, scrubbers, and cyclones), for any signs of degradation (e.g., leaks, corrosion, or improper operation) that could limit their efficiency and lead to excessive emissions. Monitor air flow at inlets and outlets (or use equivalent measures) to check for leaks (e.g., particulate deposition) or blockage in ducts. Also inspect all process and material handling equipment (e.g., conveyors, cranes, and vehicles) for leaks, drips, or the potential loss of material; and material storage areas (e.g., piles, bins, or hoppers for storing coke, coal, scrap, or slag, as well as chemicals stored in tanks and drums) for signs of material losses due to wind or storm water runoff.

11.F.5 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

(Table 11.F.5-1: Sector – Specific Benchmarks –Sector F located on following page.)

Table 11.F.5-1: Sector – Specific Benchmarks –Sector F		
Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector F1. Steel Works, Blast Furnaces, and Rolling and Finishing Mills (SIC 3312-3317)	Total Aluminum	0.75 mg/L
	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent
Subsector F2. Iron and Steel Foundries (SIC 3321-3325)	Total Aluminum	0.75 mg/L
	Total Suspended Solids (TSS)	100 mg/L
	Total Copper (saltwater)[1] Total Copper (freshwater)[2]	0.0048 Mg/L Hardness Dependent
	Total Iron	1.0 mg/L
	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent
Subsector F3. Rolling, Drawing, and Extruding of Nonferrous Metals (SIC 3351-3357)	Total Copper (saltwater)[1] Total Copper (freshwater)[2]	0.0048 mg/L Hardness Dependent
	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent
Subsector F4. Nonferrous Foundries (SIC 3363-3369)	Total Copper (saltwater)[1] Total Copper (freshwater)[2]	0.0048 mg/L Hardness Dependent
	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent

Notes:

1. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
2. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Copper (mg/L)	Zinc (mg/L)
0 – < 25	0.0038	0.04
25 – < 50	0.0056	0.05
50 – < 75	0.0090	0.08
75 – < 100	0.0123	0.11
100 – < 125	0.0156	0.13
125 – < 150	0.0189	0.16
150 – < 175	0.0221	0.18
175 – < 200	0.0253	0.20
200 – < 225	0.0285	0.23
225 – < 250	0.0316	0.25
250+	0.0332	0.26

11. Subpart G – Sector G – Metal Mining.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.G.1 Covered Storm Water Discharges.

The requirements in Subpart G apply to storm water discharges associated with industrial activity from Metal Mining facilities, including mines abandoned on Federal lands, as identified by the SIC Codes specified under Sector G in Table D-1 of Appendix D. Coverage is required for metal mining facilities that discharge storm water contaminated by contact with, or that has come into contact with, any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of the operation.

11.G.1.1 Covered Discharges from Inactive Facilities. All storm water discharges.

11.G.1.2 Covered Discharges from Active and Temporarily Inactive Facilities. Only the storm water discharges from the following areas are covered:

- Waste rock and overburden piles if composed entirely of storm water and not combining with mine drainage;
- Topsoil piles;
- Offsite haul and access roads;
- Onsite haul and access roads constructed of waste rock, overburden, or spent ore if composed entirely of storm water and not combining with mine drainage;
- Onsite haul and access roads not constructed of waste rock, overburden, or spent ore except if mine drainage is used for dust control;
- Runoff from tailings dams or dikes when not constructed of waste rock or tailings and no process fluids are present;
- Runoff from tailings dams or dikes when constructed of waste rock or tailings and no process fluids are present, if composed entirely of storm water and not combining with mine drainage;
- Concentration building if no contact with material piles;
- Mill site if no contact with material piles;

- Office or administrative building and housing if mixed with storm water from industrial area;
- Chemical storage area;
- Docking facility if no excessive contact with waste product that would otherwise constitute mine drainage;
- Explosive storage;
- Fuel storage;
- Vehicle and equipment maintenance area and building;
- Parking areas if mixed with industrial areas;
- Power plant;
- Truck wash areas if no excessive contact with waste product that would otherwise constitute mine drainage;
- Unreclaimed, disturbed areas outside of active mining area;
- Reclaimed areas released from reclamation requirements prior to December 17, 1990; and
- Partially or inadequately reclaimed areas or areas not released from reclamation requirements.

11.G.1.3 Covered Discharges from Exploration and Construction of Metal Mining and/or Ore Dressing Facilities. All storm water discharges.

11.G.1.4 Covered Discharges from Facilities Undergoing Reclamation. All storm water discharges.

11.G.2 Limitations on Coverage.

11.G.2.1 Prohibition of Storm Water Discharges. Storm water discharges not authorized by this permit include discharges from active metal mining facilities that are subject to effluent limitation guidelines for the Ore Mining and Dressing Point Source Category (40 CFR Part 440).

Note: Storm water runoff from these sources are subject to 40 CFR Part 440 if they are mixed with other discharges subject to Part 440. In this case, they are not eligible for coverage under this permit.

Discharges from overburden/waste rock and overburden/waste rock-related areas are not subject to 40 CFR Part 440 unless they:

(1) drain naturally (or are intentionally diverted) to a point source; and

(2) combine with "mine drainage" that is otherwise regulated under the Part 440 regulations.

For such sources, coverage under this permit would be available if the discharge composed entirely of storm water does not combine with other sources of mine drainage that are not subject to 40 CFR Part 440, and meets the other eligibility criteria contained in Part 1.2 of the permit.

Permit applicants bear the initial responsibility for determining if they are eligible for coverage under this permit, or must seek coverage under another APDES permit. DEC recommends that permit applicants contact the DEC for assistance to determine the nature and scope of the "active mining area" on a mine-by-mine basis, as well as to determine the appropriate permitting mechanism for authorizing such discharges.

11.G.2.2 Prohibition of Non-Storm Water Discharges. Not authorized by this permit: adit drainage, and contaminated springs or seeps discharging from waste rock dumps that do not directly result from precipitation events (see also the standard Limitations on Coverage in Part 1.2.4).

11.G.3 Definitions.

The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

11.G.3.1 Mining Operation - Consists of the active and temporarily inactive phases, and the reclamation phase, but excludes the exploration and construction phases.

11.G.3.2 Exploration Phase - Entails exploration and land disturbance activities to determine the financial viability of a site. The exploration phase is not considered part of “mining operations.”

11.G.3.3 Construction Phase - Includes the building of site access roads, facilities, and removal of overburden and waste rock to expose mineable minerals. The construction phase is not considered part of “mining operations.”

11.G.3.4 Active Phase - Activities including the extraction, removal or recovery of metal ore. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of “active mining area” found at 40 CFR 440.132(a). The active phase is considered part of “mining operations.”

11.G.3.5 *Reclamation Phase* - Activities undertaken, in compliance with applicable mined land reclamation requirements, following the cessation of the "active phase", intended to return the land to an appropriate post-mining land use in order to meet applicable Federal and State reclamation requirements. The reclamation phase is considered part of "mining operations."

11.G.3.6 *Active Metal Mining Facility* - A place where work or other activity related to the extraction, removal, or recovery of metal ore is being conducted. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 440.132(a).

11.G.3.7 *Inactive Metal Mining Facility* - A site or portion of a site where metal mining and/or milling occurred in the past but is not an active facility as defined above, and where the inactive portion is not covered by an active mining permit issued by the applicable State or Federal agency. An inactive metal mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an APDES industrial storm water permit.

11.G.3.8 *Temporarily Inactive Metal Mining Facility* - A site or portion of a site where metal mining and/or milling occurred in the past but currently are not being actively undertaken, and the facility is covered by an active mining permit issued by the applicable State or Federal agency.

11.G.4 Technology-Based Effluent Limits for Clearing, Grading, and Excavation Activities.

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phase of mining activities are covered under this permit.

11.G.4.1 *Erosion Control Measures.* A permittee must comply with the erosion control measures in this Part to minimize soil exposure on the site during construction.

11.G.4.1.1 *Delineation of Site.* A permittee must generally delineate (e.g., with flagging, stakes, signs, silt fence, etc.,) the location of specific areas that will be left undisturbed such as trees, boundaries of sensitive areas, or buffers established under Part 11.G.4.1.3.

11.G.4.1.2 *Minimize the Amount of Soil Exposed during Construction Activity.* A permittee must include the following considerations in the selection of control measures and the sequence of project construction as they apply to the project site:

- Preserve areas of native topsoil on the site, unless infeasible; and

- Sequence or phase construction activities to minimize the extent and duration of exposed soils to the extent practicable.

11.G.4.1.3 Maintain Natural Buffer Areas.

The permittee must maintain natural buffer areas at stream crossings and around the edge of any waters of the U.S. that are located within or immediately adjacent to the property where the construction activity will take place in accordance with the following:

- The buffer must be a minimum of twenty-five (25) feet wide, unless infeasible based on site dimensions, or the width as required by local ordinance.
- Exceptions are allowed for water dependent activities, specific water access activities, or necessary water crossings.
- A permittee should, to the extent practicable, use perimeter controls adjacent to buffers, and direct storm water sheet flow to buffer areas to increase sediment removal and maximize storm water infiltration, unless infeasible.

11.G.4.1.4 Control Storm Water Discharges and Flow Rates. A permittee must include the following control measures to handle storm water and total storm water volume discharges as they apply to the site:

- Divert storm water around the site so that it does not flow onto the project site and cause erosion of exposed soils;
- Slow down or contain storm water that may collect and concentrate within a site and cause erosion of exposed soils;
- Avoid placement of structural control measures in active floodplains to the degree technologically and economically practicable and achievable;
- Place velocity dissipation devices (e.g., check dams, sediment traps, or riprap) along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters; and
- Install permanent storm water management controls, if present at a site and where practical, so that they must be functional prior to construction of site improvements (e.g., impervious surfaces).

11.G.4.1.5 Protect Steep Slopes. A permittee must include the following considerations in the selection of control measures as they apply to the project site:

- Design and construct cut-and-fill slopes in a manner that will minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (e.g., track walking);

- Divert concentrated flows of storm water away from and around the disturbed portion of the slope. Applicable practices include, but are not limited to interceptor dikes and swales, grass-lined channels, pipe slope drains, subsurface drains, check dams; and

- Stabilize exposed areas of the slope in accordance with Part 11.G.4.4.

11.G.4.2 Sediment Control Measures. Sediment control measures (e.g. sediment ponds, traps, filters, etc.) must be constructed as one of the first steps in grading. These control measures must be functional before other land disturbing activities take place. A permittee must install, establish and use any of the following control measures that apply to the project site.

11.G.4.2.1 Storm Drain Inlet Protection Meaures. A permittee must install appropriate protection measures (e.g. filter berms, perimeter controls, temporary diversion dikes, etc.) to minimize the discharge of sediment prior to entry into the inlet for storm drain inlets located on site or immediately downstream of the site. Inlet protection measures must be cleaned or removed and replaced when sediment has filled one-third of the available storage.

11.G.4.2.2 Water Body Protection Measures. A permittee must install appropriate protection measures (Part 11.G.4.1.4) to minimize the discharge of sediment prior to entry into the water body for water bodies located on site or immediately downstream of the site. Protection measures must be cleaned or removed and replaced when sediment has filled one-third of the available storage.

11.G.4.2.3 Down-Slope Sediment Controls. A permittee must establish and use down-slope sediment controls (e.g., silt fence, temporary diversion dike, etc.) for any portion of the down-slope and side-slope perimeter where storm water will be discharged from disturbed areas of the site.

11.G.4.2.4 Stabilized Construction Vehicle Access and Exit Points. A permittee must establish construction vehicle access and exit points which must be stabilized. Access and exit points should be limited to one route, if possible. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

11.G.4.2.5 *Dust Generation and Track-Out from Vehicles.* A permittee must minimize the generation of dust through the application of water or other dust suppression techniques and prior to vehicle exit. A permittee must provide an effective way of minimizing off-site vehicle tracking of sediment from wheels to prevent track-out onto paved surfaces.

11.G.4.2.6 *Soil Stockpiles.* A permittee must stabilize or cover soil stockpiles, protect with sediment trapping measures, and where possible, locate soil stockpiles away from storm drain inlets, water bodies, and conveyance channels.

11.G.4.2.7 *Authorized Non-Storm Water Discharges.* A permittee must minimize any non-storm water authorized by this permit.

11.G.4.2.8 *Sediment Basins*, where applicable:

- For common drainage locations that serve an area with ten (10) or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from the drainage area from a 2-year, 24-hour storm, or equivalent sediment control measures, must be installed, maintained, and used where practicable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent sediment control measures, must be installed and used where practicable until final stabilization of the site. When computing the number of acres draining into a common location, it is not necessary to include flows from offsite areas and flows from on-site areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. In determining whether installing a sediment basin is practicable, the permittee may consider factors such as site soils, slope, available area on-site, etc. In any event, the permittee must consider public safety, especially as it relates to children, as a design factor for the sediment basin, and alternative sediment control measures must be used where site limitations would preclude a safe design.

- For drainage locations which serve ten (10) or more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not practicable, smaller sediment basins and/or sediment traps should be used. Silt fences, vegetative buffer strips, or equivalent sediment control measures are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions).

- For drainage locations serving less than ten (10) acres, smaller sediment basins and/or sediment traps should be used. Silt fences, vegetative buffer strips, or equivalent sediment control measures are required for all down slope

boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm event or 3,600 cubic feet of storage per acre drained is provided.

- When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface where practicable.
- Note: installing sediment basins in the presence of permafrost is challenging and might not be practicable in some instances because permafrost creates poor surface drainage that hinders the infiltration of runoff. Also, the excavation of permafrost in summer can trigger thawing and instability.

11.G.4.3 Dewatering.

11.G.4.3.1 If a construction activity includes excavation dewatering and has a discharge that could adversely impact a local drinking water well, an DEC-identified contaminated site, or a waters of the U.S., the permittee must review the DEC Excavation Dewatering General Permit (AKG002000, or most current version) for specific requirements the permittee may have to comply with in addition to the conditions of this permit.

11.G.4.3.2 A discharge from eligible dewatering activities, including discharges from dewatering of trenches and excavations are prohibited unless treated by appropriate control measures. Appropriate control measures include, but are not limited to, sediment basins or traps, dewatering tanks, weir tanks, or filtration systems designed to remove sediment.

11.G.4.4 Soil Stabilization.

11.G.4.4.1 Minimum Requirements for Soil Stabilization. A permittee must stabilize all disturbed areas of the site to minimize on-site erosion and sedimentation and the resulting discharge of pollutants according to the requirements of this Part. A permittee must ensure that existing vegetation is preserved wherever possible and that disturbed portions of the site are stabilized. Applicable stabilization control measures include, but are not limited to: temporary and permanent seeding, sodding, mulching, rolled erosion control product, compost blanket, soil application of polyacrylamide (PAM), the early application of gravel base on areas to be paved, and dust control. A permittee should avoid using impervious surfaces for stabilization. See the Alaska Plant Materials Center's A Revegetation Manual for Alaska at http://plants.alaska.gov for help in efforts to select appropriate seed mixes and some information on methods for revegetation. Also see the manual for coastal Alaska, Coastal Revegetation & Erosion Control Guide at http://plants.alaska.gov.

11.G.4.5 Treatment Chemicals. The use of treatment chemicals to reduce turbidity in a storm water discharge is allowed provided that all of the requirements of this Part are met.

11.G.4.5.1 Use of conventional sediment controls before and after the application of treatment chemicals. Chemicals may only be applied where storm water is treated upstream and is directed to a sediment control (e.g., sediment trap, sediment basin) before discharge.

11.G.4.5.2 Select appropriate treatment chemicals. Chemicals must be appropriately suited to the types of soils likely to be exposed during construction and present in the discharges being treated (i.e., the expected turbidity, pH, and flow rate of storm water flowing into the chemical treatment system or area, etc.)

11.G.4.5.3 Minimize discharge risk from stored chemicals. Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures (e.g., spill berms, decks, spill containment pallets), with adequate spill kits available on-site to respond if the event of a discharge of treatment chemicals occurs.

11.G.4.5.4 Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document in your SWPPP specific departures from these specifications and how they reflect good engineering practice.

11.G.4.5.5 Application of treatment chemicals through the use of manufactured products (e.g., gel bars, gel logs, floc blocks, etc.) must be used in combination with adequate ditch check dams, sediment traps, sediment basins, or physical control measure designed to settle out chemically treated storm water and minimize the presence of treatment chemicals before discharges reach waters of the U.S.. At a minimum there must be adequate ditch length downstream of the last manufactured product prior to reaching the discharge point into a water of the U.S. to provide a place for sedimentation to occur.

11.G.4.5.6 Ensure proper training. Ensure that all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training. Among other things, the training must cover proper dosing requirements.

11.G.4.5.7 Perform additional measures specified by the Department for the authorized use of cationic treatment chemicals. If the permittee plans to add “cationic treatment chemicals” (as defined in Appendix C) to storm water and/or authorized non-storm water prior to discharge, they must submit a request to the Department fourteen (14) calendar days in advance of proposed usage. The request must include the following:

- Operator Name, mailing address, phone number, and email address;

- Project/Site name, physical address, contact name, phone number, email address and MSGP permit authorization number;
- Site Map with all receiving waterbodies, proposed location of chemical treatment system, and proposed point of discharge into receiving waterbodies;
- Schematic drawing of the proposed treatment system; and
- Description of the proposed treatment system including; type of system being used, type of cationic chemicals being used, estimated start and finish date, sampling and recordkeeping schedule and reporting, and name of treatment system operator or company.

The permittee must perform all additional measures as conditioned by the Department authorization to ensure that the use of such chemicals will not cause an exceedance of water quality standards.

11.G.4.6 Prohibited Discharge. A permittee is prohibited from discharging the following from the site:

11.G.4.6.1 Wastewater from concrete washout, unless managed by an appropriate control measure;

11.G.4.6.2 Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

11.G.4.6.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

11.G.4.6.4 Soaps or solvents used in vehicle and equipment washing.

11.G.4.7 Good Housekeeping Measures. A permittee must design, install, implement, and maintain effective good housekeeping measures to prevent and/or minimize the discharge of pollutants. A permittee must include appropriate measures for any of the following activities that are used at the site.

11.G.4.7.1 Washing of Equipment and Vehicles and Wheel Wash-Down. If a permittee conducts washing of equipment or vehicles and/or wheel wash-down at the site the permittee must comply with the following requirements:

- Designate areas to be used for washing of equipment and vehicles and/or wheel wash-down and conduct such activities only in these areas;
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S.;

- Treat all wash water in a sediment basin or use alternative control measures that provide equivalent or better treatment prior to discharge; and
- To comply with the prohibition in Part 11.G.4.6.4, the discharge of soaps and solvents used in equipment and vehicle washing and/or wheel wash-down is strictly prohibited.

11.G.4.7.2 Fueling and Maintenance Areas. If a permittee conducts fueling and/or maintenance activities for equipment and vehicles at the site the permittee must comply with the following requirements:

- Designate areas to be used for fueling and/or maintenance of equipment and vehicles and conduct such activities only in these areas (the designated area may move from one location to another on linear projects);
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets and waters of the U.S.;
- Minimize the exposure to precipitation and storm water or use secondary containment structures designed to eliminate the potential for spills or leaked chemicals; and
- To comply with the prohibition in Part 11.G.4.6.3, a permittee must:
    - Clean up spills or contaminated surfaces immediately;
    - Ensure adequate clean up supplies are available at all times to handle spills, leaks, and disposal of used liquids;
    - Use drip pans or absorbents under or around leaky equipment and vehicles; and
    - Dispose of liquid wastes or materials used for fueling and maintenance in accordance with Part 11.G.4.11.

11.G.4.8 Staging and Material Storage Areas. If a permittee maintains staging and material storage areas at the site the permittee must comply with the following requirements:

- Designate areas to be used for staging and material storage areas;
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S; and
- Minimize the exposure to precipitation and storm water and vandalism for all chemicals, treatment chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment.

11.G.4.9 Washout of Applicators/Containers used for Paint, Concrete, and Other Materials. If a permittee conducts washing of applicators and/or containers used for paint, concrete, and other materials at the site, the permittee must comply with the following requirements:

- Designate areas to be used for washout;
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S.;
- Direct all concrete, paint, and other material washout activities into a lined, water-tight container or pit to ensure there is no discharge into the underlying soil and onto the surrounding areas;
- Dispose of liquid wastes in accordance with Part 11.G.4.11; and
- For concrete washout areas, remove hardened concrete waste when it has reached one-half (½) the height of the container or pit and dispose of in accordance with Part 11.G.4.11.

11.G.4.10 Fertilizer or Pesticide Use. If a permittee uses fertilizers or pesticides the permittee must comply with the following requirements:

- Application of fertilizers and pesticides in a manner and at application rates that will minimize the loss of chemical to storm water runoff. Manufacturers' label requirements for application rates and disposal requirements must be followed; and
- Use pesticides in compliance with federal, state and local requirements.

11.G.4.11 Storage, Handling, and Disposal of Construction Waste. If a permittee stores, handles and/or disposes of construction waste at the site, the permittee must comply with the following requirements:

- Locate areas dedicated for management or disposal of construction waste, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S.;
- Dispose of all collected sediment, asphalt and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other domestic wastes according to federal, state and local requirements;
- Store hazardous or toxic waste in appropriate sealed containers and dispose of these wastes in accordance with manufactures recommended method of disposal or federal, state or local requirements; and

- Provide containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water. Clean or replace sanitation facilities and inspect them regularly for leaks and spills.

11.G.4.12 Winter Considerations.

11.G.4.12.1 Winter Shutdown. A permittee who temporarily ceases construction for the winter and plans to resume construction the next summer must plan for winter shutdown. The permittee must identify the anticipated dates of fall freeze-up and spring thaw (see Appendix C) for their site and use these dates to plan for winter shutdown. For the purpose of planning ahead frozen ground by itself is not considered an acceptable control measure for stabilization. A permittee must provide for the following prior to, during, and at the conclusion of winter shutdown:

- Temporary or permanent stabilization for conveyance channels;
- Temporary or permanent stabilization for disturbed slopes, disturbed soils, and soil stockpiles; and
- Erosion and sediment control measures in anticipation of spring thaw.

11.G.4.12.2 Winter Construction. In several areas of Alaska, winter construction provides opportunities for construction not available during summer months. Permit coverage is not required for the construction of ice roads or the placement of sand or gravel on frozen tundra with no excavation or potential to pollute waters of the U.S. This permit does address those construction activities that have the potential for erosion or sediment runoff during spring thaw and summer rainfall. A permittee operating winter construction activities must plan for using appropriate control measures to minimize erosion or sediment runoff during spring thaw and summer rainfall. The Alaska Storm Water Guide, Chapters 3 and 4, provide guidance on the selection, design, and installation of winter construction practices and controls.

11.G.4.12.3 Late Winter Clearing. Cutting of trees and brush while the ground is frozen, without disturbing the vegetative mat, for the purpose of clearing in accordance with the U.S. Fish & Wildlife Service "Recommended Time Periods for Avoiding Vegetation Clearing" is allowed prior to the submittal of a project NOI. If the cutting occurs after the onset of spring thaw (as defined in Appendix C), conditions that consist of above freezing temperatures that cause melting of snow, then the permittee must develop a SWPPP and file an NOI, and receive authorization for coverage under this permit from DEC, and otherwise comply with the terms of this permit prior to such clearing.

11.G.4.13 Maintenance of Control Measures. A permittee must maintain all control measures, good housekeeping measures, and other protective measures in effective operating condition. If site inspections required by Part 6 identify control measures, good housekeeping measures, or other protective measures that are not operating effectively, the permittee must implement corrective actions in accordance with Part 8.

If existing control measures need to be modified or if additional control measures are necessary for any reason, the permittee must complete any corrective action in accordance with Part 8.3.

A permittee must remove sediment from silt fences, check dams, berms or other controls before the accumulated sediment reaches one-half (½) the distance up the above-ground height (or it reaches a lower height based on manufacturer's specifications) of the control measure. For sediment traps or sediment ponds, the permittee must remove accumulated sediment when the design capacity has been reduced by fifty (50%) percent.

11.G.4.14 Inspection of Clearing, Grading, and Excavation Activities. (See also Part 6)

11.G.4.14.1 Inspection Frequency. Inspections must be conducted at one of the following: at least once every 7 calendar days; or at least once every 14 calendar days and within 24 hours of the end of a storm event that resulted in a discharge from the site; or for areas of the state where the mean annual precipitation is forty (40) inches or greater, or relatively continuous precipitation or sequential storm events, inspect at least once every seven (7) calendar days. If the entire site is temporarily stabilized, inspection frequency may be reduced to at least once every month and within two business days of the end of a measurable storm event at actively staffed sites which resulted in a discharge from the site (pursuant to Part 11.G.4.15.2). Once active mining has begun, those areas comply with inspections according to 11.G.7. A permittee must specify in the SWPPP which schedule will be followed.

11.G.4.14.2 Winter Shutdown. If the exploration and construction phase is undergoing winter shutdown the permittee may stop inspections fourteen (14) calendar days after the anticipated fall freeze-up and must resume inspections at least twenty-one (21) calendar days prior to the anticipated spring thaw. The permittee shall identify the winter shutdown period in their SWPPP based upon the definitions of fall freeze-up and spring thaw.

11.G.4.14.3 Location of Inspections. Inspections must include all areas of the site disturbed by clearing, grading, and/or excavation activities and areas used for storage of materials that are exposed to precipitation. Sedimentation and erosion control measures must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that

such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of significant off-site sediment tracking.

11.G.4.14.4 Inspection Reports. (See also Part 6.1) For each inspection required above, the permittee must complete an inspection report. At a minimum, the inspection report must include the information required in Part 6.1.

11.G.4.15 Requirements for Cessation of Clearing, Grading, and Excavation Activities.

11.G.4.15.1 Inspections and Maintenance. Inspections and maintenance of control measures, including BMPs, associated with clearing, grading, and/or excavation activities being conducted as part of the exploration and construction phase of a mining operation must continue until final stabilization has been achieved on all portions of the disturbed area, or until the commencement of the active mining phase for those areas that have been temporarily stabilized as a precursor to mining.

11.G.4.15.2 Temporary Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where clearing, grading and/or excavation activities have temporarily ceased, but in no case more than 14 days after the clearing, grading and/or excavation activities in that portion of the site have temporarily ceased. In arid, semi-arid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after exploration, and/or construction activity has temporarily ceased, temporary vegetative stabilization measures must be initiated as soon as practicable.

The permittee must identify the anticipated dates of fall freeze-up and spring thaw (see Appendix C) for the site and use those dates to plan for winter shutdown. For the purpose of planning ahead frozen ground by itself is not considered an acceptable control measure for stabilization. Where temporary stabilization by the 14th day is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable following the actual spring thaw.

Until temporary vegetative stabilization is achieved, interim measures (e.g., surface roughening or a surface cover, including but not limited to, establishment of ground vegetation, application of mulch, or surface tackifiers with an appropriate seed base) must be employed. In areas of the site, where exploration and/or construction has permanently ceased prior to active mining, temporary stabilization measures must be implemented to minimize mobilization of sediment or other pollutants until such time as the active mining phase commences.

11.G.4.15.3 Final Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where mining, exploration, and/or construction activities have permanently ceased, but in no case more than 14 days after the exploration and/or construction activity in that portion of the site has permanently ceased. In arid, semi-arid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after mining, exploration, and/or construction activity has permanently ceased, final vegetative stabilization measures must be initiated as soon as possible. Until final stabilization is achieved, temporary stabilization measures must be used.

11.G.5 Additional Technology-Based Effluent Limits.

11.G.5.1 Employee Training. (See also Part 4.2.9) Conduct employee training at least annually at active and temporarily inactive sites.

11.G.5.2 Good Housekeeping Measures. (See also Part 4.2.2) As part of the permittees good housekeeping program, implement the following, as practicable: use sweepers and covered storage, watering haul roads to minimize dust generation, and conserving vegetation (where possible) to minimize erosion.

11.G.5.3 Preventive Maintenance. (See also Part 4.2.3) Perform inspections or other equivalent measures of storage tanks and pressure lines of fuels, lubricants, hydraulic fluid, and slurry to prevent leaks due to deterioration or faulty connections.

11.G.5.4 Storm Water Controls. Apart from the control measures implemented to meet the Part 4 control measures, implement the following control measures at the facility, as practicable. The potential pollutants identified in Part 11.G.6.3 shall determine the priority and appropriateness of the control measures selected. If the permittee selects or develops a storm water control other than one described below, the permittee shall describe it in the SWPPP.

11.G.5.4.1 Storm Water Diversions. Divert storm water away from potential pollutant sources. Implement the following options, as practicable: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

11.G.5.4.2 Velocity Dissipation Devices. Place velocity dissipation devices (e.g., check dams, sediment traps, or riprap) as practicable, along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters.

11.G.5.4.3 Down-Slope Sediment Controls. Establish and use down-slope sediment controls (e.g., silt fence or temporary diversion dike) for any portion of the down-slope and side-slope perimeter where storm water will be discharged from disturbed areas of the site.

11.G.5.4.4 Stabilized Construction Vehicle Access and Exit Points. Establish stabilized vehicle access and exit points. Off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

11.G.5.4.5 Capping. When capping is necessary to minimize pollutant discharges in storm water, identify the source being capped and the material used to construct the cap.

11.G.5.4.6 Treatment. If treatment of storm water (e.g., chemical or physical systems, oil and water separators, artificial wetlands) is necessary to protect water quality, describe the type and location of treatment used. All permanent storm water treatment devices shall receive engineering plan approval per 18 AAC 72.600. Passive and/or active treatment of storm water runoff is encouraged where practicable. Treated runoff may be discharged as a storm water source regulated under this permit provided the discharge is not combined with discharges subject to effluent limitation guidelines for the Ore Mining and Dressing Point Source Category (40 CFR Part 440).

11.G.5.5 Certification of Discharge Testing. (See also Part 5.2.4.4) Test or evaluate all outfalls covered under this permit for the presence of specific mining-related non-storm water discharges such as seeps or adit discharges, or discharges subject to effluent limitations guidelines (e.g., 40 CFR Part 440), such as mine drainage or process water. Alternatively (if applicable), the permittee may keep a certification with the SWPPP consistent with Part 11.G.6.6.

11.G.5.6 Overburden, Waste Rock, and Raw Material Piles. Overburden, topsoil, and waste rock, as well as raw material and intermediate and final product stockpiles, shall be located a minimum of 25 feet away from surface water, other sources of water, and from geologically unstable areas as practicable.

11.G.6 Additional SWPPP Requirements.

11.G.6.1 Nature of Industrial Activities. (See also Part 5.2.3) Document in the SWPPP the mining and associated activities that can potentially affect the storm water discharges covered by this permit, including a general description of the location of the site relative to major transportation routes and communities.

11.G.6.2 Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP the locations of the following (as appropriate): mining or milling site boundaries; access and haul roads; outline of the drainage areas of each storm water outfall within the facility with indications of the types of discharges from the drainage areas; location(s) of all permitted discharges covered under an individual APDES permit, outdoor equipment storage, fueling, and maintenance areas; materials handling areas; outdoor manufacturing, outdoor storage, and material disposal areas; outdoor chemicals and explosives storage areas; overburden, materials, soils, or waste storage areas; location of mine drainage (where water leaves mine) or other process water; tailings piles and ponds (including proposed ones); heap leach pads; off-site points of discharge for mine drainage and process water; surface waters; boundary of tributary areas that are subject to effluent limitations guidelines; and location(s) of reclaimed areas.

11.G.6.3 Potential Pollutant Sources. (See also Part 5.2.4) For each area of the mine or mill site where storm water discharges associated with industrial activities occur, identify the types of pollutants (e.g., heavy metals, sediment) likely to be present in significant amounts. Monitor these factors, as relevant: the mineralogy of the ore and waste rock (e.g., acid forming); toxicity and quantity of chemicals used, produced, or discharged; the likelihood of contact with storm water; vegetation of site (if any); and history of significant leaks or spills of toxic or hazardous pollutants. Also include a summary of any existing ore or waste rock or overburden characterization data and test results for potential generation of acid rock. If any new data is acquired due to changes in ore type being mined, update the SWPPP with this information.

11.G.6.4 Documentation of Control Measures. Document all control measures that the permittee implements consistent with Part 11.G.5.4. If control measures are implemented or planned but are not listed in Part 11.G.5.4 (e.g., substituting a less toxic chemical for a more toxic one), include descriptions of them in the SWPPP.

11.G.6.5 Employee Training. To the extent practical, all supervisory personnel involved in directing the maintenance of storm water control measures shall be trained and qualified in the principles and practices of erosion and sediment control. All employee training(s) must be documented in the SWPPP.

11.G.6.6 Certification of Permit Coverage for Commingled Non-Storm Water Discharges. If a permittee determines that they are able to certify, consistent with Part 11.G.5.5, that a particular discharge composed of commingled storm water and non-storm water is covered under a separate APDES permit, and that permit subjects the non-storm water portion to effluent limitations prior to any commingling, retain such certification with the SWPPP. This certification must identify the non-storm water discharges, the applicable APDES permit(s), the effluent limitations placed on the non-storm water discharge by the permit(s), and the points at which the limitations are applied.

11.G.6.7 SWPPP Submittal. At least 45 calendar days prior to the start of initial construction of a new facility the permittee shall submit the construction phase SWPPP to DEC.

11.G.6.8 SWPPP Meeting. At least 20 calendar days before the start of initial construction for a new facility, representatives of the permittee and the prime site construction contractor shall meet with DEC in a pre-construction conference to discuss the details of storm water management during construction.

11.G.7 Additional Inspection Requirements.

(See also Part 6.1 and 11.G.4.14.) Except for areas of the site subject to clearing, grading, and/or excavation activities conducted as part of the exploration and construction phase, which are subject to Part 11.G.4.14.1, the permittee must inspect sites at least quarterly unless adverse weather conditions make the site inaccessible. Sites which discharge to waters designated as outstanding waters or waters which are impaired for sediment or nitrogen must be inspected monthly. See Part 11.G.8.4 for inspection requirements for inactive and unstaffed sites.

11.G.8 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

Note: There are no Part 11.G.8 monitoring and reporting requirements for inactive and unstaffed sites.

11.G.8.1 Benchmark Monitoring for Active Copper Ore Mining and Dressing Facilities. Active copper ore mining and dressing facilities, the permittee must sample and analyze storm water discharges for the pollutants listed in Table 11.G.8-1.

Table 11.G.8-1: Benchmark Monitoring for Active Copper Ore Mining and Dressing Facilities

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector G1. Active Copper Ore Mining and Dressing Facilities (SIC 1021)	Total Suspended Solids (TSS)	100 mg/L
	Nitrate plus Nitrite Nitrogen	0.68 mg/L
	Chemical Oxygen Demand (COD)	120 mg/L

11.G.8.2 Benchmark Monitoring Requirements for Discharges from Waste Rock and Overburden Piles at Active Metal Mining Facilities. For discharges from waste rock and overburden piles, perform benchmark monitoring once in the first year for the parameters listed in Table 11.G.8-2, and twice annually in all subsequent years of coverage under this permit for any parameters for which the benchmark has been exceeded. The permittee is also required to conduct analytic monitoring for the parameters listed in Table 11.G.8-3 in accordance with the requirements in Part 11.G.8.3. The Department may also notify the permittee that the permittee must perform additional monitoring to accurately characterize the quality and quantity of pollutants discharged from their waste rock and overburden piles.

(Table 11.G.8-2: Benchmark Monitoring Requirements for Discharges from Waste Rock and Overburden Piles at Active Metal Mining Facilities located on following page.)

Table 11.G.8-2: Benchmark Monitoring Requirements for Discharges from Waste Rock and Overburden Piles at Active Metal Mining Facilities

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector G2. Iron Ores; Copper Ores; Lead and Zinc Ores; Gold and Silver Ores; Ferroalloy Ores, Except Vanadium; and Miscellaneous Metal Ores (SIC Codes 1011, 1021, 1031, 1041, 1044, 1061, 1081, 1094, 1099) (Note: when analyzing hardness for a suite of metals, it is more cost effective to add analysis of calcium and magnesium, and have hardness calculated than to require hardness analysis separately)	Total Suspended Solids (TSS)	100 mg/L
	Turbidity	See Note 1
	pH	6.5 - 8.5 s.u.
	Hardness (as CaCO3; calc. from Ca, Mg)[2]	no benchmark value
	Total Antimony	0.64 mg/L
	Total Arsenic (saltwater)[2] Total Arsenic (freshwater)	0.069 mg/L 0.15 mg/ L
	Total Beryllium	0.13 mg/L
	Total Cadmium (saltwater)[2] Total Cadmium (freshwater)[3]	0.04 mg/L Hardness Dependent
	Total Copper (saltwater)[2] Total Copper (freshwater)[3]	0.0048 mg/L Hardness Dependent
	Total Iron	1.0 mg/L
	Total Lead (saltwater)[2] Total Lead (freshwater)[3]	0.21 mg/L Hardness Dependent
	Total Mercury (saltwater)[2] Total Mercury (freshwater)[3]	0.0018 mg/L 0.0014 mg/L
	Total Nickel(saltwater)[2] Total Nickel (freshwater)[3]	0.074 mg/L Hardness Dependent
	Total Selenium	0.005 mg/L
	Total Silver (saltwater)[2] Total Silver (freshwater)[3]	0.0019 mg/L Hardness Dependent
	Total Zinc (saltwater)[2] Total Zinc (freshwater)[3]	0.09 mg/L Hardness Dependent

Note:

1. Turbidity in fresh water may not exceed 5 nephelometric turbidity units (NTU) above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10% increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 25 NTU. See 18 AAC 70.020(b)(12)(A)(i).
2. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
3. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Cadmium (mg/L)	Copper (mg/L)	Lead (mg/L)	Nickel (mg/L)	Silver (mg/L)	Zinc (mg/L)
0 – < 25	0.0005	0.0038	0.014	0.15	0.0007	0.04
25 – < 50	0.0008	0.0056	0.023	0.20	0.0007	0.05
50 – < 75	0.0013	0.0090	0.045	0.32	0.0017	0.08
75 – < 100	0.0018	0.0123	0.069	0.42	0.0030	0.11
100 – < 125	0.0023	0.0156	0.095	0.52	0.0046	0.13
125 – < 150	0.0029	0.0189	0.122	0.61	0.0065	0.16
150 – < 175	0.0034	0.0221	0.151	0.71	0.0087	0.18
175 – < 200	0.0039	0.0253	0.182	0.80	0.0112	0.20
200 – < 225	0.0045	0.0285	0.213	0.89	0.0138	0.23
225 – < 250	0.0050	0.0316	0.246	0.98	0.0168	0.25
250+	0.0053	0.0332	0.262	1.02	0.0183	0.26

11.G.8.3 Additional Analytic Monitoring Requirements for Discharges from Waste Rock and Overburden Piles at Active Metal Mining Facilities. In addition to the monitoring required in Part 11.G.8.2 for discharges from waste rock and overburden piles, the permittee must also conduct monitoring for additional parameters based on the type of ore they mine at their facility. Where a parameter in Table 11.G.8-3 is the same as a pollutant the permittee is required to monitor for in Table 11.G.8-2 (i.e., for all of the metals, the permittee must use the corresponding benchmark in Table 11.G.8-2 and they may use any monitoring results conducted for Part 11.G.8.2 to satisfy the monitoring requirement for that parameter for Part 11.G.6.3. For radium and uranium, which do not have corresponding benchmarks in Table 11.G.8-2, there are no applicable benchmarks.) The frequency and schedule for monitoring for these additional parameters is the same as that specified in Part 7.2.1.2.

Table 11.G.8-3: Additional Monitoring Requirements for Discharges from Waste Rock and Overburden Piles

Supplemental Requirements			
Type of Ore Mined	Pollutants of Concern		
	Total Suspended Solids (TSS)	pH	Metals, Total
Tungsten Ore	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Zinc (H)
Nickel Ore	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Zinc (H)
Aluminum Ore	X	X	Iron
Mercury Ore	X	X	Nickel (H)
Iron Ore	X	X	Iron (Dissolved)
Platinum Ore			Cadmium (H), Copper (H), Mercury, Lead (H), Zinc (H)
Titanium Ore	X	X	Iron, Nickel (H), Zinc (H)
Vanadium Ore	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Zinc (H)
Molybdenum	X	X	Arsenic, Cadmium (H), Copper (H), Lead (H), Mercury, Zinc (H)
Uranium, Radium, and Vanadium Ore	X	X	Chemical Oxygen Demand, Arsenic, Radium (Dissolved and Total), Uranium, Zinc (H)

Note: An "X" indicated for TSS and/or pH means that permittees are required to monitor for those parameters. (H) indicates that hardness must also be measured when this pollutant is measured.

11.G.8.4 Inactive and Unstaffed Sites – Conditional Exemption from No Exposure Requirements for Quarterly Visual Assessments and Routine Facility Inspections. As a Sector G facility, if the permittee is seeking to exercise a waiver from the quarterly visual assessment and routine facility inspection requirements for inactive and unstaffed sites (including temporarily inactive sites), they are conditionally exempt from the requirement to certify that "there are no industrial materials or activities exposed to storm water" in Part 6.2.3 and 7.2.1.6, respectively. Additionally, if the permittee is seeking to reduce their required quarterly routine inspection frequency to a once annual comprehensive inspection, as is allowed under Part 6.1.3, the permittee is also conditionally exempt from the requirement to certify that "there are no industrial materials or activities exposed to storm water." This exemption is conditioned on the following:

- If circumstances change and the permittees facility becomes active and/or staffed, this exception no longer applies and the permittee must immediately begin complying with the quarterly visual assessment requirements; and
- DEC retains the authority to revoke this exemption and/or the monitoring waiver where it is determined that the discharge causes, has a reasonable potential to cause, or contributes to an instream excursion above a WQS, including designated uses.

Subject to the two conditions above, if the permittees facility is inactive and unstaffed, they are waived from the requirement to conduct quarterly visual assessments and routine facility inspections. The permittee is not waived from conducting the Part 6.3 comprehensive site inspection. They are encouraged to inspect their site more frequently where they have reason to believe that severe weather or natural disasters may have damaged control measures or increased discharges.

(Table 11.G.8-4: Applicability of the Multi-Sector General Permit to Storm Water Runoff from Active Mining and Dressing Sites, Temporarily Inactive Sites, and Sites Undergoing Reclamation located on the following page.)

Table 11.G.8-4: Applicability of the Multi-Sector General Permit to Storm Water Runoff from Active Mining and Dressing Sites, Temporarily Inactive Sites, and Sites Undergoing Reclamation

Discharge/Source of Discharge	Note/Comment
Piles	
Waste rock/overburden	If composed entirely of storm water and not combining with mine drainage. See note below.
Topsoil	—
Roads Constructed of Waste Rock or Spent Ore	
Onsite haul roads	If composed entirely of storm water and not combining with mine drainage. See note below.
Offsite haul and access roads	—
Roads Not Constructed of Waste Rock or Spent Ore	
Onsite haul roads	Except if mine drainage is used for dust control
Offsite haul and access roads	—
Milling/Concentrating	
Runoff from tailings dams and dikes when constructed of waste rock/tailings	Except if process fluids are present and only if composed entirely of storm water and not combining with mine drainage. See Note below.
Runoff from tailings dams/dikes when not constructed of waste rock and tailings	Except if process fluids are present
Concentration building	If storm water only and no contact with piles
Mill site	If storm water only and no contact with piles
Ancillary Areas	
Office and administrative building and housing	If mixed with storm water from the industrial area
Chemical storage area	—
Docking facility	Except if excessive contact with waste product that would otherwise constitute mine drainage
Explosive storage	—
Fuel storage (oil tanks/coal piles)	—
Vehicle and equipment maintenance area/building	—
Parking areas	But coverage unnecessary if only employee and visitor-type parking
Power Plant	
Truck wash area	Except when excessive contact with waste product that would otherwise constitute mine drainage
Reclamation-Related Areas	
Any disturbed area (unreclaimed)	Only if not in active mining area
Reclaimed areas released from reclamation requirements prior to Dec. 17, 1990	—
Partially/inadequately reclaimed areas or areas not released from reclamation requirements	—

Note: Storm water runoff from these sources are subject to the APDES program for storm water unless mixed with discharges subject to 40 CFR Part 440 that are regulated by another permit prior to mixing. Non-storm water discharges from these sources are subject to APDES permitting and may be subject to the effluent limitation guidelines under 40 CFR Part 440. Discharges from overburden/waste rock and overburden/waste rock-related areas are not subject to 40 CFR Part 440 unless:

(1) it drains naturally (or is intentionally diverted) to a point source; and

(2) combines with "mine drainage" that is otherwise regulated under the Part 440 regulations. For such sources, coverage under this permit would be available if the discharge composed entirely of storm water does not combine with other sources of mine drainage that are not subject to 40 CFR Part 440, as well as meeting other eligibility criteria contained in Part 1.2 of the permit. Permittees bear the initial responsibility for determining the applicable technology-based standard for such discharges. DEC recommends that permittees contact the Department for assistance to determine the nature and scope of the "active mining area" on a mine-by-mine basis, as well as to determine the appropriate permitting mechanism for authorizing such discharges.

11.G.9 Termination of Permit Coverage.

11.G.9.1 Termination of Permit Coverage for Sites Reclaimed After December 17, 1990. A site or a portion of a site that has been released from applicable state or federal reclamation requirements after December 17, 1990, is no longer required to maintain coverage under this permit. If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Part 11.G.3.5.

11.G.9.2 Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990. A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if: (1) storm water runoff that comes into contact with raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state WQS, (2) soil disturbing activities related to mining at the sites or portion of the site have been completed, (3) the site or portion of the site has been stabilized to minimize soil erosion, and (4) as appropriate depending on location, size, and the potential to contribute pollutants to storm water discharges, the site or portion of the site has been revegetated, will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.

11. Subpart H – Sector H – Coal Mines and Coal Mining-Related Facilities.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.H.1 Covered Storm Water Discharges.

The requirements in Subpart H apply to storm water discharges associated with industrial activity from Coal Mines and Coal Mining-Related facilities as identified by the SIC Codes specified under Sector H in Table D-1 of Appendix D.

11.H.2 Limitations on Coverage.

11.H.2.1 *Prohibition of Non-Storm Water Discharges.* (See also Part 1.2.4) Not covered by this permit: discharges from pollutant seeps or underground drainage from inactive coal mines, adit discharges and refuse disposal areas that do not result from precipitation events, and discharges from floor drains in maintenance buildings and other similar drains in mining and preparation plant areas. These unauthorized discharges should be covered under a separate APDES discharge permit.

11.H.2.2 *Discharges Subject to Storm Water Effluent Guidelines.* (See also Part 1.2.4.4) Not authorized by this permit: storm water discharges subject to an existing effluent limitation guideline at 40 CFR Part 434.

11.H.3 Definitions.

The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

11.H.3.1 *Mining Operation* - Consists of the active and temporarily inactive phases, and the reclamation phase, but excludes the exploration and construction phases.

11.H.3.2 *Exploration Phase* - Entails exploration and land disturbance activities to determine the financial viability of a site. The exploration phase is not considered part of “mining operations.”

11.H.3.3 *Construction Phase* - Includes the building of site access roads, facilities, and removal of overburden and waste rock to expose mineable coal. The construction phase is not considered part of “mining operations.”

11.H.3.4 *Active Phase* - Activities including the extraction, removal or recovery of coal. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 434.11(b). The active phase is considered part of "mining operations."

11.H.3.5 *Reclamation Phase* - Activities undertaken, in compliance with applicable mined land reclamation requirements, following the cessation of the "active phase", intended to return the land to an appropriate post-mining land use. The reclamation phase is considered part of "mining operations."

11.H.3.6 *Active Coal Mining Facility* - A place where work or other activity related to the extraction, removal, or recovery of coal is being conducted. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 434.11(b).

11.H.3.7 *Inactive Coal Mining Facility* - A site or portion of a site where coal mining and/or milling occurred in the past but is not an active facility as defined above, and where the inactive portion is not covered by an active mining permit issued by the applicable State or Federal agency. An inactive coal mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an APDES industrial storm water permit.

11.H.3.8 *Temporarily Inactive Coal Mining Facility* - A site or portion of a site where coal mining and/or milling occurred in the past but currently are not being actively undertaken, and the facility is covered by an active mining permit issued by the applicable State or Federal agency.

11.H.4 Technology-Based Effluent Limits for Clearing, Grading, and Excavation Activities.

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phase of mining activities are covered under this permit.

11.H.4.1 *Erosion Control Measures.* A permittee must comply with the erosion control measures in this Part to minimize soil exposure on the site during construction.

11.H.4.1.1 *Delineation of Site.* A permittee must generally delineate (e.g., with flagging, stakes, signs, silt fence, etc.,) the location of specific areas that will be left undisturbed such as trees, boundaries of sensitive areas, or buffers established under Part 11.H.4.1.3.

11.H.4.1.2 Minimize the Amount of Soil Exposed during Construction Activity. A permittee must include the following considerations in the selection of control measures and the sequence of project construction as they apply to the project site:

- Preserve areas of native topsoil on the site, unless infeasible; and
- Sequence or phase construction activities to minimize the extent and duration of exposed soils to the extent practicable.

11.H.4.1.3 Maintain Natural Buffer Areas.

The permittee must maintain natural buffer areas at stream crossings and around the edge of any waters of the U.S. that are located within or immediately adjacent to the property where the construction activity will take place in accordance with the following:

- The buffer must be a minimum of twenty-five (25) feet wide, unless infeasible based on site dimensions, or the width as required by local ordinance.
- Exceptions are allowed for water dependent activities, specific water access activities, or necessary water crossings.
- A permittee should, to the extent practicable, use perimeter controls adjacent to buffers, and direct storm water sheet flow to buffer areas to increase sediment removal and maximize storm water infiltration, unless infeasible.

11.H.4.1.4 Control Storm Water Discharges and Flow Rates. A permittee must include the following control measures to handle storm water and total storm water volume discharges as they apply to the site:

- Divert storm water around the site so that it does not flow onto the project site and cause erosion of exposed soils;
- Slow down or contain storm water that may collect and concentrate within a site and cause erosion of exposed soils;
- Avoid placement of structural control measures in active floodplains to the degree technologically and economically practicable and achievable;
- Place velocity dissipation devices (e.g., check dams, sediment traps, or riprap) along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters; and

- Install permanent storm water management controls, if present at a site and where practical, so that they must be functional prior to construction of site improvements (e.g., impervious surfaces).

11.H.4.1.5 Protect Steep Slopes. A permittee must include the following considerations in the selection of control measures as they apply to the project site:

- Design and construct cut-and-fill slopes in a manner that will minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (e.g., track walking);

- Divert concentrated flows of storm water away from and around the disturbed portion of the slope. Applicable practices include, but are not limited to interceptor dikes and swales, grass-lined channels, pipe slope drains, subsurface drains, check dams; and

- Stabilize exposed areas of the slope in accordance with Part 11.H.4.4.

11.H.4.2 Sediment Control Measures. Sediment control measures (e.g. sediment ponds, traps, filters, etc.) must be constructed as one of the first steps in grading. These control measures must be functional before other land disturbing activities take place. A permittee must install, establish and use any of the following control measures that apply to the project site.

11.H.4.2.1 Storm Drain Inlet Protection Meaures. A permittee must install appropriate protection measures (e.g. filter berms, perimeter controls, temporary diversion dikes, etc.) to minimize the discharge of sediment prior to entry into the inlet for storm drain inlets located on site or immediately downstream of the site. Inlet protection measures must be cleaned or removed and replaced when sediment has filled one-third of the available storage.

11.H.4.2.2 Water Body Protection Measures. A permittee must install appropriate protection measures (Part 11.H.4.1.4) to minimize the discharge of sediment prior to entry into the water body for water bodies located on site or immediately downstream of the site. Protection measures must be cleaned or removed and replaced when sediment has filled one-third of the available storage.

11.H.4.2.3 Down-Slope Sediment Controls. A permittee must establish and use down-slope sediment controls (e.g., silt fence, temporary diversion dike, etc.) for any portion of the down-slope and side-slope perimeter where storm water will be discharged from disturbed areas of the site.

11.H.4.2.4 *Stabilized Construction Vehicle Access and Exit Points.* A permittee must establish construction vehicle access and exit points which must be stabilized. Access and exit points should be limited to one route, if possible. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

11.H.4.2.5 *Dust Generation and Track-Out from Vehicles.* A permittee must minimize the generation of dust through the application of water or other dust suppression techniques and prior to vehicle exit. A permittee must provide an effective way of minimizing off-site vehicle tracking of sediment from wheels to prevent track-out onto paved surfaces.

11.H.4.2.6 *Soil Stockpiles.* A permittee must stabilize or cover soil stockpiles, protect with sediment trapping measures, and where possible, locate soil stockpiles away from storm drain inlets, water bodies, and conveyance channels.

11.H.4.2.7 *Authorized Non-Storm Water Discharges.* A permittee must minimize any non-storm water authorized by this permit.

11.H.4.2.8 *Sediment Basins*, where applicable:

- For common drainage locations that serve an area with ten (10) or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from the drainage area from a 2-year, 24-hour storm, or equivalent sediment control measures, must be installed, maintained, and used where practicable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent sediment control measures, must be installed and used where practicable until final stabilization of the site. When computing the number of acres draining into a common location, it is not necessary to include flows from offsite areas and flows from on-site areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. In determining whether installing a sediment basin is practicable, the permittee may consider factors such as site soils, slope, available area on-site, etc. In any event, the permittee must consider public safety, especially as it relates to children, as a design factor for the sediment basin, and alternative sediment control measures must be used where site limitations would preclude a safe design.

- For drainage locations which serve ten (10) or more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not practicable, smaller sediment basins and/or sediment traps should be used. Silt fences, vegetative buffer strips, or equivalent sediment control measures are

required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions).

- For drainage locations serving less than ten (10) acres, smaller sediment basins and/or sediment traps should be used. Silt fences, vegetative buffer strips, or equivalent sediment control measures are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm event or 3,600 cubic feet of storage per acre drained is provided.

- When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface where practicable.

- Note: installing sediment basins in the presence of permafrost is challenging and might not be practicable in some instances because permafrost creates poor surface drainage that hinders the infiltration of runoff. Also, the excavation of permafrost in summer can trigger thawing and instability.

11.H.4.3 Dewatering.

11.H.4.3.1 If a construction activity includes excavation dewatering and has a discharge that could adversely impact a local drinking water well, an DEC-identified contaminated site, or a waters of the U.S., the permittee must review the DEC Excavation Dewatering General Permit (AKG002000, or most current version) for specific requirements the permittee may have to comply with in addition to the conditions of this permit.

11.H.4.3.2 A discharge from eligible dewatering activities, including discharges from dewatering of trenches and excavations are prohibited unless treated by appropriate control measures. Appropriate control measures include, but are not limited to, sediment basins or traps, dewatering tanks, weir tanks, or filtration systems designed to remove sediment.

11.H.4.4 Soil Stabilization.

11.H.4.4.1 Minimum Requirements for Soil Stabilization. A permittee must stabilize all disturbed areas of the site to minimize on-site erosion and sedimentation and the resulting discharge of pollutants according to the requirements of this Part. A permittee must ensure that existing vegetation is preserved wherever possible and that disturbed portions of the site are stabilized. Applicable stabilization control measures include, but are not limited to: temporary and permanent seeding, sodding, mulching, rolled erosion control product, compost blanket, soil application of polyacrylamide (PAM), the early application of gravel base on areas to be paved,

and dust control. A permittee should avoid using impervious surfaces for stabilization. See the Alaska Plant Materials Center's A Revegetation Manual for Alaska at http://plants.alaska.gov for help in efforts to select appropriate seed mixes and some information on methods for revegetation. Also see the manual for coastal Alaska, Coastal Revegetation & Erosion Control Guide at http://plants.alaska.gov.

11.H.4.5 Treatment Chemicals. The use of treatment chemicals to reduce turbidity in a storm water discharge is allowed provided that all of the requirements of this Part are met.

11.H.4.5.1 Use of conventional sediment controls before and after the application of treatment chemicals. Chemicals may only be applied where storm water is treated upstream and is directed to a sediment control (e.g., sediment trap, sediment basin) before discharge.

11.H.4.5.2 Select appropriate treatment chemicals. Chemicals must be appropriately suited to the types of soils likely to be exposed during construction and present in the discharges being treated (i.e., the expected turbidity, pH, and flow rate of storm water flowing into the chemical treatment system or area, etc.)

11.H.4.5.3 Minimize discharge risk from stored chemicals. Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures (e.g., spill berms, decks, spill containment pallets), with adequate spill kits available on-site to respond if the event of a discharge of treatment chemicals occurs.

11.H.4.5.4 Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document in your SWPPP specific departures from these specifications and how they reflect good engineering practice.

11.H.4.5.5 Application of treatment chemicals through the use of manufactured products (e.g., gel bars, gel logs, floc blocks, etc.) must be used in combination with adequate ditch check dams, sediment traps, sediment basins, or physical control measure designed to settle out chemically treated storm water and minimize the presence of treatment chemicals before discharges reach waters of the U.S.. At a minimum there must be adequate ditch length downstream of the last manufactured product prior to reaching the discharge point into a water of the U.S. to provide a place for sedimentation to occur.

11.H.4.5.6 Ensure proper training. Ensure that all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training. Among other things, the training must cover proper dosing requirements.

11.H.4.5.7 Perform additional measures specified by the Department for the authorized use of cationic treatment chemicals. If the permittee plans to add "cationic treatment chemicals" (as defined in Appendix C) to storm water and/or authorized non-storm water prior to discharge, they must submit a request to the Department fourteen (14) calendar days in advance of proposed usage. The request must include the following:

- Operator Name, mailing address, phone number, and email address;
- Project/Site name, physical address, contact name, phone number, email address and MSGP permit authorization number;
- Site Map with all receiving waterbodies, proposed location of chemical treatment system, and proposed point of discharge into receiving waterbodies;
- Schematic drawing of the proposed treatment system; and
- Description of the proposed treatment system including; type of system being used, type of cationic chemicals being used, estimated start and finish date, sampling and recordkeeping schedule and reporting, and name of treatment system operator or company.

The permittee must perform all additional measures as conditioned by the Department authorization to ensure that the use of such chemicals will not cause an exceedance of water quality standards.

11.H.4.6 Prohibited Discharge. A permittee is prohibited from discharging the following from the site:

11.H.4.6.1 Wastewater from concrete washout, unless managed by an appropriate control measure;

11.H.4.6.2 Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

11.H.4.6.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

11.H.4.6.4 Soaps or solvents used in vehicle and equipment washing.

11.H.4.7 Good Housekeeping Measures. A permittee must design, install, implement, and maintain effective good housekeeping measures to prevent and/or minimize the discharge of pollutants. A permittee must include appropriate measures for any of the following activities that are used at the site.

11.H.4.7.1 Washing of Equipment and Vehicles and Wheel Wash-Down. If a permittee conducts washing of equipment or vehicles and/or wheel wash-down at the site the permittee must comply with the following requirements:

- Designate areas to be used for washing of equipment and vehicles and/or wheel wash-down and conduct such activities only in these areas;
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S.;
- Treat all wash water in a sediment basin or use alternative control measures that provide equivalent or better treatment prior to discharge; and
- To comply with the prohibition in Part 11.H.4.6.4, the discharge of soaps and solvents used in equipment and vehicle washing and/or wheel wash-down is strictly prohibited.

11.H.4.7.2 Fueling and Maintenance Areas. If a permittee conducts fueling and/or maintenance activities for equipment and vehicles at the site the permittee must comply with the following requirements:

- Designate areas to be used for fueling and/or maintenance of equipment and vehicles and conduct such activities only in these areas (the designated area may move from one location to another on linear projects);
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets and waters of the U.S.;
- Minimize the exposure to precipitation and storm water or use secondary containment structures designed to eliminate the potential for spills or leaked chemicals; and
- To comply with the prohibition in Part 11.H.4.6.3, a permittee must:
    - Clean up spills or contaminated surfaces immediately;
    - Ensure adequate clean up supplies are available at all times to handle spills, leaks, and disposal of used liquids;
    - Use drip pans or absorbents under or around leaky equipment and vehicles; and
    - Dispose of liquid wastes or materials used for fueling and maintenance in accordance with Part 11.H.4.11.

11.H.4.8 Staging and Material Storage Areas. If a permittee maintains staging and material storage areas at the site the permittee must comply with the following requirements:

- Designate areas to be used for staging and material storage areas;

- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S; and
- Minimize the exposure to precipitation and storm water and vandalism for all chemicals, treatment chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment.

11.H.4.9 Washout of Applicators/Containers used for Paint, Concrete, and Other Materials. If a permittee conducts washing of applicators and/or containers used for paint, concrete, and other materials at the site, the permittee must comply with the following requirements:

- Designate areas to be used for washout;
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S.;
- Direct all concrete, paint, and other material washout activities into a lined, water-tight container or pit to ensure there is no discharge into the underlying soil and onto the surrounding areas;
- Dispose of liquid wastes in accordance with Part 11.H.4.11; and
- For concrete washout areas, remove hardened concrete waste when it has reached one-half (½) the height of the container or pit and dispose of in accordance with Part 11.H.4.11.

11.H.4.10 Fertilizer or Pesticide Use. If a permittee uses fertilizers or pesticides the permittee must comply with the following requirements:

- Application of fertilizers and pesticides in a manner and at application rates that will minimize the loss of chemical to storm water runoff. Manufacturers' label requirements for application rates and disposal requirements must be followed; and
- Use pesticides in compliance with federal, state and local requirements.

11.H.4.11 Storage, Handling, and Disposal of Construction Waste. If a permittee stores, handles and/or disposes of construction waste at the site, the permittee must comply with the following requirements:

- Locate areas dedicated for management or disposal of construction waste, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S.;

- Dispose of all collected sediment, asphalt and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other domestic wastes according to federal, state and local requirements;
- Store hazardous or toxic waste in appropriate sealed containers and dispose of these wastes in accordance with manufactures recommended method of disposal or federal, state or local requirements; and
- Provide containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water. Clean or replace sanitation facilities and inspect them regularly for leaks and spills.

11.H.4.12 Winter Considerations.

11.H.4.12.1 Winter Shutdown. A permittee who temporarily ceases construction for the winter and plans to resume construction the next summer must plan for winter shutdown. The permittee must identify the anticipated dates of fall freeze-up and spring thaw (see Appendix C) for their site and use these dates to plan for winter shutdown. For the purpose of planning ahead frozen ground by itself is not considered an acceptable control measure for stabilization. A permittee must provide for the following prior to, during, and at the conclusion of winter shutdown:

- Temporary or permanent stabilization for conveyance channels;
- Temporary or permanent stabilization for disturbed slopes, disturbed soils, and soil stockpiles; and
- Erosion and sediment control measures in anticipation of spring thaw.

11.H.4.12.2 Winter Construction. In several areas of Alaska, winter construction provides opportunities for construction not available during summer months. Permit coverage is not required for the construction of ice roads or the placement of sand or gravel on frozen tundra with no excavation or potential to pollute waters of the U.S. This permit does address those construction activities that have the potential for erosion or sediment runoff during spring thaw and summer rainfall. A permittee operating winter construction activities must plan for using appropriate control measures to minimize erosion or sediment runoff during spring thaw and summer rainfall. The Alaska Storm Water Guide, Chapters 3 and 4, provide guidance on the selection, design, and installation of winter construction practices and controls.

11.H.4.12.3 Late Winter Clearing. Cutting of trees and brush while the ground is frozen, without disturbing the vegetative mat, for the purpose of clearing in accordance with the U.S. Fish & Wildlife Service "Recommended Time Periods for Avoiding Vegetation Clearing" is allowed prior to the submittal of a project NOI. If the cutting occurs after the onset of spring thaw (as defined in Appendix C), conditions that consist of above freezing temperatures that cause melting of snow, then the permittee must develop a SWPPP and file an NOI, and receive authorization for coverage under this permit from DEC, and otherwise comply with the terms of this permit prior to such clearing.

11.H.4.13 Maintenance of Control Measures. A permittee must maintain all control measures, good housekeeping measures, and other protective measures in effective operating condition. If site inspections required by Part 6 identify control measures, good housekeeping measures, or other protective measures that are not operating effectively, the permittee must implement corrective actions in accordance with Part 8.

If existing control measures need to be modified or if additional control measures are necessary for any reason, the permittee must complete any corrective action in accordance with Part 8.3.

A permittee must remove sediment from silt fences, check dams, berms or other controls before the accumulated sediment reaches one-half (½) the distance up the above-ground height (or it reaches a lower height based on manufacturer's specifications) of the control measure. For sediment traps or sediment ponds, the permittee must remove accumulated sediment when the design capacity has been reduced by fifty (50%) percent.

11.H.4.14 Inspection of Clearing, Grading, and Excavation Activities. (See also Part 6)

11.H.4.14.1 Inspection Frequency. Inspections must be conducted at one of the following: at least once every 7 calendar days; or at least once every 14 calendar days and within 24 hours of the end of a storm event that resulted in a discharge from the site; or for areas of the state where the mean annual precipitation is forty (40) inches or greater, or relatively continuous precipitation or sequential storm events, inspect at least once every seven (7) calendar days. If the entire site is temporarily stabilized, inspection frequency may be reduced to at least once every month and within two business days of the end of a measurable storm event at actively staffed sites which resulted in a discharge from the site (pursuant to Part 11.G.4.15.2). Once active mining has begun, those areas comply with inspections according to 11.G.7. A permittee must specify in the SWPPP which schedule will be followed.

11.H.4.14.2 Winter Shutdown. If the exploration and construction phase is undergoing winter shutdown the permittee may stop inspections fourteen (14) calendar days after the anticipated fall freeze-up and must resume inspections at least twenty-one (21) calendar days prior to the anticipated spring thaw. The permittee shall identify the winter shutdown period in their SWPPP based upon the definitions of fall freeze-up and spring thaw.

11.H.4.14.3 Location of Inspections. Inspections must include all areas of the site disturbed by clearing, grading, and/or excavation activities and areas used for storage of materials that are exposed to precipitation. Sedimentation and erosion control measures must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of significant off-site sediment tracking.

11.H.4.14.4 Inspection Reports. (See also Part 6.1) For each inspection required above, the permittee must complete an inspection report. At a minimum, the inspection report must include the information required in Part 6.1.

11.H.4.15 Requirements for Cessation of Clearing, Grading, and Excavation Activities.

11.H.4.15.1 Inspections and Maintenance. Inspections and maintenance of control measures, including BMPs, associated with clearing, grading, and/or excavation activities being conducted as part of the exploration and construction phase of a mining operation must continue until final stabilization has been achieved on all portions of the disturbed area or until the commencement of the active mining phase for those areas that have been temporarily stabilized as a precursor to mining.

11.H.4.15.2 Temporary Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where clearing, grading and/or excavation activities have temporarily ceased, but in no case more than 14 days after the clearing, grading and/or excavation activities in that portion of the site have temporarily ceased. In arid, semi-arid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after exploration, and/or construction activity has temporarily ceased, temporary vegetative stabilization measures must be initiated as soon as practicable.

The permittee must identify the anticipated dates of fall freeze-up and spring thaw (see Appendix C) for the site and use those dates to plan for winter shutdown. For the purpose of planning ahead frozen ground by itself is not considered an acceptable control measure for stabilization. Where temporary stabilization by the 14th day is

precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable following the actual spring thaw.

Until temporary vegetative stabilization is achieved, interim measures (e.g., surface roughening or a surface cover, including but not limited to, establishment of ground vegetation, application of mulch, or surface tackifiers with an appropriate seed base) must be employed. In areas of the site, where exploration and/or construction has permanently ceased prior to active mining, temporary stabilization measures must be implemented to minimize mobilization of sediment or other pollutants until such time as the active mining phase commences.

11.H.4.15.3 Final Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where mining, exploration, and/or construction activities have permanently ceased, but in no case more than 14 days after the exploration and/or construction activity in that portion of the site has permanently ceased. In arid, semi-arid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after mining, exploration, and/or construction activity has permanently ceased, final vegetative stabilization measures must be initiated as soon as possible. Until final stabilization is achieved, temporary stabilization measures must be used.

11.H.5 Additional Technology-Based Effluent Limits.

11.H.5.1 Employee Training. (See also Part 4.2.9) Conduct employee training at least annually at active and temporarily inactive sites.

11.H.5.2 Good Housekeeping Measures. (See also Part 4.2.2) As part of the permittees good housekeeping program, implement the following, as practicable: use sweepers and covered storage, watering haul roads to minimize dust generation, and conserving vegetation (where possible) to minimize erosion.

11.H.5.3 Preventive Maintenance. (See also Part 4.2.3) Perform inspections or other equivalent measures of storage tanks and pressure lines of fuels, lubricants, hydraulic fluid, and slurry to prevent leaks due to deterioration or faulty connections.

11.H.5.4 Storm Water Controls. Apart from the control measures implemented to meet the Part 4 control measures, implement the following control measures at the facility, as practicable. The potential pollutants identified in Part 11.H.6.3 shall determine the priority and appropriateness of the control measures selected. If the permittee selects or develops a storm water control other than one described below, the permittee shall describe it in the SWPPP.

11.H.5.4.1 Storm Water Diversions. Diverting storm water away from potential pollutant sources. Implement the following options, as practicable: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

11.H.5.4.2 Velocity Dissipation Devices. Place velocity dissipation devices (e.g., check dams, sediment traps, or riprap) as practicable, along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters.

11.H.5.4.3 Down-Slope Sediment Controls. Establish and use down-slope sediment controls (e.g., silt fence or temporary diversion dike) for any portion of the down-slope and side-slope perimeter where storm water will be discharged from disturbed areas of the site.

11.H.5.4.4 Stabilized Construction Vehicle Access and Exit Points. Establish stabilized vehicle access and exit points. Off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

11.H.5.4.5 Capping. When capping is necessary to minimize pollutant discharges in storm water, identify the source being capped and the material used to construct the cap.

11.H.5.4.6 Treatment. If treatment of storm water (e.g., chemical or physical systems, oil and water separators, artificial wetlands) is necessary to protect water quality, describe the type and location of treatment used. All permanent storm water treatment devices shall receive engineering plan approval per 18 AAC 72.600. Passive and/or active treatment of storm water runoff is encouraged where practicable. Treated runoff may be discharged as a storm water source regulated under this permit provided the discharge is not combined with discharges subject to effluent limitation guidelines for the Coal Mining Point Source Category (40 CFR Part 434).

11.H.5.5 Certification of Discharge Testing. (See also Part 5.2.4.4) Test or evaluate all outfalls covered under this permit for the presence of specific mining-related non-storm water discharges such as discharges subject to effluent limitations guidelines (e.g., 40 CFR Part 434). Alternatively (if applicable), the permittee may keep a certification with the SWPPP consistent with Part 11.H.6.6.

11.H.5.6 Overburden, Waste Rock, and Raw Material Piles. Overburden, topsoil, and waste rock, as well as raw material and intermediate and final product stockpiles, should be located a minimum of 25 feet away from surface water, other sources of water, and from geologically unstable areas as practicable.

11.H.6 Additional SWPPP Requirements.

11.H.6.1 Other Applicable Regulations. Most active coal mining-related areas (SIC Codes 1221-1241) are subject to sediment and erosion control regulations of the U.S. Office of Surface Mining (OSM) that enforces the Surface Mining Control and Reclamation Act (SMCRA). OSM has granted authority to most coal-producing states to implement SMCRA through State SMCRA regulations. All SMCRA requirements regarding control of storm water-related pollutant discharges must be addressed and then documented with the SWPPP (directly or by reference).

11.H.6.2 Site Map. (See also Part 5.2.3) The permittee must document in their SWPPP where any of the following may be exposed to precipitation or surface runoff: haul and access roads; railroad spurs, sliding, and internal hauling lines; conveyor belts, chutes, and aerial tramways; equipment storage and maintenance yards; coal handling buildings, areas, and structures; and inactive mines and related areas; acidic spoil, refuse, or unreclaimed disturbed areas; and liquid storage tanks containing pollutants such as caustics, hydraulic fluids, and lubricants.

11.H.6.3 Potential Pollutant Sources. (See also Part 5.2.4) The permittee must document in their SWPPP the following sources and activities that have potential pollutants associated with them: truck traffic on haul roads and resulting generation of sediment subject to runoff and dust generation; fuel or other liquid storage; pressure lines containing slurry, hydraulic fluid, or other potential harmful liquids; and loading or temporary storage of acidic refuse or spoil.

11.H.6.4 Employee Training. To the extent practical, all supervisory personnel involved in directing the maintenance of storm water control measures shall be trained and qualified in the principles and practices of erosion and sediment control. All employee training(s) must be documented in the SWPPP.

11.H.6.5 Certification of Permit Coverage for Commingled Non-Storm Water Discharges. If a permittee determines that they are able to certify, consistent with Part 11.G.5.5, that a particular discharge composed of commingled storm water and non-storm water is covered under a separate APDES permit, and that permit subjects the non-storm water portion to effluent limitations prior to any commingling, retain such certification with the SWPPP. This certification must identify the non-storm water discharges, the applicable APDES permit(s), the effluent limitations placed on the non-storm water discharge by the permit(s), and the points at which the limitations are applied.

11.H.6.6 SWPPP Submittal. At least 45 calendar days prior to the start of initial construction of a new facility the permittee shall submit the construction phase SWPPP to DEC for review.

11.H.6.7 SWPPP Meeting. At least 20 calendar days before the start of initial construction for a new facility, representatives of the permittee and the prime site construction contractor shall meet with DEC in a pre-construction conference to discuss the details of storm water management during construction.

11.H.7 Active Mining Additional Inspection Requirements.

11.H.7.1 Inspections of Active Mining-Related Areas. (See also Part 6) Except for areas of the site subject to clearing, grading, and/or excavation activities conducted as part of the exploration and construction phase, which are subject to Part 11.H.4.14.1 perform quarterly inspections of active mining areas covered by this permit, corresponding with the inspections as performed by SMCRA inspectors, of all mining-related areas required by SMCRA. Also maintain the records of the SMCRA authority representative. See Part 11.H.8.1 for inspection requirements for inactive and unstaffed sties.

11.H.7.2 Sediment and Erosion Control. (See also Part 4.2.5) As indicated in Part 11.H.6.1, SMCRA requirements regarding sediment and erosion control measures must be complied with for those areas subject to SMCRA authority, including inspection requirements.

11.H.7.3 Comprehensive Site Inspections. (See also Part 6.3) The permittees inspection program must include inspections for pollutants entering the drainage system from activities located on or near coal mining-related areas. Among the areas to be inspected are haul and access roads; railroad spurs, sliding, and internal hauling lines; conveyor belts, chutes, and aerial tramways; equipment storage and maintenance yards; coal handling buildings, areas, and structures; and inactive mines and related areas.

11.H.8 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

Table 11.H.8-1: Sector – Specific Benchmarks – Sector H

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector H1. Coal Mines and Related Areas (SIC 1221-1241)	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L
	Total Suspended Solids (TSS)	100 mg/L

11.H.8.1 Inactive and Unstaffed Sites – Conditional Exemption from No Exposure Requirement for Routine Inspections, Quarterly Visual Assessments, and Benchmark Monitoring. As a Sector H facility, if the permittee is seeking to exercise a waiver from either the quarterly visual assessment or the benchmark monitoring requirements for inactive and unstaffed sites (including temporarily inactive sites), they are conditionally exempt from the requirement to certify that "there are no industrial materials or activities exposed to storm water" in Parts 6.2.3 and 7.2.1.6, respectively. Additionally, if the permittee is seeking to reduce their required quarterly routine inspection frequency to a once annual comprehensive inspection, as is allowed under Part 6.1.3, the permittee is also conditionally exempt from the requirement to certify that "there are no industrial materials or activities exposed to storm water." These conditional exemptions are based on the following requirements:

- If circumstances change and the permittees facility becomes active and/or staffed, this exception no longer applies and the permittee must immediately begin complying with the applicable benchmark monitoring requirements as if the permittee was in their first year of permit coverage, and the quarterly visual assessment requirements; and

- DEC retains the authority to revoke this exemption and/or the monitoring waiver where it is determined that the discharge causes, has a reasonable potential to cause or contribute to an instream excursion above a WQS, including designated uses.

Subject to the two conditions above, if the permittees facility is inactive and unstaffed, they are waived from the requirement to conduct quarterly visual assessments and routine facility inspections. The permittee is not waived from conducting the Part 6.3 comprehensive site inspection. The permittee is encouraged to inspect their site more frequently where they have reason to believe that severe weather or natural disasters may have damaged control measures or increased discharges.

11.H.9 Termination of Permit Coverage.

11.H.9.1 Termination of Permit Coverage for Sites Reclaimed After December 17, 1990. A site or a portion of a site that has been released from applicable state or federal reclamation requirements after December 17, 1990, is no longer required to maintain coverage under this permit. If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Part 11.H.3.5.

11.H.9.2 Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990. A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if: (1) storm water runoff that comes into contact with raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state WQS, (2) soil disturbing activities related to mining at the sites or portion of the site have been completed, (3) the site or portion of the site has been stabilized to minimize soil erosion, and (4) as appropriate depending on location, size, and the potential to contribute pollutants to storm water discharges, the site or portion of the site has been revegetated, will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.

11. Subpart I – Sector I – Oil and Gas Extraction.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.I.1 Covered Storm Water Discharges.

The requirements in Subpart I apply to storm water discharges associated with industrial activity from Oil and Gas Extraction facilities as identified by the SIC Codes specified under Sector I in Table D-1 of Appendix D of the permit.

Discharges of storm water runoff from field activities or operations associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities are exempt from APDES permit coverage unless, in accordance with 40 CFR 122.26(c)(1)(iii), the facility:

- Has had a discharge of storm water resulting in the discharge of a reportable quantity for which notification is or was required pursuant to 40 CFR 117.21 or 40 CFR 302.6 at anytime since November 16, 1987; or
- Has had a discharge of storm water resulting in the discharge of a reportable quantity for which notification is or was required pursuant to 40 CFR 110.6 at any time since November 16, 1987; or
- Contributes to a violation of a WQS.

Any storm water discharges that require permit coverage as a result of meeting one of the conditions of 40 CFR 122.26(c)(1)(iii) may be covered under this permit unless otherwise required to obtain coverage under an alternative APDES general permit or an individual APDES permit as specified in Part 2.8.1

Oil and Gas Facilities in the North Slope Borough with industrial storm water discharges to waters of the U.S. or directly to the tundra must file under APDES permit AKG331000 rather than this permit.

11.I.2 Limitations on Coverage.

11.I.2.1 *Storm Water Discharges Subject to Effluent Limitation Guidelines.* (See also Part 1.2.4.4) This permit does not authorize storm water discharges from petroleum drilling operations that are subject to nationally established effluent limitation guidelines found at 40 CFR Part 435, respectively.

11.I.2.2 *Non-Storm Water Discharges.* Discharges of vehicle and equipment washwater, including tank cleaning operations, are not authorized by this permit. Alternatively, washwater discharges must be authorized under a separate APDES permit, or be discharged to a sanitary sewer in accordance with applicable industrial pretreatment requirements.

11.I.3 Additional Technology-Based Effluent Limits.

11.I.3.1 *Storm Water Controls.* Apart from the control measures implemented to meet Part 4 control measures, implement the following control measures at the facility, as practicable. The potential pollutants identified in Part 11.I.4.2 shall determine the priority and appropriateness of the control measures selected. If the permittee selects or develops a storm water control other than one described below, the permittee shall describe it in the SWPPP.

11.I.3.1.1 *Vegetative Controls.* Implement vegetative practices designed to preserve existing vegetation, where attainable, and revegetate open areas as soon as practicable after grade drilling. Use one or more of the following (or equivalent measures), as practicable: temporary or permanent seeding, mulching, sod stabilization, vegetative buffer strips, and tree protection practices. Begin implementing appropriate vegetative practices on all disturbed areas within 14 days following the last activity in that area.

11.I.3.1.2 *Storm Water Diversions.* Divert storm water away from potential pollutant sources. Implement the following options, as practicable: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

11.I.3.1.3 *Velocity Dissipation Devices.* (e.g., check dams, sediment traps, or riprap) along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters.

11.I.3.1.4 *Down-Slope Sediment Controls.* Establish and use down-slope sediment controls (e.g., silt fence or temporary diversion dike) for any portion of the down-slope and side-slope perimeter where storm water will be discharged from disturbed areas of the site.

11.I.3.1.5 *Stabilized Vehicle Access and Exit Points.* Establish stabilized vehicle access and exit points. Off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

11.I.4 Additional SWPPP Requirements.

11.I.4.1 *Drainage Area Site Map.* (See also Part 5.2.3) Document in the SWPPP where any of the following may be exposed to precipitation or surface runoff: Reportable Quantity (RQ) releases; locations used for the treatment, storage, or disposal of wastes; processing areas and storage areas; chemical mixing areas; construction and drilling areas; all areas subject to the effluent guidelines requirements for "No Discharge" in accordance with 40 CFR 435.32; and the structural controls to achieve compliance with the "No Discharge" requirements.

11.I.4.2 *Potential Pollutant Sources.* (See also Part 5.2.4) Also document in the SWPPP the following sources and activities that have potential pollutants associated with them: chemical, cement, mud, or gel mixing activities; drilling or mining activities; and equipment cleaning and rehabilitation activities. In addition, include information about the reportable quantity (RQ) release that triggered the permit application requirements: the nature of the release (e.g., spill of oil from a drum storage area), amount of oil or hazardous substance released, amount of substance recovered, date of the release, cause of the release (e.g., poor handling techniques and lack of containment in the area), areas affected by the release (i.e., land and water), procedure to clean up release, actions or procedures implemented to prevent or improve response to a release, and remaining potential contamination of storm water from release (taking into account human health risks, the control of drinking water intakes, and the designated uses of the receiving water).

11.I.4.3 *Erosion and Sedimentation Control.* (See also Part 4.2.5) The additional documentation requirements for sediment and erosion controls for well drillings and sand/shale mining areas include the following:

11.I.4.3.1 *Site Description.* Also include a description in the SWPPP of the nature of the exploration activity, estimates of the total area of site and area disturbed due to exploration activity, an estimate of runoff coefficient of the site, a site drainage map, including approximate slopes, and the names of all receiving waters.

11.I.4.3.2 *Vegetative Controls.* Document vegetative practices used consistent with Part 11.I.3.1 in the SWPPP.

11.I.5 Additional Inspection Requirements.

11.I.5.1 All erosion and sedimentation control measures must be inspected either: 1) every 7 days; or 2) once every 14 calendar days and within 24 hours of a storm event.

11. Subpart J – Sector J – Non-Metallic Mineral Mining and Dressing.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.J.1 Covered Storm Water Discharges.

The requirements in Subpart J apply to storm water discharges associated with industrial activity from Active, Inactive, or Non-Traditional Non-Metallic Mineral Mining and Dressing facilities as identified by the SIC Codes specified under Sector J in Table D-1 of Appendix D of the permit.

11.J.1.1 *Covered Discharges from Inactive Facilities.* All storm water discharges.

11.J.1.2 *Covered Discharges from Active and Temporarily Inactive Facilities.* All storm water discharges, except for most storm water discharges subject to the existing effluent limitation guideline at 40 CFR Part 436. Mine dewatering discharges composed entirely of storm water or uncontaminated ground water seepage from: construction sand and gravel, industrial sand, and crushed stone mining facilities is covered by this permit.

11.J.1.3 *Covered Discharges from Exploration and Construction of Non-Metallic Mineral Mining Facilities.* All storm water discharges.

11.J.1.4 *Covered Discharges from Sites Undergoing Reclamation.* All storm water discharges.

11.J.2 Limitations on Coverage.

Most storm water discharges subject to an existing effluent limitation guideline at 40 CFR Part 436 are not authorized by this permit. The exceptions to this limitation, which are covered by this permit, are mine dewatering discharges composed entirely of storm water or uncontaminated ground water seepage from construction sand and gravel, industrial sand, and crushed stone mining facilities.

11.J.3 Definitions.

The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

11.J.3.1 *Mining Operations* - Consists of the active and temporarily inactive phases, and the reclamation phase, but excludes the exploration and construction phases.

11.J.3.2 *Exploration Phase* - Entails exploration and land disturbance activities to determine the financial viability of a site. The exploration phase is not considered part of “mining operations.”

11.J.3.3 *Construction Phase* - Includes the building of site access roads, facilities, and removal of overburden and waste rock to expose mineable minerals. The construction phase is not considered part of "mining operations".

11.J.3.4 *Active Phase* - Activities including the extraction, removal or recovery of minerals. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 440.132(a). The active phase is considered part of "mining operations."

11.J.3.5 *Reclamation Phase* - Activities undertaken, in compliance with applicable mined land reclamation requirements, following the cessation of the "active phase", intended to return the land to an appropriate post-mining land use. The reclamation phase is considered part of "mining operations".

11.J.3.6 *Non-Traditional Non-Metallic Mineral Mining Facility* - Consists of non-metallic mineral mining facilities which conduct mineral mining and dressing for the sale or distribution of aggregate materials from a non-commercial establishment to be used on multiple unrelated projects. These facilities consist of operations without any permanent sales offices, scales, or other facilities being operated by a commercial establishment that would otherwise clearly fit within one of the Standard Industrial Classification (SIC) codes found in Sector J of Appendix D of the permit. These non-traditional facilities are managed by an operator, who oversees the removal of aggregate from the site, with either written contracts for specified aggregate quantities or an informal notice approving the distribution of material. The operator of these facilities who executes the contracts or provides the authority for individuals or parties to remove aggregate would meet the definition of an operator under this permit and be the sole party responsible to obtain permit coverage, maintain a SWPPP, maintain BMPs, conduct inspections and monitoring, and submit reports.

NOTE: The following definitions are not intended to supersede the definitions of active and inactive mining facilities established by 40 CFR 122.26(b)(14)(iii).

11.J.3.7 *Active Mineral Mining Facility* - A place where work or other activity related to the extraction, removal, or recovery of minerals is being conducted. For surface mines, this definition does not include any land where grading has returned the earth to a desired contour and reclamation has begun. This definition is derived from the definition of "active mining area" found at 40 CFR 440.132(a).

11.J.3.8 *Inactive Mineral Mining Facility* - A site or portion of a site where mineral mining and/or milling occurred in the past but is not an active facility as defined above, and where the inactive portion is not covered by an active mining permit issued by the applicable State or Federal agency. An inactive mineral mining facility has an identifiable owner / operator. Sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials, and sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim are not considered either active or inactive mining facilities and do not require an APDES industrial storm water permit.

11.J.3.9 *Temporarily Inactive Mineral Mining Facility* - A site or portion of a site where mineral mining and/or milling occurred in the past but currently are not being actively undertaken, and the facility is covered by an active mining permit issued by the applicable State or Federal agency. A temporarily inactive facility includes sites that are temporarily stabilized and have small stockpiles of non-metallic mineral mining material (less than 250 cubic yards/year) for local use or road maintenance during the temporarily inactive phase.

11.J.4 Technology-Based Effluent Limits for Clearing, Grading, and Excavation Activities.

Clearing, grading, and excavation activities being conducted as part of the exploration and construction phase of mining activities are covered under this permit.

11.J.4.1 *Erosion Control Measures.* A permittee must comply with the erosion control measures in this Part to minimize soil exposure on the site during construction.

11.J.4.1.1 *Delineation of Site.* A permittee must generally delineate (e.g., with flagging, stakes, signs, silt fence, etc.,) the location of specific areas that will be left undisturbed such as trees, boundaries of sensitive areas, or buffers established under Part 11.J.4.1.3.

11.J.4.1.2 *Minimize the Amount of Soil Exposed during Construction Activity.* A permittee must include the following considerations in the selection of control measures and the sequence of project construction as they apply to the project site:

- Preserve areas of native topsoil on the site, unless infeasible; and
- Sequence or phase construction activities to minimize the extent and duration of exposed soils to the extent practicable.

11.J.4.1.3 *Maintain Natural Buffer Areas.*

The permittee must maintain natural buffer areas at stream crossings and around the edge of any waters of the U.S. that are located within or immediately adjacent to the property where the construction activity will take place in accordance with the following:

- The buffer must be a minimum of twenty-five (25) feet wide, unless infeasible based on site dimensions, or the width as required by local ordinance.
- Exceptions are allowed for water dependent activities, specific water access activities, or necessary water crossings.
- A permittee should, to the extent practicable, use perimeter controls adjacent to buffers, and direct storm water sheet flow to buffer areas to increase sediment removal and maximize storm water infiltration, unless infeasible.

11.J.4.1.4 Control Storm Water Discharges and Flow Rates. A permittee must include the following control measures to handle storm water and total storm water volume discharges as they apply to the site:

- Divert storm water around the site so that it does not flow onto the project site and cause erosion of exposed soils;
- Slow down or contain storm water that may collect and concentrate within a site and cause erosion of exposed soils;
- Avoid placement of structural control measures in active floodplains to the degree technologically and economically practicable and achievable;
- Place velocity dissipation devices (e.g., check dams, sediment traps, or riprap) along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters; and
- Install permanent storm water management controls, if present at a site and where practical, so that they must be functional prior to construction of site improvements (e.g., impervious surfaces).

11.J.4.1.5 Protect Steep Slopes. A permittee must include the following considerations in the selection of control measures as they apply to the project site:

- Design and construct cut-and-fill slopes in a manner that will minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (e.g., track walking);
- Divert concentrated flows of storm water away from and around the disturbed portion of the slope. Applicable practices include, but are not limited to

interceptor dikes and swales, grass-lined channels, pipe slope drains, subsurface drains, check dams; and

- Stabilize exposed areas of the slope in accordance with Part 11.J.4.4.

11.J.4.2 Sediment Control Measures. Sediment control measures (e.g. sediment ponds, traps, filters, etc.) must be constructed as one of the first steps in grading. These control measures must be functional before other land disturbing activities take place. A permittee must install, establish and use any of the following control measures that apply to the project site.

11.J.4.2.1 Storm Drain Inlet Protection Measures. A permittee must install appropriate protection measures (e.g. filter berms, perimeter controls, temporary diversion dikes, etc.) to minimize the discharge of sediment prior to entry into the inlet for storm drain inlets located on site or immediately downstream of the site. Inlet protection measures must be cleaned or removed and replaced when sediment has filled one-third of the available storage.

11.J.4.2.2 Water Body Protection Measures. A permittee must install appropriate protection measures (Part 11.J.4.1.4) to minimize the discharge of sediment prior to entry into the water body for water bodies located on site or immediately downstream of the site. Protection measures must be cleaned or removed and replaced when sediment has filled one-third of the available storage.

11.J.4.2.3 Down-Slope Sediment Controls. A permittee must establish and use down-slope sediment controls (e.g., silt fence, temporary diversion dike, etc.) for any portion of the down-slope and side-slope perimeter where storm water will be discharged from disturbed areas of the site.

11.J.4.2.4 Stabilized Construction Vehicle Access and Exit Points. A permittee must establish construction vehicle access and exit points which must be stabilized. Access and exit points should be limited to one route, if possible. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

11.J.4.2.5 Dust Generation and Track-Out from Vehicles. A permittee must minimize the generation of dust through the application of water or other dust suppression techniques and prior to vehicle exit. A permittee must provide an effective way of minimizing off-site vehicle tracking of sediment from wheels to prevent track-out onto paved surfaces.

11.J.4.2.6 Soil Stockpiles. A permittee must stabilize or cover soil stockpiles, protect with sediment trapping measures, and where possible, locate soil stockpiles away from storm drain inlets, water bodies, and conveyance channels.

11.J.4.2.7 Authorized Non-Storm Water Discharges. A permittee must minimize any non-storm water authorized by this permit.

11.J.4.2.8 Sediment Basins, where applicable:

- For common drainage locations that serve an area with ten (10) or more acres disturbed at one time, a temporary (or permanent) sediment basin that provides storage for a calculated volume of runoff from the drainage area from a 2-year, 24-hour storm, or equivalent sediment control measures, must be installed, maintained, and used where practicable until final stabilization of the site. Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage per acre drained, or equivalent sediment control measures, must be installed and used where practicable until final stabilization of the site. When computing the number of acres draining into a common location, it is not necessary to include flows from offsite areas and flows from on-site areas that are either undisturbed or have undergone final stabilization where such flows are diverted around both the disturbed area and the sediment basin. In determining whether installing a sediment basin is practicable, the permittee may consider factors such as site soils, slope, available area on-site, etc. In any event, the permittee must consider public safety, especially as it relates to children, as a design factor for the sediment basin, and alternative sediment control measures must be used where site limitations would preclude a safe design.

- For drainage locations which serve ten (10) or more disturbed acres at one time and where a temporary sediment basin or equivalent controls is not practicable, smaller sediment basins and/or sediment traps should be used. Silt fences, vegetative buffer strips, or equivalent sediment control measures are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions).

- For drainage locations serving less than ten (10) acres, smaller sediment basins and/or sediment traps should be used. Silt fences, vegetative buffer strips, or equivalent sediment control measures are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of the construction area unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm event or 3,600 cubic feet of storage per acre drained is provided.

- When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface where practicable.

- Note: installing sediment basins in the presence of permafrost is challenging and might not be practicable in some instances because permafrost creates poor surface drainage that hinders the infiltration of runoff. Also, the excavation of permafrost in summer can trigger thawing and instability.

11.J.4.3 Dewatering.

11.J.4.3.1 If a construction activity includes excavation dewatering and has a discharge that could adversely impact a local drinking water well, an DEC-identified contaminated site, or a waters of the U.S., the permittee must review the DEC Excavation Dewatering General Permit (AKG002000, or most current version) for specific requirements the permittee may have to comply with in addition to the conditions of this permit.

11.J.4.3.2 A discharge from eligible dewatering activities, including discharges from dewatering of trenches and excavations are prohibited unless treated by appropriate control measures. Appropriate control measures include, but are not limited to, sediment basins or traps, dewatering tanks, weir tanks, or filtration systems designed to remove sediment.

11.J.4.4 Soil Stabilization.

11.J.4.4.1 Minimum Requirements for Soil Stabilization. A permittee must stabilize all disturbed areas of the site to minimize on-site erosion and sedimentation and the resulting discharge of pollutants according to the requirements of this Part. A permittee must ensure that existing vegetation is preserved wherever possible and that disturbed portions of the site are stabilized. Applicable stabilization control measures include, but are not limited to: temporary and permanent seeding, sodding, mulching, rolled erosion control product, compost blanket, soil application of polyacrylamide (PAM), the early application of gravel base on areas to be paved, and dust control. A permittee should avoid using impervious surfaces for stabilization. See the Alaska Plant Materials Center's *A Revegetation Manual for Alaska* at http://plants.alaska.gov for help in efforts to select appropriate seed mixes and some information on methods for revegetation. Also see the manual for *Coastal Alaska, Coastal Revegetation & Erosion Control Guide* at http://plants.alaska.gov.

11.J.4.5 Treatment Chemicals. The use of treatment chemicals to reduce turbidity in a storm water discharge is allowed provided that all of the requirements of this Part are met.

11.J.4.5.1 Use of conventional sediment controls before and after the application of treatment chemicals. Chemicals may only be applied where storm water is treated upstream and is directed to a sediment control (e.g., sediment trap, sediment basin) before discharge.

11.J.4.5.2 Select appropriate treatment chemicals. Chemicals must be appropriately suited to the types of soils likely to be exposed during construction and present in the discharges being treated (i.e., the expected turbidity, pH, and flow rate of storm water flowing into the chemical treatment system or area, etc.)

11.J.4.5.3 Minimize discharge risk from stored chemicals. Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures (e.g., spill berms, decks, spill containment pallets), with adequate spill kits available on-site to respond if the event of a discharge of treatment chemicals occurs.

11.J.4.5.4 Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document in your SWPPP specific departures from these specifications and how they reflect good engineering practice.

11.J.4.5.5 Application of treatment chemicals through the use of manufactured products (e.g., gel bars, gel logs, floc blocks, etc.) must be used in combination with adequate ditch check dams, sediment traps, sediment basins, or physical control measure designed to settle out chemically treated storm water and minimize the presence of treatment chemicals before discharges reach waters of the U.S.. At a minimum there must be adequate ditch length downstream of the last manufactured product prior to reaching the discharge point into a water of the U.S. to provide a place for sedimentation to occur.

11.J.4.5.6 Ensure proper training. Ensure that all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training. Among other things, the training must cover proper dosing requirements.

11.J.4.5.7 Perform additional measures specified by the Department for the authorized use of cationic treatment chemicals. If the permittee plans to add “cationic treatment chemicals” (as defined in Appendix C) to storm water and/or authorized non-storm water prior to discharge, they must submit a request to the Department fourteen (14) calendar days in advance of proposed usage. The request must include the following:

- Operator Name, mailing address, phone number, and email address;
- Project/Site name, physical address, contact name, phone number, email address and MSGP permit authorization number;
- Site Map with all receiving waterbodies, proposed location of chemical treatment system, and proposed point of discharge into receiving waterbodies;
- Schematic drawing of the proposed treatment system; and

- Description of the proposed treatment system including; type of system being used, type of cationic chemicals being used, estimated start and finish date, sampling and recordkeeping schedule and reporting, and name of treatment system operator or company.

The permittee must perform all additional measures as conditioned by the Department authorization to ensure that the use of such chemicals will not cause an exceedance of water quality standards.

11.J.4.6 Prohibited Discharge. A permittee is prohibited from discharging the following from the site:

11.J.4.6.1 Wastewater from concrete washout, unless managed by an appropriate control measure;

11.J.4.6.2 Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

11.J.4.6.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and

11.J.4.6.4 Soaps or solvents used in vehicle and equipment washing.

11.J.4.7 Good Housekeeping Measures. A permittee must design, install, implement, and maintain effective good housekeeping measures to prevent and/or minimize the discharge of pollutants. A permittee must include appropriate measures for any of the following activities that are used at the site.

11.J.4.7.1 Washing of Equipment and Vehicles and Wheel Wash-Down. If a permittee conducts washing of equipment or vehicles and/or wheel wash-down at the site the permittee must comply with the following requirements:

- Designate areas to be used for washing of equipment and vehicles and/or wheel wash-down and conduct such activities only in these areas;
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S.;
- Treat all wash water in a sediment basin or use alternative control measures that provide equivalent or better treatment prior to discharge; and
- To comply with the prohibition in Part 11.J.4.6.4, the discharge of soaps and solvents used in equipment and vehicle washing and/or wheel wash-down is strictly prohibited.

11.J.4.7.2 Fueling and Maintenance Areas. If a permittee conducts fueling and/or maintenance activities for equipment and vehicles at the site the permittee must comply with the following requirements:

- Designate areas to be used for fueling and/or maintenance of equipment and vehicles and conduct such activities only in these areas (the designated area may move from one location to another on linear projects);
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets and waters of the U.S.;
- Minimize the exposure to precipitation and storm water or use secondary containment structures designed to eliminate the potential for spills or leaked chemicals; and
- To comply with the prohibition in Part 11.J.4.6.3, a permittee must:
    - Clean up spills or contaminated surfaces immediately;
    - Ensure adequate clean up supplies are available at all times to handle spills, leaks, and disposal of used liquids;
    - Use drip pans or absorbents under or around leaky equipment and vehicles; and
    - Dispose of liquid wastes or materials used for fueling and maintenance in accordance with Part 11.J.4.11.

11.J.4.8 Staging and Material Storage Areas. If a permittee maintains staging and material storage areas at the site the permittee must comply with the following requirements:

- Designate areas to be used for staging and material storage areas;
- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S; and
- Minimize the exposure to precipitation and storm water and vandalism for all chemicals, treatment chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment.

11.J.4.9 Washout of Applicators/Containers used for Paint, Concrete, and Other Materials. If a permittee conducts washing of applicators and/or containers used for paint, concrete, and other materials at the site, the permittee must comply with the following requirements:

- Designate areas to be used for washout;

- Locate such activities, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S.;
- Direct all concrete, paint, and other material washout activities into a lined, water-tight container or pit to ensure there is no discharge into the underlying soil and onto the surrounding areas;
- Dispose of liquid wastes in accordance with Part 11.J.4.11; and
- For concrete washout areas, remove hardened concrete waste when it has reached one-half (½) the height of the container or pit and dispose of in accordance with Part 11.J.4.11.

11.J.4.10 Fertilizer or Pesticide Use. If a permittee uses fertilizers or pesticides the permittee must comply with the following requirements:

- Application of fertilizers and pesticides in a manner and at application rates that will minimize the loss of chemical to storm water runoff. Manufacturers' label requirements for application rates and disposal requirements must be followed; and
- Use pesticides in compliance with federal, state and local requirements.

11.J.4.11 Storage, Handling, and Disposal of Construction Waste. If a permittee stores, handles and/or disposes of construction waste at the site, the permittee must comply with the following requirements:

- Locate areas dedicated for management or disposal of construction waste, to the extent practicable, away from storm water conveyance channels, storm drain inlets, and waters of the U.S.;
- Dispose of all collected sediment, asphalt and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other domestic wastes according to federal, state and local requirements;
- Store hazardous or toxic waste in appropriate sealed containers and dispose of these wastes in accordance with manufactures recommended method of disposal or federal, state or local requirements; and
- Provide containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water. Clean or replace sanitation facilities and inspect them regularly for leaks and spills.

11.J.4.12 Winter Considerations.

11.J.4.12.1 Winter Shutdown. A permittee who temporarily ceases construction for the winter and plans to resume construction the next summer must plan for winter shutdown. The permittee must identify the anticipated dates of fall freeze-up and spring thaw (see Appendix C) for their site and use these dates to plan for winter shutdown. For the purpose of planning ahead frozen ground by itself is not considered an acceptable control measure for stabilization. A permittee must provide for the following prior to, during, and at the conclusion of winter shutdown:

- Temporary or permanent stabilization for conveyance channels;
- Temporary or permanent stabilization for disturbed slopes, disturbed soils, and soil stockpiles; and
- Erosion and sediment control measures in anticipation of spring thaw.

11.J.4.12.2 Winter Construction. In several areas of Alaska, winter construction provides opportunities for construction not available during summer months. Permit coverage is not required for the construction of ice roads or the placement of sand or gravel on frozen tundra with no excavation or potential to pollute waters of the U.S. This permit does address those construction activities that have the potential for erosion or sediment runoff during spring thaw and summer rainfall. A permittee operating winter construction activities must plan for using appropriate control measures to minimize erosion or sediment runoff during spring thaw and summer rainfall. The Alaska Storm Water Guide, Chapters 3 and 4, provide guidance on the selection, design, and installation of winter construction practices and controls.

11.J.4.12.3 Late Winter Clearing. Cutting of trees and brush while the ground is frozen, without disturbing the vegetative mat, for the purpose of clearing in accordance with the U.S. Fish & Wildlife Service "Recommended Time Periods for Avoiding Vegetation Clearing" is allowed prior to the submittal of a project NOI. If the cutting occurs after the onset of spring thaw (as defined in Appendix C), conditions that consist of above freezing temperatures that cause melting of snow, then the permittee must develop a SWPPP and file an NOI, and receive authorization for coverage under this permit from DEC, and otherwise comply with the terms of this permit prior to such clearing.

11.J.4.13 Maintenance of Control Measures. A permittee must maintain all control measures, good housekeeping measures, and other protective measures in effective operating condition. If site inspections required by Part 6 identify control measures, good housekeeping measures, or other protective measures that are not operating effectively, the permittee must implement corrective actions in accordance with Part 8.

If existing control measures need to be modified or if additional control measures are necessary for any reason, the permittee must complete any corrective action in accordance with Part 8.3.

A permittee must remove sediment from silt fences, check dams, berms or other controls before the accumulated sediment reaches one-half (½) the distance up the above-ground height (or it reaches a lower height based on manufacturer's specifications) of the control measure. For sediment traps or sediment ponds, the permittee must remove accumulated sediment when the design capacity has been reduced by fifty (50%) percent.

11.J.4.14 Inspection of Clearing, Grading, and Excavation Activities. (See also Part 6)

11.J.4.14.1 Inspection Frequency. Inspections must be conducted at one of the following: at least once every 7 calendar days; or at least once every 14 calendar days and within 24 hours of the end of a storm event that resulted in a discharge from the site; or for areas of the state where the mean annual precipitation is forty (40) inches or greater, or relatively continuous precipitation or sequential storm events, inspect at least once every seven (7) calendar days. If the entire site is temporarily stabilized, inspection frequency may be reduced to at least once every month and within two business days of the end of a measurable storm event at actively staffed sites which resulted in a discharge from the site (pursuant to Part 11.G.4.15.2). Once active mining has begun, those areas comply with inspections according to 11.G.7. A permittee must specify in the SWPPP which schedule will be followed.

11.J.4.14.2 Winter Shutdown. If the exploration and construction phase is undergoing winter shutdown the permittee may stop inspections fourteen (14) calendar days after the anticipated fall freeze-up and must resume inspections at least twenty-one (21) calendar days prior to the anticipated spring thaw. The permittee shall identify the winter shutdown period in their SWPPP based upon the definitions of fall freeze-up and spring thaw.

11.J.4.14.3 Location of Inspections. Inspections must include all areas of the site disturbed by clearing, grading, and/or excavation activities and areas used for storage of materials that are exposed to precipitation. Sedimentation and erosion control measures must be observed to ensure proper operation. Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of significant off-site sediment tracking.

11.J.4.14.4 Inspection Reports. (See also Part 6.1) For each inspection required above, the permittee must complete an inspection report. At a minimum, the inspection report must include the information required in Part 6.1.

11.J.4.15 ***Requirements for Cessation of Clearing, Grading, and Excavation Activities***.

11.J.4.15.1 Inspections and Maintenance. Inspections and maintenance of control measures, including any BMPs, associated with clearing, grading, and/or excavation activities being conducted as part of the exploration and construction phase of a mining operation must continue until final stabilization has been achieved on all portions of the disturbed area or until the commencement of the active mining phase for those areas that have been temporarily stabilized as a precursor to mining.

11.J.4.15.2 Temporary Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where clearing, grading and/or excavation activities have temporarily ceased, but in no case more than 14 days after the clearing, grading and/or excavation activities in that portion of the site have temporarily ceased. In arid, semi-arid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after exploration and/or construction activity has temporarily ceased, temporary vegetative stabilization measures must be initiated as soon as practicable.

The permittee must identify the anticipated dates of fall freeze-up and spring thaw (see Appendix C) for the site and use those dates to plan for winter shutdown. For the purpose of planning ahead frozen ground by itself is not considered an acceptable control measure for stabilization. Where temporary stabilization by the 14th day is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable following the actual spring thaw.

Until temporary vegetative stabilization is achieved, interim measures (e.g., surface roughening or a surface cover, including but not limited to, establishment of ground vegetation, application of mulch, or surface tackifiers with an appropriate seed base) must be employed. In areas of the site, where exploration and/or construction has permanently ceased prior to active mining, temporary stabilization measures must be implemented to minimize mobilization of sediment or other pollutants until such time as the active mining phase commences.

11.J.4.15.3 Final Stabilization of Disturbed Areas. Stabilization measures should be initiated immediately in portions of the site where mining, exploration, and/or construction activities have permanently ceased, but in no case more than 14 days after the exploration and/or construction activity in that portion of the site has permanently ceased. In arid, semi-arid, and drought-stricken areas, or in areas subject to snow or freezing conditions, where initiating perennial vegetative stabilization measures is not possible within 14 days after mining, exploration, and/or construction activity has permanently ceased, final vegetative stabilization measures must be initiated as soon as possible. Until final stabilization is achieved, temporary stabilization measures must be used.

11.J.5 Additional Technology-Based Effluent Limits.

11.J.5.1 *Employee Training.* (See also Part 4.2.9) Conduct employee training at least annually at active and temporarily inactive sites.

11.J.5.2 *Good Housekeeping Measures.* (See also Part 4.2.2) As part of the permittees good housekeeping program, implement the following, as practicable: use sweepers and covered storage, watering haul roads to minimize dust generation, and conserving vegetation (where possible) to minimize erosion.

11.J.5.3 *Preventive Maintenance.* (See also Part 4.2.3) Perform inspections or other equivalent measures of storage tanks and pressure lines of fuels, lubricants, and hydraulic fluid to prevent leaks due to deterioration or faulty connections.

11.J.5.4 *Storm Water Controls.* Apart from the control measures implemented to meet the Part 4 control measures, implement the following control measures at the facility as practicable. The potential pollutants identified in Part 11.J.5.5 shall determine the priority and appropriateness of the control measures selected. . If the permittee selects or develops a storm water control other than one described below, the permittee shall describe it in the SWPPP.

11.J.5.4.1 *Storm Water Diversions.* Divert storm water away from potential pollutant sources. Implement the following options, as practicable: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

11.J.5.4.2 *Velocity Dissipation Devices.* Place velocity dissipation devices (e.g., check dams, sediment traps, or riprap) as practicable, along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters.

11.J.5.4.3 *Down-Slope Sediment Controls.* Establish and use down-slope sediment controls (e.g., silt fence or temporary diversion dike) for any portion of the down-slope and side-slope perimeter where storm water will be discharged from disturbed areas of the site.

11.J.5.4.4 *Stabilized Construction Vehicle Access and Exit Points.* Establish stabilized vehicle access and exit points. Off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

11.J.5.4.5 Capping. When capping is necessary to minimize pollutant discharges in storm water, identify the source being capped and the material used to construct the cap.

11.J.5.4.6 Treatment. If treatment of storm water (e.g., chemical or physical systems, oil and water separators, artificial wetlands) is necessary to protect water quality, describe the type and location of treatment used. All permanent storm water treatment devices shall receive engineering plan approval per 18 AAC 72.600. Passive and/or active treatment of storm water runoff is encouraged where practicable. Treated runoff may be discharged as a storm water source regulated under this permit provided the discharge is not combined with discharges subject to effluent limitation guidelines for the Mineral Mining and Processing Point Source Category (40 CFR Part 436).

11.J.5.5 Certification of Discharge Testing. (See also Part 5.2.4.4) Test or evaluate all outfalls covered under this permit for the presence of specific mining-related non-storm water discharges such as discharges subject to effluent limitations guidelines (e.g., 40 CFR Part 436). Alternatively (if applicable), the permittee may keep a certification with the SWPPP consistent with 11.J.6.5.

11.J.5.6 Overburden, Waste Rock, and Raw Material Piles. Overburden, topsoil, and waste rock, as well as raw material and intermediate and final product stockpiles, should be located a minimum of 25 feet away from surface water, other sources of water, and from geologically unstable areas as practicable.

11.J.6 Additional SWPPP Requirements.

The requirements in Part 11.J.6 are applicable for sites undergoing exploration and construction, active mineral mining facilities, temporarily inactive mineral mining facilities, and sites undergoing reclamation. The requirements in Part 11.J.6 are not applicable to inactive mineral mining facilities.

11.J.6.1 Nature of Industrial Activities. (See also Part 5.2.3) Document in the SWPPP the mining and associated activities that can potentially affect the storm water discharges covered by this permit, including a general description of the location of the site relative to major transportation routes and communities.

11.J.6.2 *Site Map.* (See also Part 5.2.3) The permittee must document in the SWPPP the locations of the following (as appropriate): mining or milling site boundaries; access and haul roads; outline of the drainage areas of each storm water outfall within the facility with indications of the types of discharges from the drainage areas; location(s) of all permitted discharges covered under an individual APDES permit, outdoor equipment storage, fueling, and maintenance areas; materials handling areas; outdoor manufacturing, outdoor storage, and material disposal areas; outdoor chemicals and explosives storage areas; overburden, materials, soils, or waste storage areas; location of mine drainage dewatering or other process water; heap leach pads; off-site points of discharge for mine dewatering and process water; surface waters; boundary of tributary areas that are subject to effluent limitations guidelines; and location(s) of reclaimed areas.

11.J.6.3 *Potential Pollutant Sources.* (See also Part 5.2.4) For each area of the mine or mill site where storm water discharges associated with industrial activities occur, document in the SWPPP the types of pollutants (e.g., heavy metals, sediment) likely to be present in significant amounts. For example, phosphate mining facilities will likely need to document pollutants such as selenium, which can be present in significant amounts in their discharges. Consider these factors: the mineralogy of the waste rock (e.g., acid forming); toxicity and quantity of chemicals used, produced, or discharged; the likelihood of contact with storm water; vegetation of site (if any); and history of significant leaks or spills of toxic or hazardous pollutants. Also include a summary of any existing waste rock or overburden characterization data and test results for potential generation of acid rock drainage.

11.J.6.4 *Storm Water Controls.* To the extent that a permittee uses any of the control measures in Part 11.J.5.4, document them in the SWPPP pursuant to Part 5.2.5. If control measures are implemented or planned but are not listed here (e.g., substituting a less toxic chemical for a more toxic one), include descriptions of them in the SWPPP.

11.J.6.5 *Certification of Permit Coverage for Commingled Non-Storm Water Discharges.* If a permittee determines that they are able to certify, consistent with Part 11.J.5.5, that a particular discharge composed of commingled storm water and non-storm water is covered under a separate APDES permit, and that permit subjects the non-storm water portion to effluent limitations prior to any commingling, the permittee must retain such certification with their SWPPP. This certification must identify the non-storm water discharges, the applicable APDES permit(s), the effluent limitations placed on the non-storm water discharge by the permit(s), and the points at which the limitations are applied.

11.J.6.6 Dewatering. Mine dewatering discharges composed entirely of storm water or ground water seepage from mines located within fifteen hundred feet of a DEC-identified contaminated site are required to have additional discharge authorization under the DEC Excavation Dewatering General Permit (AKG002000), or most current version. The Notice of Intent, NOI, application for authorization to discharge mine dewatering which may influence a contaminated area can be completed through the DEC's online application system at *http://www.dec.alaska.gov/water/oasys/index.html*.

11.J.7 Additional Inspection Requirements.

Except for areas of the site subject to clearing, grading, and/or excavation activities conducted as part of the exploration and construction phase, which are subject to Part 11.J.4.14.1, the permittee must inspect sites at least quarterly unless adverse weather conditions make the site inaccessible. Sites which discharge to waters which are designated as outstanding waters or waters which are impaired for sediment or nitrogen must be inspected monthly. See Part 11.J.8.1 for inspection requirements for inactive and unstaffed sites. (See also Part 6.1 and 11.J.4.14.)

11.J.8 Sector-Specific Benchmarks.

Table 11.J.8-1 identifies benchmarks that apply to the specific subsectors of Sector J. These benchmarks apply to both the permittees primary industrial activity and any co-located industrial activities, which describe their site activities.

Table 11.J.8-1: Sector – Specific Benchmarks – Sector J

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector J1. Sand and Gravel Mining (SIC 1442, 1446)	Nitrate plus Nitrite Nitrogen	0.68 mg/L
	Total Suspended Solids (TSS)	100 mg/L
Subsector J2. Dimension and Crushed Stone and Nonmetallic Minerals (except fuels) (SIC 1411, 1422-1429, 1481, 1499)	Total Suspended Solids (TSS)	100 mg/L

11.J.8.1 Inactive and Unstaffed Sites – Conditional Exemption from No Exposure Requirement for Routine Inspections, Quarterly Visual Assessments, and Benchmark Monitoring. As a Sector J facility, if the permittee is seeking to exercise a waiver from either the routine inspection, quarterly visual assessment or the benchmark monitoring requirements for inactive and unstaffed sites (including temporarily inactive sites), they are conditionally exempt from the requirement to certify that "there are no industrial materials or activities exposed to storm water" in Parts 6.2.3 and 7.2.1.6, respectively. Additionally, if the permittee is seeking to reduce their required quarterly routine inspection frequency to a once annual comprehensive inspection, as is allowed under Part 6.1.3, the permittee is also conditionally exempt from the requirement to certify that "there are no industrial materials or activities exposed to storm water." This exemption is conditioned on the following:

- If circumstances change and the permittees facility becomes active and/or staffed, this exception no longer applies and the permittee must immediately begin complying with the applicable benchmark monitoring requirements as if they were in their first year of permit coverage, and the quarterly visual assessment requirements; and

- DEC retains the authority to revoke this exemption and/or the monitoring waiver where it is determined that the discharge causes, has a reasonable potential to cause, or contributes to an instream excursion above a WQS, including designated uses.

Subject to the two conditions above, if the permittees facility is inactive and unstaffed, they are waived from the requirement to conduct quarterly visual assessments and routine facility inspections. The permittee is not waived from conducting the Part 6.3 comprehensive site inspection. The permittee is encouraged to inspect their site more frequently where they have reason to believe that severe weather or natural disasters may have damaged control measures or increased discharges.

11.J.9 Effluent Limitations Based on Effluent Limitations Guidelines. (See also Part 7.2.2.1 of the permit)

Table 11.J.9-1 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table 11.J.9-1: Effluent Limitations Based on Effluent Limitations Guidelines

Industrial Activity	Parameter	Effluent Limit[1]
Mine dewatering discharges at crushed stone mining facilities (SIC 1422 - 1429)	pH	6.5 – 8.5[2]
Mine dewatering discharges at construction sand and gravel mining facilities (SIC 1442)	pH	6.5 – 8.5[2]
Mine dewatering discharges at industrial sand mining facilities (SIC 1446)	Total Suspended Solids (TSS)	25 mg/L, monthly avg.
		45 mg/L, daily maximum
	pH	6.5 – 8.5[2]

Note:
1. Monitor annually.
2. pH shall be within the limits specified above.

11.J.10 Termination of Permit Coverage.

11.J.10.1 Termination of Permit Coverage for Sites Reclaimed After December 17, 1990. A site or a portion of a site that has been released from applicable state or federal reclamation requirements after December 17, 1990, is no longer required to maintain coverage under this permit. If the site or portion of a site reclaimed after December 17, 1990, was not subject to reclamation requirements, the site or portion of the site is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed as defined in Part 11.J.3.5.

11.J.10.2 Termination of Permit Coverage for Sites Reclaimed Before December 17, 1990. A site or portion of a site that was released from applicable state or federal reclamation requirements before December 17, 1990, or that was otherwise reclaimed before December 17, 1990, is no longer required to maintain coverage under this permit if the site or portion of the site has been reclaimed. A site or portion of a site is considered to have been reclaimed if: (1) storm water runoff that comes into contact with raw materials, intermediate byproducts, finished products, and waste products does not have the potential to cause or contribute to violations of state WQS, (2) soil disturbing activities related to mining at the sites or portion of the site have been completed, (3) the site or portion of the site has been stabilized to minimize soil erosion, and (4) as appropriate depending on location, size, and the potential to contribute pollutants to storm water discharges, the site or portion of the site has been revegetated, will be amenable to natural revegetation, or will be left in a condition consistent with the post-mining land use.

11. Subpart K – Sector K – Hazardous Waste Treatment, Storage, or Disposal Facilities.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.K.1 Covered Storm Water Discharges.

The requirements in Subpart K apply to storm water discharges associated with industrial activity from Hazardous Waste Treatment, Storage, or Disposal facilities (TSDFs) as identified by the Activity Code specified under Sector K in Table D-1 of Appendix D of the permit.

11.K.2 Industrial Activities Covered by Sector K.

This permit authorizes storm water discharges associated with industrial activity from facilities that treat, store, or dispose of hazardous wastes, including those that are operating under interim status or a permit under subtitle C of Resource Conservation and Recovery Act (RCRA).

Disposal facilities that have been properly closed and capped, and have no significant materials exposed to storm water, are considered inactive and do not require permits.

11.K.3 Limitations on Coverage.

11.K.3.1 Prohibition of Non-Storm Water Discharges. (See also Part 1.2.4) The following are not authorized by this permit: leachate, gas collection condensate, drained free liquids, contaminated ground water, laboratory-derived wastewater, and contact washwater from washing truck and railcar exteriors and surface areas that have come in direct contact with solid waste at the landfill facility.

11.K.4 Definitions.

11.K.4.1 Contaminated Storm Water - Storm water that comes into direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater as defined in Part 11.K.4.5. Some specific areas of a landfill that may produce contaminated storm water include (but are not limited to) the open face of an active landfill with exposed waste (no cover added); the areas around wastewater treatment operations; trucks, equipment, or machinery that has been in direct contact with the waste; and waste dumping areas.

11.K.4.2 Drained Free Liquids - Aqueous wastes drained from waste containers (e.g., drums) prior to landfilling.

11.K.4.3 *Landfill* - An area of land or an excavation in which wastes are placed for permanent disposal, but that is not a land application or land treatment unit, surface impoundment, underground injection well, waste pile, salt dome formation, salt bed formation, underground mine, or cave as these terms are defined in 40 CFR 257.2, 258.2, and 260.10.

11.K.4.4 *Landfill Wastewater* - As defined in 40 CFR Part 445 (Landfills Point Source Category), all wastewater associated with, or produced by, landfilling activities except for sanitary wastewater, non-contaminated storm water, contaminated groundwater, and wastewater from recovery pumping wells. Landfill wastewater includes, but is not limited to, leachate, gas collection condensate, drained free liquids, laboratory derived wastewater, contaminated storm water, and contact washwater from washing truck, equipment, and railcar exteriors and surface areas that have come in direct contact with solid waste at the landfill facility.

11.K.4.5 *Leachate* - Liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.

11.K.4.6 *Non-Contaminated Storm Water* - Storm water that does not come into direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater as defined in Part 11.K.4.4. Non-contaminated storm water includes storm water that flows off the cap, cover, intermediate cover, daily cover, and/or final cover of the landfill.

11.K.5 Sector-Specific Benchmarks.

Table 11.K.5-1 identifies benchmarks that apply to the specific subsectors of Sector K. These benchmarks apply to both the permittees primary industrial activity and any co-located industrial activities, which describe their site activities.

(Table 11.K.5-1: Sector – Specific Benchmarks – Sector K located on following page.)

Table 11.K.5-1: Sector – Specific Benchmarks – Sector K

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector K1. ALL - Industrial Activity Code "HZ" (Note: permit coverage limited in some States). Benchmarks only applicable to discharges not subject to effluent limitations in 40 CFR Part 445 Subpart A (see below).	Ammonia	2.14 mg/L
	Total Magnesium	0.064 mg/L
	Chemical Oxygen Demand (COD)	120 mg/L
	Total Arsenic (saltwater)[1] Total Arsenic (freshwater)[2]	0.069 mg/L 0.15 mg/L
	Total Cadmium (saltwater)[1] Total Cadmium (freshwater)[2]	0.04 mg/L Hardness Dependent
	Total Cyanide (saltwater)[1] Total Cyanide (freshwater)[2]	0.001 mg/L 0.022 mg/ L
	Total Lead (saltwater)[1] Total Lead (freshwater)[2]	0.21 mg/L Hardness Dependent
	Total Mercury (saltwater)[1] Total Mercury (freshwater)[2]	0.0018 mg/L 0.0014 mg/ L
	Total Selenium (saltwater)[1] Total Selenium (freshwater)[2]	0.29 mg/L 0.005 mg/L
	Total Silver (saltwater)[1] Total Silver (freshwater)[2]	0.0019 mg/L Hardness Dependent

Note:

1. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
2. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Cadmium (mg/L)	Lead (mg/L)	Silver (mg/L)
0 – < 25	0.0005	0.014	0.0007
25 – < 50	0.0008	0.023	0.0007
50 – < 75	0.0013	0.045	0.0017
75 – < 100	0.0018	0.069	0.0030
100 – < 125	0.0023	0.095	0.0046
125 – < 150	0.0029	0.122	0.0065
150 – < 175	0.0034	0.151	0.0087
175 – < 200	0.0039	0.182	0.0112
200 – < 225	0.0045	0.213	0.0138
225 – < 250	0.0050	0.246	0.0168
250+	0.0053	0.262	0.0183

11.K.6 Effluent Limitations Based on Effluent Limitations Guidelines. (See also Part 7.2.2.1 of the permit.)

Table 11.K.6-1 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table 11.K.6-1: Effluent Limitations Based on Effluent Limitations Guidelines

Industrial Activity	Parameter	Effluent Limit
Discharges from hazardous waste landfills subject to effluent limitations in 40 CFR Part 445 Subpart A (see footnote).	Biochemical Oxygen Demand (BOD_5)	220 mg/L, daily maximum
		56 mg/L, monthly avg. maximum
	Total Suspended Solids (TSS)	88 mg/L, daily maximum
		27 mg/L, monthly avg. maximum
	Ammonia	10 mg/L, daily maximum
		4.9 mg/L, monthly avg. maximum
	Alpha Terpineol	0.042 mg/L, daily maximum
		0.019 mg/L, monthly avg. maximum
	Aniline	0.024 mg/L, daily maximum
		0.015 mg/L, monthly avg. maximum
	Benzoic Acid	0.119 mg/L, daily maximum
		0.073 mg/L, monthly avg. maximum
	Naphthalene	0.059 mg/L, daily maximum
		0.022 mg/L, monthly avg. maximum
	p-Cresol	0.024 mg/L, daily maximum
		0.015 mg/L, monthly avg. maximum
	Phenol	0.048 mg/L, daily maximum
		0.029 mg/L, monthly avg. maximum
	Pyridine	0.072 mg/L, daily maximum
		0.025 mg/L, monthly avg. maximum
	Total Arsenic	1.1 mg/L, daily maximum
		0.54 mg/L, monthly avg. maximum
	Total Chromium	1.1 mg/L, daily maximum
		0.46 mg/L, monthly avg. maximum
	Total Zinc	0.535 mg/L, daily maximum
		0.296 mg/L, monthly avg. maximum
	pH	6.5 - 8.5 s.u. and within 0.5 s.u. of background level

Note:

1. Monitor annually. As set forth at 40 CFR Part 445 Subpart A, these numeric limitations apply to contaminated storm water discharges from hazardous waste landfills subject to the provisions of RCRA Subtitle C at 40 CFR Parts 264 (Subpart N) and 265 (Subpart N) except for any of the following facilities:
   a. Landfills operated in conjunction with other industrial or commercial operations when the landfill receives only wastes generated by the industrial or commercial operation directly associated with the landfill;
   b. Landfills operated in conjunction with other industrial or commercial operations when the landfill receives wastes generated by the industrial or commercial operation directly associated with the landfill and also receives other wastes, provided that the other wastes received for disposal are generated by a facility that is subject to the same provisions in 40 CFR Subchapter N as the industrial or commercial operation or that the other wastes received are of similar nature to the wastes generated by the industrial or commercial operation;
   c. Landfills operated in conjunction with Centralized Waste Treatment (CWT) facilities subject to 40 CFR Part 437, so long as the CWT facility commingles the landfill wastewater with other non-landfill wastewater for discharge. A landfill directly associated with a CWT facility is subject to this part if the CWT facility discharges landfill wastewater separately from other CWT wastewater or commingles the wastewater from its landfill only with wastewater from other landfills; or
   d. Landfills operated in conjunction with other industrial or commercial operations when the landfill receives wastes from public service activities, so long as the company owning the landfill does not receive a fee or other remuneration for the disposal service.

11. Subpart L – Sector L – Landfills, Land Application Sites, and Open Dumps.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.L.1 Covered Storm Water Discharges.

The requirements in Subpart L apply to storm water discharges associated with industrial activity from Landfills and Land Application Sites and Open Dumps as identified by the Activity Code specified under Sector L in Table D-1 of Appendix D of the permit.

11.L.2 Industrial Activities Covered by Sector L.

This permit may authorize storm water discharges for Sector L facilities associated with waste disposal at landfills, land application sites, and open dumps that receive or have received industrial waste, including sites subject to regulation under Subtitle D of Resource Conservation and Recovery Act (RCRA). This permit does not cover discharges from landfills that receive only municipal wastes.

11.L.3 Limitations on Coverage.

11.L.3.1 *Prohibition of Non-Storm Water Discharges.* (See also Part 1.2.4) The following discharges are not authorized by this permit: leachate, gas collection condensate, drained free liquids, contaminated ground water, laboratory wastewater, and contact washwater from washing truck and railcar exteriors and surface areas that have come in direct contact with solid waste at the landfill facility. Discharges from open dumps as defined under RCRA are also not authorized under this permit.

11.L.4 Definitions.

11.L.4.1 *Contaminated Storm Water* - Storm water that comes into direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater. Some areas of a landfill that may produce contaminated storm water include (but are not limited to) the open face of an active landfill with exposed waste (no cover added); the areas around wastewater treatment operations; trucks, equipment, or machinery that has been in direct contact with the waste; and waste dumping areas.

11.L.4.2 *Drained Free Liquids* - Aqueous wastes drained from waste containers (e.g., drums) prior to landfilling.

11.L.4.3 *Landfill Wastewater* - As defined in 40 CFR Part 445 (Landfills Point Source Category) all wastewater associated with, or produced by, landfilling activities except for sanitary wastewater, non-contaminated storm water, contaminated groundwater, and wastewater from recovery pumping wells. Landfill process wastewater includes, but is not limited to, leachate; gas collection condensate; drained free liquids; laboratory-derived wastewater; contaminated storm water; and contact washwater from washing truck, equipment, and railcar exteriors and surface areas that have come in direct contact with solid waste at the landfill facility.

11.L.4.4 *Leachate* - Liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste.

11.L.4.5 *Non-Contaminated Storm Water* - Storm water that does not come into direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater. Non-contaminated storm water includes storm water that flows off the cap, cover, intermediate cover, daily cover, and/or final cover of the landfill.

11.L.5 Additional Technology-Based Effluent Limits.

11.L.5.1 *Preventive Maintenance Program.* (See also Part 4.2.3) As part of a permittees preventive maintenance program, maintain the following: all elements of leachate collection and treatment systems, to prevent commingling of leachate with storm water; the integrity and effectiveness of any intermediate or final cover (including repairing the cover as necessary), to minimize the effects of settlement, sinking, and erosion.

11.L.5.2 *Erosion and Sedimentation Control.* (See also Part 4.2.5) Provide temporary stabilization (e.g., temporary seeding, mulching, and placing geotextiles on the inactive portions of stockpiles) for the following: materials stockpiled for daily, intermediate, and final cover; inactive areas of the landfill or open dump; landfills or open dump areas that have gotten final covers but where vegetation has yet to establish itself; and land application sites where waste application has been completed but final vegetation has not yet been established.

11.L.5.3 *Storm Water Diversions.* Divert storm water away from potential pollutant sources. Implement the following options, as practicable: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

11.L.5.4 *Place Velocity Dissipation Devices:* (e.g., check dams, sediment traps, or riprap) along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters.

11.L.5.5 Unauthorized Discharge Test Certification. (See also Part 5.2.4.4) The discharge test and certification must also be conducted for the presence of leachate and vehicle washwater.

11.L.6 Additional SWPPP Requirements.

11.L.6.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in their SWPPP where any of the following may be exposed to precipitation or surface runoff: active and closed landfill cells or trenches, active and closed land application areas, locations where open dumping is occurring or has occurred, locations of any known leachate springs or other areas where uncontrolled leachate may commingle with runoff, and leachate collection and handling systems.

11.L.6.2 Summary of Potential Pollutant Sources. (See also Part 5.2.4) Document in the permittees SWPPP the following sources and activities that have potential pollutants associated with them: fertilizer, herbicide, and pesticide application; earth and soil moving; waste hauling and loading or unloading; outdoor storage of significant materials, including daily, interim, and final cover material stockpiles as well as temporary waste storage areas; exposure of active and inactive landfill and land application areas; uncontrolled leachate flows; and failure or leaks from leachate collection and treatment systems.

11.L.7 Additional Inspection Requirements. (See also Part 6)

11.L.7.1 Inspections of Active Sites. Except in arid and semi-arid climates, inspect operating landfills, open dumps, and land application sites at least once every seven (7) days. Focus on areas of landfills that have not yet been finally stabilized; active land application areas, areas used for storage of material and wastes that are exposed to precipitation, stabilization, and structural control measures; leachate collection and treatment systems; and locations where equipment and waste trucks enter and exit the site. Ensure that sediment and erosion control measures are operating properly. For stabilized sites and areas where land application has been completed, or where the climate is arid or semi-arid, conduct inspections at least once every month.

11.L.7.2 Inspections of Inactive Sites. Inspect inactive landfills, open dumps, and land application sites at least quarterly. Qualified Personnel must inspect landfill (or open dump) stabilization and structural erosion control measures, leachate collection and treatment systems, and all closed land application areas.

11.L.8 Additional Post-Authorization Documentation Requirements.

11.L.8.1 Recordkeeping and Internal Reporting. Keep records with the SWPPP of the types of wastes disposed of in each cell or trench of a landfill or open dump. For land application sites, track the types and quantities of wastes applied in specific areas.

11.L.9 Sector-Specific Benchmarks.

Table 11.L.9-1 identifies benchmarks that apply to the specific subsectors of Sector L. These benchmarks apply to both the permittees primary industrial activity and any co-located industrial activities. If the results of four quarters of benchmark monitoring exceeds the benchmark monitoring concentration specified in Table 11.L.9-1, then the permittee must take samples to monitor compliance with the concentrations specified in Table 11.L.10-1.

Table 11.L.9-1: Sector – Specific Benchmarks – Sector L

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration[1]
Subsector L1. All Landfill, Land Application Sites and Open Dumps (Industrial Activity Code "LF")	Total Suspended Solids (TSS)	100 mg/L
Subsector L2. All Landfill, Land Application Sites and Open Dumps, except Municipal Solid Waste Landfill (MSWLF) Areas Closed in Accordance with 40 CFR 258.60 (Industrial Activity Code "LF")	Total Iron	1.0 mg/L

Note:
1. Benchmark monitoring required only for discharges not subject to effluent limitations in 40 CFR Part 445 Subpart B (see Table 11.L 10-1).

11.L.10 Effluent Limitations Based on Effluent Limitations Guidelines. (See also Part 7.2.2.1 of the permit.)

Table 11.L.10-1 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

(Table 11.L.10-1: Effluent Limitations Based on Effluent Limitations Guidelines located on following page.)

Table 11.L.10-1: Effluent Limitations Based on Effluent Limitations Guidelines[1]

Industrial Activity	Parameter	Effluent Limit
Discharges from non-hazardous waste landfills subject to effluent limitations in 40 CFR Part 445 Subpart B.	Biochemical Oxygen Demand (BOD_5)	140 mg/L, daily maximum
		37 mg/L, monthly avg. maximum
	Total Suspended Solids (TSS)	88 mg/L, daily maximum
		27 mg/L, monthly avg. maximum
	Ammonia	10 mg/L, daily maximum
		4.9 mg/L, monthly avg. maximum
	Alpha Terpineol	0.033 mg/L, daily maximum
		0.016 mg/L monthly avg. maximum
	Benzoic Acid	0.12 mg/L, daily maximum
		0.071 mg/L, monthly avg. maximum
	p-Cresol	0.025 mg/L, daily maximum
		0.014 mg/L, monthly avg. maximum
	Phenol	0.026 mg/L, daily maximum
		0.015 mg/L, monthly avg. maximum
	Total Zinc	0.20 mg/L, daily maximum
		0.11 mg/L, monthly avg. maximum
	pH	6.5 - 8.5 s.u.

Note:

1. Monitor annually. As set forth at 40 CFR Part 445 Subpart B, these numeric limitations apply to contaminated storm water discharges from MSWLFs that have not been closed in accordance with 40 CFR 258.60, and to contaminated storm water discharges from those landfills that are subject to the provisions of 40 CFR Part 257 except for discharges from any of the following facilities:
   a. Landfills operated in conjunction with other industrial or commercial operations, when the landfill receives only wastes generated by the industrial or commercial operation directly associated with the landfill;
   b. Landfills operated in conjunction with other industrial or commercial operations, when the landfill receives wastes generated by the industrial or commercial operation directly associated with the landfill and also receives other wastes, provided that the other wastes received for disposal are generated by a facility that is subject to the same provisions in 40 CFR Subchapter N as the industrial or commercial operation, or that the other wastes received are of similar nature to the wastes generated by the industrial or commercial operation;
   c. Landfills operated in conjunction with Centralized Waste Treatment (CWT) facilities subject to 40 CFR Part 437, so long as the CWT facility commingles the landfill wastewater with other non-landfill wastewater for discharge. A landfill directly associated with a CWT facility is subject to this part if the CWT facility discharges landfill wastewater separately from other CWT wastewater or commingles the wastewater from its landfill only with wastewater from other landfills; or
   d. Landfills operated in conjunction with other industrial or commercial operations when the landfill receives wastes from public service activities, so long as the company owning the landfill does not receive a fee or other remuneration for the disposal service.

11. Subpart M – Sector M – Automobile Salvage Yards.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.M.1 Covered Storm Water Discharges.

The requirements in Subpart M apply to storm water discharges associated with industrial activity from Automobile Salvage Yards as identified by the SIC Code specified under Sector M in Table D-1 of Appendix D of this permit.

11.M.2 Additional Technology-Based Effluent Limits.

11.M.2.1 Spill and Leak Prevention Procedures. (See also Part 4.2.4) Drain vehicles intended to be dismantled of all fluids upon arrival at the site (or as soon thereafter as feasible), or employ some other equivalent means to prevent spills and leaks. Collected automotive fluids should be containerized, labeled, and stored to minimize exposure to storm water. Salvage yard operators should develop and implement a mercury switch removal and disposal procedure to remove mercury as a potential pollutant source. All facilities should be provided with a nearby spill containment kit and fluids managed in accordance with all applicable state and federal regulations.

11.M.2.2 Employee Training. (See also Part 4.2.9) If applicable to the facility, address the following areas (at a minimum) in the permittees employee training program: proper handling (collection, storage, and disposal) of oil, used mineral spirits, anti-freeze, mercury switches, and solvents.

11.M.2.3 Management of Runoff. (See also Part 4.2.6) Use the following management practices, as practicable: berms or drainage ditches on the property line (to help prevent run-on from neighboring properties); berms for uncovered outdoor storage of oily parts, engine blocks, and above-ground liquid storage; installation of detention ponds; and installation of filtering devices and oil and water separators.

11.M.2.4 Vehicle Crushing Activities. If a crusher is used on-site provide timely maintenance and inspection of the crusher to prevent any fluid leaks and document in the SWPPP. The crusher should be provided with a device to capture any automotive fluids generated during crushing.

11.M.3 Additional SWPPP Requirements.

11.M.3.1 Drainage Area Site Map. (See also Part 5.2.3) Identify locations used for dismantling, storage, and maintenance of used motor vehicle parts. Also identify where any of the following may be exposed to precipitation or surface runoff: dismantling areas, parts (e.g., engine blocks, tires, hub caps, batteries, hoods, mufflers) storage areas, and liquid storage tanks and drums for fuel and other fluids.

11.M.3.2 Potential Pollutant Sources. (See also Part 5.2.4) Assess the potential for the following to contribute pollutants to storm water discharges: vehicle storage areas, dismantling areas, parts storage areas (e.g., engine blocks, tires, hub caps, batteries, hoods, mufflers), and fueling stations.

11.M.4 Additional Inspection Requirements.

(See also Part 6.1) Immediately (or as soon thereafter as feasible) inspect vehicles arriving at the site for leaks and inspect area designated for the draining and collecting of automotive fluids. Inspect quarterly for signs of leakage of all equipment containing oily parts, hydraulic fluids, any other types of fluids, or mercury switches. Also, inspect quarterly for signs of leakage of all vessels and areas where hazardous materials and general automotive fluids are stored, including, but not limited to, mercury switches, brake fluid, transmission fluid, radiator water, and antifreeze.

(Table 11.M.5-1: Sector – Specific Benchmarks – Sector M located on the following page.)

11.M.5 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

Table 11.M.5-1: Sector – Specific Benchmarks – Sector M

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector M1. Automobile Salvage Yards (SIC 5015)	Total Suspended Solids (TSS)	100 mg/L
	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L
	Total Lead (saltwater)[1] Total Lead (freshwater)[2]	0.21 mg/L Hardness Dependent

Note:

1. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
2. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Lead (mg/L)
0 – < 25	0.014
25 – < 50	0.023
50 – < 75	0.045
75 – < 100	0.069
100 – < 125	0.095
125 – < 150	0.122
150 – < 175	0.151
175 – < 200	0.182
200 – < 225	0.213
225 – < 250	0.246
250+	0.262

11. Subpart N – Sector N – Scrap Recycling and Waste Recycling Facilities.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.N.1 Covered Storm Water Discharges.

The requirements in Subpart N apply to storm water discharges associated with industrial activity from Scrap Recycling and Waste Recycling facilities as identified by the SIC Code specified under Sector N in Table D-1 of Appendix D of the permit.

11.N.2 Limitation on Coverage.

Separate permit requirements have been established for recycling facilities that only receive source-separated recyclable materials primarily from non-industrial and residential sources (i.e., common consumer products including paper, newspaper, glass, cardboard, plastic containers, and aluminum and tin cans). This includes recycling facilities commonly referred to as material recovery facilities (MRF). See Part 11.N.3.3

11.N.2.1 Prohibition of Non-Storm Water Discharges. (See also Part 1.2.4) Non-storm water discharges from turnings containment areas are not covered by this permit (see also Part 11.N.3.2.3). Discharges from containment areas as well as all others in the absence of a storm event are prohibited unless covered by a separate APDES permit.

11.N.3 Additional Technology-Based Effluent Limits.

11.N.3.1 Scrap and Waste Recycling Facilities (Non-Source Separated, Nonliquid Recyclable Materials). Requirements for facilities that receive, process, and do wholesale distribution of nonliquid recyclable wastes (e.g., ferrous and nonferrous metals, plastics, glass, cardboard, and paper). These facilities may receive both nonrecyclable and recyclable materials. This section is not intended for those facilities that accept recyclables only from primarily non-industrial and residential sources.

11.N.3.1.1 Inbound Recyclable and Waste Material Control Program. Minimize the chance of accepting materials that could be significant sources of pollutants by conducting inspections of inbound recyclables and waste materials. Following are some control measure options: (a) provide information and education to suppliers of scrap and recyclable waste materials on draining and properly disposing of residual fluids (e.g., from vehicles and equipment engines, radiators and transmissions, oil filled transformers, and individual containers or drums) and removal of mercury switches from vehicles before delivery to the facility; (b) establish procedures to minimize the potential of any residual fluids from coming into contact with precipitation or runoff; (c) establish procedures for accepting scrap lead-acid batteries (additional requirements for the handling, storage, and disposal or recycling of batteries are contained in the scrap lead-acid battery program provisions in Part 11.N.3.1.6); (d) provide training targeted for those personnel engaged in the inspection and acceptance of inbound recyclable materials; and (e) establish procedures to ensure that liquid wastes, including used oil, are stored in materially compatible and non-leaking containers and are disposed of or recycled in accordance with the Resource Conservation and Recovery Act (RCRA).

11.N.3.1.2 Scrap and Waste Material Stockpiles and Storage (Outdoor). Minimize contact of storm water runoff with stockpiled materials, processed materials, and nonrecyclable wastes. Following are some control measure options: (a) permanent or semi-permanent covers; (b) sediment traps, vegetated swales and strips, catch basin filters, and sand filters to facilitate settling or filtering of pollutants; (c) dikes, berms, containment trenches, culverts, and surface grading to divert runoff from storage areas; (d) silt fencing; and (e) oil and water separators, sumps, and dry absorbents for areas where potential sources of residual fluids are stockpiled (e.g., automobile engine storage areas).

11.N.3.1.3 Stockpiling of Turnings Exposed to Cutting Fluids (Outdoor Storage). Minimize contact of surface runoff with residual cutting fluids by: (a) storing all turnings exposed to cutting fluids under some form of permanent or semi-permanent cover, or (b) establishing dedicated containment areas for all turnings that have been exposed to cutting fluids. Any containment areas must be constructed of concrete, asphalt, or other equivalent types of impermeable material and include a barrier (e.g., berms, curbing, elevated pads) to prevent contact with storm water run-on. Storm Water runoff from these areas can be discharged, provided that any runoff is first collected and treated by an oil and water separator or its equivalent. The permittee must regularly maintain the oil and water separator (or its equivalent) and properly dispose of or recycle collected residual fluids.

11.N.3.1.4 Scrap and Waste Material Stockpiles and Storage (Covered or Indoor Storage). Minimize contact of residual liquids and particulate matter from materials stored indoors or under cover with surface runoff. Following are some control measure options: (a) good housekeeping measures, including the use of dry absorbents or wet vacuuming to contain, dispose of, or recycle residual liquids originating from recyclable containers, or mercury spill kits for spills from storage of mercury switches; (b) not allowing washwater from tipping floors or other processing areas to discharge to the storm sewer system; and (c) disconnecting or sealing off all floor drains connected to the storm sewer system.

11.N.3.1.5 Scrap and Recyclable Waste Processing Areas. Minimize surface runoff from coming in contact with scrap processing equipment. Pay attention to operations that generate visible amounts of particulate residue (e.g., shredding) to minimize the contact of accumulated particulate matter and residual fluids with runoff (i.e., through good housekeeping, preventive maintenance, etc.). Following are some control measure options: (a) regularly inspect equipment for spills or leaks and malfunctioning, worn, or corroded parts or equipment; (b) establish a preventive maintenance program for processing equipment; (c) use dry-absorbents or other cleanup practices to collect and dispose of or recycle spilled or leaking fluids or use mercury spill kits for spills from storage of mercury switches; (d) on unattended hydraulic reservoirs over 150 gallons in capacity, install protection devices such as low-level alarms or equivalent devices, or secondary containment that can hold the entire volume of the reservoir; (e) containment or diversion structures such as dikes, berms, culverts, trenches, elevated concrete pads, and grading to minimize contact of storm water runoff with outdoor processing equipment or stored materials; (f) oil and water separators or sumps; (g) permanent or semi-permanent covers in processing areas where there are residual fluids and grease; (h) retention or detention ponds or basins; sediment traps, and vegetated swales or strips (for pollutant settling and filtration); (i) catch basin filters or sand filters.

11.N.3.1.6 Scrap Lead-Acid Battery Program. Properly handle, store, and dispose of scrap lead-acid batteries. Following are some control measure options (a) segregate scrap lead-acid batteries from other scrap materials; (b) properly handle, store, and dispose of cracked or broken batteries; (c) collect and dispose of leaking lead-acid battery fluid; (d) minimize or eliminate (if possible) exposure of scrap lead-acid batteries to precipitation or runoff; and (e) provide employee training for the management of scrap batteries.

11.N.3.1.7 Spill Prevention and Response Procedures. (See also Part 4.2.4) Install alarms and/or pump shutoff systems on outdoor equipment with hydraulic reservoirs exceeding 150 gallons in the event of a line break. Alternatively, a secondary containment system capable of holding the entire contents of the reservoir plus room for precipitation can be used. Use a mercury spill kit for any release of mercury from switches, anti-lock brake systems, and switch storage areas.

11.N.3.1.8 Supplier Notification Program. As appropriate, notify major suppliers which scrap materials will not be accepted at the facility or will be accepted only under certain conditions.

11.N.3.2 Waste Recycling Facilities (Liquid Recyclable Materials).

11.N.3.2.1 Waste Material Storage (Indoor). Minimize or eliminate contact between residual liquids from waste materials stored indoors and from surface runoff. The plan may refer to applicable portions of other existing plans, such as Spill Prevention, Control, and Countermeasure (SPCC) plans required under 40 CFR Part 112. Following are some control measure options (a) procedures for material handling (including labeling and marking); (b) clean up spills and leaks with dry absorbent materials, a wet vacuum system; (c) appropriate containment structures (trenching, curbing, gutters, etc.); and (d) a drainage system, including appurtenances (e.g., pumps or ejectors, manually operated valves), to handle discharges from diked or bermed areas. Drainage should be discharged to an appropriate treatment facility or sanitary sewer system, or otherwise disposed of properly. These discharges may require coverage under a separate APDES wastewater permit or industrial user permit under the pretreatment program.

11.N.3.2.2 Waste Material Storage (Outdoor). Minimize contact between stored residual liquids and precipitation or runoff. The plan may refer to applicable portions of other existing plans, such as SPCC plans required under 40 CFR Part 112. Discharges of precipitation from containment areas containing used oil must also be in accordance with applicable sections of 40 CFR Part 112. Following are some control measure options (a) appropriate containment structures (e.g., dikes, berms, curbing, pits) to store the volume of the largest tank, with sufficient extra capacity for precipitation; (b) drainage control and other diversionary structures; (c) corrosion protection and/or leak detection systems for storage tanks; and (d) dry-absorbent materials or a wet vacuum system to collect spills.

11.N.3.2.3 Trucks and Rail Car Waste Transfer Areas. Minimize pollutants in discharges from truck and rail car loading and unloading areas. Include measures to clean up minor spills and leaks resulting from the transfer of liquid wastes. Following are two control measure options: (a) containment and diversionary structures to minimize contact with precipitation or runoff, and (b) dry clean-up methods, wet vacuuming, roof coverings, or runoff controls.

11.N.3.3 Recycling Facilities (Source-Separated Materials). The following identifies considerations for facilities that receive only source-separated recyclables, primarily from non-industrial and residential sources.

11.N.3.3.1 Inbound Recyclable Material Control. Minimize the chance of accepting nonrecyclables (e.g., hazardous materials) that could be a significant source of pollutants by conducting inspections of inbound materials. Following are some control measure options: (a) providing information and education measures to inform suppliers of recyclables about acceptable and non-acceptable materials, (b) training drivers responsible for pickup of recycled material, (c) clearly marking public drop-off containers regarding which materials can be accepted, (d) rejecting nonrecyclable wastes or household hazardous wastes at the source, and (e) establishing procedures for handling and disposal of nonrecyclable material.

11.N.3.3.2 Outdoor Storage. Minimize exposure of recyclables to precipitation and runoff. Use good housekeeping measures to prevent accumulation of particulate matter and fluids, particularly in high traffic areas. Following are some control measure options (a) provide totally enclosed drop-off containers for the public; (b) install a sump and pump with each container pit and treat or discharge collected fluids to a sanitary sewer system; (c) provide dikes and curbs for secondary containment (e.g., around bales of recyclable waste paper); (d) divert surface water runoff away from outside material storage areas; (e) provide covers over containment bins, dumpsters, and roll-off boxes; and (f) store the equivalent of one day's volume of recyclable material indoors.

11.N.3.3.3 Indoor Storage and Material Processing. Minimize the release of pollutants from indoor storage and processing areas. Following are some control measure options (a) schedule routine good housekeeping measures for all storage and processing areas, (b) prohibit tipping floor washwater from draining to the storm sewer system, and (c) provide employee training on pollution prevention practices.

11.N.3.3.4 Vehicle and Equipment Maintenance. Following are some control measure options for areas where vehicle and equipment maintenance occur outdoors (a) prohibit vehicle and equipment washwater from discharging to the storm sewer system, (b) minimize or eliminate outdoor maintenance areas whenever practicable, (c) establish spill prevention and clean-up procedures in fueling areas, (d) avoid topping off fuel tanks, (e) divert runoff from fueling areas, (f) store lubricants and hydraulic fluids indoors, and (g) provide employee training on proper handling and storage of hydraulic fluids and lubricants.

11.N.4 Additional SWPPP Requirements.

11.N.4.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP the locations of any of the following activities or sources that may be exposed to precipitation or surface runoff: scrap and waste material storage, outdoor scrap and waste processing equipment; and containment areas for turnings exposed to cutting fluids.

11.N.4.2 Maintenance Schedules/Procedures for Collection, Handling, and Disposal or Recycling of Residual Fluids at Scrap and Waste Recycling Facilities. If the permittee is subject to Part 11.N.3.1.3, the SWPPP must identify any applicable maintenance schedule and the procedures to collect, handle, and dispose of or recycle residual fluids.

11.N.5 Additional Inspection Requirements.

11.N.5.1 Inspections for Waste Recycling Facilities. The inspections must be performed quarterly, pursuant to Part 6.1, and include, at a minimum, all areas where waste is generated, received, stored, treated, or disposed of and that are exposed to either precipitation or storm water runoff.

11.N.6 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

(Table 11.N.6-1: Sector – Specific Benchmarks – Sector N located on following page.)

Table 11.N.6-1: Sector – Specific Benchmarks – Sector N

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector N1. Scrap Recycling and Waste Recycling Facilities except Source-Separated Recycling (SIC 5093)	Chemical Oxygen Demand (COD)	120 mg/L
	Total Suspended Solids (TSS)	100 mg/L
	Total Recoverable Aluminum	0.75 mg/L
	Total Copper (saltwater)[1] Total Copper (freshwater)[2]	0.0048 mg/L Hardness Dependent
	Total Recoverable Iron	1.0 mg/L
	Total Lead (saltwater)[1] Total Lead (freshwater)[2]	0.21 mg/L Hardness Dependent
	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent

Note:

1. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
2. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)
0 – < 25	0.0038	0.014	0.04
25 – < 50	0.0056	0.023	0.05
50 – < 75	0.0090	0.045	0.08
75 – < 100	0.0123	0.069	0.11
100 – < 125	0.0156	0.095	0.13
125 – < 150	0.0189	0.122	0.16
150 – < 175	0.0221	0.151	0.18
175 – < 200	0.0253	0.182	0.20
200 – < 225	0.0285	0.213	0.23
225 – < 250	0.0316	0.246	0.25
250+	0.0332	0.262	0.26

11. Subpart O – Sector O – Steam Electric Generating Facilities.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.O.1 Covered Storm Water Discharges.

The requirements in Subpart O apply to storm water discharges associated with industrial activity from Steam Electric Power Generating Facilities as identified by the Activity Code specified under Sector O in Table D-1 of Appendix D.

11.O.2 Industrial Activities Covered by Sector O.

This permit authorizes storm water discharges from the following industrial activities at Sector O facilities:

11.O.2.1 Steam electric power generation using coal, natural gas, oil, nuclear energy, etc., to produce a steam source, including coal handling areas;

11.O.2.2 Coal pile runoff, including effluent limitations established by 40 CFR Part 423; and

11.O.2.3 Dual fuel facilities that could employ a steam boiler.

11.O.3 Limitations on Coverage.

11.O.3.1 Prohibition of Non-Storm Water Discharges. Non-storm water discharges subject to effluent limitations guidelines are not covered by this permit.

11.O.3.2 Prohibition of Storm Water Discharges. Storm water discharges from the following are not covered by this permit:

11.O.3.2.1 Ancillary Facilities (e.g., fleet centers and substations) that are not contiguous to a stream electric power generating facility;

11.O.3.2.2 Gas Turbine Facilities (providing the facility is not a dual-fuel facility that includes a steam boiler), and combined-cycle facilities where no supplemental fuel oil is burned (and the facility is not a dual-fuel facility that includes a steam boiler); and

11.O.3.2.3 Cogeneration (combined heat and power) facilities utilizing a gas turbine.

11.O.4 Additional Technology-Based Effluent Limits. The following good housekeeping measures are required in addition to Part 4.2.2:

11.O.4.1 Fugitive Dust Emissions. Minimize fugitive dust emissions from coal handling areas. To minimize the tracking of coal dust offsite, adopt, as practicable, procedures such as installing specially designed tires or washing vehicles in a designated area before they leave the site and controlling the wash water.

11.O.4.2 Delivery Vehicles. Minimize contamination of storm water runoff from delivery vehicles arriving at the plant site. Adopt procedures to inspect delivery vehicles arriving at the plant site and ensure overall integrity of the body or container and procedures to deal with leakage or spillage from vehicles or containers.

11.O.4.3 Fuel Oil Unloading Areas. Minimize contamination of precipitation or surface runoff from fuel oil unloading areas. Use containment curbs in unloading areas, have personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up, and use spill and overflow protection devices (e.g., drip pans, drip diapers, or other containment devices placed beneath fuel oil connectors to contain potential spillage during deliveries or from leaks at the connectors).

11.O.4.4 Chemical Loading and Unloading. Minimize contamination of precipitation or surface runoff from chemical loading and unloading areas. Use containment curbs at chemical loading and unloading areas to contain spills, have personnel familiar with spill prevention and response procedures present during deliveries to ensure that any leaks or spills are immediately contained and cleaned up, and loading and unloading in covered areas and storing chemicals indoors.

11.O.4.5 Miscellaneous Loading and Unloading Areas. Minimize contamination of precipitation or surface runoff from loading and unloading areas. Use the following, as practicable, cover the loading area; grade, berm, or curb around the loading area to divert run-on; locate the loading and unloading equipment and vehicles so that leaks are contained in existing containment and flow diversion systems; or equivalent procedures.

11.O.4.6 Liquid Storage Tanks. Minimize contamination of surface runoff from above-ground liquid storage tanks. Use the following, as practicable, protective guards around tanks, containment curbs, spill and overflow protection, dry cleanup methods, or equivalent measures.

11.O.4.7 Large Bulk Fuel Storage Tanks. Minimize contamination of surface runoff from large bulk fuel storage tanks. Use containment berms (or their equivalent) as required by applicable State and Federal Laws. The permittee must also comply with applicable State and Federal laws, including Spill Prevention, Control and Countermeasure (SPCC) Plan requirements.

11.O.4.8 Spill Reduction Measures. Minimize the potential for an oil or chemical spill, or reference the appropriate part of the permittees SPCC plan. Visually inspect as part of the routine facility inspection the structural integrity of all above-ground tanks, pipelines, pumps, and related equipment that may be exposed to storm water, and make any necessary repairs immediately.

11.O.4.9 Oil-Bearing Equipment in Switchyards. Minimize contamination of surface runoff from oil-bearing equipment in switchyard areas. Use level grades and gravel surfaces to retard flows and limit the spread of spills, or collect runoff in perimeter ditches.

11.O.4.10 Residue-Hauling Vehicles. Inspect all residue-hauling vehicles for proper covering over the load, adequate gate sealing, and overall integrity of the container body. Repair vehicles without load covering or adequate gate sealing, or with leaking containers or beds.

11.O.4.11 Ash Loading Areas. Reduce or control the tracking of ash and residue from ash loading areas. Clear the ash building floor and immediately adjacent roadways of spillage, debris, and excess water before departure of each loaded vehicle.

11.O.4.12 Areas Adjacent to Disposal Ponds or Landfills. Minimize contamination of surface runoff from areas adjacent to disposal ponds or landfills. Reduce ash residue that may be tracked on to access roads traveled by residue handling vehicles, and reduce ash residue on exit roads leading into and out of residue handling areas.

11.O.4.13 Landfills, Scrap yards, Surface Impoundments, Open Dumps, General Refuse Sites. Minimize the potential for contamination of runoff from these areas.

11.O.5 Additional SWPPP Requirements.

11.O.5.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP the locations of any of the following activities or sources that may be exposed to precipitation or surface runoff: storage tanks, scrap yards, and general refuse areas; short- and long-term storage of general materials (including but not limited to supplies, construction materials, paint equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizer, and pesticides); landfills and construction sites; and stock pile areas (e.g., coal or limestone piles).

11.O.5.2 Documentation of Good Housekeeping Measures. The permittee must document in the SWPPP the good housekeeping measures implemented to meet the effluent limits in Part 11.O.4.

11.O.6 Additional Inspection Requirements.

11.O.6.1 Comprehensive Site Compliance Inspection. (See also Part 6.3) As part of the permittees inspection, inspect the following areas monthly: coal handling areas, loading or unloading areas, switchyards, fueling areas, bulk storage areas, ash handling areas, areas adjacent to disposal ponds and landfills, maintenance areas, liquid storage tanks, and long term and short term material storage areas.

11.O.7 Sector-Specific Benchmarks

Table 11.O.7-1 identifies benchmarks that apply to the specific subsectors of Sector O. These benchmarks apply to both the permittees primary industrial activity and any co-located industrial activities, which describe their facility activities.

Table 11.O.7-1: Sector – Specific Benchmarks – Sector O

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector O1. Steam Electric Generating Facilities (Industrial Activity Code "SE")	Total Iron	1.0 mg/L

11.O.8 Effluent Limitations Based on Effluent Limitations Guidelines. (See also Part 7.2.2.1 of the permit.)

Table 11.O.8-1 identifies effluent limits that apply to the industrial activities described below. Compliance with these effluent limits is to be determined based on discharges from these industrial activities independent of commingling with any other wastestreams that may be covered under this permit.

Table 11.O.8-1: Effluent Limitations Based on Effluent Limitations Guidelines[1]

Industrial Activity	Parameter	Effluent Limit
Discharges from coal storage piles at Steam Electric Generating Facilities	TSS	50 mg/l [2]
	pH	6.5 - 8.5 s.u.

Notes:
1. Monitor annually.
2. If the permittees facility is designed, constructed, and operated to treat the volume of coal pile runoff that is associated with a 10-year, 24-hour rainfall event, any untreated overflow of coal pile runoff from the treatment unit is not subject to the 50 mg/L limitation for total suspended solids.

11. Subpart P – Sector P – Land Transportation and Warehousing.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.P.1 Covered Storm Water Discharges.

The requirements in Subpart P apply to storm water discharges associated with industrial activity from Land Transportation and Warehousing facilities as identified by the SIC Codes specified under Sector P in Table D-1 of Appendix D of the permit.

11.P.2 Limitation on Coverage.

11.P.2.1 Prohibited Discharges. (See also Part 1.2.4) This permit does not authorize the discharge of vehicle/equipment/surface washwater, including tank cleaning operations. Such discharges must be authorized under a separate APDES permit, discharged to a sanitary sewer in accordance with applicable industrial pretreatment requirements, or recycled on-site.

11.P.3 Additional Technology-Based Effluent Limits.

11.P.3.1 Good Housekeeping Measures. (See also Part 4.2.2) In addition to the Good Housekeeping requirements in Part 4.2.2, the permittee must do the following. Recommended control measures are discussed as indicated:

11.P.3.1.1 Vehicle and Equipment Storage Areas. Minimize the potential for storm water exposure to leaky or leak-prone vehicles/equipment awaiting maintenance. Implement the following (or other equivalent measures), as practicable: use of drip pans under vehicles/equipment, indoor storage of vehicles and equipment, installation of berms or dikes, use of absorbents, roofing or covering storage areas, and cleaning pavement surfaces to remove oil and grease.

11.P.3.1.2 Fueling Areas. Minimize contamination of storm water runoff from fueling areas. Implement the following (or other equivalent measures), as practicable: Covering the fueling area; using spill/overflow protection and cleanup equipment; minimizing storm water run-on/runoff to the fueling area; using dry cleanup methods; and treating and/or recycling collected storm water runoff.

11.P.3.1.3 Material Storage Areas. Maintain all material storage vessels (e.g., for used oil/oil filters, spent solvents, paint wastes, hydraulic fluids) to prevent contamination of storm water and plainly label them (e.g., "Used Oil," "Spent Solvents," etc.). Implement the following (or other equivalent measures), as practicable: storing the materials indoors; installing berms/dikes around the areas; minimizing runoff of storm water to the areas; using dry cleanup methods; and treating and/or recycling collected storm water runoff.

11.P.3.1.4 Vehicle and Equipment Cleaning Areas. Minimize contamination of storm water runoff from all areas used for vehicle/equipment cleaning. Implement the following (or other equivalent measures), as practicable: performing all cleaning operations indoors; covering the cleaning operation, ensuring that all washwater drains to a proper collection system (i.e., not the storm water drainage system); treating and/or recycling collected washwater, or other equivalent measures.

11.P.3.1.5 Vehicle and Equipment Maintenance Areas. Minimize contamination of storm water runoff from all areas used for vehicle/equipment maintenance. Implement the following (or other equivalent measures), as practicable: performing maintenance activities indoors; using drip pans; keeping an organized inventory of materials used in the shop; draining all parts of fluid prior to disposal; prohibiting wet clean up practices if these practices would result in the discharge of pollutants to storm water drainage systems; using dry cleanup methods; treating and/or recycling collected storm water runoff, minimizing run on/runoff of storm water to maintenance areas.

11.P.3.1.6 Locomotive Sanding (Loading Sand for Traction) Areas. Implement the following (or other equivalent measures), as practicable: covering sanding areas; minimizing storm water run on/runoff; or appropriate sediment removal practices to minimize the offsite transport of sanding material by storm water.

11.P.3.2 Employee Training. (See also Part 4.2.9) Train personnel at least once a year and address the following activities, as applicable: used oil and spent solvent management; fueling procedures; general good housekeeping practices; proper painting procedures; and used battery management.

11.P.4 Additional SWPPP Requirements.

11.P.4.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP the following areas of the facility and indicate whether activities occurring there may be exposed to precipitation/surface runoff: Fueling stations; vehicle/equipment maintenance or cleaning areas; storage areas for vehicle/equipment with actual or potential fluid leaks; loading/unloading areas; areas where treatment, storage or disposal of wastes occur; liquid storage tanks; processing areas; and storage areas.

11.P.4.2 Potential Pollutant Sources. (See also Part 5.2.4) Assess the potential for the following activities and facility areas to contribute pollutants to storm water discharges: Onsite waste storage or disposal; dirt/gravel parking areas for vehicles awaiting maintenance; illicit plumbing connections between shop floor drains and the storm water conveyance system(s); and fueling areas. Describe these activities in the SWPPP.

11.P.4.3 Description of Good Housekeeping Measures. The permittee must document in the SWPPP the good housekeeping measures they implement consistent with Part 11.P.3.

11.P.4.4 Vehicle and Equipment Washwater Requirements. If applicable, attach to or reference in the SWPPP, a copy of the APDES permit issued for vehicle/ equipment washwater; if an APDES permit has not been issued, a copy of the pending application. If an industrial user permit is issued under a local pretreatment program, attach a copy to the SWPPP. In any case, implement all non-storm water discharge permit conditions or pretreatment conditions in the SWPPP. If washwater is handled in another manner (e.g., hauled offsite), describe the disposal method and attach all pertinent documentation/ information (e.g., frequency, volume, destination, etc.) in the plan.

11.P.5 Additional Inspection Requirements. (See also Part 6.1) Inspect all the following areas/activities: storage areas for vehicles/equipment awaiting maintenance, fueling areas, indoor and outdoor vehicle/equipment maintenance areas, material storage areas, vehicle/equipment cleaning areas, loading/unloading areas, and any petroleum bulk fuel storage areas. Quarterly visual assessment of the bulk fuel storage areas should focus on identifying any potential leaks in tanks, pipelines, valves, etc. and implementing temporary spill containment measures until permanent corrective actions can be made.

11. Subpart Q – Sector Q – Water Transportation.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.Q.1 Covered Storm Water Discharges.

The requirements in Subpart Q apply to storm water discharges associated with industrial activity from Water Transportation facilities as identified by the SIC Codes specified under Sector Q in Table D-1 of Appendix D of the permit.

11.Q.2 Limitations on Coverage.

11.Q.2.1 Prohibition of Non-Storm Water Discharges. (See also Part 1.2.4) Not covered by this permit: bilge and ballast water, sanitary wastes, pressure wash water, and cooling water originating from vessels.

11.Q.3 Additional Technology-Based Effluent Limits.

11.Q.3.1 Good Housekeeping Measures. A permittee must implement the following good housekeeping measures in addition to the requirements of Part 4.2.2:

11.Q.3.1.1 Pressure Washing Area. If pressure washing is used to remove marine growth from vessels, the discharge water must be permitted by a separate APDES permit. Collect or contain the discharges from the pressure washing areas so that they are not co-mingled with storm water discharges authorized by this permit.

11.Q.3.1.2 Blasting and Painting Area. Minimize the potential for spent abrasives, paint chips, and overspray to discharge into receiving waters or the storm sewer systems. Contain all blasting and painting activities or use other measures to minimize the discharge of contaminants (e.g., hanging plastic barriers or tarpaulins during blasting or painting operations to contain debris). When necessary, regularly clean storm water conveyances of deposits of abrasive blasting debris and paint chips.

11.Q.3.1.3 Material Storage Areas. Store and plainly label all containerized materials (e.g., fuels, paints, solvents, waste oil, antifreeze, batteries) in a protected, secure location away from drains. Minimize the contamination of precipitation or surface runoff from the storage areas. Specify which materials are stored indoors, and consider containment or enclosure for those stored outdoors. If abrasive blasting is performed, discuss the storage and disposal of spent abrasive materials generated at the facility. Implement an inventory control plan to limit the presence of potentially hazardous materials onsite.

11.Q.3.1.4 *Engine Maintenance and Repair Areas.* Minimize the contamination of precipitation or surface runoff from all areas used for engine maintenance and repair. Implement the following (or their equivalents), as practicable: performing all maintenance activities indoors, maintaining an organized inventory of materials used in the shop, draining all parts of fluid prior to disposal, prohibiting the practice of hosing down the shop floor, using dry cleanup methods, and treating and/or recycling storm water runoff collected from the maintenance area.

11.Q.3.1.5 *Material Handling Area.* Minimize the contamination of precipitation or surface runoff from material handling operations and areas (e.g., fueling, paint and solvent mixing, disposal of process wastewater streams from vessels). Implement the following (or their equivalents), as practicable: covering fueling areas, using spill and overflow protection, mixing paints and solvents in a designated area (preferably indoors or under a shed), and minimizing runoff of storm water to material handling areas.

11.Q.3.1.6 *Drydock Activities.* Routinely maintain and clean the drydock to minimize pollutants in storm water runoff. Address the cleaning of accessible areas of the drydock prior to flooding, and final cleanup following removal of the vessel and raising the dock. Include procedures for cleaning up oil, grease, and fuel spills occurring on the drydock. Implement the following (or their equivalents), as practicable: sweeping rather than hosing off debris and spent blasting material from accessible areas of the drydock prior to flooding and making absorbent materials and oil containment booms readily available to clean up or contain any spills.

11.Q.3.2 *Storm Water Diversions.* Divert storm water away from potential pollutant sources. Implement the following options, as practicable: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

11.Q.3.3 *Velocity Dissipation Devices.* (e.g., check dams, sediment traps, or riprap) Place velocity dissipation devices, as practicable, along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters.

11.Q.3.4 *Employee Training.* (See also Part 4.2.9) As part of the permittees employee training program, address, at a minimum, the following activities (as practicable): used oil management, spent solvent management, disposal of spent abrasives, disposal of vessel wastewaters, spill prevention and control, fueling procedures, general good housekeeping practices, painting and blasting procedures, and used battery management.

11.Q.3.5 Preventive Maintenance. (See also Part 4.2.3) As part of the permittees preventive maintenance program, perform timely inspection and maintenance of storm water management devices (e.g., cleaning oil and water separators and sediment traps to ensure that spent abrasives, paint chips, and solids will be intercepted and retained prior to entering the storm drainage system), as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.

11.Q.4 Additional SWPPP Requirements.

11.Q.4.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP where any of the following may be exposed to precipitation or surface runoff: fueling; engine maintenance and repair; vessel maintenance and repair; pressure washing; painting; sanding; blasting; welding; metal fabrication; loading and unloading areas; locations used for the treatment, storage, or disposal of wastes; liquid storage tanks; liquid storage areas (e.g., paint, solvents, resins); and material storage areas (e.g., blasting media, aluminum, steel, scrap iron).

11.Q.4.2 Summary of Potential Pollutant Sources. (See also Part 5.2.4) The permittee must document in the SWPPP the following additional sources and activities that have potential pollutants associated with them: outdoor manufacturing or processing activities (e.g., welding, metal fabricating) and significant dust or particulate generating processes (e.g., abrasive blasting, sanding, and painting.)

11.Q.5 Additional Inspection Requirements.

(See also Part 6.1) Include the following in all quarterly routine facility inspections: pressure washing area; blasting, sanding, and painting areas; material storage areas; engine maintenance and repair areas; material handling areas; drydock area; and general yard area.

11.Q.6 Sector-Specific Benchmarks.

(See also Part 7 of the permit.)

(Table 11.N.6-1: Sector – Specific Benchmarks – Sector N located on following page.)

Table 11.Q.6-1: Sector – Specific Benchmarks – Sector Q

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector Q1. Water Transportation Facilities (SIC 4412-4499)	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L
	Total Lead (saltwater)[1]	0.21 mg/L
	Total Lead (freshwater)[2]	Hardness Dependent
	Total Zinc (saltwater)[1]	0.09 mg/L
	Total Zinc (freshwater)[2]	Hardness Dependent

Note:

1. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
2. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Lead (mg/L)	Zinc (mg/L)
0 – < 25	0.014	0.04
25 – < 50	0.023	0.05
50 – < 75	0.045	0.08
75 – < 100	0.069	0.11
100 – < 125	0.095	0.13
125 – < 150	0.122	0.16
150 – < 175	0.151	0.18
175 – < 200	0.182	0.20
200 – < 225	0.213	0.23
225 – < 250	0.246	0.25
250+	0.262	0.26

11. Subpart R – Sector R – Ship and Boat Building and Repair Yards.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.R.1 Covered Storm Water Discharges.

The requirements in Subpart R apply to storm water discharges associated with industrial activity from Ship and Boat Building and Repair Yards as identified by the SIC Codes specified under Sector R in Table D-1 of Appendix D of the permit.

11.R.2 Limitations on Coverage.

11.R.2.1 Prohibition of Non-Storm Water Discharges. (See also Part 1.2.4) Discharges containing bilge and ballast water, sanitary wastes, pressure wash water, and cooling water originating from vessels are not covered by this permit.

11.R.3 Additional Technology-Based Effluent Limits.

11.R.3.1 Good Housekeeping Measures. (See also Part 4.2.2)

11.R.3.1.1 Pressure Washing Area. If pressure washing is used to remove marine growth from vessels, the discharged water must be permitted as a process wastewater by a separate APDES permit.

11.R.3.1.2 Blasting and Painting Area. Minimize the potential for spent abrasives, paint chips, and overspray to discharging into the receiving water or the storm sewer systems. To the extent practicable contain all blasting and painting activities, or use other measures to prevent the discharge of the contaminants (e.g., hanging plastic barriers or tarpaulins during blasting or painting operations to contain debris). When necessary, regularly clean storm water conveyances of deposits of abrasive blasting debris and paint chips.

11.R.3.1.3 Material Storage Areas. Store and plainly label all containerized materials (e.g., fuels, paints, solvents, waste oil, antifreeze, batteries) in a protected, secure location away from drains. Minimize the contamination of precipitation or surface runoff from the storage areas. If abrasive blasting is performed, discuss the storage and disposal of spent abrasive materials generated at the facility. Implement an inventory control plan to limit the presence of potentially hazardous materials onsite.

11.R.3.1.4 Engine Maintenance and Repair Areas. Minimize the contamination of precipitation or surface runoff from all areas used for engine maintenance and repair. Implement the following (or their equivalents), as practicable: perform all maintenance activities indoors, maintain an organized inventory of materials used in the shop, drain all parts of fluid prior to disposal, prohibit the practice of hosing down the shop floor, use dry cleanup methods, and treat and/or recycle storm water runoff collected from the maintenance area.

11.R.3.1.5 Material Handling Area. Minimize the contamination of precipitation or surface runoff from material handling operations and areas (e.g., fueling, paint and solvent mixing, disposal of process wastewater streams from vessels). Implement the following (or their equivalents), as practicable: cover fueling areas, use spill and overflow protection, mix paints and solvents in a designated area (preferably indoors or under a shed), and minimize storm water run-on to material handling areas.

11.R.3.1.6 Drydock Activities. Routinely maintain and clean the drydock to minimize pollutants in storm water runoff. Clean accessible areas of the drydock prior to flooding and final cleanup following removal of the vessel and raising the dock. Include procedures for cleaning up oil, grease, or fuel spills occurring on the drydock. Implement the following (or their equivalents), as practicable: sweep rather than hosing off debris and spent blasting material from accessible areas of the drydock prior to flooding, and have absorbent materials and oil containment booms readily available to clean up and contain any spills.

11.R.3.2 Storm Water Diversions. Divert storm water away from potential pollutant sources. Implement the following options, as practicable: interceptor or diversion controls (e.g., dikes, swales, curbs, or berms); pipe slope drains; subsurface drains; conveyance systems (e.g., channels or gutters, open-top box culverts, and waterbars; rolling dips and road sloping; roadway surface water deflector and culverts); or their equivalents.

11.R.3.3 Velocity Dissipation Devices. (e.g., check dams, sediment traps, or riprap) Place along the length of any conveyance channel to provide a non-erosive flow velocity. Also place velocity dissipation devices where discharges from the conveyance channel or structure join a water course to prevent erosion and to protect the channel embankment, outlet, adjacent stream bank slopes, and downstream waters.

11.R.3.4 Employee Training. (See also Part 4.2.9) As part of the permittees employee training program, address, at a minimum, the following activities (as applicable): used oil management, spent solvent management, disposal of spent abrasives, disposal of vessel wastewaters, spill prevention and control, fueling procedures, general good housekeeping practices, painting and blasting procedures, and used battery management.

11.R.3.5 Preventive Maintenance. (See also Part 4.2.3) As part of the permittees preventive maintenance program, perform timely inspection and maintenance of storm water management devices (e.g., cleaning oil and water separators and sediment traps to ensure that spent abrasives, paint chips, and solids will be intercepted and retained prior to entering the storm drainage system), as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.

11.R.4 Additional SWPPP Requirements.

11.R.4.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP where any of the following may be exposed to precipitation or surface runoff: fueling; engine maintenance or repair; vessel maintenance or repair; pressure washing; painting; sanding; blasting; welding; metal fabrication; loading and unloading areas; treatment, storage, and waste disposal areas; liquid storage tanks; liquid storage areas (e.g., paint, solvents, resins); and material storage areas (e.g., blasting media, aluminum, steel, scrap iron).

11.R.4.2 Potential Pollutant Sources. (See also Part 5.2.4) The Permittee must document in the SWPPP the following additional sources and activities that have potential pollutants associated with them (if applicable): outdoor manufacturing or processing activities (e.g., welding, metal fabricating) and significant dust or particulate generating processes (e.g., abrasive blasting, sanding, and painting).

11.R.4.3 Documentation of Good Housekeeping Measures. The permittee must document in the SWPPP any good housekeeping measures implemented to meet the effluent limits in Part 11.R.3.

11.R.4.3.1 Blasting and Painting Areas. The permittee must document in the SWPPP any standard operating practices relating to blasting and painting (e.g., prohibiting uncontained blasting and painting over open water or prohibiting blasting and painting during windy conditions, which can render containment ineffective).

11.R.4.3.2 Storage Areas. Specify in the permittees SWPPP which materials are stored indoors, anddescribe containment or enclosure practices for those stored outdoors.

11.R.5 Additional Inspection Requirements.

(See also Part 6.1) Include the following in all quarterly routine facility inspections: pressure washing area; blasting, sanding, and painting areas; material storage areas; engine maintenance and repair areas; material handling areas; drydock area; and general yard area.

11. Subpart S – Sector S – Air Transportation.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.S.1 Covered Storm Water Discharges.

The requirements in Subpart S apply to storm water discharges associated with industrial activity from Air Transportation facilities identified by the SIC Codes specified under Sector S in Table D-1 of Appendix D of the permit at primary airports.

11.S.2 Limitation on Coverage.

11.S.2.1 *Limitations on Coverage.* This permit authorizes storm water discharges from only those portions of the air transportation facility that are involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling and lubrication), equipment cleaning operations or deicing operations.

Note: "deicing" will generally be used to imply both deicing (removing frost, snow or ice) and anti-icing (preventing accumulation of frost, snow or ice) activities, unless specific mention is made regarding anti-icing and/or deicing activities.

11.S.2.2 *Prohibition of Non-Storm Water Discharges.* (See also Part 1.2.4 and Part 11.S.3) This permit does not authorize the discharge of aircraft, ground vehicle, runway and equipment washwaters; nor the dry weather discharge of deicing chemicals. Such discharges must be covered by separate APDES permit(s). Note that a discharge resulting from snowmelt is not a dry weather discharge.

11.S.3 Multiple Operators at Air Transportation Facilities

Air transportation facilities often have more than one operator who could discharge stormwater associated with industrial activity. Operators include the airport authority and airport tenants, including air passenger or cargo companies, fixed based operators, and other parties who routinely perform industrial activities on airport property.

11.S.3.1 *Permit Coverage/Submittal of NOIs.* Where an airport transportation facility has multiple industrial operators that discharge stormwater, each individual operator must obtain coverage under an APDES stormwater permit. To obtain coverage under the MSGP, all such operators must meet the eligibility requirements in Part 1.2 and must submit an NOI, per Part 2.2 (or, if appropriate, a no exposure certification per Part 1.3).

11.S.3.2 *MSGP Implementation Responsibilities for Airport Authority and Tenants.* The airport authority, in collaboration with its tenants, may choose to implement certain MSGP requirements on behalf of its tenants in order to increase efficiency and eliminate redundancy or duplication of effort. Options available to the airport authority and its tenants for implementation of MSGP requirements include:

11.S.3.2.1 The airport authority performs certain activities on behalf of itself and its tenants and reports on its activities*;*

11.S.3.2.2 Tenants provide the airport authority with relevant inputs about tenants' activities, including deicing chemical usage*, and the airport authority compiles and reports on tenants' and its own activities; or

11.S.3.2.3 Tenants independently perform, document and submit required information on their activities.

**Tenants who report their deicing chemical usage to the airport authority and rely on the airport authority to perform monitoring should not check the glycol and urea use box on their NOI forms.*

11.S.3.3 SWPPP Requirements. A SWPPP must be developed for all stormwater discharges associated with industrial activity at the airport before submittal of any NOIs. The airport authority, in collaboration with its tenants, may choose to develop a single comprehensive SWPPP, or they may choose to develop individual SWPPP. The comprehensive SWPPP should be developed collaboratively by the airport authority and tenants. If any operator develops a SWPPP for discharges from its own areas of the airport, that SWPPP must be coordinated and integrated with the comprehensive SWPPP. All operators and their separate SWPPP contributions and compliance responsibilities must be clearly identified in the comprehensive SWPPP, which all operators must sign and certify per Part 5.2.7. As applicable, the comprehensive SWPPP must clearly specify the MSGP requirements to be complied with by*:*

- The airport authority for itself;
- The airport authority on behalf of its tenants;
- Tenants for themselves.

For each activity that an operator (e.g., the airport authority) conducts on behalf of another operator (e.g., a tenant), the comprehensive SWPPP must describe a process for reporting results to the latter operator and for ensuring appropriate follow-up, if necessary, by all affected operators. This is to ensure all actions are taken to correct any potential deficiencies or permit violations. For example, where the airport authority is conducting monitoring for itself and its tenants, the comprehensive SWPPP must identify how the airport authority will share the monitoring results with its tenants, and then follow-up with its tenants where there are any exceedances of benchmarks, effluent limits, or water quality standards. In turn, the comprehensive SWPPP must describe how the tenants will also follow-up to ensure permit compliance. If the airport authority and its tenants choose to use a comprehensive SWPPP, they have one hundred eighty (180) days after the effective date of this permit to develop a comprehensive SWPPP and file the NOI according to Part 2.1.

11.S.3.4 *Duty to Comply.* All individual operators are responsible for implementing their assigned portion of the comprehensive SWPPP, and operators must ensure that their individual activities do not render another operator's stormwater controls ineffective. In addition, the standard permit conditions found in Appendix A apply to each individual operator, including 1.2 Duty to Comply (which states, in part, "A permittee [each individual operator] shall comply with all conditions of the permittee's APDES permit."). For multiple operators at an airport this means that each individual operator remains responsible for ensuring all requirements of its own MSGP are met regardless of whether the comprehensive SWPPP allocates the actual implementation of any of those responsibilities to another entity. That is, the failure of the entity allocated responsibility in the SWPPP to implement an MSGP requirement on behalf of other operators does not negate the other operators' ultimate liability.

11.S.4 Additional Technology-Based Effluent Limits.

11.S.4.1 *Good Housekeeping Measures.* (See also Part 4.2.2) Implement control measures (as described in 11.S.4.1.1 through 11.S.4.1.7–each list is not exclusive) where determined to be practicable and that accommodate considerations of safety, space, operational constraints, and flight considerations.

11.S.4.1.1 *Aircraft, Ground Vehicle and Equipment Maintenance Areas.* Minimize the contamination of storm water runoff from all areas used for aircraft, ground vehicle and equipment maintenance (including the maintenance conducted on the terminal apron and in dedicated hangers). Consider the following control measures: performing maintenance activities indoors; maintaining an organized inventory of material used in the maintenance areas; draining all parts of fluids prior to disposal; prohibiting the practice of hosing down the apron or hanger floor; using dry cleanup methods; and collecting the storm water runoff from the maintenance area and providing treatment or recycling.

11.S.4.1.2 *Aircraft, Ground Vehicle and Equipment Cleaning Areas.* Clearly demarcate these areas on the ground using signage or other appropriate means. Minimize the contamination of storm water runoff from cleaning areas.

11.S.4.1.3 *Aircraft, Ground Vehicle and Equipment Storage Areas.* Store all aircraft, ground vehicles and equipment awaiting maintenance in designated areas only and minimize the contamination of storm water runoff from these storage areas. Consider the following control measures, including any BMPs: store aircraft and ground vehicles indoors; use drip pans for the collection of fluid leaks; and perimeter drains, dikes or berms surrounding the storage areas.

11.S.4.1.4 *Material Storage Areas.* Maintain the vessels of stored materials (e.g., used oils, hydraulic fluids, spent solvents, and waste aircraft fuel) in good condition, to prevent or minimize contamination of storm water. Also plainly label the vessels (e.g., "used oil," "Contaminated Jet A," etc.). Minimize contamination of precipitation/runoff from these areas. Consider the following control measures: store materials indoors; store waste materials in a centralized location; and install berms/dikes around storage areas.

11.S.4.1.5 *Airport Fuel System and Fueling Areas.* Minimize the discharge of fuel to the storm sewer/surface waters resulting from fuel servicing activities or other operations conducted in support of the airport fuel system. Consider the following control measures: implement spill and overflow practices; use only dry cleanup methods; and collect storm water runoff.

11.S.4.1.6 *Source Reduction.* Minimize, and where practicable, eliminate the use of urea and glycol-based deicing chemicals, in order to reduce the aggregate amount of deicing chemicals used and/or lessen the environmental impact. Chemical options to replace ethylene glycol, propylene glycol and urea include: potassium acetate; magnesium acetate; calcium acetate; and anhydrous sodium acetate.

- *Runway Deicing Operation:* Minimize contamination of storm water runoff from runways as a result of deicing operations. Evaluate whether over-application of deicing chemicals occurs by analyzing application rates, and adjust as necessary, consistent with considerations of flight safety. Consider these control measure options: metered application of chemicals; pre-wetting dry chemical constituents prior to application; install a runway ice detection system; implement anti-icing operations as a preventive measure against ice buildup.

- *Aircraft Deicing Operations.* Minimize contamination of storm water runoff from aircraft deicing operations. Determine whether excessive application of deicing chemicals occurs and adjust as necessary, consistent with considerations of flight safety. Evaluate using alternative deicing/anti-icing

agents as well as containment measures for all applied chemicals. Consider these control measure options for reducing deicing fluid use: forced-air deicing systems, computer-controlled fixed-gantry systems, infrared technology, hot water, varying glycol content to air temperature, enclosed-basket deicing trucks, mechanical methods, solar radiation, hangar storage, aircraft covers, and thermal blankets for MD-80s and DC-9s. Also consider using ice-detection systems and airport traffic flow strategies and departure slot allocation systems. The evaluations and determinations required by this Part should be carried out by the personnel most familiar with the particular aircraft and flight operations and related systems in question (versus an outside entity such as the airport authority).

11.S.4.1.7 Management of Runoff.

(See also 4.2.6) Where deicing operations occur, implement a program to control or manage contaminated runoff to minimize the amount of pollutants being discharged from the site. Consider these control measure options: a dedicated deicing facility with a runoff collection/recovery system; using vacuum/collection trucks; storing contaminated storm water/deicing fluids in tanks and releasing controlled amounts to a publicly owned treatment works; collecting contaminated runoff in a wet pond for biochemical decomposition (be aware of attracting wildlife that may prove hazardous to flight operations); or directing runoff into vegetative swales or other infiltration measures. Also consider recovering deicing materials when these materials are applied during non-precipitation events (e.g., covering storm sewer inlets, using booms, installing absorptive interceptors in the drains, etc.) to prevent these materials from later becoming a source of storm water contamination. Deicing operations should be developed with an emphasis on using a combination of the BMPs listed above to contain, capture, and reuse deicing materials. Used deicing fluid should be recycled whenever practicable.

11.S.4.2 Deicing Season. (See also Part 11.S.7.) The permittee must determine the seasonal timeframe (e.g., December- February, October - March, etc.) during which deicing activities typically occur at the facility. Implementation of control measures, including any BMPs, facility inspections and monitoring must be conducted with particular emphasis throughout the defined deicing season. If the permittee meets the deicing chemical usage thresholds of 100,000 gallons glycol and/or 100 tons of urea, the deicing season they identified is the timeframe during which the permittee must obtain the four required benchmark monitoring event results for deicing-related parameters, i.e., BOD, COD, ammonia and pH.

11.S.5 Additional SWPPP Requirements.

An airport authority and tenants of the airport are encouraged to work in partnership in the development of a SWPPP. If an airport tenant obtains authorization under this permit and develops a SWPPP for

discharges from his or her own areas of the airport, prior to authorization, that SWPPP must be coordinated and integrated with the SWPPP for the entire airport. Tenants of the airport facility include air passenger or cargo companies, fixed based operators and other parties who have contracts with the airport authority to conduct business operations on airport property and whose operations result in storm water discharges associated with industrial activity.

11.S.5.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP the following areas of the facility and indicate whether activities occurring there may be exposed to precipitation/surface runoff: aircraft and runway deicing operations; fueling stations; aircraft, ground vehicle and equipment maintenance/cleaning areas; storage areas for aircraft, ground vehicles and equipment awaiting maintenance.

11.S.5.2 Potential Pollutant Sources. (See also Part 5.2.4) In the permittees inventory of exposed materials, describe in the SWPPP the potential for the following activities and facility areas to contribute pollutants to storm water discharges: aircraft, runway, ground vehicle and equipment maintenance and cleaning; aircraft and runway deicing operations (including apron and centralized aircraft deicing stations, runways, taxiways and ramps). If the permittee uses deicing chemicals, they must maintain a record of the types (including the Material Safety Data Sheets [MSDS]) used and the monthly quantities, either as measured or, in the absence of metering, as estimated to the best of the permittees knowledge. This includes all deicing chemicals, not just glycols and urea (e.g., potassium acetate), because large quantities of these other chemicals can still have an adverse impact on receiving waters. Tenants or other fixed-based operations that conduct deicing operations must provide the above information to the airport authority for inclusion with any comprehensive airport SWPPPs.

11.S.5.3 Vehicle and Equipment Washwater Requirements. Attach to or reference in the SWPPP, a copy of the APDES permit issued for vehicle/equipment washwater or, if an APDES permit has not been issued, a copy of the pending application. If an industrial user permit is issued under a local pretreatment program, include a copy in the SWPPP. In any case, if the permittee is subject to another permit, describe the control measures for implementing all non-storm water discharge permit conditions or pretreatment requirements in the SWPPP. If washwater is handled in another manner (e.g., hauled offsite, retained onsite), describe the disposal method and attach all pertinent documentation/information (e.g., frequency, volume, destination, etc.) in the SWPPP.

11.S.5.4 Documentation of Control Measures Used for Management of Runoff. Document in the SWPPP the control measures used for collecting or containing contaminated melt water from collection areas used for disposal of contaminated snow.

11.S.6 Additional Inspection Requirements.

11.S.6.1 Inspections. (See also Part 6.1) At a minimum, conduct routine facility inspections at least monthly during the deicing season (e.g., October through April for most airports). If a permittees facility needs to deice before or after this period, expand the monthly inspections to include all months during which deicing chemicals may be used. The Department may specifically require the permittee to increase inspection frequencies.

11.S.6.2 Comprehensive Site Inspections. (See also Part 6.3) Using only qualified personnel, conduct the annual site inspection during periods of actual deicing operations, if possible. If not practicable during active deicing because of weather, conduct the inspection during the season when deicing operations occur and the materials and equipment for deicing are in place.

11.S.7 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

Monitor per the requirements in Table 11.S.7-1.

Table 11.S.7-1: Sector – Specific Benchmarks – Sector S

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
For airports where a single permittee, or a combination of permitted facilities use more than 100,000 gallons of pure glycol in glycol-based deicing fluids and/or 100 tons or more of urea on an average annual basis, monitor the first four parameters in ONLY those outfalls that collect runoff from areas where deicing activities occur (SIC 4512-4581).	Biochemical Oxygen Demand (BOD_5)[1]	30 mg/L
	Chemical Oxygen Demand (COD)[1]	120 mg/L
	Ammonia[1, 2]	2.14 mg/L
	pH[1]	6.5 – 8.5 s.u.

Note:
1. These are deicing-related parameters. Collect the four benchmark samples, and any required follow-up benchmark samples, during the timeframe defined in Part 11.S.4.2 when deicing activities are occurring.
2. If a permittee certifies annually that it does not use airfield deicing products that contain urea, then the permittee does not need to sample for ammonia.

11.S.8 Sector-Specific Effluent Limitation Guideline.

There shall be no discharge of airfield pavement deicers containing urea, unless there is monitoring. To comply with this limitation, any existing point source must certify annually that it does not use airfield deicing products that contain urea or alternatively, airfield pavement discharges at every discharge point must achieve the numeric limitations for ammonia in Table 11.S.8-1, prior to any dilution or commingling with any non-deicing discharge. The certification statement shall be maintained in the SWPPP and signed in accordance with Appendix A, Part 1.12. Monitor per the requirements in Table 11.S.8-1.

Table 11.S.8-1: Effluent Limitations Based on 40 CFR Part 449 BAT Limitations

Wastestream	Paramter	Daily Maximum
Runoff containing urea from airfield pavement deicing at existing primary airports with 1,000 or more annual non-propeller aircraft[1] departures.	Ammonia as Nitrogen[2]	14.7 mg/l

Note:
1. Annual non-propellar aircraft is the average annual aircraft departures of commercial turbine-engine aircraft that are propelled by jet, i.e., turbojet or turbofan as tabulated by the Federal Aviation Administration.
2. Monitor twice a deicing season during the timeframe defined in Part 11.S.4.2 when deicing activities are occuring.

11.S.9 Technology Based – Effluent Limits for New Sources with At Least 1,000 Annual Non-Propellar Aircraft Departures.

A new airport with at least 1,000 annual non-propeller aircraft departures must apply for an individual APDES permit.

11. Subpart T – Sector T – Treatment Works.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.T.1 Covered Storm Water Discharges.

The requirements in Subpart T apply to storm water discharges associated with industrial activity from Treatment Works as identified by the Activity Code specified under Sector T in Table D-1 of Appendix D of the permit.

11.T.2 Industrial Activities Covered by Sector T.

The requirements listed under this part apply to all existing point source storm water discharges associated with the following activities:

11.T.2.1 *Treatment works treating domestic sewage,* or any other sewage sludge or wastewater treatment device or system used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge; that are located within the confines of a facility with a design flow of 1.0 million gallons per day (MGD) or more; or are required to have an approved pretreatment program under 40 CFR Part 403.

11.T.2.2 *The following are not required to have permit coverage:* farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located within the facility, or areas that are in compliance with Section 405 of the CWA.

11.T.3 Limitations on Coverage.

11.T.3.1 *Prohibition of Non-Storm Water Discharges.* (See also Part 1.2.4) Sanitary and industrial wastewater and equipment and vehicle washwater are not authorized by this permit.

11.T.4 Additional Technology-Based Effluent Limits.

11.T.4.1 *Control Measures.* (See also the non-numeric effluent limits in Part 4.2) In addition to the other control measures, implement the following, as practicable: routing storm water to the treatment works; or covering exposed materials (i.e., from the following areas: grit, screenings, and other solids handling, storage, or disposal areas; sludge drying beds; dried sludge piles; compost piles; and septage or hauled waste receiving station).

11.T.4.2 Employee Training. (See also Part 4.2.9) At a minimum, training must address the following areas when applicable to a facility: petroleum product management; process chemical management; spill prevention and controls; fueling procedures; general good housekeeping practices; and proper procedures for using fertilizer, herbicides, and pesticides.

11.T.5 Additional SWPPP Requirements.

11.T.5.1 Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP where any of the following may be exposed to precipitation or surface runoff: grit, screenings, and other solids handling, storage, or disposal areas; sludge drying beds; dried sludge piles; compost piles; septage or hauled waste receiving station; and storage areas for process chemicals, petroleum products, solvents, fertilizers, herbicides, and pesticides.

11.T.5.2 Potential Pollutant Sources. (See also Part 5.2.4) Document in the SWPPP the following additional sources and activities that have potential pollutants associated with them, as applicable: grit, screenings, and other solids handling, storage, or disposal areas; sludge drying beds; dried sludge piles; compost piles; septage or hauled waste receiving station; and access roads and rail lines.

11.T.5.3 Wastewater and Washwater Requirements. Keep a copy of all the permittees current APDES permits issued for wastewater and industrial, vehicle and equipment washwater discharges or, if an APDES permit has not yet been issued, a copy of the pending application(s) with the SWPPP. If the washwater is handled in another manner, the disposal method must be described and all pertinent documentation must be retained onsite.

11.T.6 Additional Inspection Requirements.

(See also Part 6.1) Include the following areas in all inspections: access roads and rail lines; grit, screenings, and other solids handling, storage, or disposal areas; sludge drying beds; dried sludge piles; compost piles; and septage or hauled waste receiving station.

11. Subpart U – Sector U – Food and Kindred Products.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.U.1 Covered Storm Water Discharges.

The requirements in Subpart U apply to storm water discharges associated with industrial activity from Food and Kindred Products facilities as identified by the SIC Codes specified in Table D-1 of Appendix D of the permit.

11.U.2 Limitations on Coverage.

11.U.2.1 Prohibition of Non-Storm Water Discharges. (See also Part 1.2.4) The following discharges are not authorized by this permit: discharges containing boiler blowdown, cooling tower overflow and blowdown, ammonia refrigeration purging, and vehicle washing and clean-out operations.

11.U.3 Additional Technology-Based Limitations.

11.U.3.1 Employee Training. (See also Part 4.2.9) Address pest control in the permittees employee training program.

11.U.4 Additional SWPPP Requirements.

11.U.4.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP the locations of the following activities if they are exposed to precipitation or runoff: vents and stacks from cooking, drying, and similar operations; dry product vacuum transfer lines; animal holding pens; spoiled product; and broken product container storage areas.

11.U.4.2 Potential Pollutant Sources. (See also Part 5.2.4) The permittee must document in the SWPPP, in addition to food and kindred products processing-related industrial activities, application and storage of pest control chemicals (e.g., rodenticides, insecticides, fungicides) used on plant grounds.

11.U.5 Additional Inspection Requirements.

(See also Part 6.1) Inspect on a quarterly basis, at a minimum, the following areas where the potential for exposure to storm water exists: loading and unloading areas for all significant materials; storage areas, including associated containment areas; waste management units; vents and stacks emanating from industrial activities; spoiled product and broken product container holding areas; animal holding pens; staging areas; and air pollution control equipment.

11.U.6 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

Table 11.U.6-1: Sector – Specific Benchmarks – Sector U

Subsector (Permittees may be subject to requirements for more than one Sector / Subsector)	Parameter	Benchmark Monitoring Concentration
Subsector U1. Grain Mill Products (SIC 2041-2048)	Total Suspended Solids (TSS)	100 mg/L
Subsector U2. Fats and Oils Products (SIC 2074-2079)	Biochemical Oxygen Demand (BOD_5)	30 mg/L
	Chemical Oxygen Demand (COD)	120 mg/L
	Nitrate plus Nitrite Nitrogen	0.68 mg/L
	Total Suspended Solids (TSS)	100 mg/L

11. Subpart V – Sector V – Textile Mills, Apparel, and Other Fabric Products.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.V.1 Covered Storm Water Discharges.

The requirements in Subpart V apply to storm water discharges associated with industrial activity from Textile Mills, Apparel, and Other Fabric Product manufacturing as identified by the SIC Codes specified under Sector V in Table D-1 of Appendix D of the permit.

11.V.2 Limitations on Coverage.

11.V.2.1 Prohibition of Non-Storm Water Discharges. (See also Part 1.2.4) The following are not authorized by this permit: discharges of wastewater (e.g., wastewater resulting from wet processing or from any processes relating to the production process), reused or recycled water, and waters used in cooling towers. If the permittee has these types of discharges from the facility, the permittee must cover them under a separate APDES permit.

11.V.3 Additional Technology-Based Limitations.

11.V.3.1 Good Housekeeping Measures. (See also Part 4.2.2)

11.V.3.1.1 Material Storage Areas. Plainly label and store all containerized materials (e.g., fuels, petroleum products, solvents, and dyes) in a protected area, away from drains. Minimize contamination of the storm water runoff from such storage areas. Implement an inventory control plan to prevent excessive purchasing of potentially hazardous substances. For storing empty chemical drums or containers, ensure that the drums and containers are clean (consider triple-rinsing) and that there is no contact of residuals with precipitation or runoff. Collect and dispose of washwater from these cleanings properly.

11.V.3.1.2 Material Handling Areas. Minimize contamination of storm water runoff from material handling operations and areas. Implement the following (or their equivalents), as practicable: use of spill and overflow protection; cover fueling areas; and cover or enclose areas where the transfer of material may occur. When applicable, address the replacement or repair of leaking connections, valves, transfer lines, and pipes that may carry chemicals, dyes, or wastewater.

11.V.3.1.3 Fueling Areas. Minimize contamination of storm water runoff from fueling areas. Implement the following (or their equivalents), as practicable: cover the fueling area, use of spill and overflow protection, minimize run-on of storm water to the fueling areas, use of dry cleanup methods, and treating and/or recycling storm water runoff collected from the fueling area.

11.V.3.1.4 Above-Ground Storage Tank Area. Minimize contamination of the storm water runoff from above-ground storage tank areas, including the associated piping and valves. Implement the following (or their equivalents), as practicable: regular cleanup of these areas; include measures for tanks, piping and valves explicitly in the permittees SPCC program; minimize runoff of storm water from adjacent areas; restrict access to the area; insert filters in adjacent catch basins; provide absorbent booms in unbermed fueling areas; use dry cleanup methods; and permanently sealing drains within critical areas that may discharge to a storm drain.

11.V.3.2 Employee Training. (See also Part 4.2.9) As part of the permittees employee training program, address, at a minimum, the following activities (as applicable): use of reused and recycled waters, solvents management, proper disposal of dyes, proper disposal of petroleum products and spent lubricants, spill prevention and control, fueling procedures, and general good housekeeping practices.

11.V.4 Additional SWPPP Requirements.

11.V.4.1 Potential Pollutant Sources. (See also Part 5.2.4) The permittee must document in the SWPPP the following additional sources and activities that have potential pollutants associated with them: industry-specific significant materials and industrial activities (e.g., backwinding, beaming, bleaching, backing bonding, carbonizing, carding, cut and sew operations, desizing, drawing, dyeing locking, fulling, knitting, mercerizing, opening, packing, plying, scouring, slashing, spinning, synthetic-felt processing, textile waste processing, tufting, turning, weaving, web forming, winging, yarn spinning, and yarn texturing).

11.V.4.2 Description of Good Housekeeping Measures for Material Storage Areas. The permittee must document in the SWPPP the containment area or enclosure for materials stored outdoors in connection with Part 11.V.3.1.1 above.

11.V.5 Additional Inspection Requirements.

(See also Part 6.1) Inspect, at least monthly, the following activities and areas (at a minimum): transfer and transmission lines, spill prevention, good housekeeping practices, management of process waste products, and all structural and nonstructural management practices.

11. Subpart W – Sector W – Furniture and Fixtures.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of a permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.W.1 Covered Storm Water Discharges.

The requirements in Subpart W apply to storm water discharges associated with industrial activity from Furniture and Fixtures facilities as identified by the SIC Codes specified under Sector W in Table D-1 of Appendix D of the permit.

11.W.2 Additional SWPPP Requirements.

11.W.2.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP where any of the following may be exposed to precipitation or surface runoff: material storage (including tanks or other vessels used for liquid or waste storage) areas; outdoor material processing areas; areas where wastes are treated, stored, or disposed of; access roads; and rail spurs.

11. Subpart X – Sector X – Printing and Publishing.

The permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.X.1 Covered Storm Water Discharges.

The requirements in Subpart X apply to storm water discharges associated with industrial activity from Printing and Publishing facilities as identified by the SIC Codes specified under Sector X in Table D-1 of Appendix D of the permit.

11.X.2 Additional Technology-Based Effluent Limits.

11.X.2.1 Good Housekeeping Measures. (See also Part 4.2.2)

11.X.2.1.1 Material Storage Areas. Plainly label and store all containerized materials (e.g., skids, pallets, solvents, bulk inks, hazardous waste, empty drums, portable and mobile containers of plant debris, wood crates, steel racks, and fuel oil) in a protected area, away from drains. Minimize contamination of the storm water runoff from such storage areas. Implement an inventory control plan to prevent excessive purchasing of potentially hazardous substances. In order to minimize storm water exposure materials should be stored indoors or under cover.

11.X.2.1.2 Material Handling Area. Minimize contamination of storm water runoff from material handling operations and areas (e.g., blanket wash, mixing solvents, loading and unloading materials). Implement the following (or their equivalents), as practicable: use spill and overflow protection, cover fueling areas, and cover or enclose areas where the transfer of materials may occur. When applicable, address the replacement or repair of leaking connections, valves, transfer lines, and pipes that may carry chemicals or wastewater.

11.X.2.1.3 Fueling Areas. Minimize contamination of storm water runoff from fueling areas. Implement the following (or their equivalents), as practicable: cover the fueling area, use spill and overflow protection, minimize runoff of storm water to the fueling areas, use dry cleanup methods, and treat aor recycle storm water runoff collected from the fueling area.

11.X.2.1.4 Above Ground Storage Tank Area. Minimize contamination of the storm water runoff from above-ground storage tank areas, including the associated piping and valves. Implement the following (or their equivalents), as practicable: regularly clean these areas, explicitly address tanks, piping and valves in the SPCC program, minimize storm water runoff from adjacent areas, restrict access to the area, insert filters in adjacent catch basins, provide absorbent booms in unbermed fueling areas, use dry cleanup methods, and permanently seal drains within critical areas that may discharge to a storm drain.

11.X.2.2 Employee Training. (See also Part 4.2.9) As part of the permittees employee training program, address, at a minimum, the following activities (as applicable): spent solvent management, spill prevention and control, used oil management, fueling procedures, and general good housekeeping practices.

11.X.3 Additional SWPPP Requirements.

11.X.3.1 Description of Good Housekeeping Measures for Material Storage Areas. In connection with Part 11.X.2.1.1, describe in the SWPPP the containment area or enclosure for materials stored outdoors.

11. Subpart Y – Sector Y – Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.Y.1 Covered Storm Water Discharges.

The requirements in Subpart Y apply to storm water discharges associated with industrial activity from Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing Industries facilities as identified by the SIC Codes specified under Sector Y in Table D-1 of Appendix D of the permit.

11.Y.2 Additional Technology-Based Effluent Limits.

11.Y.2.1 *Controls for Rubber Manufacturers.* (See also Part 4.2) Minimize the discharge of zinc in a permittees storm water discharges. Parts 11.Y.2.1.1 to 11.Y.2.1.5 give possible sources of zinc to be reviewed and list some specific control measures to be considered for implementation (or their equivalents). Following are some general control measure options to consider: using chemicals purchased in pre-weighed, sealed polyethylene bags; storing in-use materials in sealable containers, ensuring an airspace between the container and the cover to minimize "puffing" losses when the container is opened, and using automatic dispensing and weighing equipment.

11.Y.2.1.1 *Zinc Bags.* Ensure proper handling and storage of zinc bags at the permittees facility. Following are some control measure options: employee training on the handling and storage of zinc bags, indoor storage of zinc bags, cleanup of zinc spills without washing the zinc into the storm drain, and the use of 2,500-pound sacks of zinc rather than 50- to 100-pound sacks.

11.Y.2.1.2 *Dumpsters.* Minimize discharges of zinc from dumpsters. Following are some control measure options: covering the dumpster, moving the dumpster indoors, or providing a lining for the dumpster.

11.Y.2.1.3 *Dust Collectors and Baghouses.* Minimize contributions of zinc to storm water from dust collectors and baghouses. Replace or repair, as appropriate, improperly operating dust collectors and baghouses.

11.Y.2.1.4 *Grinding Operations.* Minimize contamination of storm water as a result of dust generation from rubber grinding operations. One control measure option is to install a dust collection system.

11.Y.2.1.5 Zinc Stearate Coating Operations. Minimize the potential for storm water contamination from drips and spills of zinc stearate slurry that may be released to the storm drain. One control measure option is to use alternative compounds to zinc stearate.

11.Y.2.2 Controls for Plastic Products Manufacturers. Minimize the discharge of plastic resin pellets in the storm water discharges. Control measures to be considered for implementation (or their equivalents) include minimizing spills, cleaning up of spills promptly and thoroughly, sweeping thoroughly, pellet capturing, employee education, and disposal precautions.

11.Y.3 Additional SWPPP Requirements.

11.Y.3.1 Potential Pollutant Sources for Rubber Manufacturers. (See also Part 5.2.4) The permittee must document in the SWPPP the use of zinc at their facility and the possible pathways through which zinc may be discharged in storm water runoff.

11.Y.4 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

Table 11.Y.4-1: Sector – Specific Benchmarks – Sector Y

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector Y1. Rubber Products Manufacturing (SIC 3011, 3021, 3052, 3053, 3061, 3069)	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent

Note:
1. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
2. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Zinc (mg/L)
0 – < 25	0.04
25 – < 50	0.05
50 – < 75	0.08
75 – < 100	0.11
100 – < 125	0.13
125 – < 150	0.16
150 – < 175	0.18
175 – < 200	0.20
200 – < 225	0.23
225 – < 250	0.25
250+	0.26

11. Subpart Z – Sector Z – Leather Tanning and Finishing.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.Z.1 Covered Storm Water Discharges.

The requirements in Subpart Z apply to storm water discharges associated with industrial activity from Leather Tanning and Finishing facilities as identified by the SIC Code specified under Sector Z in Table D-1 of Appendix D of the permit.

11.Z.2 Additional Technology-Based Effluent Limits.

11.Z.2.1 Good Housekeeping Measures. (See also Part 4.2.2)

11.Z.2.1.1 Storage Areas for Raw, Semiprocessed, or Finished Tannery By-products. Minimize contamination of storm water runoff from pallets and bales of raw, semiprocessed, or finished tannery by-products (e.g., splits, trimmings, shavings). Use indoor storage or protection with polyethylene wrapping, tarpaulins, roofed storage, etc. Place materials on an impermeable surface and enclose or put berms (or equivalent measures) around the area to prevent storm water run-on and runoff.

11.Z.2.1.2 Material Storage Areas. Label storage containers of all materials (e.g., specific chemicals, hazardous materials, spent solvents, waste materials) minimize contact of such materials with storm water.

11.Z.2.1.3 Buffing and Shaving Areas. Minimize contamination of storm water runoff with leather dust from buffing and shaving areas. Use dust collection enclosures, preventive inspection and maintenance programs, or other appropriate preventive measures.

11.Z.2.1.4 Receiving, Unloading, and Storage Areas. Minimize contamination of storm water runoff from receiving, unloading, and storage areas. If these areas are exposed, use the following (or their equivalents): covering all hides and chemical supplies, diverting drainage to the process sewer, or grade berming or curbing the area to prevent storm water runoff.

11.Z.2.1.5 Outdoor Storage of Contaminated Equipment. Minimize contact of storm water with contaminated equipment. Use the following (or their equivalents): covering equipment, diverting drainage to the process sewer, or cleaning thoroughly prior to storage.

11.Z.2.1.6 Waste Management. Minimize contamination of storm water runoff from waste storage areas. Use the following (or their equivalents): covering dumpsters, moving waste management activities indoors, covering waste piles with temporary covering material such as tarpaulins or polyethylene, or minimizing storm water runoff by enclosing the area or building berms around the area.

11.Z.3 Additional SWPPP Requirements.

11.Z.3.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP where any of the following may be exposed to precipitation or surface runoff: processing and storage areas of the beamhouse, tanyard, and re-tan wet finishing and dry finishing operations.

11.Z.3.2 Potential Pollutant Sources. (See also Part 5.2.4) The permittee must document in the SWPPP the following sources and activities that have potential pollutants associated with them (as appropriate): temporary or permanent storage of fresh and brine-cured hides; extraneous hide substances and hair; leather dust, scraps, trimmings, and shavings.

11. Subpart AA – Sector AA – Fabricated Metal Products.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.AA.1 Covered Storm Water Discharges.

The requirements in Subpart AA apply to storm water discharges associated with industrial activity from Fabricated Metal Products facilities as identified by the SIC Codes specified under Sector AA in Table D-1 of Appendix D of the permit.

11.AA.2 Additional Technology-Based Effluent Limits.

11.AA.2.1 Good Housekeeping Measures. (See also Part 4.2.2)

11.AA.2.1.1 Raw Steel Handling Storage. Minimize the generation of and/or recover and properly manage scrap metals, fines, and iron dust. Include measures for containing materials within storage handling areas.

11.AA.2.1.2 Paints and Painting Equipment. Minimize exposure of paint and painting equipment to storm water.

11.AA.2.2 Spill Prevention and Response Procedures. (See also Part 4.2.4) Ensure that the necessary equipment to implement a cleanup is available to personnel. The following areas should be addressed:

11.AA.2.2.1 Metal Fabricating Areas. Maintain clean, dry, orderly conditions in these areas. Use dry clean-up techniques.

11.AA.2.2.2 Storage Areas for Raw Metal. Keep these areas free of conditions that could cause, or impede appropriate and timely response to, spills or leakage of materials. Implement the following (or their equivalents): maintaining storage areas so that there is easy access in the event of a spill, and labeling stored materials to aid in identifying spill contents.

11.AA.2.2.3 Metal Working Fluid Storage Areas. Minimize the potential for storm water contamination from storage areas for metal working fluids.

11.AA.2.2.4 Cleaners and Rinse Water. Control and clean up spills of solvents and other liquid cleaners, control sand buildup and disbursement from sand-blasting operations, and prevent exposure of recyclable wastes. Substitute environmentally benign cleaners when possible.

11.AA.2.2.5 Lubricating Oil and Hydraulic Fluid Operations. Minimize the potential for storm water contamination from lubricating oil and hydraulic fluid operations. Use appropriate monitoring methods or equipment or other devices to detect and control leaks and overflows. Install perimeter controls such as dikes, curbs, grass filter strips, or equivalent measures, as practicable.

11.AA.2.2.6 Chemical Storage Areas. Minimize storm water contamination and accidental spillage in chemical storage areas. Include a program to inspect containers and identify proper disposal methods.

11.AA.2.3 Spills and Leaks. (See also Part 5.2.4.3) In the permittees spill prevention and response procedures, required by Part 4.2.4, pay attention to the following materials (at a minimum): chromium, toluene, pickle liquor, sulfuric acid, zinc and other water priority chemicals, and hazardous chemicals and wastes.

11.AA.3 Additional SWPPP Requirements.

11.AA.3.1 Drainage Area Site Map. (See also Part 5.2.3) The permittee must document in the SWPPP where any of the following may be exposed to precipitation or surface runoff: raw metal storage areas; finished metal storage areas; scrap disposal collection sites; equipment storage areas; retention and detention basins; temporary and permanent diversion dikes or berms; right-of-way or perimeter diversion devices; sediment traps and barriers; processing areas, including outside painting areas; wood preparation; recycling; and raw material storage.

11.AA.3.2 Potential Pollutant Sources. (See also Part 5.2.4) The permittee must document in the SWPPP the following additional sources and activities that have potential pollutants associated with them: loading and unloading operations for paints, chemicals, and raw materials; outdoor storage activities for raw materials, paints, empty containers, corn cobs, chemicals, and scrap metals; outdoor manufacturing or processing activities such as grinding, cutting, degreasing, buffing, and brazing; onsite waste disposal practices for spent solvents, sludge, pickling baths, shavings, ingot pieces, and refuse and waste piles.

11.AA.4 Additional Inspection Requirements.

11.AA.4.1 Inspections. (See also Part 6) At a minimum, include the following areas in all inspections: raw metal storage areas, finished product storage areas, material and chemical storage areas, recycling areas, loading and unloading areas, equipment storage areas, paint areas, and vehicle fueling and maintenance areas.

11.AA.4.2 Comprehensive Site Inspections. (See also Part 6.3) As part of the permittees inspections, also inspect areas associated with the storage of raw metals, spent solvents and chemicals storage areas, outdoor paint areas, and drainage from roof. Potential pollutants include chromium, zinc, lubricating oil, solvents, aluminum, oil and grease, methyl ethyl ketone, steel, and related materials.

11.AA.5 Sector-Specific Benchmarks. (See also Part 7 of the permit.)

Table 11.AA.5-1: Sector – Specific Benchmarks – Sector AA

Subsector (Permittees may be subject to requirements for more than one sector/subsector)	Parameter	Benchmark Monitoring Concentration
Subsector AA1. Fabricated Metal Products, except Coating (SIC 3411-3499; 3911-3915)	Total Aluminum	0.75 mg/L
	Total Iron	1.0 mg/L
	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent
	Nitrate plus Nitrite Nitrogen	0.68 mg/L
Subsector AA2. Fabricated Metal Coating and Engraving (SIC 3479)	Total Zinc (saltwater)[1] Total Zinc (freshwater)[2]	0.09 mg/L Hardness Dependent
	Nitrate plus Nitrite Nitrogen	0.68 mg/L

Note:

1. Saltwater benchmark values apply to storm water discharges into saline waters where indicated.
2. The freshwater benchmark values of some metals are dependent on water hardness. For these parameters, permittees must determine the hardness of the receiving water (see Appendix E, "Calculating Hardness in Receiving Waters for Hardness Dependent Metals," for methodology), in accordance with Part 7.2.1.1, to identify the applicable 'hardness range' for determining their benchmark value applicable to their facility. The ranges occur in 25 mg/L increments. Hardness Dependent Benchmarks follow in the table below:

Water Hardness Range (mg/L)	Zinc (mg/L)
0 – < 25	0.04
25 – < 50	0.05
50 – < 75	0.08
75 – < 100	0.11
100 – < 125	0.13
125 – < 150	0.16
150 – < 175	0.18
175 – < 200	0.20
200 – < 225	0.23
225 – < 250	0.25
250+	0.26

11. Subpart AB – Sector AB — Transportation Equipment, Industrial or Commercial Machinery Facilities.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.AB.1 Covered Storm Water Discharges.

The requirements in Subpart AB apply to storm water discharges associated with industrial activity from Transportation Equipment, Industrial or Commercial Machinery facilities as identified by the SIC Codes specified under Sector AB in Table D-1 of Appendix D of the permit.

11.AB.2 Additional SWPPP Requirements.

11.AB.2.1 Drainage Area Site Map. (See also Part 5.2.3) Identify in the permittees SWPPP where any of the following may be exposed to precipitation or surface runoff: vents and stacks from metal processing and similar operations.

11. Subpart AC– Sector AC –Electronic and Electrical Equipment and Components, Photographic and Optical Goods.

A Permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.AC.1 Covered Storm Water Discharges.

The requirements in Subpart AC apply to storm water discharges associated with industrial activity from facilities that manufacture Electronic and Electrical Equipment and Components, Photographic and Optical goods as identified by the SIC Codes specified in Table D-1 of Appendix D of the permit.

11.AC.2 Additional Requirements.

No additional sector-specific requirements apply.

11. Subpart AD – Sector AD – Discharges Designated by the Director as Requiring Permits.

A permittee must comply with Part 11 sector-specific requirements associated with their primary industrial activity and any co-located industrial activities, as defined in Appendix C. The sector-specific requirements apply to those areas of the permittees facility where those sector-specific activities occur. These sector-specific requirements are in addition to any requirements specified elsewhere in this permit.

11.AD.1 Covered Discharges.

Sector AD is used to provide permit coverage for facilities designated by the Department.

11.AD.1.1 Eligibility for Permit Coverage. Because this sector is primarily intended for use by discharges designated by the Department as needing a permit (which is an atypical circumstance), the permittee must obtain the Department's written permission to use this permit prior to submitting an NOI. If a permittee is authorized to use this permit, they will still be required to ensure that their discharges meet the basic eligibility provisions of this permit at Part 1.2.

11.AD.3 Sector-Specific Benchmarks and Effluent Limits. (See also Part 7 of the permit.)

The Department will establish any additional monitoring and reporting requirements for the permittees facility prior to authorizing the permittee to be covered by this permit. Additional monitoring requirements would be based on the nature of activities at the facility and the storm water discharges.

Appendix A – Standard Conditions

Table of Contents

Appendix A of the permit contains standard regulatory language that must be included in all APDES permits. These requirements are based on the regulations and cannot be challenged in the context of an individual APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements. Appendix A, Standard Conditoins is an integral and enforceable part of the permit. Failure to comply with a Standard Condition in this Appendix constitutes a violation of the permit and is subject to enforcement.

1.0 Standard Conditions Applicable to All Permits

1.1. Contact Information and Addresses

1.1.1. Permitting Program

Documents, reports, and plans required under the permit and Appendix A are to be sent to the following address:

State of Alaska
Department of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, Alaska 99501
Telephone (907) 269-6285
Fax (907) 269-3487
Email: DEC.Water.WQPermit@alaska.gov

1.1.2. Compliance and Enforcement Program

Documents and reports required under the permit and Appendix A relating to compliance are to be sent to the following address:

State of Alaska
Department of Environmental Conservation
Division of Water
Compliance and Enforcement Program
555 Cordova Street
Anchorage, Alaska 99501
Telephone Nationwide (877) 569-4114
Anchorage Area / International (907) 269-4114
Fax (907) 269-4604
Email: dec-wqreporting@alaska.gov

1.2. Duty to Comply

A permittee shall comply with all conditions of the permittee's APDES permit. Any permit noncompliance constitutes a violation of 33 U.S.C. 1251-1387 (Clean Water Act) and state law and is grounds for enforcement action including termination, revocation and reissuance, or modification of a permit, or denial of a permit renewal application. A permittee shall comply with effluent standards or prohibitions established under 33 U.S.C. 1317(a) for toxic pollutants

within the time provided in the regulations that establish those effluent standards or prohibitions even if the permit has not yet been modified to incorporate the requirement.

1.3. Duty to Reapply

If a permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. In accordance with 18 AAC 83.105(b), a permittee with a currently effective permit shall reapply by submitting a new application at least 180 days before the existing permit expires, unless the Department has granted the permittee permission to submit an application on a later date. However, the Department will not grant permission for an application to be submitted after the expiration date of the existing permit.

1.4. Need to Halt or Reduce Activity Not a Defense

In an enforcement action, a permittee may not assert as a defense that compliance with the conditions of the permit would have made it necessary for the permittee to halt or reduce the permitted activity.

1.5. Duty to Mitigate

A permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

1.6. Proper Operation and Maintenance

1.6.1. A permittee shall at all times properly operate and maintain all facilities and systems of treatment and control and related appurtenances that the permittee installs or uses to achieve compliance with the conditions of the permit. The permittee's duty to operate and maintain properly includes using adequate laboratory controls and appropriate quality assurance procedures. However, a permittee is not required to operate back-up or auxiliary facilities or similar systems that a permittee installs unless operation of those facilities is necessary to achieve compliance with the conditions of the permit.

1.6.2. Operation and maintenance records shall be retained and made available at the site.

1.7. Permit Actions

A permit may be modified, revoked and reissued, or terminated for cause as provided in 18 AAC 83.130. If a permittee files a request to modify, revoke and reissue, or terminate a permit, or gives notice of planned changes or anticipated noncompliance, the filing or notice does not stay any permit condition.

1.8. Property Rights

A permit does not convey any property rights or exclusive privilege.

1.9. Duty to Provide Information

A permittee shall, within a reasonable time, provide to the Department any information that the Department requests to determine whether a permittee is in compliance with the permit, or whether cause exists to modify, revoke and reissue, or terminate the permit. A permittee shall also provide to the Department, upon request, copies of any records the permittee is required to keep under the permit.

1.10. Inspection and Entry

A permittee shall allow the Department, or an authorized representative, including a contractor acting as a representative of the Department, at reasonable times and on presentation of credentials establishing authority and any other documents required by law, to:

1.10.1. Enter the premises where a permittee's regulated facility or activity is located or conducted, or where permit conditions require records to be kept;

1.10.2. Have access to and copy any records that permit conditions require the permittee to keep;

1.10.3. Inspect any facilities, equipment, including monitoring and control equipment, practices, or operations regulated or required under a permit; and

1.10.4. Sample or monitor any substances or parameters at any location for the purpose of assuring permit compliance or as otherwise authorized by 33 U.S.C. 1251-1387 (Clean Water Act).

1.11. Monitoring and Records

A permittee must comply with the following monitoring and recordkeeping conditions:

1.11.1. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.

1.11.2. The permittee shall retain records in Alaska of all monitoring information for at least three years, or longer at the Department's request at any time, from the date of the sample, measurement, report, or application. Monitoring records required to be kept include:

1.11.2.1. All calibration and maintenance records,

1.11.2.2. All original strip chart recordings or other forms of data approved by the Department for continuous monitoring instrumentation,

1.11.2.3. All reports required by a permit,

1.11.2.4. Records of all data used to complete the application for a permit,

1.11.2.5. Field logbooks or visual monitoring logbooks,

1.11.2.6. Quality assurance chain of custody forms,

1.11.2.7. Copies of discharge monitoring reports, and

1.11.2.8. A copy of this APDES permit.

1.11.3. Records of monitoring information must include:

1.11.3.1. The date, exact place, and time of any sampling or measurement;

1.11.3.2. The name(s) of any individual(s) who performed the sampling or measurement(s);

1.11.3.3. The date(s) and time any analysis was performed;

1.11.3.4. The name(s) of any individual(s) who performed any analysis;

1.11.3.5. Any analytical technique or method used; and

1.11.3.6. The results of the analysis.

1.11.4. Monitoring Procedures

Analyses of pollutants must be conducted using test procedures approved under 40 CFR Part 136, adopted by reference at 18 AAC 83.010, for pollutants with approved test procedures, and using test procedures specified in the permit for pollutants without approved methods.

1.12. Signature Requirement and Penalties

1.12.1. Any application, report, or information submitted to the Department in compliance with a permit requirement must be signed and certified in accordance with 18 AAC 83.385. Any person who knowingly makes any false material statement, representation, or certification in any application, record, report, or other document filed or required to be maintained under a permit, or who knowingly falsifies, tampers with, or renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be subject to penalties under 33 U.S.C. 1319(c)(4), AS 12.55.035(c)(1)(B), (c)(2) and (c)(3), and AS 46.03.790(g).

1.12.2. In accordance with 18 AAC 83.385, an APDES permit application must be signed as follows:

1.12.2.1. For a corporation, a responsible corporate officer shall sign the application; in this subsection, a responsible corporate officer means:

1.12.2.1.1. A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or

1.12.2.1.2. The manager of one of more manufacturing, production, or operating facilities, if

1.12.2.1.2.1. The manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations;

1.12.2.1.2.2. The manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and

1.12.2.1.3. Authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

1.12.2.2. For a partnership or sole proprietorship, by the general partner or the proprietor, respectively, shall sign the application.

1.12.2.3. For a municipality, state, federal, or other public agency, either a principal executive officer or ranking elected official shall sign the application; in this subsection, a principal executive officer of an agency means:

1.12.2.3.1. The chief executive officer of the agency; or

1.12.2.3.2. A senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

1.12.3. Any report required by an APDES permit, and a submittal with any other information requested by the Department, must be signed by a person described in Appendix A, Part 1.12.2, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1.12.3.1. The authorization is made in writing by a person described in Appendix A, Part 1.12.2;

1.12.3.2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, including the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility; or an individual or position having overall responsibility for environmental matters for the company; and

1.12.3.3. The written authorization is submitted to the Department to the Permitting Program address in Appendix A, Part 1.1.1.

1.12.4. If an authorization under Appendix A, Part 1.12.3 is no longer effective because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Appendix A, Part 1.12.3 must be submitted to the Department before or together with any report, information, or application to be signed by an authorized representative.

1.12.5. Any person signing a document under Appendix A, Part 1.12.2 or Part 1.12.3 shall certify as follows:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

1.13. Proprietary or Confidential Information

1.13.1. A permit applicant or permittee may assert a claim of confidentiality for proprietary or confidential business information by stamping the words “confidential business information” on each page of a submission containing proprietary or confidential business information. The Department will treat the stamped submissions as confidential if the information satisfies the test in 40 CFR §2.208, adopted by reference at 18 AAC 83.010, and is not otherwise required to be made public by state law.

1.13.2. A claim of confidentiality under Appendix A, Part 1.13.1 may not be asserted for the name and address of any permit applicant or permittee, a permit application, a permit, effluent data, sewage sludge data, and information required by APDES or NPDES application forms provided by the Department, whether submitted on the forms themselves or in any attachments used to supply information required by the forms.

1.13.3. A permittee's claim of confidentiality authorized under Appendix A, Part 1.13.1 is not waived if the Department provides the proprietary or confidential business information to the EPA or to other agencies participating in the permitting process. The Department will supply any information obtained or used in the administration of the state APDES program to the EPA upon request under 40 CFR §123.41, as revised as of July 1, 2005. When providing information submitted to the Department with a claim of confidentiality to the EPA, the Department will notify the EPA of the confidentiality claim. If the Department provides the EPA information that is not claimed to be confidential, the EPA may make the information available to the public without further notice.

1.14. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any action or relieve a permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under state laws addressing oil and hazardous substances.

1.15. Cultural and Paleontological Resources

If cultural or paleontological resources are discovered because of this disposal activity, work that would disturb such resources is to be stopped, and the Office of History and Archaeology, a Division of Parks and Outdoor Recreation of the Alaska Department of Natural Resources (http://www.dnr.state.ak.us/parks/oha/), is to be notified immediately at (907) 269-8721.

1.16. Fee

A permittee must pay the appropriate permit fee described in 18 AAC 72.

1.17. Other Legal Obligations

This permit does not relieve the permittee from the duty to obtain any other necessary permits from the Department or from other local, state, or federal agencies and to comply with the requirements contained in any such permits. All activities conducted and all plan approvals implemented by the permittee pursuant to the terms of this permit shall comply with all applicable local, state, and federal laws and regulations.

2.0 Special Reporting Obligations

2.1. Planned Changes

2.1.1. The permittee shall give notice to the Department as soon as possible of any planned physical alteration or addition to the permitted facility if:

2.1.1.1. The alteration or addition may make the facility a "new source" under one or more of the criteria in 18 AAC 83.990(44); or

2.1.1.2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged if those pollutants are not subject to effluent limitations in the permit or to notification requirements under 18 AAC 83.610.

2.1.2. If the proposed changes are subject to plan review, then the plans must be submitted at least 30 days before implementation of changes (see 18 AAC 15.020 and 18 AAC 72 for plan review requirements). Written approval is not required for an emergency repair or routine maintenance.

2.1.3. Written notice must be sent to the Permitting Program address in Appendix A, Part 1.1.1.

2.2. Anticipated Noncompliance

2.2.1. A permittee shall give seven days' notice to the Department before commencing any planned change in the permitted facility or activity that may result in noncompliance with permit requirements.

2.2.2. Written notice must be sent to the Compliance and Enforcement Program address in Appendix A, Part 1.1.2.

2.3. Transfers

2.3.1. A permittee may not transfer a permit for a facility or activity to any person except after notice to the Department in accordance with 18 AAC 83.150. The Department may modify or revoke and reissue the permit to change the name of the permittee and incorporate such other requirements under 33 U.S.C. 1251-1387 (Clean Water Act) or state law.

2.3.2. Written notice must be sent to the Permitting Program address in Appendix A, Part 1.1.1.

2.4. Compliance Schedules

2.4.1. A permittee must submit progress or compliance reports on interim and final requirements in any compliance schedule of a permit no later than 14 days following the scheduled date of each requirement.

2.4.2. Written notice must be sent to the Compliance and Enforcement Program address in Appendix A, Part 1.1.2.

2.5. Corrective Information

2.5.1. If a permittee becomes aware that it failed to submit a relevant fact in a permit application or submitted incorrect information in a permit application or in any report to the Department, the permittee shall promptly submit the relevant fact or the correct information.

2.5.2. Information must be sent to the Permitting Program address in Appendix A, Part 1.1.1.

2.6. Bypass of Treatment Facilities

2.6.1. **Prohibition of Bypass**

Bypass is prohibited. The Department may take enforcement action against a permittee for any bypass, unless:

2.6.1.1. The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2.6.1.2. There were no feasible alternatives to the bypass, including use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. However, this condition is not satisfied if the permittee, in the exercise of reasonable engineering judgment, should have installed adequate back-up equipment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

2.6.1.3. The permittee provides notice to the Department of a bypass event in the manner, as appropriate, under Appendix A, Part 2.6.2.

2.6.2. **Notice of bypass**

2.6.2.1. For an anticipated bypass, the permittee submits notice at least 10 days before the date of the bypass. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the conditions of Appendix A, Parts 2.6.1.1 and 2.6.1.2.

2.6.2.2. For an unanticipated bypass, the permittee submits 24-hour notice, as required in 18 AAC 83.410(f) and Appendix A, Part 3.4, Twenty-four Hour Reporting.

2.6.2.3. Written notice must be sent to the Compliance and Enforcement Program address in Appendix A, Part 1.1.2.

2.6.3. Notwithstanding Appendix A, Part 2.6.1, a permittee may allow a bypass that:

2.6.3.1. Does not cause an effluent limitation to be exceeded, and

2.6.3.2. Is for essential maintenance to assure efficient operation.

2.7. Upset Conditions

2.7.1. In any enforcement action for noncompliance with technology-based permit effluent limitations, a permittee may claim upset as an affirmative defense. A permittee seeking to establish the occurrence of an upset has the burden of proof to show that the requirements of Appendix A, Part 2.7.2 are met.

2.7.2. To establish the affirmative defense of upset, the permittee must demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that:

2.7.2.1. An upset occurred and the permittee can identify the cause or causes of the upset;

2.7.2.2. The permitted facility was at the time being properly operated;

2.7.2.3. The permittee submitted 24-hour notice of the upset, as required in 18 AAC 83.410(f) and Appendix A, Part 3.4, Twenty-four Hour Reporting; and

2.7.2.4. The permittee complied with any mitigation measures required under 18 AAC 83.405(e) and Appendix A, Part 1.5, Duty to Mitigate.

2.7.3. Any determination made in administrative review of a claim that noncompliance was caused by upset, before an action for noncompliance is commenced, is not final administrative action subject to judicial review.

2.8. Existing Manufacturing, Commercial, Mining, and Silvicultural Discharges

2.8.1. In addition to the reporting requirements under 18 AAC 83.410, an existing manufacturing, commercial, mining, and silvicultural discharger shall notify the Department as soon as that discharger knows or has reason to believe that any activity has occurred or will occur that would result in:

2.8.1.1. The discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in the permit, if that discharge will exceed the highest of the following notification levels:

2.8.1.1.1. One hundred micrograms per liter (100 µg/L);

2.8.1.1.2. Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile, 500 micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol, and one milligram per liter (1 mg/L) for antimony;

2.8.1.1.3. Five times the maximum concentration value reported for that pollutant in the permit application in accordance with 18 AAC 83.310(c)-(g); or

2.8.1.1.4. The level established by the Department in accordance with 18 AAC 83.445.

2.8.1.2. Any discharge, on a non-routine or infrequent basis, of a toxic pollutant that is not limited in the permit, if that discharge will exceed the highest of the following notification levels:

2.8.1.2.1. Five hundred micrograms per liter (500 µg/L);

2.8.1.2.2. One milligram per liter (1 mg/L) for antimony;

2.8.1.2.3. Ten times the maximum concentration value reported for that pollutant in the permit application in accordance with 18 AAC 83.310(c)-(g); or

2.8.1.2.4. The level established by the Department in accordance with 18 AAC 83.445.

3.0 Monitoring, Recording, and Reporting Requirements

3.1. Representative Sampling

A permittee must collect effluent samples from the effluent stream after the last treatment unit before discharge into the receiving waters. Samples and measurements must be representative of the volume and nature of the monitored activity or discharge.

3.2. Reporting of Monitoring Results

At intervals specified in the permit, monitoring results must be reported on the EPA discharge monitoring report (DMR) form, as revised as of March 1999, adopted by reference.

3.2.1. Monitoring results shall be summarized each month on the DMR or an approved equivalent report. The permittee must submit reports monthly postmarked by the 15th day of the following month.

3.2.2. The permittee must sign and certify all DMRs and all other reports in accordance with the requirements of Appendix A, Part 1.12, Signature Requirement and Penalties. All signed and certified legible original DMRs and all other documents and reports must be submitted

to the Department at the Compliance and Enforcement Program address in Appendix A, Part 1.1.2.

3.2.3. If, during the period when this permit is effective, the Department makes available electronic reporting, the permittee may, as an alternative to the requirements of Appendix A, Part 3.2.2, submit monthly DMRs electronically by the 15th day of the following month in accordance with guidance provided by the Department. The permittee must certify all DMRs and other reports, in accordance with the requirements of Appendix A, Part 1.12, Signature Requirement and Penalties. The permittee must retain the legible originals of these documents and make them available to the Department upon request.

3.3. Additional Monitoring by Permittee

If the permittee monitors any pollutant more frequently than the permit requires using test procedures approved in 40 CFR Part 136, adopted by reference at 18 AAC 83.010, or as specified in this permit, the results of that additional monitoring must be included in the calculation and reporting of the data submitted in the DMR or annual report required by Appendix A, Part 3.2. All limitations that require averaging of measurements must be calculated using an arithmetic means unless the Department specifies another method in the permit. Upon request by the Department, the permittee must submit the results of any other sampling and monitoring regardless of the test method used.

3.4. Twenty-four Hour Reporting

A permittee shall report any noncompliance event that may endanger health or the environment as follows:

3.4.1. A report must be made:

3.4.1.1. Orally within 24 hours after the permittee becomes aware of the circumstances, and

3.4.1.2. In writing within five days after the permittee becomes aware of the circumstances.

3.4.2. A report must include the following information:

3.4.2.1. A description of the noncompliance and its causes, including the estimated volume or weight and specific details of the noncompliance;

3.4.2.2. The period of noncompliance, including exact dates and times;

3.4.2.3. If the noncompliance has not been corrected, a statement regarding the anticipated time the noncompliance is expected to continue; and

3.4.2.4. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

3.4.3. An event that must be reported within 24 hours includes:

3.4.3.1. An unanticipated bypass that exceeds any effluent limitation in the permit (see Appendix A, Part 2.6, Bypass of Treatment Facilities).

3.4.3.2. An upset that exceeds any effluent limitation in the permit (see Appendix A, Part 2.7, Upset Conditions).

3.4.3.3. A violation of a maximum daily discharge limitation for any of the pollutants listed in the permit as requiring 24-hour reporting.

3.4.4. The Department may waive the written report on a case-by-case basis for reports under Appendix A, Part 3.4 if the oral report has been received within 24 hours of the permittee becoming aware of the noncompliance event.

3.4.5. The permittee may satisfy the written reporting submission requirements of Appendix A, Part 3.4 by submitting the written report via e-mail, if the following conditions are met:

3.4.5.1. The Noncompliance Notification Form or equivalent form is used to report the noncompliance;

3.4.5.2. The written report includes all the information required under Appendix A, Part 3.4.2;

3.4.5.3. The written report is properly certified and signed in accordance with Appendix A, Parts 1.12.3 and 1.12.5;

3.4.5.4. The written report is scanned as a PDF (portable document format) document and transmitted to the Department as an attachment to the e-mail; and

3.4.5.5. The permittee retains in the facility file the original signed and certified written report and a printed copy of the conveying email.

3.4.6. The e-mail and PDF written report will satisfy the written report submission requirements of this permit provided the e-mail is received by the Department within five days after the time the permittee becomes aware of the noncompliance event and the e-mail and written report satisfy the criteria of Part 3.4.5. The e-mail address to report noncompliance is: dec-wqreporting@alaska.gov.

3.5. Other Noncompliance Reporting

A permittee shall report all instances of noncompliance not required to be reported under Appendix A, Parts 2.4 (Compliance Schedules), 3.3 (Additional Monitoring by Permittee), and 3.4 (Twenty-four Hour Reporting) at the time the permittee submits monitoring reports under Appendix A, Part 3.2. (Reporting of Monitoring Results). A report of noncompliance under this part must contain the information listed in Appendix A, Part 3.4.2 and be sent to the Compliance and Enforcement Program address in Appendix A, Part 1.1.2.

4.0 Penalties for Violations of Permit Conditions

Alaska laws allow the State to pursue both civil and criminal actions concurrently. The following is a summary of Alaska law. Permittees should read the applicable statutes for further substantive and procedural details.

4.1. Civil Action

Under AS 46.03.760(e), a person who violates or causes or permits to be violated a regulation, a lawful order of the Department, or a permit, approval, or acceptance, or term or condition of a permit, approval or acceptance issued under the program authorized by AS 46.03.020 (12) is liable, in a civil action, to the State for a sum to be assessed by the court of not less than $500

nor more than $100,000 for the initial violation, nor more than $10,000 for each day after that on which the violation continues, and that shall reflect, when applicable:

4.1.1. Reasonable compensation in the nature of liquated damages for any adverse environmental effects caused by the violation, that shall be determined by the court according to the toxicity, degradability, and dispersal characteristics of the substance discharged, the sensitivity of the receiving environment, and the degree to which the discharge degrades existing environmental quality;

4.1.2. Reasonable costs incurred by the State in detection, investigation, and attempted correction of the violation;

4.1.3. The economic savings realized by the person in not complying with the requirements for which a violation is charged; and

4.1.4. The need for an enhanced civil penalty to deter future noncompliance.

4.2. Injunctive Relief

4.2.1. Under AS 46.03.820, the Department can order an activity presenting an imminent or present danger to public health or that would be likely to result in irreversible damage to the environment be discontinued. Upon receipt of such an order, the activity must be immediately discontinued.

4.2.2. Under AS 46.03.765, the Department can bring an action in Alaska Superior Court seeking to enjoin ongoing or threatened violations for Department-issued permits and Department statutes and regulations.

4.3. Criminal Action

Under AS 46.03.790(h), a person is guilty of a Class A misdemeanor if the person negligently:

4.3.1. Violates a regulation adopted by the Department under AS 46.03.020(12);

4.3.2. Violates a permit issued under the program authorized by AS 46.03.020(12);

4.3.3. Fails to provide information or provides false information required by a regulation adopted under AS 46.03.020(12);

4.3.4. Makes a false statement, representation, or certification in an application, notice, record, report, permit, or other document filed, maintained, or used for purposes of compliance with a permit issued under or a regulation adopted under AS 46.03.020(12); or

4.3.5. Renders inaccurate a monitoring device or method required to be maintained by a permit issued or under a regulation adopted under AS 46.03.020(12).

4.4. Other Fines

Upon conviction of a violation of a regulation adopted under AS 46.03.020(12), a defendant who is not an organization may be sentenced to pay a fine of not more than $10,000 for each separate violation (AS 46.03.790(g)). A defendant that is an organization may be sentenced to pay a fine not exceeding the greater of: (1) $200,00; (2) three times the pecuniary gain realized by the defendant as a result of the offense; or (3) three times the pecuniary damage or loss

caused by the defendant to another, or the property of another, as a result of the offense (AS 12.55.035(c)(B), (c)(2), and (c)(3)).

APPENDIX B
ABBREVIATIONS AND ACRONYMS

Appendix B – Abbreviations and Acronyms

BOD_5 – Biochemical Oxygen Demand (5-day test)

BMP – Best Management Practice

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act

CGP – Construction General Permit

COD – Chemical Oxygen Demand

CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)

CWT – Centralized Waste Treatment

DMR – Discharge Monitoring Report

EPA – U. S. Environmental Protection Agency

ESA – Endangered Species Act

FWS – U. S. Fish and Wildlife Service

LA – Load Allocations

MDMR – MSGP Discharge Monitoring Report

MGD – Million Gallons per Day

MOS – Margin of Safety

MS4 – Municipal Separate Storm Sewer System

MSDS – Material Safety Data Sheet

MSGP – Multi-Sector General Permit

NAICS – North American Industry Classification System

NEPA – National Environmental Policy Act

NHPA – National Historic Preservation Act

NMFS – U. S. National Marine Fisheries Service

NOI – Notice of Intent

NOT – Notice of Termination

NPDES – National Pollutant Discharge Elimination System

NRC – National Response Center

NRHP – National Register of Historic Places

NSPS – New Source Performance Standard

NTU – Nephelometric Turbidity Unit

OMB – U. S. Office of Management and Budget

ORW – Outstanding Resource Water

OSM – U. S. Office of Surface Mining

POTW – Publicly Owned Treatment Works

RCRA – Resource Conservation and Recovery Act

RQ – Reportable Quantity

SARA – Superfund Amendments and Reauthorization Act

SHPO – State Historic Preservation Officer

SIC – Standard Industrial Classification

SMCRA – Surface Mining Control and Reclamation Act

SPCC – Spill Prevention, Control, and Countermeasures

SWPPP – Stormwater Pollution Prevention Plan

THPO – Tribal Historic Preservation Officer

TMDL – Total Maximum Daily Load

TSDF – Treatment, Storage, or Disposal Facility

TSS – Total Suspended Solids

USGS – United States Geological Survey

WLA – Wasteload Allocation

WQS – Water Quality Standard

APPENDIX C
DEFINITIONS

Appendix C – Definitions (for the purposes of this permit).

Action Area – all areas to be affected directly or indirectly by the storm water discharges, allowable non-storm water discharges, and storm water discharge-related activities, and not merely the immediate area involved in these discharges and activities.

Arid Climate – areas where annual rainfall averages from 0 to 10 inches.

Best Management Practices (BMPs) – schedules of activities, practices (and prohibitions of practices), structures, vegetation, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. See 40 CFR 122.2.

Cationic Treatment Chemical – For the purposes of this permit, means polymers, flocculants, or other chemicals that contain an overall positive charge. Among other things, they are used to reduce turbidity in storm water discharges by chemically bonding to the overall negative charge of suspended silts and other soil materials and causing them to bind together and settle out. Common examples of cationic treatment chemicals are chitosan and cationic PAM.

Co-Located Industrial Activities – Any industrial activities, excluding your primary industrial activity(ies), located on-site that are defined by the storm water regulations at 122.26(b)(14)(i)-(ix) and (xi). An activity at a facility is not considered co-located if the activity, when considered separately, does not meet the description of a category of industrial activity covered by the storm water regulations or identified by the SIC code list in Appendix D.

Control Measure – refers to any BMP or other method (including effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

Director – a Director of the Division of Water within the Department of Environmental Conservation.

Discharge – when used without qualification, means the "discharge of a pollutant." See 40 CFR 122.2.

Discharge of a Pollutant – any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source,” or any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. See 40 CFR 122.2.

Discharge-Related Activities – activities that cause, contribute to, or result in storm water and allowable non-storm water point source discharges, and measures such as the siting, construction and operation of BMPs to control, reduce, or prevent pollution in the discharges.

Drought-Stricken Area – a period of below average water content in streams, reservoirs, ground-water aquifers, lakes and soils.

EPA Approved or Established Total Maximum Daily Loads (TMDLs) – "EPA Approved TMDLs" are those that are developed by a State and approved by EPA. "EPA Established TMDLs" are those that are developed by EPA.

Existing Discharger – an operator applying for coverage under this permit for discharges authorized previously under an NPDES general or individual permit.

Facility or Activity – any NPDES "point source" (including land or appurtenances thereto) that is subject to regulation under the NPDES program. See 40 CFR 122.2.

Fall Freeze-up –For the purposes of this permit, means for planning purposes in the development of the SWPPP and initial planning of the control measure maintenance the date in the fall that air temperatures will be predominately below freezing. It is the date in the fall that has an 80% probability that a minimum temperature below a threshold of 32.5 degrees Fahrenheit will occur on or after the given date. This date can be found by looking up the "Fall 'Freeze' Probabilities" for the weather station closest to the facility on the website www.wrcc.dri.edu/summary/Climsmak.html. NOTE: This estimation of "Fall Freeze-up" is for planning purposes only. During construction and operation the permittee will need to maintain control measures based on actual conditions.

Federal Facility – any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the federal government.

Final Stabilization - For the purposes of this permit, means that:

1. All soil disturbing activities at the site have been completed and either of the two following criteria shall be met:

    a. a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or

    b. equivalent non vegetative permanent stabilization measures have been employed (such as the use of riprap, gabions, porous backfill (ADOT&PF Specification 703-2.10), railroad ballast or subballast, ditch lining (ADOT&PF Specification 610-2.01 with <3% smaller than #200 sieve), geotextiles, or fill material with low erodibility as determined by an engineer familiar with the site and documented in the SWPPP).

2. When background native vegetation will cover less than 100 percent of the ground (e.g., arid areas, beaches), the 70 percent coverage criteria is adjusted as follows: if the native vegetation covers 50 percent of the ground, then 70 percent of 50 percent (0.70 X 0.50 = 0.35) would

require 35 percent total cover for final stabilization. On a beach with no natural vegetation, no stabilization is required.

3. In arid and semi-arid areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:

    a. Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by the permittee;

    b. The temporary erosion control measures are selected, designed, and installed to achieve 70 percent vegetative coverage within three years.

Impaired Water (or "Water Quality Impaired Water" or "Water Quality Limited Segment") – A water is impaired for purposes of this permit if it has been identified by a State or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting applicable State water quality standards (these waters are called "water quality limited segments" under 40 CFR 30.2(j)). Impaired waters include both waters with approved or established TMDLs, and those for which a TMDL has not yet been approved or established.

Indian Country – (a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation; (b) all dependent Indian communities within the borders of the United States, whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a State, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. This definition includes all land held in trust for an Indian tribe. (18 U.S.C. 1151)

Industrial Activity – the 10 categories of industrial activities included in the definition of "storm water discharges associated with industrial activity" as defined in 40 CFR 122.26(b)(14)(i)-(ix) and (xi).

Industrial Storm Water – storm water runoff from industrial activity.

Measurable Storm Event - a storm event that results in an actual discharge from the facility that follows the preceding measurable storm event by at least 72 hours (3 days). No specific storm magnitude (i.e., 0.1 inches or greater) is specified, only an event which results in a discharge. For snowmelt, an event which some point in time produces a measurable discharge from the facility.

Minimize – To reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practice.

Municipal Separate Storm Sewer System (MS4) – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

a. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

b. Designed or used for collecting or conveying storm water;

c. Which is not a combined sewer; and

d. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2. See 40 CFR 122.26(b)(4) and (b)(7).

New Discharger – a facility from which there is a discharge, that did not commence the discharge at a particular site prior to August 13, 1979, which is not a new source, and which has never received a finally effective NPDES permit for discharges at that site. See 40 CFR 122.2.

New Source – any building, structure, facility, or installation from which there is or may be a "discharge of pollutants," the construction of which commenced:

- after promulgation of standards of performance under section 306 of the CWA which are applicable to such source, or

- after proposal of standards of performance in accordance with section 306 of the CWA which are applicable to such source, but only if the standards are promulgated in accordance with section 306 within 120 days of their proposal. See 40 CFR 122.2.

New Source Performance Standards (NSPS) – technology-based standards for facilities that qualify as new sources under 40 CFR 122.2 and 40 CFR 122.29.

No exposure – all industrial materials or activities are protected by a storm-resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. See 40 CFR 122.26(g).

Operator – any entity with a storm water discharge associated with industrial activity that meets either of the following two criteria:

a. The entity has operational control over industrial activities, including the ability to modify those activities;

b. The entity has day-to-day operational control of activities at a facility necessary to ensure compliance with the permit (e.g., the entity is authorized to direct workers at a facility to carry out activities required by the permit); or

c. The entity is either the owner or leasee of a parcel of land which is being used as a Non-Traditional Non-Metallic Mineral Mining facility.

Permittee – Is a person who is authorized to discharge pollutants to waters of the United States in accordance with the conditions and requirements of this permit.

Person – an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof. See 40 CFR 122.2.

Point Source – any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff. See 40 CFR 122.2.

Pollutant – dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water. See 40 CFR 122.2.

Pollutant of Concern – A pollutant which causes or contributes to a violation of a water quality standard, including a pollutant which is identified as causing an impairment in a state's 303(d) list.

Polymer – For the purposes of this permit, means coagulants and flocculants used to enhance sediment removal capabilities of check dams, sediment traps, or basins. Common construction site polymers include polyacrylamide (PAM), chitosan, alum, polyaluminum, chloride, and gypsum.

Practicable – For the purposes of this permit, means capable of being done after taking into consideration costs, existing technology, standards of construction practice, impacts to water quality, site conditions, and logistics in light of the overall project purpose.

Primary Airport – are publicly owned airports that receive scheduled passenger service and have more than 10,000 passengers boarding each year.

Primary Industrial Activity – includes any activities performed on-site which are (1) identified by the facility's primary SIC code; or (2) included in the narrative descriptions of 122.26(b)(14)(i), (iv), (v), or (vii), and (ix). [For co-located activities covered by multiple SIC codes, it is recommended that the primary industrial determination be based on the value of receipts or revenues or, if such information is not available for a particular facility, the number of employees or production rate for each process may be compared. The operation that generates the most revenue or employs the most personnel is the operation in which the facility is primarily engaged. In situations where the vast majority of on-site activity falls within one SIC code, that activity may be the primary industrial activity.] Narrative descriptions in 40 CFR 122.26(b)(14) identified above include: (i) activities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards; (iv) hazardous waste treatment storage, or disposal facilities including those that are operating under interim status or a permit under subtitle C of the Resource Conservation and Recovery Act (RCRA); (v) landfills, land application sites and open dumps that receive or have received industrial wastes; (vii)

steam electric power generating facilities; and (ix) sewage treatment works with a design flow of 1.0 mgd or more.

Qualified Personnel – Qualified personnel are those who possess the knowledge and skills to assess conditions and activities that could impact storm water quality at your facility, and who can also evaluate the effectiveness of control measures.

Reportable Quantity Release – a release of a hazardous substance at or above the established legal threshold that requires emergency notification. Refer to 40 CFR Parts 110, 117, and 302 for complete definitions and reportable quantities for which notification is required.

Runoff Coefficient – the fraction of total rainfall that will appear at the conveyance as runoff. See 40 CFR 122.26(b)(11).

Saline Water – salinity equal or exceed 0.5 parts per thousand (by mass).

Semi-Arid Climate – areas where annual rainfall averages from 10 to 20 inches.

Significant Materials – includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges. See 40 CFR 122.26(b)(12).

Special Aquatic Sites – sites identified in 40 CFR 230 Subpart E. These are geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region.

Spring Thaw –For the purposes of this permit, means for planning purposes in the development of the SWPPP and initial planning of the control measure maintenance the date in the spring that air temperatures will be predominately above freezing. It is the date in the spring that has a 20% probability that a minimum temperature below a threshold of 32.5 degrees Fahrenheit will occur on or after the given date. This date can be found by looking up the "Spring 'Freeze' Probabilities" for the weather station closest to the facility on the website www.wrcc.dri.edu/summary/Climsmak.html NOTE: This estimation of "Spring Thaw" is for planning purposes only. During construction and operation the permittee will need to maintain control measures based on actual conditions.

Storm Water – storm water runoff, snow melt runoff, and surface runoff and drainage. See 40 CFR 122.26(b)(13).

Storm Water Discharges Associated with Construction Activity – a discharge of pollutants in storm water runoff from areas where soil disturbing activities (e.g., clearing, grading, or excavating),

construction materials, or equipment storage or maintenance (e.g., fill piles, borrow areas, concrete truck washout, fueling), or other industrial storm water directly related to the construction process (e.g., concrete or asphalt batch plants) are located. See 40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15).

Storm Water Discharges Associated with Industrial Activity – the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under Part 122. For the categories of industries identified in this section, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities include those that are federally, State, or municipally owned or operated that meet the description of the facilities listed in 40 CFR 122.26(b)(14). The term also includes those facilities designated under the provisions of 40 CFR 122.26(a)(1)(v). See 40 CFR 122.26(b)(14).

Tackifier and Soil Stabilizer (binder) – For the purposes of this permit, means hydraulically applied chemicals derived from natural and synthetic sources used to promote adhesion among soil particles or mulch materials. In general soil stabilizers (also known as soil binders) are used to increase soil adhesion, which improves soil stabilization by reducing water and wind driven erosion. Tackifiers are used as “glue” to bind and immobilize straw, cellulose products, pine needles, or other mulch that has been applied to a seeded area. Common examples include polyacrylamide (PAM), guar, chloride compounds, psyllium, resins, enzymes, surfactants, and various polymers, starches, and other compounds.

Temporary Stabilization – measures taken to protect soils from erosion by rainfall, snow melt, runoff, or wind, with surface roughening or a surface cover, including, but not limited to, establishment of ground vegetation, application of mulch, surface tackifers, rolled erosion control products, gravel or paving.

Total Maximum Daily Loads (TMDLs) – A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes wasteload allocations (WLAs) for point source discharges; load allocations (LAs) for nonpoint sources and/or natural background, and must include a

margin of safety (MOS) and account for seasonal variations. (See Section 303(d) of the Clean Water Act and 40 CFR 130.2 and 130.7).

Treatment Chemicals – For the purposes of this permit, means polymers, flocculants, or other chemicals used to reduce turbidity in storm water. Tackifier and soil stabilizers (binders) are not considered treatment chemicals.

Uncontaminated – Free from the presence of pollutants attributable to industrial activity.

Water Quality Impaired – See 'Impaired Water'.

Water Quality Standards – For the purposes of this permit, means the Alaska Water Quality Standards (18 AAC 70) as approved by U.S. EPA. As defined in 40 CFR §131.3 water quality standards are provisions of State or Federal law which consist of a designated use or uses for the waters of the United States and water quality criteria for such waters based upon such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act.

Winter Shutdown – The cessation of soil disturbing or soil stabilizing construction activity for the winter. Typically this period is from October/November to April/May and is approximately from fall freeze-up to spring thaw.

"You" and "Your" – as used in this permit are intended to refer to the permittee, the operator, or the discharger as the context indicates and that party's facility or responsibilities. The use of "you" and "your" refers to a particular facility and not to all facilities operated by a particular entity. For example, "you must submit" means the permittee must submit something for that particular facility. Likewise, "all your discharges" would refer only to discharges at that one facility.

APPENDIX D
ACTIVITIES COVERED

Appendix D – Facilities and Activities Covered

Your permit eligibility is limited to discharges from facilities in the "sectors" of industrial activity summarized in Table D-1. These sector descriptions are based on Standard Industrial Classification (SIC) Codes and Industrial Activity Codes. References to "sectors" in this permit (e.g., sector-specific monitoring requirements) refer to these groupings.

Table D-1. Sectors of Industrial Activity Covered by This Permit

Subsector (May be subject to more than one sector/subsector)	SIC Code or Activity Code[1]	Activity Represented
SECTOR A: TIMBER PRODUCTS		
A1	2421	General Sawmills and Planing Mills
A2	2491	Wood Preserving
A3	2411	Log Storage and Handling
A4	2426	Hardwood Dimension and Flooring Mills
	2429	Special Product Sawmills, Not Elsewhere Classified
	2431-2439 (except 2434)	Millwork, Veneer, Plywood, and Structural Wood (see Sector W)
	2448	Wood Pallets and Skids
	2449	Wood Containers, Not Elsewhere Classified
	2451, 2452	Wood Buildings and Mobile Homes
	2493	Reconstituted Wood Products
	2499	Wood Products, Not Elsewhere Classified
A5	2441	Nailed and Lock Corner Wood Boxes and Shook
SECTOR B: PAPER AND ALLIED PRODUCTS		
B1	2631	Paperboard Mills
B2	2611	Pulp Mills
	2621	Paper Mills
	2652-2657	Paperboard Containers and Boxes
	2671-2679	Converted Paper and Paperboard Products, Except Containers and Boxes
SECTOR C: CHEMICALS AND ALLIED PRODUCTS		
C1	2873-2879	Agricultural Chemicals
C2	2812-2819	Industrial Inorganic Chemicals
C3	2841-2844	Soaps, Detergents, and Cleaning Preparations; Perfumes, Cosmetics, and Other Toilet Preparations
C4	2821-2824	Plastics Materials and Synthetic Resins, Synthetic Rubber, Cellulosic and Other Manmade Fibers Except Glass
C5	2833-2836	Medicinal Chemicals and Botanical Products; Pharmaceutical Preparations; in vitro and in vivo Diagnostic Substances; and Biological Products, Except Diagnostic Substances
	2851	Paints, Varnishes, Lacquers, Enamels, and Allied Products
	2861-2869	Industrial Organic Chemicals
	2891-2899	Miscellaneous Chemical Products
C5	3952 (limited to list of inks and paints)	Inks and Paints, Including China Painting Enamels, India Ink, Drawing Ink, Platinum Paints for Burnt Wood or Leather Work, Paints for China Painting, Artist's Paints and Artist's Watercolors
	2911	Petroleum Refining

Table D-1. Sectors of Industrial Activity Covered by This Permit

Subsector (May be subject to more than one sector/subsector)	SIC Code or Activity Code[1]	Activity Represented
SECTOR D: ASPHALT PAVING AND ROOFING MATERIALS AND LUBRICANTS		
D1	2951, 2952	Asphalt Paving and Roofing Materials
D2	2992, 2999	Miscellaneous Products of Petroleum and Coal
SECTOR E: GLASS, CLAY, CEMENT, CONCRETE, AND GYPSUM PRODUCTS		
E1	3251-3259	Structural Clay Products
	3261-3269	Pottery and Related Products
E2	3271-3275	Concrete, Gypsum, and Plaster Products
E3	3211	Flat Glass
	3221, 3229	Glass and Glassware, Pressed or Blown
	3231	Glass Products Made of Purchased Glass
	3241	Hydraulic Cement
	3281	Cut Stone and Stone Products
	3291-3299	Abrasive, Asbestos, and Miscellaneous Nonmetallic Mineral Products
SECTOR F: PRIMARY METALS		
F1	3312-3317	Steel Works, Blast Furnaces, and Rolling and Finishing Mills
F2	3321-3325	Iron and Steel Foundries
F3	3351-3357	Rolling, Drawing, and Extruding of Nonferrous Metals
F4	3363-3369	Nonferrous Foundries (Castings)
F5	3331-3339	Primary Smelting and Refining of Nonferrous Metals
	3341	Secondary Smelting and Refining of Nonferrous Metals
	3398, 3399	Miscellaneous Primary Metal Products
SECTOR G: METAL MINING (ORE MINING AND DRESSING)		
G1	1021	Copper Ore and Mining Dressing Facilities
G2	1011	Iron Ores
	1021	Copper Ores
	1031	Lead and Zinc Ores
	1041, 1044	Gold and Silver Ores
	1061	Ferroalloy Ores, Except Vanadium
	1081	Metal Mining Services
	1094, 1099	Miscellaneous Metal Ores
SECTOR H: COAL MINES AND COAL MINING-RELATED FACILITIES		
H1	1221-1241	Coal Mines and Coal Mining-Related Facilities
SECTOR I: OIL AND GAS EXTRACTION AND REFINING		
I1	1311	Crude Petroleum and Natural Gas
	1321	Natural Gas Liquids
	1381-1389	Oil and Gas Field Services
SECTOR J: MINERAL MINING AND DRESSING		
J1	1442	Construction Sand and Gravel
	1446	Industrial Sand
J2	1411	Dimension Stone
	1422-1429	Crushed and Broken Stone, Including Rip Rap
	1481	Nonmetallic Minerals Services, Except Fuels
	1499	Miscellaneous Nonmetallic Minerals, Except Fuels
J3	1455, 1459	Clay, Ceramic, and Refractory Materials
	1474-1479	Chemical and Fertilizer Mineral Mining

Table D-1. Sectors of Industrial Activity Covered by This Permit

Subsector (May be subject to more than one sector/subsector)	SIC Code or Activity Code[1]	Activity Represented
SECTOR K: HAZARDOUS WASTE TREATMENT, STORAGE, OR DISPOSAL FACILITIES		
K1	HZ	Hazardous Waste Treatment, Storage, or Disposal Facilities, including those that are operating under interim status or a permit under subtitle C of RCRA
SECTOR L: LANDFILLS, LAND APPLICATION SITES, AND OPEN DUMPS		
L1	LF	All Landfill, Land Application Sites and Open Dumps
L2	LF	All Landfill, Land Application Sites and Open Dumps, except Municipal Solid Waste Landfill (MSWLF) Areas Closed in Accordance with 40 CFR 258.60
SECTOR M: AUTOMOBILE SALVAGE YARDS		
M1	5015	Automobile Salvage Yards
SECTOR N: SCRAP RECYCLING FACILITIES		
N1	5093	Scrap Recycling and Waste Recycling Facilities except Source-Separated Recycling
N2	5093	Source-separated Recycling Facility
SECTOR O: STEAM ELECTRIC GENERATING FACILITIES		
O1	SE	Steam Electric Generating Facilities, including coal handling sites
SECTOR P: LAND TRANSPORTATION AND WAREHOUSING		
P1	4011, 4013	Railroad Transportation
	4111-4173	Local and Highway Passenger Transportation
	4212-4231	Motor Freight Transportation and Warehousing
	4311	United States Postal Service
	5171	Petroleum Bulk Stations and Terminals
SECTOR Q: WATER TRANSPORTATION		
Q1	4412-4499	Water Transportation Facilities
SECTOR R: SHIP AND BOAT BUILDING AND REPAIRING YARDS		
R1	3731, 3732	Ship and Boat Building or Repairing Yards
SECTOR S: AIR TRANSPORTATION FACILITIES		
S1	4512-4581	Air Transportation Facilities
SECTOR T: TREATMENT WORKS		
T1	TW	Treatment Works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR Part 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with section 405 of the CWA
SECTOR U: FOOD AND KINDRED PRODUCTS		
U1	2041-2048	Grain Mill Products
U2	2074-2079	Fats and Oils Products
U3	2011-2015	Meat Products
	2021-2026	Dairy Products

Table D-1. Sectors of Industrial Activity Covered by This Permit

Subsector (May be subject to more than one sector/subsector)	SIC Code or Activity Code[1]	Activity Represented
U3	2032-2038	Canned, Frozen, and Preserved Fruits, Vegetables, and Food Specialties
	2051-2053	Bakery Products
	2061-2068	Sugar and Confectionery Products
	2082-2087	Beverages
	2091-2099	Miscellaneous Food Preparations and Kindred Products
	2111-2141	Tobacco Products
SECTOR V: TEXTILE MILLS, APPAREL, AND OTHER FABRIC PRODUCT MANUFACTURING; LEATHER AND LEATHER PRODUCTS		
V1	2211-2299	Textile Mill Products
	2311-2399	Apparel and Other Finished Products Made from Fabrics and Similar Materials
	3131-3199	Leather and Leather Products (note: see Sector Z1 for Leather Tanning and Finishing)
SECTOR W: FURNITURE AND FIXTURES		
W1	2434	Wood Kitchen Cabinets
	2511-2599	Furniture and Fixtures
SECTOR X: PRINTING AND PUBLISHING		
X1	2711-2796	Printing, Publishing, and Allied Industries
SECTOR Y: RUBBER, MISCELLANEOUS PLASTIC PRODUCTS, AND MISCELLANEOUS MANUFACTURING INDUSTRIES		
Y1	3011	Tires and Inner Tubes
	3021	Rubber and Plastics Footwear
	3052, 3053	Gaskets, Packing and Sealing Devices, and Rubber and Plastic Hoses and Belting
	3061, 3069	Fabricated Rubber Products, Not Elsewhere Classified
Y2	3081-3089	Miscellaneous Plastics Products
	3931	Musical Instruments
	3942-3949	Dolls, Toys, Games, and Sporting and Athletic Goods
	3951-3955 (except 3952 – see Sector C)	Pens, Pencils, and Other Artists' Materials
	3961, 3965	Costume Jewelry, Costume Novelties, Buttons, and Miscellaneous Notions, Except Precious Metal
	3991-3999	Miscellaneous Manufacturing Industries
SECTOR Z: LEATHER TANNING AND FINISHING		
Z1	3111	Leather Tanning and Finishing
SECTOR AA: FABRICATED METAL PRODUCTS		
AA1	3411-3499 (except 3479)	Fabricated Metal Products, Except Machinery and Transportation Equipment, and Coating, Engraving, and Allied Services.
	3911-3915	Jewelry, Silverware, and Plated Ware
AA2	3479	Fabricated Metal Coating and Engraving
SECTOR AB: TRANSPORTATION EQUIPMENT, INDUSTRIAL OR COMMERCIAL MACHINERY		
AB1	3511-3599 (except 3571-3579)	Industrial and Commercial Machinery, Except Computer and Office Equipment (see Sector AC)

Table D-1. Sectors of Industrial Activity Covered by This Permit

Subsector (May be subject to more than one sector/subsector)	SIC Code or Activity Code[1]	Activity Represented
AB1	3711-3799 (except 3731, 3732)	Transportation Equipment Except Ship and Boat Building and Repairing (see Sector R)
SECTOR AC: ELECTRONIC, ELECTRICAL, PHOTOGRAPHIC, AND OPTICAL GOODS		
AC1	3571-3579	Computer and Office Equipment
	3812-3873	Measuring, Analyzing, and Controlling Instruments; Photographic and Optical Goods, Watches, and Clocks
	3612-3699	Electronic and Electrical Equipment and Components, Except Computer Equipment
SECTOR AD: NON-CLASSIFIED FACILITIES		
AD1	Other stormwater discharges designated by the Director as needing a permit (see 40 CFR 122.26(a)(9)(i)(C) & (D)) or any facility discharging stormwater associated with industrial activity not described by any of Sectors A-AC. NOTE: Facilities may not elect to be covered under Sector AD. Only the Director may assign a facility to Sector AD.	

[1] A complete list of SIC Codes (and conversions from the newer North American Industry Classification System" (NAICS)) can be obtained from the Internet at www.census.gov/epcd/www/naics.html or in paper form from various locations in the document titled *Handbook of Standard Industrial Classifications*, Office of Management and Budget, 1987.

Appendix E
Calculating Hardness in Receiving Waters for Hardness Dependent Metals

Appendix E – Calculating Hardness in Receiving Waters for Hardness Dependent Metals

E.1 Overview

DEC adjusted the benchmarks for six hardness-dependent metals (i.e., cadmium, copper, lead, nickel, silver, and zinc) to further ensure compliance with water quality standards and provide additional protection for endangered species and their critical habitat. For any sectors required to conduct benchmark samples for a hardness-dependent metal, DEC includes 'hardness ranges' from which benchmark values are determined. To determine which hardness range to use, you must collect data on the hardness of your receiving water(s). Once the site-specific hardness data have been collected, the corresponding benchmark value for each metal is determined by comparing where the hardness data fall within 25 mg/L ranges, as shown in Table E.1.

Table E.1: Hardness Ranges to Be Used to Determine Benchmark Values for Cadmium, Copper, Lead, Nickel, Silver, and Zinc.

	Benchmark Values (mg/L, total)					
Hardness (mg/L)	**Cadmium**	**Copper**	**Lead**	**Nickel**	**Silver**	**Zinc**
0 - 25	0.0005	0.0038	0.014	0.15	0.0007	0.04
25 - 50	0.0008	0.0056	0.023	0.20	0.0007	0.05
50 - 75	0.0013	0.0090	0.045	0.32	0.0017	0.08
75 - 100	0.0018	0.0123	0.069	0.42	0.0030	0.11
100 - 125	0.0023	0.0156	0.095	0.52	0.0046	0.13
125 - 150	0.0029	0.0189	0.122	0.61	0.0065	0.16
150 - 175	0.0034	0.0221	0.151	0.71	0.0087	0.18
175 - 200	0.0039	0.0253	0.182	0.80	0.0112	0.20
200 - 225	0.0045	0.0285	0.213	0.89	0.0138	0.23
225 - 250	0.0050	0.0316	0.246	0.98	0.0168	0.25
250+	0.0053	0.0332	0.262	1.02	0.0183	0.26

E.2 How to Determine Hardness for Hardness-Dependent Parameters.

You may select one of three methods to determine hardness, including; individual grab sampling, grab sampling by a group of operators which discharge to the same receiving water, or using third-party data. Regardless of the method used, you are responsible for documenting the procedures used for determining hardness values. Once the hardness value is established, you are required to include this information in your first benchmark report submitted to DEC so that the Department can make appropriate comparisons between your benchmark monitoring results and the corresponding benchmark. You must retain all report and monitoring data in accordance with Part 9.5 of the permit. The three method options for determining hardness are detailed in the following sections.

(1) Permittee Samples for Receiving Stream Hardness

This method involves collecting samples in the receiving water and submitting these to a laboratory for analysis. If you elect to sample your receiving water(s) and submit samples for analysis, hardness must be determined from the closest intermittent or perennial stream downstream of your point of discharge.

The sample can be collected during either dry or wet weather. Collection of the sample during wet weather is more representative of conditions during stormwater discharges; however, collection of in-stream samples during wet weather events may be impracticable or present safety issues.

Hardness must be sampled and analyzed using approved methods as described in 40 CFR Part 136 (Guidelines Establishing Test Procedures for the Analysis of Pollutants).

(2) Group Monitoring for Receiving Stream Hardness

You can be part of a group of permittees discharging to the same receiving waters and collect samples that are representative of the hardness values for all members of the group. In this scenario, hardness of the receiving water must be determined using 40 CFR Part 136 procedures and the results shared by group members. To use the same results, hardness measurements must be taken on a stream reach within a reasonable distance of the discharge points of each of the group members.

(3) Collection of Third-Party Hardness Data

You can submit receiving stream hardness data collected by a third party provided the results are collected consistent with the approved 40 CFR Part 136 methods. These data may come from a local water utility, previously conducted stream reports, TMDLs, peer reviewed literature, other government publications, or data previously collected by the permittee. Data should be less than 10 years old.

Water quality data for many of the nation's surface waters are available on-line or by contacting EPA or a state environmental agency. EPA's data system STORET, short for STOrage and RETrieval, is a repository for receiving water quality, biological, and physical data and is used by state environmental agencies, EPA and other federal agencies, universities, private citizens, and many others. Similarly, state environmental agencies and the U.S. Geological Service (USGS) also have water quality data available that, in some instances, can be accessed online. "Legacy STORET" codes for hardness include: 259 hardness, carbonate; 260 hardness, noncarbonated; and 261 calcium + magnesium, while more recent, "Modern STORET" data codes include: 00900 hardness, 00901 carbonate hardness, and 00902 noncarbonate hardness; or the discrete measurements of calcium (00915) and magnesium (00925) can be used to calculate hardness. Hardness data historically has been reported as "carbonate," "noncarbonate," or "Ca + Mg." If these are unavailable, then individual results for calcium (Ca) and magnesium (Mg) may be used to calculate hardness using the following equation:

$$\frac{mg}{L}CAO_3 = 2.497\left(Ca\frac{mg}{L}\right) + 4.118\left(Mg\frac{mg}{L}\right)$$

When interpreting the data for carbonate and non-carbonate hardness, note that total hardness is equivalent to the sum of carbonate and noncarbonate hardness if both forms are reported. If only carbonate hardness is reported, it is more than likely that noncarbonate hardness is absent and the total hardness is equivalent to the available carbonate hardness.

Appendix F – MSGP Forms

Notice of Intent (NOI) Form

To obtain coverage under this permit, you must submit a Notice of Intent (NOI). You must submit an NOI using either:

(1) DEC's Electronic Notice of Intent (eNOI) system, available at http://dec.alaska.gov/water/wastewater/stormwater/apdesenoi/, or

(2) file a paper copy of the NOI.

Notice of Termination (NOT) Form

To terminate coverage under this permit, you must submit a Notice of Termination (NOT). You must either

(1) terminate coverage using DEC's online eNOI system, available at http://dec.alaska.gov/water/wastewater/stormwater/apdesenoi/ or

(2) file a paper copy of the NOT.

The following forms are available at:

http://dec.alaska.gov/water/wastewater/stormwater/forms

- Notice of Intent (NOI) Form
- Notice of Termination (NOT) Form
- Annual Report Form
- Corrective Action Form
- NOI Modification Form
- No Exposure Certification Form
- Noncompliance Notification Form
- MSGP Industrial Discharge Monitoring Report (DMR)

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity under the APDES Multi-Sector General Permit (MSGP)

Facility Information

Facility Name:

Have storm water discharges from your site been covered previously under an APDES Permit? ☐ Yes ☐ No

If Yes, provide the permit authorization number: _____

Street Location

Street:	Borough or similar government subdivision		
City:		State: Alaska	Zip:
Latitude:	Longitude:	Determined By: ☐ GPS ☐ Internet Map Service ☐ Other:	

Estimated area of industrial activity at your site exposed to storm water: _____ (acres)

Briefly describe the nature of the industrial activities at the facility:

Identify the 4-digit Standard Industrial Classification (SIC) code or 2-letter Activity Code that best represents the products produced or services rendered for which your facility is primarily engaged, as defined in the MSGP.

Primary SIC Code: _____ or Primary Activity Code: _____

Is your site presently inactive or unstaffed?* ☐ Yes ☐ No

** Note that if your facility becomes inactive and unstaffed during the permit term, you must submit an NOI modification to reflect the change.*

If Yes, is your site expected to be inactive and unstaffed for the entire permit term? ☐ Yes ☐ No

If No, indicate the length of time that you expect your facility to be inactive and unstaffed. _____

Federal Effluent Limitation Guidelines and Sector-Specific Requirements

Are you requesting permit coverage for storm water discharges subject to effluent limitation guidelines? ☐ Yes ☐ No

If yes, which effluent limitation guidelines apply to your storm water discharge?

40 CFR Part/Subpart	Eligible Discharges	Affected MSGP Sector	Check if applicable
Part 411, Subpart C	Runoff from material storage piles at cement manufacturing facilities.	E	☐
Part 418, Subpart A	Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished products, by-products, or waste products (SIC 2874).	C	☐
Part 423	Coal pile runoff at steam electric generating facilities.	O	☐
Part 429, Subpart I	Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas.	A	☐
Part 436, Subpart B, C, or D	Mine dewatering discharges at crushed stone mines, construction sand and gravel mines, or industrial sand mines.	J	☐
Part 443, Subpart A	Runoff from asphalt emulsion facilities.	D	☐
Part 445, Subparts A & B	Runoff from hazardous waste and non-hazardous waste landfills.	K, L	☐
Part 449, Subpart A	Runoff from Air Transportation	S	☐

If you are a Sector S (Air Transportation facility, do you anticipate using more than 100,000 gallons of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis? ☐ Yes ☐ No

Identify the applicable sector(s) and subsector(s) of industrial activity, including co-located industrial activity, for which you are requesting coverage:

Sector	Subsector	Sector	Subsector	Sector	Subsector	Sector	Subsector	Sector	Subsector	Sector	Subsector

Discharge Information

Does your facility discharge into a Municipal Separate Storm Sewer System (MS4)? ☐ Yes ☐ No
If Yes, provide the name of the MS4 Operator: ____________________________

If you are subject to benchmark monitoring requirements for a hardness-dependent metal:
– What is the hardness of your receiving water(s) (See Appendix E)? ____________
– Does your facility discharge into any saltwater receiving waters? ☐ Yes ☐ No

Outfalls: *(Attach a separate list if necessary)*

List all of the storm water outfalls from your facility. Each outfall must be identified by a unique 3-digit ID (e.g., 001, 002). Also provide the latitude and longitude in decimal degrees for each outfall.		**For each outfall, provide the following receiving water information:** Provide the name of the first water of the U.S. that receives storm water directly from the outfall and/or from the MS4 that the outfall discharges to:	If the receiving water is impaired (on the CWA 303(d) list), list the pollutants that are causing the impairment:	Are the pollutant(s) causing the impairment present in your discharge? Yes	No	If a TMDL has been completed for this receiving waterbody, provide the following information:
Outfall ID	001A			☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						
Outfall ID				☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						
Outfall ID				☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						
Outfall ID				☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						
Outfall ID				☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						

Operator Information

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

Mailing Address ☐ Check if same as Operator Information	Street (PO Box)		
	City	State	Zip

Storm Water Pollution Prevention Plan (SWPPP) Contact / Location Information

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

Mailing Address ☐ Check if same as Operator Information	Street (PO Box)		
	City	State	Zip

Universal Resource Locator or URL:

Billing Contact / Location Information

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

Mailing Address ☐ Check if same as Operator Information	Street (PO Box)		
	City	State	Zip

NOI Preparer Contact / Location Information *(Complete if NOI was prepared by someone other than the Certifier)*

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

Mailing Address ☐ Check if same as Operator Information	Street (PO Box)		
	City	State	Zip

Document Attachments

Documents attached with this application:

☐ Storm Water Pollution Prevention Plan (SWPPP)

☐ Other:

Certification Information

An Alaska Pollutant Discharge Elimination System (APDES) permit application or report must be signed by an individual with the appropriate authority per 18 AAC 83.385. For additional information, please refer to 18 AAC 83.385 at the following link: http://www.legis.state.ak.us/basis/aac.asp#18.83.385.

Corporate Executive Officer 18 AAC 83.385 (a)(1)(A)	For a corporation, a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation.
Corporate Operations Manager 18 AAC 83.385 (a)(1)(B)	For a corporation, the manager of one or more manufacturing, production, or operating facilities, if (i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations; (ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and (iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
Sole Proprietor or General Partner 18 AAC 83.385 (a)(2)	For a partnership or sole proprietorship, the general partner or the proprietor respectively.
Public Agency, Chief Executive Officer 18 AAC 83.385 (a)(3)(A)	For a municipality, state, or other public agency, the chief executive officer of the agency.
Public Agency, Senior Executive Officer 18 AAC 83.385 (a)(3)(B)	For a municipality, state, or other public agency, a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

Any report required by an APDES permit, and a submittal with any other information requested by the department, must be signed by a person described in above, or by a duly authorized representative of that person.
**For Delegated Authority: the delegation must be made in writing and submitted to the DEC.*
Your signature will not be approved until DEC receives the written delegation.
An Example of written authorization delegating authority can be found on the Division of Water website:
http://dec.alaska.gov/media/13316/delegation-of-signatory-authority.pdf

Operations Manager *(Delegated Authority)** 18 AAC 83.385 (b)(2)(A)	For a duly authorized representative, an individual or a position having responsibility for the overall operation of the regulated facility or activity, including the position of plant manager, operator of a well or a well field, superintendent or position of equivalent responsibility.
Environmental Manager *(Delegated Authority)** 18 AAC 83.385 (b)(2)(B)	For a duly authorized representative, an individual or position having overall responsibility for environmental matters for the company.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Organization:	Name:	Title:

Phone:	Fax (optional):	Email:

Mailing Address: ☐ Check if same as Operator Information	Street (PO Box):		
	City:	State:	Zip:

Signature/Responsible Official

Date

Instructions for Completing the Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity under the Multi-Sector General Permit (MSGP)

Who must file a NOI?

Under section 402(p) of the Clean Water Act (CWA) and regulations at 40 CFR Part 122.26, adopted by reference at 18 AAC 83.010 (3) storm water discharges associated with industrial activity are prohibited to waters of the United States unless authorized under an Alaska Pollutant Discharge Elimination System (APDES) permit. You can obtain coverage under the MSGP by submitting a completed NOI if you operate a facility that:

- is located in a jurisdiction where DEC is the permitting authority, listed in Part 1.1 of the MSGP;
- discharges storm water associated with industrial activities, identified in Appendix D of the MSGP;
- meet the eligibility requirements in Part 1.2 of the permit;
- develop a storm water pollution prevention plan (SWPPP) in accordance with Part 5 of the MSGP; and
- install and implement control measures in accordance with Part 4 to meet numeric and non-numeric effluent limits.

If you are unsure if you need an APDES storm water permit, contact your APDES storm water permit program. Contacts are listed at:

http://dec.alaska.gov/water/wastewater/stormwater/

One NOI must be submitted for each facility or site for which you are seeking permit coverage. You do not need to submit separate NOIs for each type of industrial activity present at your facility, provided your SWPPP covers all activities.

When to File the NOI Form

Do not file your NOI until you have obtained and thoroughly read a copy of the MSGP. A copy of the MSGP is located on the DEC website (http://dec.alaska.gov/water/wastewater/stormwater/multisector/). The MSGP describes procedures to ensure your eligibility, prepare your SWPPP, install and implement appropriate storm water control measures, and complete the NOI form questions – all of which must be done before you sign the NOI certification statement attesting to the accuracy and completeness of your NOI. You will also need a copy of the MSGP once you have obtained coverage so that you can comply with the implementation requirements of the permit.

Completing the NOI Form

To complete this form, type or print in the appropriate areas only. Please make sure you complete all questions. Make sure you make a photocopy for your records before you send the completed form to the address below. You may also use this paper form as a checklist for the information you will need when filing an NOI electronically via DEC's OASys system. http://dec.alaska.gov/water/oasys.aspx.

Facility Information

Enter the facility's official or legal name. Unless the name of your facility has changed, please use the same name provided on prior NOIs or permit applications.

Indicate if industrial storm water discharges from your facility were previously covered by an APDES permit.

If your facility was previously covered by the MSGP, please include the tracking number that you received in your confirmation letter or email from DEC's Storm water Program. You can find the tracking number assigned to your previous NOI on DEC's Online Permit Search: http://dec.alaska.gov/Applications/Water/WaterPermitSearch/search.

Enter the street address, including city, state, zip code, borough or similar government subdivision of the actual physical location of the facility. Do NOT use a P.O. Box.

Provide the facility latitude and longitude in decimal degrees format. You can obtain your facility's latitude and longitude though Global Positioning System (GPS) receivers, internet map service, U.S. Geological Survey (USGS) quadrangle or topographic maps, or EPA's web-based siting-tools, among other methods. For consistency, DEC requests that measurements be taken from the approximate center of the facility. Specify which method you used to determine latitude and longitude.

Identify the data source that you used to determine the facility latitude and longitude. If you did not use a USGS quadrangle or topographic map or GPS receivers, then select "Other" and write the method used on the line provided. If you used a USGS quadrangle or topographic map, write the map scale on the line provided. Scale should be identified on the map.

Enter the estimated area of industrial activity at your site exposed to storm water, in acres.

Briefly describe the nature of the industrial activities present at your facility.

Indicate whether your facility is currently inactive and unstaffed. If so then indicate whether your facility will be inactive and unstaffed for the entire permit term; or, if not, specify the specific length of time in units of days, weeks, months, or years (e.g. 3 months) that you expect the facility to be inactive and unstaffed.

Federal Effluent Limitation Guidelines and Sector-Specific Requirements

Depending on your industrial activities, your facility may be subject to effluent limitation guidelines which include additional effluent limits and monitoring requirements for your facility. Please review these requirements, described in Part 4.3 of the MSGP and check any appropriate boxes on the NOI form.

For Sector S facilities (Air Transportation), indicate whether you anticipate that the entire airport facility will use more than 100,000 gallons of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis. If so, additional effluent limits and monitoring conditions apply to your discharge (see Part 11 Sector S of the MSGP).

List the four-digit Standard Industrial Classification (SIC) code and/or two character activity code that best describes the primary industrial activities performed by your facility under which you are required to obtain permit coverage. Your primary industrial activity includes any activities performed on-site which are (1) identified by the facility's one SIC code for which the facility is primarily engaged; and (2) included in the narrative descriptions of 40 CFR 122.26(b)(14)(i), (iv), (v), or (vii), and (ix). See Appendix D of the MSGP for a complete list of SIC codes and activities codes.

If your site has co-located industrial activities that are not identified as your primary industrial activity, identify the sector and subsector codes that describe these other industrial activities. For a complete list of sector and subsector codes, see Appendix D of the MSGP.

Discharge Information

Receiving Waters and Wetlands

You must identify all the outfalls from your facility that discharge storm water. Each outfall must be assigned a unique 3-digit ID (e.g., 001, 002, 003). You must also provide the latitude and longitude for each outfall from your facility. Indicate whether any outfalls are substantially identical to an outfall already listed, and identify the outfall it is identical to. For each unique outfall you list, you must specify the name of the first water of the U.S. that receives storm water directly from the outfall and/or the Municipal Separate Storm Sewer System (MS4) that the outfall discharges to.

Your receiving water may be a lake, stream, river, ocean, wetland, or other waterbody, and may or may not be located adjacent to your facility. Your storm water may discharge directly to the receiving water or indirectly via a storm sewer system, an open drain or ditch, or other conveyance structure. Do NOT list a man-made conveyance, such as a storm sewer system, as your receiving water. Indicate the first receiving water your storm water discharge enters. For example, if your discharge enters a storm sewer system that empties into Trout Creek, which flows into Pine River, your receiving water is Trout Creek, because it is the first waterbody your discharge will reach. Similarly, a discharge into a ditch that feeds Spring Creek should be identified as “Spring Creek” since the ditch is a manmade conveyance. If you discharge into a MS4, you must identify the waterbody into which that portion of the storm sewer discharges and also provide the name of the MS4 operator. That information should be readily available from the operator of the MS4. If you are uncertain of the MS4 operator, contact DEC Division of Water for that information.

You must specify whether any receiving waters that you discharge to are listed as “impaired” as defined in Appendix C, and the pollutants for which the water is impaired. You must also check/identify any Total Maximum Daily Loads (TMDL) that have been completed for any of the waters of the U.S. that you discharge to. You must also provide information about the outfall latitude/ longitude. Further information regarding impaired waters and TMDLs can be found at http://dec.alaska.gov/water/water-quality/impaired-waters.

If you are subject to any benchmark monitoring requirements for metals (see the requirements applicable to your Sector(s) in Part 11 of the permit), indicate the hardness for your receiving water(s). See Appendix E of the permit for information about determining waterbody hardness.

If you are subject to benchmark monitoring requirements for hardness-dependent metals, you must also answer whether your facility discharges into any saltwater receiving waters.

Operator Information

Provide the name of the contact person and the legal name of the firm, public organization, or any other public entity that operates the facility described in this application. An operator of a facility is a legal entity that controls the operation of the facility.

Provide the operator’s mailing address, telephone number, fax number (optional), and email address. Correspondence will be sent to this address.

Storm Water Pollution Prevention Plan (SWPPP) Contact Information

Identify the name, telephone number, and email address of the person who will serve as a contact for DEC on issues related to storm water management at your facility. This person should be able to answer questions related to storm water discharges, the SWPPP, and other issues related to storm water permit coverage or have immediate access to individuals with that knowledge. This person does not have to be the facility operator but should have intimate knowledge of storm water management activities at the facility.

If you are making your SWPPP publicly available on a website, provide the appropriate Internet URL address.

Billing Contact Information

Provide the name of the contact person and the legal name of the firm, public organization, or any other public entity that is responsible for accounts payable for this facility.

Provide the billing contact’s mailing address, telephone number, fax number (optional), and email address. Correspondence for billing purposes will be sent to this address. If the billing contact address is the same as the operator, check the box and continue to Section III Facility Information. See 18 AAC 72.956 for applicable authorization fee to be paid with the submittal of the NOI.

Certification Information

The NOIs, must be signed as follows:

(1) For a corporation, a responsible corporate officer shall sign the NOI, a responsible corporate officer means:

  (A) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or

  (B) the manager of one or more manufacturing, production, or operating facilities, if

    (i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations;

    (ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and

    (iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship, the general partner or the proprietor, respectively; or

(3) for a municipality, state, or other public agency, either a principal executive officer or ranking elected official shall sign the application; in this subsection, a principal executive officer of an agency means

  (A) the chief executive officer of the agency; or

  (B) a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

Include the name, title, organization, and email address of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered valid application for permit coverage.

If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the facility SWPPP contact or a consultant for the certifier's signature), include the name, organization, telephone number, and email address of the NOI preparer.

Where to File the NOI Form

DEC encourages you to complete the NOI form and SWPPP electronically via the Internet. DEC's Online Application System (OASys) can be found at http://dec.alaska.gov/water/oasys.aspx. Filing electronically is the fastest way to obtain permit coverage and help ensure that your NOI is complete. If you choose not to file electronically, you must send the NOI to the address listed below.

If you file by mail, remember to retain a copy for your records.

NOIs sent by mail:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
Storm Water NOI
555 Cordova Street
Anchorage, AK 99501
Phone: (907) 269-6285
dec.water.wqpermit@alaska.gov

Your SWPPP needs to be submitted with the NOI as required in Part 5 of the MSGP. You must keep a copy of your SWPPP on-site or otherwise make it available to facility personnel responsible for implementing provisions of the permit.

For Agency Use

Permit #_____

Notice of Termination (NOT) of Coverage for Storm Water Discharges Associated with Industrial Activity under an APDES General Permit

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with industrial activity under the APDES program for the facility identified in Section III of this form. All necessary information must be included on the form. The NOT must be submitted within 30 days of one of the conditions in Section 10 of the MSGP being met. Refer to the instructions at the end of this form for information on submitting a Notice of Termination.

I. Permit Information

Permit Tracking Number:

Reason for Termination (Check only one):

- ☐ You transferred operational control to another operator.
- ☐ You no longer have storm water discharge associated with industrial activity subject to regulation under the APDES program, and you have already implemented necessary sediment and erosion controls as required by Part 4.2.5.
- ☐ You are a Sector G, H, or J facility and you have met the applicable termination requirements.
- ☐ You obtained coverage under an alternative APDES permit.

☐ All required reports (including DMR if applicable) and certifications have been submitted to DEC.

II. Operator Information

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:
Mailing Address — Street (PO Box)		
City	State	Zip

III. Facility Information

Facility Name:

Location Address:

City: State: Alaska Zip:

Borough or Similar Government Subdivision:

IV. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Organization:	Name:	Title:
Phone:	Fax (optional):	Email:
Mailing Address: ☐ Check if same as Operator Information — Street (PO Box):		
City:	State:	Zip:

_____ Signature/Responsible Official

_____ Date

Instructions for Completing a Notice of Termination Form for Storm Water Discharges Associated with INDUSTRIAL ACTIVITY under the Multi-Sector General Permit (MSGP)

Who May File Notice of Termination (NOT) Form
A permittee currently covered by Alaska's APDES Storm water Multi-Sector General Permit may submit a Notice of Termination (NOT) form. You must submit an NOT within 30 days after one or more of the following conditions have been met:

- *a new owner or operator has assumed responsibility for the facility;*
- *you have ceased operations at the facility and there are nt or no longer will be discharges of storm water associated with industrial activity from the facility, and you have already implemented necessary sediment and erosion controls as required by Part 4.2.5;*
- *you are a Sector G, H, or J facility, and you have met the applicable termination requirements; or*
- *you have obtained coverage under an individual or alternative general permit for all discharges required to be covered by an APDES permit.*

See the MSGP Part 10 for more information.

Completing the Form

Type or print, in the appropriate areas only. "NA" can be entered in areas that are not applicable. If you have any questions about how or when to use this form, contact the DEC Storm Water Program at (907) 269-6285 or online at http://dec.alaska.gov/water/wastewater/stormwater/.

Section I. Permit Information
Enter the existing APDES Storm water General Permit Tracking Number assigned to the facility by DEC's Storm Water Program. If you do not know the tracking number, you can find the tracking number assigned to your facility on DEC's Water Permit Search
http://dec.alaska.gov/Applications/Water/WaterPermitSearch//Search.aspx.

Indicate your reason for submitting the NOT by checking the appropriate box. (See MSGP Part 10 for more information) Check only one box.

Section II. Operator Information
Provide the legal name of the person, firm, public organization, or any other entity that operates the facility described in this application and is covered by the permit tracking number identified in Section I. The operator is the legal entity that controls the facility's operation, rather than the site manager. Enter the operator's complete mailing address, telephone number, email address, and. the fax number (optional) of the operator.

Section III. Facility Information
Enter the official or legal name and complete street address, including city, state, zip code, and borough or similar government subdivision of the facility.

Section IV. Certification Information
The NOTs, must be signed as follows:

(1) For a corporation, a responsible corporate officer shall sign the NOT, a responsible corporate officer means:

(A) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or

(B) the manager of one or more manufacturing, production, or operating facilities, if

(i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations;

(ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and

(iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship, the general partner or the proprietor, respectively; or

(3) for a municipality, state, or other public agency, either a principal executive officer or ranking elected official shall sign the application; in this subsection, a principal executive officer of an agency means

(A) the chief executive officer of the agency; or

(B) a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Where to File NOT form
DEC encourages you to complete the NOT form electronically via the Internet. DEC's Online Application System (OASys) can be found at http://dec.alaska.gov/water/oasys.aspx .Filing electronically is the fastest way to terminate permit coverage and help ensure that your NOT is complete. If you choose not to file electronically, you must send the NOT to the address listed below.

If you file by mail, please remember to retain a copy for your records.

NOTs sent by mail:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501
Phone: (907) 269-6285

For Agency Use
Permit Tracking #: _____

Alaska Department of Environmental Conservation
MSGP Annual Reporting Form

Section I. General Information

Facility Name	APDES Permit Tracking Number

Facility Physical Address

Street	City	State	Zip Code
		Alaska	

Contact Person	Title	Phone	Email

Lead Inspector's Name	Additional Inspector's Name	Additional Inspector's Name	Inspection Date

Section II. General Inspection Findings

1. As part of this comprehensive site inspection, did you inspect all potential pollutant sources, including areas where industrial activity may be exposed to storm water? ☐ Yes ☐ No

   If NO, describe why not:

***Note**: Complete Section III of this form for each industrial activity area inspected and included in your SWPPP or as newly defined, in Section II parts 2 and 3 below, where pollutants may be exposed to storm water.*

2. Did this inspection identify any storm water or non-storm water outfalls not previously identified in your SWPPP? ☐ Yes ☐ No

   If YES, for each location, describe the sources of those storm water and non-storm water discharges and any associated control measures in place:

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3. Did this inspection identify any sources of storm water or non-storm water discharges not previously identified in your SWPPP? ☐ Yes ☐ No

   If YES, describe these sources of storm water or non-storm water pollutants expected to be present in these discharges, and any control measures in place:

4. Did you review storm water monitoring data as part of this inspection to identify potential pollutant hotspots? ☐ Yes ☐ No ☐ NA, no monitoring performed

   If YES, summarize the findings of that review and describe any additional inspection activities resulting from this review:

5. Describe any evidence of pollutants entering the drainage system or discharging to surface waters, and the condition of and around outfalls, including flow dissipation measure to prevent scouring:

6. Have you taken or do you plan to take corrective actions, as specified in Part 8 of the permit, since your last annual report submission (or since you received authorization to discharge under this permit if this is your first annual report), including any corrective actions identified as a result of this annual comprehensive site inspection? ☐ Yes ☐ No

   If YES, how many conditions requiring review for corrective action as specified in Parts 8.1 and 8.2 of the MSGP were addressed by these corrective actions?

***Note**: Complete the attached Corrective Action Form (Section IV) for each condition identified, including any conditions identified as a result of this comprehensive storm water inspection.*

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Section III. Industrial Activity Area Specific Findings

***Complete one block for each industrial activity area where pollutants may be exposed to storm water**. Copy this page for additional industrial activity areas. In reviewing each area, you should consider:*

- *Industrial materials, residue, or trash that may have or could come into contact with storm water;*
- *Leaks or spills from industrial equipment, drums, tanks, and other containers;*
- *Offsite tracking of industrial or waste materials from areas of no exposure to exposed areas; and*
- *Tracking or blowing of raw, final, or waste material from areas of no exposure to exposed areas.*

Industrial Activity Area:

1. Brief Description:

2. Are any control measures in need of maintenance or repair?	☐ Yes	☐ No
3. Have any control measures failed and require replacement?	☐ Yes	☐ No
4. Are any additional/revised control measures necessary in this area?	☐ Yes	☐ No

If YES, to any of these three questions, provide a description of the problem: *(Any necessary corrective actions should be described on the attached Corrective Action Form.)*

Industrial Activity Area:

1. Brief Description:

2. Are any control measures in need of maintenance or repair?	☐ Yes	☐ No
3. Have any control measures failed and require replacement?	☐ Yes	☐ No
4. Are any additional/revised control measures necessary in this area?	☐ Yes	☐ No

If YES, to any of these three questions, provide a description of the problem: *(Any necessary corrective actions should be described on the attached Corrective Action Form.)*

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Industrial Activity Area:

1. Brief Description:

2. Are any control measures in need of maintenance or repair?	☐	Yes	☐	No
3. Have any control measures failed and require replacement?	☐	Yes	☐	No
4. Are any additional/revised control measures necessary in this area?	☐	Yes	☐	No

If YES, to any of these three questions, provide a description of the problem: *(Any necessary corrective actions should be described on the attached Corrective Action Form.)*

Industrial Activity Area:

1. Brief Description:

2. Are any control measures in need of maintenance or repair?	☐	Yes	☐	No
3. Have any control measures failed and require replacement?	☐	Yes	☐	No
4. Are any additional/revised control measures necessary in this area?	☐	Yes	☐	No

If YES, to any of these three questions, provide a description of the problem: *(Any necessary corrective actions should be described on the attached Corrective Action Form.)*

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Permit Tracking #: _____

Section IV. Corrective Actions

Complete this page for each specific condition requiring a corrective action or a review determining that no corrective action is needed. Copy this page for additional corrective actions or reviews.

Include both corrective actions that have been initiated or completed since the last annual report, and future corrective actions needed to address problems identified in the comprehensive storm water inspection. Include an update on any outstanding corrective actions that had not been completed at the time of your previous annual report.

1. Corrective Action # of for this reporting period.

2. Is this corrective action:
   - ☐ An update on a corrective action from a previous annual report; or
   - ☐ A new corrective action?

3. Identify the condition(s) triggering the need for this review:
   - ☐ Unauthorized release of discharge
   - ☐ Numeric effluent limitation exceedance
   - ☐ Control measures inadequate to meet applicable water quality standards
   - ☐ Control measures inadequate to meet non-numeric effluent limitations
   - ☐ Control measures not properly operated or maintained
   - ☐ Change in facility operations necessitated change in control measures
   - ☐ Average benchmark value exceedance
   - ☐ Other (describe):

4. Briefly describe the nature of the problem identified:

5. Date problem identified:

6. How problem was identified:
   - ☐ Comprehensive site inspection
   - ☐ Quarterly visual assessment
   - ☐ Routine facility inspection
   - ☐ Notification by EPA or DEC
   - ☐ Other (describe):

7. Description of corrective action(s) taken or to be taken to eliminate or further investigate the problem (e.g., describe modifications or repairs to control measures, analysis to be conducted, etc.) or if no modification is needed, basis for that determination.

8. Did/will this corrective action require modification of your SWPPP? ☐ Yes ☐ No

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9. Date corrective action initiated:	
10. Date corrective action completed:	Or expected to be completed:
11. If corrective action not yet completed, provide the status of the corrective action as the time of the comprehensive site inspections and describe any remaining steps (including timeframes associated with each step) necessary to complete the corrective action:	

Section V. Annual Report Certification

Compliance Certification

Do you certify that your annual inspection has met the requirements of Part 6.3 of the permit, and that, based upon the results of this inspection, to the best of your knowledge, you are in compliance with the permit? ☐ Yes ☐ No

If NO, summarize why you are not in compliance with the permit:

Annual Report Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those person directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name of Authorized Representative	Title	Email
Signature		Date Signed

For Agency Use

Permit Tracking #: _____

Alaska Department of Environmental Conservation
MSGP Corrective Action Form

Section I. General Information

Facility Name	APDES Permit Tracking Number

Facility Physical Address

Street	City	State	Zip Code
		Alaska	

Contact Person	Title	Phone	Email

Lead Inspector's Name	Additional Inspector's Name	Additional Inspector's Name	Inspection Date

Section II. Corrective Actions

Complete this page for each specific condition requiring a corrective action or a review determining that no corrective action is needed. Copy this page for additional corrective actions or reviews.

Include both corrective actions that have been initiated or completed since the last annual report, and future corrective actions needed to address problems identified in the comprehensive storm water inspection. Include an update on any outstanding corrective actions that had not been completed at the time of your previous annual report.

1. Corrective Action # of for this reporting period.

2. Is this corrective action:
   - ☐ An update on a corrective action from a previous annual report; or
   - ☐ A new corrective action?

3. Identify the condition(s) triggering the need for this review:
   - ☐ Unauthorized release of discharge
   - ☐ Numeric effluent limitation exceedance
   - ☐ Control measures inadequate to meet applicable water quality standards
   - ☐ Control measures inadequate to meet non-numeric effluent limitations
   - ☐ Control measures not properly operated or maintained
   - ☐ Change in facility operations necessitated change in control measures
   - ☐ Average benchmark value exceedance
   - ☐ Other (describe):

4. Briefly describe the nature of the problem identified:

5. Date problem identified:

6. How problem was identified:
   - ☐ Comprehensive site inspection
   - ☐ Quarterly visual assessment
   - ☐ Routine facility inspection
   - ☐ Notification by EPA or DEC
   - ☐ Other (describe):

For Agency Use

Permit Tracking #: _____

7. Description of corrective action(s) taken or to be taken to eliminate or further investigate the problem (e.g., describe modifications or repairs to control measures, analysis to be conducted, etc.) or if no modification is needed, basis for that determination.

8. Did/will this corrective action require modification of your SWPPP? ☐ Yes ☐ No

9. Date corrective action initiated:

10. Date corrective action completed: Or expected to be completed:

11. If corrective action not yet completed, provide the status of the corrective action as the time of the comprehensive site inspections and describe any remaining steps (including timeframes associated with each step) necessary to complete the corrective action:

Section III. Certification

Do you certify that your annual inspection has met the requirements of Part 6.3 of the permit, and that, based upon the results of this inspection, to the best of your knowledge, you are in compliance with the permit? ☐ Yes ☐ No

If NO, summarize why you are not in compliance with the permit:

Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those person directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name of Authorized Representative | Title | Email

Signature | Date Signed

Notice of Intent (NOI) Modification Form for Storm Water Discharges Associated with Industrial Activity under the APDES Multi-Sector General Permit (MSGP)

Current NOI Information (Please copy content exactly from your NOI. Indicate changes on the next pages.)

Permit Number:

Facility Information (as it appears on your NOI):

Facility Name:			
Street Location	Street:	Borough or similar government subdivision	
	City:	State: Alaska	Zip:
	Latitude:	Longitude:	Determined By: ☐ GPS ☐ Internet Map Service ☐ Other:

Operator Information (as it appears on your NOI):

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:
Mailing Address	Street (PO Box)	
	City	State / Zip

Instructions for Completing a Modification to an APDES Notice of Intent (NOI)

Use the form on the subsequent pages to indicate the items for which you are submitting this modification. Only enter information you wish to change. You may use this form to modify an NOI that you submitted to DEC for coverage under the Multi-Sector General Permit (MSGP) If you have any questions about modifying your NOI, call the DEC Storm Water Program at (907) 269-6285.

When Should You Modify Your Notice of Intent (NOI)?

You can use this form to update or correct information on your NOI, including:

- Owner/Operator address and contact information
- Changes to the SWPPP Contact
- Facility/Site information
- Acreage of industrial area exposed to storm water
- Changes in SIC code or industrial sector designation; or
- Changes to discharge information

When must you Submit a Notice of Termination (NOT) Instead of a Modification Form?

- The owner/operator has changed: You must submit an NOT when you transfer control of a site to a new owner/operator.
- The new owner/operator must then file a new NOI to obtain coverage under the MSGP. Coverage is not transferable.
- You have ceased operations at the facility and there are no longer discharges associated with industrial activity at the facility.
- You are a Sector G, H, or J facility and you have met the applicable termination requirements; or
- You have obtained coverage under an individual or alternative general permit for all discharges required to be covered by an APDES permit, unless ADEC has required that you obtain such coverage under authority of Part 2.8.1 of the MSGP, in which case coverage under this permit will terminate automatically.

Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity under the APDES Multi-Sector General Permit (MSGP)

Facility Information

Facility Name:

Have storm water discharges from your site been covered previously under an APDES Permit? ☐ Yes ☐ No

If Yes, provide the permit authorization number: _____

Street Location

Street:	Borough or similar government subdivision		
City:		State: Alaska	Zip:
Latitude:	Longitude:	Determined By: ☐ GPS ☐ Internet Map Service ☐ Other:	

Estimated area of industrial activity at your site exposed to storm water: _____ (acres)

Briefly describe the nature of the industrial activities at the facility:

Identify the 4-digit Standard Industrial Classification (SIC) code or 2-letter Activity Code that best represents the products produced or services rendered for which your facility is primarily engaged, as defined in the MSGP.

Primary SIC Code: _____ or Primary Activity Code: _____

Is your site presently inactive or unstaffed?* ☐ Yes ☐ No

** Note that if your facility becomes inactive and unstaffed during the permit term, you must submit an NOI modification to reflect the change.*

If Yes, is your site expected to be inactive and unstaffed for the entire permit term? ☐ Yes ☐ No

If No, indicate the length of time that you expect your facility to be inactive and unstaffed. _____

Federal Effluent Limitation Guidelines and Sector-Specific Requirements

Are you requesting permit coverage for storm water discharges subject to effluent limitation guidelines? ☐ Yes ☐ No

If yes, which effluent limitation guidelines apply to your storm water discharge?

40 CFR Part/Subpart	Eligible Discharges	Affected MSGP Sector	Check if applicable
Part 411, Subpart C	Runoff from material storage piles at cement manufacturing facilities.	E	☐
Part 418, Subpart A	Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished products, by-products, or waste products (SIC 2874).	C	☐
Part 423	Coal pile runoff at steam electric generating facilities.	O	☐
Part 429, Subpart I	Discharges resulting from spray down or intentional wetting of logs at wet deck storage areas.	A	☐
Part 436, Subpart B, C, or D	Mine dewatering discharges at crushed stone mines, construction sand and gravel mines, or industrial sand mines.	J	☐
Part 443, Subpart A	Runoff from asphalt emulsion facilities.	D	☐
Part 445, Subparts A & B	Runoff from hazardous waste and non-hazardous waste landfills.	K, L	☐
Part 449, Subpart A	Runoff from Air Transportation	S	☐

If you are a Sector S (Air Transportation facility, do you anticipate using more than 100,000 gallons of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis? ☐ Yes ☐ No

Identify the applicable sector(s) and subsector(s) of industrial activity, including co-located industrial activity, for which you are requesting coverage:

Sector	Subsector	Sector	Subsector	Sector	Subsector	Sector	Subsector	Sector	Subsector	Sector	Subsector

Permit #: ____________

Discharge Information

Does your facility discharge into a Municipal Separate Storm Sewer System (MS4)? ☐ Yes ☐ No
If Yes, provide the name of the MS4 Operator: ____________________________

If you are subject to benchmark monitoring requirements for a hardness-dependent metal:
– What is the hardness of your receiving water(s) (See Appendix E)? ____________
– Does your facility discharge into any saltwater receiving waters? ☐ Yes ☐ No

Outfalls: *(Attach a separate list if necessary)*

List all of the storm water outfalls from your facility. Each outfall must be identified by a unique 3-digit ID (e.g., 001, 002). Also provide the latitude and longitude in decimal degrees for each outfall.		**For each outfall, provide the following receiving water information:** Provide the name of the first water of the U.S. that receives storm water directly from the outfall and/or from the MS4 that the outfall discharges to:	If the receiving water is impaired (on the CWA 303(d) list), list the pollutants that are causing the impairment:	Are the pollutant(s) causing the impairment present in your discharge? Yes	No	If a TMDL has been completed for this receiving waterbody, provide the following information:
Outfall ID	001A			☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						
Outfall ID				☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						
Outfall ID				☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						
Outfall ID				☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						
Outfall ID				☐	☐	TMDL ID#:
Latitude						TMDL Name:
Longitude						Pollutant(s) for which there is a TMDL:
If substantially identical to other outfall, list identical outfall ID: ____________						

Operator Information

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

Mailing Address ☐ Check if same as Operator Information	Street (PO Box)		
	City	State	Zip

Storm Water Pollution Prevention Plan (SWPPP) Contact / Location Information

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

Mailing Address ☐ Check if same as Operator Information	Street (PO Box)		
	City	State	Zip

Universal Resource Locator or URL:

Billing Contact / Location Information

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

Mailing Address ☐ Check if same as Operator Information	Street (PO Box)		
	City	State	Zip

NOI Preparer Contact / Location Information *(Complete if NOI was prepared by someone other than the Certifier)*

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

Mailing Address ☐ Check if same as Operator Information	Street (PO Box)		
	City	State	Zip

Document Attachments

Documents attached with this application:

☐ Storm Water Pollution Prevention Plan (SWPPP)

☐ Other:

Certification Information

An Alaska Pollutant Discharge Elimination System (APDES) permit application or report must be signed by an individual with the appropriate authority per 18 AAC 83.385. For additional information, please refer to 18 AAC 83.385 at the following link: http://www.legis.state.ak.us/basis/aac.asp#18.83.385.

Corporate Executive Officer 18 AAC 83.385 (a)(1)(A)	For a corporation, a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation.
Corporate Operations Manager 18 AAC 83.385 (a)(1)(B)	For a corporation, the manager of one or more manufacturing, production, or operating facilities, if (i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations; (ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and (iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
Sole Proprietor or General Partner 18 AAC 83.385 (a)(2)	For a partnership or sole proprietorship, the general partner or the proprietor respectively.
Public Agency, Chief Executive Officer 18 AAC 83.385 (a)(3)(A)	For a municipality, state, or other public agency, the chief executive officer of the agency.
Public Agency, Senior Executive Officer 18 AAC 83.385 (a)(3)(B)	For a municipality, state, or other public agency, a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

Any report required by an APDES permit, and a submittal with any other information requested by the department, must be signed by a person described in above, or by a duly authorized representative of that person.
**For Delegated Authority: the delegation must be made in writing and submitted to the DEC.*
Your signature will not be approved until DEC receives the written delegation.
An Example of written authorization delegating authority can be found on the Division of Water website:
http://dec.alaska.gov/media/13316/delegation-of-signatory-authority.pdf

Operations Manager *(Delegated Authority)** 18 AAC 83.385 (b)(2)(A)	For a duly authorized representative, an individual or a position having responsibility for the overall operation of the regulated facility or activity, including the position of plant manager, operator of a well or a well field, superintendent or position of equivalent responsibility.
Environmental Manager *(Delegated Authority)** 18 AAC 83.385 (b)(2)(B)	For a duly authorized representative, an individual or position having overall responsibility for environmental matters for the company.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Organization:	Name:	Title:
Phone:	Fax (optional):	Email:

Mailing Address: ☐ Check if same as Operator Information	Street (PO Box):		
	City:	State:	Zip:

Signature/Responsible Official

Date

Instructions for Completing the Notice of Intent (NOI) for Storm Water Discharges Associated with Industrial Activity under the Multi-Sector General Permit (MSGP)

Who must file a NOI?

Under section 402(p) of the Clean Water Act (CWA) and regulations at 40 CFR Part 122.26, adopted by reference at 18 AAC 83.010 (3) storm water discharges associated with industrial activity are prohibited to waters of the United States unless authorized under an Alaska Pollutant Discharge Elimination System (APDES) permit. You can obtain coverage under the MSGP by submitting a completed NOI if you operate a facility that:

- is located in a jurisdiction where DEC is the permitting authority, listed in Part 1.1 of the MSGP;
- discharges storm water associated with industrial activities, identified in Appendix D of the MSGP;
- meet the eligibility requirements in Part 1.2 of the permit;
- develop a storm water pollution prevention plan (SWPPP) in accordance with Part 5 of the MSGP; and
- install and implement control measures in accordance with Part 4 to meet numeric and non-numeric effluent limits.

If you are unsure if you need an APDES storm water permit, contact your APDES storm water permit program. Contacts are listed at:

http://dec.alaska.gov/water/wastewater/stormwater/

One NOI must be submitted for each facility or site for which you are seeking permit coverage. You do not need to submit separate NOIs for each type of industrial activity present at your facility, provided your SWPPP covers all activities.

When to File the NOI Form

Do not file your NOI until you have obtained and thoroughly read a copy of the MSGP. A copy of the MSGP is located on the DEC website (http://dec.alaska.gov/water/wastewater/stormwater/multisector/). The MSGP describes procedures to ensure your eligibility, prepare your SWPPP, install and implement appropriate storm water control measures, and complete the NOI form questions – all of which must be done before you sign the NOI certification statement attesting to the accuracy and completeness of your NOI. You will also need a copy of the MSGP once you have obtained coverage so that you can comply with the implementation requirements of the permit.

Completing the NOI Form

To complete this form, type or print in the appropriate areas only. Please make sure you complete all questions. Make sure you make a photocopy for your records before you send the completed form to the address below. You may also use this paper form as a checklist for the information you will need when filing an NOI electronically via DEC's OASys system. http://dec.alaska.gov/water/oasys.aspx.

Facility Information

Enter the facility's official or legal name. Unless the name of your facility has changed, please use the same name provided on prior NOIs or permit applications.

Indicate if industrial storm water discharges from your facility were previously covered by an APDES permit.

If your facility was previously covered by the MSGP, please include the tracking number that you received in your confirmation letter or email from DEC's Storm water Program. You can find the tracking number assigned to your previous NOI on DEC's Online Permit Search: http://dec.alaska.gov/Applications/Water/WaterPermitSearch/search.

Enter the street address, including city, state, zip code, borough or similar government subdivision of the actual physical location of the facility. Do NOT use a P.O. Box.

Provide the facility latitude and longitude in decimal degrees format. You can obtain your facility's latitude and longitude though Global Positioning System (GPS) receivers, internet map service, U.S. Geological Survey (USGS) quadrangle or topographic maps, or EPA's web-based siting-tools, among other methods. For consistency, DEC requests that measurements be taken from the approximate center of the facility. Specify which method you used to determine latitude and longitude.

Identify the data source that you used to determine the facility latitude and longitude. If you did not use a USGS quadrangle or topographic map or GPS receivers, then select "Other" and write the method used on the line provided. If you used a USGS quadrangle or topographic map, write the map scale on the line provided. Scale should be identified on the map.

Enter the estimated area of industrial activity at your site exposed to storm water, in acres.

Briefly describe the nature of the industrial activities present at your facility.

Indicate whether your facility is currently inactive and unstaffed. If so then indicate whether your facility will be inactive and unstaffed for the entire permit term; or, if not, specify the specific length of time in units of days, weeks, months, or years (e.g. 3 months) that you expect the facility to be inactive and unstaffed.

Federal Effluent Limitation Guidelines and Sector-Specific Requirements

Depending on your industrial activities, your facility may be subject to effluent limitation guidelines which include additional effluent limits and monitoring requirements for your facility. Please review these requirements, described in Part 4.3 of the MSGP and check any appropriate boxes on the NOI form.

For Sector S facilities (Air Transportation), indicate whether you anticipate that the entire airport facility will use more than 100,000 gallons of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis. If so, additional effluent limits and monitoring conditions apply to your discharge (see Part 11 Sector S of the MSGP).

List the four-digit Standard Industrial Classification (SIC) code and/or two character activity code that best describes the primary industrial activities performed by your facility under which you are required to obtain permit coverage. Your primary industrial activity includes any activities performed on-site which are (1) identified by the facility's one SIC code for which the facility is primarily engaged; and (2) included in the narrative descriptions of 40 CFR 122.26(b)(14)(i), (iv), (v), or (vii), and (ix). See Appendix D of the MSGP for a complete list of SIC codes and activities codes.

If your site has co-located industrial activities that are not identified as your primary industrial activity, identify the sector and subsector codes that describe these other industrial activities. For a complete list of sector and subsector codes, see Appendix D of the MSGP.

Discharge Information

Receiving Waters and Wetlands

You must identify all the outfalls from your facility that discharge storm water. Each outfall must be assigned a unique 3-digit ID (e.g., 001, 002, 003). You must also provide the latitude and longitude for each outfall from your facility. Indicate whether any outfalls are substantially identical to an outfall already listed, and identify the outfall it is identical to. For each unique outfall you list, you must specify the name of the first water of the U.S. that receives storm water directly from the outfall and/or the Municipal Separate Storm Sewer System (MS4) that the outfall discharges to.

Your receiving water may be a lake, stream, river, ocean, wetland, or other waterbody, and may or may not be located adjacent to your facility. Your storm water may discharge directly to the receiving water or indirectly via a storm sewer system, an open drain or ditch, or other conveyance structure. Do NOT list a man-made conveyance, such as a storm sewer system, as your receiving water. Indicate the first receiving water your storm water discharge enters. For example, if your discharge enters a storm sewer system that empties into Trout Creek, which flows into Pine River, your receiving water is Trout Creek, because it is the first waterbody your discharge will reach. Similarly, a discharge into a ditch that feeds Spring Creek should be identified as “Spring Creek” since the ditch is a manmade conveyance. If you discharge into a MS4, you must identify the waterbody into which that portion of the storm sewer discharges and also provide the name of the MS4 operator. That information should be readily available from the operator of the MS4. If you are uncertain of the MS4 operator, contact DEC Division of Water for that information.

You must specify whether any receiving waters that you discharge to are listed as “impaired” as defined in Appendix C, and the pollutants for which the water is impaired. You must also check/identify any Total Maximum Daily Loads (TMDL) that have been completed for any of the waters of the U.S. that you discharge to. You must also provide information about the outfall latitude/ longitude. Further information regarding impaired waters and TMDLs can be found at http://dec.alaska.gov/water/water-quality/impaired-waters.

If you are subject to any benchmark monitoring requirements for metals (see the requirements applicable to your Sector(s) in Part 11 of the permit), indicate the hardness for your receiving water(s). See Appendix E of the permit for information about determining waterbody hardness.

If you are subject to benchmark monitoring requirements for hardness-dependent metals, you must also answer whether your facility discharges into any saltwater receiving waters.

Operator Information

Provide the name of the contact person and the legal name of the firm, public organization, or any other public entity that operates the facility described in this application. An operator of a facility is a legal entity that controls the operation of the facility.

Provide the operator’s mailing address, telephone number, fax number (optional), and email address. Correspondence will be sent to this address.

Storm Water Pollution Prevention Plan (SWPPP) Contact Information

Identify the name, telephone number, and email address of the person who will serve as a contact for DEC on issues related to storm water management at your facility. This person should be able to answer questions related to storm water discharges, the SWPPP, and other issues related to storm water permit coverage or have immediate access to individuals with that knowledge. This person does not have to be the facility operator but should have intimate knowledge of storm water management activities at the facility.

If you are making your SWPPP publicly available on a website, provide the appropriate Internet URL address.

Billing Contact Information

Provide the name of the contact person and the legal name of the firm, public organization, or any other public entity that is responsible for accounts payable for this facility.

Provide the billing contact’s mailing address, telephone number, fax number (optional), and email address. Correspondence for billing purposes will be sent to this address. If the billing contact address is the same as the operator, check the box and continue to Section III Facility Information. See 18 AAC 72.956 for applicable authorization fee to be paid with the submittal of the NOI.

Certification Information

The NOIs, must be signed as follows:

(1) For a corporation, a responsible corporate officer shall sign the NOI, a responsible corporate officer means:

  (A) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or

  (B) the manager of one or more manufacturing, production, or operating facilities, if

    (i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations;

    (ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and

    (iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship, the general partner or the proprietor, respectively; or

(3) for a municipality, state, or other public agency, either a principal executive officer or ranking elected official shall sign the application; in this subsection, a principal executive officer of an agency means

  (A) the chief executive officer of the agency; or

  (B) a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

Include the name, title, organization, and email address of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered valid application for permit coverage.

If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the facility SWPPP contact or a consultant for the certifier's signature), include the name, organization, telephone number, and email address of the NOI preparer.

Where to File the NOI Form

DEC encourages you to complete the NOI form and SWPPP electronically via the Internet. DEC's Online Application System (OASys) can be found at http://dec.alaska.gov/water/oasys.aspx. Filing electronically is the fastest way to obtain permit coverage and help ensure that your NOI is complete. If you choose not to file electronically, you must send the NOI to the address listed below.

If you file by mail, remember to retain a copy for your records.

NOIs sent by mail:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
Storm Water NOI
555 Cordova Street
Anchorage, AK 99501
Phone: (907) 269-6285
dec.water.wqpermit@alaska.gov

Your SWPPP needs to be submitted with the NOI as required in Part 5 of the MSGP. You must keep a copy of your SWPPP on-site or otherwise make it available to facility personnel responsible for implementing provisions of the permit.

For Agency Use
Permit Tracking #: _____

No Exposure Certification for Exclusion from APDES Storm Water Permitting

Submission of this No Exposure Certification constitutes notice that the entity identified in Section I does not require permit authorization for its storm water discharges associated with industrial activity in Alaska identified in Section II under ADEC's Storm Water Multi-Sector General Permit (MSGP) due to the existence of a condition of no exposure.

A condition of no exposure exists at an industrial facility when all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, or waste product. A storm resistant shelter is not required for the following industrial materials and activities:

- drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak. "Sealed" means banded or otherwise secured and without operational taps or valves;
- adequately maintained vehicles used in material handling; and
- final products, other than products that would be mobilized in storm water discharges (e.g., rock salt).

A No Exposure Certification must be provided for each facility qualifying for the no exposure exclusion. In addition, the exclusion from APDES permitting is available on a facility-wide basis only, not for individual outfalls. If any industrial activities or materials are or will be exposed to precipitation, the facility is not eligible for the no exposure exclusion.

By signing and submitting this No Exposure Certification form, the entity in Section I is certifying that a condition of no exposure exists at its facility or site, and is obligated to comply with the terms and conditions of 40 CFR 122.26(g), adopted by reference at 18 AAC 83.010(b)(3).

ALL INFORMATION MUST BE PROVIDED ON THIS FORM.

Detailed instructions for completing this form and obtaining the no exposure exclusion are provided on page 3.

Section I. Facility Operator Information

Organization: Contact Person:

Mailing Address:

Street (PO Box):

City: State: Zip:

Phone: Fax (optional): Mobile:

Email:

Section II. Facility Location Information

Facility Name:

Location Address:

Street: Borough or Similar Government Subdivision

City: State: Alaska Zip:

Latitude: Longitude: Determined By:

☐ GPS ☐ USGS Topographic Map

☐ Other:

If you used a USGS Topographic map, what was the scale?

Estimated area of industrial activity at your site exposed to storm water: (acres)

Is this a federal facility? ☐ Yes ☐ No Is this facility located on Indian Lands? ☐ Yes ☐ No

For Agency Use
Permit Tracking #:

Identify the 4-digit Standard Industrial Classification (SIC) code or 2-letter Activity Code that best represents the products produced or services rendered for which your facility is primarily engaged, as define in MSGP:	Primary SIC Code: or Primary Activity Code:

Was the facility or site previously covered under an NPDES or APDES storm water permit? ☐ Yes ☐ No

a. If Yes, enter the NPDES or APDES permit number or tracking number:

Have you paved or roofed over a formerly exposed pervious area in order to qualify for the no exposure exclusion? ☐ Yes ☐ No

If yes, please indicate approximately how much area was paved or roofed over. Completing this question does not disqualify you for the no exposure exclusion. However, your permitting authority may use this information in considering whether storm water discharges from your site are likely to have an adverse impact on water quality, in which case you could be required to obtain permit coverage.

☐ Less than one acre ☐ One to five acres ☐ More than five acres

Section III. Exposure Checklist

Are any of the following materials or activities exposed to precipitation, now or in the foreseeable future? (Please check either "Yes" of "No" in the appropriate box.) **If you answer "Yes" to any of these questions, (1) through (11), you are not eligible for the no exposure exclusion.**	Yes	No
(1) Using, storing, or cleaning industrial machinery or equipment, and areas where residuals from using, storing, or cleaning industrial machinery or equipment remain and are exposed to storm water.	☐	☐
(2) Materials or residuals on the ground or in storm water inlets from spills/leaks.	☐	☐
(3) Materials or products from past industrial activity.	☐	☐
(4) Material handling equipment (except adequately maintained vehicles).	☐	☐
(5) Materials or products during loading/unloading or transporting activities.	☐	☐
(6) Materials or products stored outdoors (except final products intended for outside use [e.g., new cars] where exposure to storm water does not result in the discharge of pollutants).	☐	☐
(7) Materials contained in open, deteriorated, or leaking storage drums, barrels, tanks, and similar containers.	☐	☐
(8) Materials or products handled/stored on roads or railways owned or maintained by the discharger.	☐	☐
(9) Waste material (except waste in covered, non-leaking containers [e.g., dumpsters]).	☐	☐
(10) Application or disposal of process wastewater (unless otherwise permitted).	☐	☐
(11) Particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated (i.e., under an air quality control permit) and evident in the storm water outflow.	☐	☐

Section VIII. Certification Information

I certify under penalty of law that I have read and understand the eligibility requirements for claiming a condition of "no exposure" and obtaining an exclusion from APDES storm water permitting under DEC Multi-Sector General Permit.

I certify under penalty of law that there are no discharges of storm water contaminated by exposure to industrial activities or materials from the industrial facility or site identified in this document (except as allowed under 40 CFR 122.26(g)(2)).

I understand that I am obligated to submit a no exposure certification form once every five years to the APDES permitting authority and, if requested, to the operator of the local municipal separate storm sewer system (MS4) into which the facility discharges (where applicable). I understand that I must allow the APDES permitting authority, or MS4 operator where the discharge is into the local MS4, to perform inspections to confirm the condition of no exposure and to make such inspection reports publicly available upon request. I understand that I must obtain coverage under an APDES permit prior to any point source discharge of storm water from the facility.

Additionally, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name of Authorized Official

Title

Signature

Date

Email

For Agency Use
Permit Tracking #: _____

Instructions for the No Exposure Certification for Exclusion from APDES Storm Water Permitting

Who May File a No Exposure Certification

Federal law at 40 CFR Part 122.26, adopted by reference at 18 AAC 83.010(b)(3), prohibits point source discharges of storm water associated with industrial activity to waters of the U.S. without an Alaska Pollutant Discharge Elimination System (APDES) permit. However, APDES permit coverage is not required for discharges of storm water associated with industrial activities identified at 40 CFR 122.26(b)(14)(i)-(ix) and (xi) if the discharger can certify that a condition of "no exposure" exists at the industrial facility or site.

Storm water discharges from construction activities identified in 40 CFR 122.26(b)(14)(x) and (b)(15) are not eligible for the no exposure exclusion.

Obtaining and Maintaining the No Exposure Exclusion

This form is used to certify that a condition of no exposure exists at the industrial facility or site described herein. This certification is only applicable in jurisdictions where DEC is the NPDES permitting authority and must be re-submitted at least once every five years.

The industrial facility operator must maintain a condition of no exposure at its facility or site in order for the no exposure exclusion to remain applicable. If conditions change resulting in the exposure of materials and activities to storm water, the facility operator must obtain coverage under an APDES storm water permit immediately.

Completing the Form

You must type or print in appropriate areas only. One form must be completed for each facility or site for which you are seeking to certify a condition of no exposure. Additional guidance on completing this form can be accessed at DEC's Storm water Program website: http://dec.alaska.gov/water/wnpspc/stormwater/index.htm.

Please make sure you have addressed all applicable questions and have made a photocopy for your records before sending the completed form to this address.

Section I. Facility Operator Information

- Provide the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this certification. The name of the operator may or may not be the same as the name of the facility. The operator is the legal entity that controls the facility's operation, rather than the plant or site manager.
- Provide the telephone number of the facility operator.
- Provide the email address of the facility operator.
- Provide the mailing address of the operator (P.O. Box numbers may be used). Include the city, state, and zip code. All correspondence will be sent to this address.

Section II. Facility/Site Location Information

- Enter the official or legal name of the facility or site.
- Enter the complete street address (if no street address exists, provide a geographic description [e.g., Intersection of Routes 9 and 55]), city, state, zip code, and borough or similar government subdivision. Do not use a P.O. Box number.
- Indicate whether the facility is located on Indian Lands.
- Indicate whether the industrial facility is operated by a department or agency of the Federal Government (see also Section 313 of the Clean Water Act).
- Enter the latitude and longitude of the approximate center of the facility or site. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, among others.
- Indicate whether the facility was previously covered under an NPDES or APDES storm water permit. If so, include the permit number or permit tracking number.
- List the four-digit Standard Industrial Classification (SIC) code and/or two character activity code that best describes the primary industrial activities performed by your facility. Your primary industrial activity includes any activities performed on-site which are:
  - (1) identified by the facility's one SIC code for which the facility is primarily engaged; and
  - (2) included in the narrative descriptions of 40 CFR 122.26(b)(14)(i), (iv), (v), or (vii), and (ix). See Appendix D of the MSGP for a complete list of SIC codes and activities codes.
- Enter the total size of the site associated with industrial activity in acres. Acreage may be determined by dividing square footage by 43,560.
- Check "Yes" or "No" as appropriate to indicate whether you have paved or roofed over a formerly exposed, pervious area (e.g., lawn, meadow, dirt or gravel road/parking lot) in order to qualify for no exposure. If yes, also indicate approximately how much area was paved or roofed over and is now impervious area.

Section III. Exposure Checklist

Check "Yes" or "No" as appropriate to describe the exposure condition at your facility. If you answer "Yes" to **ANY** of the questions, (1) through (11), in this section, a potential for exposure exists at your site and you cannot certify to a condition of no exposure. You must obtain (or already have) coverage under an APDES storm water permit. After obtaining permit coverage, you can institute modifications to eliminate the potential for a discharge of storm water exposed to industrial activity and then certify to a condition of no exposure.

Section IV. Certification Information

The Certification of No Exposure, must be signed as follows:

(1) For a corporation, a responsible corporate officer shall sign the Certification, a responsible corporate officer means:

  (A) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or

  (B) the manager of one or more manufacturing, production, or operating facilities, if

    (i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations;

    (ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and

    (iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship, the general partner or the proprietor, respectively; or

(3) for a municipality, state, or other public agency, either a principal executive officer or ranking elected official shall sign the application; in this subsection, a principal executive officer of an agency means

  (A) the chief executive officer of the agency; or

  (B) a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated Certification form will not be considered valid exclusion from permit coverage.

Where to File Certification form

Please submit the Certification to DEC as follows:

If you file by mail, please submit the original form with a signature in ink. DEC will not accept a photocopied signature. Remember to retain a copy for your records.

Certifications sent by mail:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501
Phone: (907) 269-6285

Alaska Department of Environmental Conservation
Division of Water, Compliance and Enforcement Program
555 Cordova Street
Anchorage, Alaska 99501
Nationwide Toll Free: 1(877) 569-4114 Anchorage/International: (907) 269-4114
Fax: (907) 269-4604 E-mail address: dec-wqreporting@alaska.gov.

NONCOMPLIANCE NOTIFICATION

GENERAL INFORMATION	PERMIT# (if any):	
Owner or Operator:	**Facility Name:**	**Facility Location:**
Person Reporting:	**Phone Numbers of Person Reporting:**	**Reported How? (e.g. by phone):**
Date/Time Event was Noticed:	**Date/Time Reported:**	**Name of DEC Staff Contacted:**

VERBAL NOTIFICATION MUST BE MADE TO ADEC WITHIN 24 HOURS OF DISCOVERY OF NONCOMPLIANCE

INCIDENT DETAILS (attach additional sheets, lab reports, and photos as necessary)

Period of Noncompliance	**Start Date/Time** (exact):	**End Date/Time** (exact):

If noncompliance has not been corrected, provide a statement regarding the anticipated time the noncompliance is expected to continue:

Estimated Quantity involved (volume or weight):

Description of the noncompliance and its cause (be specific):

Actions taken to reduce, eliminate, and prevent reoccurrence of noncompliance and Actual/Potential Impact on Environmental Health (describe in detail) (e.g. Supplied drinking water to nearby well owners and informed well owners not to drink from wells until further notice)

Permit Condition Deviation (Identify each permit condition exceeded during the event.)

Parameter (e.g. BOD pH)	Permit Limit	Exceedance (sample result)	Sample Date

Corrective Actions (Attach a description of corrective actions taken to restore the system to normal operation and to minimize or eliminate chances of recurrence.)

Environmental Damage: (if yes, provide details below) ☐ **Yes** ☐ **No** ☐ **Unknown**

Actual /Potential Impact on Environment/Public Health (describe in detail)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: **Title:** **Signature:** **Date:**

FORMS MUST BE SENT TO ADEC WITHIN FIVE DAYS OF BECOMING AWARE OF THE EVENT.

Alaska Department of Environmental Conservation
Multi-Sector General Permit (MSGP)

Discharge Monitoring Report (DMR)

Part 9.1 requires you to use the electronic NetDMR system to prepare and submit your Discharge Monitoring Report (DMR) form. However, if you are given approval by the DEC (Permitting Program or Compliance and Enforcement Program, see Standard Conditions, Appendix A, Part 1.1 Contact Information and Addresses) to use a paper DMR form, and you elect to use it, you must complete and submit the following form.

Reason(s) for Submission *(Check all that apply)*

- ☐ Submitting monitoring data (fill in all Sections).
- ☐ Reporting no discharge for all outfalls for this monitoring period (fill in Sections I, II, III, IV, and VI).
- ☐ Reporting that your site status has changed to inactive and unstaffed (fill in Sections I, II, VI and include date of status change in comments field in Section V).
- ☐ Reporting that your site status has changed to active (fill in all sections and include date of status change in comments field in Section V).
- ☐ Reporting that no further pollutant reductions are achievable for all outfalls and for all pollutants via Part 7.2.1.4 of the MSGP (fill in Sections I, II, and VI).

Section I. Permit Information

Permit Authorization Number:

Section II. Facility Information

Facility Name:			
Street Location — Street:			
City:		State: Alaska	Zip:

Contact Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

DMR Preparer (Complete if DMR was prepared by someone other than the person signing the certification in Section VI):

Name:	Organization:	Title:
Phone:	Fax (optional):	Email:

Section III. Discharge Information

Identify Monitoring Period:	Check here if proposing alternative monitoring periods due to irregular storm water runoff. Identify alternative monitoring schedule and indicate for which alternative period you are reporting monitoring data.	
☐ Quarter 1 (January 1 – March 31)	Quarter 1: From:	To:
☐ Quarter 2 (April 1 – June 30)	Quarter 2: From:	To:
☐ Quarter 3 (July 1 – September 30)	Quarter 3: From:	To:
☐ Quarter 4 (October 1 – December 31)	Quarter 4: From:	To:

Are you required to monitor for cadmium, copper, chromium, lead, nickel, silver, or zinc? ☐ Yes, ☐ No (Skip to Section IV)
What is the hardness level of the receiving water? _____ mg/L

Section IV. Outfall Information

How many outfalls are identified in your SWPPP? _____ List names of outfalls required to be monitored in the table below.
Do any of your outfalls discharge substantially identifical effluents? ☐ Yes, ☐ No
If YES, for each monitored outfall, indicate outfall names that are substantially identical in the table below.

a. Monitored Outfall Name*	b. Substantially Identical Outfalls [List name(s) of outfall(s) that are substantially identical to outfall in a.]	c. No Discharge?

* Reference attachment if additional space is needed to complete the table.

Section V. Monitoring Information

Permit Tracking Number:

Nature of Discharge: ☐ Rainfall (complete a, b. and c below) ☐ Snowmelt

a. Duration of the rainfall event (hours): _____ b. Rainfall amount (inches): _____ c. Time since previous measurable storm event (days): _____

Outfall Name	Monitoring Type (QBM, ELG, S, I, O)*	Parameter	Quality or Concentration	Units	Results Description	Collection Date	Exceedance due to natural background pollutant levels	No further pollutant reductions achievable?

* (QBM) – Quarterly benchmark monitoring; (ELG) – Annual effluent limitation guidelines monitoring; (S) – State specific monitoring; (I) – Impaired waters monitoring; (O) – Other monitoring as required by DEC

Comment and/or Explanation of any Violations (Reference all attachments here)

Section VI. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Organization:		Name:	Title:
Phone:	Fax (optional):	Email:	
Mailing Address:	Street (PO Box):		
	City:	State:	Zip:

_____ _____

Signature/Responsible Official Date

Instructions for Completing the MSGP Industrial Discharge Monitoring Report (DMR)

Who Must Submit A Discharge Monitoring Report to DEC?

- An operator or owner of a facility covered under the Multi-Sector General Permit (MSGP or permit) that are required to monitor pursuant to Parts 7.2.1, 7.2.2, 7.2.3, and 7.2.4 of the permit must submit the MSGP Discharge Monitoring Report (DMR) consistent with the reporting requirements specified in Part 9.1 of the permit.

Completing the Form

- Type or print, in the appropriate areas only. "NA" can be entered in areas that are not applicable. If you have any questions about how or when to use this form, contact the DEC Storm Water Program at (907) 269-6285 or online at http://dec.alaska.gov/water/wastewater/stormwater/.

Reasons for Submission

- Indicate your reason(s) for submitting this DMR by checking all boxes that apply. The reasons for submission are defined as follows:
- *Submitting monitoring data*: For each storm event sampled, submit one DMR form with data for all outfalls sampled. Select this reason even if you only have monitoring data for some of your outfalls (i.e., some outfalls did not discharge). If you select this reason, you are required to complete all Sections of the form.
- *Reporting no discharge for all outfalls for this monitoring period*: Indicates that there were no discharges from all outfalls during this monitoring period. If you select this reason, you are only required to complete Sections I, II, III, IV, and VI.
- *Reporting that your site status has changed to inactive and unstaffed*: Indicates that your facility is currently inactive and unstaffed (See Part 7.2.1.6 of the permit for more information). If you select this reason, you are only required to complete Sections I, II, and VI and include date of status change in the comment field in Section V.
- *Reporting that your site status has changed from inactive to active*: Indicates that your facility is currently active (See Part 7.2.1.6 of the permit for more information). If you select this reason, you are required to complete all Sections of the form and include date of status change in the comment field in Section V.
- Reporting that no further reductions are achievable for all outfalls and for all effluent monitoring pollutants via Part 7.2.1.4 and Parts 4 of the permit: Indicates that your facility has determined that no further pollutant reductions are technologically available and economically practicable and achievable in light of best industry practice to meet the technology-based effluent limitations or are necessary to meet the water-quality-based effluent limitations in Parts 4 of the permit (See Part7.2.1.4 of the permit for more information). If you select this reason, you are required to complete Sections I, II and VI. However, if you can make this finding for some outfalls and pollutants, but not for others, you cannot select this reason; you will instead be able to identify which outfalls and which pollutants you can make this finding for in Section V.

Section I. Permit Tracking Number

- Enter the APDES tracking number assigned by DEC to the facility. If you do not know the tracking number, you can find the tracking number assigned to your facility on DEC's Water Permit Search http://dec.alaska.gov/Applications/Water/WaterPermitSearch/Search.aspx

Section II. Facility Information

- Enter the facility's official or legal name. Unless the name of your facility has changed, please use the same name provided on your NOI. You can use ADEC's Water Permit Search, http://dec.alaska.gov/Applications/Water/WaterPermitSearch/Search.aspx to view your NOI.
- Enter the street address, including city, state, and zip code of the actual physical location of the facility. Do not use a P.O. Box.
- Identify the name, telephone number, and email address of the person who will serve as a contact for DEC on issues related to monitoring at your facility. This person should be able to answer questions related to stormwater discharges and monitoring or have immediate access to individuals with that knowledge. This person does not have to be the facility operator but should have intimate knowledge of monitoring activities at the facility.
- If the form was prepared by someone other than the person who is signing the certification statement in Section VI (for example, if the DMR was prepared by a member of the facility's storm water pollution prevention team or a consultant for the certifier's signature), include the name, organization, telephone number, and email address of the DMR preparer.

Section III. Discharge Information

- Indicate the appropriate monitoring period (Quarter 1, 2, 3, or 4) covered by the DMR. "Alternative" monitoring periods can apply to facilities located in arid and semi-arid climates or in areas subject to snow or prolonged freezing. To use alternative monitoring periods, you must provide a revised monitoring schedule here in the first monitoring report submitted and indicate for which alternative monitoring period you are reporting monitoring data. If using alternative monitoring periods, identify the first day of the monitoring period through the last day of the monitoring period for each of the four periods. The dates should be displayed as month (Mo) / day (Day). See Part 7.2.1.2 of the permit for more information.
- If you are submitting benchmark monitoring data, identify if your facility is required to collect benchmark samples for one or more hardness-dependent metals (i.e., cadmium, copper, lead, nickel, silver, and zinc). If you select "yes" to this question you must also complete the table in Section III., and if you select "no" to this question, you may skip to Section IV.
- If you selected "yes" for the previous question, then you are required to submit to DEC with your first benchmark report a hardness level established consistent with the procedures in Appendix E of the permit, which is representative of your receiving water. If your outfalls discharge to more than one receiving water, as reported in your NOI form, you should report hardness for the receiving water with the lowest hardness values. Hardness values must be reported in milligrams per liter (mg/L).

Section IV. Outfall Information

- Enter the total number of outfalls identified in your SWPPP. Outfalls are locations where storm water exits the facility, including pipes, ditches, swales, and other structures used to remove storm water from the facility.
- Indicate if your facility has two or more outfalls that you believe discharge substantially identical effluents (i.e., storm water), based on the similarities of the general industrial activities and control measures, exposed materials that may significantly contribute pollutants to storm water, and runoff coefficients of

their drainage areas. See Parts 5.2.6.2 and 6.2.3 of the permit for more information on substantially identical outfalls.

- If you selected "yes" for the previous question, then you must list the outfall name(s) in Column b that you expect to be substantially identical to the corresponding outfall in Column a.
  a. *Monitored Outfall Name:* List name(s) of outfall(s) you are required to monitor.
  b. *Substantially Identical Outfalls:* List name(s) of outfall(s) substantially identical to "*Monitored Outfall*" in Column a. (if applicable)].
  c. *No Discharge:* Check box if you are reporting "No Discharge" for the monitored outfall for the reporting period identified in Section III.

Example:

a. Monitored Outfall Name	b. Substantially Identical Outfall	c. No Discharge
Outfall A	Outfall B, Outfall C	☐
Outfall D		☒

Reference attachments if additional space is needed to complete the table in Section IV.

Section V. Monitoring Information

- Enter the APDES tracking number assigned to the facility reported in Section I.
- For the reported monitoring event, indicate whether the discharge was from a rainfall or snowmelt event. If you select "rainfall", then indicate:
  - the duration (in hours) of the rainfall event;
  - rainfall total (in inches) for that rainfall event; and
  - time (in days) since the previous measurable storm event.
- If the discharge occurs during a period of both rainfall and snowmelt, check both the rainfall and snowmelt boxes and report the appropriate rainfall information in items a-c. To report multiple monitoring events in the same reporting period, copy Page 2 of this Form and enter each monitoring event separately with data for all outfalls sampled.
- For each pollutant monitored at an outfall, you must complete one row in the Table as follows:
  - *Outfall Name*: Provide the outfall name for which you monitored (e.g., Outfall 1, Outfall 2, Outfall 3).
  - *Monitoring Type*: Provide the type of monitoring using the specified codes below:
    - QBM – Quarterly benchmark monitoring;
    - ELG – Annual effluent limitations guidelines monitoring;
    - S – State specific monitoring;
    - I - Impaired waters monitoring; or
    - O – Other monitoring as required by DEC.
- *Parameter(s)*: Enter each "Parameter" (or "pollutant") monitored. For QBM and ELG monitoring, use the same parameter name as in Part 11 of the permit.
- *Quality or Concentration*: Enter sample measurement value for each parameter analyzed and required to be reported. Enter "ND" (i.e., not detected) for any sample results below the method detection limit or "BQL" (i.e., below quantitation limit) for sample results above the detection limit but below the quantitation limit.
- *Units*: Enter the units for sample measurement values (e.g., "mg/L" for milligrams per liter) for each parameter analyzed and required to be reported. For monitoring results reported as ND or BQL, this space will be left blank and the units will be reported under Results Description.
- *Results Description*: This section must be completed for any monitoring results reported as ND or BQL in the "Quality or Concentration" column. For ND, report the laboratory detection level and units in this column. For BQL, report the laboratory quantitation limit and units in this column.
- *Collection Date*: Identify the sampling date for each parameter monitoring result reported on this form.
- *Exceedance due to natural background pollutant levels*: Check box if following the first 4 quarters of benchmark monitoring (or sooner if the exceedance is triggered by less than 4 quarters of data) you have determined that the exceedance of the benchmark is attributable solely to the presence of that pollutant in the natural background for that outfall and any substantially identical outfalls. See Part 7.2.1.5 of the permit for more information. Attach supporting rationale for your determination to the submitted DMR and reference attachment in comments portion of Section V.
- *No further pollutant reductions achievable*: Check box if after collection of 4 quarterly samples (or sooner if the exceedance is triggered by less than 4 quarters of data), the average of the 4 monitoring values for any parameter exceeds the benchmark and you have made the determination that no further pollutant reductions are technologically available and economically practicable and achievable in light of best industry practice to meet the technology-based effluent limitations or are necessary to meet the water-quality-based effluent limitations in Parts 4 of the permit (See Part 7.2.1.4 of the permit for more information) for that outfall and any substantially identical outfalls. Attach supporting rationale for your determination to the submitted DMR and reference attachment in comments portion of Section V.
- Where violations of the permit requirements are reported, include a brief explanation to describe the cause and corrective actions taken and reference each violation by date. Also, this section should include any additional comments such as are required when changing site status from inactive and unstaffed to active or vice versa. Attach additional pages if you need more space.
- Attach additional copies of Section V as necessary to address all outfalls and parameters.

Section VI. Certification

- Enter *Printed Name and Title of Principal Executive Officer or Authorized Agent* with *Signature of Principal Executive Officer or Authorized Agent*, and the *Date* this form was signed and the email address of the "*Principal Executive Officer or Authorized Agent*." If you submit multiple pages of Section V monitoring data, each page must be appropriately signed and certified as described below.

The DMRs must be signed as follows:

(1) For a corporation, a responsible corporate officer shall sign the DMR, a responsible corporate officer means:
  (A) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or
  (B) the manager of one or more manufacturing, production, or operating facilities, if
    (i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations;

(ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and
(iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship, the general partner or the proprietor, respectively; or
(3) for a municipality, state, or other public agency, either a principal executive officer or ranking elected official shall sign the application; in this subsection, a principal executive officer of an agency means
(A) the chief executive officer of the agency; or
(B) a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

- Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated DMR will not be considered valid.

Where to File the DMR Form

- Monitoring data collected pursuant to Part 7.2 of the permit must be reported on the paper DMR form and sent to the following address:
- If you file by mail, remember to retain a copy for your records.
  - DMRs sent by mail:
    Alaska Dept. of Environmental Conservation
    Wastewater Discharge Authorization Program
    Office of Compliance
    555 Cordova Street
    Anchorage, AK 99501
    Phone: (907) 269-6285
    dec-wqreporting@alaska.gov

Appendix D:
NOI and Acknowledgement

Appendix E:
Corrective Action Log

Corrective Action Documentation

Instructions:

Within 24 hours of becoming aware of a condition identified in Parts 4.1 or 4.2 of the 2015 MSGP, document the existence of the condition and subsequent actions. Note that this information must be summarized in the annual report (as required in Part 7.5 of the 2015 MSGP).

Description of Condition:

For Spills and Leaks:

Description of Incident:

Material:

Date/Time:

Amount:

Location:

Reason for Spill:

Discharge to Waters of U.S.:

Date:

Immediate Actions:

Actions Taken within 14 Days:

14 Day Infeasibility:

45 Day Extension:

Appendix F:
Employee Training Log

Employee Training

Instructions:

- Keep records of employee training, including the date of the training (see Parts 2.1.2.8 and 5.2.5.1 of the 2015 MSGP).
- For in-person training, consider using the tables below to document your employee trainings. For computer-based or other types of training, keep similar records on who was trained, the training date, and the type of training conducted.

Training Date:	
Training Description:	
Trainer:	
Employee(s) trained	Employee signature

Appendix G:

Stormwater Industrial Routine Facility Inspection Report

Stormwater Industrial Routine Facility Inspection Report

General Information			
Facility Name			
NPDES Tracking No.			
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			

Weather Information
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snow ❑ High Winds ❑ Other: Temperature:
Have any previously unidentified discharges of pollutants occurred since the last inspection? ❑Yes ❑No **If yes, describe:**
Are there any discharges occurring at the time of inspection? ❑Yes ❑No **If yes, describe:**

Control Measures

- *Number the structural stormwater control measures identified in your SWPPP on your site map and list them below (add as many control measures as are implemented on-site). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required control measures at your facility.*
- *Identify if maintenance or corrective action is needed.*
  - *If maintenance is needed, fill out section B of this template*
  - *If corrective action is needed, fill out section G of this template*

	Structural Control Measure	Control Measure is Operating Effectively?	If No, In Need of Maintenance, Repair, or Replacement?	Maintenance or Corrective Action Needed and Notes
1		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
2		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	

	Structural Control Measure	Control Measure is Operating Effectively?	If No, In Need of Maintenance, Repair, or Replacement?	Maintenance or Corrective Action Needed and Notes
3		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
4		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
5		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
6		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
7		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
8		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
9		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	
10		❑Yes ❑No	❑ Maintenance ❑ Repair ❑ Replacement	

Areas of Industrial Materials or Activities Exposed to Stormwater

Below are some general areas that should be assessed during routine inspections. Customize this list as needed for the specific types of industrial materials or activities at your facility that are potential pollutant sources. Identify if maintenance or corrective action is needed. If maintenance is needed, fill out section B of this template. If corrective action is needed, fill out section G of this template.

	Area/Activity	Inspected?	Controls Adequate (appropriate, effective and operating)?	Maintenance or Corrective Action Needed and Notes
1	**Material loading/unloading and storage areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
2	**Equipment operations and maintenance areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
3	**Fueling areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
4	**Outdoor vehicle and equipment washing areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
5	**Waste handling and disposal areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
6	**Erodible areas/construction**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
7	**Non-stormwater/ illicit connections**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
8	**Salt storage piles or pile containing salt**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
9	**Dust generation and vehicle tracking**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
10	**Processing areas**	❑Yes ❑No ❑ N/A	❑Yes ❑No	

11	**Areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
12	**Immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
13	**(Other)**	❑Yes ❑No ❑ N/A	❑Yes ❑No	
14	**(Other)**	❑Yes ❑No ❑ N/A	❑Yes ❑No	

Discharge Points

At discharge points, describe any evidence of, or the potential for, pollutants entering the drainage system. Also describe observations regarding the physical condition of and around all outfalls, including any flow dissipation devices, and evidence of pollutants in discharges and/or the receiving water. Identify if any corrective action is needed.

Non-Compliance

Describe any incidents of non-compliance observed and not described above:

Additional Control Measures

Describe any additional control measures needed to comply with the permit requirements:

Notes

Use this space for any additional notes or observations from the inspection:

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Signature: _____**Date:**_____

Appendix H:
Quarterly Visual Assessment Reports

MSGP Quarterly Visual Assessment Form

(Complete a separate form for each outfall you assess)

Name of Facility: NPDES Tracking No.

Outfall Name: "Substantially Identical Discharge Point"? ☐ Yes ☐ No

Person(s)/Title(s) collecting sample:

Person(s)/Title(s) examining sample:

Date & Time Discharge Began: Date & Time Sample Collected: Date & Time Sample Examined:

Substitute Sample? ☐ No ☐ Yes

Nature of Discharge: ☐ Rainfall ☐ Snowmelt

If rainfall: Rainfall Amount: _ Previous Storm Ended > 72 hours Before Start of This Storm? ☐ Yes ☐ No*

Pollutants Observed

Color ☐ None ☐ Other (describe): _____

Odor ☐ None ☐ Musty ☐ Sewage ☐ Sulfur ☐ Sour ☐ Petroleum/Gas ☐ Solvents ☐ Other (describe): _____

Clarity ☐ Clear ☐ Slightly Cloudy ☐ Cloudy ☐ Opaque ☐ Other

Floating Solids ☐ No ☐ Yes (describe): _____

Settled Solids** ☐ No ☐ Yes (describe): _____

Suspended Solids ☐ No ☐ Yes (describe): _____

Foam (gently shake sample) ☐ No ☐ Yes (describe): _____

Oil Sheen ☐ None ☐ Flecks ☐ Globs ☐ Sheen ☐ Slick ☐ Other (describe): _____

Other Obvious Indicators of Stormwater Pollution ☐ No ☐ Yes (describe): _____

* The 72-hour interval can be waived when the previous storm did not yield a measurable discharge or if you are able to document (attach applicable documentation) that less than a 72-hour interval is representative of local storm events during the sampling period.

** Observe for settled solids after allowing the sample to sit for approximately one-half hour.

Identify probably sources of any observed stormwater contamination. Also, include any additional comments, descriptions of pictures taken, and any corrective actions necessary below (attach additional sheets as necessary).

Certification Statement (Refer to MSGP Subpart 11 Appendix B for Signatory Requirements)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name: B. Title:

C. Signature: D. Date Signed:

Appendix I:
eNOI Instructions

Storm Water Multi-Sector General Permit eNOI

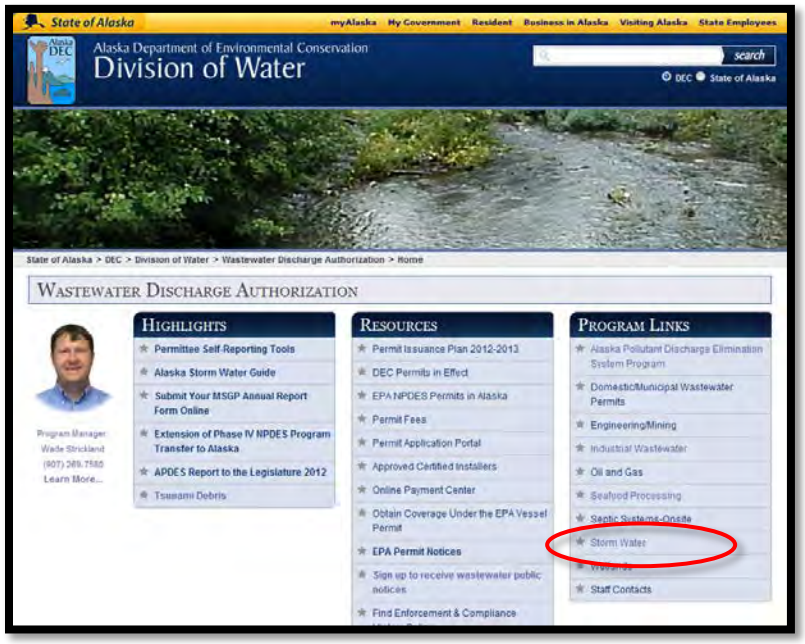
Step-by-Step Guide

The Multi-Sector General Permit (MSGP) Notice of Intent (NOI) can now be filled out using the Division of Water's Online Application System. This document will guide you through this online process.

2015 Multi-Sector General Permit eNOI

1 Go to the Division of Water's Wastewater Discharge Authorization home page at:
http://www.dec.state.ak.us/water/wwdp/index.htm

Select the "**Storm Water"** link under **Program Links**.



2

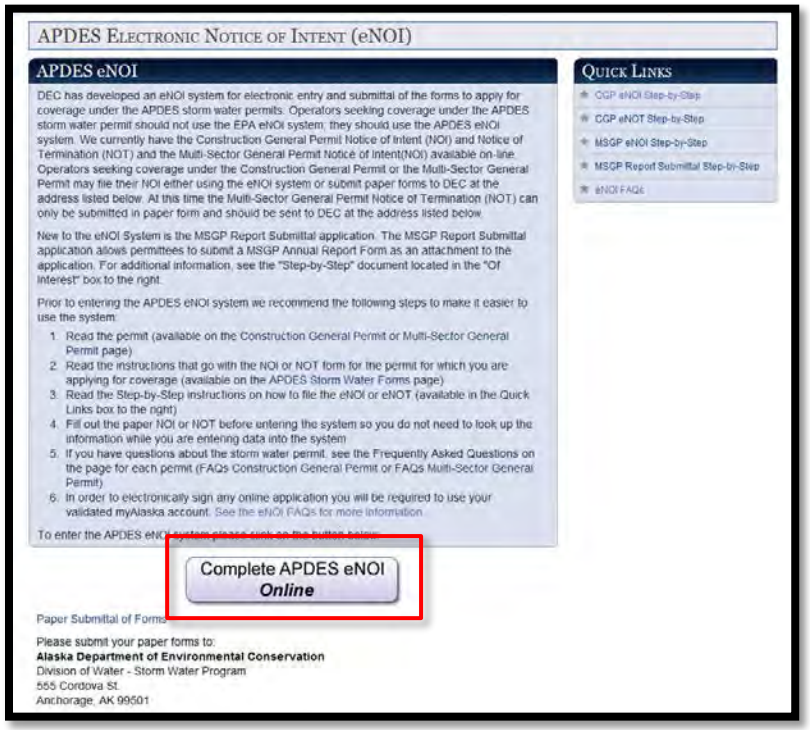
The Storm Water home page contains links to the Multi-Sector General Permit, APDES Storm Water Forms and many other resources for permittees.

When you are ready to begin the online eNOI application process, click on the **"APDES eNOI"** link under **Permits/Approvals**.

3

On the next page, click the **"Complete APDES eNOI Online"** button.

Storm Water eNOI System FAQs are available at: http://dec.alaska.gov/water/wnpspc/pdfs/eNOIFAQs.pdf



4 Welcome to the **Water Online Application System** (OASys)! From the OASys home page, you can continue to your application by clicking the **"Continue to MyAlaska"** button.

TIP: OASys requires an active myAlaska account. If you do not have a myAlaska account skip to step 6 below.

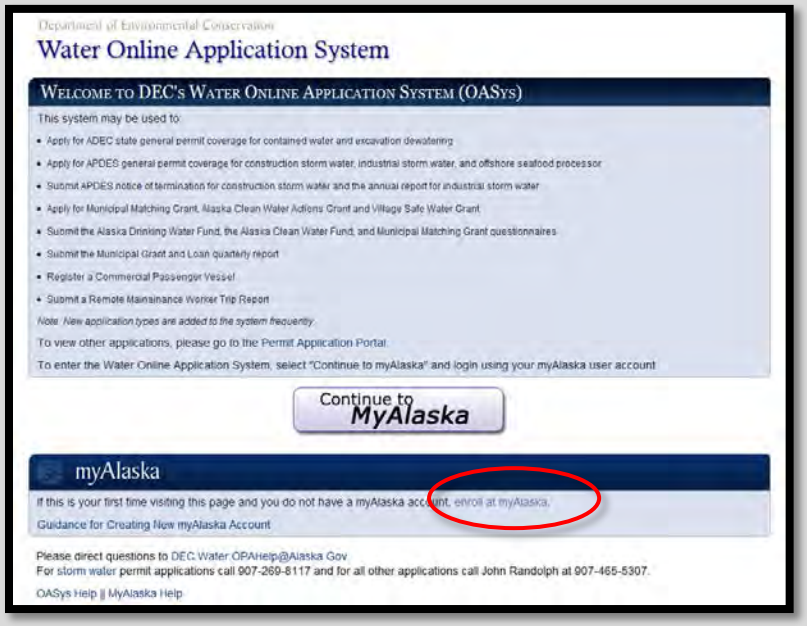
NOTE: If you have used a **myAlaska** account to apply for and e-sign a PDF then you already have an active myAlaska account.

5 Log in to your myAlaska account and skip to step 7 in this guidance.

6 If you don't have a myAlaska account, select the **"enroll at myAlaska"** link. You only need to create a myAlaska account once.

Guidance for creating a new myAlaska account is available at:

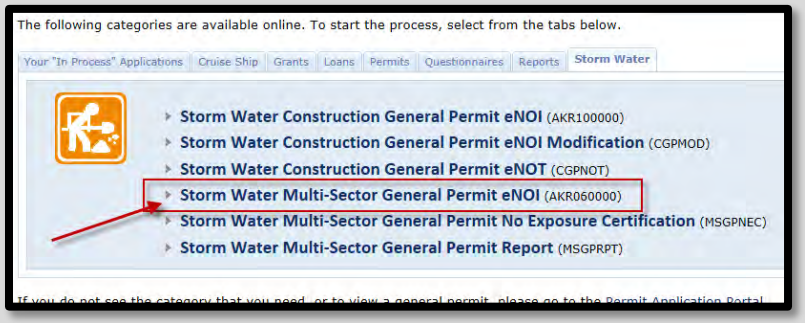
http://dec.alaska.gov/water/OASysHelp/attachments/myAK_Reg_guidance.pdf



7 After successfully logging in to myAlaska, you will arrive at the Water Online Application system.

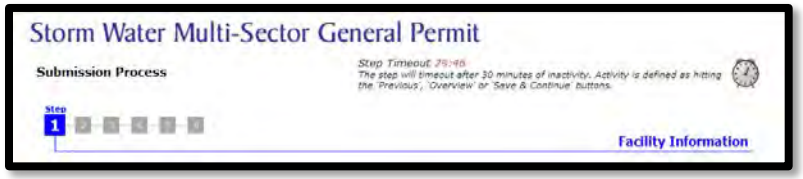
Select the "**Storm Water**" tab.

8 Select the "**Storm Water Multi-Sector General Permit eNOI"** from the available categories.

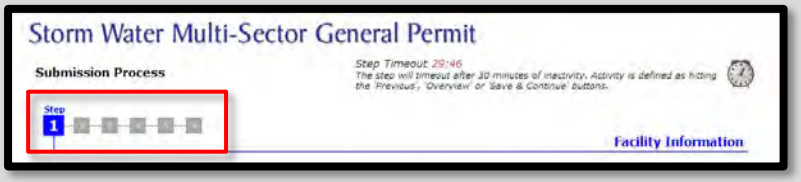


9 A series of steps will take you through the application, asking for information pertinent to your project.
Fill out the information on these pages as completely and thoroughly as possible.

(Below you will find a few "Tips" that provide additional information regarding navigation of these steps.)



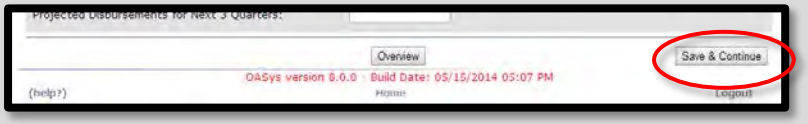
The step numbers at the top of the page can be used to navigate directly to pages that have already been completed.



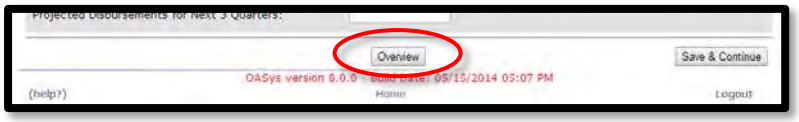
10 Any question with a red star (*) next to it is required and must be completed before the current step can be completed.

11 When finished with a step, go to the next page by selecting the "**Save & Continue"** button in the lower right corner of the page.

NOTE: At any time, you can logout, and your information will be saved, however changes to the current page are not saved until you hit **"Save & Continue"**.



12 At any time, you can also select the **"Overview"** button at the bottom of any page to go to the overview step (**last step**). This step allows you to review your information and to edit previously entered information.

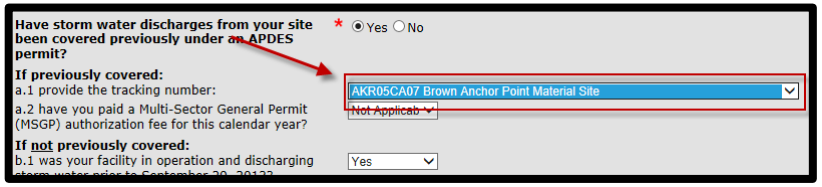


13 For **Step 1** of the application process carefully read the information provided on this page and answer all questions as required. then click **"Save & Continue"** to continue to the next step.

14

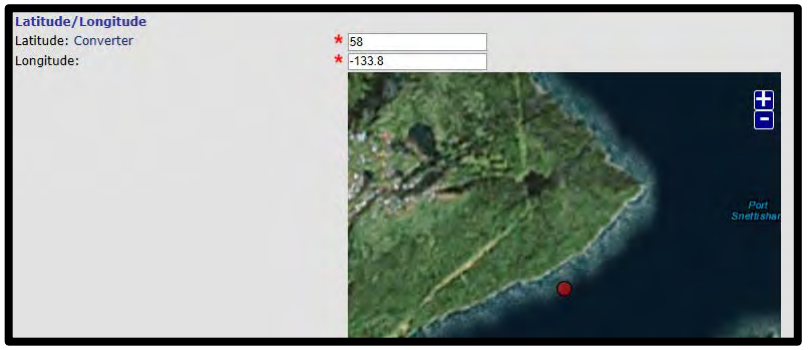
Highlighted Feature #1:

Step 1 contains a question regarding previous coverage. If your site was previously covered, you can select the tracking number from a list of valid MSGP authorizations in our database.



Highlighted Feature #2:

Step 1 contains a map that will display the location of the latitude and longitude you enter. This is for <u>display purposes only.</u> Note that you cannot move the red dot to update the latitude and longitude values.

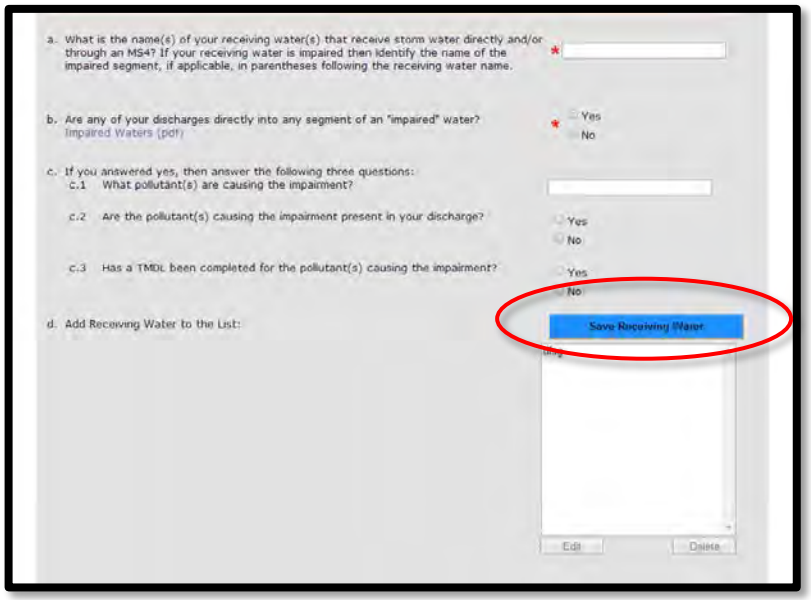


15

Step 2 collects information regarding your storm water discharge. Answer all questions as required then click **"Save & Continue"** to continue to the next step.

16

Step 3 collects information regarding the receiving waters into which storm water from your facility will discharge.



For each receiving water, complete the required questions "a." and "b." and if applicable, questions in part "c." and then click the blue **"Save Receiving Water"** button.

Once all receiving waters have been entered, click **"Save & Continue"** to continue to the next step.

17

Step 4 requires you to enter contact information for the Facility Operator, SWPPP Contact, NOI Preparer, Billing Contact and **NOI Certifier**. All contacts that are marked as required MUST have a contact that fulfills that role.

Click the "**Add"** button to access the Contact Details window. You must enter contact information for all required persons before continuing.

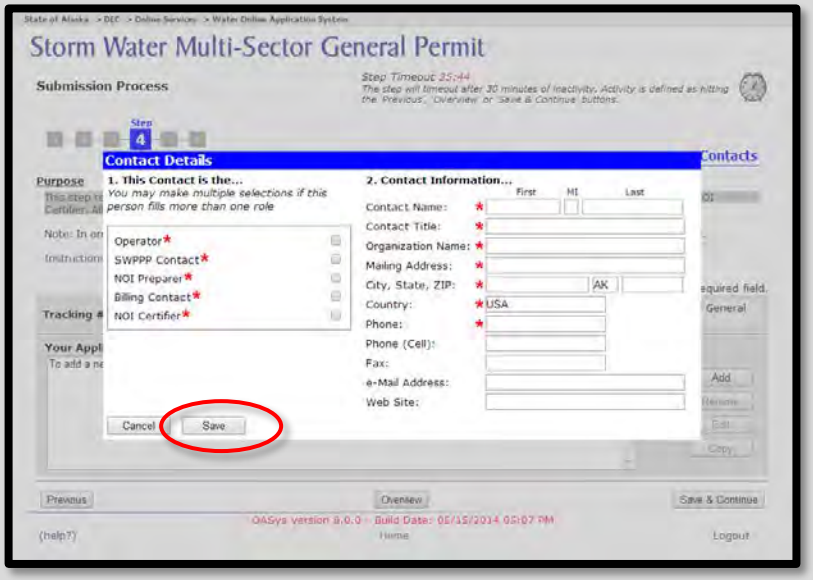
In the Contact Details pop out window answer all required fields and click the **"Save"** button.

Once completed, click **"Save & Continue"** to move to the next step.

TIP: You may enter multiple contacts and a single contact may fulfill multiple roles. Simply check all applicable roles for each contact.

IMPORTANT: The **NOI Certifier** must have the signing authority as required by 18 AAC 83.385 to sign the eNOI.

http://dec.alaska.gov/commish/regulations/pdfs/18%20AAC%2083.pdf#page=71



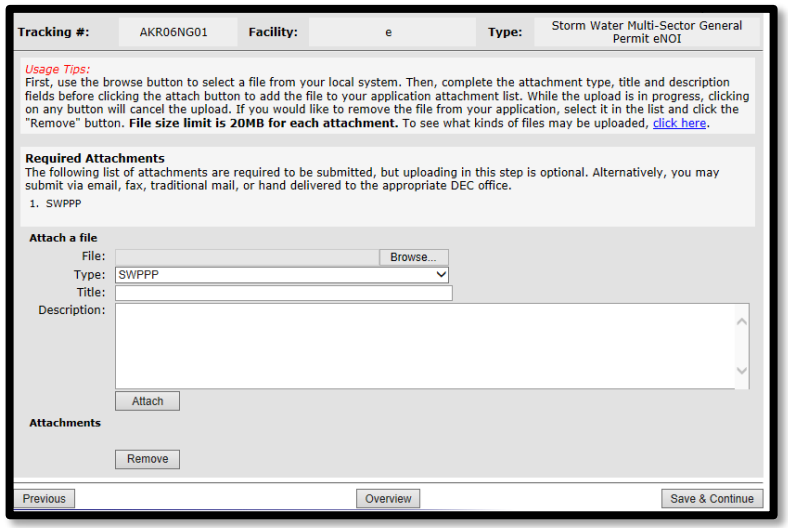
18

Step 5 allows you to electronically submit any supporting documents. If you don't supply the required documents here, you will need to send them in later.

To attach a file:

- Click the **"Browse…"** button
- A file browser window will open. Select the file you want to upload then click the Open button. The name of the file you selected will appear next to the "Browse…" button.
- Select what kind of file it is from the drop-down menu and add a title and description.
- Click **"Attach"** when you have all the information completed to submit your document.

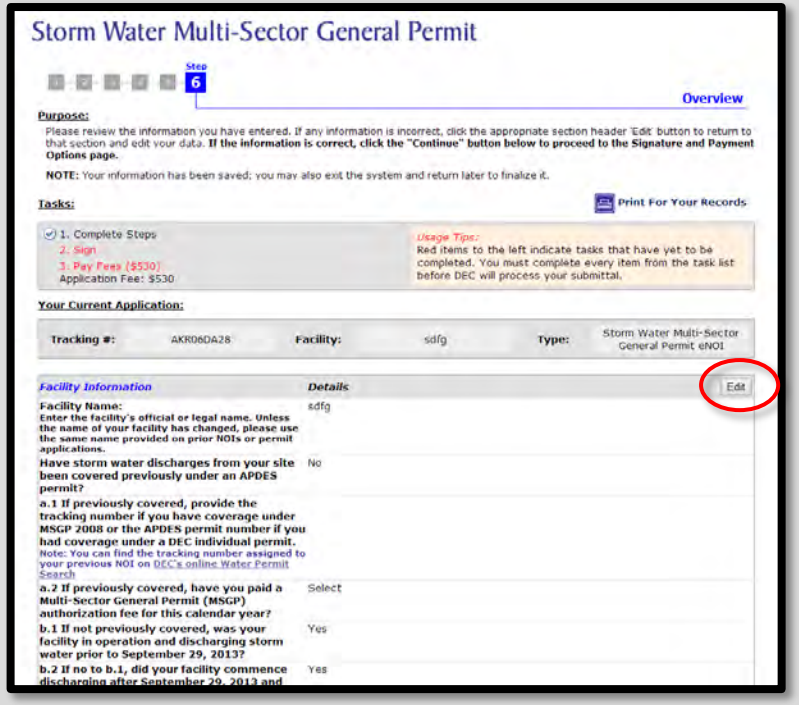
Click **"Save & Continue"** to continue to the next step.



19

Step 6 is the overview page. Here you can review all the information you have entered and make sure it is correct. You can use the **"Edit"** button for any given section to go back and make any necessary adjustments.

Any fields you have left blank will be highlighted yellow, so you can go back and edit them if you need to.

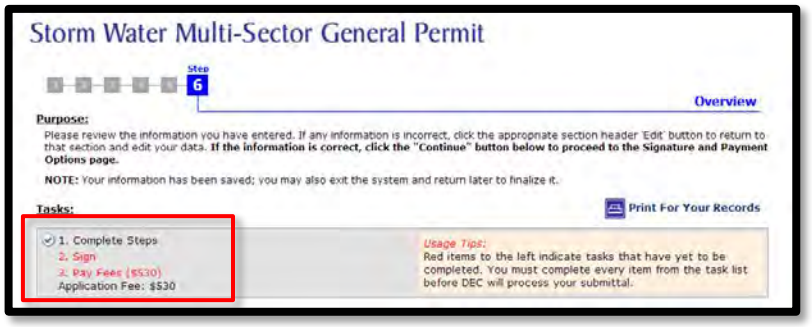


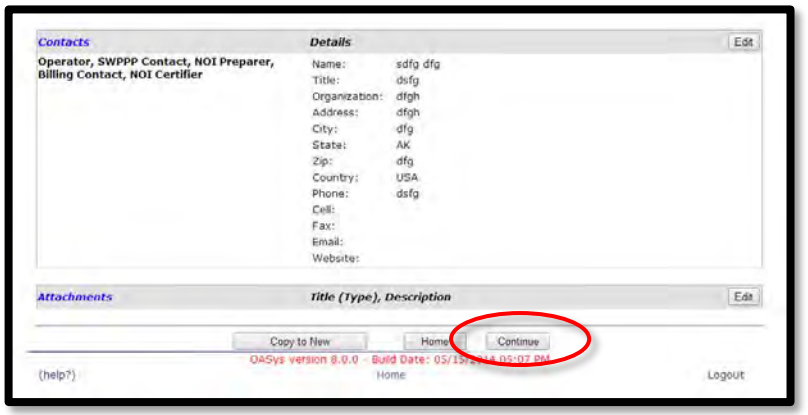
20

After all information is entered and you have finished adding all online attachments, you will need to sign and submit your application.

A check will appear next to **"Complete Steps"** if the application is complete and ready to be signed.

To go the **Final Steps** page, select the **"Sign"** link under tasks on the Application Overview page. You can also click on the **"Continue"** button at the bottom of the page.



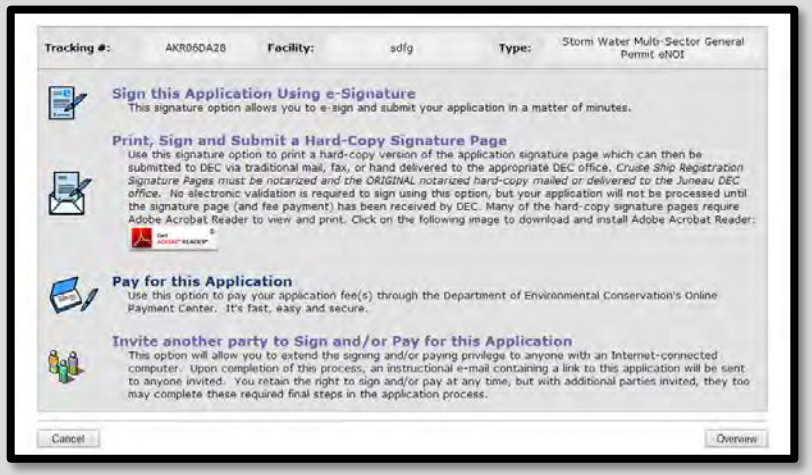


21

The **"Final Steps"** page presents the options for signing and paying for your application.

To sign your application, you may:

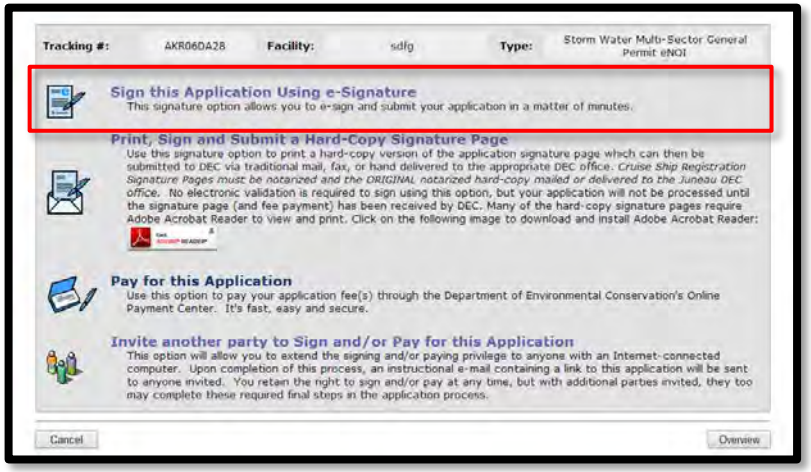
- Sign using an e-Signature
  (Continue to the step 19 of this guide)
- Print and sign a hard-copy
  (Skip to step 22 of this guide)
- Invite another party to sign your application
  (Skip to step 28 of this guide)



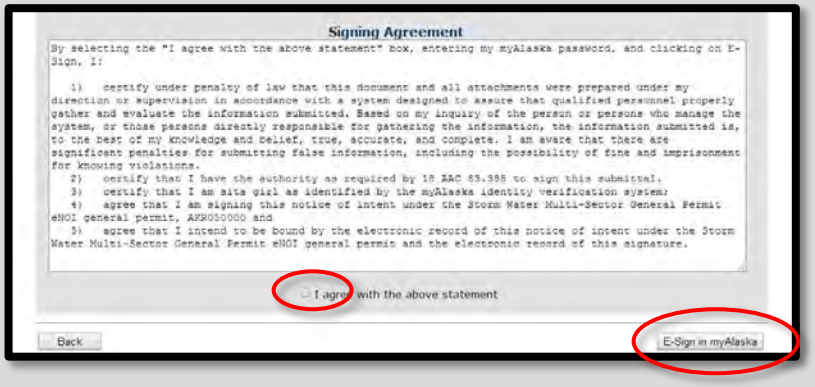
To pay for your application, you may either:

- Pay by credit card or electronic funds transfer
  (Skip to step 24 of this guide)
- Invite another party to pay for your application
  (Skip to step 27 of this guide)

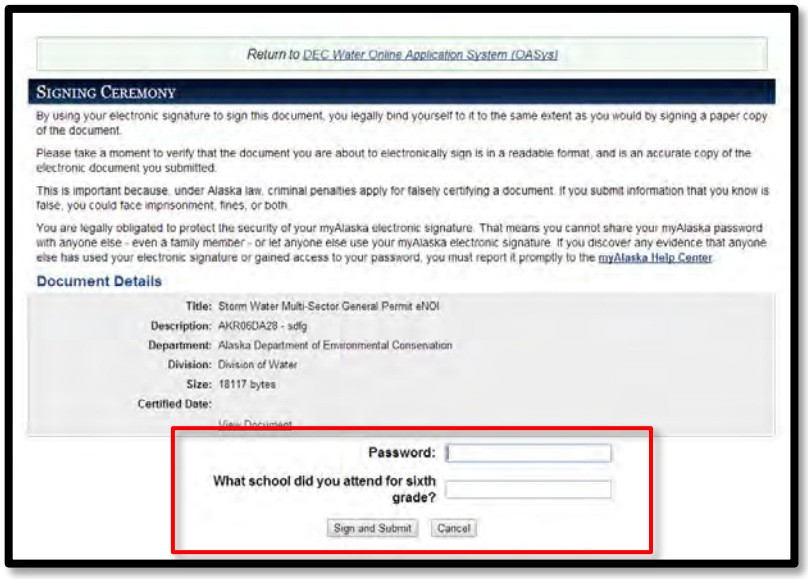
22 Select **"Sign this Application Using e-Signature"** if you are already approved to electronically sign an application.



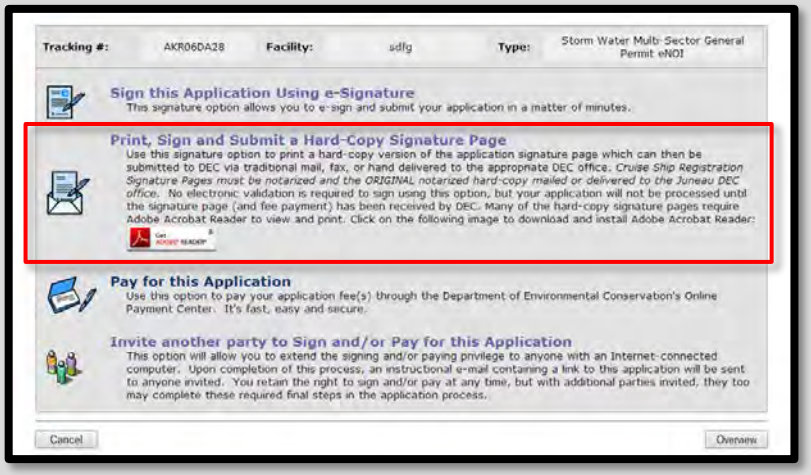
23 Check the box indicating that you agree with the Signing Agreement. To complete the signing process, click on the **"E-Sign in myAlaska"** button to continue to the Signing Ceremony.



24 To complete the signature process enter your myAlaska password, answer the secret question and click the **"Sign & Submit"** button to submit your signature.
(Skip to step 25 of this guidance)

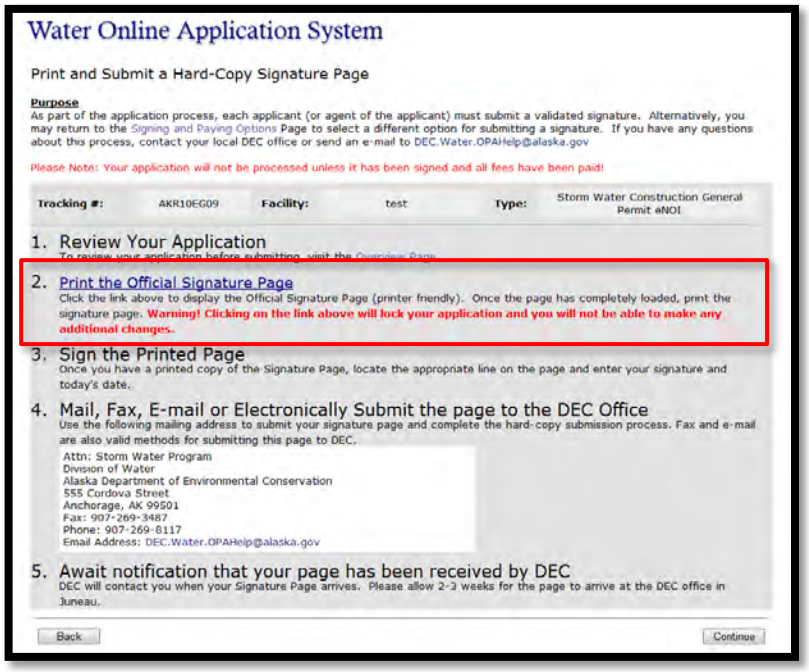


25 To print a hard-copy signature page, select **"Print, Sign and Submit a Hard-Copy Signature Page"**.



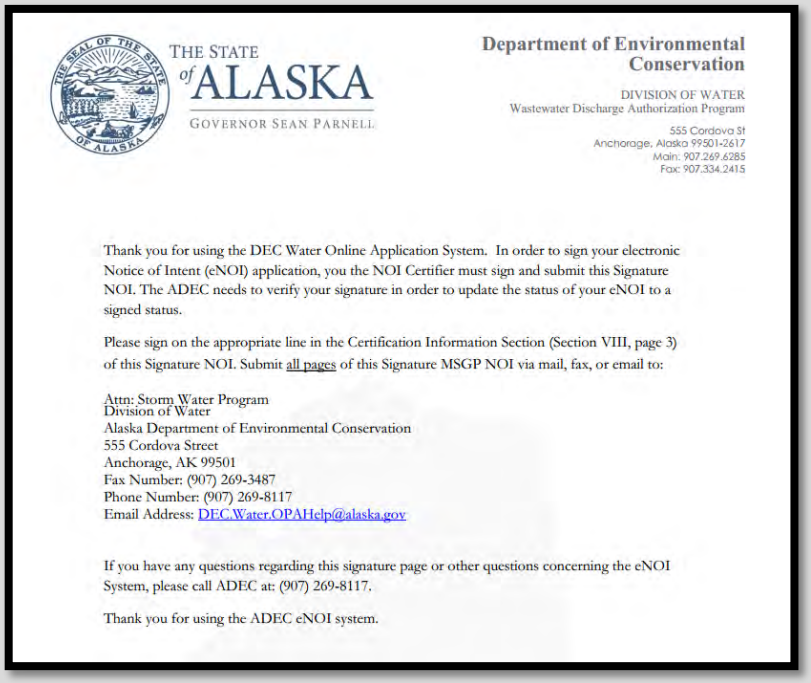
26 Carefully read the steps to submitting your application on this page. Click the **"Print the Official Signature Page"** link to access your printable signature page.

WARNING: Printing your official signature page will lock your application and you will not be able to make any additional changes.



27 When your document has finished downloading print it, sign it on the appropriate line and send it to the address provided in the Signature NOI:

Attn: Storm Water Program
Division of Water
Alaska Dept. of Environmental Conservation
555 Cordova Street
Anchorage, AK 99501



THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Environmental Conservation

DIVISION OF WATER
Wastewater Discharge Authorization Program

555 Cordova St
Anchorage, Alaska 99501-2617
Main: 907.269.6285
Fax: 907.334.2415

Thank you for using the DEC Water Online Application System. In order to sign your electronic Notice of Intent (eNOI) application, you the NOI Certifier must sign and submit this Signature NOI. The ADEC needs to verify your signature in order to update the status of your eNOI to a signed status.

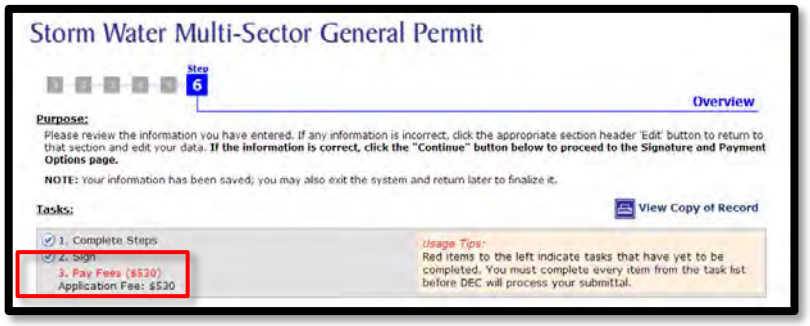
Please sign on the appropriate line in the Certification Information Section (Section VIII, page 3) of this Signature NOI. Submit all pages of this Signature MSGP NOI via mail, fax, or email to:

Attn: Storm Water Program
Division of Water
Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage, AK 99501
Fax Number: (907) 269-3487
Phone Number: (907) 269-8117
Email Address: DEC.Water.OPAHelp@alaska.gov

If you have any questions regarding this signature page or other questions concerning the eNOI System, please call ADEC at: (907) 269-8117.

Thank you for using the ADEC eNOI system.

28 To pay for your application, on the Overview page click the **"Pay Fees ($530)"** link.



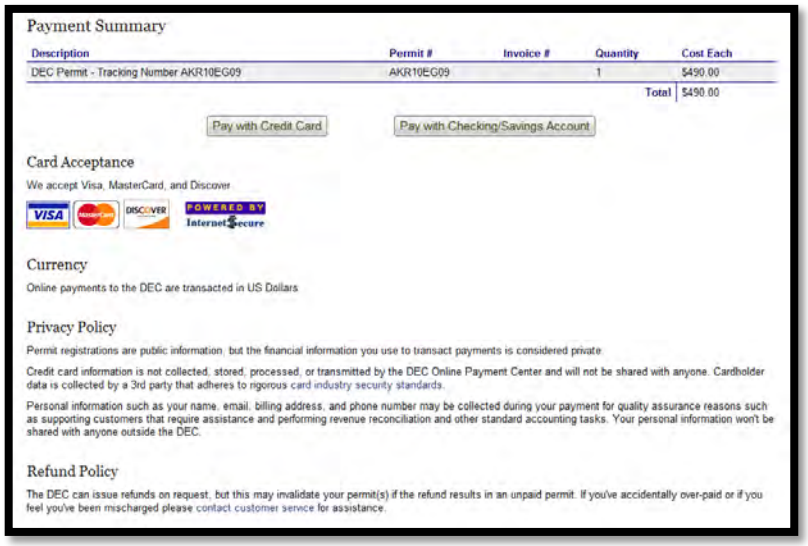
29 Select **"Pay for this Application."**

(If you will be inviting another party to pay for this application skip to step 28 of this guidance.)

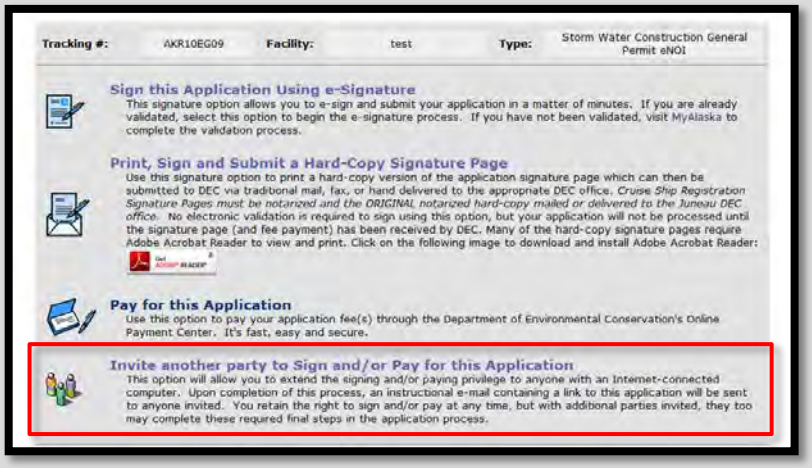
30 You will be taken to the **Payment Summary** page. From here, you can choose to pay via credit card or an electronic funds transfer from a checking or savings bank account.

Follow the on-screen instructions, you will be taken back to your application.

(Skip to step 33 of this guidance.)



31 If you require another party to sign or pay for your application, select the "**Invite another party to Sign and/or Pay for this Application**" and proceed to the next step of this guide.



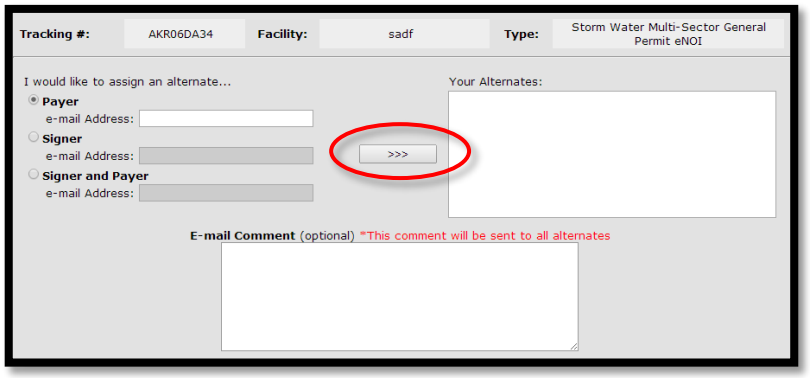
32

Depending on whether you are inviting another party to sign, pay, or both, select from the available options: **Payer, Signer,** or **Signer and Payer**. Then enter the email of your alternative signer/payer into the input field and click the >>> button to add that contact to the e-mail list.

TIP: You can enter multiple emails in this step. Simply enter each additional contact as described above, pressing the >>> button after each contact.

Click the "**Continue**" button and an email will be sent to each of your invited alternates.

WARNING: You must click the >>> button to add the e-mail to the displayed list of alternates before clicking the "Continue" button or else they won't receive an e-mail.



33

An instructional email containing a link to this application is sent to each alternate signer/payer allowing them to complete the final steps in the application process.

NOTE: The alternate signer will need to have a myAlaska account.

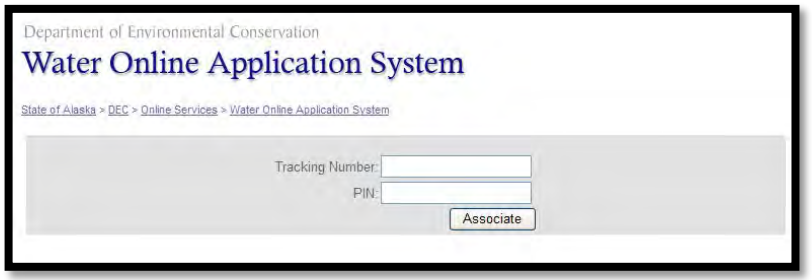

Storm Water Multi-Sector General Permit

sita d girl (salome.starbuck@alaska.gov) has identified you as the person responsible to sign and pay for application number 'AKR06DA34' for the facility: 'sadf'.
This application is for a discharge under the Storm Water Multi-Sector General Permit eNOI AKR06.

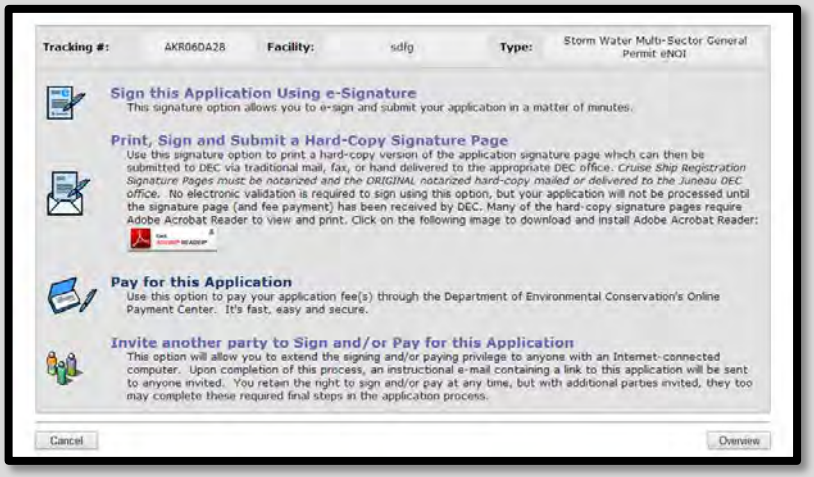
In order to access this application, you will need the following Tracking Number and PIN:
Tracking Number: AKR06DA34
Pin: 3582

To continue, please visit the Water Online Application (https://test.dec.alaska.gov/applications/water/osys/Associate.aspx) site.
Please direct questions to DEC.Water.OPAHelp@alaska.gov.
For storm water applications call 907-269-8117 and for all other applications call John Randolph at 907-465-5407.

34 After clicking on the link provided in the email, the alternate signer/payer will login to OASys and enter the Tracking Number and PIN which are also provided in the email.



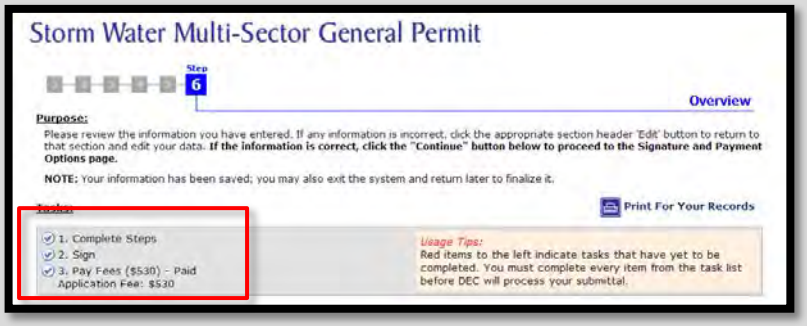
35 The alternate signer will be taken to the **"Final Steps"** page, giving them the opportunity to e-sign (if validated) or print, sign and submit a hard-copy signature page.



36 After your application has been signed or paid, you will receive an email certifying that your application was signed or paid and another after being both signed and paid that your application was successfully submitted.

If you submitted a hard-copy signature page, it may take a few days to process.

37 If you choose to return to the application in the Water Online Application System, the Application Overview will display all tasks completed.



38 **Highlighted Feature:**

The **"Copy to New"** button allows you to create a new questionnaire of the same type that pre-populates with information from a previous questionnaire.

To copy previously submitted information, open your original submittal and select **"Copy to New"** at the bottom of the questionnaire overview page.

For assistance with the online process, please contact the Division of Water at 907-465-5180 or email DEC.Water.OPAHelp@alaska.gov

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Natural Resources
DIVISION OF MINING, LAND & WATER
Southcentral Regional Land Office

550 West 7th Avenue, Suite 900C
Anchorage, Alaska 99501-3577
Main: 907.269.8503
TTY: 711 or 800-770-8973
Fax: 907.269.8913

September 18, 2024

Central Gravel Products
P.O. Box 800 Palmer
Palmer, AK 99645

Re: LAS 35179 – Non-State Land Reclamation Plan Approval

Dear Kelly Heck, and Jade Laughlin,

The Department of Natural Resources (DNR), Division of Mining, Land and Water (DMLW), Southcentral Regional Office (SCRO), received your Non-State Reclamation Plan (NSRP) for the reclamation of 150 acres total, after extracting 230,000 cubic yards of material annually. According to the application, the subject site is located on private lands of Bob and Jean Havemeister, Ralph Kircher, and Bob and Franci Havemeister within Section 27 of Township 18 North, Range 1 East, Seward Meridian.

Thank you for submitting a NSRP for extraction activities taking place from 2024 through 2054. After reviewing the reclamation plan we have determined that the plan is complete as submitted. The proposed reclamation measures are appropriate provided that the operation is conducted in a manner that will prevent unnecessary and undue degradation of land and water resources, and the operation shall be reclaimed using current reclamation methods so that the site is left in a stable and safe condition.

Per Alaska Statute (AS) 27.19.040(a) financial assurance is required. Development of the proposed 150-acre material site requires $750 of financial assurance per acre of mined area. 11 AAC 97.420 (b) states *"(b) If a miner shows to the commissioner's satisfaction that the reasonable and probable costs of reclamation under an approved reclamation plan are less than $750 per acre, the commissioner will reduce the bond to those costs. The miner's showing must be submitted along with the proposed reclamation plan and must include an estimate of the labor and equipment costs that would be incurred to hire a third-party contractor to perform the reclamation in accordance with the plan. In evaluating a miner's proposal for reduction of the bond amount, the commissioner will consider the nature of the surface, its uses, improvements in the vicinity of the land, the degree of risk involved in the mining operation, and all other relevant factors. The commissioner will make a determination on this request of bond reduction in the time schedules set out in 11 AAC 97.300."*

Due to the mining area being disturbed 10-acres at a time, per year, and being reclaimed at the same rate, a reclamation bond is only required for the 10-acres disturbed annually, for a total bond of $7,500.00.

This acceptance letter does not alleviate the necessity to obtain authorizations required by other agencies and entities for this activity. If you have any questions, please feel free to contact Grace Newcomb at (907) 269-8560 or at grace.newcomb@alaska.gov.

Sincerely,

Joni Sweetman
Natural Resource Manager 2 Southcentral Regional Land Office

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

Division of Mining, Land and Water

Northern Regional Land Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2740
nro.lands@alaska.gov

Southcentral Regional Land Office
550 West 7th Ave, Suite 900C
Anchorage, AK 99501-3577
(907) 269-8503
dnr.pic@alaska.gov

Southeast Regional Land Office
P.O. Box 111020
Juneau, AK 99811-1020
(907) 465-3400
sero@alaska.gov

Statewide TTY – 771 for Alaska Relay or 1-800-770-8973

MATERIAL SITE RECLAMATION PLAN OR LETTER OF INTENT/ANNUAL RECLAMATION STATEMENT AS 27.19.030 – 27.19.050

In accordance with Alaska Statute 27.19, reclamation is required of all mining operations, including sand and gravel extraction. Completion of this form will meet the law's requirements for a **reclamation plan** (see below for filing requirements; due date: at least 45 days before mining is proposed to begin; requires approval by the Division of Mining, Land and Water). Completion of this form will also serve as a **letter of intent** for operations exempt from the plan requirement (due date: before mining begins). No approval is required for a letter of intent, but a miner who files a letter of intent must, before December 31, file an **annual reclamation statement** (Section 8 of this form).
Check applicable box:

☒ A. RECLAMATION PLAN (REQUIRED if the operation will disturb five or more acres this year, OR 50,000 cubic yards, OR if the operation has a cumulative disturbed area of five or more acres)

☐ B. RECLAMATION PLAN-VOLUNTARY (for an operation below the limits shown in Box A but wanting to qualify for the statewide bonding pool)

☐ C. LETTER OF INTENT (less than five acres to be disturbed AND less than 50,000 cubic yards AND less than five acres unreclaimed area) NOTE: A miner who files a letter of intent is also required to file an annual reclamation statement at the end of the year.

THIS RECLAMATION PLAN/LETTER OF INTENT IS FOR CALENDAR YEAR 2024-2054
(If you checked either box a or b above and propose a multi-year plan, state all years covered.)

1. **MINER INFORMATION** (If there is more than one miner, attach a list of the names, addresses, and telephone numbers of all other owners, operators, or leaseholders of the mining operation)

Jade Laughlin and Kelly Heck
Name of miner who will serve as agent for notice purposes

Mailing = P.O. Box 800 Palmer, AK 99645 Home/Office = 2151 N Hemmer Road Palmer, AK
Address (notify the department of any later change of address)

Palmer	AK	99645	907-841-7270
City	State	Zip code	Telephone

See attched information for property owners.
Name of landowner (if other than miner) or public land management agency

Attached are notarized signatures of the owners of the three lots being developed.
Federal or state casefile number (if any) assigned to the site

2. **LEGAL DESCRIPTION OF PROPOSED MINING SITE**

Lots D1, D2, and A2 of Section 27	18N	1E	Seward
Legal Subdivision/Section/Quarter-Section	Township	Range	Meridian

3. **DESCRIPTION OF THE MINING OPERATION** (if you checked box a or b on p. 1 of this form and are proposing a multi-year reclamation plan, attach separate sheets as needed showing acreage to be mined, volume to be mined, and existing acreage of mined area for each year covered by the plan)

   a. 10 Total acreage to be mined or disturbed during the year.

   b. 230,000 CY Estimated total volume to be mined or disturbed, including overburden.

   c. sand, gravel, topsoil Type of material (sand, gravel, peat, etc.).

   d. 0 Existing acreage of mined area (disturbed area that has not yet been reclaimed, but counting only acreage disturbed after October 15, 1991).

4. **DESCRIPTION OF THE RECLAMATION OPERATION**

   a. The total acreage that will be reclaimed during the year (or each year, if for a multi-year reclamation plan) is: 10 acres

   b. Provide a list of equipment (type and quantity) to be used during the reclamation operation.

   c. A time schedule of reclamation measures shall be included as part of the plan.

The following measures must be considered in preparing and implementing the reclamation plan. Please mark those measures appropriate to your reclamation activity:

☒ Topsoil that is not promptly redistributed to an area being reclaimed will be separated and stockpiled for future use. This material will be protected from erosion and contamination by acidic or toxic materials and preserved in a condition suitable for later use.

☒ The area will be backfilled, graded and recontoured using strippings, overburden, and topsoil to a condition that allows for the reestablishment of renewable resources on the site within a reasonable period of time. It will be stabilized to a condition that will allow sufficient moisture to be retained for natural revegetation.

☒ Stockpiled topsoil will be spread over the reclaimed area to promote natural plant growth that can reasonably be expected to revegetate the area within five years.

☐ Stream channel diversions will be relocated to a stable location in the flood plain.

☒ Exploration trenches or pits will be backfilled. Brush piles, vegetation, topsoil, and other organics will be spread on the backfilled surface to inhibit erosion and promote natural revegetation.

☒ All buildings and structures constructed, used, or improved on land owned by the State of Alaska will be removed, dismantled, or otherwise properly disposed of at the completion of the mining operation.

☒ Any roads, airstrips or other facilities constructed to provide access to the mining operation shall be reclaimed (unless otherwise authorized) and included in the reclamation plan.

☒ Peat and topsoil mine operations shall ensure a minimum of two inches of suitable growing medium is left or replaced on the site upon completion of the reclamation activity.

☐ If extraction occurs within a flood plain, the reclamation activity shall reestablish a stable bed and bank profile such that river currents will not be altered and erosion and deposition patterns will not change.

NOTE: If you propose to use reclamation measures other than those shown above, or if the private landowner or public land manager of the site requires you to use stricter reclamation measures than those shown above, attach a list of those measures to this plan.

5. **ALTERNATE POST-MINING LAND USE**

☐ The mining site is public land. The land management agency's land use plan (if any) for post-mining land use is:
N/A

☐ The mining site is public land. As allowed by AS 27.19.030(b), I propose to reclaim it to the following post-mining land use:
N/A

☒ The mining site is private property. The private landowner plans to use it for the following post-mining land use:
Residential Subdivision

6. **ATTACHMENTS**

☒ If the mining operation has additional owners, operators, or leaseholders not shown on p. 1 of this form, attach a list of their names, addresses, and telephone numbers.

☒ Attach a USGS map at a scale no smaller than 1:63,360 (inch to the mile) showing the general vicinity of the mining operation and the specific property to be mined. Option: If you checked Box C on the first page of this form and the mining site is adjacent to an airport or public highway, state the name of the airport or the name and milepost of the public highway.

☒ Attach a diagram of the mined area (this term includes the extraction site, stockpile sites, overburden disposal sites, stream diversions, settling ponds, etc.) and the mining operation as a whole (this term includes the roads you plan to build, your power lines, support facilities, etc.). Show and state the number of acres to be mined during the year. (If you checked Box A or B on the first page of this form and your plan covers more than one year, show each year's work.) Show the location corners or property boundaries of the site in relation to the reclamation work and any other areas affected by the operation.

☒ Attach a list of the equipment (type and quantity) to be used during the reclamation activity.

☒ A time schedule of events must be attached that includes dates and activities related to this reclamation plan.

☒ If the site is private land not owned by the miner, attach a signed, notarized statement from the landowner indicating the landowner's consent to the operation. The landowner may also use the consent statement to notify the department that the landowner plans a post-mining land use incompatible with natural revegetation and therefore believes that reclamation to the standard of AS 27.19.020 is not feasible.

☒ For those miners that are required to file an annual reclamation statement, attach photographs and/or videotapes dated and described as to location of the reclamation activity that was completed.

☒ If you propose to use reclamation measures other than those listed on this form, or if the private landowner or public land manager of the site requires you to use stricter reclamation measures, attach a list of those measures.

7. **RECLAMATION BONDING** (REQUIRED **ONLY** IF YOU CHECKED BOX A or B ON THE FIRST PAGE OF THIS FORM)

The total acreage of my mining operation that is subject to the bonding requirement for the current year is 10 acres (add acreages stated in Section 3(a) and 3(d) of this form).

The per-acre bond amount is $750/acre or a total bond amount of $ 7,500

Please check the appropriate bonding method that you will apply toward this reclamation plan:

- ☐ Participation in the statewide bonding pool.
- ☐ Posting a corporate surety bond.
- ☒ Posting a personal bond accompanied by a letter of credit, certificate of deposit, or a deposit of cash or gold.
- ☐ Posting a bond or financial guarantee with another government agency that has jurisdiction over the mining operation, as allowed by a cooperative management agreement between that agency and the Division of Mining, Land and Water.
- ☐ Posting a general performance bond with a state agency that meets the requirements of 11 AAC 97.400(4).

The above reclamation plan/letter of intent and all attachments are correct and complete to the best of my knowledge.

Signature of Miner

5/10/2024
Date

AS 27.19.030 and AS 27.19.050 require a miner either to file a reclamation plan for approval or to file a letter of intent followed by an annual reclamation statement. AS 38.05.035(a) authorizes the director to decide what information is needed to process an application for the sale or use of state land and resources. This information is made a part of the state public land records and becomes public information under AS 40.25.110 and 40.25.120 (unless the information qualifies for confidentiality under AS 38.05.035(a)(8) and confidentiality is requested, AS 43.05.230, or AS 45.48). Public information is open to inspection by you or any member of the public. A person who is the subject of the information may challenge its accuracy or completeness under AS 44.99.310, by giving a written description of the challenged information, the changes needed to correct it, and a name and address where the person can be reached. False statements made in an application for a benefit are punishable under AS 11.56.210. In submitting this form, the applicant agrees with the Department to use "electronic" means to conduct "transactions" (as those terms are used in the Uniform Electronic Transactions Act, AS 09.80.010 – AS 09.80.195) that relate to this form and that the Department need not retain the original paper form of this record: the department may retain this record as an electronic record and destroy the original. In submitting this form, the applicant certifies that he or she has not changed the original text of the form or any attached documents provided by the Division.

State of Alaska Department of Natural Resources
Division of Mining, Land, and Water

MATERIAL SITE RECLAMATION PLAN

AUTHORIZATION OF PROPERTY OWNER FOR GRAVEL PIT DEVELOPMENT

NAME OF PROPERTY OWNER:

Lot D1, Section 27, T18N, R1E, Seward Meridian
Name: Bob and Jean Havemeister
Address: P.O. Box 2349 Palmer, AK 99645
Phone Number: 907-232-0628
Email: HavemeisterTrucking@GMAIL.com

We, Bob or Jean Havemeister, owners of the above referenced property, authorized Central Gravel Products to develop the above referenced property as needed for material extraction (gravel pit). Central Gravel Products is responsible for following all federal, state, and local regulations including the reclamation plan associated with this submittal as required by the Alaska Department of Natural Resources, AS 27.19-030 – 27.19-050.

Signature: Property Owner | Bob Havemeister | 5/2/24
Printed Name | Date

This is to certify that on the 2nd day of MAY 2024, before me, the undersigned, a Notary Public, duly commissioned and sworn as such, personally appeared

Bob Havemeister and acknowledged the above instrument
(Printed Name of signer)
was signed and sealed as their free and voluntary act and deed, for the uses and purposes therein mentioned.

Witnees my hand and official seal.

CYNTHIA BELGARDE
Notary Public
State of Alaska
My Commission Expires Feb 14, 2028

Notary Public in and for Alaska

My Commision Expires Feb. 14, 2028

State of Alaska Department of Natural Resources
Division of Mining, Land, and Water

MATERIAL SITE RECLAMATION PLAN

AUTHORIZATION OF PROPERTY OWNER FOR GRAVEL PIT DEVELOPMENT

NAME OF PROPERTY OWNER:

Lot D1, Section 27, T18N, R1E, Seward Meridian
Name: Ralph Kircher
Address: 3182 N. Trunk Road Palmer, AK 99645
Phone Number: 253-850-9570
Email: PRECIOUSRALPH@AOL.COM

We, Ralph Kircher, owner of the above referenced property, authorized Central Gravel Products to develop the above referenced property as needed for material extraction (gravel pit). Central Gravel Products is responsible for following all federal, state, and local regulations including the reclamation plan associated with this submittal as required by the Alaska Department of Natural Resources, AS 27.19-030 – 27.19-050.

Ralph O. Kircher RALPH O. KIRCHER 5/2/2024

Signature: Property Owner Printed Name Date

This is to certify that on the 02 day of May, before me, the undersigned, a Notary Public, duly commissioned and sworn as such, personally appeared

Ralph O. Kircher and acknowledged the above instrument
(Printed Name of signer)
was signed and sealed as their free and voluntary act and deed, for the uses and purposes therein mentioned.

Witnees my hand and official seal.

Notary Public
State of Washington
TUAN LE
LICENSE # 23012376
MY COMMISSION EXPIRES
APRIL 18, 2027

Notary Public in and for ~~Alaska~~ WASHINGTON

My Commision Expires 04/18/2027

State of Alaska Department of Natural Resources
Division of Mining, Land, and Water

MATERIAL SITE RECLAMATION PLAN

AUTHORIZATION OF PROPERTY OWNER FOR GRAVEL PIT DEVELOPMENT

NAME OF PROPERTY OWNER:
Lot A2, Section 27, T18N, R1E, Seward Meridian
Name: Bob and Franci Havemeister
Address: P.O. Box 467 Palmer, AK 99645
Phone Number: 907-232-0628
Email: Havemeistertrucking@gmail.com

We, Bob or Franci Havemeister, owners of the above referenced property, authorized Central Gravel Products to develop the above referenced property as needed for material extraction (gravel pit). Central Gravel Products is responsible for following all federal, state, and local regulations including the reclamation plan associated with this submittal as required by the Alaska Department of Natural Resources, AS 27.19-030 – 27.19-050.

Signature: Property Owner | Bob Havemeister (Printed Name) | 5/24/24 (Date)

This is to certify that on the 2 day of May, 2024, before me, the undersigned, a Notary Public, duly commissioned and sworn as such, personally appeared

Bob G. Havemeister and acknowledged the above instrument
(Printed Name of signer)
was signed and sealed as their free and voluntary act and deed, for the uses and purposes therein mentioned.

Witnees my hand and official seal.

HOLLY M. KRAMER
Notary Public
State of Alaska
My Commission Expires Jan 18, 2026

Holly M. Kramer
Notary Public in and for Alaska

My Commision Expires 01/18/2026

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 6898
JBER, AK 99506-0898

June 21, 2024

Regulatory Division
POA-2024-00081

Dan Steiner
SDCS, LLC
5900 W. Dewberry Dr.
Wasilla, AK 99623

Dear Mr. Steiner:

This is in response to your letter requesting a Department of the Army (DA) Jurisdictional Determination (JD) for an area in the parcel of land located within Section 27, T. 18 N., R. 1 E., Seward Meridian; Latitude 61.61605° N., Longitude 149.24436° W.; Matanuska-Susitna Borough, Lot D1; 3182 N Trunk Rd., in Palmer, Alaska.

Based on our review of information available to our office and the information you provided, we have determined that the subject parcel contains wetlands that are not a water of the U.S., under the U.S. Army Corps of Engineers (Corps) regulatory jurisdiction. The wetlands on your property are isolated, intrastate, non-navigable, and have no connection to interstate or foreign commerce. Therefore, pursuant to the federal guidance on the Solid Waste Agency of Northern Cook County versus U.S. Army Corps of Engineers consistent with Sackett, a DA permit is not required for any activities that may occur in the review area.

A copy of the Approved Jurisdictional Determination (AJD) form is available at: https://www.poa.usace.army.mil/Missions/Regulatory/Jurisdictional-Determinations/Issued-Approved-Jurisdictional-Determinations/ under June 2024, under your file number. It is also enclosed for your records.

This AJD does not establish any precedent with respect to any other JD under Section 404 of the Clean Water Act.

The wetlands on your parcel were reviewed pursuant to Section 404 of the Clean Water Act which requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands, prior to conducting the work (33 U.S.C. 1344).

For regulatory purposes, the Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

This AJD is valid for a period of five (5) years from the date listed on the AJD form, unless new information supporting a revision is provided to us before the expiration date. Also enclosed is a Notification of Administrative Appeals Options and Process and Request for Appeal form regarding this AJD (see section labeled "Approved Jurisdictional Determination").

Nothing in this letter excuses you from compliance with other federal, state, or local statutes, ordinances, or regulations.

Please contact me via email at Emily.N.Vullo@usace.army.mil, by mail at the address above, by phone at (907) 753-2704, or toll free from within Alaska at (800) 478-2712, if you have questions. For more information about the Regulatory Program, please visit our website at www.poa.usace.army.mil/Missions/Regulatory.

Sincerely,

Emily Vullo

Emily Vullo
Project Manager

Enclosures

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 6898
JBER, AK 99506-0898

CEPOA-RDS-SS

29 May 2024

MEMORANDUM FOR RECORD

SUBJECT: US Army Corps of Engineers (Corps) Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023) ,[1] POA-2024-00081, MFR 2 of 2[2]

BACKGROUND. An Approved Jurisdictional Determination (AJD) is a Corps document stating the presence or absence of waters of the United States on a parcel or a written statement and map identifying the limits of waters of the United States on a parcel. AJDs are clearly designated appealable actions and will include a basis of JD with the document.[3] AJDs are case-specific and are typically made in response to a request. AJDs are valid for a period of five years unless new information warrants revision of the determination before the expiration date or a District Engineer has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.[4] For the purposes of this AJD, we have relied on section 10 of the Rivers and Harbors Act of 1899 (RHA),[5] the Clean Water Act (CWA) implementing regulations published by the Department of the Army in 1986 and amended in 1993 (references 2.a. and 2.b. respectively), the 2008 *Rapanos-Carabell* guidance (reference 2.c.), and other applicable guidance, relevant case law and longstanding practice, (collectively the pre-2015 regulatory regime), and the *Sackett* decision (reference 2.d.) in evaluating jurisdiction.

This Memorandum for Record (MFR) constitutes the basis of jurisdiction for a Corps AJD as defined in 33 CFR §331.2. The features addressed in this AJD were evaluated consistent with the definition of "waters of the United States" found in the pre-2015 regulatory regime and consistent with the Supreme Court's decision in *Sackett*. This AJD did not rely on the 2023 "Revised Definition of 'Waters of the United States,'" as

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[1] While the Supreme Court's decision in *Sackett* had no effect on some categories of waters covered under the CWA, and no effect on any waters covered under RHA, all categories are included in this Memorandum for Record for efficiency.

[2] When documenting aquatic resources within the review area that are jurisdictional under the Clean Water Act (CWA), use an additional MFR and group the aquatic resources on each MFR based on the TNW, interstate water, or territorial seas that they are connected to. Be sure to provide an identifier to indicate when there are multiple MFRs associated with a single AJD request (i.e., number them 1, 2, 3, etc.).

[3] 33 CFR 331.2.

[4] Regulatory Guidance Letter 05-02.

[5] USACE has authority under both Section 9 and Section 10 of the Rivers and Harbors Act of 1899 but for convenience, in this MFR, jurisdiction under RHA will be referred to as Section 10.

CEPOA-RDS-SS
SUBJECT: Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023), POA-2024-00081

amended on 8 September 2023 (Amended 2023 Rule) because, as of the date of this decision, the Amended 2023 Rule is not applicable in this state due to litigation.

1. SUMMARY OF CONCLUSIONS.

   a. Provide a list of each individual feature within the review area and the jurisdictional status of each one (i.e., identify whether each feature is/is not a water of the United States and/or a navigable water of the United States).

      i. Wetland 1; non-jurisdictional

2. REFERENCES.

   a. Final Rule for Regulatory Programs of the Corps of Engineers, 51 FR 41206 (November 13, 1986).

   b. Clean Water Act Regulatory Programs, 58 FR 45008 (August 25, 1993).

   c. U.S. EPA & U.S. Army Corps of Engineers, Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States* (December 2, 2008)

   d. *Sackett v. EPA*, 598 U.S. _, 143 S. Ct. 1322 (2023)

   e. 2008 Rapanos Guidance: List of Resources

   f. 2003 SWANCC Guidance: List of Resources

3. REVIEW AREA. The area of review is located at Lot D1, T18N, R1E, Section 27, Seward Meridian, 3182 N Trunk Rd. Palmer, AK and consists of a 3.16-acre area bound on the east side by Old Homestead Road and bound on the south side by East Bogard Road. There is a small creek (Wasilla Creek) outside of the review area to the east in-between the review area and Old Homestead Road. The area of review is contained within a parcel owned by Ralph Kircher. The northern portion of the lot is currently undeveloped and is uplands. The southern portion of the lot (surrounding the review area) and the lot to the west is developed as farmland. The approximate center of the area of review is located at latitude 61.61605° North, longitude 149.24436° West. No other AJDs have been done in the general vicinity.

CEPOA-RDS-SS
SUBJECT: Pre-2015 Regulatory Regime Approved Jurisdictional Determination in Light of *Sackett v. EPA*, 143 S. Ct. 1322 (2023), POA-2024-00081

4. NEAREST TRADITIONAL NAVIGABLE WATER (TNW), INTERSTATE WATER, OR THE TERRITORIAL SEAS TO WHICH THE AQUATIC RESOURCE IS CONNECTED. The nearest TNW is Knik Arm, which is part of the territorial seas.[6]

5. FLOWPATH FROM THE SUBJECT AQUATIC RESOURCES TO A TNW, INTERSTATE WATER, OR THE TERRITORIAL SEAS
Wasilla Creek flows directly into Knick Arm, which is part of the territorial seas. However, Wetland 1 is not connected to Wasilla Creek or another TNW via a continuous surface connection. Available LiDAR and satellite imagery indicate that Wetland 1 is contained within a depression that is entirely surrounded by uplands. Neighboring vegetation is dominated by vegetation signatures that are indicative of upland communities.

   Additionally, no surface connection is indicated by the National Hydrography Dataset (NHD) nor National Wetland Inventory (NWI) or the Cook Inlet Wetlands Mapper. Satellite imagery, spanning several years and different seasons, shows no signs of surface water or hydrology patterns between the review wetland and a TNW, nor did Google Earth Street View. There are some aerial images which show a "path," but they have been confirmed to be ATV tracks and are not present on recent aerial imagery.

6. SECTION 10 JURISDICTIONAL WATERS[7]: Describe aquatic resources or other features within the review area determined to be jurisdictional in accordance with Section 10 of the Rivers and Harbors Act of 1899. Include the size of each aquatic resource or other feature within the review area and how it was determined to be jurisdictional in accordance with Section 10.[8] N/A

7. SECTION 404 JURISDICTIONAL WATERS: Describe the aquatic resources within the review area that were found to meet the definition of waters of the United States in accordance with the pre-2015 regulatory regime and consistent with the Supreme

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[6] This MFR should not be used to complete a new stand-alone TNW determination. A stand-alone TNW determination for a water that is not subject to Section 9 or 10 of the Rivers and Harbors Act of 1899 (RHA) is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where upstream or downstream limits or lake borders are established.

[7] 33 CFR 329.9(a) A waterbody which was navigable in its natural or improved state, or which was susceptible of reasonable improvement (as discussed in § 329.8(b) of this part) retains its character as "navigable in law" even though it is not presently used for commerce, or is presently incapable of such use because of changed conditions or the presence of obstructions.

[8] This MFR is not to be used to make a report of findings to support a determination that the water is a navigable water of the United States. The district must follow the procedures outlined in 33 CFR part 329.14 to make a determination that water is a navigable water of the United States subject to Section 10 of the RHA.

Court's decision in *Sackett*. List each aquatic resource separately, by name, consistent with the naming convention used in section 1, above. Include a rationale for each aquatic resource, supporting that the aquatic resource meets the relevant category of "waters of the United States" in the pre-2015 regulatory regime. The rationale should also include a written description of, or reference to a map in the administrative record that shows, the lateral limits of jurisdiction for each aquatic resource, including how that limit was determined, and incorporate relevant references used. Include the size of each aquatic resource in acres or linear feet and attach and reference related figures as needed.

a. TNWs (a)(1): N/A

b. Interstate Waters (a)(2): N/A

c. Other Waters (a)(3): N/A

d. Impoundments (a)(4): N/A

e. Tributaries (a)(5): N/A

f. The territorial seas (a)(6): N/A

g. Adjacent wetlands (a)(7): N/A

8. NON-JURISDICTIONAL AQUATIC RESOURCES AND FEATURES

a. Describe aquatic resources and other features within the review area identified as "generally non-jurisdictional" in the preamble to the 1986 regulations (referred to as "preamble waters").[9] Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA as a preamble water. N/A

b. Describe aquatic resources and features within the review area identified as "generally not jurisdictional" in the *Rapanos* guidance. Include size of the aquatic resource or feature within the review area and describe how it was determined to be non-jurisdictional under the CWA based on the criteria listed in the guidance.

Wetland 1 (0.47-acres) is not adjacent to or abutting a jurisdictional water and therefore would not be considered jurisdictional. The nearest jurisdictional water, Wasilla Creek, is about 0.1 miles (170 meters) southeast of the review area and

[9] 51 FR 41217, November 13, 1986.

is separated due to changes in topography. The wetland is in a depression. No culverts are present to facilitate a continuous surface connection to Wasilla Creek. Given the lack of reasonable proximity or hydrologic connection, the review wetlands are unlikely to have more than a speculative or insubstantial effect on the chemical, physical, and/or biological integrity of Wasilla Creek or Knik Arm.

c. Describe aquatic resources and features identified within the review area as waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA. Include the size of the waste treatment system within the review area and describe how it was determined to be a waste treatment system. N/A

d. Describe aquatic resources and features within the review area determined to be prior converted cropland in accordance with the 1993 regulations (reference 2.b.). Include the size of the aquatic resource or feature within the review area and describe how it was determined to be prior converted cropland. N/A

e. Describe aquatic resources (i.e. lakes and ponds) within the review area, which do not have a nexus to interstate or foreign commerce, and prior to the January 2001 Supreme Court decision in "*SWANCC*," would have been jurisdictional based solely on the "Migratory Bird Rule." Include the size of the aquatic resource or feature, and how it was determined to be an "isolated water" in accordance with *SWANCC*.

Wetland 1 (0.47-acre) is a non-navigable intrastate water that does not have a nexus to interstate or foreign commerce. It is located on private property and is not accessible to the public. Wetland 1 is not currently being used for commercial navigation, has not historically been used for commercial navigation, nor is susceptible to being used in the future for commercial navigation, including commercial water-borne recreation as they contain no open water. The wetlands are not adjacent to or abutting a jurisdictional water and therefore would not be considered jurisdictional. Hydrologic connectivity to jurisdictional waters is broken by uplands and lack culverts to support a continuous surface or subsurface connection. Given the absence of reasonable proximity or hydrologic connection to a jurisdictional water and the lack of a nexus to interstate or foreign commerce, the review wetland is considered an isolated water. This wetland would only have been jurisdictional based on the Migratory Bird Rule.

f. Describe aquatic resources and features within the review area that were determined to be non-jurisdictional because they do not meet one or more categories of waters of the United States under the pre-2015 regulatory regime

consistent with the Supreme Court's decision in *Sackett* (e.g., tributaries that are non-relatively permanent waters; non-tidal wetlands that do not have a continuous surface connection to a jurisdictional water).

Wetland 1 is not a TNW or tributary to a TNW. The non-tidal wetland is a combination of palustrine scrub shrub (PSS) and palustrine emergent (PEM) wetlands and does not have a continuous surface water connection to a jurisdictional water as discussed in 8 (b) and 8 (e) above. Therefore, the review wetlands are considered non-jurisdictional.

9. DATA SOURCES. List sources of data/information used in making determination. Include titles and dates of sources used and ensure that information referenced is available in the administrative record.

   a. U.S. Fish and Wildlife Service. 2023. National Wetlands Inventory website. U.S. Department of the Interior, Fish, and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/; accessed April 2024

   b. USDA Soil Mapper; https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey; accessed April 2024

   c. Cook Inlet Wetland Mapper; https://msb.maps.arcgis.com/apps/webappviewer/index.html?id=1565847242 7f459ab6d73b1d3ca5ab77; accessed April 2024

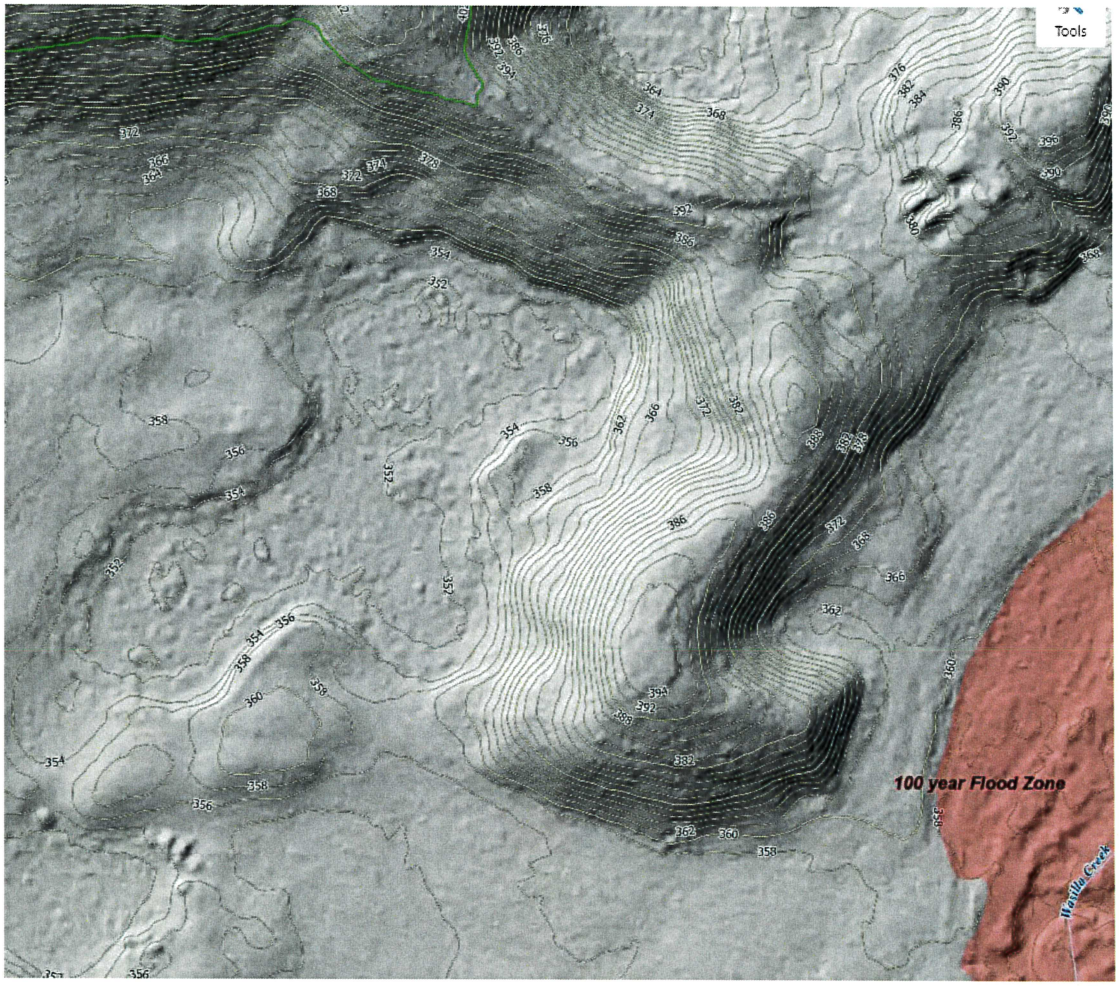
   d. Matanuska-Susitna Borough Mapper, 2019 USGS LiDAR Contours and Imagery: https://mapping.matsugov.us/Html5Viewer/index.html?viewer=MSB_Parcel_Viewer; accessed May 29, 2024

10. OTHER SUPPORTING INFORMATION. The on-site wetland is not adjacent to or abutting a TNW and therefore cannot be considered jurisdictional. The wetland is bordered by uplands. The nearest RPW that flows into a TNW, Wasilla Creek, is over 0.1-mile east of the review area. As described in Sections 8 (b), (e), and (f) above, there is no continuous surface water connection between the review area wetland and an RPW or a TNW. Given the lack of reasonable proximity or hydrologic connection to a jurisdictional water, the review wetlands are considered non-jurisdictional.

11. NOTE: The structure and format of this MFR were developed in coordination with the EPA and Department of the Army. The MFR's structure and format may be

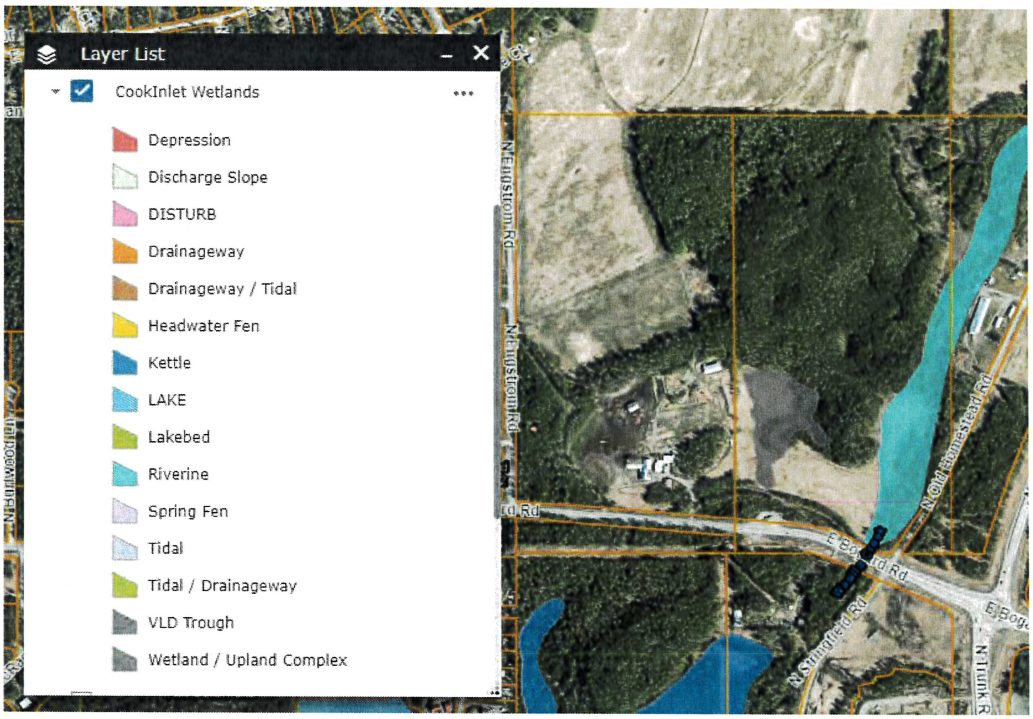
subject to future modification or may be rescinded as needed to implement additional guidance from the agencies; however, the approved jurisdictional determination described herein is a final agency action.


Tools
S18N01E27
AREA IN QUESTION
3182
Wasilla Creek
S18N01E26
3400
N Trunk Rd
7927
7955
E Bogard Rd
N Old Homestead Rd
S18N01E34
8110
S18N01E35

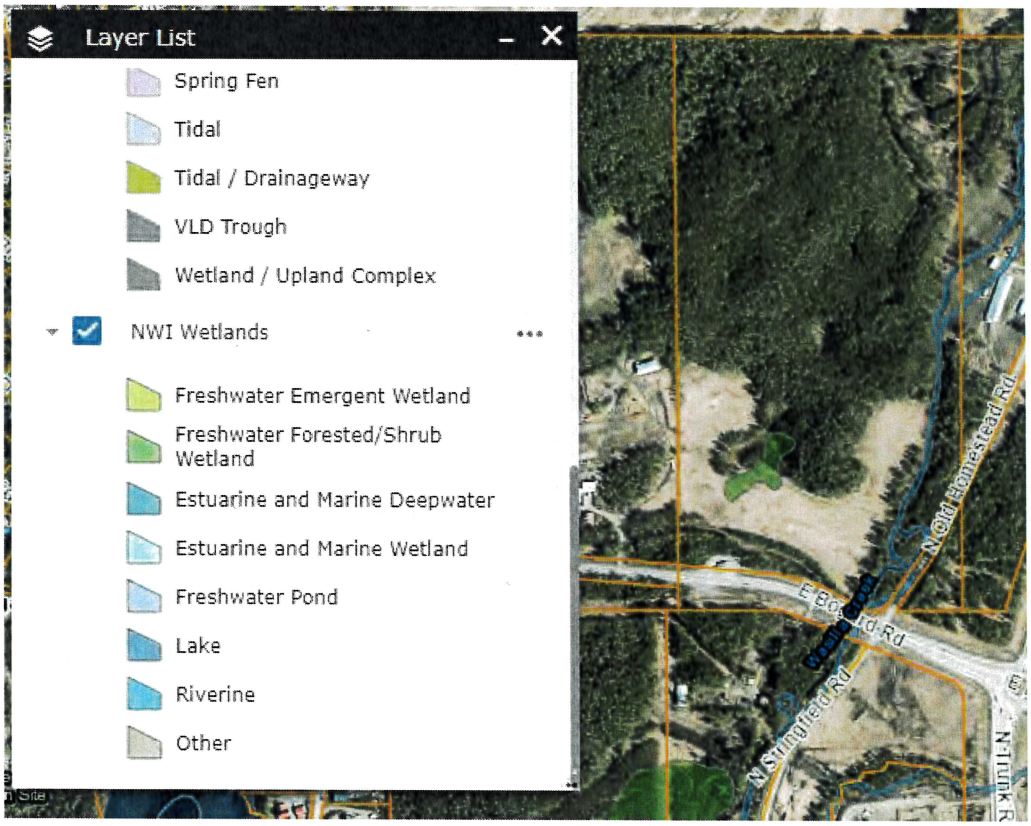


2019 Matanuska-Susitna Borough Mapper, 2019 USGS LiDAR Hillshade and Contours

Wetland 1



Cook Inlet Wetlands



NWI Wetlands

2022 imagery

2021 imagery

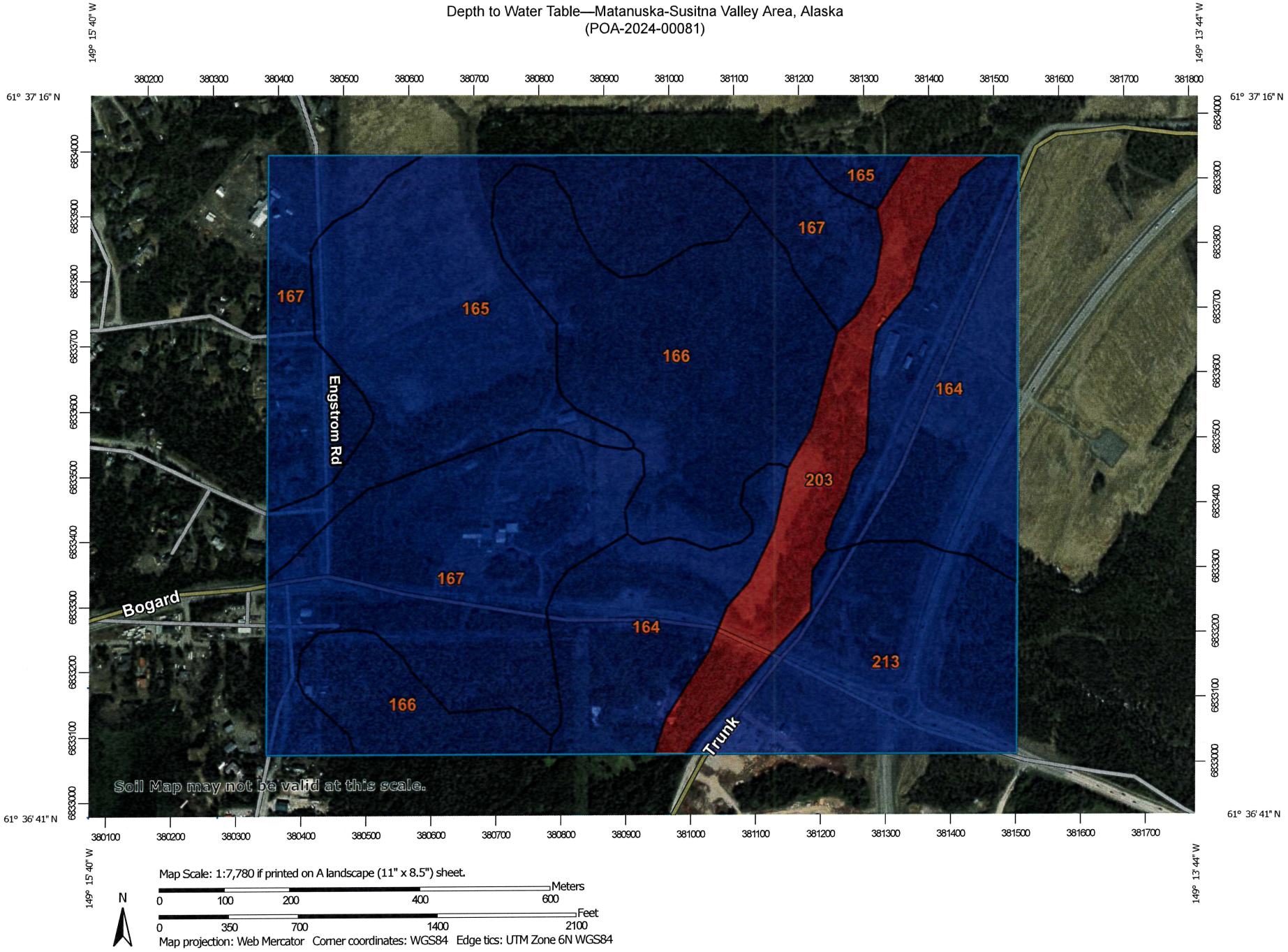
2019 imagery

2017 imagery

2016 imagery

2011 imagery

Depth to Water Table—Matanuska-Susitna Valley Area, Alaska
(POA-2024-00081)



Depth to Water Table—Matanuska-Susitna Valley Area, Alaska
(POA-2024-00081)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Matanuska-Susitna Valley Area, Alaska
Survey Area Data: Version 21, Sep 6, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 25, 2015—Oct 19, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
164	Knik silt loam, 0 to 3 percent slopes	>200	50.2	19.0%
165	Knik silt loam, gently sloping and moderately steep	>200	49.0	18.6%
166	Knik silt loam, steep and sloping	>200	50.7	19.2%
167	Knik silt loam, undulating	>200	64.8	24.6%
203	Typic Cryaquents, 0 to 2 percent slopes	23	19.5	7.4%
213	Yensus silt loam, sloping and moderately steep	>200	29.7	11.2%
Totals for Area of Interest			**264.0**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Dan Steiner	File Number: POA-2024-00081	Date: June 21, 2024

Attached is:		See Section Below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Emily Vullo Alaska District Corps of Engineers CEPOA-RD-S P.O. Box 6898 JBER, AK 99506-0898 907-753-2704 Emily.N.Vullo@usace.army.mil	Ms. Kate Bliss Regulatory Program Manager U.S. Army Corps of Engineers, Pacific Ocean Division CEPOD-PDC, Bldg. 525 Fort Shafter, HI 96858-5440 (808) 835-4626 Kate.M.Bliss@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

PUBLIC HEARING QUASI-JUDICIAL

Resolution No. 24-30

Little Mount Susitna Wind

(Page 407 - 945)

PUBLIC HEARING

STAFF REPORT

MATANUSKA-SUSITNA BOROUGH
Planning and Land Use Department
Development Services Division
350 East Dahlia Avenue • Palmer, AK 99645
Phone (907) 861-7822
www.matsugov.us

DEVELOPMENT SERVICES DIVISION STAFF REPORT

Date: October 9, 2024

File Number: 10033

Applicant: Chad Allen, for Little Mount Susitna Wind LLC

Property Owner: State of Alaska

Request: Conditional Use Permit in accordance with MSB 17.67 – Tall Structures Including Telecommunication Facilities, Wind Energy Conversion Systems, and Other Tall Structures

Locations:

Site Name	Lat/Lon (WGS84)	MTRS
LMS_Met_5	61.473061N, 150.988809W	S016N010W13
LMS_Met_6	61.476704N, 150.895905W	S016N009W16
LMS_Met_7	61.444640N, 150.927867W	S016N009W29
LMS_Met_8	61.429372N, 150.900878W	S016N009W33
LMS_Met_9	61.430890N, 150.916978W	S016N009W32
LMS_Met_10	61.421817N, 150.928003W	S015N009W05

Reviewed By: Jason Ortiz, Development Services Manager J.O.

Staff: Rick Benedict, Current Planner

Staff Recommendation: Approval with conditions

EXECUTIVE SUMMARY

A Conditional Use Permit application under MSB 17.67 – Tall Structures Including Telecommunication Facilities, Wind Energy Conversion Systems, and Other Tall Structures has been submitted to construct six guyed meteorological towers, approximately 197 feet tall, at the above-referenced locations on state-owned property. The purpose of the meteorological towers is to allow for the quantitative assessment of wind resources in the area to enable the development of a wind farm project.

A tall structure exceeding 125 feet in height is only permitted upon the issuance of a Conditional Use Permit. Unless this type of use is maintained under and in accordance with a lawfully issued permit, a tall structure is declared to be a public nuisance. The operation of such a land use without a permit is prohibited.

LAND USE

Existing Land Use:
The proposed locations for the six meteorological towers are within whole (undivided) sections of state-owned land within Township 15 North, Range 9 West, Section 5, Township 16 North, Range 9 West, Sections 16, 29, 32, and 33, and Township 16 North, Range 10 West, Section 13, Seward Meridian. The subject sites do not have Tax ID numbers or addresses. More specifically, the six proposed sites are located on the plateau of Little Mount Susitna, approximately 32 miles west of Big Lake.

Surrounding Land Use:
The six proposed tower sites are surrounded by undeveloped wilderness, and the nearest privately owned land is approximately 2.7 miles northeast of site LMS_Met_6.

REVIEW OF APPLICABLE CRITERIA AND FINDINGS

MSB 17.03 – Public Notification
Staff mailed notices on September 17, 2024. MSB 17.67 requires notices to be mailed to all property owners within one-half mile of the proposed use and to the applicable community council. There is only one property owner within one-half mile, the State of Alaska, and the proposed use is outside a community council boundary. To further involve the community, the Borough significantly expanded noticing. A total of 337 notices were mailed to the closest property owners and the closest community council, the Willow Area Community Organization. The Frontiersman published the public hearing notice in their September 18, 2024, edition. Staff posted the application material on the Borough website for public review on September 12, 2024. A request for comment was emailed to the Willow Area Community Organization and other governmental agencies on September 12, 2024. Staff received no comments from the Willow Area Community Organization. Five written comments in opposition to the meteorological towers and one no-objection comment were received from the public.

Section 17.67.040 Types of Permits Available

(A) There are three types of permits available for tall structures:

(1) Administrative permit: new tall structures that are greater than 85 feet but less than or equal to 125 feet. The applicant may request that the decision on an administrative permit be made by the planning commission. The request shall be in writing at the time of application and all requirements for a conditional use permit shall be followed.

(2) Conditional use permit: new tall structures greater than 125 feet; or tall structures that exceed the height threshold at which a conditional use permit within a special land use district is required.

(3) Network improvement permit: allows legally constructed telecommunication towers to be increased in height in accordance with MSB 17.67.110.

Findings of Fact:

1. According to the application material, the six proposed guyed meteorological towers are each approximately 197 feet tall.
2. The proposed locations are not within a special land use district.

Conclusion of Law: Based on the above findings, the proposed use meets the criteria to qualify for a Conditional Use Permit for the construction of six 197-foot-tall meteorological towers (MSB 17.67.040(A)(1)).

Section 17.67.050 Pre-Application Requirements for New Tall Structures That Require a Conditional Use Permit

(A) Prior to applying for a conditional use permit for a new tall structure, the potential applicant shall hold at least one community meeting:
- *(1) The meeting shall be held at the nearest facility where community council meetings are regularly scheduled. If the facility is not available, the nearest available public facility that is capable of seating a minimum of 20 people shall be utilized;*
- *(2) The meeting shall be held at least 15 calendar days after mailing of the notification;*
- *(3) The meeting shall not start prior to 5 p.m. and no later than 7 p.m.;*
- *(4) Notification of the meeting shall, at a minimum, include the following:*
  - *(a) legal description and map of the general parcel, or parcels, within the coverage area under consideration for the telecommunication facility;*
  - *(b) description of the proposed development including height, design, lighting, potential access to the site, and proposed service;*
  - *(c) date, time, and location of informational meeting;*
  - *(d) contact name, telephone number, and address of applicant; and*
  - *(e) comment form created by the borough that has a comment submittal deadline and provides options for submitting comments.*
- *(5) At a minimum, the notification area for the meeting shall include the following:*
  - *(a) property owners within one-half mile of the parcels under consideration for the proposed tall structure; and*
  - *(b) the nearest community council and any community council whose boundary is within 1,200 feet of the parcels under consideration for the tall structure.*

(B) A written report summarizing the results of the community meeting shall be prepared that includes the following information:
- *(1) dates and locations of all meetings where citizens were invited to discuss the potential applicant's proposal;*
- *(2) content, dates mailed, and numbers of mailings, including letters, meeting notices, newsletters, and other publications;*
- *(3) sign-in sheet(s) used at the meeting, that includes places for names, addresses, phone numbers, and other contact information such as email addresses;*
- *(4) a list of residents, property owners, and interested parties who have requested in writing that they be kept informed of the proposed development through notices, newsletters, or other written materials;*
- *(5) the number of people who attended meetings;*
- *(6) copies of written comments received at the meeting;*
- *(7) a certificate of mailing identifying all who were notified of the meeting; and*
- *(8) a written summary that addresses the following:*

(a) the substance of the public's written concerns, issues, and problems;
(b) how the applicant has addressed, or intends to address, concerns, issues, and problems expressed during the process; and
(c) concerns, issues, and problems the applicant has not addressed or does not intend to address and why.

Findings of Fact:

1. The proposed use is not within a community council boundary.
2. The nearest community to the proposed tower locations is the Willow Area Community Organization.
3. The Willow Area Community Organization holds meetings within the Willow Community Center.
4. According to the application material, the applicant held a public meeting at the Willow Community Center on June 3, 2024, from 5:30 to 6:45 p.m.
5. The applicant provided the notice letter, address list, certificates of mailing, and the letters returned for the community meeting.
6. Planning staff provided the applicant with the mailing addresses for property owners within a ten-mile radius of the proposed locations and the Willow Area Community Organization.
7. A certified mailing notification shows 110 notices were mailed to property owners and the Willow Area Community Organization on May 16, 2024.
8. The notification included a legal description and map of the parcel, a description of the proposed development, the date, time, and location of the informational meeting, contact name, telephone number, and address of the applicant, and a comment form created by the Borough with a deadline to submit comments and submittal options.
9. The application material contains a copy of the meeting sign-in sheet, a written report summarizing the comments received during the public meeting, and the applicant's detailed response.
10. According to the applicant, one written comment was received resulting from the public meeting notification.

Conclusion of Law: Based on the above findings, the applicant has met the pre-application requirements for new tall structures that require a conditional use permit (MSB 17.67.050).

Section 17.60.080 Standards for Approval of New Tall Structures

(A) A permit for a new tall structure may only be approved if it meets the requirements of this section in addition to any other applicable standards required by this chapter.
(B) In granting or denying a permit, the commission or director shall make findings on whether the applicant has demonstrated that:
(1) To the extent that is technically feasible and potentially available, the location of the tall structure is such that its negative effects on the visual and scenic resources of all surrounding properties have been minimized;

Findings of Fact:

1. The proposed tower sites are located on lands managed by the State of Alaska.

2. The applicant provided a land use permit for the proposed tower installations, dated August 20, 2024, permitted by the Department of Natural Resources under LAS 34057.
3. According to the application material, the tower locations were chosen to properly quantify the wind speed attributes across the proposed wind farm project.
4. The proposed meteorological towers' remote locations and the area's lack of privately owned property provide a natural buffer that helps to minimize the visual impacts on the surrounding area.
5. The six proposed tower sites are surrounded by undeveloped wilderness, and the nearest privately owned land is approximately 2.7 miles northeast of site LMS_Met_6.
6. According to the application material, the proposed towers are not visible from public parks.
7. The closest recognized trail is the Sleeping Lady Trail, approximately 5 miles east of the site known as LMS_Met_6.
8. The closest waterbody is Trail Lake, approximately 11 miles northeast of the site known as LMS_Met_6.
9. According to the site plan, site LMS_Met_5 is located within Township 16 North, Range 10 West, Section 13. The east side of Section 13 is approximately 1,285 feet from the proposed site, and the north side is approximately 2,535 feet from the proposed site.
10. According to the site plan, site LMS_Met_6 is located within Township 16 North, Range 9 West, Section 16. The east side of Section 16 is approximately 2,592 feet from the proposed site, and the north side is approximately 1,866 feet from the proposed site.
11. According to the site plan, site LMS_Met_7 is located within Township 16 North, Range 9 West, Section 29. The east side of Section 29 is approximately 1,426 feet from the proposed site, and the north side is approximately 2,167 feet from the proposed site.
12. According to the site plan, site LMS_Met_8 is located within Township 16 North, Range 9 West, Section 33. The east side of Section 33 is approximately 1,084 feet from the proposed site, and the south side of Section 33 is approximately 2,539 feet from the proposed site.
13. According to the site plan, site LMS_Met_9 is located within Township 16 North, Range 9 West, Section 32. The east side of Section 32 is approximately 1,640 feet from the proposed site, and the north side is approximately 285 feet from the proposed site.
14. According to the site plan, site LMS_Met_10 is located within Township 15 North, Range 9 West, Section 5. The west side of Section 5 is approximately 1,683 feet from the proposed site, and the north side is approximately 2,225 feet from the proposed site.

Conclusion of Law: Based on the above findings, the locations of the meteorological towers are such that their negative effects on the visual and scenic resources of all surrounding properties have been minimized (MSB 17.67.080(B)(1)).

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(2) Visibility of the tall structure from public parks, trails recognized within adopted borough plans, and water bodies has been minimized to the extent that is technically feasible and potentially available;

Findings of Fact:

1. The closest recognized trail is the Sleeping Lady Trail, approximately 5 miles east of the site known as LMS_Met_6.
2. The closest waterbody is Trail Lake, approximately 11 miles northeast of the site, known as LMS_Met_6.
3. According to the application material, the proposed towers are not visible from public parks.
4. According to the application material, the tower locations were chosen to properly quantify the wind speed attributes across the proposed wind farm project.
5. The proposed meteorological towers' remote locations and the area's lack of privately owned property provide natural buffers that help minimize the visual impacts on the surrounding area.

Conclusion of Law: Based on the above findings, the visibility of the proposed meteorological towers from public parks and trails has been minimized (MSB 17.67.080(B)(2)).

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(3) The tall structure will not interfere with the approaches to any existing airport or airfield that are identified in the borough's regional aviation system plan or by the Alaska State Aviation System Plan; and

Findings of Fact:

1. According to the Matanuska-Susitna Borough's Regional Aviation System Plan Study (Phase II, May 2017), Flat Horn Lake is approximately 15 miles east of the site known as LMS_Met_8.
2. According to the application material, the Federal Aviation Administration (FAA) online "Notice Criteria Tool" indicates the proposed meteorological towers and their corresponding locations do not exceed the FAA Notice Criteria.

Discussion: The FAA Notice Criteria Tool is intended to identify potential hazards to existing airports and airfields. Developments, such as the proposed meteorological towers, which do not exceed the notice criteria, do not pose a hazard to existing airports and airfields.

Conclusion of Law: Based on the above findings, the proposed tall structure will not interfere with the approaches to any existing airport or airfield that are identified in the borough's regional aviation system plan or by the Alaska State Aviation System Plan (MSB 17.67.080(B)(3)).

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(4) Granting the permit will not be harmful to the public health, safety, convenience, and welfare.

Findings of Fact:

1. The proposed tower sites are located on lands managed by the State of Alaska.
2. The applicant provided a land use permit for the proposed tower installations, dated August 20, 2024, permitted by the Department of Natural Resources under LAS 34057.
3. The six proposed tower sites are surrounded by undeveloped wilderness, and the nearest privately owned land is approximately 2.7 miles northeast of site LMS_Met_6.

4. According to the site plan, site LMS_Met_5 is located within Township 16 North, Range 10 West, Section 13. The east side of Section 13 is approximately 1,285 feet from the proposed site, and the north side is approximately 2,535 feet from the proposed site.
5. According to the site plan, site LMS_Met_6 is located within Township 16 North, Range 9 West, Section 16. The east side of Section 16 is approximately 2,592 feet from the proposed site, and the north side is approximately 1,866 feet from the proposed site.
6. According to the site plan, site LMS_Met_7 is located within Township 16 North, Range 9 West, Section 29. The east side of Section 29 is approximately 1,426 feet from the proposed site, and the north side is approximately 2,167 feet from the proposed site.
7. According to the site plan, site LMS_Met_8 is located within Township 16 North, Range 9 West, Section 33. The east side of Section 33 is approximately 1,084 feet from the proposed site, and the south side of Section 33 is approximately 2,539 feet from the proposed site.
8. According to the site plan, site LMS_Met_9 is located within Township 16 North, Range 9 West, Section 32. The east side of Section 32 is approximately 1,640 feet from the proposed site, and the north side is approximately 285 feet from the proposed site.
9. According to the site plan, site LMS_Met_10 is located within Township 15 North, Range 9 West, Section 5. The west side of Section 5 is approximately 1,683 feet from the proposed site, and the north side is approximately 2,225 feet from the proposed site.
10. The closest recognized trail is the Sleeping Lady Trail, approximately 5 miles east of the site known as LMS_Met_6.
11. According to the application material, the tower and its guy wires have been marked with FAA-compliant paint, guy guards, and marker balls.
12. According to the application material, the proposed meteorological towers will not be lit.
13. According to the Matanuska-Susitna Borough's Regional Aviation System Plan Study (Phase II, May 2017), Flat Horn Lake is approximately 15 miles east of the site known as LMS_Met_8.
14. According to the application material, the proposed towers have been engineered with wind and ice load limits that meet the ANSI/TIA-222-G standards.
15. The applicant submitted a structural design report for the proposed towers, which contains certified drawings from Registered Professional Engineer Aaron Boonstra, licensed to practice in Alaska.

Discussion: Five written comments in opposition to the meteorological towers and one no-objection comment were received from the public. These comments are available for review within the Planning Commission packet materials.

Conclusion of Law: Based on the above findings, the proposed towers will not be harmful to public health, safety, convenience, and welfare (MSB 17.60.080(B)(4)).

Section 17.67.090 Operation Standards for New Tall Structures

(A) The following setback requirements shall apply to all new telecommunications towers regulated under this chapter:

(1) The equipment compound shall meet minimum setback distances from all property lines in accordance with MSB 17.55.

(2) Minimum setback for the tower base shall be a distance equal to the height of the tower.

(a) The commission, or director if it is an administrative permit, may reduce the setback to a distance less than the height of the tower, if the applicant demonstrates there is no risk to public health, safety, or welfare of adjacent property owners.

Findings of Fact:

1. The proposed towers are not telecommunication towers, so the requirements of this paragraph and subparagraph do not apply.

Conclusion of Law: Based on the above finding, MSB 17.67.090(A) does not apply to the proposed meteorological towers.

(B) For all tall structures regulated under this chapter, adequate vehicle parking shall be provided on the subject property, outside of public use easements and rights-of-way, to enable emergency vehicle access.

(1) No more than two spaces per provider shall be required.

Findings of Fact:

1. According to the application material, each site has adequate space for emergency vehicle access.
2. According to the application material, each site is accessible via helicopter for emergency response.

Conclusion of Law: Based on the above finding, adequate vehicle parking has been provided (MSB 17.67.090(B)(1)).

(C) The following requirements apply to all new and existing telecommunication towers and wind energy conversion systems regulated under this chapter:

(1) The following signage shall be visibly posted at the equipment compound:

(a) *informational signs for the purpose of identifying the tower such as the antenna structure registration number required by the Federal Communications Commission, as well as the party responsible for the operation and maintenance of the facility;*

(b) if more than 220 volts are necessary for the operation of the facility, warning signs shall be located at the base of the facility and shall display in large, bold, high contrast letters the following: "HIGH VOLTAGE – DANGER"; and

(c) a 24-hour emergency contact number.

(2) A fence or wall not less than six feet in height with a secured gate shall be maintained around the base of the tower.

Findings of Fact:

1. The proposed towers are not telecommunication towers, so the requirements of this paragraph and subparagraph do not apply.

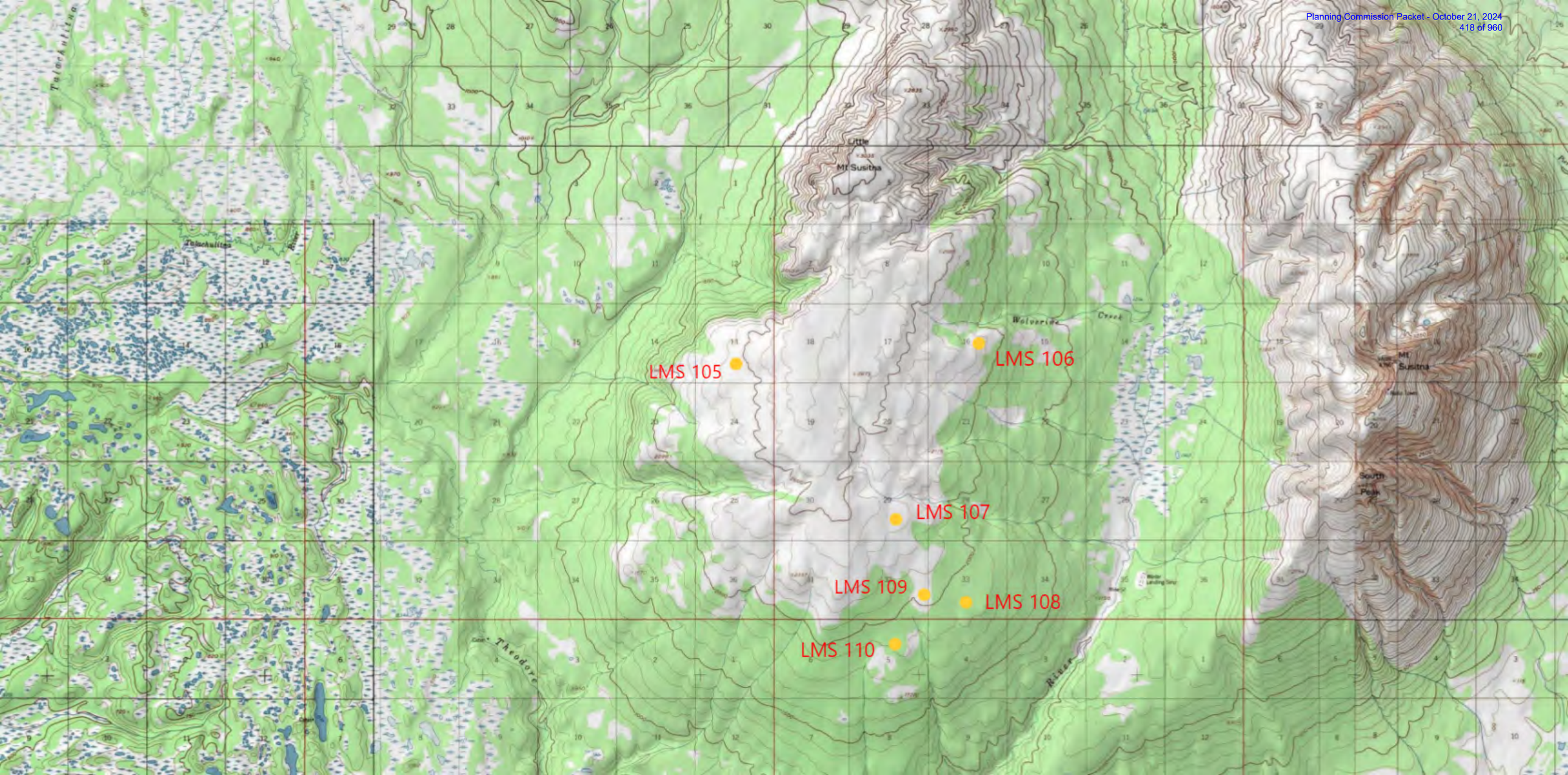
Conclusion of Law: Based on the above finding, MSB 17.67.090(C) does not apply to the proposed meteorological towers.

STAFF RECOMMENDATIONS

Staff recommends approval of the Conditional Use Permit to construct six 197-foot-tall guyed meteorological towers. This application meets all the applicable standards of MSB 17.67, and staff recommends approval of this request with the following conditions:

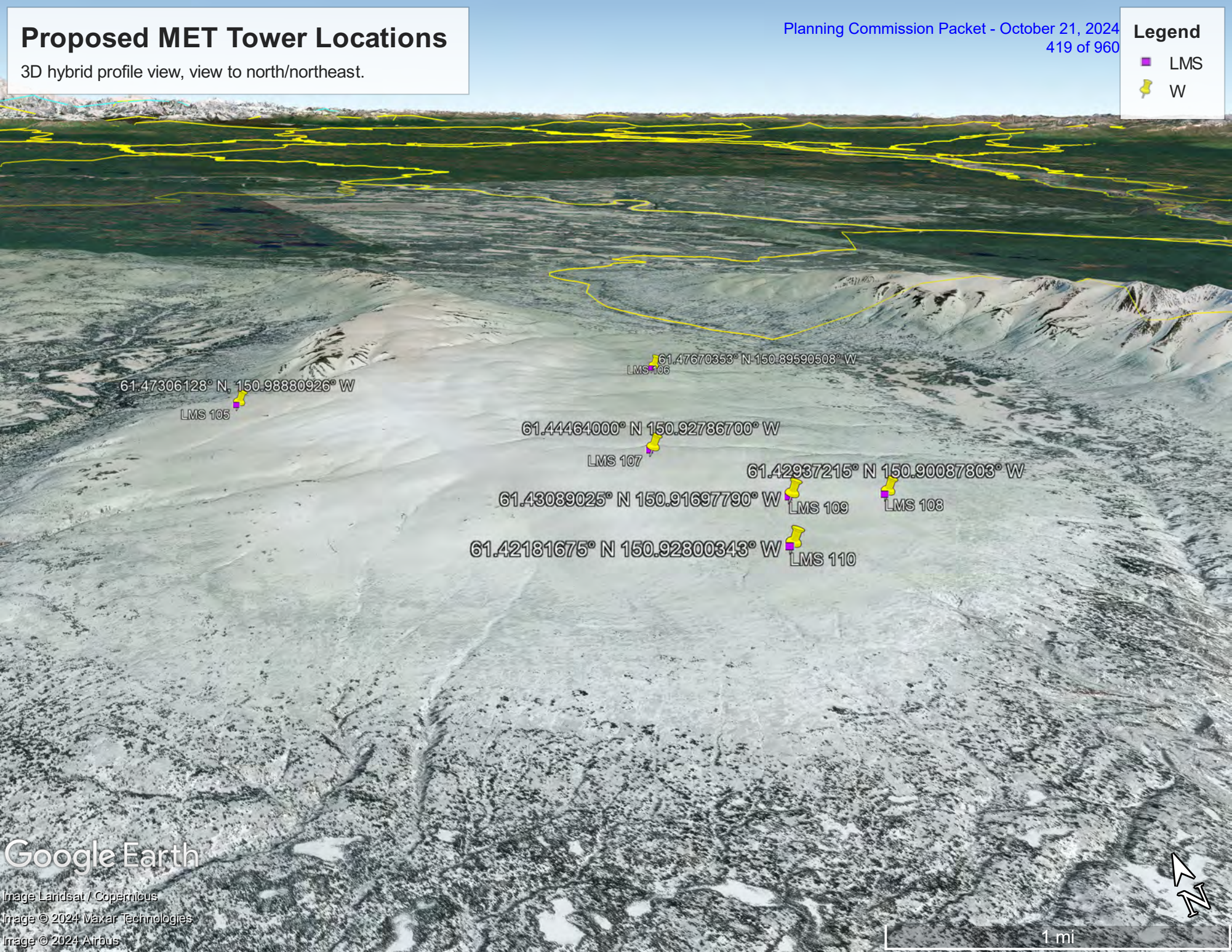
1. The operation shall comply with all applicable federal, state, and local regulations.
2. Authorized borough representatives shall be allowed to inspect the site and related records at reasonable times to monitor compliance with all permit conditions. Upon reasonable notice from the borough, the permittee shall provide necessary assistance to facilitate authorized inspections (MSB 17.67.300(D)).
3. The facility shall be removed at the owner's expense within 90 days after abandonment or termination of the permit in accordance with MSB 17.67.130(A)(1).

MAPS

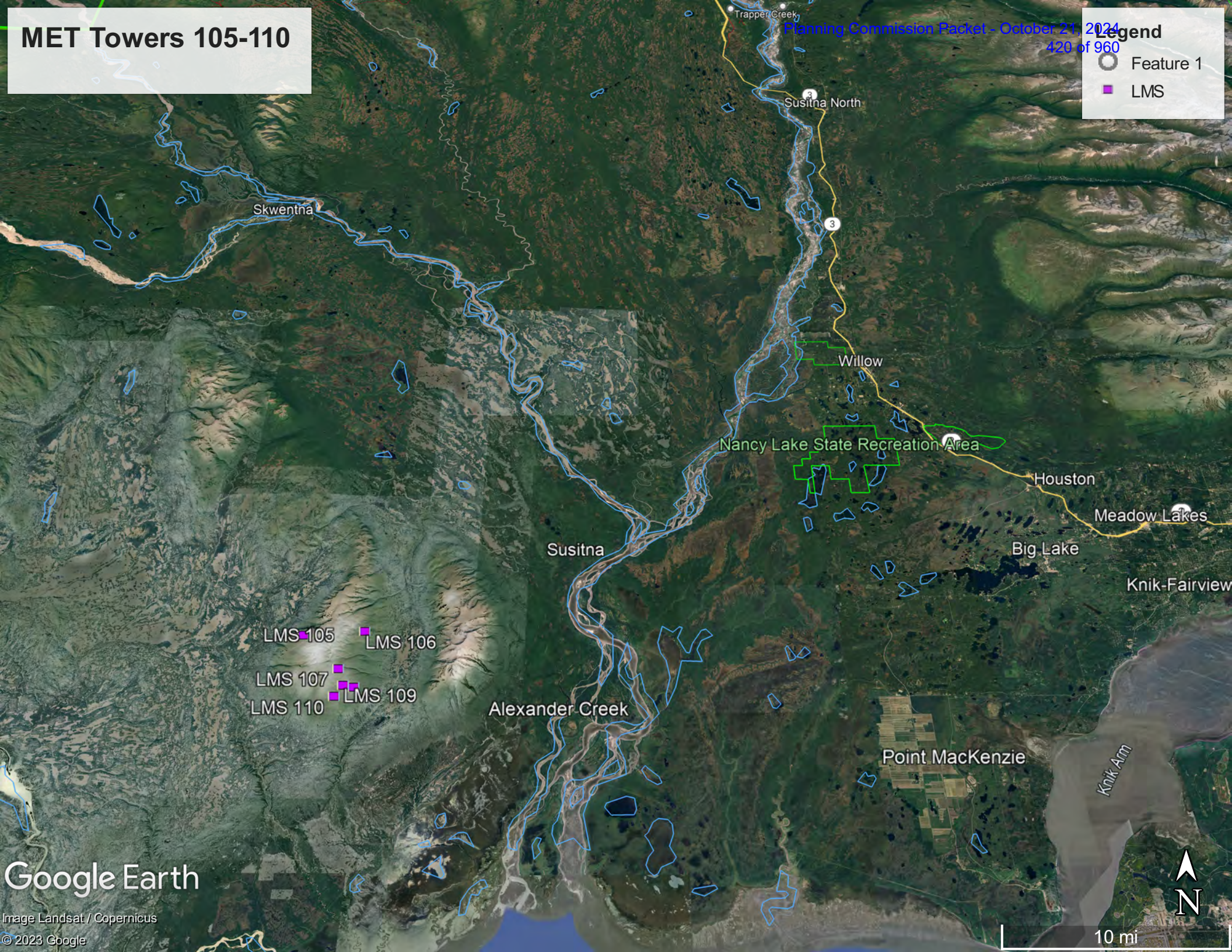

LMS 105
LMS 106
LMS 107
LMS 108
LMS 109
LMS 110
Little
Mt Susitna
Wolverine
Creek
Mt
Susitna
South
Peak
Theodore
River

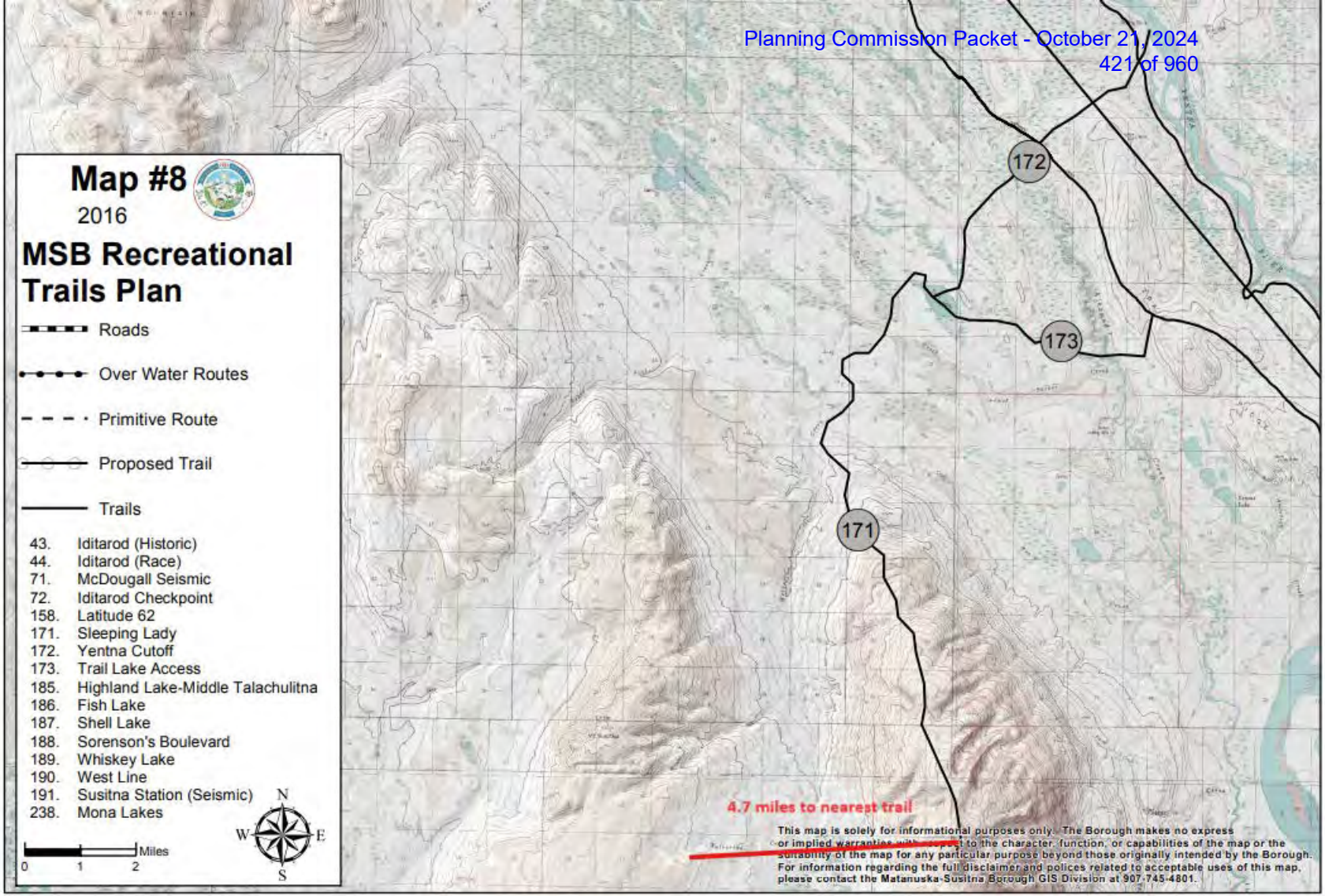
Proposed MET Tower Locations

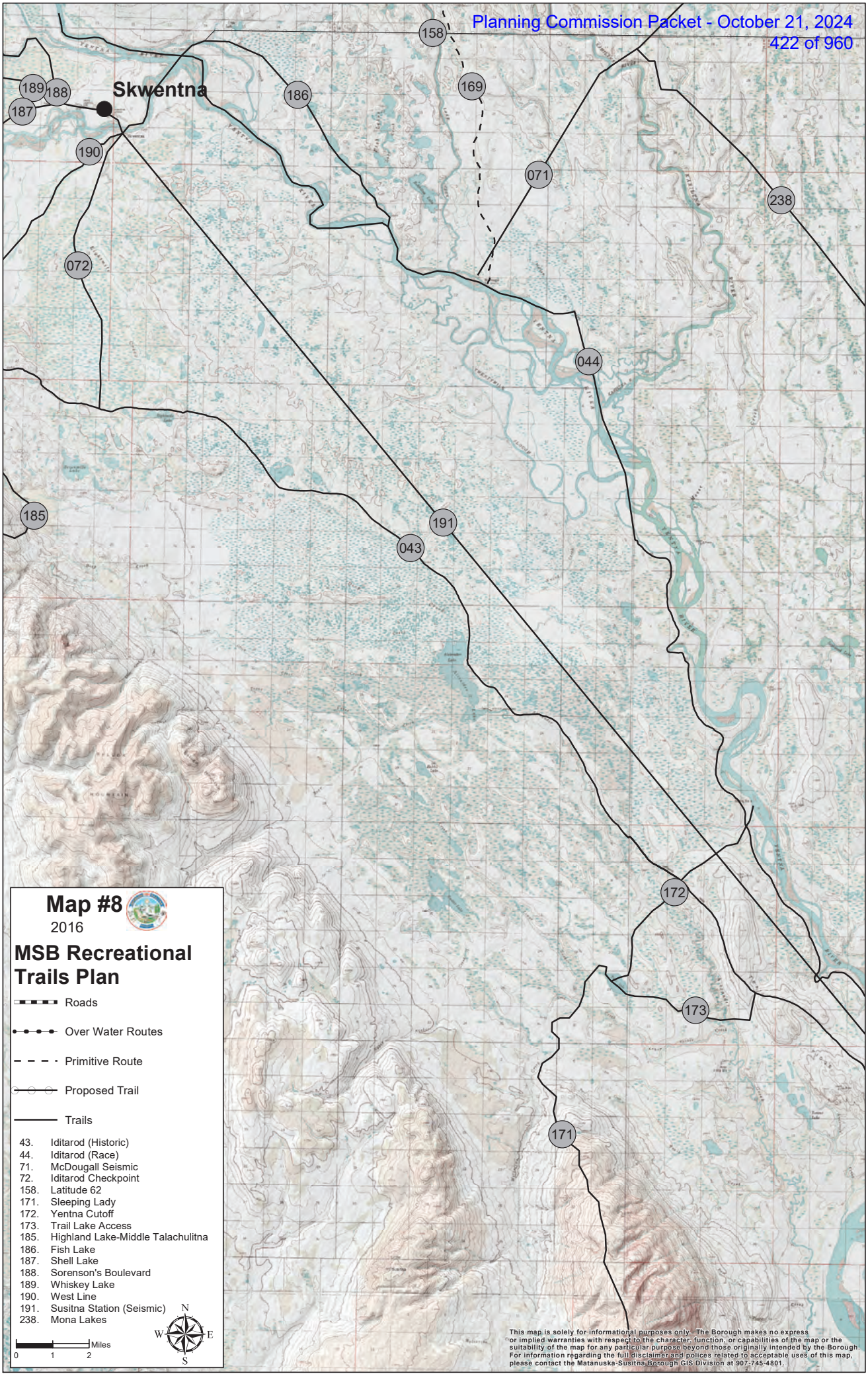
3D hybrid profile view, view to north/northeast.



MET Towers 105-110




Map #8
2016
MSB Recreational Trails Plan
Roads
Over Water Routes
Primitive Route
Proposed Trail
Trails
43. Iditarod (Historic)
44. Iditarod (Race)
71. McDougall Seismic
72. Iditarod Checkpoint
158. Latitude 62
171. Sleeping Lady
172. Yentna Cutoff
173. Trail Lake Access
185. Highland Lake-Middle Talachulitna
186. Fish Lake
187. Shell Lake
188. Sorenson's Boulevard
189. Whiskey Lake
190. West Line
191. Susitna Station (Seismic)
238. Mona Lakes
N
W
E
S
Miles
0 1 2
172
173
171
4.7 miles to nearest trail
This map is solely for informational purposes only. The Borough makes no express or implied warranties with respect to the character, function, or capabilities of the map or the suitability of the map for any particular purpose beyond those originally intended by the Borough. For information regarding the full disclaimer and polices related to acceptable uses of this map, please contact the Matanuska-Susitna Borough GIS Division at 907-745-4801.



Map #8

2016

MSB Recreational Trails Plan

- Roads
- Over Water Routes
- Primitive Route
- Proposed Trail
- Trails

43. Iditarod (Historic)
44. Iditarod (Race)
71. McDougall Seismic
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186. Fish Lake
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188. Sorenson's Boulevard
189. Whiskey Lake
190. West Line
191. Susitna Station (Seismic)
238. Mona Lakes

N W E S

0 1 2 Miles

PUBLIC NOTICING

UNITED STATES POSTAL SERVICE®

Certificate of Bulk Mailing — Domestic

Fee for Certificate

Up to 1,000 pieces (1 certificate for total number)

For each additional 1,000 pieces, or fraction thereof

Duplicate Copy ☐

Use Current Price List (Notice 123)

Postage: Mailers must affix meter, PC Postage®, or (uncanceled) postage stamps here in payment of total fee due.

Acceptance employee must cancel p affixed (by round-date) at the time of

US POSTAGE PITNEY BOWES
ZIP 99645 $ 012.50⁰
02 7W
0008035337 SEP 17 2024

If payment of total fee due is being paid by Permit Imprint, include the *PostalOne!*® Transaction Number here: _____

Number of Identical Weight Pieces	Class of Mail	Postage for Each Mailpiece Paid	Number of Pieces to the Pound
337/2	1st	☐ Verified	45

Total Number of Pounds	Total Postage Paid for Mailpieces	Fee Paid
71bs. 4.30z	232.53/3.30	12.50

Mailed For	Mailed By
Dev. Ser. Permits	I. Fodge

PALMER AK 99645 SEP 17 2024 USPS

Postmaster's Certification

It is hereby certified that the number of mailpieces presented and the associated postage and fee were verified. This certificate does not provide evidence that a piece was mailed to a particular address.

(Postmaster or Designee)

PS Form **3606-D**, January 2016 PSN 7530-17-000-5548

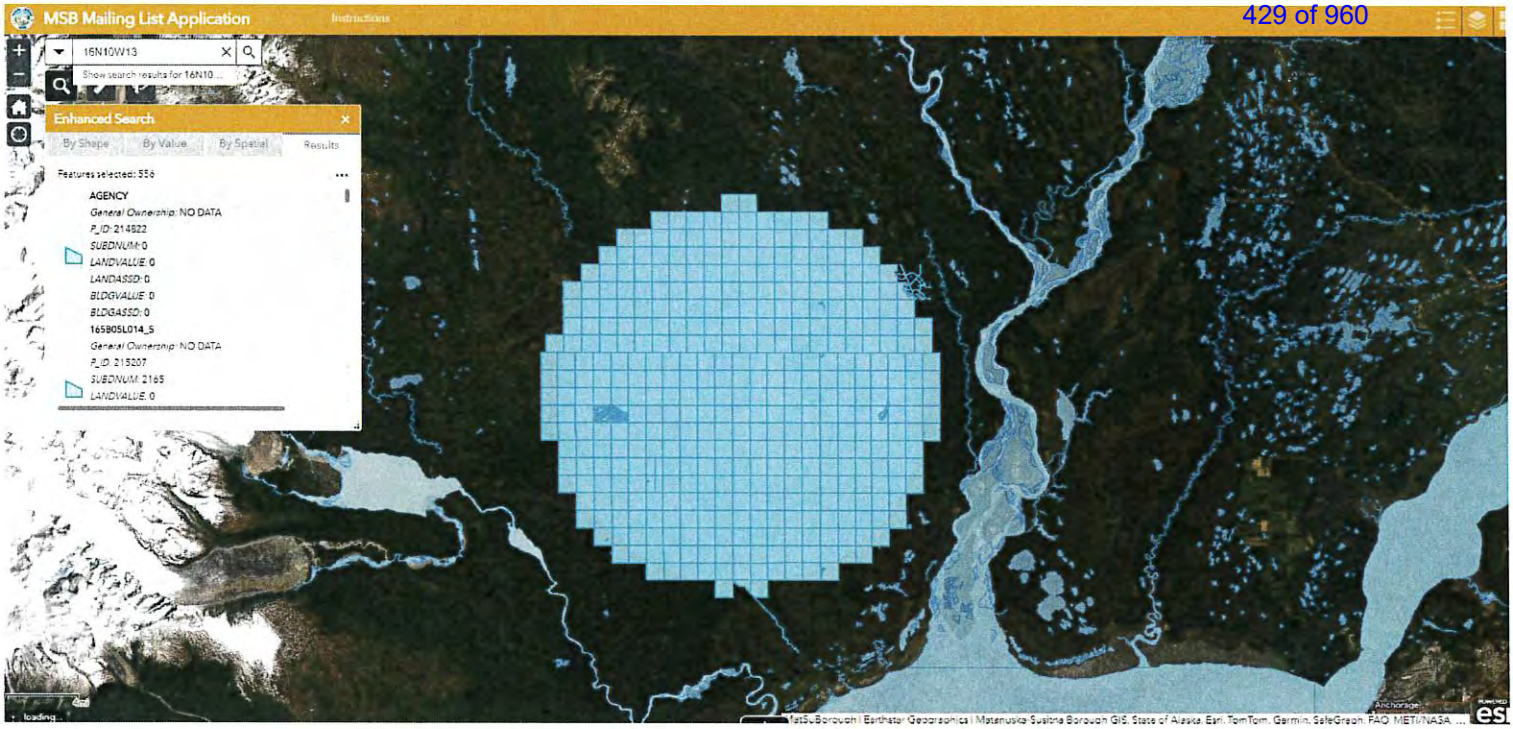
See Reverse for Instructions

Number	Tax Account	OWNER_1	MAILING_ADDRESS_LINE_B	MAILING_ADDRESS_CITY	MAILING_A	MAILING_ADDRESS_ZIP
1	2165B08L004	MOORE MICHAEL S & DNA S	6215 KANAN-DUME RD	MALIBU	CA	90265
2	2165B07L008	WEBBER MARK EUGENE	PO BOX 3601	VALDEZ	AK	99686-3601
3	1237000T00G	STARK RONALD EST, % THOMAS L STARK	11340 ELMORE RD	ANCHORAGE	AK	99516
4	1237000T00T-1	ALBRITTON VERONICA Y	2028 S 17TH ST	TACOMA	WA	98405
5	1740000T00B	VANN PERRY, % PAULA LEWIS	335 N JUANITA AVE #103	LOS ANGELAS	NV	90004
6	27940000000	MERCURIO J COSMO	26994 JOHANSEN DR	KASILOF	AK	99610
7	1740000T00H	SEARS LEWIS J & BETTY P REV TR	13030 ADMIRALITY PL	ANCHORAGE	AK	99515-3726
8	24550000000	MOREHOUSE REX L EST	PO BOX 1047	WILLOW	AK	99688-1047
9	1726000T00A	MEIER KIM L & SUSAN E	5131 E ALDER DR	WASILLA	AK	99654
10	15N10W07B001	COOK INLET REGION INC	PO BOX 93330	ANCHORAGE	AK	99509-3330
11	2165B03L006	ALASKA STATE OF DEPT OF NATURAL RESOURCES DIV OF LANDS	550 W 7TH AVE	ANCHORAGE	AK	99501-3579
12	1234000T00D	VERNOLA KRISTIN	2499 N SEWARD MERIDIAN	WASILLA	AK	99654
13	2165B07L011	MOORE JAMIE R	654 S RED MOUNTAIN BLVD	IVINS	UT	84738
14	1234000T00M	VERNOLA KRISTIN M	2499 N SEWARD MERIDIAN	WASILLA	AK	99654
15	1237000T00O	STARK THOS L& ELIZABETH A	11340 ELMORE RD	ANCHORAGE	AK	99516
16	1575000T00F	BAHSON EDWARD REID JR, DRISCOLL ELLEN MARIE	PO BOX 415	GIRDWOOD	AK	99587-0415
17	1237000T00S	JACKSON G W	5716 CRAIG DR	ANCHORAGE	AK	99504-3027
18	1575000T00B	JONES LEROY C JR	8050 PIONEER DR # 602	ANCHORAGE	AK	99504
19	14N10W21A001	MATANUSKA-SUSITNA BOROUGH	350 E DAHLIA AVE	PALMER	AK	99645-6488
20	3207000T00A	GARDNER IVAN & CATHERINE	PO BOX ACR ALEXANDER CREE	ANCHORAGE	AK	99695-0020
21	1236000T00K	FORTIER GILBERT III	645 G ST #542	ANCHORAGE	AK	99501
22	2165B04L004	LOWERY TODD J	850 HOWARD ST TRLR 41	RAYMOND	WA	98577-1500
23	1740000T00C	BOWIE PHYLLIS J	4101 COVENTRY DR	ANCHORAGE	AK	99507-3321
24	U01824000L01-1	BUDNEY HENRY S TR BUDNEY ALAN F TRE	267 MEIGGS BACKUS RD	SANDWICH	MA	02563-2750
25	1237000T00E	WALTERS LAURA MARIE	PO BOX 220071	ANCHORAGE	AK	99522
26	1726000T00B	LE BOEUF KENNETH R&JEAN 7 BENOIT LINDA & NOWALK J PICHE DONNA& MAU	W 4028 HWY 2	POWERS	MI	49874
27	2165B06L009	CATHER JEFF & BOOTS TOM	4821 BECHAROF ST	ANCHORAGE	AK	99507
28	1236000T00L	JOHNSON ERNEST, JACK-JOHNSON GILDA	PO BOX 553	CROSBY	TX	77532
29	2165B03L009	KITTLE CORY LEE	8420 RUTH DR	EAGLE RIVER	AK	99577
30	1740000T00F	SHELFF ENTERPRISES LVG TR, GARDNER HATTIE L TRE	23010 BLACKSTONE PK RD	KATY	TX	77493
31	1236000T00I	ADAMS RYAN C	130 WOODLAND AVE	RENO	NV	89523-8909
32	1237000T00T	ALBRITTON MELVIN M	2028 S 17TH ST	TACOMA	WI	98405
33	2165B03L005	CARTER LAWRENCE C	PO BOX 4225	FORT EUSTIS	VA	23604
34	1726000T00C	LINDLEY PHILIP J	2230 STEEPLE DR	ANCHORAGE	AK	99516-2694
35	1575000T00D	STEVENS DON	PO BOX 661	WHITTIER	AK	99693-0661
36	1237000T00D-1	FP REV TR, KRISHNAMURTHY MICHELE TRE, % STEPHAN M PAULI FINANC	4020 DEFIANCE ST	ANCHORAGE	AK	99504-4368
37	2165B01L014	KOONTZ KENNETH DWAYNE	110 PETTIS RD	ANCHORAGE	AK	99515-3403
38	1237000T00O-1	STARK THOS L	11340 ELMORE ST	ANCHORAGE	AK	99516
39	1237000T00H	PYHALA PATRICIA J	PO BOX 161	ANCHOR POINT	AK	99556-0161
40	15720000000	THOMAS ALLEN CARL PARTICK	PO BOX 693	WILLOW	AK	99688
41	1237000T00C-2	DORRANCE KAY F	2440 BENZ CIR	ANCHORAGE	AK	99502
42	1237000T00R	STARK THOMAS L	11340 ELMORE RD	ANCHORAGE	AK	99516-1523
43	1235000T00D	COUILLARD RUTH WENDULA, % C. BENTE	22765 HAMBURG	GERMANY		99999
44	1234000T00N	PINCKNEY DONNA CHENEY	8677 VILLA LA JOLLA DR #245	LA JOLLA	CA	92037
45	2165B03L003	BRYANT TERRY MICHAEL	229 E COMMONWEALTH # 235	FULLERTON	CA	92832
46	1740000T00K	SMITH MAURY JAY	8103 E US HIGHWAY 36 # 145	AVON	IN	46123
47	23810000000	FINLEY CHRISTOPHER V	3617 N INSPIRATION LOOP	WASILLA	AK	99654-1264
48	1236000T00J	COPELAND BRIDGETT MOSES, NELSON JUANITA & ROGERS MOSES M & R &	PO BOX 39209	DENVER	CO	89239-9209
49	2165B07L001	JAQUES RANDY LEE, GUSTY JEANIE LADY	3501 IOWA ST	ANCHORAGE	AK	99517-2123
50	2165B04L003	SELLERS JAKE A, ERVIN ELLIOTT LEE	17409 FOUR CORNER RD	PRAIRIE GROVE	AR	72753-9765
51	2165B06L007	WINDLASS REST LLC	PO BOX 872590	VANCOUVER	WA	98687
52	21130000000	THOMPSON JOAL W & PATT L	21786 425TH AVE	CLITHERALL	MN	56524-9651
53	1237000T00G-1	STARK JOHN A	PO BOX 520491	BIG LAKE	AK	99652
54	2165B07L010	SARAZUA GONZALO J	9621 SW 77TH AVE APT 303	MIAMI	FL	33156-2654
55	1740000T00A	VANN LUELLA P, % PAULA LEWIS	335 N JUANITA AVE # 103	LOS ANGELAS	NV	90004
56	15N07W06A002	ALEXANDER CREEK INC	8128 CRANBERRY DR	ANCHORAGE	AK	99508
57	2165B02L008	LEE JESSICA K	402A W PALM VALLEY BLVD #153	ROUND ROCK	TX	78664
58	1237000T00E-1	DOWNS ALAN & DEBRA	1948 CHAMPION CIR	VIRGINIA BEACH	VA	23456
59	1235000T00A	COUILLARD DONALD O EST, % TED ROTHAUPT	44747 21ST ST W	LANCASTER	CA	93536
60	1575000T00E	BOLDT ARTEYA, NUNLEY KYLE	PO BOX 352	SUTTON	AK	99674
61	25620000000	STARK JOHN & NICOLE	PO BOX 520491	BIG LAKE	AK	99652
62	1237000T00F-1	STOVER HAROLD REV LVG TR, STOVER MARGARET	3800 BONIFACE PKY	ANCHORAGE	AK	99504-4307
63	2165B03L004	REMARAIS CASSANDRE, % CASSANDRE MACLAIRD	1920 6TH ST # 347	SANTA MONICA	CA	90405
64	1234000T00O	JOHNSON ADA	4119 VISTA CT	ANCHORAGE	AK	99508
65	1726000T00D	NGUYEN CHANH T	21017 SCENIC DR	CHUGIAK	AK	99567
66	2165B06L008	JAQUES RANDY L, JAQUES PAUL T	PO BOX 870182	WASILLA	AK	99687
67	1235000T00B	PAAPKE RONALD E, LEINO JANE I	90480 PETER JOHNSON RD	ASTORIA	OR	97103
68	1575000T00A	STARK THOMAS L & ELIZABETH A	11340 ELMORE RD	ANCHORAGE	AK	99516
69	1235000T00C	SORENSON FRED A	PO BOX 1636	COLUMBIA FALLS	MT	59912
70	2165B06L010	CATHER JEFFERY DEAN	4821 BECHAROF	ANCHORAGE	AK	83815
71	1237000T00D	JENSEN-TOWNE JENNIFER C	2046 WESTLAKE N #102	SEATTLE	AK	98109
72	U04624000L01	ACS INTERNET INC, ATTEN: TAX DEPT MS #8 STO	600 TELEPHONE AVE	ANCHORAGE	AK	99503-6010
73	2165B01L010	KOONTZ KENNETH D	110 PETTIS DR	ANCHORAGE	AK	99515
74	2165B03L002	STINSON WILLIAM FREEMAN	37830 LUSCOMBE CIR	STERLING	AK	99672
75	1740000T00J	SMITH MAURY J	8103 E US HIGHWAY 36 #145	AVON	IN	46123
76	2165B03L001	TRENT RUSSELL V & ASHLEY C	3810 WILDROSE AVE	KENAI	AK	99611-8400
77	9997000U0029	ALASKA COMMUNICATIONS, ATTN TAX DEPT	600 TELEPHONE AVE MS # 8	ANCHORAGE	AK	99503
78	1234000T00P	SMITH KERRY W	13301 E JENSEN AVE	PALMER	AK	99645-9408
79	1236000T00H	QUINTAVELL KEITH	PO BOX 3974	PALMER	AK	99645-3974
80	2165B05L022	GREGG WARREN M, GREGG HALEY RAE	PO BOX 3436	PALMER	AK	99645-3436
81	2165B05L023	GREGG TO ITALIA D & PURSLEY JUSTIN, GREGG WARREN M & JULIE	PO BOX 3436	PALMER	AK	99645-3436
82	1237000T00B	SPRAGUE TERESA	PO BOX 875513	WASILLA	AK	99687-5513
83	18140000000	BLISS GEORGE R REV TR TRE, BLISS ANNE A REV TR TRE	3723 E 17TH AVE	ANCHORAGE	AK	99508
84	2051B04L007	JOHNSON JUSTIN SKYLER	11816 INWOOD RD PMB 70036	DALLAS	TX	75244
85	1234000T00A	BLAIR DEREK N	225 BISHOP HILL RD	CHIMACUM	WA	98325
86	2051B06L019	DOWNES MARY	48 KUUALA ST	KAILUA	HI	96734-2728
87	2051B06L010	KIEFERLAND LLC	PO BOX 310	LAGUNA BEACH	CA	92652
88	2051B05L010	MCKAY RONALD WM	693 POPLAR CIR	KENAI	AK	99611-7511
89	2051B04L017	MOORE CHRISTY LYNN	13701 VENUS WAY	ANCHORAGE	AK	99515-3924
90	4124000T00E-2	BLUE STARR LLC	14151 STOVER PL	ANCHORAGE	AK	99516
91	2251B02L020-1	HOLLIS ANGELA, HOLLIS ANYA	8920 E KIVA WAY	PALMER	AK	99645
92	1234000T00U	DAVIS AL Z	PO BOX 2140	SILVERDALE	WA	98383-2140
93	1231000T00B	GEUPEL JOHN S & PAULA J	PO BOX ACR	ALEXANDER CREEK	AK	99695-0020
94	1481000T00S	ANDERSON KENNETH W	1130 IVY LN	ASHLAND	OR	97520
95	2051B04L002	NGUYEN JOE CUONG	1405 HORIZON CT	HERNDON	VA	20170
96	1819000L002	AECKERLE JORG	97922 LAUDA-KONIGSHOFEN, FORELLENWEG 8	GERMANY		99999
97	1819000L001	WEIS GUNTER DR	PO BOX 5, A6112 WATTENS	AUSTRIA/EUROPE		99999

98	1234000T00J	BERENS GARY L	PO BOX 875513	WASILLA	AK	99687-5513	
99	2051B03L007	ANDERSON JOSHUA	2743 E SUNNY MEADOW AVE	WASILLA	AK		99654
100	4124000T00A-8	TOLBERT GEORGIA LEE	14151 STOVER PL	ANCHORAGE	AK		99516
101	1481000T00L	PIRLET DAN'L D	39505 MALLARD VIEW DR	BATH	SD	57427-5940	
102	1481000T00X	HALL ROBERT H, HALL JESSE H JR	PO BOX 770336	EAGLE RIVER	AK	99577-0336	
103	1324000T00C	COGDELL TANIS M, % TANIS JAMAR	5402 S US HWY 281	BURNET	TX	78611-4517	
104	4124000T00A-2	WOOD STEPHANIE NORMA	PO BOX 670226	CHUGIAK	AK	99567-0226	
105	2051B03L009	CORDOVA TRISHA E LVG TR, %JEREMY STONEBURNER	2822 KRISTEN CIR	ANCHORAGE	AK	99507-4719	
106	4124000T00B-3	DINGLISHNA TRUST	PO BOX 190624	ANCHORAGE	AK		99519
107	1236000T00F	LYMAN DEBORAH	30 MAPLE AVE	MERIDEN	CT	06450	
108	1753000T00A	TYNAN APRIL A REV TR TRE	1160 E HIDDEN RANCH LOOP	PALMER	AK	99645-8312	
109	2051B01L010	BUSBICE DONALD B JR	303 TRUMAN ST	NEWBURG	MO	65550-9458	
110	2051B05L005	TINGLEY T J TR	1505 W GRANGE AVE	POST FALLS	ID		83854
111	U03733000L01	CLUB 61 LLC, % DON MCCLINTOCK	1227 W 9TH AVE STE 200	ANCHORAGE	AK		99501
112	U03733000L04	BRADY TRAVIS R TRE BRADY PRPTY TR, STRADLEY BILLIE	2700 KARLUK ST	ANCHORAGE	AK	99508-3966	
113	1237000T00N	BROWN MARY L	11202 W GRANADA DR	SUN CITY	AZ	85373-1815	
114	1237000T00V	MACLEOD ANDREW S, ALAO-MACLEOD VANESSA	PO BOX 92224	ANCHORAGE	AK	99509-2224	
115	2051B06L014	NUWER HENRY J, WROBLEWSKA-NUWER MALGORZATA	PO BOX 73446	FAIRBANKS	AK		99701
116	2051B02L007	KESSLER LYLE O & JESSICA S	2650 W ROAN DR	WASILLA	AK		99654
117	1234000T00F	THORSON VICTORIA, THORSON KAZUKO M TR TRE	3170 N SNOW GOOSE DR	WASILLA	AK	99654-2502	
118	2051B05L004	KASCHMITTER DONALD A & JEANETTE	PO BOX 772	CATHLAMET	WA	98612-0070	
119	4124000T00C-2	HIGHTOWER WILLIAM C	20632 DAVID AVE	EAGLE RIVER	AK	99577-8756	
120	1234000T00B	ALLEN JERRY & CAROLYN TR	PO BOX 873594	WASILLA	AK	99687-3594	
121	2426000T00A	SCHACHLE THEODORE A, SCHACHLE VALERIE A	PO BOX 176	WILLOW	AK	99688-0176	
122	U03733000L03	PETRIE MICHAEL A & SHERRYL L	PO BOX 671731	CHUGIAK	AK	99567-1731	
123	2051B01L040	RANZ MICHAEL J & ANGELIA D	2904 POND RUN LN	NEW RICHMOND	OH		45157
124	2251B02L022-1	GIERCZAK LYLE L	3400 TANGLEWOOD PL	ANCHORAGE	AK		99517
125	2051B03L013	BINGHAM GROUP LLC	PO BOX 310	LAGUNA BEACH	CA		92652
126	2051B01L008	BOSCH BYRON LEE	2930 BEAVERBROOK DR	HAILEY	ID		83333
127	2051B03L005	TREJO MICHAEL JOE & YESENIA	2607 SUNSET RD	BISHOP	CA		93514
128	1740000T00D	BOWIE LANCE S	4101 COVENTRY DR	ANCHORAGE	AK	99507-3321	
129	2051B05L001	KASCHMITTER DONALD A & JEANETTE M	PO BOX 772	CATHLAMET	WA		98612
130	2051B04L014	MANN NEIL & DARLENE FAM TR	6951 W HIGHLAND DR	WASILLA	AK		99623
131	4124000T00E-3	NOVAK HENRY	PO BOX 957	KASILOF	AK	99610-0957	
132	1469000T00B	GRUBB KEVIN	175 N LAUREN	PALMER	AK		99645
133	2051B01L033	AMUNDSON CURTIS ALAN	5130 N WASILLA-FISHHOOK	WASILLA	AK		99654
134	1234000T00H	MORGAN JOINT REV TR, MORGAN EARNEST & LYDIA TRES	1303 NW HAWK CREEK DR	BLUE SPRINGS	MO		64015
135	26060000000	HAGNER SABINE	1151 E DUNEDIN ST	WASILLA	AK		99654
136	2051B04L011	DUMOIT JEREMY	408 RIVER RD	BENTON	ME	04901-3442	
137	1481000T00I	BRAUN ROBT	18075 E PINE NEEDLE WAY	PALMER	AK		99645
138	1237000T00A-1	EAGLE ROYCE A, PURUGGANAN LIANA K	PO BOX 10787	FAIRBANKS	AK		99710
139	2051B01L027	BEASOM DOUGLAS A	120 LAKEWOOD DR	MOORE	SC	29369-9618	
140	1324000T00B	BARNEY ERNEST	2571 BARNETT LN	STEVENSON RANCH	CA		91381
141	2051B06L005	MARCUM RAYMOND & PATRICIA	1301 W 72ND CIR	ANCHORAGE	AK		99518
142	2251B02L024-1	OWENS JACOB	1581 NELCHINA ST APT A5	ANCHORAGE	AK		99501
143	2051B03L010	TOWNSEND BRENT	2430 WINDBLOWN DR	CORPUS CHRISTI	TX		78414
144	2051B06L012	PRESTON GAIL E	385 S GOOD HOPE RD	GREENVILLE	PA	16125-8628	
145	1234000T00R	WYATT KRISTY E SMITH	1510 OCEANVIEW DR	ANCHORAGE	AK		99515
146	1753000T00F	PFEIFFER FAM TR	8341 PAINE RD	ANCHORAGE	AK		99511
147	2051B04L003	LE MICHELLE	12005 WANDSWORTH DR	WESTCHASE	FL		33626
148	1390000T00B	MARTIN JAMES D & CINDI LEE	400 N MAIN ST	WASILLA	AK		99654
149	2125000T00B	BOWDEN JEFF E	28323 EAGLE RIVER RD	EAGLE RIVER	AK		99577
150	2051B01L030	WILLIAMS DOUGLAS & CHERI	645 S ARDMORE AVE	VILLA PARK	IL		60181
151	2251000T00G	OWNERS OF DINGLISHNA HLS	GENERAL DELIVERY	SKWENTNA	AK	99667-9999	
152	1234000T00V	DAVIS A L ESTATE, % AL Z DAVIS	PO BOX 2140	SILVERDALE	WA	98383-1240	
153	4124000T00A-3	THIELE THANE LOUISE	8126 WISTERIA ST	ANCHORAGE	AK	99502-4573	
154	2051B01L028	HOLLINGSWORTH DUANNE, APT #12	802 PRICE ST	ANCHORAGE	AK		99508
155	1236000T00C	KENDALL LEA G	PO BOX 1036	CALISTOGA	CA	94515-6036	
156	2051B06L017	TWIN ROCK INVESTMENTS LLC	63 VIA PICO PLZ # 544	SAN CLEMENTE	CA		92672
157	1481000T00O	FRARY DALE G	PO BOX 671450	CHUGIAK	AK	99567-1450	
158	2051B01L024	YORK LOUISE M	PO BOX 872286	WASILLA	AK	99687-2286	
159	U04626000L00	KIMBALL RICHARD P LVG TR/TRE	PO BOX 110088	ANCHORAGE	AK	99511-0088	
160	2124000T00B	BRIAN GARLAND & MARY KATE	10162 N TIRIAN CIR	PALMER	AK		99645
161	2251B02L030-1	PALMER SCOTT & TAMMY	1440 W RIDGEVIEW DR	WASILLA	AK		99654
162	1469000T00E	MUSTO DEREK, TISHINA ANNA	1513 WINTERGREENS	ANCHORAGE	AK		99508
163	U03733000L02	WOODHEAD DALE & BRENDA	PO BOX 617	KASILOF	AK	99610-0617	
164	1813000T00B	FETHEROLF JACQUELINE	11508 GREENWOOD AVE N, UNIT B3	SEATTLE	WA	98133-8681	
165	2051B01L032	VOORHIES DEBORAH EST, SCHROEDER STEPHEN	59-563 MAKANA RD	HALEIWA	HI		96712
166	2051B07L002	HITCHCOCK THOS B	2131 SW 162ND CT	BURIEN	WA	98166-2666	
167	1753000T00E	BRONGA RILEY J, CRUTCH MAXWELL L	8060 RESURRECTION DR	ANCHORAGE	AK		99504
168	4124000T00D-2	MCELHANEY ROBERT LEE, CHANDELLE LTD	1200 SOUTHHAMPTON DR	ANCHORAGE	AK	99503-6957	
169	1324000T00I	BEATTY COURTNEY S	609 CANADA ST, APT A	OJAI	CA	93023-2561	
170	1390000T00C-1	MUSCHANY CHARLES M & KATHY K	4870 RETRIEVER CIR	ANCHORAGE	AK		99502
171	2251B02L011-1	FRENCH DAN'L & TERESA	3408 S 15TH ST	MANITOWOC	WI	54220-6940	
172	1481000T00J	CJC TRUST	1017 DRY CREEK CT	WINDSOR	CO		80550
173	1481000T00G	KERRIGAN JOHN L& COLEEN A	808 NE 28TH ST	MCMINNVILLE	OR		97128
174	2603000T00B	CHURCHILL LIVING TRUST	PO BOX 672445	CHUGIAK	AK		99567
175	2051B01L019	OBA CHRIS T	165 BLOSSOM HILL RD, SPC 92	SAN JOSE	CA	95123-5907	
176	2051B06L007	MARCUM RAYMOND A & PATRICIA B	1301 W 72ND CIR	ANCHORAGE	AK		99518
177	2124000T00C	MEYER JAMES CODY	PO BOX 157	DESDEMONA	TX		76445
178	4124000T00D-4	TUTIAKOFF TIFFANY	6901 SERENITY DR	ANCHORAGE	AK		99502
179	1231000T00C	KIRK SCOTT & NICOLE, MULHOLLAND JOHN W	PO BOX 376	GIRDWOOD	AK		99587
180	4124000T00A-6	THOMPSON STEPHANIE	8128 CRANBERRY ST	ANCHORAGE	AK		99502
181	2125000T00A	BOWDEN JEFFREY E	28323 EAGLE RIVER RD	EAGLE RIVER	AK		99577
182	1481000T00E	COTE ANNA LVG TR TRE, % STEVEN COTE	2660 DE ARMOUN RD	ANCHORAGE	AK		99516
183	4124000T00C-1	HIGHTOWER REV TR, HIGHTOWER W C & EATON MARI C	PO BOX 1956	PALMER	AK	99645-1956	
184	4124000T00D-1	GIERCZAK LYLE L & LINDA J	3752 MILKY WAY DR	ANCHORAGE	AK	99517-1667	
185	2051B07L001	BROSMAN WAYNE H	20920 FAWN CT #18	WEST LINN	OR	97068-2549	
186	2051B07L004	HOULE TIM	3826 N ENCHANTED RIDGE CI	WASILLA	AK		99654
187	2051B01L036	DUNAWAY JAS D & JOYCE P	416 ALDAMA AVE	LADY LAKE	FL		32159
188	4124000T00C-3	HIGHTOWER JAMES A	10132 CHICKALOON ST	EAGLE RIVER	AK		99577
189	4124000T00E-5	FURBER DAVID E	3931 MARQUIS WAY	ANCHORAGE	AK		99502
190	2251B02L032-1	ROTONDO DANIEL E, JOHNSON RACHAEL K	PO BOX 52	WILLOW	AK	99688-0052	
191	2051B01L048	MACIUPA JACK MARTIN	GENERAL DELIVERY	ANCHORAGE	AK	99501-9999	
192	1237000T00H-1	PYHALA PAUL A& PATRICIA J	PO BOX 161	ANCHOR POINT	AK	99556-0161	
193	1390000T00D	BALLARD DAVID& L K FAM TR	PO BOX 670735	CHUGIAK	AK		99567
194	4124000T00A-1	DRAPER KRIS & MARIE	PO BOX 190685	ANCHORAGE	AK		99519
195	15030000000	BIBLE RYAN G	8391 TERN CIR	HUNTINGTON BEAC	CA		92646

196	4124000T00E-8	TOLBERT WITHERS VANCE	PO BOX 324	KING SALMON	AK	99613-0324		
197	2051B01L022	FRANKS ELDON E MGMT TR	23046 PINEY CREEK DR	ATHENS	AL		35613	
198	1324000T00D	COGDELL COREY A	450 PAISLEY DR	COLORADO SPRING	CO		80906	
199	15730000000	HEUN ROBERT W TR AGMT, HEUN MICHELLE L TR AGMT	PO BOX 1092	PALMER	AK		99645	
200	1231000T00F	EQUITY TRUST CO, CUSTODIAN FBO Z064577 IRA	1 EQUITY WAY	WESTLAKE	OH		44145	
201	1234000T00T	PACE MAXINE E	611 GEISSLER RD	MONTESANO	WA	98563-9614		
202	1481000T00H	POTTER FAMILY TRUST, WILLIAM A JR & OPAL K CO TRES	13202 UNION SQ DR	HUNTERSVILLE	NC	28078-4374		
203	2051B03L004	MURADYAN ARMAN	9228 KENWOOD RD	BLUE ASH	OH	45242-7438		
204	2051B06L004	GOLIA JAMES CHARLES, GOLIA JACOB A GOLIA SUMMER L	11935 MAYES DR	LA MIRANDA	CA	90638-1540		
205	2051B05L031	FOSTER TRACY	PO BOX 520937	BIG LAKE	AK	99652-0937		
206	2051B04L012	DIOCESE OF SITKA & AK ORTHODOX CHURCH	PO BOX 230108	ANCHORAGE	AK		99523	
207	1390000T00G	MARCUM RAY A & PATRICIA B	1301 W 72ND CIR	ANCHORAGE	AK		99518	
208	1469000T00A	BARNES STEWART A TR TRE, MOATS-BARNES KIM M TR TRE	6960 E BEECHCRAFT RD	WASILLA	AK	99654-9326		
209	1390000T00C	MARCUM RAYMOND A	1301 W 72ND CIR	ANCHORAGE	AK		99518	
210	2051B04L005	BURGESS WM S & KIMBERLY A	5600 PENNY CIR	ANCHORAGE	AK		99516	
211	2051B01L047	EGGMANN PETER	11424 BELOIT SNODES RD	BELOIT	OH	44609-9207		
212	2051B01L026	TEAGUE MICHAEL	319 N HOYT	ANCHORAGE	AK		99508	
213	1753000T00C	SADLER TERRY P JR	PO BOX 1503	KENAI	AK	99611-1503		
214	6476000L002C	LUPER GARY M, STEIGE WALTER E JR	2600 BROOK DR	ANCHORAGE	AK	99517-1277		
215	1481000T00W	HENDERSON CARL M EST, % SHIRLEY A HENERSON CO-P	7615 PORT ORFORD DR	ANCHORAGE	AK	99507-6021		
216	1324000T00G	COGDELL RICHARD FLOYD	5402 S US HIGHWAY 281	BURNET	TX	78611-4517		
217	2051B05L026	GABBERT KEITH L, GABBERT PAUL S GABBERT MICHAEL I	8960 GOLOVIN ST	ANCHORAGE	AK	99507-3832		
218	1390000T00E	MARCUM DANIEL, MULCAHY MARY E	741 W 71ST AVE	ANCHORAGE	AK		99518	
219	1237000T00K	NIESEN GREG J & LENORA H	PO BOX 8485	NIKISKI	AK	99635-8485		
220	4124000T00D-3	NIWA SCOTT & STACY	7444 TARSUS DR	ANCHORAGE	AK		99502	
221	1237000T00U	KOHRING PATRICIA E	341 N ALASKA	PALMER	AK		99645	
222	24150000000	MEYER CODY	PO BOX 157	DESDEMONA	TX		76445	
223	1481000T00D	BROWN ERBY EST & DOROTHY A	3181 E GISLASON DR	WASILLA	AK	99654-0960		
224	1236000T00E	WOESSNER DENNIS	200 MIDDLETOWN RD	COLCHESTER	CT	06415		
225	23800000000	LEE MARY ANN	1408 FAIRMONT DR	NEOSHO	MO	64850-2627		
226	2426000T00C	LARKSPUR TRUST, SCHACHLE JARED W	2770 E SCHACHLE DR	WASILLA	AK	99654-0535		
227	2426000T00B	SCHACHLE LEO V EST, % SHERIAN SCHACHLE	2398 SHOAL CREEK DR	PENSACOLA	FL		32514	
228	4124000T00B-1	THIELE THERESA ANASTASIA, % THERESA ANASTASIA WOOLS	PO BOX 261	SEWARD	AK	99664-0261		
229	1236000T00B	HASTINGS MARY J	7302 OAKMONT DR	SANTA ROSA	CA	95409-6305		
230	26110000000	GREEN CURT H	3380 S ELKINS ST	WASILLA	AK	99623-0613		
231	1469000T00D	MELTON JAMES E	3740 IMAGE DR	ANCHORAGE	AK		99504	
232	2678000T00A	BOSCH MELANIE J	7830 LADASA PL	ANCHORAGE	AK		99507	
233	1481000T00A	BURNEY CAREY N	4007 SE DRAKE ST	MILWAUKE	OR		97222	
234	2251B02L018-1	PRUDENCE TED	PO BOX 870684	WASILLA	AK	99687-0684		
235	1481000T00N	EXCLUSIVELY ALASKAN GOOD LLC, % ERNEST F THOMAS UNIT A	3807 WILSON ST	ANCHORAGE	AK		99503	
236	1924000T00B	IENS JESSE J	18444 E WALLING RD	PALMER	AK	99645-8296		
237	1236000T00D	FORRISTAL BRENDAN DARRAH	521 W COLLEGE AVE	SALISBURY	MD		21801	
238	4124000T00D-5	BURGOYNE KATHLEEN	3100 E 142ND AVE	ANCHORAGE	AK		99516	
239	2051B01L042	PIERCE-BULGER MARILYN	9089 NUTHATCH PL UNIT K	ANCHORAGE	AK	99507-4946		
240	19800000000	CUFFEL DOMINIC, CUFFEL JEREMY	22665 E QUINTERO CT	QUEEN CREEK	AZ		85142	
241	2051B06L003	FEHRS LEVI, FEHRS JOHN	12721 MIDDLE BAY DR	KODIAK	AK		99615	
242	2051B05L013	HODGE JAMES S H & CATHERINE T	13836 LAKE OTIS PKY	ANCHORAGE	AK		99516	
243	1234000T00Q	WYATT KRISTY E	1510 OCEANVIEW DR	ANCHORAGE	AK	99515-3911		
244	1237000T00L-1	MACLEOD ANDREW S &VANESSA	PO BOX 92224	ANCHORAGE	AK	99509-2224		
245	2051B06L008	THEIGE DAREN D	35426 CROSS ST	FRUITLAND PARK	FL		34731	
246	U03733000L06	SMITH TIMOTHY E & VICKI L, EAGLEY RONALD	8251 OPAL DR	ANCHORAGE	AK		99502	
247	2251B02L028-1	NUNLEY WILLIAM J	PO BOX 871962	WASILLA	AK	99687-1962		
248	2051B03L006	TRAVIS SANDRA SUE	3705 ARCTIC BLVD # 1286	ANCHORAGE	AK		99503	
249	2051B01L050	MACKEY GERALD MARTIN	1624 19TH AVE NW	ROCHESTER	MN	55901-0740		
250	2051B06L001	SWORD ROBYN	1736 LEWIS AVE UNIT A	LONG BEACH	CA		90813	
251	2051B01L046	KALININ ALEXEY	206 HAWTHORNE AVE	PACIFIC	WA		98047	
252	2051B01L037	APPIAH EMMANUEL	3310 TILLEY DR	ROSENBERG	TX		77471	
253	2051B04L010	MANN JODIE L	PO BOX 2701	PALMER	AK	99645-2701		
254	1481000T00R	STITT MICHAEL W JR	PO BOX 877636	WASILLA	AK		99687	
255	27980000000	HILL GREGG ALAN	38090 RIVER FRONTAGE RD	NEW CASTLE	CO		81647	
256	1481000T00M	PIRLET MAVIS J	39505 MALLARD VIEW DR	BATH	SD	57427-5940		
257	2051B01L045	JONES JAMES & JAMIE	161 W FREEDOM LN	SHELTON	WA		98584	
258	1481000T00C	COTE ANNA LIVING TR, % STEVEN COTE	2660 DE ARMOUN RD	ANCHORAGE	AK		99516	
259	2124000T00A	ROSANO LISA J	PO BOX 91275	ANCHORAGE	AK	99509-1275		
260	23320000000	SINGER DAVID MICHAEL	PO BOX 521686	BIG LAKE	AK		99652	
261	1924000T00A	CANET MARC E & JENNIFER E	PO BOX 168	WILLOW	AK		99688	
262	2251B02L016-1	FORTUNE JOSHUA L	PO BOX 521529	BIG LAKE	AK	99652-1529		
263	2251B02L009-1	BRUPBACHER CARL P& JUDITH	13231 VERN DR	ANCHORAGE	AK	99516-2650		
264	2051B02L010	O'CONNOR DANIEL ROBERT & LORI A	7280 WYCLIFF LN	LAS VEGAS	AK		89156	
265	1231000T00E	PALIN TODD M & RICHARDS RON D, HANSON CAROLYN	1140 W PARKS HWY	WASILLA	AK		99654	
266	2051B01L034	KINNEY CARL ANDREW	PO BOX 874051	WASILLA	AK	99687-4051		
267	1753000T00D	NIX BENIAMIN D	1978 COMMODORE DR	ANCHORAGE	AK		99507	
268	2051B04L013	SHADE LARRY E	8990 19TH ST # 302	ALTA LOMA	CA		91701	
269	1236000T00G	KING OWEN W	31441 28TH PL SW	FEDERAL WAY	WA	98023-7837		
270	1231000T00D	SADLER TERRY P JR & JAMIE	PO BOX 1503	KENAI	AK		99611	
271	2051B05L027	GABBERT PAUL S	6125 N CRUPPERDOCK DR	PALMER	AK	99645-1819		
272	2051B01L043	GONGLIEWSKI TYLER J	17810 SANCTUNRY DR	EAGLE RIVER	AK		99577	
273	2051B04L008	SELDES MICHAEL BRUCE	517 WHITE OAK DR	SEVERNA PARK	MD	21146-3730		
274	24560000000	PEEPLES WILBUR S & ANN C, PEEPLES TARA LYN	10925 E SCOTT RD	PALMER	AK		99645	
275	1237000T00W	BROWN DOUGLAS C	478 LEWIS & CLARK TRAIL	BOZEMAN	MT	59718-7294		
276	2051B01L025	DUNLAP MATT	38 CASTLEWOOD DR	PLEASANTON	CA	94566-9729		
277	1236000T00A	KONTE MICHAEL D	7031 CLAIRMONT CIR	ANCHORAGE	AK		99507	
278	1740000T00E	BOWIE OZELLA EST, % LANCE BOWIE	4101 COVENTRY DR	ANCHORAGE	AK	99507-3321		
279	2251B02L026-1	BRISCO PAUL J	PO BOX 1895	CLEARLAKE OAKS	CA	95423-1895		
280	2051B06L018	BLANCHARD RALPH L JR	501 OCEANVIEW DR	ANCHORAGE	AK	99515-3757		
281	2051B04L015	MANN NEIL & DARLENE FAMILY TR THE	6951 W HIGHLAND DR	WASILLA	AK		99623	
282	1481000T00Q	WEILAND TOD	17580 E THREE SISTERS DR	PALMER	AK		99645	
283	1324000T00A	BARNEY ALMA FAM TR	25710 BARNETT LN	STEVENSON RANCH	CA		91381	
284	2051B01L029	DUMAY LYCESSE	PO BOX 3021	STAMFORD	CT	06905-0021		
285	1234000T00C	BRINSON THELMA	12333 NE MORRIS ST	PORTLAND	OR	97230-1629		
286	1234000T00L	ROETMAN RUSSELL E	4351 E BOGARD RD	WASILLA	AK	99654-4214		
287	4124000T00A-9	THIELE THANE L	8128 CRANBERRY ST	ANCHORAGE	AK	99502-4446		
288	2051B06L011	MARTIN JAMES & MARTIN CINDI, MARTIN DAVID & MARTIN DEBORAH K	400 N MAIN ST	WASILLA	AK		99654	
289	2051B04L016	CONSEPCION JUAN RUBEN JR	18333 MAIN ST	HESPERIA	CA		92345	
290	4124000T00F-3	BILLINGSLEY TRUST	PO BOX 670765	CHUGIAK	AK		99567	
291	1469000T00C	ANDERSON JACK S	12840 BAINBRIDGE RD	ANCHORAGE	AK	99516-3052		
292	1234000T00S	PACE WM L II	611 GEISSLER RD	MONTESANO	WA	98563-9614		
293	1481000T00V	DOUGLAS CLARA V	534 N LANE ST	ANCHORAGE	AK	99508-1712		

294	2051B07L005	ANDREWS SEAN L	PO BOX 298688	WASILLA	AK	99629-8688	
295	1390000T00B-1	MESTAS DENNIS M IRRV TR, MESTAS DEBORAH S TRE	1519 F ST	ANCHORAGE	AK		99501
296	1753000T00I	BLISS JACKIE D	PO BOX 870361	WASILLA	AK	99687-0361	
297	2051B05L02B	COLVARD CLARENCE W & JUDITH A EST, % NICK COLVARD	PO BOX 103	CHIMACUM	WA	98325-0103	
298	1390000T00H	DEHART CHRISTOPHER	PO BOX 520642	BIG LAKE	AK		99652
299	1753000T00H	OLSON RONNIE E	15425 E WHIRL-A-WAY CIR	PALMER	AK		99645
300	2051B01L035	KINNEY CARL A	PO BOX 874051	WASILLA	AK	99687-4051	
301	16N07W19D002	DRUCE EVAN, LUGDON ANDREW	2012 S LAURIE MEADOWS DR	WASILLA	AK	99623-0073	
302	1237000T00A	PRITCHETT RICKY LEE, PRITCHETT JENNIFER LYNN	2521 E MTN VILLAGE DR STE B PMB 810	WASILLA	AK	99654-7332	
303	4124000T00F-2	THIELE KARL JACOB TRE, THIELE CHRISTINE A TRE THIELE TR THE	4618 E ARDMORE RD	PHOENIX	AZ		85044
304	1813000T00A	FETHEROLF TERI	298 RACHEL RD	KENNEWICK	WA	99338-7333	
305	1324000T00E	ALLSUP IRMA S LARSON	14021 GOLDEN VIEW DR	ANCHORAGE	AK		99516
306	2051B06L009	SCHROEDER LLOYD NATHAN, LASATER SUSAN P	1008 PARK PL	BURNSVILLE	MN	55337-4673	
307	4124000T00A-10	NOVAK ANNA L, %STEPHEN N NOVAK	3230 E 142ND AVE	ANCHORAGE	AK		99516
308	16N07W06C002	RUDOLPH DARREN M & JOY M	4750 E DIMOND WAY	WASILLA	AK	99654-8639	
309	2051B01L021	BARBANEL EMELIA	5800 ARLINGTON AVE APT 10A	BRONX	NY	10471-1412	
310	2251B02L013-1	NUNLEY JAMES O'DELL	6800 E UPPER MESA DR	PALMER	AK	99645-7717	
311	1481000T00Y	HALL ROBERT HENRY	PO BOX 4929	PALMER	AK		99645
312	2051B05L029	MORRIS SHARON M	740 W SELINA LN	WASILLA	AK	99654-7980	
313	2603000T00A	PINKHAM TERRY & LISA J, % TERRYLYNN FOWLER	400 EXETER RD	CORINTH	ME	04427-3047	
314	1390000T00I	KARCZ STEPHEN KENNETH LVG TR	PO BOX 190151	ANCHORAGE	AK		99519
315	2051B06L013	KASSER DAVID STEPHEN	645 G ST STE 612	ANCHORAGE	AK	99501-3443	
316	1234000T00E	ROETMAN RUSSELL	4351 E BOGARD RD	WASILLA	AK	99654-4214	
317	7130000L006	MCKNIGHT LEE J & KELSIE J	4645 W GOLD LEAF CIR	WASILLA	AK		99623
318	7130000L004	OSOWSKI JENNIFER L	7362 W PARKS HWY PMB 489	WASILLA	AK		99623
319	4124000T00J-1	NOVAK CARL VANCE	PO BOX 23287	KETCHIKAN	AK		99901
320	6130000L00B	HIGHTOWER KENNETH B, HIGHTOWER WM & JAS & EATON MARI	PO BOX 1956	PALMER	AK	99645-1956	
321	1224-100000	PENSCO TR CO CUST FBO, TURNER TIMOTHY P IRA	PO BOX 981012	BOSTON	MA	02298-1012	
322	U03409000L00	DEVITA VICTOR	PO BOX 879520	WASILLA	AK	99687-9520	
323	6478000L002B	SWENSON CARL & MELANIE	PO BOX 520301	BIG LAKE	AK	99652-0301	
324	7130000L001	KINN JERRY M & DEBRA L	9900 HILLHAVEN CIR	ANCHORAGE	AK	99507-5922	
325	1224-200000	LEFFEL AUDREY	PO BOX 875112	WASILLA	AK	99687-5112	
326	4124000T00G-1	THIELE REINHOLD JR	7720 STRAWBERRY PATCH PL	ANCHORAGE	AK	99502-7165	
327	4224000L002	LILLO CHANNING & SHEILA JT REV TR	15630 SOUTHPARK LOOP	ANCHORAGE	AK		99516
328	4124000T00J-3	NOVAK CARL V	PO BOX 23287	KETCHIKAN	AK		99901
329	4124000T00G-2	THIELE REINHOLD M JR	3747 W 78TH	ANCHORAGE	AK		99502
330	5133000L003	MCGEE KIRK S	16551 CHASEWOOD LN	ANCHORAGE	AK	99516-4830	
331	7130000L012	FOSTER CARY L & VESTAL SV, ALEXANDER CREEK	710 HARBOR CIR	ANCHORAGE	AK	99515-3638	
332	3591000L004B	WALSH LEO A JR	2111 MULDOON RD	ANCHORAGE	AK	99504-3612	
333	U04628000L02	JCE INVESTMENTS LLC	20710 PTARMIGAN BLVD	EAGLE RIVER	AK		99577
334	U03168000L00	THIELE CYNTHIA L & CARL G JR & THERESA A, GARVEY KAREN E & NOLCINI PAMELA T	PO BOX 877374	WASILLA	AK		99687
335		BOOTHBY TAUNNIE	PO BOX 962	WILLOW	AK		99688
336		WILLIAMS MICHAEL W, EAGLESONG PEONY FARM	200 W 34TH AVE. STE 295	ANCHORAGE	AK		99503
337		DARDEN JOHNG THOMAS II, SHAFFER SARAH LAWRENCE	PO BOX 62262	VIRGINIA BEACH	VA		23604
338		RUSSELL ZACHERY	PO BOX 167	CANTWELL	AK		99729
339		WILLOW AREA COMMUNITY ORGANIZATION	PO BOX 1027	WILLOW	AK		99688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Enhanced Search
By Shape
By Value
By Spatial
Results
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LANDASSD: 0
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BLDGASSD: 0
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General Ownership: NO DATA
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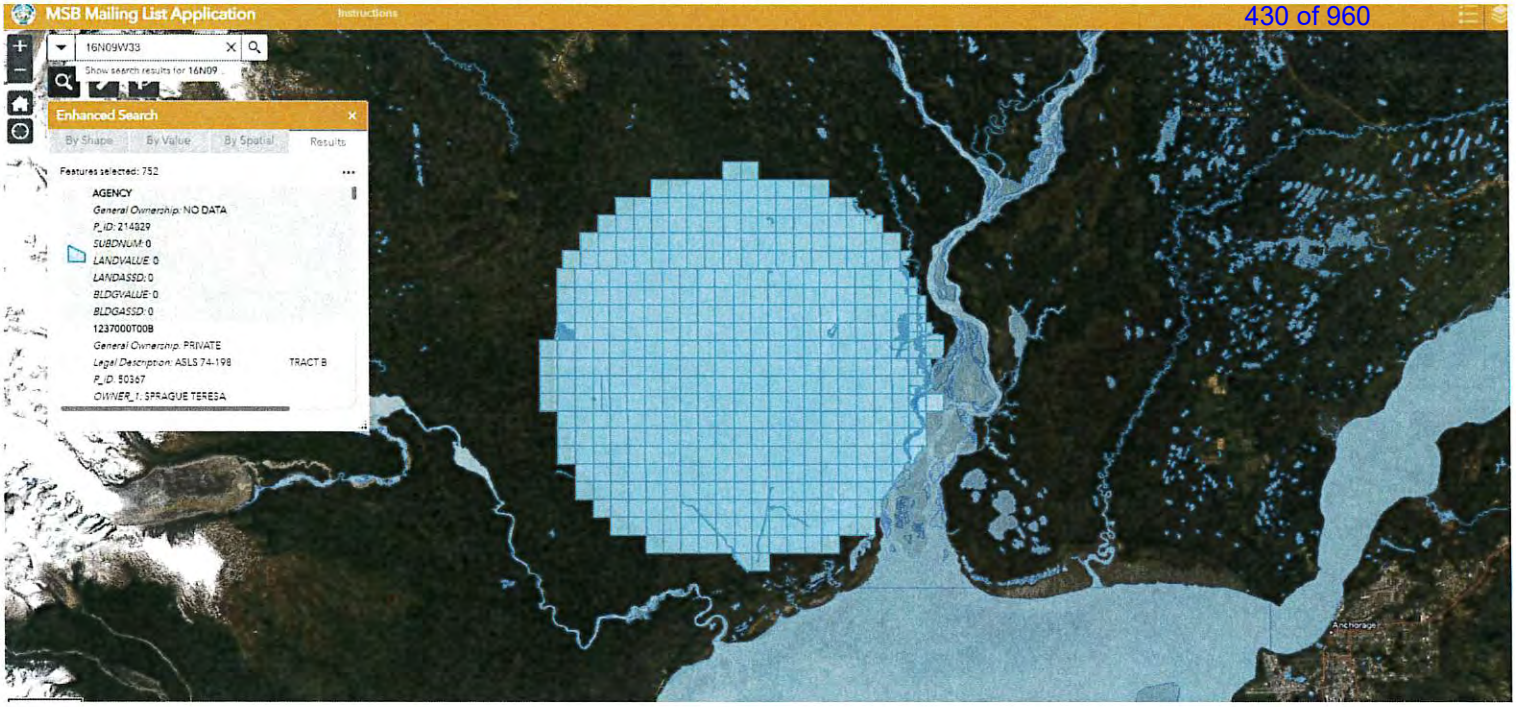
Anchorage
Matanuska-Susitna Borough GIS, State of Alaska, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, ...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Enhanced Search
By Shape
By Value
By Spatial
Results
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LANDASSD: 0
BLDGVALUE: 0
BLDGASSD: 0
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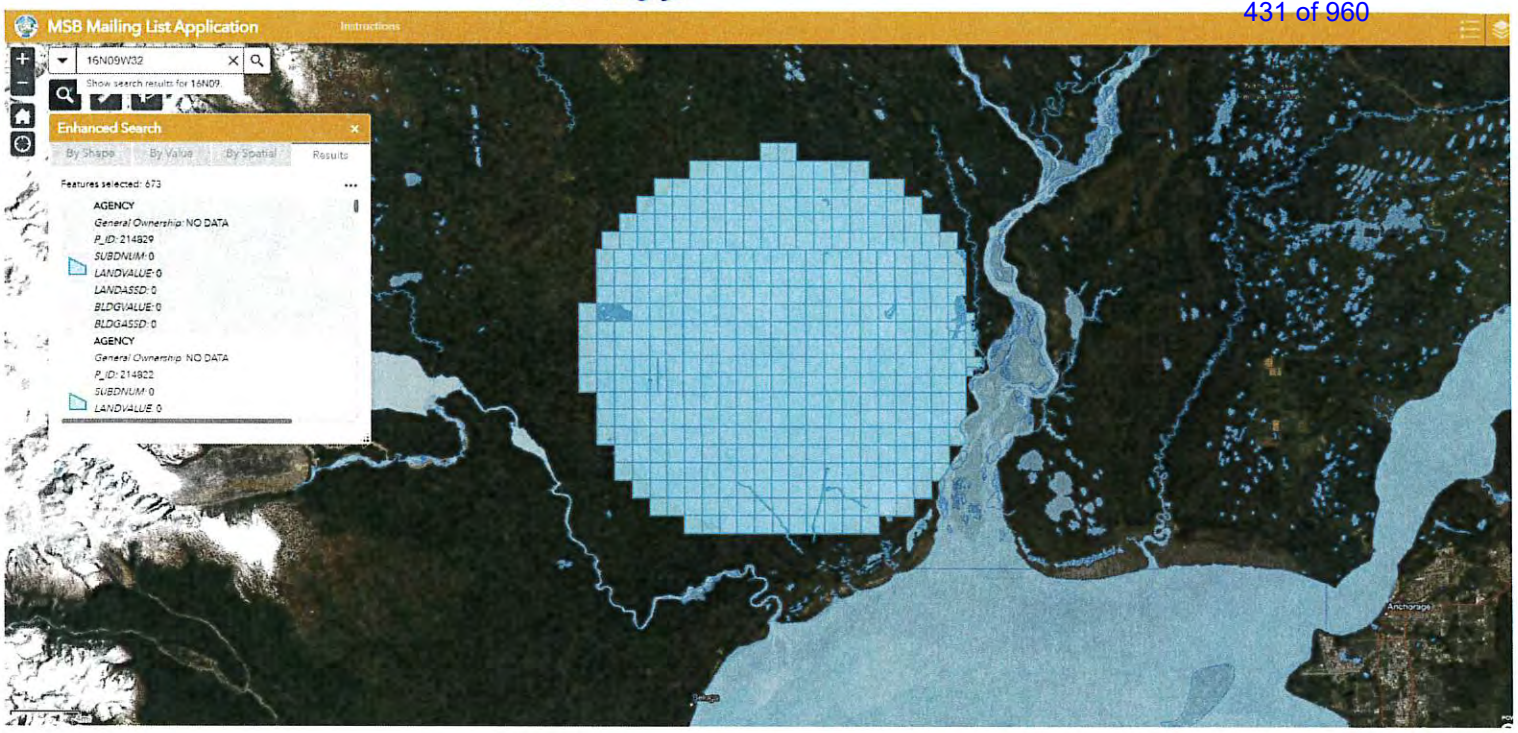
Legal Description: ASLS 74-198
TRACT B
P_ID: 50367
OWNER_1: SPRAGUE TERESA
Anchorage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Enhanced Search
By Shape
By Value
By Spatial
Results
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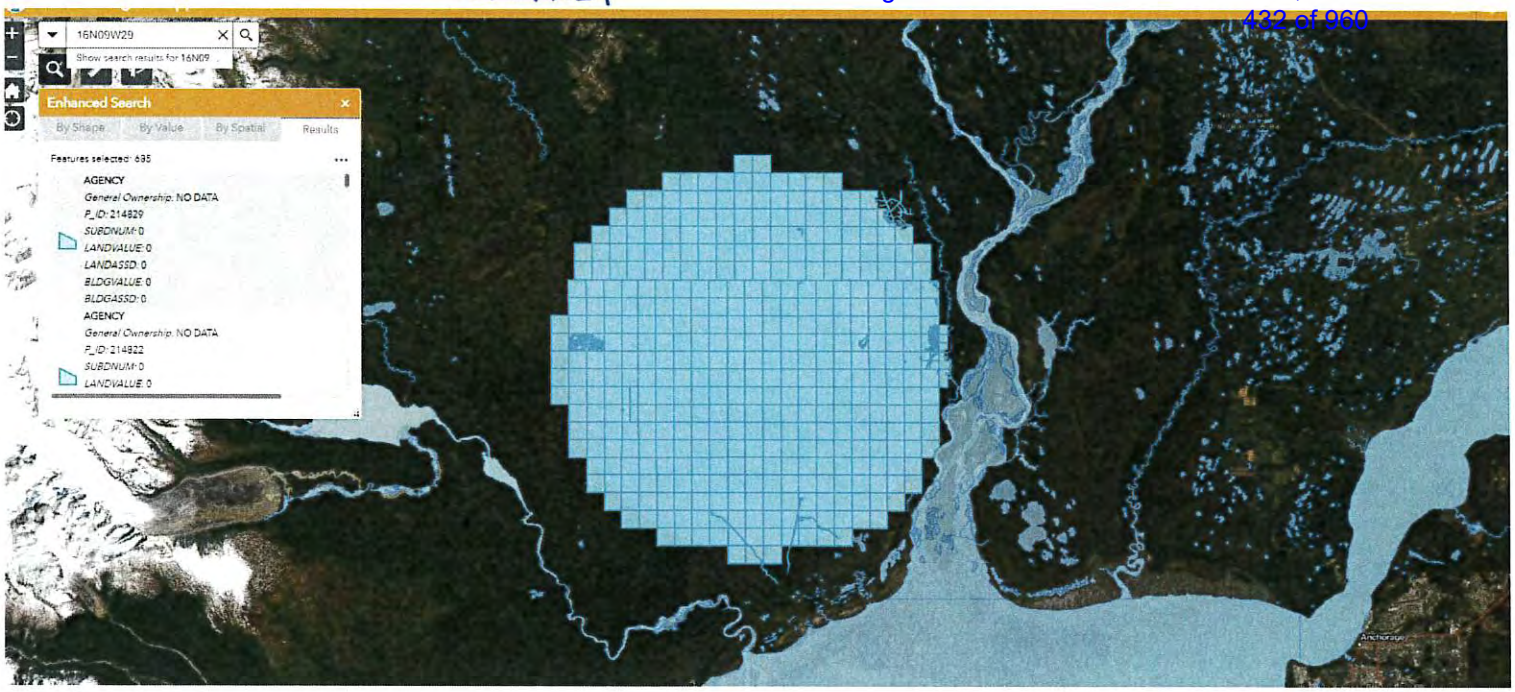
LANDVALUE: 0
Anchorage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Enhanced Search
By Shape
By Value
By Spatial
Results
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AGENCY
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LANDVALUE: 0
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AGENCY
General Ownership: NO DATA
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SUBDIVNUM: 0
LANDVALUE: 0


MSB Mailing List Application
Instructions
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Enhanced Search
By Shape
By Value
By Spatial
Results
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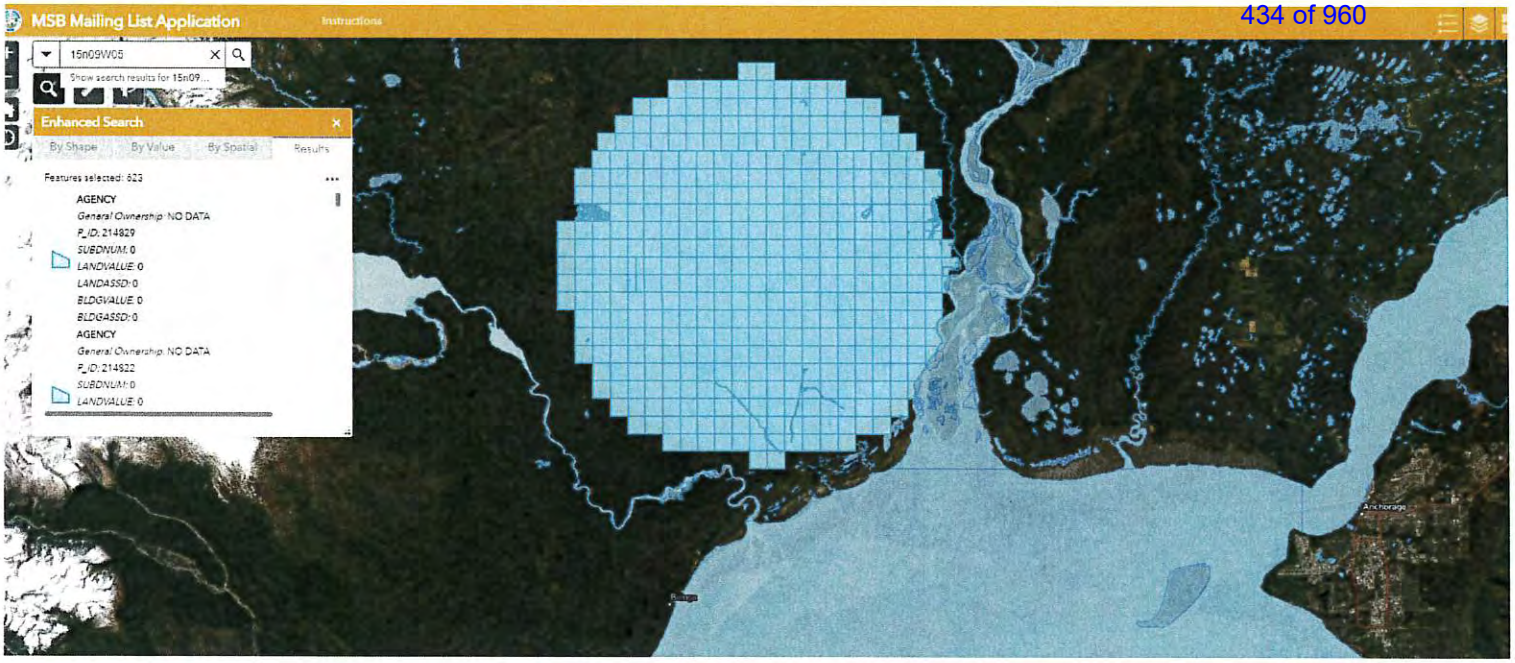
General Ownership: PRIVATE
Legal Description: ASLS 74-198 TRACT B
P_ID: 50367
OWNER_1: SPRAGUE TERESA
Anchorage
App State
Click to restore the map extent and layer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Enhanced Search
By Shape
By Value
By Spatial
Results
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General Ownership: NO DATA
P_ID: 214922
SUBDNUM: 0
LANDVALUE: 0
Anchorage

Matanuska-Susitna Borough
Development Services Division
350 E. Dahlia Avenue
Palmer, Alaska 99645

«NAME»
«ADDRESS_1»
«ADDRESS_2»
«ADDRESS_3»

Chad Allen, for Little Mount Susitna Wind LLC, applied for a Conditional Use Permit under MSB 17.67 – Tall Structures to construct six meteorological towers up to 197 feet tall. The proposed tower locations are within Township 15 North, Range 9 West, Section 5, Township 16 North, Range 9 West, Sections 16, 29, 32, and 33, and Township 16 North, Range 10 West, Section 13, Seward Meridian. There are no Tax ID numbers or addresses for the subject sites.

The Matanuska-Susitna Borough Planning Commission will conduct a public hearing concerning the application on ***Monday, October 21, 2024,*** at 6:00 p.m. in the Borough Assembly Chambers at 350 E. Dahlia Avenue in Palmer. This may be the only presentation of this item before the Planning Commission, and you are invited to attend. Planning Commission members may not receive or engage in ex-parte contact with the applicant, other interested parties in the application, or members of the public concerning the application or issues presented in the application.

Application materials may be viewed online at www.matsugov.us by clicking "All Public Notices & Announcements." For additional information, you may contact Rick Benedict, Current Planner, by phone: 907-861-8527. Provide written comments by e-mail to rick.benedict@matsugov.us, or by mail to MSB Development Services Division, 350 E. Dahlia Avenue, Palmer, AK 99645.

The public may provide verbal testimony at the meeting or telephonically by calling 1-855-290-3803. To be eligible to file an appeal from a decision of the Planning Commission, a person must be designated an interested party. See MSB 15.39.010 for the definition of an interested party. The procedures governing appeals to the Board of Adjustment and Appeals are contained in MSB 15.39.010-250, which is available on the Borough home page at www.matsugov.us, in the Borough Clerk's office, and at various libraries within the borough.

Comments are due on or before ***October 4, 2024,*** and will be included in the Planning Commission packet. Please be advised that comments received from the public after that date will not be included in the staff report but will be provided to the Commission at the meeting.

Name: _____ ***Mailing Address:*** _____

Location/Legal Description of your property: _____

Comments: _____

_____

_____

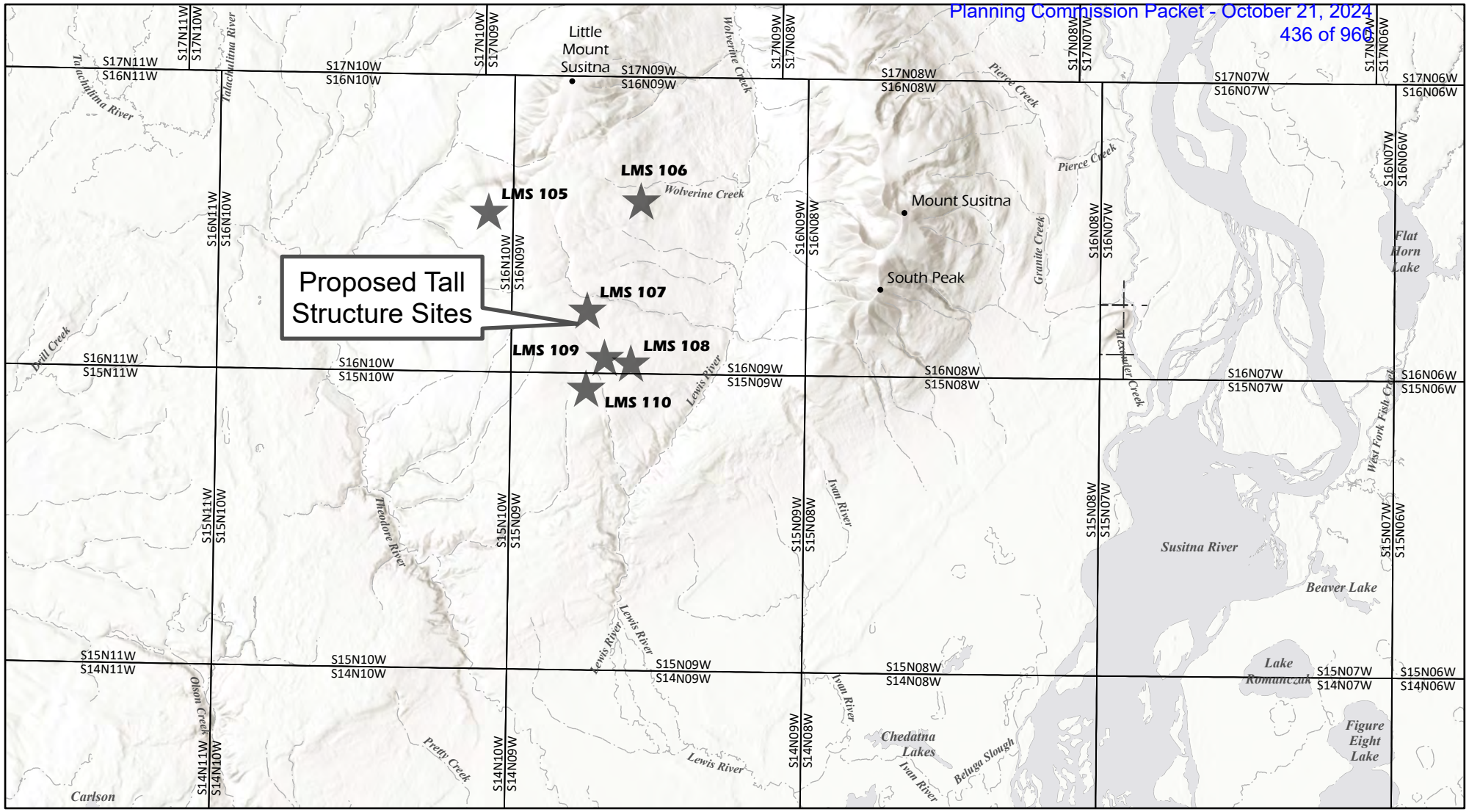
_____

_____

_____

_____

Note: Vicinity Map Located on Reverse Side



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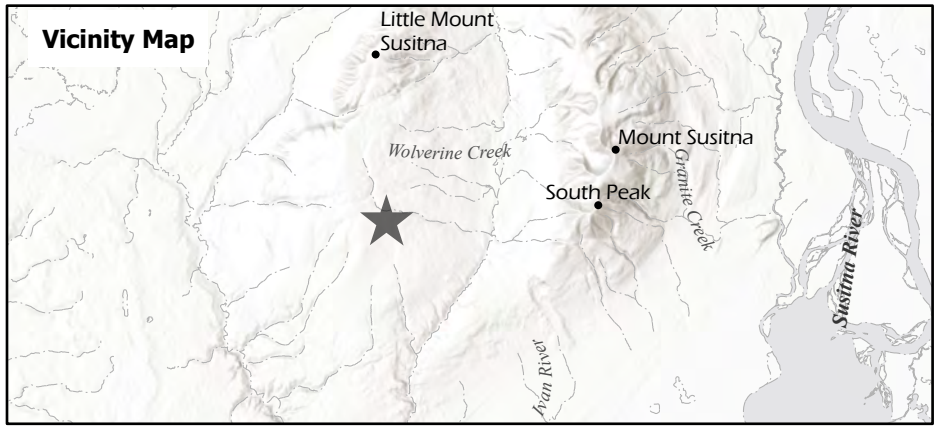


N

MSB Information Technology/GIS
August 13, 2024

0 1,000 Feet

Matanuska-Susitna Borough

www.matsugov.us

MATANUSKA-SUSITNA BOROUGH
NOTICE OF PUBLIC MEETINGS

All meetings of recognized boards, committees, and commissions of the Borough are open to the public and are held at Borough offices, 350 E. Dahlia Ave., Palmer, AK, unless specified otherwise. Three or more Assembly Members may be present at advertised public meetings of federal, state, and local governments or other entities. Meetings are scheduled as follows:

BOARD	DATE	TIME	LOCATION
Abbreviated Plat	09/18/24	8:30 am	Assembly Chambers
Agriculture Advisory Board	09/18/24	4:30 pm	Lower Level Conference Room
Platting Board (To Participate Telephonically Call 855-290-3803)	09/19/24	1:00 pm	Assembly Chambers
Local Road Service Area Advisory Board (There May Be A Quorum Of Individual RSA Boards Present)	09/19/24	7:00 pm	West Lakes, Station 7-3 & Teams ID: 236 315 759 929 Passcode: bnzjcC
Transportation Advisory Board	09/20/24	11:00 am	Conference Room 203 & Teams ID: 244 388 588 195 Passcode: jRvtLX
MSB Fish & Wildlife Commission, Board Of Fisheries Work Group	09/23/24	10:00 am	Conference Room 110 & Teams ID: 272 180 196 453 Passcode: 4ErQL8
Fairview RSA No. 14 Board of Supervisors	09/24/24	4:00 pm	Fairview Loop Baptist Church
Abbreviated Plat	09/25/24	8:30 am	Assembly Chambers
MSB Fish & Wildlife Commission	09/26/24	4:00 pm	Assembly Chambers & Teams ID: 266 680 706 600 Passcode: qCjBUL
Assembly Special Meeting Re: Filling The Assembly District 4 Vacancy (To Provide Public Comment Telephonically Call 855-225-2326)	10/01/24	4:00 pm	Assembly Chambers
Assembly Regular Meeting (To Provide Public Comment Telephonically Call 855-225-2326)	10/01/24	6:00 pm	Assembly Chambers
Abbreviated Plat	10/02/24	8:30 am	Assembly Chambers
Talkeetna Sewer & Water SSA No. 36 Board of Supervisors	10/02/24	1:00 pm	Talkeetna Library Conference Room

If you would like further information on any of these meetings or are interested in serving on any of the advisory boards, please call the Borough Clerk's Office at 907-861-8683, Monday through Friday, 8 a.m. to 5 p.m. The Borough's website address is: **https://www.matsugov.us/publicmeetings**

Disabled persons needing reasonable accommodation in order to participate at a Borough Board/ Commission meeting should contact the Borough ADA Coordinator at 907-861-8432 at least one week in advance of the meeting.

The Community Council meetings scheduled are: (Community Councils are not agencies or subgroups of the Borough. There may be a quorum of Mat-Su Borough advisory boards in attendance at community council meetings.)

Knik-Fairview Community Council Board	09/18/24	6:30 pm	Settlers Bay Lounge
Trapper Creek Community Council (To Participate Telephonically Call 907-373-2663 Participant Code: 991090)	09/19/24	6:30 pm	Trapper Creek Community Center
South Knik River Community Council	09/19/24	7:00 pm	South Knik River Community Building
North Lakes Community Council Road & Traffic Safety Committee	09/22/24	3:00 pm	Karma Kafe
Big Lake Community Council Board	09/24/24	6:00 pm	Big Lake Family Restaurant
Tanaina Community Council	09/24/24	7:00 pm	Sleepy Hollow Golf Course
Sutton Community Council	09/25/24	7:00 pm	Sutton Public Library & Zoom ID: 938 1463 4307 Passcode: 614331
Glacier View Community Council	09/26/24	6:00 pm	Glacier View School
North Lakes Community Council (nlakes.cc)	09/26/24	7:00 pm	Boys & Girls Club & Zoom ID: 896 0473 7544 Passcode: 982374
Willow Area Community Organization	10/02/24	7:00 pm	Willow Community Center

Publish Date: September 18, 2024 0924-24

MATANUSKA-SUSITNA BOROUGH
VOTE EARLY/ABSENTEE OR BY-MAIL
REGULAR ELECTION: TUESDAY, NOVEMBER 5, 2024

Interested Borough registered voters may apply for an absentee by-mail ballot by submitting a completed Absentee By-Mail Ballot Application to the Borough Clerk's Office, by the deadline: **Tuesday, October 29, 2024.**

Absentee By-Mail Ballot Applications are available online at **www.matsugov.us/elections**, from the Borough Clerk's Office located at 350 E. Dahlia Avenue in Palmer, or by calling 907-861-8683 to request an application. Applications must be submitted annually.

Early/Absentee In-Person voting will begin on **Monday, October 21, 2024**, and continue through **Monday, November 4, 2024** at the following locations and times:

- **Mat-Su Borough Building: 350 E. Dahlia Avenue, Palmer**
  - o Monday-Friday 8 a.m. - 5 p.m.
- **Division of Elections, Mat-Su Regional Office: 1700 E. Bogard Road, Building B, Suite 102, Wasilla**
  - o Monday-Friday 8 a.m. - 5 p.m., Saturdays 10 a.m. - 4 p.m., and Sundays 12 p.m. – 4 p.m.
- **Houston City Hall and Talkeetna and Trapper Creek Libraries**
  - o October 21 through November 4 – During Normal Business Hours

Voting Assistance

A Touch Screen Voting unit will be available at the Mat-Su Borough Building and at the Division of Elections, Mat-Su Regional Office 15 days prior to the election at the dates and times specified above. Touch screen voting is intended for the blind, disabled and voters with reading difficulties. The touch screen units allow disabled voters to vote unassisted with a magnified, high contrast and audio ballot.

For more information, please call the Borough Clerk's Office at 907-861-8683.

Publish Date: September 18, 2024 0724-05

MATANUSKA-SUSITNA BOROUGH
NOTICE OF VOTER REGISTRATION

The Matanuska-Susitna Borough will hold a regular election on **TUESDAY, NOVEMBER 5, 2024.** The deadline to register to vote in this election or update your voter registration is:

SUNDAY, OCTOBER 6, 2024

You can update or register to vote online or print a Voter Registration Application from the Alaska State Division of Elections at **www.elections.alaska.gov**, or you may register to vote at one of the following locations:

Alaska State Division of Elections
North Fork Professional Bldg. B, Suite 102
1700 E. Bogard Road
Wasilla, Alaska
907-373-8952

Matanuska-Susitna Borough
Clerk's Office
350 E. Dahlia Avenue
Palmer, Alaska
907-861-8683

Voter registration applications are also available at the City Clerk's Office in Houston, Palmer, and Wasilla.

Voter Qualifications. A person may vote in a Borough election only if the person: is qualified to vote in State elections under AS 15.05.010; has been a resident of the Borough for 30 days immediately preceding the election; is registered to vote in State elections at a residence address within the Borough at least 30 days before the Borough election at which the person seeks to vote; and is not disqualified under Article V of the State Constitution.

Contact the Borough Clerk's Office at 907-861-8683, with questions or visit us online at **http://www.matsugov.us/elections**

Publish Date: September 18, 2024 0824-17

NOTICE OF VACANCY
ASSEMBLY DISTRICT 4

Assembly District 4 is vacant, and the Assembly will appoint a person to fill the seat until the next regular election, in November 2025.

Candidate Qualifications: A person is eligible to be an assembly member if the person is a qualified borough voter and has been a borough resident and a resident in the territory embraced with the assembly district for which they file for one year immediately prior to the appointment.

District 4 includes the city of Wasilla and the greater Wasilla area (from Seward Merdian to the east, to Sylvan Road in the west, to Spruce Avenue to the North, and runs along part of the north side of Knik Goose Bay Road). If you are unsure if you reside in Assembly District 4, please contact the Clerk's Office at the number below or go to the following website and search your address: https://msb.maps.arcgis.com/apps/MapSeries/index.html?appid=1843d2e279c64ca0adadce8af7724372

For the Assembly to consider you as a candidate to fill the vacancy in Assembly District 4, you will need to fill out an application and return it to the Clerk's Office. You can find the application at www.matsugov.us, or you can contact the Clerk's Office at the number below for an application to be emailed, or come to the Clerk's Office at 350 E. Dahlia Avenue to pick up an application.

The successful candidate will be required to file a Financial Disclosure Form with the Alaska Public Offices Commission within 30 days of appointment.

Application deadline is 5 p.m. on Friday, September 27, 2024.

If you have any questions, please contact the Clerk's Office at (907) 861-8683 or in person at 350 E. Dahlia Avenue, Palmer.

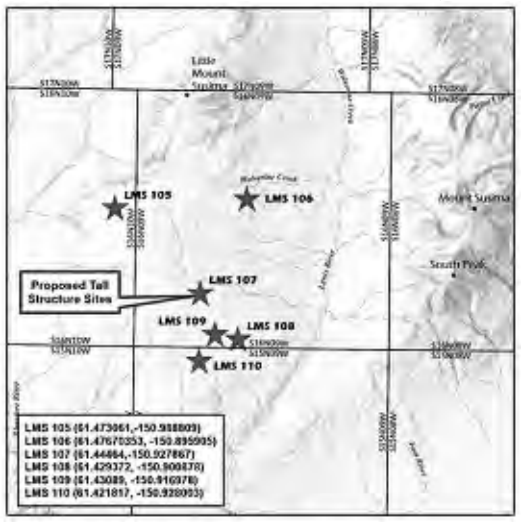
Publish Date: September 18, 2024 0924-17

PUBLIC HEARING

Chad Allen, for Little Mount Susitna Wind LLC, applied for a Conditional Use Permit under MSB 17.67 – Tall Structures to construct six meteorological towers up to 197 feet tall. The proposed tower locations are within Township 15 North, Range 9 West, Section 5, Township 16 North, Range 9 West, Sections 16, 29, 32, and 33, and Township 16 North, Range 10 West, Section 13, Seward Meridian. There are no Tax ID numbers or addresses for the subject sites.

The Matanuska-Susitna Borough Planning Commission will conduct a public hearing concerning the application on ***Monday, October 21, 2024***, at 6:00 p.m. in the Borough Assembly Chambers at 350 E. Dahlia Avenue in Palmer. This may be the only presentation of this item before the Planning Commission, and you are invited to attend. Planning Commission members may not receive or engage in ex-parte contact with the applicant, other interested parties in the application, or members of the public concerning the application or issues presented in the application.

Application materials may be viewed online at www.matsugov.us by clicking "All Public Notices & Announcements." For additional information, you may contact Rick Benedict, Current Planner, by phone: 907-861-8527. Provide written comments by e-mail to rick.benedict@matsugov.us, or by mail to MSB Development Services Division, 350 E. Dahlia Avenue, Palmer, AK 99645.



The public may provide verbal testimony at the meeting or telephonically by calling 1-855-290-3803. To be eligible to file an appeal from a decision of the Planning Commission, a person must be designated an interested party. See MSB 15.39.010 for the definition of an interested party. The procedures governing appeals to the Board of Adjustment and Appeals are contained in MSB 15.39.010-250, which is available on the Borough home page at www.matsugov.us, in the Borough Clerk's office, and at various libraries within the borough.

Comments are due on or before ***October 4, 2024***, and will be included in the Planning Commission packet. Please be advised that comments received from the public after that date will not be included in the staff report, but will be provided to the Commission at the meeting.

Publish Date: September 18, 2024 0924-19

From: Ben Borg
To: Rick Benedict
Cc: Petra Albecker; Corinne Lindfors; Lacie Olivieri
Subject: Re: MSB Page Ad: Little Mount Susitna Wind, LLC
Date: Thursday, September 12, 2024 9:57:42 AM

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
Received and added to the submission folder for 9.18. Thanks!

On Thu, Sep 12, 2024 at 8:27 AM Rick Benedict <Rick.Benedict@matsugov.us> wrote:

> Hello,
>
> Please see the attached ad, map, and ad request for publication on Wednesday, September 18, 2024.
>
> Thank you!
>
> Rick Benedict – Current Planner
>
> Development Services Division
>
> Matanuska-Susitna Borough
>
> (907)861-8527 direct

--

Sincerely,
Ben Borg
Sales Representative, The Mat-Su Valley Frontiersman & The Anchorage Press
https://www.frontiersman.com/ and https://www.anchoragepress.com/
5751 E Mayflower Ct, Wasilla, AK 99654
(907) 600-1696 OFFICE
(907) 987-2059 CELLULAR

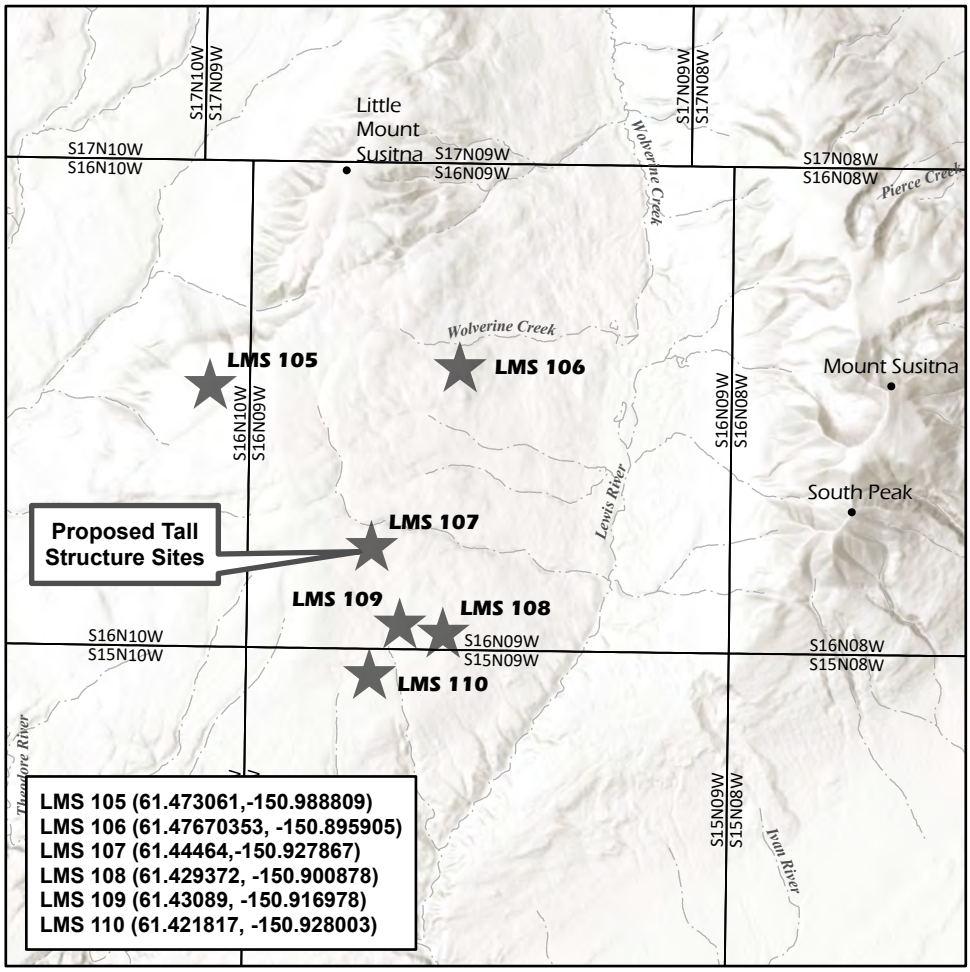
From: Rick Benedict
To: Ben Borg
Cc: Petra Albecker; Corinne Lindfors; Lacie Olivieri
Subject: MSB Page Ad: Little Mount Susitna Wind, LLC
Date: Thursday, September 12, 2024 8:27:00 AM
Attachments: Mount Susitna New MetTowers Ad Map.pdf
Ad Request Form_Little Mount Susitna Wind LLC.docx
Newspaper Ad_Little Mount Susitna Wind CUP.docx

Hello,

Please see the attached ad, map, and ad request for publication on Wednesday, September 18, 2024.

Thank you!

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct


S17N10W
S17N09W
S17N09W
S17N08W
S17N10W
S16N10W
Little
Mount
Susitna
S17N09W
S16N09W
S17N08W
S16N08W
Wolverine Creek
Pierce Creek
Wolverine Creek
LMS 105
LMS 106
Mount Susitna
S16N10W
S16N09W
S16N09W
S16N08W
South Peak
Lewis River
Proposed Tall
Structure Sites
LMS 107
LMS 109
LMS 108
S16N10W
S15N10W
S16N09W
S15N09W
S16N08W
S15N08W
LMS 110
Theodore River
S15N09W
S15N08W
Ivan River
LMS 105 (61.473061,-150.988809)
LMS 106 (61.47670353, -150.895905)
LMS 107 (61.44464,-150.927867)
LMS 108 (61.429372, -150.900878)
LMS 109 (61.43089, -150.916978)
LMS 110 (61.421817, -150.928003)

From:	Rick Benedict
To:	Rick Benedict
Bcc:	DEC Agency Reviews; "msb.hpc@gmail.com"; "mearow@matanuska.com"; "row@mtasolutions.com"; "row@enstarnaturalgas.com"; "GCI ROW"; Tom Adams; Jamie Taylor; Brad Sworts; Charlyn Spannagel; Alex Strawn; Jason Ortiz; Corinne Lindfors; Permit Center; Peggy Horton; Fred Wagner; Planning; John Aschenbrenner; Daniel Dahms; Tammy Simmons; "lmb@matsugov.us"; Michelle Olsen; "Kyler Hylton; ben.white@alaska.gov; Huling, Kristina N (DOT; colton.percy@alaska.gov; Brian Davis; Katrina Kline; "sarah.myers@alaska.gov"; usswcd@mtaonline.net; regpagemaster@usace.army.mil; MSB Farmers; TimHaleDistrict1@gmail.com; ben.white@alaska.gov; Huling, Kristina N (DOT; dylan.blankenship@alaska.gov; dnr.scro@alaska.gov; Planning; Edna DeVries; stephanienowersdistrict2@gmail.com; Dolores McKee; mokietew@gmail.com; Dmitri Fonov; fonov@yahoo.com; Ron Bernier; admin@waco-ak.org; at-large1@waco-ak.org; waco_vchair@waco-ak.org; waco_secretary@waco-ak.org; at-large2@waco-ak.org; at-large3@waco-ak.org; waco_treasurer@waco-ak.org; at-large4@waco-ak.org; Stuart.Leidner@alaska.gov; carol.fowler@alaska.gov; james.walker2@alaska.gov; mhtlo@alaska.gov; judy.bittner@alaska.gov; usswcd@mtaonline.net; Richard Boothby; Taunnie Boothby
Subject:	Request for Review and Comments: MSB 17.67 – Tall Structures
Date:	Thursday, September 12, 2024 3:11:00 PM

APPLICANT: Chad Allen, for Little Mount Susitna Wind LLC

LOCATION: Township 15 North, Range 9 West, Section 5, Seward Meridian
Township 16 North, Range 9 West, Section 16, Seward Meridian
Township 16 North, Range 9 West, Section 29, Seward Meridian
Township 16 North, Range 9 West, Section 32, Seward Meridian
Township 16 North, Range 9 West, Section 33, Seward Meridian
Township 16 North, Range 10 West, Section 13, Seward Meridian

An application for a Conditional Use Permit under MSB 17.67 – Tall Structures. The Planning Commission will conduct a public hearing on this request on October 21, 2024.

Application materials may be viewed online at www.matsugov.us by clicking on 'All Public Notices & Announcements.' A direct link to the application material is here:

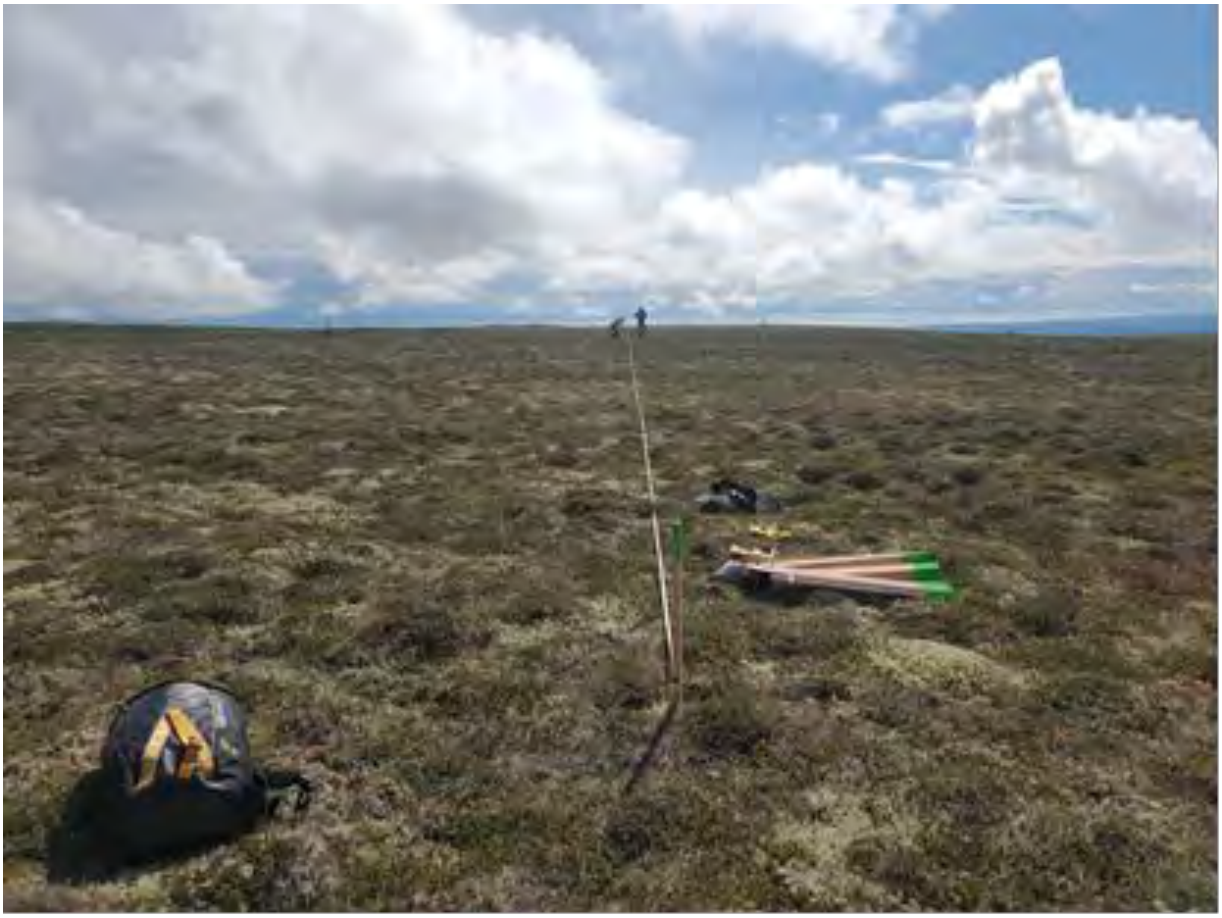
Matanuska-Susitna Borough - Public Notice - Conditional Use Permit under MSB 17.67 - Tall Structures (matsugov.us)

Comments are due on or before October 4, 2024, and will be included in the Planning Commission's packet for review and information. Please be advised that comments received after that date will not be included in the packet to the Planning Commission. Thank you for your review.

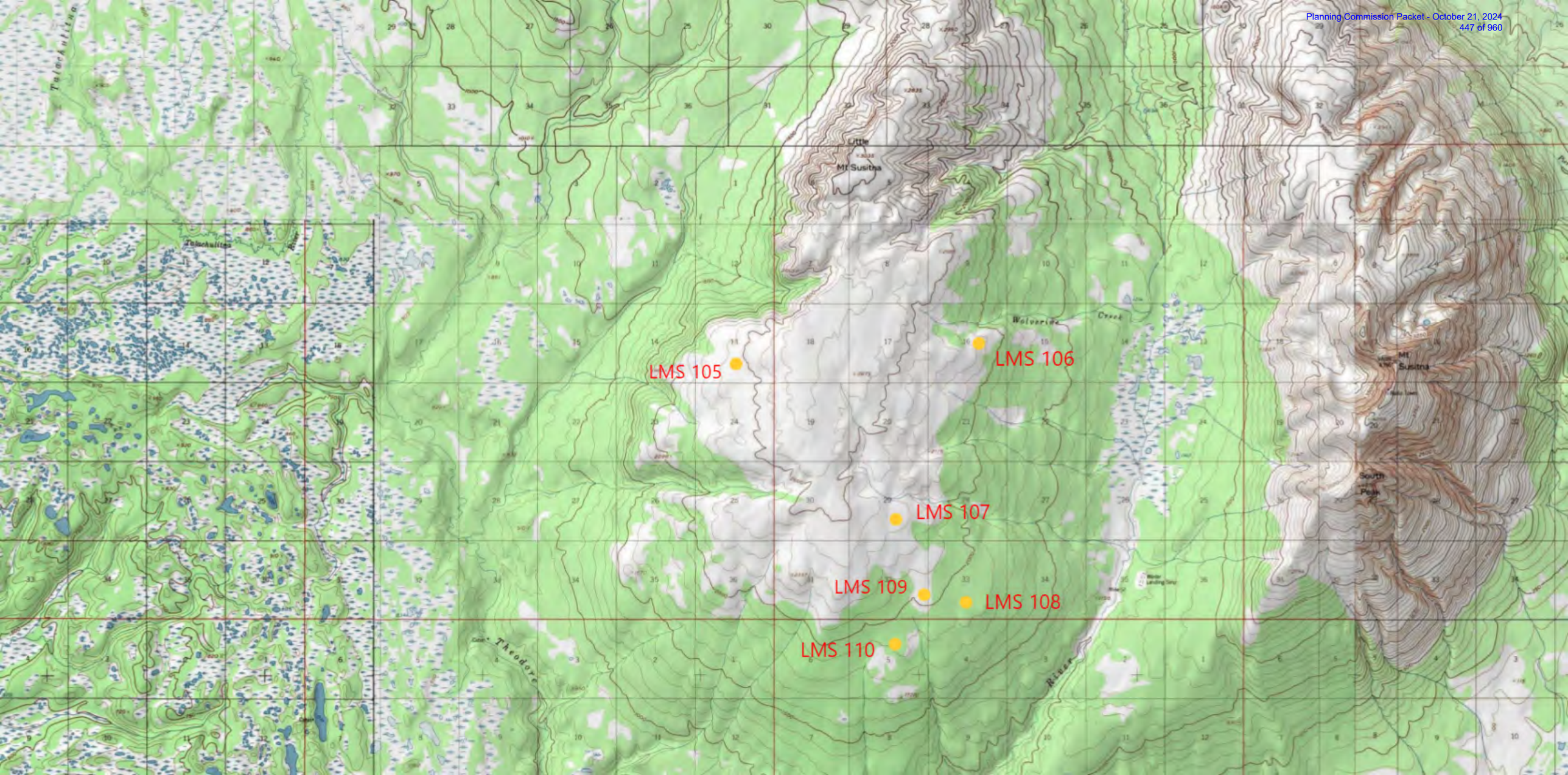
Respectfully,

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct

Site Photos from Applicant

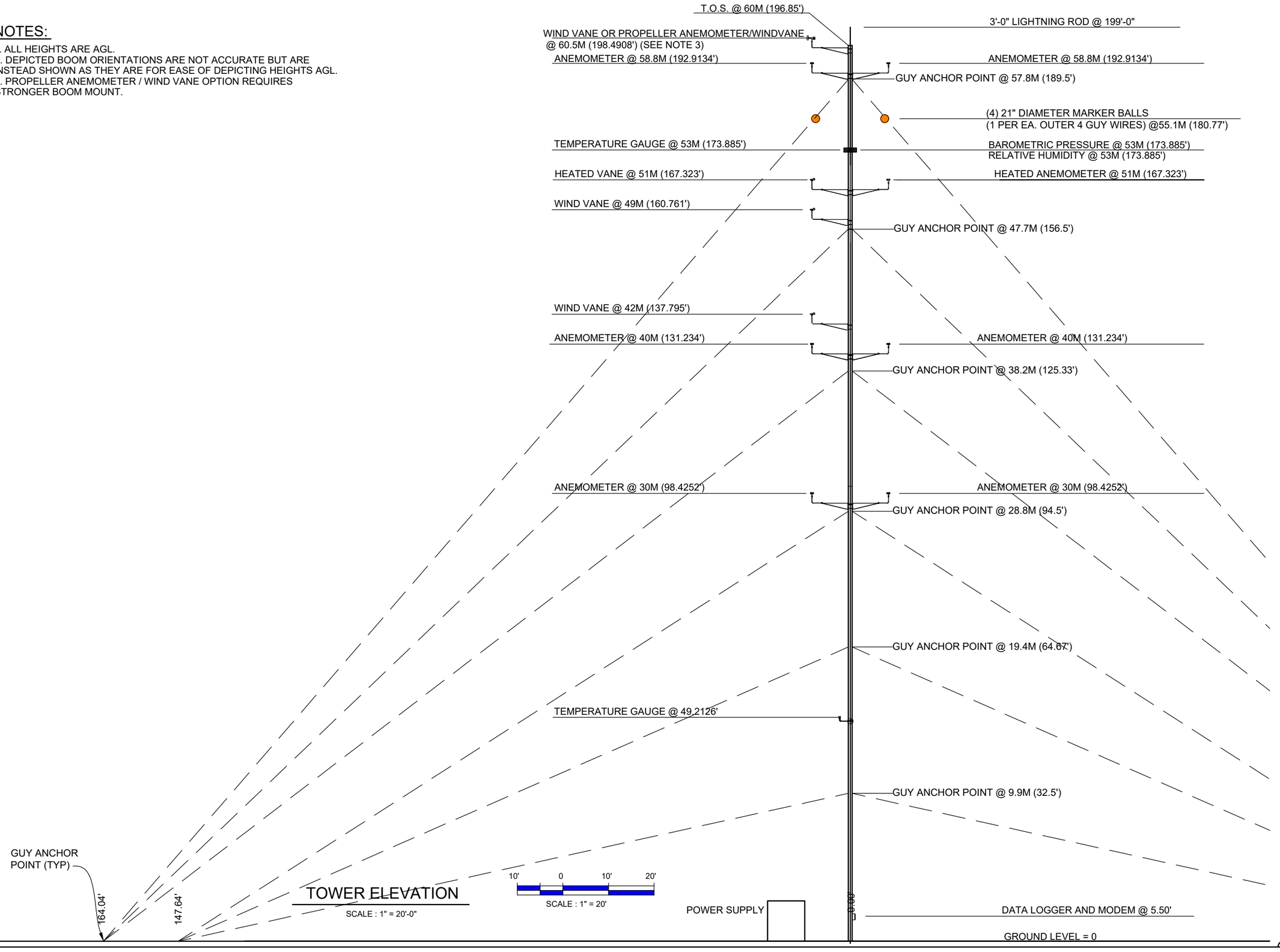


SITE PLAN


LMS 105
LMS 106
LMS 107
LMS 108
LMS 109
LMS 110
Little
Mt Susitna
Wolverine
Creek
Mt
Susitna
South
Peak
Theodore
River

NOTES:

1. ALL HEIGHTS ARE AGL.
2. DEPICTED BOOM ORIENTATIONS ARE NOT ACCURATE BUT ARE INSTEAD SHOWN AS THEY ARE FOR EASE OF DEPICTING HEIGHTS AGL.
3. PROPELLER ANEMOMETER / WIND VANE OPTION REQUIRES STRONGER BOOM MOUNT.



longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	60M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1		
2	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
MATANUSKA-SUSITNA BOROUGH, AK

TOWER TYPE:
60M SUPER XHD NRG TALL TOWER

SHEET TITLE:
TOWER ELEVATION

SHEET NO.
1 OF 9

NOTES:

1. MET TOWERS WINCHED UPRIGHT APPROXIMATELY FROM THE NORTH SIDE.

GUYED TOWER NOTES

1) GUY WIRE INSTALLATION:
ALL GUY WIRES ARE TO BE INSTALLED PER MANUFACTURER'S GUIDELINES AND TENSIONED TO MANUFACTURER'S SPECIFIED LIMITS AND CONFIRMED BY THE USE OF A CALIBRATED TENSIONOMETER. THE TOWER MUST BE PLUMBED TO MANUFACTURER'S SPECIFICATIONS UTILIZING AN ENGINEER TRANSIT AND MUST NOT VARY MORE THAN ONE INCH PER 100 FT OF TOWER HEIGHT. FINAL TENSIONS ARE TO BE RECORDED IN TOWER ERECTION MANUAL AND SUBMITTED TO CONSTRUCTION MANAGER UPON COMPLETION.

2) GUY WIRES:
ALL CUT GUY WIRES WILL BE LASHED WITH A NON-FERROUS MATERIAL AND PAINTED WITH ZINC RICH COMPOUND UPON COMPLETION.

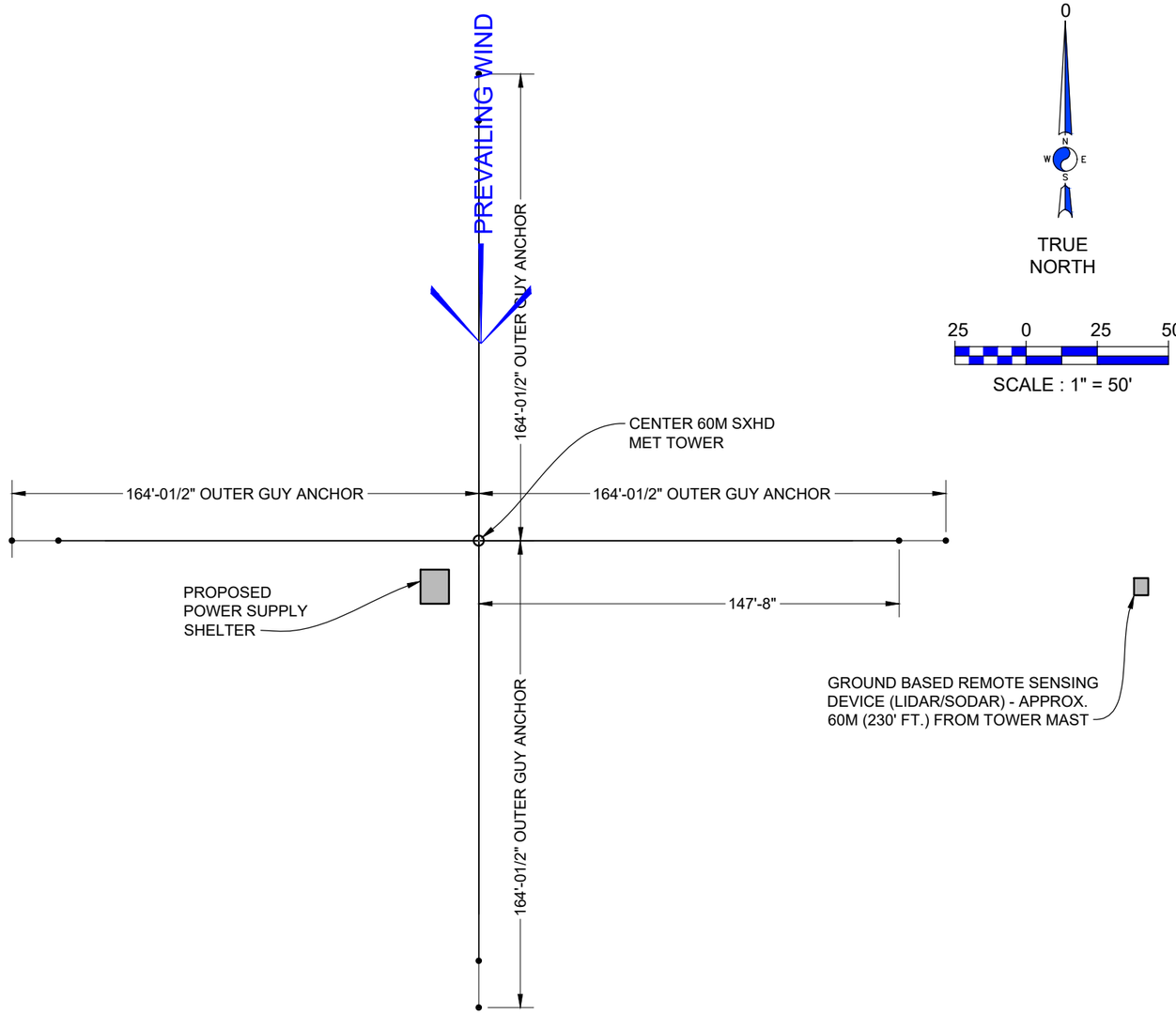
3) TURNBUCKLES:
ALL TURNBUCKLES ARE TO BE INSTALLED IN THE SAME ORIENTATION (WHEN BEHIND ANCHOR AND FACING TOWER, A CLOCKWISE TURN OF THE ADJUSTER WILL TIGHTEN THE TENSION AND A COUNTER-CLOCKWISE TURN OF THE ADJUSTER WILL LOOSEN TENSION). ALL ATTACHMENTS (BOLTS, PINS, CLEVISES) ARE TO BE INSTALLED IN THE SAME DIRECTION. DURING ERECTION, EACH GUY WIRE ADJUSTMENT WILL HAVE A TEMPORARY SAFETY INSTALLED. UPON COMPLETION, FOLLOWING FINAL PLUMB AND TENSION OF TOWER, ALL TURNBUCKLE ADJUSTERS WILL HAVE A SAFETY CABLE
ROUTED THROUGHOUT THEM AND SECURED TOGETHER WITH A WIRE ROPE CLIP, TO ENSURE NO MOVEMENT OF ADJUSTER.

4) PREFORM GRIPS:
UPON COMPLETION ALL GUY WIRES WILL HAVE AN ICE CLIP DEVICE INSTALLED AS DIRECTED AND
SUPPLIED BY TOWER MANUFACTURER. ANY ABRASIONS ARE TO BE PAINTED WITH ZINC RICH PAINT.

5) GUY WIRE GROUNDS:
ALL GUY WIRES ARE TO BE GROUNDED IN UNISON UTILIZING #2 STRANDED WIRE AND MANUFACTURER
SUPPLIED CONNECTORS AND COPPER SHEILD ON CABLE TO WIRE CONNECTIONS TO THE ANCHOR'S EARTHEN GROUND RING.

6) CONTRACTOR SHALL PROVIDE THE MINIMUM NUMBER OF GROUND RODS INDICATED, SEE GROUNDING PLAN FOR APPROXIMATE LOCATIONS.

7) GUY TOWER INSTALLATIONS MUST MEET OR EXCEED THE LATEST TIA/EIA-222-H STANDARDS.



60M SUPER XHD NRG TALL TOWER PLAN

SCALE : 1" = 50'-0"

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	60M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1		
2	06.26.2024	I.F.C.

STATE OF ALASKA
49 TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
MATANUSKA-SUSITNA BOROUGH, AK

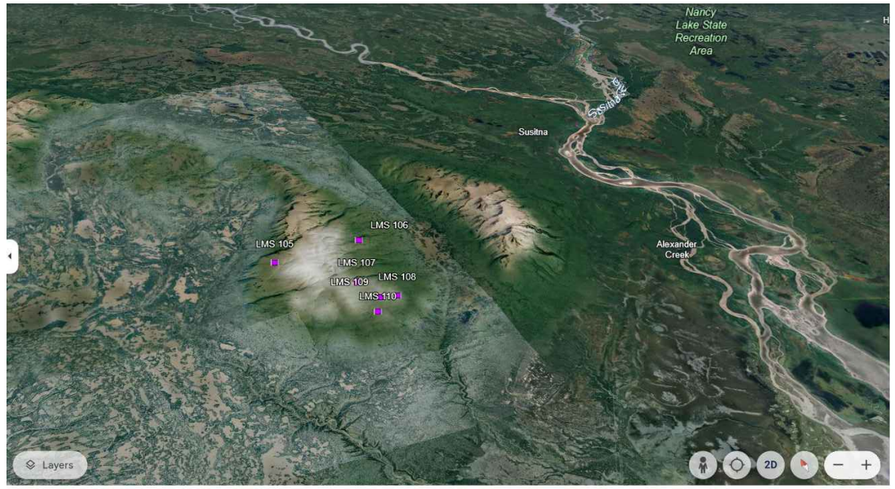
TOWER TYPE:
60M SUPER XHD NRG TALL TOWER

SHEET TITLE:
TOWER PLAN

SHEET NO.
2 OF 9

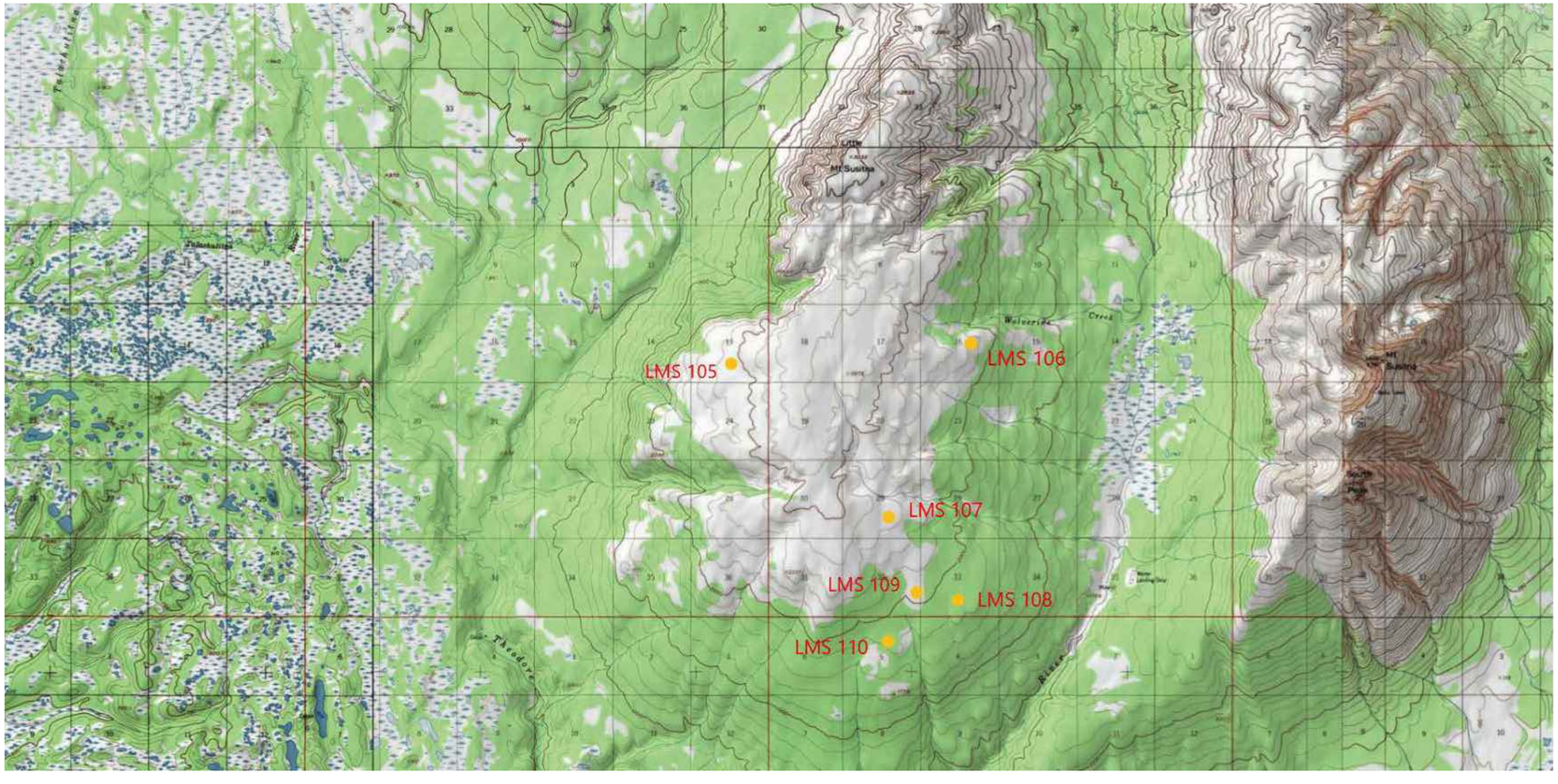
20240430				
LMS met twrs to be permitted				
dataset	littleMountSusitna_toBePermittedMetTwrs_20240430_ja.shp			
	UTM WGS84 z5 meters		WGS84	
id	X	Y	LATITUDE	LONGITUDE
LMS 105	607144	6817133	61.47306128° N	150.98880926° W
LMS 106	612079	6817695	61.47670353° N	150.89590508° W
LMS 107	610490	6814070	61.44464000° N	150.92786700° W
LMS 108	611983	6812416	61.42937215° N	150.90087803° W
LMS 109	611119	6812558	61.43089025° N	150.91697790° W
LMS 110	610563	6811529	61.42181675° N	150.92800343° W

AK MET TOWER LATITUDE & LONGITUDE COORDINATE TABLE



LMS 105 THRU 110 GOOGLE MAPS LOCATIONS

SCALE : N.T.S.



LMS 105 THRU 110 LOCATIONS

SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	60M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1		
2	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
MATANUSKA-SUSITNA BOROUGH, AK

TOWER TYPE:
60M SUPER XHD NRG TALL TOWER

SHEET TITLE:
SITE LOCATIONS

SHEET NO.
3 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S016N010W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	438610.156, 837190.354	**NE:**	448157.576, 837035.014
SW:	438439.045, 827536.254	**SE:**	448013.17, 827380.568

Township Gracticule:

	Radians	DMS
S Latitude:	1.0720902342723964	61 25 34.48445 N
E Longitude:	-2.6349935005514356	150 58 26.42385 W
N Latitude:	1.0736025151373458	61 30 46.41477 N
W Longitude:	-2.6381243219055466	151 09 12.20211 W

BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

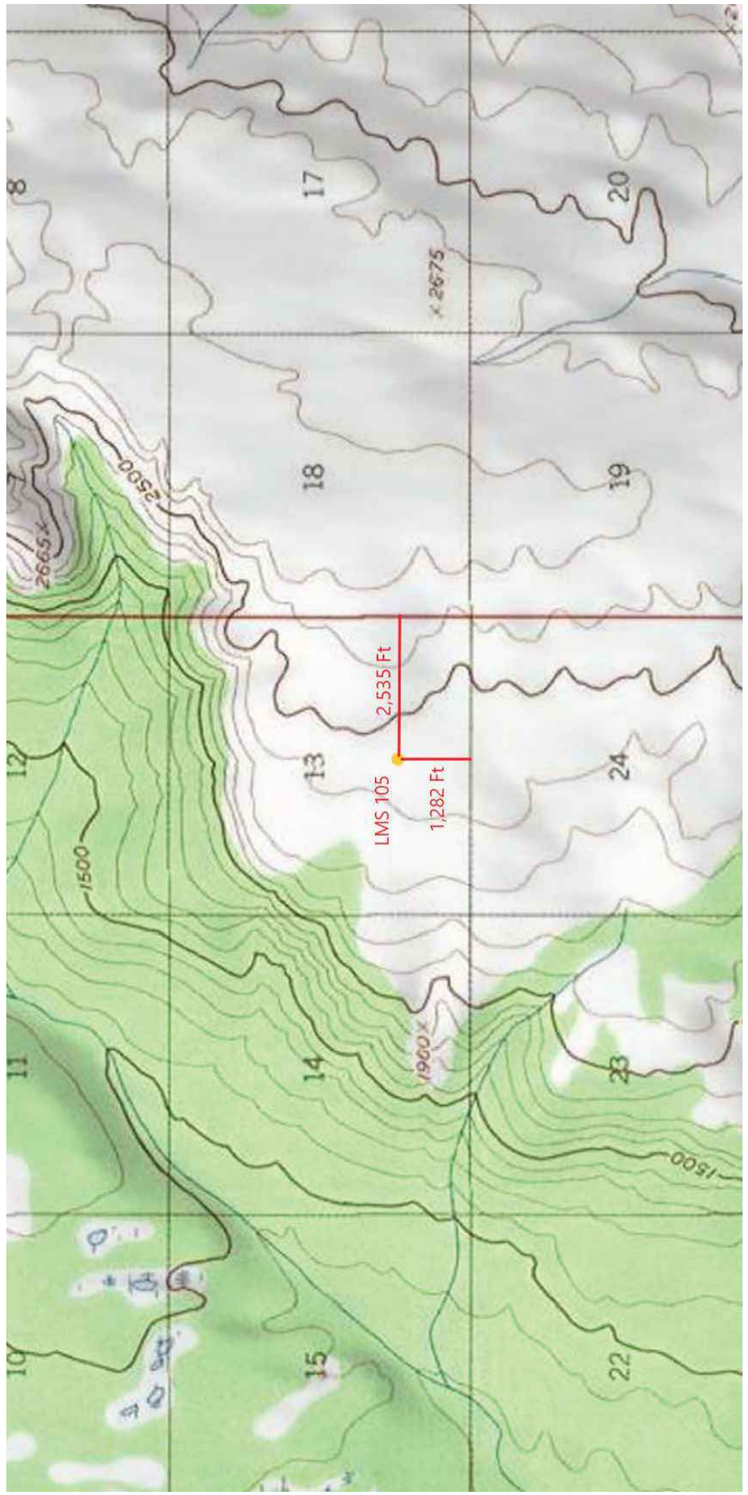
NW ITM Name:	TYONEK C-4	**NE ITM Name:**	TYONEK C-3
SW ITM Name:	TYONEK B-4	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:10 PM)

LMS 105 TOWNSHIP DATA



LMS 105 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

longroad ENERGY
ALASKARENEWABLES
NewTower Engineering LLC
AHOLA ENGINEERING

A&E PROJECT #:	60M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
MATANUSKA-SUSITNA BOROUGH, AK

TOWER TYPE:
60M SUPER XHD NRG TALL TOWER

SHEET TITLE:
SITE LOCATION LMS 105

SHEET NO.
4 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S016N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448157.576, 837035.014	**NE:**	457705.264, 836905.964
SW:	448013.17, 827380.568	**SE:**	457587.577, 827251.266

Township Gracticule:

	Radians	DMS
S Latitude:	1.0720903097927932	61 25 34.50003 N
E Longitude:	-2.631862563063116	150 47 40.62164 W
N Latitude:	1.0736025881444686	61 30 46.42983 N
W Longitude:	-2.6349934345081767	150 58 26.41023 W

BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

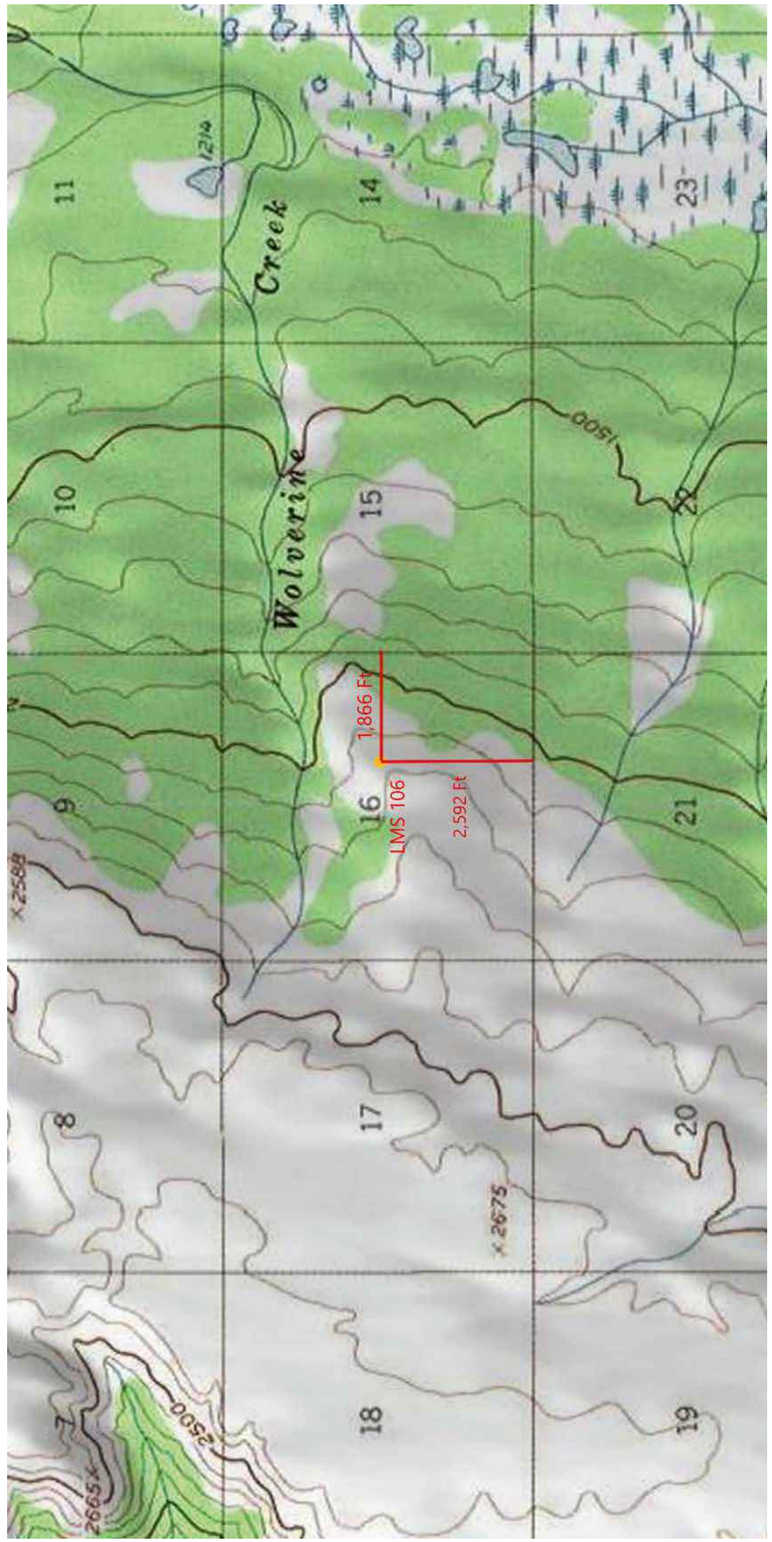
NW ITM Name:	TYONEK C-3	**NE ITM Name:**	TYONEK C-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:13 PM)

LMS 106 TOWNSHIP DATA



LMS 106 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	60M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3	06.26.2024	I.F.C.

STATE OF ALASKA
49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
MATANUSKA-SUSITNA BOROUGH, AK

TOWER TYPE:
60M SUPER XHD NRG TALL TOWER

SHEET TITLE:
SITE LOCATION
LMS 106

SHEET NO.
5 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S016N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448157.576, 837035.014	**NE:**	457705.264, 836905.964
SW:	448013.17, 827380.568	**SE:**	457587.577, 827251.266

Township Gracticule:

	Radians	DMS
S Latitude:	1.0720903097927932	61 25 34.50003 N
E Longitude:	-2.631862563063116	150 47 40.62164 W
N Latitude:	1.0736025881444686	61 30 46.42983 N
W Longitude:	-2.6349934345081767	150 58 26.41023 W

BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

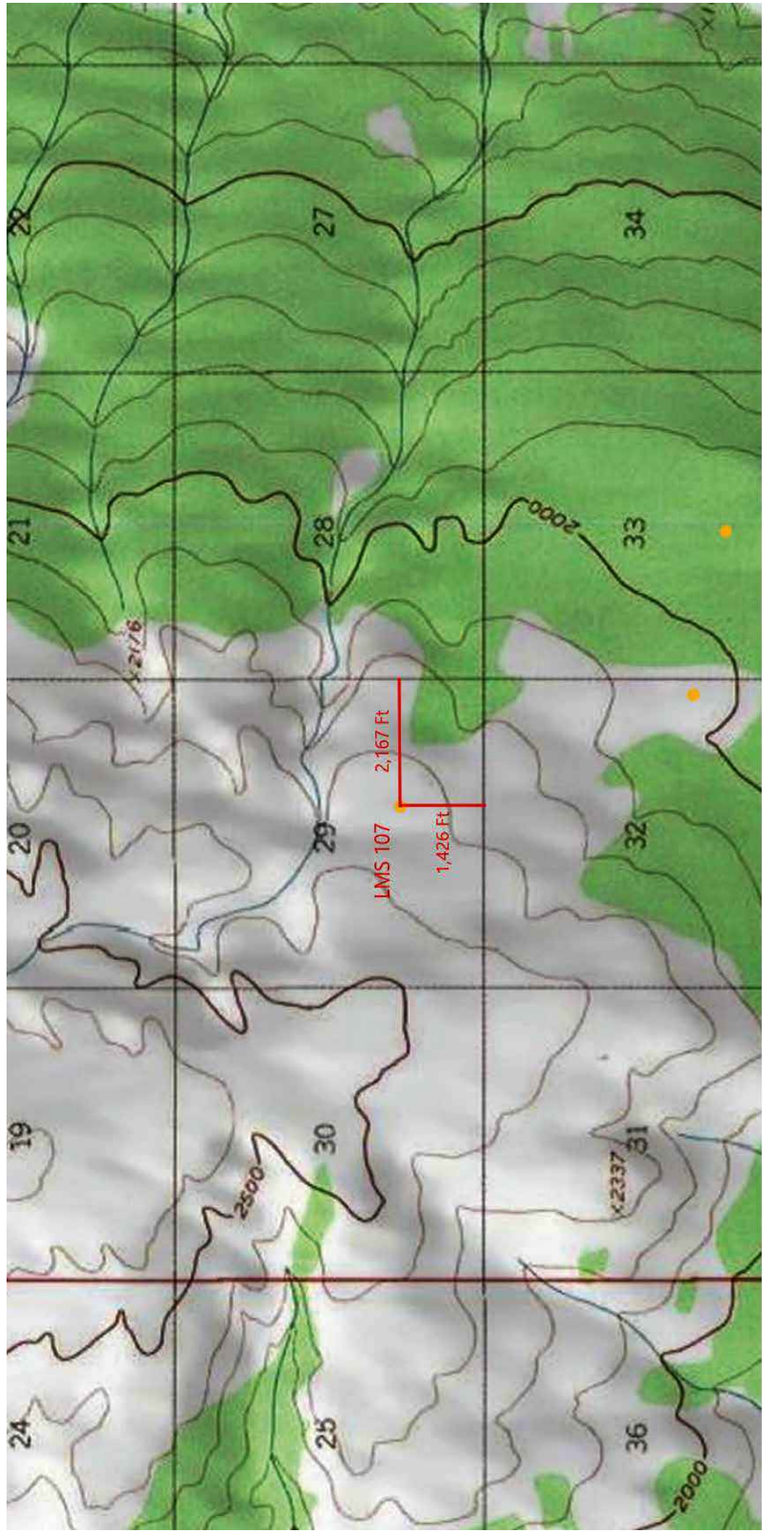
NW ITM Name:	TYONEK C-3	**NE ITM Name:**	TYONEK C-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 1:58 PM)

LMS 107 TOWNSHIP DATA



LMS 107 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	60M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS		
1		
2	06.26.2024	I.F.C.
NO.	DATE	DESCRIPTION

STATE OF ALASKA
49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
MATANUSKA-SUSITNA BOROUGH, AK

TOWER TYPE:
60M SUPER XHD NRG TALL TOWER

SHEET TITLE:
SITE LOCATION
LMS 107

SHEET NO.
6 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S015N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448013.17, 827380.568	**NE:**	457587.577, 827251.266
SW:	447868.883, 817726.177	**SE:**	457469.991, 817596.635

Township Gracticule:

	Radians	DMS
S Latitude:	1.0705779481540059	61 20 22.55305 N
E Longitude:	-2.631862575612033	150 47 40.62423 W
N Latitude:	1.0720902342723964	61 25 34.48445 N
W Longitude:	-2.6349935005514356	150 58 26.42385 W

BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

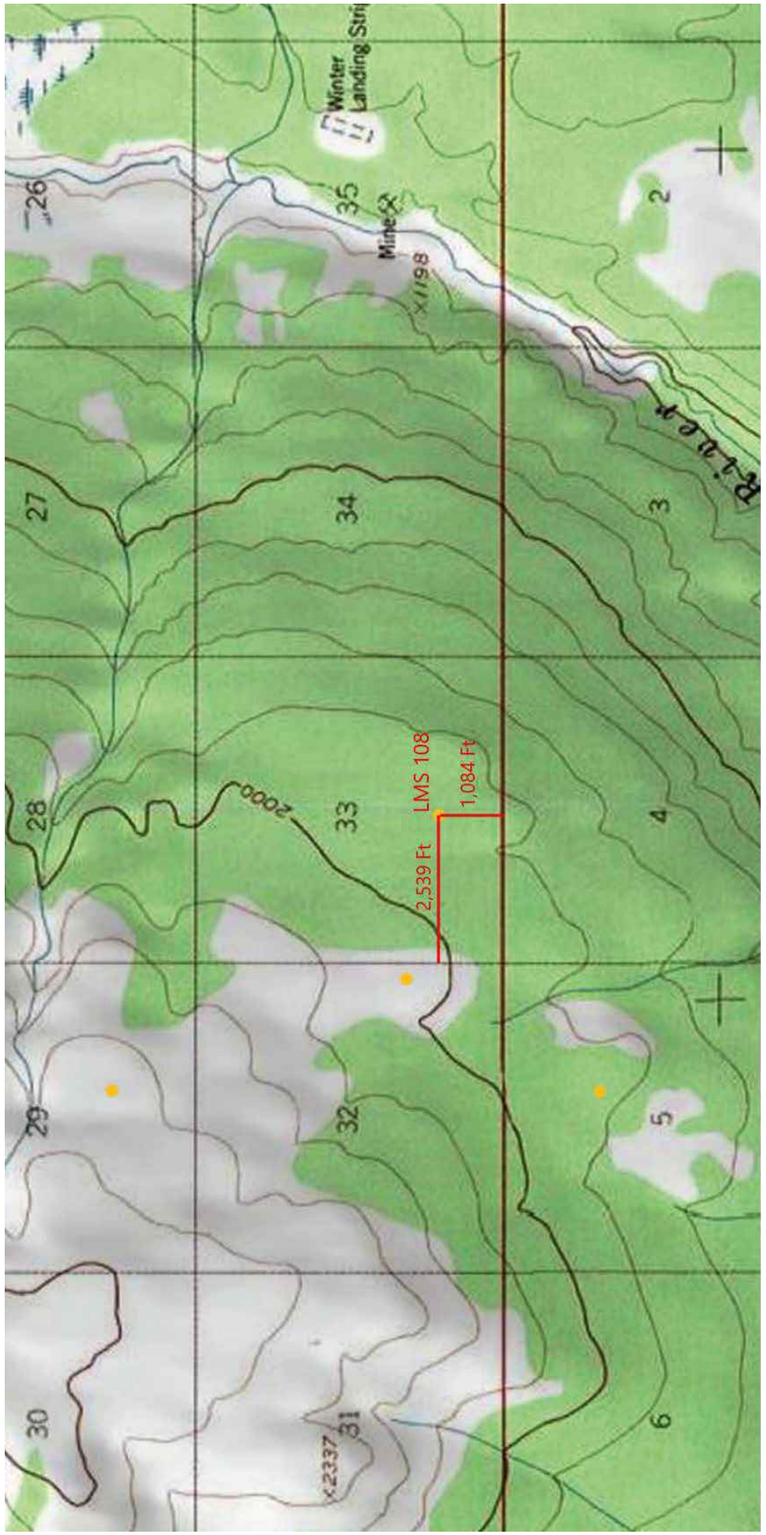
NW ITM Name:	TYONEK B-3	**NE ITM Name:**	TYONEK B-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:16 PM)

LMS 108 TOWNSHIP DATA



LMS 108 SETBACK DISTANCES TO SECTION LINES
SCALE: N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	60M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
MATANUSKA-SUSITNA BOROUGH, AK

TOWER TYPE:
60M SUPER XHD NRG TALL TOWER

SHEET TITLE:
SITE LOCATION LMS 108

SHEET NO.
7 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S016N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448157.576, 837035.014	**NE:**	457705.264, 836905.964
SW:	448013.17, 827380.568	**SE:**	457587.577, 827251.266

Township Gracticule:

	Radians	DMS
S Latitude:	1.0720903097927932	61 25 34.50003 N
E Longitude:	-2.631862563063116	150 47 40.62164 W
N Latitude:	1.0736025881444686	61 30 46.42983 N
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BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

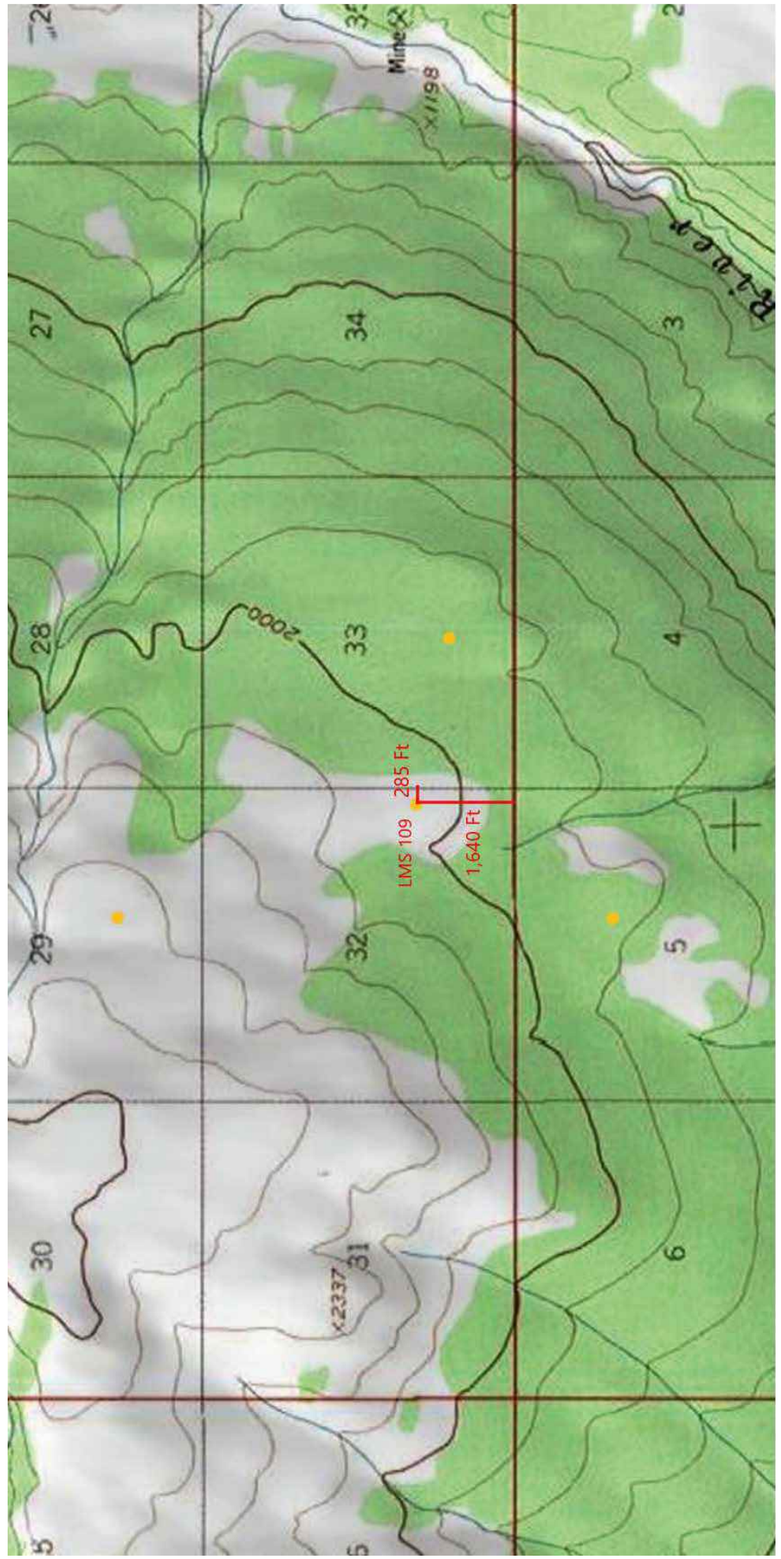
NW ITM Name:	TYONEK C-3	**NE ITM Name:**	TYONEK C-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:17 PM)

LMS 109 TOWNSHIP DATA



LMS 109 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	60M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
MATANUSKA-SUSITNA BOROUGH, AK

TOWER TYPE:
60M SUPER XHD NRG TALL TOWER

SHEET TITLE:
SITE LOCATION LMS 109

SHEET NO.
8 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S015N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448013.17, 827380.568	**NE:**	457587.577, 827251.266
SW:	447868.883, 817726.177	**SE:**	457469.991, 817596.635

Township Gracticule:

	Radians	DMS
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E Longitude:	-2.631862575612033	150 47 40.62423 W
N Latitude:	1.0720902342723964	61 25 34.48445 N
W Longitude:	-2.6349935005514356	150 58 26.42385 W

BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

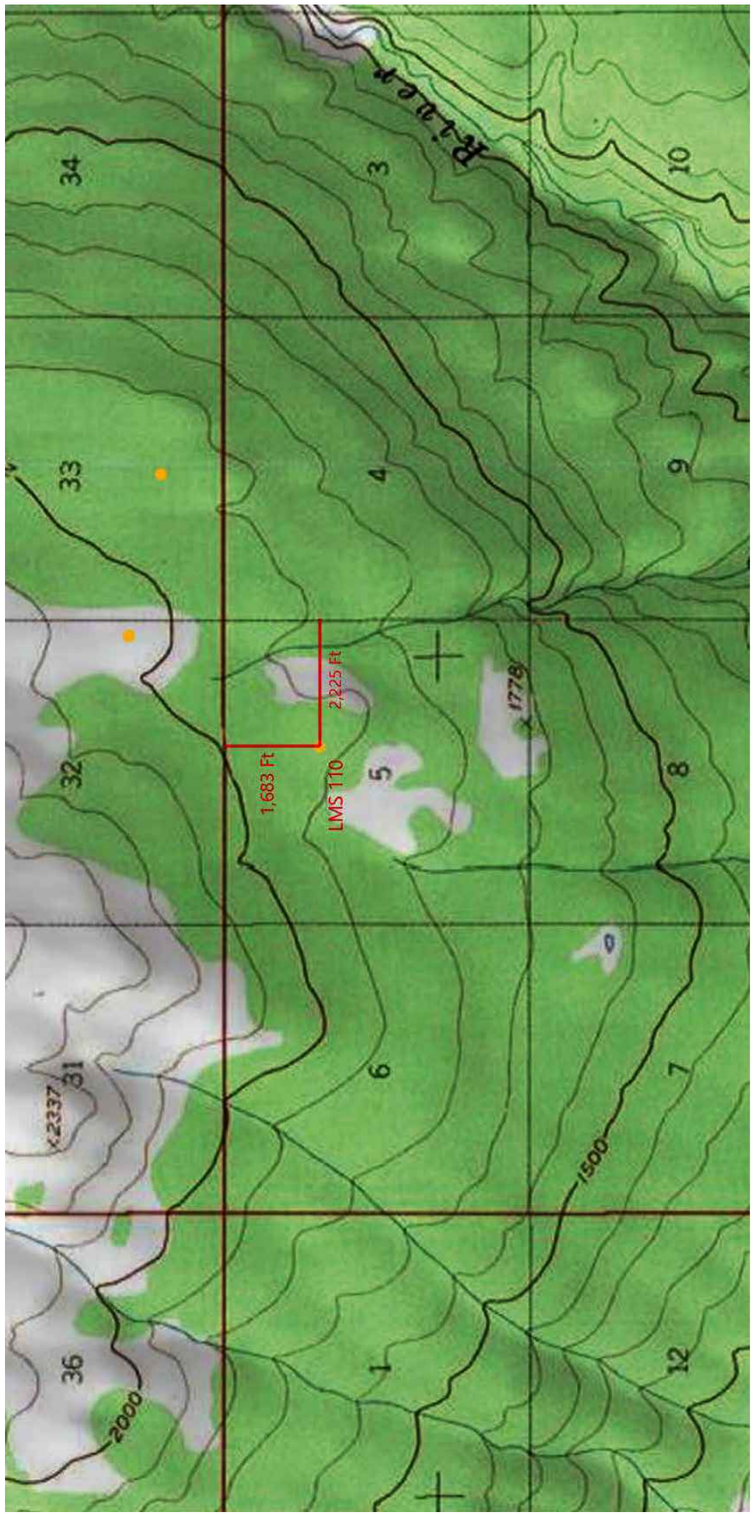
NW ITM Name:	TYONEK B-3	**NE ITM Name:**	TYONEK B-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:07 PM)

LMS 110 TOWNSHIP DATA



LMS 110 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	60M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
MATANUSKA-SUSITNA BOROUGH, AK

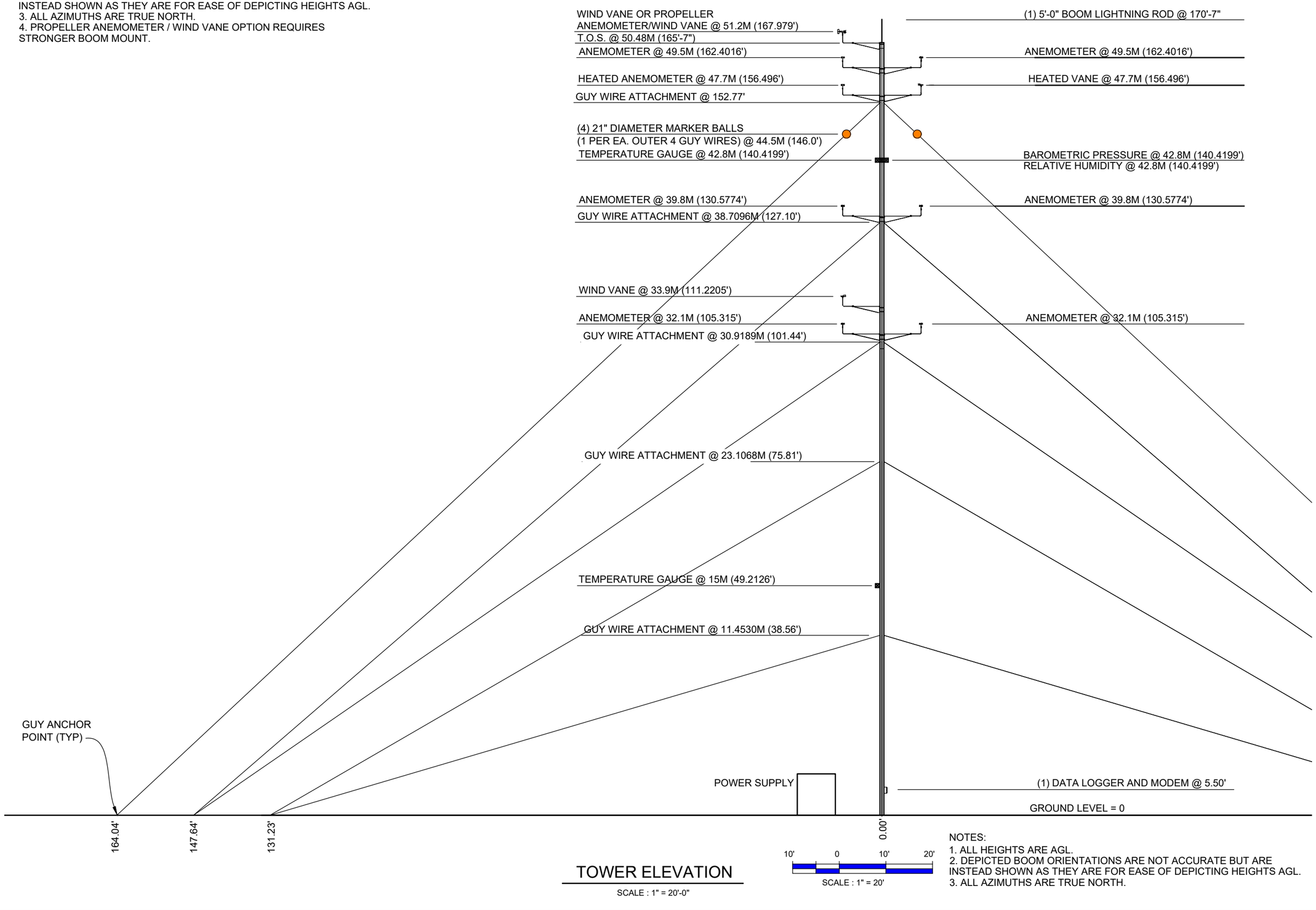
TOWER TYPE:
60M SUPER XHD NRG TALL TOWER

SHEET TITLE:
SITE LOCATION LMS 110

SHEET NO.
9 OF 9

NOTES:

1. ALL HEIGHTS ARE AGL.
2. DEPICTED BOOM ORIENTATIONS ARE NOT ACCURATE BUT ARE INSTEAD SHOWN AS THEY ARE FOR EASE OF DEPICTING HEIGHTS AGL.
3. ALL AZIMUTHS ARE TRUE NORTH.
4. PROPELLER ANEMOMETER / WIND VANE OPTION REQUIRES STRONGER BOOM MOUNT.



TOWER ELEVATION

SCALE : 1" = 20'-0"

10' 0 10' 20'

SCALE : 1" = 20'

NOTES:
1. ALL HEIGHTS ARE AGL.
2. DEPICTED BOOM ORIENTATIONS ARE NOT ACCURATE BUT ARE INSTEAD SHOWN AS THEY ARE FOR EASE OF DEPICTING HEIGHTS AGL.
3. ALL AZIMUTHS ARE TRUE NORTH.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	50M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1		
2	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
50M XHD MET TOWER
MATANUSKA-SUSITNA BOROUGH, AK

DESIGN TYPE:
50M XHD MET TOWER
STANDARD FOOTPRINT

SHEET TITLE:
TOWER ELEVATION

SHEET NO.
1 OF 9

NOTES:
1. MET TOWERS WINCHED UPRIGHT FROM APPROXIMATELY THE NORTH SIDE.

GUYED TOWER NOTES

1) GUY WIRE INSTALLATION:
ALL GUY WIRES ARE TO BE INSTALLED PER MANUFACTURER'S GUIDELINES AND TENSIONED TO MANUFACTURER'S SPECIFIED LIMITS AND CONFIRMED BY THE USE OF A CALIBRATED TENSIONOMETER. THE TOWER MUST BE PLUMBED TO MANUFACTURER'S SPECIFICATIONS UTILIZING AN ENGINEER TRANSIT AND MUST NOT VARY MORE THAN ONE INCH PER 100 FT OF TOWER HEIGHT. FINAL TENSIONS ARE TO BE RECORDED IN TOWER ERECTION MANUAL AND SUBMITTED TO CONSTRUCTION MANAGER UPON COMPLETION.

2) GUY WIRES:
ALL CUT GUY WIRES WILL BE LASHED WITH A NON-FERROUS MATERIAL AND PAINTED WITH ZINC RICH COMPOUND UPON COMPLETION.

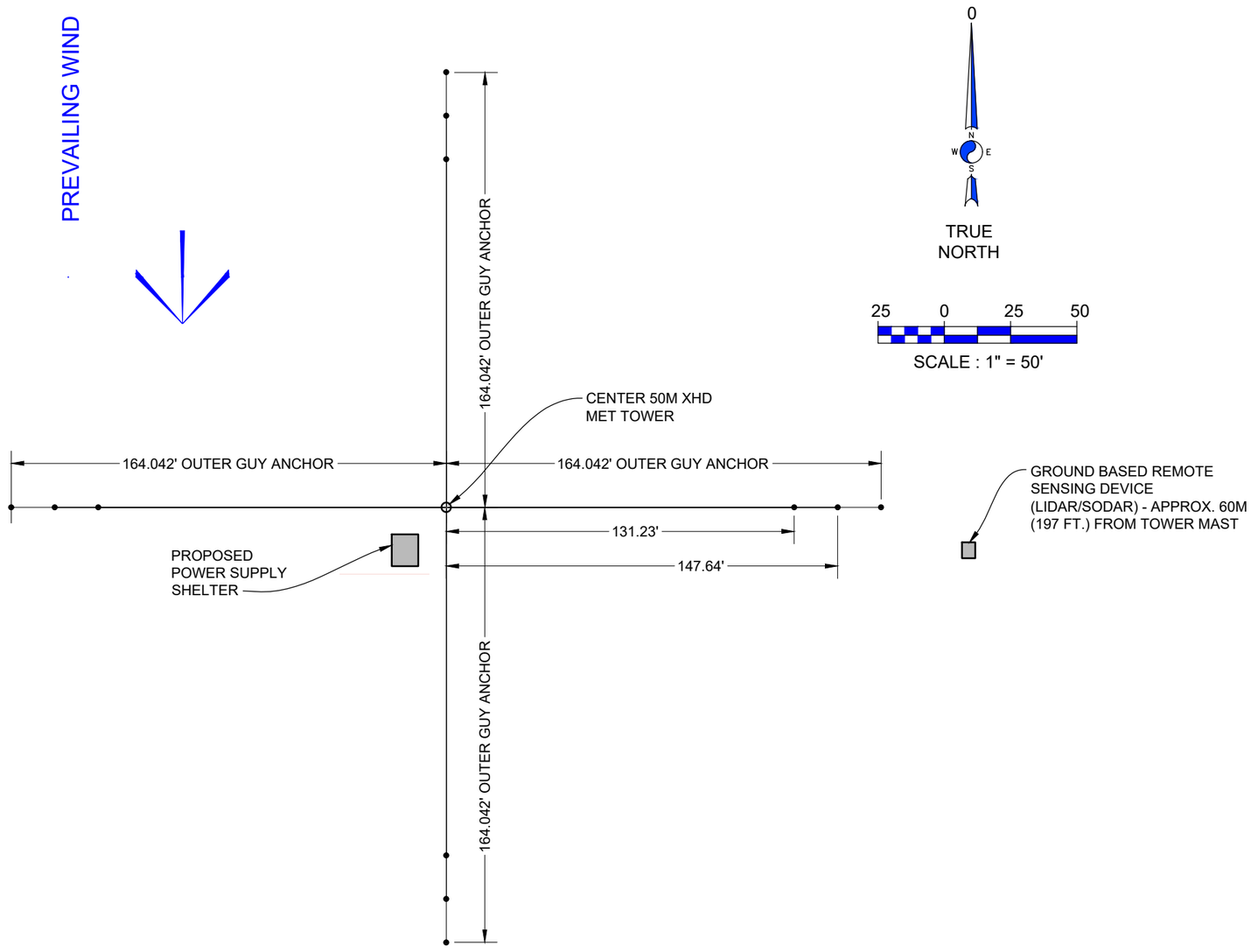
3) TURNBUCKLES:
ALL TURNBUCKLES ARE TO BE INSTALLED IN THE SAME ORIENTATION (WHEN BEHIND ANCHOR AND FACING TOWER, A CLOCKWISE TURN OF THE ADJUSTER WILL TIGHTEN THE TENSION AND A COUNTER-CLOCKWISE TURN OF THE ADJUSTER WILL LOOSEN TENSION). ALL ATTACHMENTS (BOLTS, PINS, CLEVISES) ARE TO BE INSTALLED IN THE SAME DIRECTION. DURING ERECTION, EACH GUY WIRE ADJUSTMENT WILL HAVE A TEMPORARY SAFETY INSTALLED. UPON COMPLETION, FOLLOWING FINAL PLUMB AND TENSION OF TOWER, ALL TURNBUCKLE ADJUSTERS WILL HAVE A SAFETY CABLE
ROUTED THROUGHOUT THEM AND SECURED TOGETHER WITH A WIRE ROPE CLIP, TO ENSURE NO MOVEMENT OF ADJUSTER.

4) PREFORM GRIPS:
UPON COMPLETION ALL GUY WIRES WILL HAVE AN ICE CLIP DEVICE INSTALLED AS DIRECTED AND
SUPPLIED BY TOWER MANUFACTURER. ANY ABRASIONS ARE TO BE PAINTED WITH ZINC RICH PAINT.

5) GUY WIRE GROUNDS:
ALL GUY WIRES ARE TO BE GROUNDED IN UNISON UTILIZING #2 STRANDED WIRE AND MANUFACTURER
SUPPLIED CONNECTORS AND COPPER SHIELD ON CABLE TO WIRE CONNECTIONS TO THE ANCHOR'S EARTHEN GROUND RING.

6) CONTRACTOR SHALL PROVIDE THE MINIMUM NUMBER OF GROUND RODS INDICATED, SEE GROUNDING PLAN FOR APPROXIMATE LOCATIONS.

7) GUY TOWER INSTALLATIONS MUST MEET OR EXCEED THE LATEST TIA/EIA-222-H STANDARDS.



50M XHD TOWER PLAN

SCALE : 1" = 50'-0"

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	50M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
50M XHD MET TOWER
MATANUSKA-SUSITNA BOROUGH, AK

DESIGN TYPE:
50M XHD MET TOWER STANDARD FOOTPRINT

SHEET TITLE:
SITE PLAN

SHEET NO.
2 OF 9

20240430				
LMS met twrs to be permitted				
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	UTM WGS84 z5 meters		WGS84	
id	X	Y	LATITUDE	LONGITUDE
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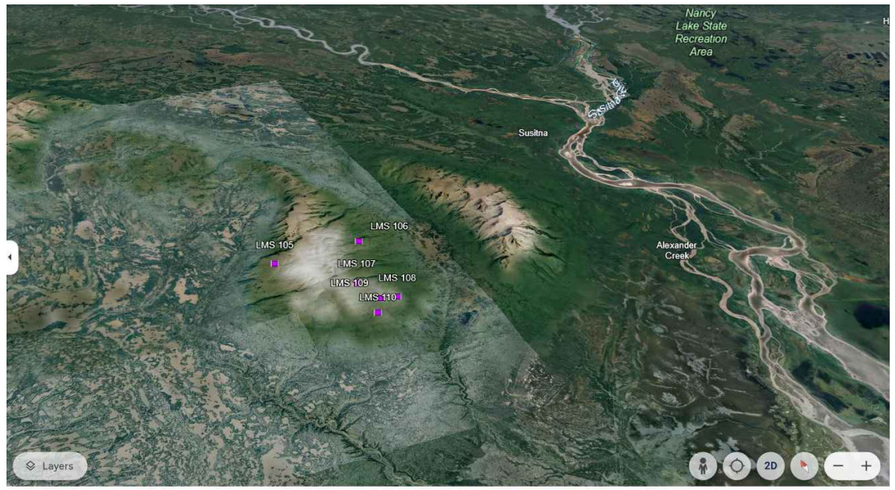
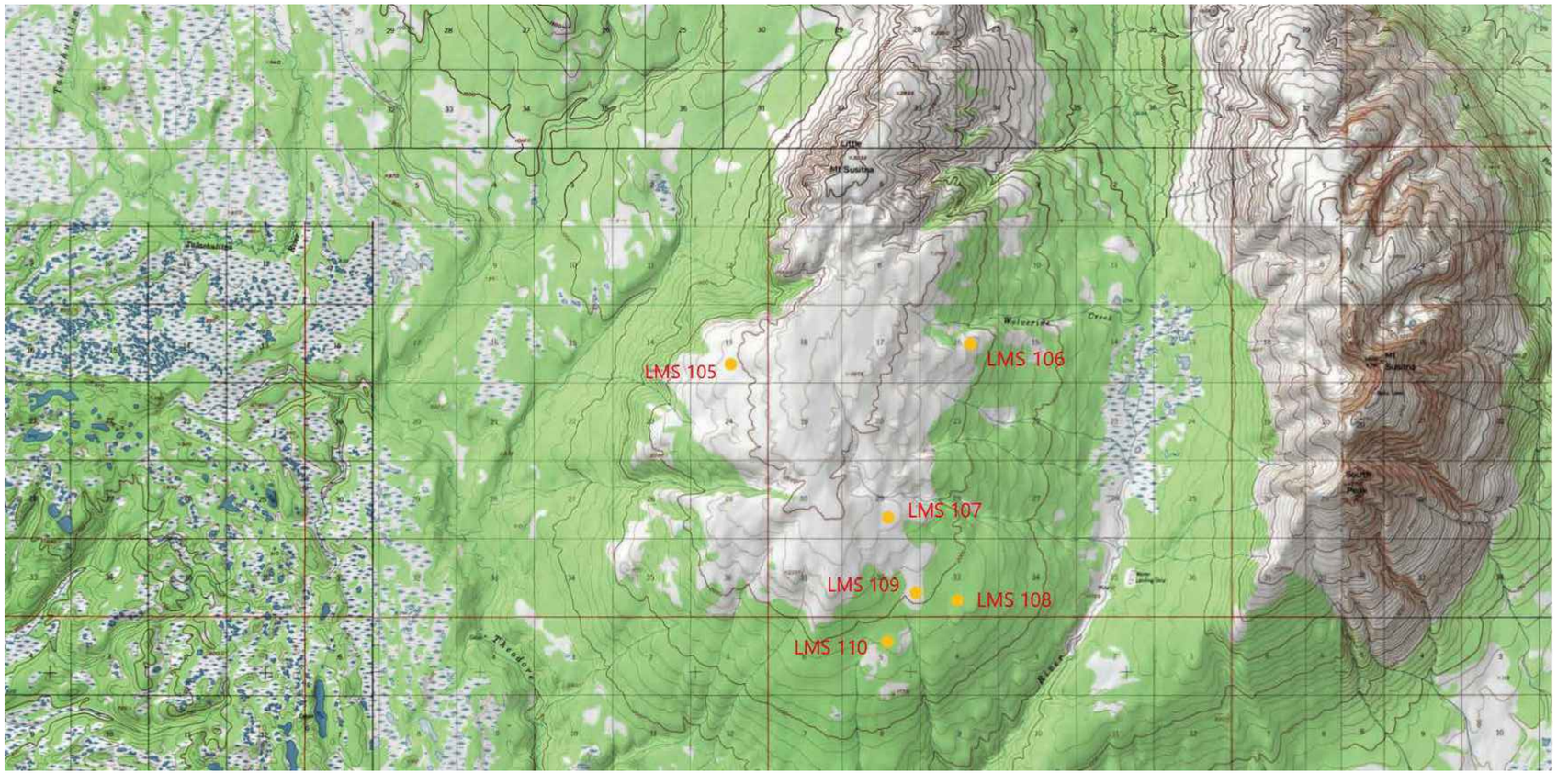
LMS 106	612079	6817695	61.47670353° N	150.89590508° W
LMS 107	610490	6814070	61.44464000° N	150.92786700° W
LMS 108	611983	6812416	61.42937215° N	150.90087803° W
LMS 109	611119	6812558	61.43089025° N	150.91697790° W
LMS 110	610563	6811529	61.42181675° N	150.92800343° W

AK MET TOWER LATITUDE & LONGITUDE COORDINATE TABLE



LMS 105 THRU 110 GOOGLE MAPS LOCATIONS

SCALE : N.T.S.



LMS 105 THRU 110 LOCATIONS

SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	50M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1		
2	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
50M XHD MET TOWER
MATANUSKA-SUSITNA BOROUGH, AK

DESIGN TYPE:
50M XHD MET TOWER STANDARD FOOTPRINT

SHEET TITLE:
SITE LOCATIONS

SHEET NO.
3 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S016N010W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	438610.156, 837190.354	**NE:**	448157.576, 837035.014
SW:	438439.045, 827536.254	**SE:**	448013.17, 827380.568

Township Gracticule:

	Radians	DMS
S Latitude:	1.0720902342723964	61 25 34.48445 N
E Longitude:	-2.6349935005514356	150 58 26.42385 W
N Latitude:	1.0736025151373458	61 30 46.41477 N
W Longitude:	-2.6381243219055466	151 09 12.20211 W

BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

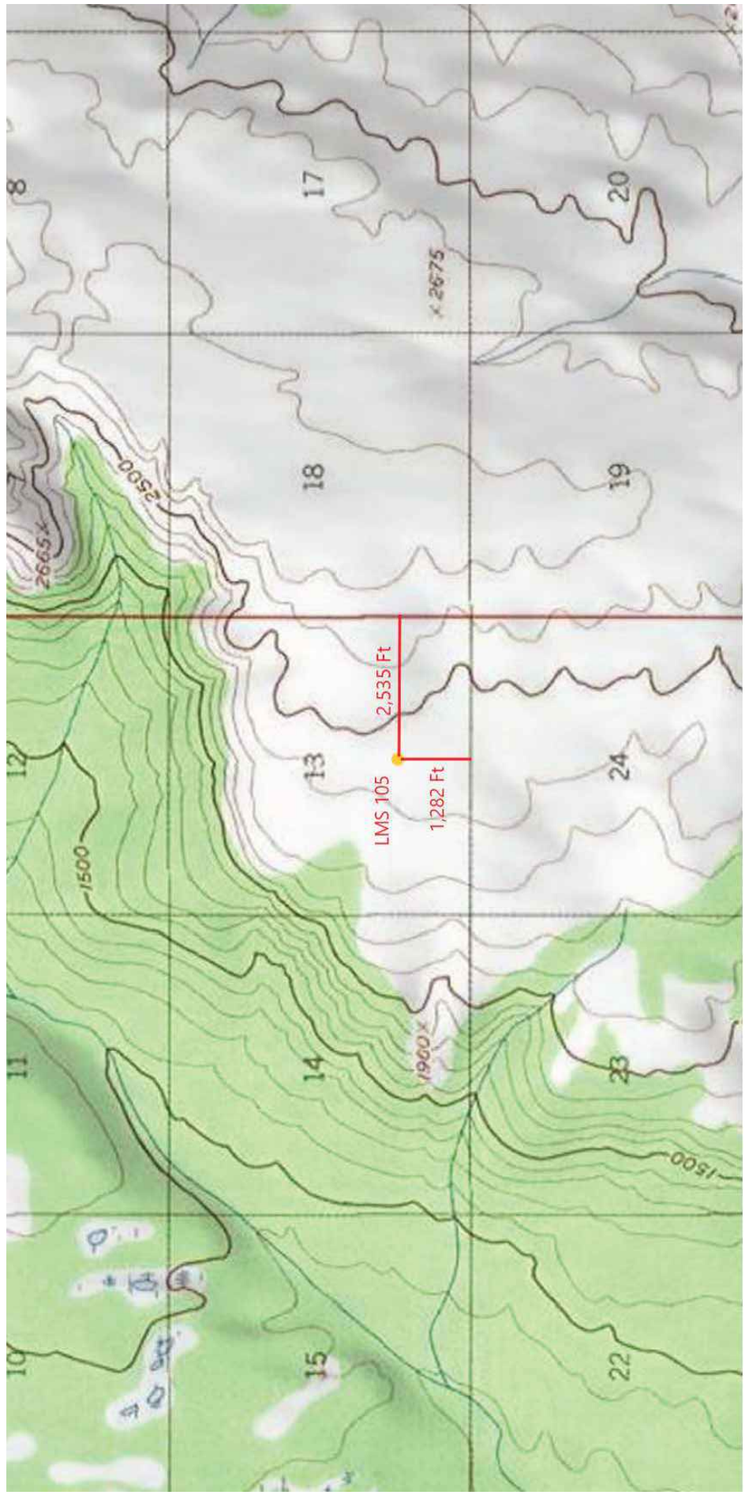
NW ITM Name:	TYONEK C-4	**NE ITM Name:**	TYONEK C-3
SW ITM Name:	TYONEK B-4	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:10 PM)

LMS 105 TOWNSHIP DATA



LMS 105 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

A&E PROJECT #:	50M XHD ALASKA	
DRAWN BY:	CB	
CHECKED BY:	MA	

REVISIONS

NO.	DATE	DESCRIPTION
1	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
50M XHD MET TOWER
MATANUSKA-SUSITNA
BOROUGH, AK

DESIGN TYPE:
50M XHD MET TOWER
STANDARD FOOTPRINT

SHEET TITLE:
LMS 105

SHEET NO.
4 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S016N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448157.576, 837035.014	**NE:**	457705.264, 836905.964
SW:	448013.17, 827380.568	**SE:**	457587.577, 827251.266

Township Gracticule:

	Radians	DMS
S Latitude:	1.0720903097927932	61 25 34.50003 N
E Longitude:	-2.631862563063116	150 47 40.62164 W
N Latitude:	1.0736025881444686	61 30 46.42983 N
W Longitude:	-2.6349934345081767	150 58 26.41023 W

BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

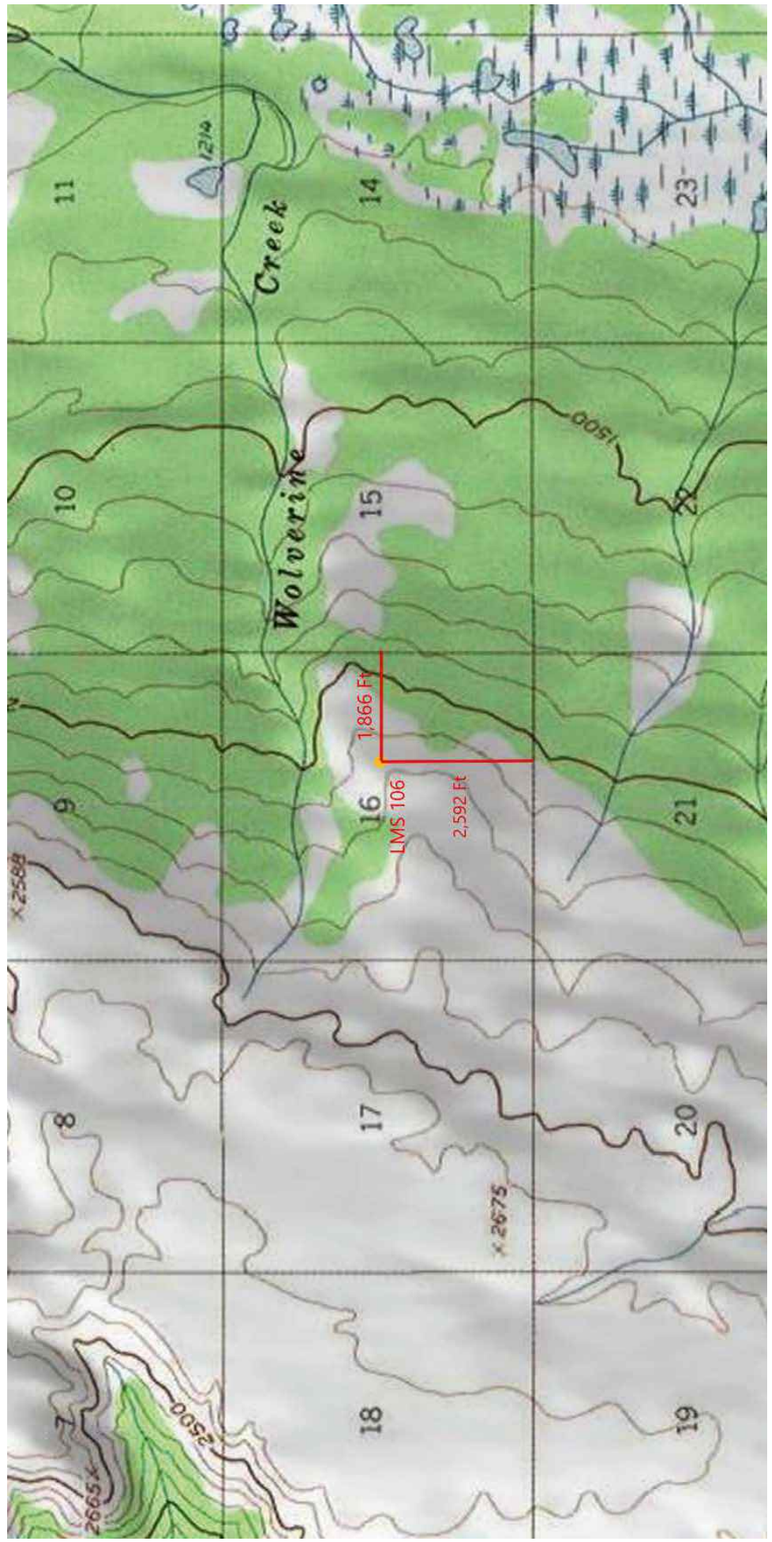
NW ITM Name:	TYONEK C-3	**NE ITM Name:**	TYONEK C-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:13 PM)

LMS 106 TOWNSHIP DATA



LMS 106 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	50M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1	06.26.2024	I.F.C.

STATE OF ALASKA
49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
50M XHD MET TOWER
MATANUSKA-SUSITNA
BOROUGH, AK

DESIGN TYPE:
50M XHD MET TOWER
STANDARD FOOTPRINT

SHEET TITLE:
LMS 106

SHEET NO.
5 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S016N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448157.576, 837035.014	**NE:**	457705.264, 836905.964
SW:	448013.17, 827380.568	**SE:**	457587.577, 827251.266

Township Gracticule:

	Radians	DMS
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E Longitude:	-2.631862563063116	150 47 40.62164 W
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Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

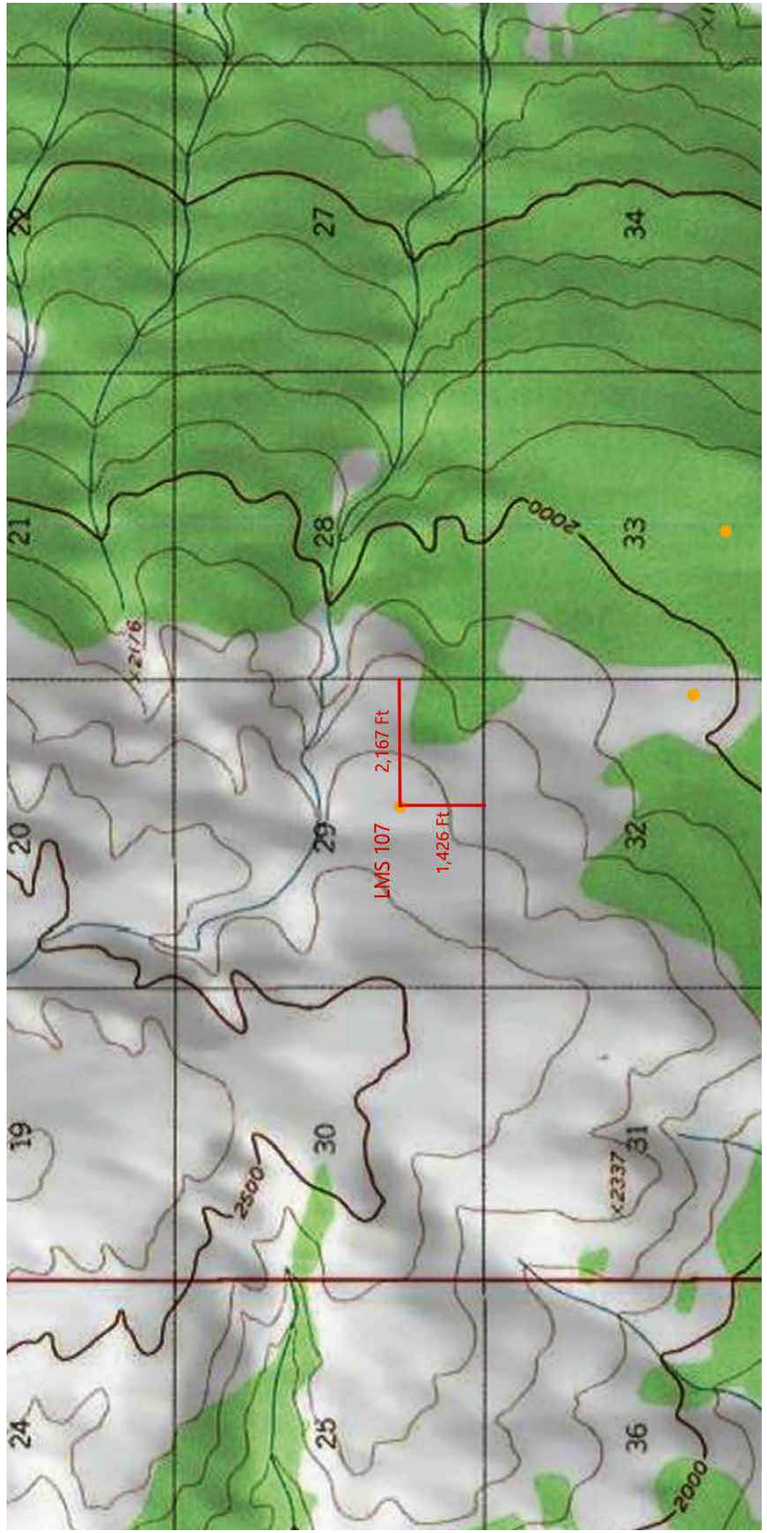
NW ITM Name:	TYONEK C-3	**NE ITM Name:**	TYONEK C-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 1:58 PM)

LMS 107 TOWNSHIP DATA



LMS 107 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	50M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1	06.26.2024	I.F.C.

STATE OF ALASKA
49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
50M XHD MET TOWER
MATANUSKA-SUSITNA
BOROUGH, AK

DESIGN TYPE:
50M XHD MET TOWER
STANDARD FOOTPRINT

SHEET TITLE:
LMS 107

SHEET NO.
6 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S015N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448013.17, 827380.568	**NE:**	457587.577, 827251.266
SW:	447868.883, 817726.177	**SE:**	457469.991, 817596.635

Township Gracticule:

	Radians	DMS
S Latitude:	1.0705779481540059	61 20 22.55305 N
E Longitude:	-2.631862575612033	150 47 40.62423 W
N Latitude:	1.0720902342723964	61 25 34.48445 N
W Longitude:	-2.6349935005514356	150 58 26.42385 W

BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

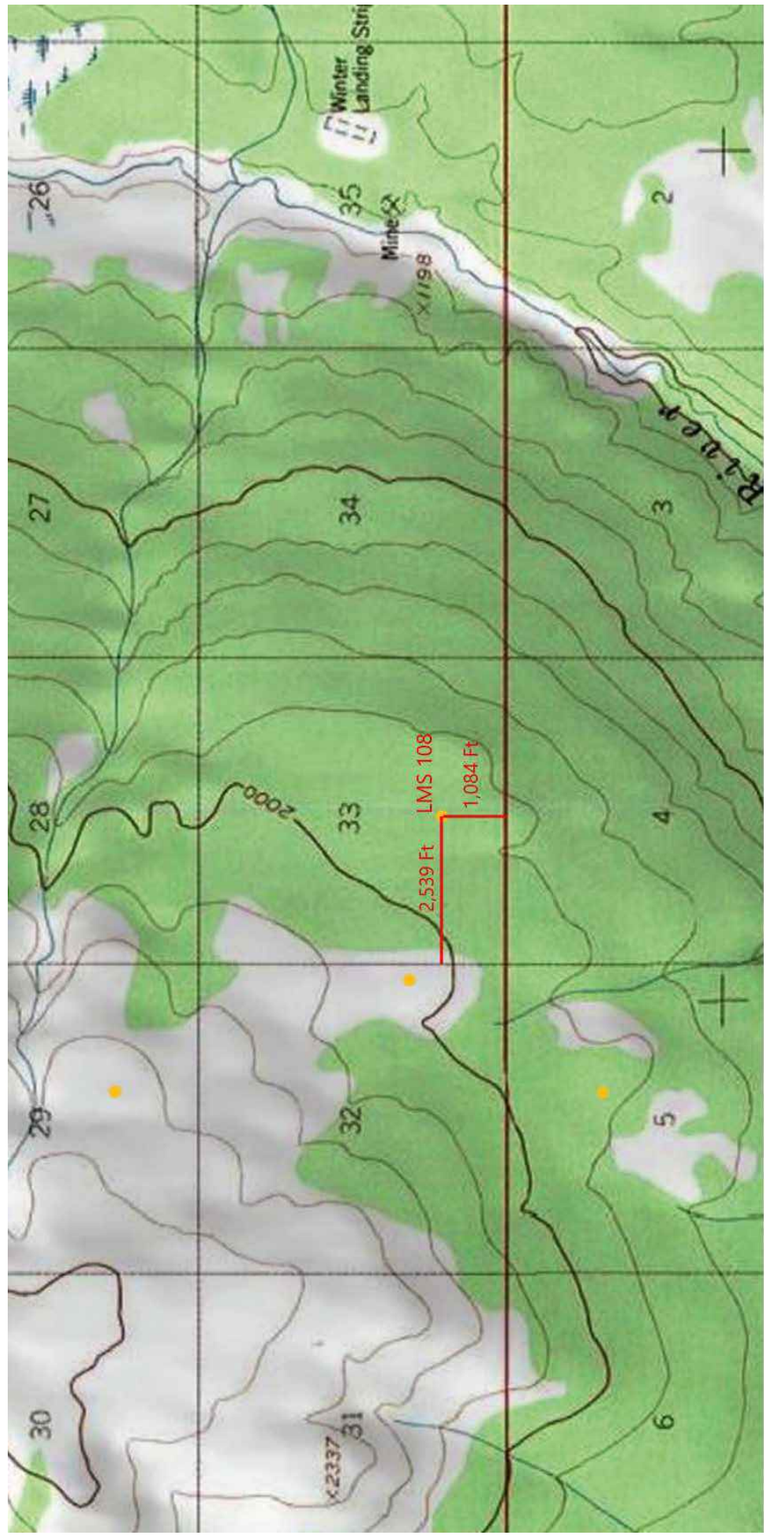
NW ITM Name:	TYONEK B-3	**NE ITM Name:**	TYONEK B-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:16 PM)

LMS 108 TOWNSHIP DATA



LMS 108 SETBACK DISTANCES TO SECTION LINES
SCALE: N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	50M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
50M XHD MET TOWER
MATANUSKA-SUSITNA BOROUGH, AK

DESIGN TYPE:
50M XHD MET TOWER STANDARD FOOTPRINT

SHEET TITLE:
LMS 108

SHEET NO.
7 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S016N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448157.576, 837035.014	**NE:**	457705.264, 836905.964
SW:	448013.17, 827380.568	**SE:**	457587.577, 827251.266

Township Gracticule:

	Radians	DMS
S Latitude:	1.0720903097927932	61 25 34.50003 N
E Longitude:	-2.631862563063116	150 47 40.62164 W
N Latitude:	1.0736025881444686	61 30 46.42983 N
W Longitude:	-2.6349934345081767	150 58 26.41023 W

BLM Protraction Diagram: S-13-03
Approved Date: 01/25/1963
Amended Date:

ADL Protraction Diagram: S-13-03
Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

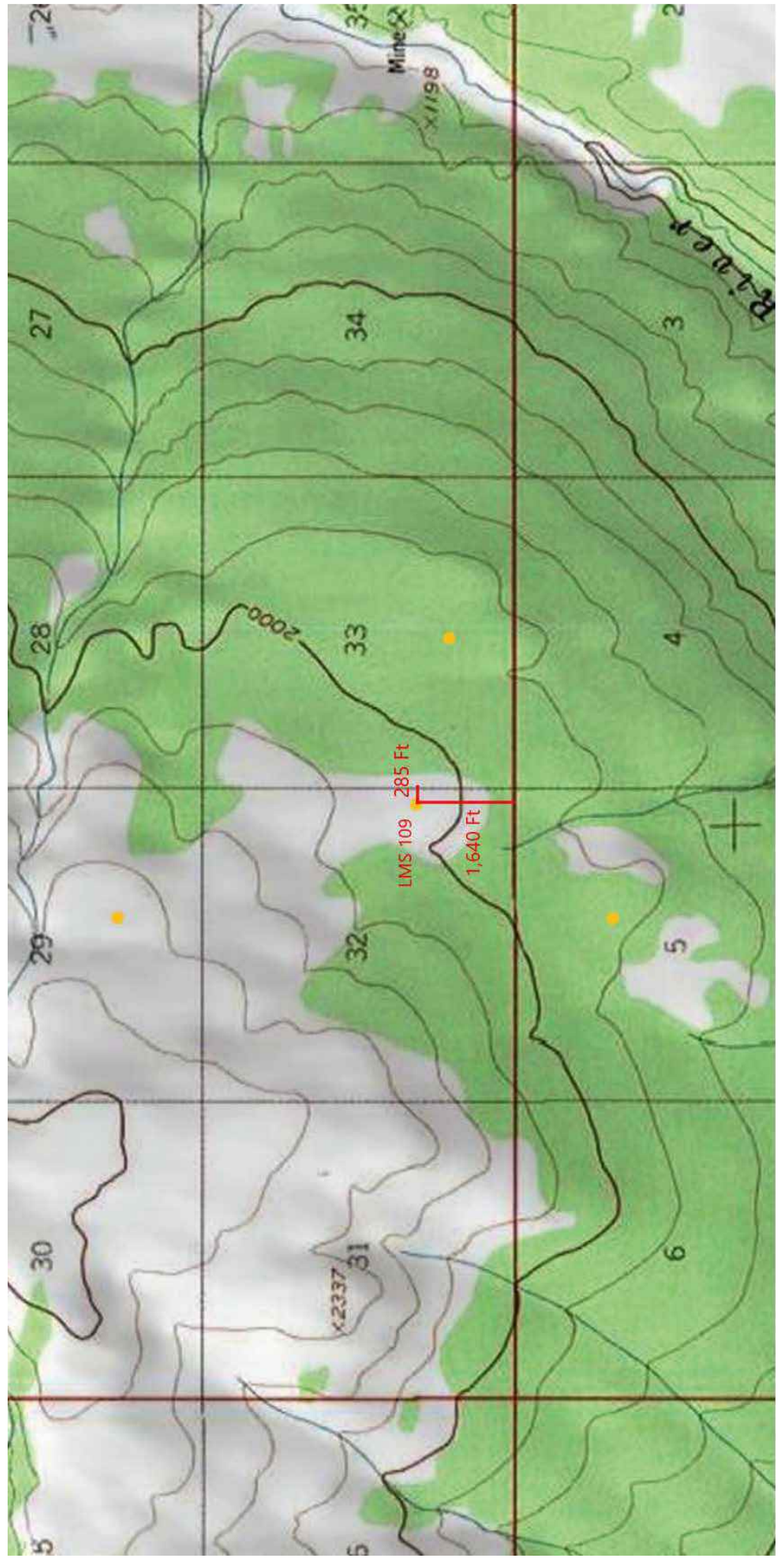
NW ITM Name:	TYONEK C-3	**NE ITM Name:**	TYONEK C-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:17 PM)

LMS 109 TOWNSHIP DATA



LMS 109 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	50M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1	06.26.2024	I.F.C.

STATE OF ALASKA 49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
50M XHD MET TOWER
MATANUSKA-SUSITNA
BOROUGH, AK

DESIGN TYPE:
50M XHD MET TOWER
STANDARD FOOTPRINT

SHEET TITLE:
LMS 109

SHEET NO.
8 OF 9

Township Information

Note: All generated information is based on the NAD83 datum.

Township: S015N009W

State Plane Zone: 4

Township Corners (State Plane Coordinates in Meters):

NW:	448013.17, 827380.568	**NE:**	457587.577, 827251.266
SW:	447868.883, 817726.177	**SE:**	457469.991, 817596.635

Township Gracticule:

	Radians	DMS
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E Longitude:	-2.631862575612033	150 47 40.62423 W
N Latitude:	1.0720902342723964	61 25 34.48445 N
W Longitude:	-2.6349935005514356	150 58 26.42385 W

BLM Protraction Diagram: S-13-03
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Approved Date: 12/29/1960
Amended Date:

USGS Quadrangles:

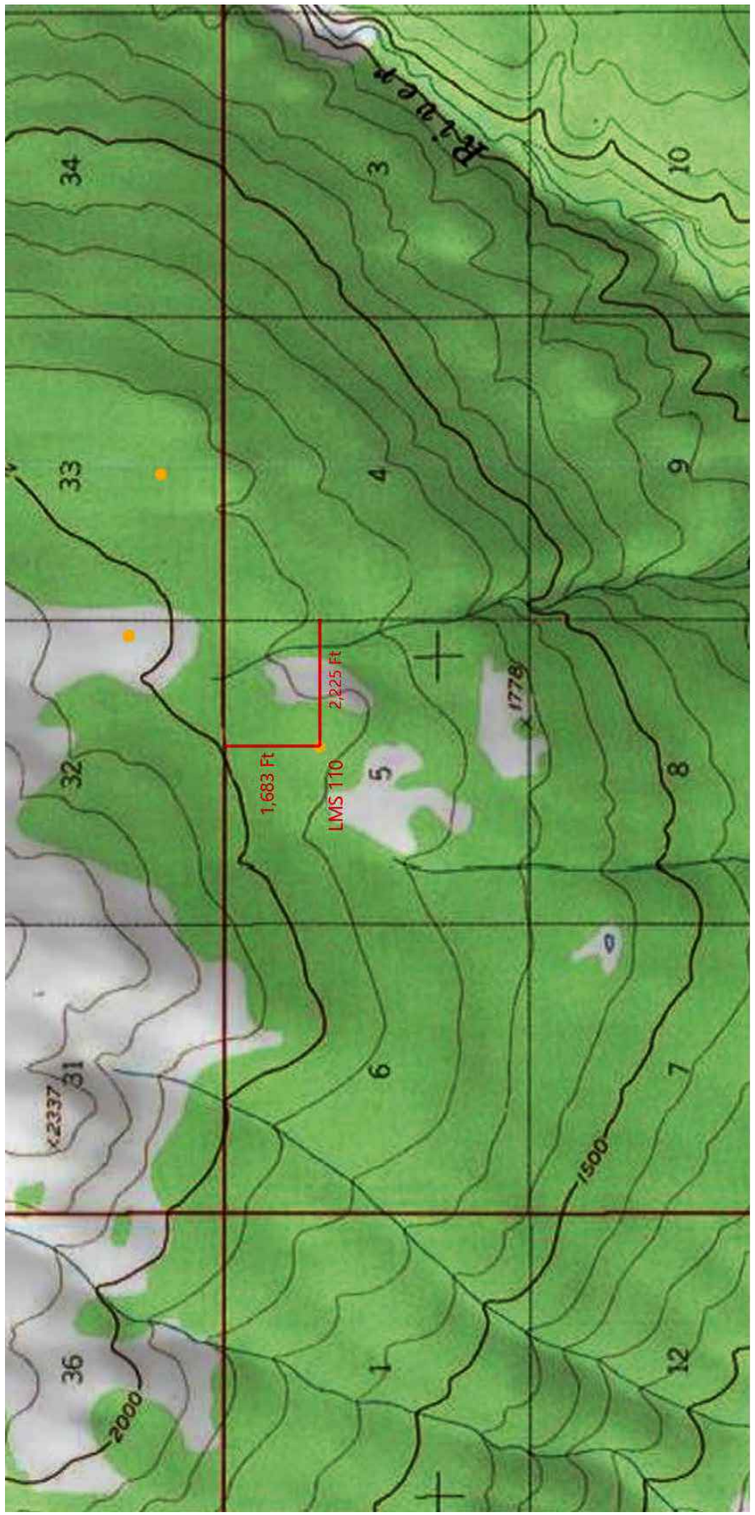
NW ITM Name:	TYONEK B-3	**NE ITM Name:**	TYONEK B-3
SW ITM Name:	TYONEK B-3	**SE ITM Name:**	TYONEK B-3

Recording Districts: ANCHORAGE RECORDING DISTRICT

Boroughs: Matanuska-Susitna Borough

Source: Alaska Department of Natural Resources, Support Services Division, Information Resource Management, GIS Programming Unit, Township Information Generator (Date Generated: June 26, 2024, 2:07 PM)

LMS 110 TOWNSHIP DATA



LMS 110 SETBACK DISTANCES TO SECTION LINES
SCALE : N.T.S.

longroad ENERGY

ALASKARENEWABLES

NewTower Engineering LLC

AHOLA ENGINEERING

A&E PROJECT #:	50M XHD ALASKA
DRAWN BY:	CB
CHECKED BY:	MA

REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3	06.26.2024	I.F.C.

STATE OF ALASKA
49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

SITE ADDRESS:
50M XHD MET TOWER
MATANUSKA-SUSITNA
BOROUGH, AK

DESIGN TYPE:
50M XHD MET TOWER
STANDARD FOOTPRINT

SHEET TITLE:
LMS 110

SHEET NO.
9 OF 9

APPLICATION MATERIAL

MATANUSKA-SUSITNA BOROUGH

Planning and Land Use Department
Development Services Division
350 East Dahlia Avenue • Palmer, AK 99645
Phone (907) 861-7822 • Fax (907) 861-8158
Email: permitcenter@matsugov.us

APPLICATION FOR A TALL STRUCTURE – MSB 17.67

Carefully read instructions and applicable borough code. Fill out forms completely. Attach information as needed. Incomplete applications will not be processed.

Application fee must be attached:
X **$1,500** for **Conditional Use Permit** - > 125 feet in height
_____ **$ 500** for **Administrative Permit** – 85' to 125' in height
_____ **$ 100** for **Network Improvement Permit** – In accordance with MSB 17.67.110.

*Prior to the public hearing, the applicant must also pay the mailing and advertising fees associated with the application. Applicants will be provided with a statement of advertising and mailing charges. Payment must be made **prior** to the application presentation before the Borough Planning Commission or Planning Director decision.*

Subject Property Township: _____, Range: _____, Section: _____, Meridian____
MSB Tax Account # S16N10W13, S16N09W16, S16N09W29, S16N09W33, S16N09W32
SUBDIVISION: STATE OF ALASKA BLOCK(S): _____, LOT(S): S15N09W05
STREET ADDRESS: _____
(US Survey, Aliquot Part, Lat. /Long. etc) _____

Ownership A *written authorization by the owner must be attached for an agent or contact person, if the owner is using one for the application.* Is authorization attached? **x Yes o No o N/A**

Name of Property Owner
State of Alaska, DNR
Address: 550 7th Ave, 900c
Phone: Hm _____ Fax _____
Wk 907-269-5032 Cell _____
E-mail john.forbes@alaska.gov

Name of Agent/ Contact for application
Chad Allen, Little Mount Susitna Wind LLC
Address: 125 High St, 17th Floor High St
Suite 1705. Boston, MA 02110
Phone: Hm _____ Fax _____
Work 207-210-1175 Cell _____
E-mail _____

Special Land Use District *(if applicable)*: N/A

Pre-Application Requirements for New Tall Structures that Require a Conditional Use Permit	
Prior to applying for a conditional use permit for a new tall structure, the applicant shall hold at least one community meeting.	
1. The meeting shall be held at the nearest facility where community council meetings are regularly scheduled. If the facility is not available, the nearest available public facility that is capable of seating a minimum of 20 people shall be utilized.	
2. The meeting shall be held at least 15 calendar days after mailing of the notification.	
3. The meeting shall not start prior to 5:00 p.m. and no later than 7:00 p.m.	
4. Notification of the meeting shall, at a minimum, include the following: • Legal description and map of the general parcel, or parcels, within the coverage area under consideration for the telecommunication facility. • Description of the proposed development including height, design, lighting, potential access to the site and proposed service. • Date, time, and location of the informational meeting. • Contact name, telephone number, and address of applicant. • Comment form created by the borough that has a comment submittal deadline and provides options for submitting comments.	
5. At a minimum, the notification area for the meeting shall include the following: • Property owners within one-half mile of the parcels under consideration for the proposed tall structure. • The nearest community council and any community council whose boundary is within 1200 feet of the parcels under consideration for the tall structure.	
A written report summarizing the results of the community meeting shall be prepared that includes the following information:	**Attached**
1. Dates and locations of all meetings where citizens were invited to discuss the potential applicant's proposal.	X
2. Content, dates mailed, and numbers of mailings, including letters, meeting notices, newsletters and other publications.	X
3. Sign-in sheet(s) used at the meeting, that includes places for names, address, phone numbers and other contact information such as e-mail addresses.	X
4. A list of residents, property owners, and interested parties who have requested in writing that they keep informed of the proposed development through notices, newsletters, or other written materials.	X
5. The number of people who attended meetings.	X
6. Copies of written comments received at the meeting.	X
7. A certificate of mailing identifying all who were notified of the meeting.	X
8. A written summary that addresses the following: • The substance of the public's written concerns, issues, and problems. • How the applicant has addressed, or intends to address, concerns, issues and problems expressed during the process. • Concerns issues, and problems the applicant has not addressed or does not intend to address and why.	X

General application requirements for <u>Administrative</u> and <u>Conditional Use Permits</u>	**Attached**
1. Design drawings for the proposed tall structure, drawn to scale, and certified by a registered engineer or architect.	X
2. Citizen participation report *(if applying for a Conditional Use Permit)*	X
3. Certified site plan *(As defined in MSB 17.125.010)*	X
4. Copy of a determination of no hazard to air navigation from the Federal Aviation Administration.	X
5. If breakpoint technology is intended to be utilized, a written statement specifying the height at which the engineered structural weakness will be located.	No breakpoint

In order to grant a <u>Conditional Use Permit</u> or <u>Administrative Permit</u> the Planning Commission or Planning Director must find that each of the following criteria has been met. Explain the following in detail:	**Attached**
1. To the extent that is technically feasible and potentially available, the location of the tall structure is such that its negative effects on the visual and scenic resources of all surrounding properties have been minimized.	X
2. Visibility of the tall structure from public parks, trails recognized within adopted MSB plans, and waterbodies has been minimized to the extent that is technically feasible and potentially available.	X
3. The tall structure will not interfere with the approaches to any existing airport or airfield that are identified in the MSB Regional Aviation System Plan or by the Alaska State Aviation System Plan.	X
4. That granting the permit will not be harmful to the public health, safety, convenience, and welfare.	X

Application requirements for a <u>Network Improvement Permit</u>	**Attached**
1. A description of the proposed modifications to the telecommunication tower, including a description of the height, type, and lighting of the new or modified structure and the existing structure.	N/A
2. A certified site *(as defined in MSB 17.125.010)* for purposes of setback verification.	N/A
3. Design drawings for the proposed modified or new structure, drawn to scale, and certified by a registered engineer or architect.	N/A

In order to grant a <u>Network Improvement Permit</u> the Planning Director must find that each of the following criteria has been met. Explain the following in detail.	**Attached**
1. The proposed development conforms to setback requirements of MSB 17.55.	N/A
2. The telecommunication tower being extended was lawfully constructed at the time of application for a Network Improvement Permit.	N/A
3. The proposed modification does not violate permit conditions of any valid permits that have been issued to the existing facility, provided that the condition being violated does not limit height of the structure.	N/A

Operation Standards for New Tall Structures – Conditional Use Permit, Administrative Permit, and Network Improvement Permit	**Attached**
1. The equipment compound shall meet minimum setback distances from all property lines in accordance with MSB 17.55	X
2. Setbacks shall be determined from the dimensions of the entire lot, even though the tower may be located on lease areas within the lot.	X
3. Adequate vehicle parking shall be provided on the subject property, outside of public use easements and rights-of-way to enable emergency vehicle access. No more than two spaces per provider shall be required.	X
4. Information signs for the purpose of identifying the tower such as the antenna structure registration number required by the Federal Communications Commission, as well as the party responsible for the operation and maintenance of the facility shall be visibly posted at the equipment compound.	X
5. If more than 220 volts are necessary for the operation of the facility, warning signs shall be located at the base of the facility and shall display in large, bold, high contrast letters the following: "HIGH VOLTAGE – DANGER".	N/A
6. A 24-hour emergency contact number shall be visibly posted at the equipment compound.	X
7. A fence or wall not less than six (6) feet in height with a secured gate shall be maintained around the base of the tower.	N/A

Additional Standards for <u>Wind Energy Conversion Systems</u> (WECS) – In addition to the operations standards for new tall structures, the following standards shall apply to WECS	**Attached**
1. WECS shall be equipped with an automatic overspeed control device designed to protect the system form sustaining structural failure such as splintered or thrown blades and the overturning or breaking of towers due to an uncontrolled condition brought on by high winds.	N/A
2. WECS shall have a manually operable method that assures the WECS can be brought to a safe condition in high winds. Acceptable methods include mechanical or hydraulic brakes or tailvane deflection systems which turn the rotor out of the wind.	N/A

OWNER'S STATEMENT: I am owner of the following property:

MSB Tax parcel ID #(s) _____ and,
I hereby apply for approval conditional use permit on that property as described in this application.

I understand all activity must be conducted in compliance with all applicable standards of MSB _____ and with all other applicable borough, state or federal laws.

I understand that other rules such as local, state and federal regulations, covenants, plat notes, and deed restrictions may be applicable and other permits or authorization may be required. I understand that the borough may also impose conditions and safeguards designed to protect the public's health, safety and welfare and ensure the compatibility of the use with other adjacent uses.

I understand that it is my responsibility to identify and comply with all applicable rules and conditions, covenants, plat notes, and deed restrictions, including changes that may occur in such requirements.

I understand that this permit and zoning status may transfer to subsequent owners of this land and that it is my responsibility to disclose the requirements of this status to the buyer when I sell the land.

I understand that changes from the approved conditional use permit may require further authorization by the Borough Planning Commission. I understand that failure to provide applicable documentation of compliance with approved requirements, or violation of such requirements will nullify legal status, and may result in penalties.

I grant permission for borough staff members to enter onto the property as needed to process this application and monitor compliance. Such access will at a minimum, be allowed when the activity is occurring and, with prior notice, at other times necessary to monitor compliance.

The information submitted in this application is accurate and complete to the best of my knowledge.

Signature: Property Owner	Printed Name	Date
Michael U. Alvarez	Michael U. Alvarez	7/24/2024
Signature: Agent	Printed Name	Date

MSB USE ONLY

Date application submitted:

Date application determined complete: _____

PERMIT CENTER – FEE RECEIPT FORM

Property Location: SOA Locations (DNR) Applicant: Little Mount Susitna Wind LLC

61.473061N, 150.988809W - 61.476704N, 150.895905W - 61.444640N, 150.927867W
61.429372N, 150.900878W
61.430890N, 150.916978W
61.421817N, 150.928003W

	USE PERMITS (100.000.000.341.300)	Fee
	8.35 Public Display of Fireworks	**$25.00**
	8.40.010 Liquor License - Alcohol & Marijuana Control Office (AMCO) Referrals for Matanuska Susitna Borough Review of Issuance, renewal or transfer (location, owner)	**$100.00**
	8.40.060 Liquor License Relocation	**$500.00**
	8.41.010 Marijuana License - Alcohol & Marijuana Control Office (AMCO) Referrals for Matanuska Susitna Borough Review of Issuance, renewal or transfer (location, owner)	**$100.00**
	8.52 Temporary Noise Permit	**$1000.00**
	8.55 Special Events Permit 500 – 1000 Attendees 1000+ Attendees **8.55** Special Events Permit Site Monitor Fee / Per Day	 **$500.00** **$1,000.00** **$300.00**
	17.02 Mandatory Land Use Permits Commercial	 **$50.00**
	17.04 Nancy Lake Special Land Use District CUP	**$1,500.00**
	17.06 Electrical Generating & Delivery Facility Application	**$500.00**
	17.08 Hay Flats Special Land Use District Exception Application	**$1000.00**
	17.17 Denali State Park Conditional Use Permit	**$1500.00**
	17.18 Chickaloon Special Land Use District CUP	**$1500.00**
	17.19 Glacier View Special Land Use District CUP	**$1500.00**
	17.23 Port MacKenzie Development Permit	**$1000.00**
	17.25 Talkeetna Special Land Use CUP	**$1500.00**
	17.25 Talkeetna Conditional Use Permit – Variance	**$1500.00**
	17.27 Sutton Special Land Use District CUP	**$1500.00**
	17.29 Flood Damage Prevention Development Permit	**$100.00**
	17.29 Flood Damage Prevention Development Permit –Variance	**$500.00**
	17.30.040 Earth Materials Extraction Admin. Permit	**$1000.00**
	17.30.050 Earth Materials Extraction CUP	**$1500.00**
	17.36 Residential Planned Unit Development Application – Concept Plan – up to 50 Lots Additional Lots or tracts being created – Per Lot	 **$500.00** **$100.00**
	17.48 Mobile Home Park Application	**$500.00**
	17.52 Residential Land Use District App (Rezone)	**$1,000.00**
	17.52 Residential Land Use District CUP	**$1,500.00**
	17.55 Shoreline Setback Exception Application	**$300.00**
	17.60 Conditional Use Permit Application	**$1500.00**
	17.60 Transfer of Junkyard CUP	**$500.00**

	17.61 Commercial/Industrial Core Area Conditional Use Permit	**$1500.00**
	17.62 Coal Bed Methane Conditional Use Permits	**$1500.00**
	17.63 Racetracks Conditional Use Permit	**$1500.00**
	17.64 Waste Incinerator Conditional Use Permit	
	17.65 Variance	**$1500.00**
X	**17.67** Tall Structures - Network Improvement Permit Nonconforming Use Administrative Permit Conditional Use Permit	**$100.00** **$200.00** **$500.00** **$1500.00**
	17.70 Regulation of Alcoholic Beverage Conditional Use Permit	**$1500.00**
	17.73 Multi-Family Land Use Permit – add $25.00 for each additional unit beyond 5 units.	**$500.00**
	17.75 Single-Family Residential Land Use District CUP	**$1500.00**
	17.76 Large Lot Single-Family Residential Land Use District	**$1500.00**
	17.80 Nonconforming Structures (Amnesty) Pre-Existing Legal Nonconforming (Grandfather)	**$300.00** **$300.00**
	17.90 Regulation of Adult Businesses – Conditional Use Permit	**$1500.00**

	RIGHT-OF-WAY FEES:	
	Driveway	**$50.00**
☐	Driveway Deposit {100.226.100}	**$150.00**
	Construction	**$200.00**
	Utility (Application Fee = $100 ~ Distance Fee $0.25/per lineal foot)	
	Encroachment	**$150.00**
	Construction Bond {100.227.000}	

	PLATTING PRE-APPLICATION CONFERENCE:	
	Pre-Application Fee	**$50.00**

	FEES:	
	Flood Plain Development Survey CD	**$10.00**
	CD/DVD/DVD-R	**$7.50**
	Construction Manual/Title 43	**$5.00**
	Plat Map/Tax Map Copies/Mylar	**$5.00**
	Color Maps	**$12.00**
	Xerox Copies (B/W = $0.25 ~ Color $1.00/page 11X17 Color $1.75/page)	
	Advertising Fees	
	Cultural Resources Books or Maps	
☐	Citation Payment (If sent to collections – use total due from Courtview)	
	Thumb Drive 8GB = $10; 16GB = $15; 32GB = $20	

$ 1,500.00 **Amount Paid** **Date:** 8/7/2024 **Receipt #** 0202753 **By:** [illegible]

check #001501

Revised: 11/28/23

Matanuska Susitna Borough

Payment Date Friday, August 9, 2024
Deposit Number 54394
Operator thom1274

Real 2024 (Total) $0.00
MCR (Planning/Platting) $1,500.00
Misc Rec
Tax Map # 2MISC

Total Paid $1,500.00
Check $1,500.00
Change $0.00

Receipt Number msb92022538
8/9/2024 10:19:09 AM
Paid By LONGROAD DEVELOPMENT CO
Cashier Id. thom1274

From: Faith Tyson
To: Rick Benedict
Cc: Matthew Perkins; Andrew McDonnell; Jeff Armbruster; Chad Allen
Subject: Re: LMSW - Tall Tower CUP Application & Materials
Date: Tuesday, August 27, 2024 11:17:23 AM
Attachments: CUP Nearest Trail.png
20240701_NRG 60m Super XHD Std Footprint Met Towers_LMS 105 thru LMS 110_Alaska Drawings_S&S_070124_noparking.pdf
20240701_NRG 50m XHD Std Footprint Met Towers_LMS 105 thru LMS 110_Alaska Drawings_S&S_070124_noparking.pdf

---

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
Hi Rick,

Thanks for getting this over! Please find the responses below.

1. MSB 17.67.080(B)(2) requires the commission to consider whether the proposed towers will
be visible from public parks.
a. The application does not identify the nearest public park to the proposed towers, and/or whether any of the proposed towers will be visible from that park. Provide a narrative clarifying this subject.
Given the remote locations, the proposed towers are not expected to be visible from any Matanuska Susitna Borough public park (all more than 30 miles away). The nearest "trail" is on Mount Susitna, at a distance of 4.7 miles from the nearest proposed tower (see attached map). The towers may be marginally visible from these distances in weather and lighting conditions that offer excellent visibility, but given their small diameter and the distances involved, it is unlikely that a casual observer will notice them on the landscape.

2. MSB 17.67.090(B)(1) requires a minimum of two parking spaces for emergency vehicle access.
a. Two parking spaces are reflected on the provided site plans; however, the application narrative indicates that no parking will be provided due to the remoteness of the locations.
b. Remove the proposed parking spaces from the site plans and provide a narrative addressing how emergency vehicles and personnel can access the site.
The parking spaces have been removed, and updated site plans are attached. If emergency personnel are required on the tower sites, the sites can be accessed by helicopter. Landing sites are readily available on the open tundra adjacent to all towers. On-site personnel will be trained to direct emergency helicopters to an appropriate landing spot.

3. Provide a narrative detailing the timeline for the erection of each of the six proposed towers.
a. Explain whether the locations identified in the application are final or approximate.
b. If approximate, describe the maximum distance from each proposed tower location. It may help to provide a map identifying the radius of the area of consideration that will not exceed for the installation of each of the six proposed towers.

Under this permit, we plan to install up to six towers in total, with up to two of those installed in 2024, and any remaining towers in 2025. This schedule is approximate and may be subject to changes based on operational needs.

Tower Locations: The tower sites are approximate and will be finalized when taking into account ground conditions during the installation process. The towers may be sited anywhere within

their respective PLSS section boundaries, while respecting a one tower- height setback from the PLSS section boundaries. Visuals of the intended locations and the surrounding section boundaries within which the tower will be located are displayed in the engineer's site plans.

4. MSB 17.67.050(B) requires specific criteria be described in a written report in the application
submittal to summarize the results of the community meeting:
a. Summarize the public notification content, dates mailed, and numbers of mailings, including letters, meeting notices, newsletters, and other publications.
b. A list of residents, property owners, and interested parties who have requested in writing that they be kept informed of the proposed development through notices, newsletters, or other written materials.
c. A written summary that addresses the following:
i. The substance of the public's written concerns, issues, and problems.
ii. How the applicant has addressed, or intends to address, concerns, issues, and problems expressed during the process; and
iii. Concerns, issues, and problems
In the dropbox folder that was originally submitted, there is a subfolder titled Community Meeting Materials—the specific criteria of MSB 17.67.050(B) are addressed in the report.

If more questions arise, please feel free to reach out. Thank you!

/ft

On Thu, Aug 22, 2024 at 6:01 PM Rick Benedict <Rick.Benedict@matsugov.us> wrote:

> Good afternoon all,
>
> I have attached a request for additional information for you. If you have any questions, please contact me.
>
> Respectfully,
>
> Rick Benedict – Current Planner
>
> Development Services Division
>
> Matanuska-Susitna Borough
>
> (907)861-8527 direct

From: Faith Tyson <faith@alaskarenewables.com>
Sent: Wednesday, August 7, 2024 9:54 AM
To: Rick Benedict <Rick.Benedict@matsugov.us>
Cc: Peggy Horton <Peggy.Horton@matsugov.us>; Chad Allen <chad.allen@longroadenergy.com>; Andrew McDonnell <andrew@alaskarenewables.com>; Jeff Armbruster <jeff.armbruster@longroadenergy.com>; Matthew Perkins <matt@alaskarenewables.com>
Subject: Re: LMSW - Tall Tower CUP Application & Materials

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]

Goodmorning Rick, happy Wednesday!

I wanted to reach out to you and let you know that the check was mailed from the PNW last Friday. The check number is 1501, and it is from Longroad Development Company. Could you confirm that you've received it?

Additionally, I wanted to follow up and see if you would be interested in meeting to review the application in depth with us. If so, please send some dates and times that work for you in the next week or so.

Talk soon!

/ft

On Tue, Jul 30, 2024 at 10:52 AM Faith Tyson <faith@alaskarenewables.com> wrote:

> Hi Rick!
>
> Happy Tuesday. The application was paid by check - the purchase order was just approved, so the check will be mailed on Thursday!

Best,

Faith

/ft

On Mon, Jul 29, 2024 at 12:49 PM Rick Benedict <Rick.Benedict@matsugov.us> wrote:

Hello Faith,

How was the application fee paid? I don't see a payment in our transaction history for online payments. If paid through the Borough's online portal, do you know who made the payment, the date, and the amount? I will conduct another search once I have more information.

Respectfully,

Rick Benedict – Current Planner

Development Services Division

Matanuska-Susitna Borough

(907)861-8527 direct

From: Faith Tyson <faith@alaskarenewables.com>
Sent: Thursday, July 25, 2024 1:54 PM
To: Peggy Horton <Peggy.Horton@matsugov.us>; Rick Benedict <Rick.Benedict@matsugov.us>
Cc: Chad Allen <chad.allen@longroadenergy.com>; Andrew McDonnell <andrew@alaskarenewables.com>; Jeff Armbruster <jeff.armbruster@longroadenergy.com>; Matthew Perkins <matt@alaskarenewables.com>
Subject: LMSW - Tall Tower CUP Application & Materials

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]

Dear Peggy & Rick,

I am writing you to officially submit a Tall Tower CUP application on behalf of Little Mount Susitna Wind LLC. Due to the size of files, I have compiled all documents in a dropbox link for download. The application fee was processed on our end as of yesterday. Please reach out with any questions or concerns. We are looking forward to working with you all!

Best,

Faith Tyson (she/they)

Community Engagement and Accountability Manager

Alaska Renewables LLC

[c] +1-907-202-0507 [e] faith@alaskarenewables.com

Alaska Renewables LLC occupies the ancestral, traditional, and contemporary lands of Alaska Native people that have resided, occupied, and called this land home. I recognize the historic Indigenous individuals and communities who live here now and those who were forcibly removed from their homes. In offering this land acknowledgement, I affirm Indigenous sovereignty, history and experiences.

Conditional Use Permit Request for Remote Meteorological Towers on Little Mount Susitna

Little Mount Susitna Wind LLC

Little Mount Susitna Wind LLC seeks a Conditional Use Permit for up to six temporary meteorological tower installations at sites on a remote plateau (Little Mount Susitna) in the far southwest corner of the Matanuska Susitna Borough. The purpose of these installations is to allow for the quantitative assessment of the wind resources in order to enable the development of a future utility-scale wind energy generation project that would provide reliable, low-cost renewable energy to Southcentral Alaska.

Proposed Locations:

Site Name	Lat/Lon (WGS84)	Elevation (ft)	MTRS
LMS_Met_5	61.473061N, 150.988809W	2466	S016N010W13
LMS_Met_6	61.476704N, 150.895905W	2200	S016N009W16
LMS_Met_7	61.444640N, 150.927867W	2339	S016N009W29
LMS_Met_8	61.429372N, 150.900878W	1934	S016N009W33
LMS_Met_9	61.430890N, 150.916978W	2037	S016N009W32
LMS_Met_10	61.421817N, 150.928003W	1903	S015N009W05

The meteorological towers will each consist of a Super 60m XHD TallTower manufactured by NRG Systems consisting of 8-10 inch diameter tube sections and six levels of supporting guy wires. The tower has FAA-compliant industrial paint, guy guards, and marker balls. Because it is below the 200 ft height requirement for FAA lighting, the tower does not have a light on it. This tower model is designed for the wind resource assessment industry and is engineered specifically for harsh climates like Alaska with wind and ice load limits that meet the ANSI/TIA-222-G Standard.

Little Mount Susitna Wind LLC has engaged a number of experts including NRG Systems (tower manufacturer), RESPEC (engineering feasibility and design), Northern Geotechnical Engineering (anchoring geotechnical assessment), Alaska Line Builders (anchor and tower installation), V3 Energy LLC and Lou Bowers (meteorological consultants), and KB Energy (qualified NRG Super-60 installer), as well as a number of Mat-Su based helicopter operators including Heli Alaska, Soloy, Pollux, and Northern Pioneer in order to ensure a safe, well-designed, and reliable meteorological tower installation at this challenging and remote location.

A stamped engineering analysis and report is attached, along with the required site plans, all stamped by an engineer authorized to do so in Alaska.

The tower sites are located on lands managed by the State of Alaska. The tower installations were permitted by the Department of Natural Resources under LAS 34057.

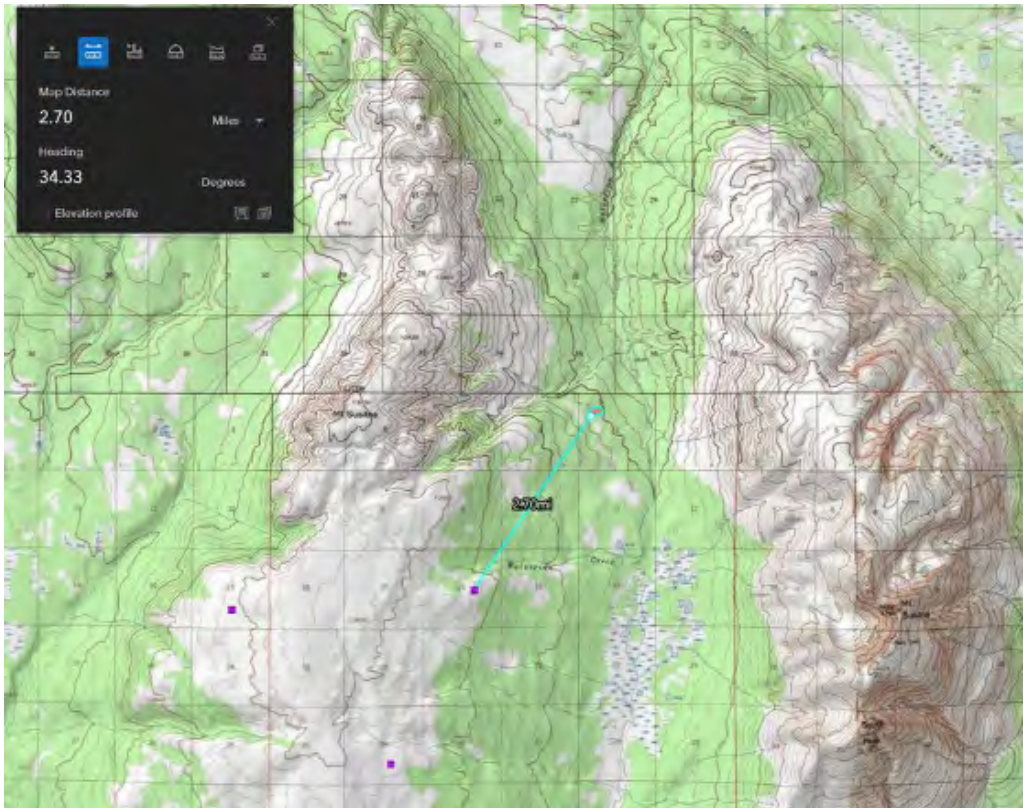
The Conditional Use Permit for Tall Towers requires a pre-application community meeting to be held at the facility where community council meetings are held. Notifications for the meeting are required to be delivered to property owners within one-half mile of the tower site and the nearest community council and any community council whose boundary is within 1200 feet of the tower site. The tower sites are over 2.75 miles from the nearest private parcel, and 19 miles from the nearest active community council (Willow) boundary. Using the contact information provided by MSB, we notified the nearest land owners.

The community meeting was held on June 3rd, 2024 at 5:30 pm. The gathering took place at the Willow Area Community Center, located at 69 Parks Highway, Willow, AK 99688. The written report is attached.

Responses to Specific Criteria:

1. To the extent that is technically feasible and potentially available, the location of the tall structures is such that its negative effects on the visual and scenic resources of all surrounding properties have been minimized.

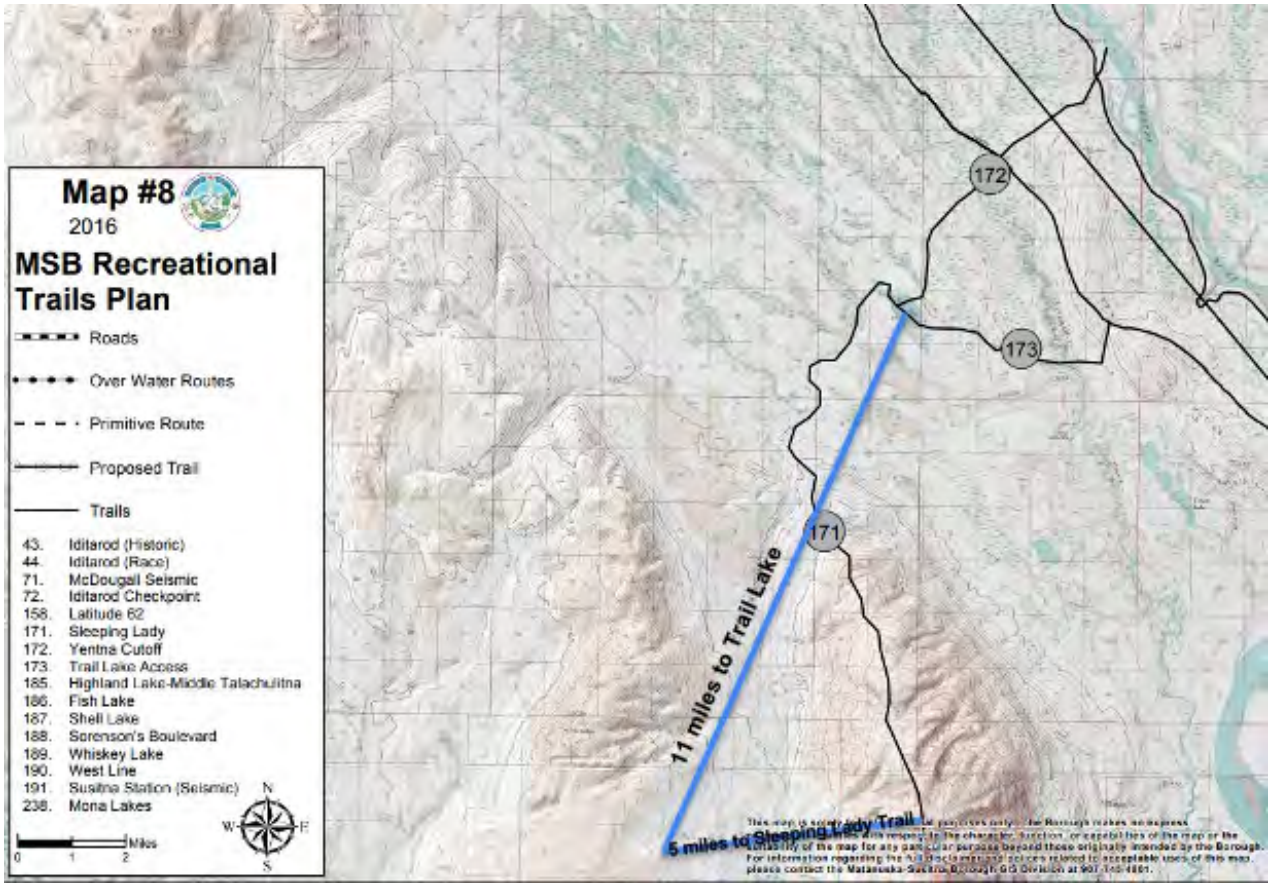
The towers are not expected to have any significant visual impacts for surrounding properties. The nearest property is 2.7 miles away from the northernmost tower site, and is not expected to be visible from this location. One tower may be visible from Trail Lake at a distance of over 11 miles.



2. Visibility of the tall structure from public parks, trails recognized within adopted MSB

plans, and waterbodies has been minimized to the extent that is technically feasible and potentially available.

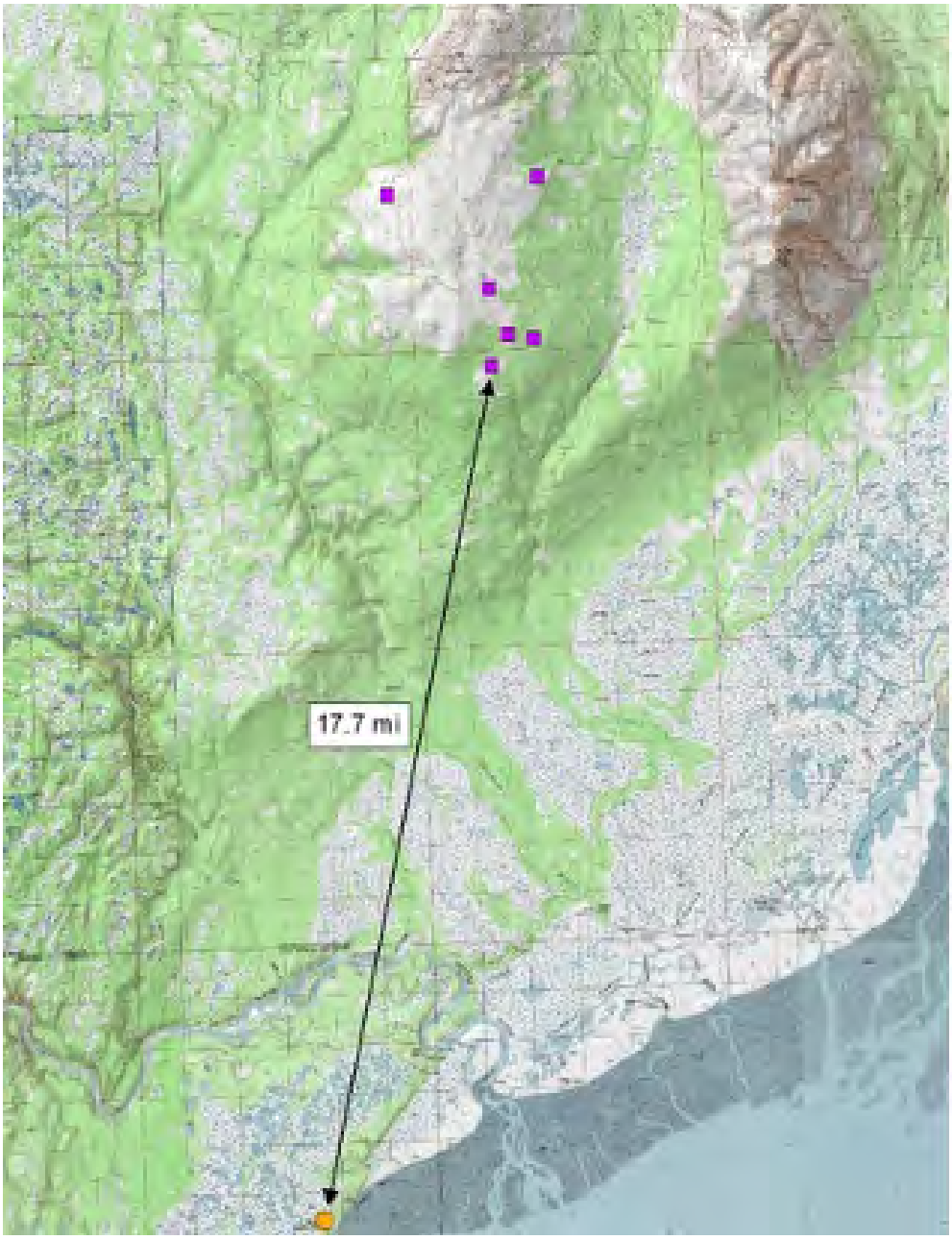
Given that the tower diameter is only 8-10 inches, but does carry high visibility paint and marker balls for aviation safety, the tower is estimated to be visible to casual observers at distances up to approximately 5 miles. Given this, the towers are not expected to have any visual impacts for any public parks, trails, or waterbodies, as there are none within this range of visibility for these remote towers.



Map illustrating the distances of 5 miles and 11 miles from the northernmost tower location to the nearest trail (Sleeping Lady and named lake (Trail Lake), respectively.

3. The tall structure will not interfere with the approaches to any existing airport or airfield that are identified in the MSB Regional Aviation System Plan or by the Alaska State Aviation System Plan.

There are no nearby airfields and the tower installations are outside of the study area for the MSB Regional Aviation System Plan. The tower sites and specifications were evaluated with the FAA Notice Criteria Tool which found that the structure does not exceed notice criteria.



The nearest airport is the Beluga, 17.77 miles away from the nearest proposed meteorological tower.

4. That granting the permit will not be harmful to the public health, safety, convenience, and welfare.

Given the remote nature of the towers, very few members of the public will even be aware that the towers exist. They will not be harmful to public health, safety, convenience or welfare, especially given their remote nature. The most relevant impact is for remote bush pilots that will have to avoid the tower if navigating in the area of Little Mount Susitna. For these purposes, the

tower and its guy wires have been marked with FAA compliant paint, guy guards, and marker balls.

At the base of the towers there will be a power supply shelter that will hold power supply electronics (PV modules, batteries, methanol or propane fuel cell, and data logger box) that will be fenced and locked with a padlock. Contact information markings will be added to the power supply shelter and tower.

No parking will be provided due to the remote nature of the locations.

Attached are other supporting documents such as the DNR Land Use Permit, Written Community Meeting Report, Site Drawings, Maps, and others.

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Natural Resources
DIVISION OF MINING, LAND & WATER
Southcentral Regional Land Office
550 W. 7th Ave., Suite 900C
Anchorage, Alaska 99501-3577
Main: (907) 269-8503
TTY: 711 or 880.770.8973
Fax: (907) 269-8913

LAND USE PERMIT
AS 38.05.850

PERMIT # LAS 34057

Little Mount Susitna Wind LLC herein known as the Grantee, is issued this permit from the Department of Natural Resources, herein known as the Grantor, authorizing the use of state land within:

Legal Description:

- LMS_101: Section 19, Township 16 North, Range 9 West, Seward Meridian 61.4639N, 150.9664W
- LMS_102: Section 8, Township 16 North, Range 9 West, Seward Meridian 61.4863N, 150.9399W
- LMS_103: Section 32, Township 17 North, Range 9 West, Seward Meridian 61.5134N, 150.9352W
- LMS_104: Section 25, Township 16 North, Range 10 West, Seward Meridian 61.4434N, 150.9928W
- LMS_105: Section 13, Township 16 North, Range 10 West, Seward Meridian 61.473061N, 150.988809W
- LMS_106: Section 16, Township 16 North, Range 9 West, Seward Meridian 61.476704N, 150.895905W
- LMS_107: Section 29, Township 16 North, Range 9 West, Seward Meridian 61.444640N, 150.927867W
- LMS_108: Section 33, Township 16 North, Range 9 West, Seward Meridian 61.429372N, 150.900878W
- LMS_109: Section 32, Township 16 North, Range 9 West, Seward Meridian 61.430890N, 150.916978W
- LMS_110: Section 5, Township 15 North, Range 9 West, Seward Meridian 61.421817N, 150.928003W

This permit is issued for the purpose of authorizing the following:

The temporary placement of up to ten meteorological towers (met towers) on state lands atop Little Mount Susitna to gather meteorological data and on-site wind conditions. Each tower is between 60 - 80 meters in height and is supported by three sets of guy wires at different intervals. Each tower and co-located LIDAR unit requires a footprint of up to five acres. Brush clearing will be kept to a minimum, but would not exceed five acres at each site.

This permit is for the term beginning **June 15, 2022** and ending **June 14, 2027** unless sooner terminated at the state's discretion, effective the date of signature by the Authorized State Representative. This permit does not convey an interest in state land and as such is revocable, with or without cause. The Grantor will give 30 days' notice before revoking a permit at will. A revocation for cause is effective immediately. No preference right for use or conveyance of the land is granted or implied by this authorization.

This permit is issued subject to the following:

- Remittance of a performance guaranty in the amount of $5,000.00 as required in the stipulations below.
- Proof of insurance as described in stipulations below.
- Payment of the annual use fee in the amount of $1,560.00 per each 5-acre met-tower site, due on or before the annual anniversary date and any additional fees identified in the stipulations below.

The non-receipt of a courtesy billing notice does not relieve the Grantee from the responsibility of paying fees on or before the due date.

All activities shall be conducted in accordance with the following stipulations:

1. **Authorized Officer:** The Authorized Officer (AO) for the State of Alaska (State), Department of Natural Resources (DNR), Division of Mining, Land and Water (DMLW), is the Regional Manager or designee.

2. **Change of Contact Information:** The Grantee shall maintain current contact information with the AO. Any change of contact information must be submitted in writing to the AO.

3. **Valid Existing Rights:** This authorization is subject to all valid existing rights and reservations in and to the authorized area. The State makes no representations or warranties, whatsoever, either expressed or implied, as to the existence, number, or nature of such valid existing rights.

4. **Preference Right:** No preference right for subsequent authorizations is granted or implied by this authorization.

5. **Inspections:** The AO shall have reasonable access to the authorized area for inspection, which may be conducted without prior notice. If the Grantee is found to be in noncompliance the authorized area may be subject to reinspection. The Grantee may be charged for actual expenses of any inspection.

6. **Public Access:** The construction, operation, use, and maintenance of the authorized area shall not interfere with public use of roads, trails, waters, landing areas, and public access easements. The ability to use or access state land or public waters may not be restricted in any manner. However, if a specific activity poses a safety concern, the AO may allow the restriction of public access for a specific period of time. The Grantee is required to contact the AO in advance for approval. No restriction is allowed unless specifically authorized in writing by the AO.

7. **Public Trust Doctrine:** This authorization is subject to the principles of the Public Trust Doctrine regarding navigable or public waters which guarantees public access to, and the public right to use, navigable and public waters and the land beneath them for navigation, commerce, fishing, and other purposes. The AO reserves the right to grant other interests consistent with the Public Trust Doctrine.

8. **Alaska Historic Preservation Act:** The Alaska Historic Preservation Act, AS 41.35.200, prohibits the appropriation, excavation, removal, injury, or destruction of any state owned historic, prehistoric, archaeological or paleontological site without written approval from the DNR Commissioner. Should any sites be discovered, the Grantee shall cease any activities that may cause damage and immediately contact the AO and the Office of History and Archaeology in the Division of Parks and Recreation.

9. **Compliance with Government Requirements:** The Grantee shall, at its expense, comply with all federal, state, and local laws, regulations, and ordinances directly or indirectly related to this authorization. The Grantee shall ensure compliance by its employees, agents, contractors, subcontractors, licensees, or invitees.

10. **Incurred Expenses:** The Grantor shall in no way be held liable for expenses incurred by the Grantee connected with the activities directly or indirectly related to this authorization.

11. **Waiver of Forbearance:** Any failure on the part of the AO to enforce the terms of this authorization, or the waiver of any right under this authorization by the Grantee, unless in writing, shall not discharge or invalidate the authorization of such terms. No forbearance or written waiver affects the right of the AO to enforce any terms in the event of any subsequent violations of terms of this authorization.

12. **Severability Clause:** If any clause or provision of this authorization is, in a final judicial proceeding, determined illegal, invalid, or unenforceable under present or future laws, then the Grantor and the Grantee agree that the remainder of this authorization will not be affected, and in lieu of each clause or provision of this authorization that is illegal, invalid, or unenforceable, there will be added as a part of this authorization a clause or provision as similar in terms to the illegal, invalid, or unenforceable clause or provision as may be possible, legal, valid, and enforceable.

13. **Permit Extensions/Reissuance:** Any request for permit extension or reissuance should be submitted at least 90 days prior to the end of the authorized term. A written statement requesting a one-year extension confirming there will be no changes to the development/operations plan, including photographs clearly depicting the current condition of the site and any improvements, must be submitted to the AO with any required filing fee. A new Land Use Permit application and any required filing fee is required when requesting reissuance of up to five years or for modifications to the approved development/operations plan on file with DMLW.

14. **Assignment:** This permit may not be transferred or assigned.

15. **Reservation of Rights:**
    a. The AO reserves the right to grant additional authorizations to third parties for compatible uses on or adjacent to the land under this authorization.

b. Authorized concurrent users of state land, their agents, employees, contractors, subcontractors, and licensees, shall not interfere with the operation or maintenance activities of each user.
c. The AO may require authorized concurrent users of state land to enter into an equitable operation or maintenance agreement.

16. **Violations:** A violation of this authorization is subject to any action available to the State for enforcement and remedies, including revocation of the permit, civil action for forcible entry and detainer, ejectment, trespass, damages, and associated costs, or arrest and prosecution for criminal trespass in the second degree. The State may seek damages available under a civil action, including restoration damages, compensatory damages, and treble damages under AS 09.45.730 or AS 09.45.735 for violations involving injuring or removing trees or shrubs, gathering geotechnical data, or taking mineral resources.

17. **Directives:** Directives may be issued for corrective actions that are required to correct a deviation from design criteria, project specifications, stipulations, State statutes or regulations. Work at the area subject to the Directive may continue while implementing the corrective action. Corrective action may include halting or avoiding specific conduct, implementing alternative measures, repairing any damage to state resources that may have resulted from the conduct, or other action as determined by DNR.

18. **Stop Work Orders:** Stop Work Orders may be issued if there is a deviation from design criteria, project specifications, stipulations, State statutes or regulations and that deviation is causing or is likely to cause significant damage to state resources. Under a Stop Work Order, work at the area subject to the Stop Work Order may not resume until the deviation is cured and corrective action is taken. Corrective action may include halting or avoiding specific conduct, implementing alternative measures, repairing any damage to state resources that may have resulted from the conduct, or other action as determined by DNR.

19. **Notification of Discharge:** Notification of Discharge: The Grantee shall immediately notify the Department of Environmental Conservation (DEC) and AO of any unauthorized discharge of oil to water, any discharge of hazardous substances (other than oil), and any discharge of oil greater than 55 gallons on land. All fires and explosions must also be reported immediately. If a discharge, including a cumulative discharge, of oil is greater than 10 gallons but less than 55 gallons, or a discharge of oil greater than 55 gallons is made to an impermeable secondary containment area, the Grantee shall report the discharge within 48 hours. Any discharge of oil greater than one gallon up to 10 gallons, including a cumulative discharge, solely to land, must be reported in writing on a monthly basis.
Notification of discharge during normal business hours must be made to the nearest DEC Area Response Team: Anchorage (907) 269-3063, fax (907) 269-7648; Fairbanks (907) 451-2121, fax (907) 451-2362; Juneau (907) 465-5340, fax (907) 465-5245. To report a spill outside of normal business hours, call toll free 1-800-478-9300 or international 1-907-269-0667.
Notification of discharge must be made to the appropriate DNR Office, preferably by e-mail: Anchorage email dnr.scro.spill@alaska.gov, (907) 269-8528; Fairbanks email dnr.nro.spill@alaska.gov, (907) 451-2739; Juneau email sero@alaska.gov, (907) 465-3513. The Grantee shall supply the AO with all incident reports submitted to DEC.

20. **Batteries:** Batteries which contain hazardous liquids should be completely sealed valve regulated, spill-proof, leak-proof and mounted in an appropriate container. Batteries lacking the preceding properties must have an appropriate drip pan designed to hold 110% of the total

liquids held by the battery/batteries. Batteries, new or used, may not be stored or warehoused. Any battery/batteries that are not in use must be removed and disposed of in accordance with existing federal, state and local laws, regulations and ordinances. All hazardous material containers shall be marked with the Grantee's or contractor's name, dated, and transported in accordance with 49 CRF 172 (EPA Hazardous Material Regulations) and 18 AAC 62.

21. **Returned Check Penalty:** A returned check penalty of $50.00 will be charged for any check on which the bank refuses payment. Late payment penalties shall continue to accrue.

22. **Late Payment Penalty Charges:** The Grantee shall pay a fee for any late payment. The amount is the greater of either $50.00 or interest accrued daily at the rate of 10.5% per annum and will be assessed on each past-due payment until paid in full.

23. **Use Fees:** The Grantee shall pay to DMLW an annual use fee of $1,560.00 for each tower deployed. The use fee is due on or before the annual anniversary of the effective date of this permit without the necessity of any billing by DMLW. The annual use fee is subject to adjustments in any relevant fee schedule.

24. **Request for Information:** The AO, at any time, may require the Grantee to provide any information directly or indirectly related to this authorization, in a manner prescribed by the AO.

25. **Completion Report:** A completion report shall be submitted prior to relinquishment, or within 30 days after expiration or termination of the authorization. Failure to submit a satisfactory report subjects the site to a field inspection requirement for which the Grantee may be assessed an inspection fee, as outlined herein. The report shall contain the following information:
    a. a statement of restoration activities and methods of debris disposal;
    b. a statement that the Grantee has removed all improvements and personal property from the authorized area;
    c. a report covering any known incidents of damage to the vegetative mat and underlying substrate, and follow-up corrective actions that may have taken place while operating under this authorization;
    d. and, photographs of the permitted site taken before, during and after the proposed activity to document permit compliance. Photographs must consist of a series of aerial view or ground-level view photographs that clearly depict compliance with site cleanup and restoration guidelines;

26. **Site Disturbance:** Site disturbance shall be kept to a minimum to protect local habitats. All activities at the site shall be conducted in a manner that will minimize the disturbance of soil and vegetation and changes in the character of natural drainage systems.
    a. Brush clearing is allowed but should be kept to the minimum necessary. Removal or destruction of the vegetative mat is not authorized under this permit.
    b. Establishment of, or improvements to, landing areas (i.e. leveling the ground or removing or modifying a substantial amount of vegetation) is prohibited.
    c. Attention must be paid to prevent pollution and siltation of streams, lakes, ponds, wetlands, and disturbances to fish and wildlife habitat.
    d. Any ground disturbances which may have occurred shall be contoured to blend with the natural topography to protect human and wildlife health and safety.

27. **Site Restoration:** On or before permit expiration (if a reissuance application has not been submitted) or termination of this authorization by the Grantee, the Grantee shall remove all improvements, personal property, and other chattels, and return the permitted area to a clean and safe condition. In the event the Grantee fails to comply with this requirement, the Grantee shall be held liable for any and all costs incurred by the State to return the permitted area to a clean and safe condition.

28. **Ground Disturbance Restoration:** The Grantee shall immediately restore areas where soil has been disturbed, or the vegetative mat has been damaged or destroyed. Restoration shall be accomplished in accordance with the directives of the DNR Plant Materials Center, 5310 S. Bodenburg Road, Palmer, AK 99645, (907) 745-4469. All rehabilitation shall be completed to the satisfaction of the AO.

29. **Indemnification:** The Grantee assumes all responsibility, risk and liability for its activities and those of its employees, agents, contractors, subcontractors, licensees, or invitees, directly or indirectly related to this permit, including environmental and hazardous substance risk and liability, whether accruing during or after the term of this permit. The Grantee shall defend, indemnify, and hold harmless the State, its agents and employees, from and against any and all suits, claims, actions, losses, costs, penalties, and damages of whatever kind or nature, including all attorney's fees and litigation costs, arising out of , in connection with, or incident to any act or omission by the Grantee, its employees, agents, contractors, subcontractors, licensees, or invitees, unless the proximate cause of the injury or damage is the sole negligence or willful misconduct of the State or a person acting on the State's behalf. Within 15 days, the Grantee shall accept any such cause, action or proceeding upon tender by the State. This indemnification shall survive the termination of the permit.

30. **Insurance:** Pursuant to 11 AAC 96.065 the Grantee shall secure or purchase at its own expense, and maintain in force at all times during the term of this permit, liability coverage and limits consistent with what is professionally recommended as adequate to protect the Grantee (the insured) and Grantor (the State, its officers, agents and employees) from the liability exposures of ALL the insured's operations on state land. Certificates of Insurance must be furnished to the AO prior to the issuance of this permit and must provide for a notice of cancellation, non-renewal, or material change of conditions in accordance with policy provisions. The Grantee must provide for a 60-day prior notice to the State before they cancel, not renew or make material changes to conditions to the policy. Failure to furnish satisfactory evidence of insurance, or lapse of the policy, are material breaches of this permit and shall be grounds, at the option of the State, for termination of the permit. All insurance policies shall comply with, and be issued by, insurers licensed to transact the business of insurance under Alaska Statute, Title 21. The policy shall be written on an "occurrence" form and shall not be written as a "claims-made" form unless specifically reviewed and agreed to by the Division of Risk Management, Department of Administration. The State must be named as an additional named insured on the policy with respect to the operations of the Grantee on or in conjunction with the permitted premises, referred to as LAS 34057.

31. **Performance Guaranty:** Pursuant to 11 AAC 96.060, the Grantee shall provide a surety bond or other form of security acceptable to the DMLW in the amount of $5,000.00 payable to the State of Alaska. Such performance guaranty shall remain in effect for the term of this authorization and shall secure performance of the Grantee's obligations hereunder. The amount of the performance guaranty may be adjusted by the AO in the event of approved amendments to this authorization, changes in the development plan, or any change in the

activities or operations conducted on the premises. The guaranty may be utilized by the State to cover actual costs incurred by the State to pay for any necessary corrective actions in the event the Grantee does not comply with the site utilization, restoration requirements and other stipulations contained in this permit agreement. If the Grantee fails to perform the obligations under this permit within a reasonable timeframe, the State may perform the Grantee's obligations at the Grantee's expense. The Grantee agrees to pay within 20 days following demand, all costs and expenses incurred by the State as a result of the failure of the Grantee to comply with the terms and conditions of this permit. Failure to do so may result in the termination of an authorization and/or forfeiture of the performance guaranty. The provisions of this permit shall not prejudice the State's right to obtain a remedy under any law or regulation. If the AO determines that the Grantee has satisfied the terms and conditions of this authorization, the performance guaranty will be subject to release. The performance guaranty may only be released in writing by the AO.

32. **Fuel and Hazardous Substances:** No fuel or hazardous substances may be stored on state land.

33. **Fuel and Hazardous Substances:**
    a. The use and/or storage of hazardous substances by the Grantee must be done in accordance with existing federal, state and local laws, regulations and ordinances. Debris (such as soil) contaminated with used motor oil, solvents, or other chemicals may be classified as a hazardous substance and must be removed and disposed of in accordance with existing federal, state and local laws, regulations and ordinances.
    b. Drip pans and materials, such as sorbent pads, must be on hand to contain and clean up spills from any transfer or handling of fuel.
    c. Vehicle refueling shall not occur within the annual floodplain or tidelands. This restriction does not apply to water-borne vessels provided no more than 30 gallons of fuel are transferred at any given time.
    d. During equipment maintenance operations, the site shall be protected from leaking or dripping hazardous substances or fuel. The Grantee shall place drip pans or other surface liners designed to catch and hold fluids under the equipment or develop a maintenance area by using an impermeable liner or other suitable containment mechanism. Secondary containment shall be provided for fuel or hazardous substances. All fuel and hazardous substance containers shall be inspected for defects and marked with the contents and the Grantee's name using paint or a permanent label. Secondary containment shall be provided for fuel or hazardous substances. All fuel and hazardous substance containers shall be marked with the contents and the Grantee's name using paint or a permanent label.

34. **Fuel and Hazardous Substance Storage:**
    a. The storage of petroleum products below Ordinary High Water (OHW) or Mean High Water Mark (MHWM) is prohibited.
    b. Fuel containers which exceed a total combined capacity of 110 gallons must be stored within an impermeable diked area or portable impermeable containment structure capable of containing 110 percent (115 Percent in the Aleutians West CRSA) capacity of the largest independent container (plus 12 inches of freeboard in the Kenai Peninsula Coastal District and Aleutians West CRSA).
    c. Fuel storage containers, including flow test holding tanks and hazardous substances, with a total combined capacity larger than 55 gallons shall not be placed within 100

feet (500 feet in the Bering Straits CRSA) from the ordinary high water mark of waterbodies.

d. All fuel storage containers and associated materials must be removed by the permit expiration date.
e. Secondary containment shall be provided for fuel or hazardous substances.
f. All fuel and hazardous substance containers shall be marked with the contents and the permittee's name using paint or a permanent label.
g. The AO may under unique or special circumstances grant exceptions to this stipulation on a case-by-case basis. Requests for exceptions should be made to the AO.
h. Definitions.
    i. Containers means any item which is used to hold fuel or hazardous substances. This includes tanks, drums, double-walled tanks, portable testing facilities, fuel tanks on small equipment such as light plants and generators, flow test holding tanks, slop oil tanks, bladders, and bags. Manifolded tanks or any tanks in a series must be considered as single independent containers. Vehicles, including mobile seismic tanks, are not intended to be included under this definition.
    ii. Hazardous substances are defined under AS 46.03.826(5) as (a) an element or compound which, when it enters the atmosphere, water, or land, presents an imminent and substantial danger to the public health or welfare, including fish, animals, or vegetation; (b) oil; or (c) a substance defined as a hazardous substance under 42 U.S.C. 9601(14).
    iii. Secondary containment means an impermeable diked area or portable impermeable containment structure capable of containing 110 percent of the volume of the largest independent container. Double-walled tanks do not qualify as secondary containment unless an exception is granted for a particular tank. All piping and manifolds shall be within secondary containment.
    iv. Surface liner means any safe, non-permeable container (e.g., drips pans, fold-a-tanks, etc.) designed to catch and hold fluids for the purpose of preventing spills. Surface liners should be of adequate size and volume based on worst-case spill risk.

35. Waste Disposal: On-site refuse disposal is prohibited, unless specifically authorized. All waste generated during operation, maintenance, and termination activities under this authorization shall be removed and disposed of at an off-site DEC approved disposal facility. Waste, in this paragraph, means all discarded matter, including but not limited to human waste, trash, garbage, refuse, oil drums, petroleum products, ashes and discarded equipment.

36. Wastewater Disposal: No pit privies are authorized.

37. Solid Waste:

a. All solid waste and debris, including dog waste, generated from the activities conducted under this authorization shall be removed to a facility approved by DEC on a regular basis such that the premise be maintained to ensure a healthy and safe environment.
b. Putrescible waste (waste that can decompose and cause obnoxious odor) shall be stored in a manner that prevents the attraction of or access to wildlife or disease vectors; and

c. Paper products may be burned on site if measures (e.g. burn barrels, clearing of burn area to mineral soil) are taken to prevent wildfires.

38. **Destruction of Markers:** The Grantee shall protect all survey monuments, witness corners, reference monuments, mining claim posts, bearing trees, and unsurveyed corner posts against damage, destruction, or obliteration. The Grantee shall notify the AO of any damaged, destroyed, or obliterated markers and shall reestablish the markers at the Grantee's expense in accordance with accepted survey practices of the DMLW.

39. **Site Maintenance:** The authorized area shall be maintained in a neat, clean, and safe condition, free of any solid waste, debris, or litter, except as specifically authorized herein. Nothing may be stored that would be an attractive nuisance to wildlife or create a potentially hazardous situation.

40. **Maintenance of Improvements:** The Grantor is not responsible for maintenance of authorized improvements or liable for injuries or damages related to those improvements. No action or inaction of the Grantor is to be construed as assumption of responsibility.

41. **Amendment or Modification:** The Grantee may request an amendment or modification of this authorization; the Grantee's request must be in writing. Any amendment or modification must be approved by the AO in advance and may require additional fees and changes to the terms of this authorization.

42. **Development Plan:** Development shall be limited to the authorized area and improvements specified in the approved development plan or subsequent modifications approved by the AO. The Grantee is responsible for accurately siting development and operations within the authorized area. Any proposed revisions to the development plan must be approved in writing by the AO before the change in use or development occurs.

43. **Proper Location:** This authorization is for activities on state lands or interests managed by DMLW. It does not authorize any activities on private, federal, native, and municipal lands, or lands which are owned or solely managed by other offices and agencies of the State. The Grantee is responsible for proper location within the authorized area.

44. **Improvements:** Any improvements/structures that may be authorized under this permit must be constructed in a manner that will allow for removal from the permitted site within 48 hours of receiving a notice to vacate. The establishment of permanent foundations and structures is prohibited under this permit. Authorized temporary improvements must be sited in a manner which impacts the least amount of ground consistent with the purpose of the facility. Any use of these improvements for purposes other than those explicitly authorized by this permit are prohibited.

45. **Visual Screening:** The Grantee shall limit the visual impact of their activity. Examples include, but are not limited to, using non-reflective roof cover material, applying dark paint to all metal or light-colored plywood or other surfaces and storing all equipment in an acceptable, well-kept manner. Improvements should be screened from sight whenever possible using vegetation or other natural features.

46. **Fire Prevention, Protection and Liability:** The Grantee shall take all reasonable precautions to prevent and suppress forest, structure, brush and grass fires, and shall assume full liability

for any damage to state land and structures resulting from the negligent use of fire. The State is not liable for damage to the Grantee's personal property and is not responsible for forest fire protection of the Grantee's activity. To report a wildfire, call 911 or 1-800-237-3633.

47. **Tower Hazard:** All improvements on site must be clearly marked in a manner which will reduce the likelihood of conflict with other users. Guy wires and tower structure must be clearly visible. Commercially available full round guy wire markers will be used on all guy wires and will be installed at the time of installation of the tower. Full round guy wire markers will be a minimum of 10 feet (above ground level) in length and of a color that dramatically contrast with the local environment. Anchors or other project features that could be struck by other users in the area will be clearly marked. The guy wire markers and other markings shall be routinely inspected, and any defective or missing markers shall be replaced immediately. In substitution of guy wire markers, plastic fencing of a color that dramatically contrasts with the local environment can be used to mark the improvements on site.

Permit Advisories:

1. For any MET towers remaining on the project site throughout the project's lifespan (per ADL 233892 Development Plan), it is strongly recommended to utilize monopole over lattice construction, discouraging guywires when feasible. This measure aims to deter nesting and perching birds, ultimately reducing the risk of bird strikes in wind turbines.

The Authorized Officer reserves the right to modify these stipulations or use additional stipulations as deemed necessary. The Grantee will be advised before any such modifications or additions are finalized. DNR has the authority to implement and enforce these conditions under AS 38.05.850. Any correspondence on this authorization may be directed to the Department of Natural Resources, Division of Mining, Land and Water, Southcentral Regional Land Office, 550 W. 7th Ave., Suite 900C, Anchorage, AK 99501-3577, (907) 269-8503.

I have read and understand all of the foregoing and attached stipulations. By signing this authorization, I agree to conduct the authorized activity in accordance with the terms and conditions of this authorization.

Michael U. Alvarez	Chief Operating Officer	8/16/2024
Signature of Grantee or Authorized Representative	Title	Date

125 High St, 17th Floor High St Tower, Suite 1705	Boston	MA	02110
Grantee's Address	City	State	Zip

Chad Allen	207-210-1175	
Contact Person	Home Phone	Work Phone

Rachel Longacre		8/20/2024
Signature of Authorized State Representative	Title	Date

NewTower Engineering LLC

Date: **July 01, 2024**

Jeff Armbruster
Longroad Energy
125 High Street, Boston, MA 02210
Phone: (857) 202-7475

Subject: **Matanuska Susitna Borough Met Tower Conditional Use Permit**

Applicant: ***Longroad Energy / Alaska Renewables***

Land Owner: ***State of Alaska***

Engineering Project No.: **Project Number:** 101-24-002

Tower Data: **(6) NRG Systems 50m XHD Tall Meteorological Towers**
Matanuska-Susitna Borough, AK

	UTM WGS84 z5 meters		WGS84	
id	X	Y	LATITUDE	LONGITUDE
LMS 105	607144	6817133	61.47306128° N	150.98880926° W
LMS 106	612079	6817695	61.47670353° N	150.89590508° W
LMS 107	610490	6814070	61.44464000° N	150.92786700° W
LMS 108	611983	6812416	61.42937215° N	150.90087803° W
LMS 109	611119	6812558	61.43089025° N	150.91697790° W
LMS 110	610563	6811529	61.42181675° N	150.92800343° W

Dear Mr. Armbruster,

Please find enclosed the following for the subject six (6) NRG 50m XHD Met Towers with Standard Footprint permit application:

1. A full tower structural analysis is provided (refer attached report and Appendix A output results) in accordance with the 2021 Alaska Building Code, 2021 International Building Code, ASCE 7-16 Code, and ANSI TIA 222-Rev H, based upon an ultimate 3-second gust wind speed of 115 mph (V_{ult}), Risk Category I, and Exposure Category C. Seismic analysis not required for Risk Category I structures.
2. Refer Appendix C and the Conclusions/Recommendations for recommended Manta Ray (MR-2) guy anchor, 8" double helix (or approved equal) along with details and minimum pull forces required (Table 4). No soils report is available for the site. As such, anchor pull tests will be required to meet the minimum resultant anchor loads as listed in Table 4 of this report.
3. Refer Appendix D for typical tower grounding and tower installation details.

Structural analysis prepared by: Mikko P. Ahola, PE

Respectfully submitted by:

Aaron Boonstra, PE
Professional Engineer

TABLE OF CONTENTS

1) INTRODUCTION

The purpose of this report is to investigate the structural adequacy of proposed (6) NRG Systems 50m XHD guyed pole temporary meteorological towers to be located in the Matanuska-Susitna Borough, Alaska (refer Appendix D map locations). The met towers will support wind monitoring devices. The computer plots & output based on a 3D structural analysis using tnxTOWER (Version 8.2.2) is provided in Appendix A.

The 50m XHD tall guyed pole MET towers are designed and manufactured by NRG Systems.

The finite element program “tnxTower” used in this analysis is developed by Tower Numerics in Lexington, MA. It is a specialized 3D structural analysis program widely used and accepted in the tower industry.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the 2021 Alaska Building Code, 2021 International Building Code, and ANSI TIA-222-Rev H for the tower site locations in Alaska based upon an ultimate 3-second gust wind speed of 115 mph (V_{ult}). Exposure Category C, Risk Category I along with topographic category 2 and crest height of 1,500 feet were used in this analysis (typical for all 6 tower sites). Met towers are temporary structures (1 to 3-year installation duration typical) and analyzed as Risk Category I structures with 115 mph ultimate gust wind speed at the met tower site locations per the 2021 IBC/ASCE 7-16 (refer Appendix A ASCE7-16 Hazard Map). Table 1 below shows the proposed MET tower loading.

Table 1 - Proposed 50m XHD Tall Super XHD Met Tower Equipment Loading

Center Line Elevation (ft)	Number of Antennas	Antenna/Mount Manufacturer	Antenna/Mount Model	Number of Feed Lines	Feed Line Size (in)	Note
167.98 (51.2 m)	1	Young	Propellor Anemometer/ Wind Vane	1	0.14”ϕ cable	1
167.98 (51.2 m)	1	NRG Systems	NRG No. 4214 (95” Long Side Boom)	-	-	1
162.40 (49.5 m)	2	NRG Systems	NRG #40C Anemometers	2	0.14”ϕ cables	1
162.40 (49.5 m)	2	NRG Systems	NRG No. 4214 (95” Long Side Booms)	-	-	1
156.496 (47.7 m)	2	NRG Systems	Heated Anemometer	2	0.14”ϕ cables	1
156.496 (47.7 m)	2	NRG Systems	NRG No. 4214 (95” Long Side Booms)	-	-	1
145.997 (44.5 m)	4	NRG Systems	21” ϕ Orange Marker Balls (3.1m From Top Guy Ring)	-	-	1
140.42 (42.8 m)	1 1 1	Campbell Scientific	Barometric Pressure Gauge Relative Humidity Sensor Temperature Sensor	3	0.14”ϕ cables	1
130.58 (39.8 m)	2	NRG Systems	NRG #40C Anemometers	2	0.14”ϕ cables	1
130.58 (39.8 m)	2	NRG Systems	NRG No. 4214 (95” Long Side Booms)	-	-	1
111.22 (33.9 m)	1	NRG Systems	NRG 200P Wind Vane	1	0.14”ϕ cable	1
111.22 (33.9 m)	1	NRG Systems	NRG No. 4214 (95” Long Side Boom)	-	-	1
105.32 (32.1 m)	2	NRG Systems	NRG #40C Anemometers	2	0.14”ϕ cables	1
105.32	2	NRG Systems	NRG No. 4214	-	-	1

Center Line Elevation (ft)	Number of Antennas	Antenna/Mount Manufacturer	Antenna/Mount Model	Number of Feed Lines	Feed Line Size (in)	Note
(32.1 m)			(95” Long Side Booms)			
49.21 (15.0 m)	1	Unknown	Temperature Sensor	1	0.14”ϕ cable	1
4.92 (1.5 m)	1	NRG Systems	Data Logger & Modem	-	-	1

Notes: 1. Proposed Equipment

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Met Tower Equipment Loading	Anemometers, Wind Vanes, Marker Balls	06/20/2024	Longroad Energy
50M XHD & 60M XHD Tall Tower Installation	User’s Manual (Rev 10)	11/02/2018	NRG Systems

3.1) Analysis Method

tnxTower (version 8.2.2), a commercially available analysis software package, was used to analyze the 50m XHD MET tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1. The pole steel is 45 ksi yield.
2. The 50m XHD MET tower is supported by 1/4" diameter Aircraft guy wiring with breaking strength of 7.0 kips with 0.182 kips (2.6%) initial tension (refer 50M & 60M XHD Installation Manual for instructions on proper guy wire tensioning and recommended methods to utilize).
3. The proposed MET tower is temporary (typically 1 to 3-year installation duration)
4. The met tower and guy anchors are to be installed by a professional contractor with prior experience in met tower erection and will be installed following the instructions in the NRG 50m & 60m XHD Installation Manual & Specifications & other manufacturer specifications.

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	165.604 - 152.771	Pole	Guyed Pole 8" OD	2	-152.147	91413.297	35.5	Pass
L2	152.771 - 127.104	Pole	Guyed Pole 8" OD	3	-5902.010	91413.297	36.6	Pass
L3	127.104 - 101.437	Pole	Guyed Pole 8" OD	4	-11052.500	91413.297	44.7	Pass
L4	101.437 - 75.812	Pole	Guyed Pole 10" OD	5	-14517.000	113300.000	35.7	Pass
L5	75.812 - 38.562	Pole	Guyed Pole 10" OD	6	-17002.199	113300.000	36.5	Pass
L6	38.562 - 0	Pole	Guyed Pole 10" OD	7	-19226.801	113300.000	49.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L2	152.771 - 127.104	Guy A@152.771	NRG 0.030125	11	4029.750	4200.000	95.9	Pass
L3	127.104 - 101.437	Guy A@127.104	NRG 0.030125	15	2847.590	4200.000	67.8	Pass
L4	101.437 - 75.812	Guy A@101.437	NRG 0.030125	19	2124.400	4200.000	50.6	Pass
L5	75.812 - 38.562	Guy A@75.812	NRG 0.030125	23	2050.680	4200.000	48.8	Pass
L6	38.562 - 0	Guy A@38.562	NRG 0.030125	27	1976.560	4200.000	47.1	Pass
L2	152.771 - 127.104	Guy B@152.771	NRG 0.030125	10	4027.520	4200.000	95.9	Pass
L3	127.104 - 101.437	Guy B@127.104	NRG 0.030125	14	2848.480	4200.000	67.8	Pass
L4	101.437 - 75.812	Guy B@101.437	NRG 0.030125	18	2125.370	4200.000	50.6	Pass
L5	75.812 - 38.562	Guy B@75.812	NRG 0.030125	22	2050.790	4200.000	48.8	Pass
L6	38.562 - 0	Guy B@38.562	NRG 0.030125	26	1975.270	4200.000	47.0	Pass
L2	152.771 - 127.104	Guy C@152.771	NRG 0.030125	9	4027.030	4200.000	95.9	Pass
L3	127.104 - 101.437	Guy C@127.104	NRG 0.030125	13	2849.140	4200.000	67.8	Pass
L4	101.437 - 75.812	Guy C@101.437	NRG 0.030125	17	2125.700	4200.000	50.6	Pass
L5	75.812 - 38.562	Guy C@75.812	NRG 0.030125	21	2050.790	4200.000	48.8	Pass
L6	38.562 - 0	Guy C@38.562	NRG 0.030125	25	1974.240	4200.000	47.0	Pass
L2	152.771 - 127.104	Guy D@152.771	NRG 0.030125	8	4027.610	4200.000	95.9	Pass
L3	127.104 - 101.437	Guy D@127.104	NRG 0.030125	12	2848.430	4200.000	67.8	Pass
L4	101.437 - 75.812	Guy D@101.437	NRG 0.030125	16	2125.330	4200.000	50.6	Pass
L5	75.812 - 38.562	Guy D@75.812	NRG 0.030125	20	2050.790	4200.000	48.8	Pass
L6	38.562 - 0	Guy D@38.562	NRG 0.030125	24	1975.280	4200.000	47.0	Pass
							Summary	
						Pole (L6)	49.9	Pass
						Guy A (L2)	95.9	Pass
						Guy B (L2)	95.9	Pass
						Guy C (L2)	95.9	Pass
						Guy D (L2)	95.9	Pass
						RATING =	**95.9**	**Pass**

Table 4 – Guy Anchor Reactions

Anchor Radius	Factored Uplift Force (Vertical)	Factored Shear Force (Horizontal)	Factored Resultant Force
Inner Anchor (Radius = 131.234 ft)	1,501 lbs	3,689 lbs	3,983 lbs
Middle Anchor (Radius = 147.638 ft)	2,863 lbs	4,017 lbs	4,933 lbs
Outer Anchor (Radius = 164.042 ft)	2,610 lbs	3,046 lbs	4,011 lbs

1. Anchor reactions are factored.

4.1) Conclusions & Recommendations

The proposed NRG 50m XHD MET towers with standard footprint were analyzed with the proposed new wind monitoring devices and marker balls (Refer Table 1) per the 2021 International Building Code/ASCE 7-16 and ANSI TIA 222 Rev H codes for the typical site conditions at the 6 tower site locations in Matanuska-Susitna Borough, AK based upon an ultimate 3-second gust wind speed of 115 mph (V_{ult}). Exposure Category C, Risk Category I along with topographic category 2 and crest height of 1,500 feet were used in this analysis. Seismic loading is not required for Risk Category I Structures.

The analysis results show that:

1. The overall tower pole structure and guy wires are structurally adequate to support the proposed equipment. A maximum tower steel usage of 95.9% was computed (Refer Table 3).

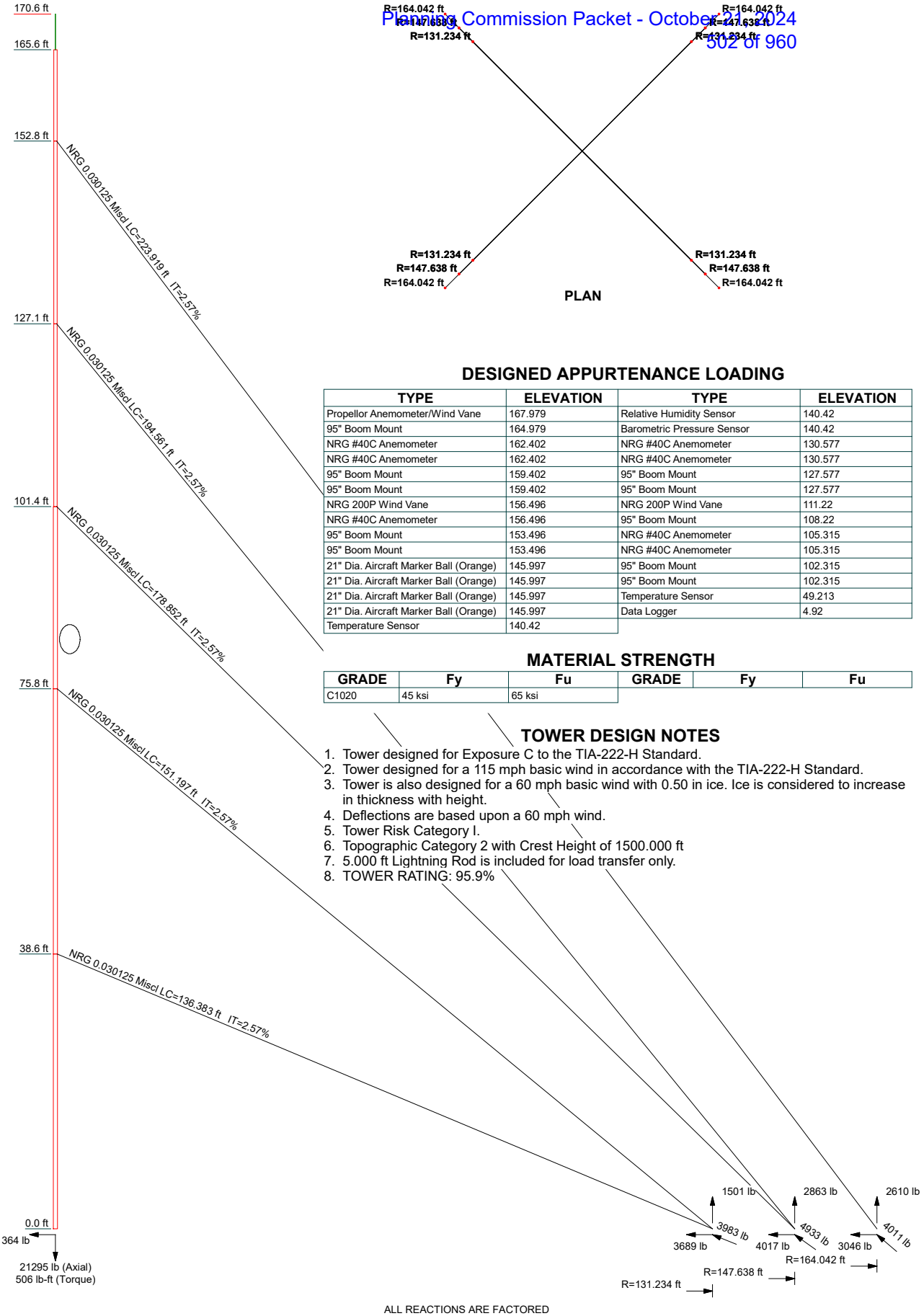
2. The maximum factored guy anchor resultant force computed was 4,933 lbs (Refer Table 4). The Manta Ray Earth Anchor (Model MR-2) has holding capacities up to 36,000 lbs or 8" double helix anchors (depending on soil type – Refer Appendix C earth anchor details & ultimate capacites) and would be adequate to secure the guy anchors in place under the wind loads shown in this analysis. However, no soils report was available to confirm the soil type at the proposed location of the towers. As such, a standard pull test will be required to ensure they meet the minimum factored resultant anchor loads in Table 4 above.

3. The maximum factored axial compression force at the base of the met tower is computed to be 21,295 lbs. Per the NRG tower specs, the 50m XHD standard footprint steel base plate has a surface area of 7.7 ft^2. Assuming a typical 1,500 psf allowable soil bearing stress per the IBC code with a Safety of Factor of 2.0 in soil bearing, the ultimate soil bearing stress would be 3,000 psf. Thus, based on factored loads the computed maximum soil bearing stress is 2,766 psf < 3,000 psf and acceptable.

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (lb)
1	Guyed Pole 8" OD	12.833	C1020	103.0
2	Guyed Pole 8" OD	25.667		206.1
3	Guyed Pole 8" OD	25.667		206.1
4	Guyed Pole 10" OD	25.625		268.5
5	Guyed Pole 10" OD	37.250		390.3
6	Guyed Pole 10" OD	38.562		404.1
				1578.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Propellor Anemometer/Wind Vane	167.979	Relative Humidity Sensor	140.42
95" Boom Mount	164.979	Barometric Pressure Sensor	140.42
NRG #40C Anemometer	162.402	NRG #40C Anemometer	130.577
NRG #40C Anemometer	162.402	NRG #40C Anemometer	130.577
95" Boom Mount	159.402	95" Boom Mount	127.577
95" Boom Mount	159.402	95" Boom Mount	127.577
NRG 200P Wind Vane	156.496	NRG 200P Wind Vane	111.22
NRG #40C Anemometer	156.496	95" Boom Mount	108.22
95" Boom Mount	153.496	NRG #40C Anemometer	105.315
95" Boom Mount	153.496	NRG #40C Anemometer	105.315
21" Dia. Aircraft Marker Ball (Orange)	145.997	95" Boom Mount	102.315
21" Dia. Aircraft Marker Ball (Orange)	145.997	95" Boom Mount	102.315
21" Dia. Aircraft Marker Ball (Orange)	145.997	Temperature Sensor	49.213
21" Dia. Aircraft Marker Ball (Orange)	145.997	Data Logger	4.92
Temperature Sensor	140.42		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
C1020	45 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 115 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 60 mph basic wind with 0.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category I.
6. Topographic Category 2 with Crest Height of 1500.000 ft
7. 5.000 ft Lightning Rod is included for load transfer only.
8. TOWER RATING: 95.9%

ALL REACTIONS ARE FACTORED

Ahola Engineering LLC
P.O. Box 989
Winter Park, CO 80482-0989
Phone: (719) 640-2408
FAX:

Job: ***165.6' (50 meters) XHD MET Tower with Standard Footpri***		
Project: ***Matanuska-Susitna Borough, AK***		
Client: NRG	Drawn by: Mikko Ahola, PE	App'd:
Code: TIA-222-H	Date: 07/01/24	Scale: NTS
Path:		Dwg No. E-1

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 1 of 32
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 08:34:34 07/01/24
	Client: NRG	Designed by: Mikko Ahola, PE

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 2461.000 ft.
Basic wind speed of 115 mph.
Risk Category I.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 2.
Crest Height: 1500.000 ft.
Nominal ice thickness of 0.500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 60 mph is used in combination with ice.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Safety factor used in guy design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	165.604-152.771	12.833	Guyed Pole 8" OD	C1020 (45 ksi)	
L2	152.771-127.104	25.667	Guyed Pole 8" OD	C1020 (45 ksi)	
L3	127.104-101.437	25.667	Guyed Pole 8" OD	C1020 (45 ksi)	
L4	101.437-75.812	25.625	Guyed Pole 10" OD	C1020 (45 ksi)	
L5	75.812-38.562	37.250	Guyed Pole 10" OD	C1020 (45 ksi)	
L6	38.562-0.000	38.562	Guyed Pole 10" OD	C1020 (45 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 165.604-152.771				1	1	1			
L2 152.771-127.1				1	1	1			

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 2 of 32
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 08:34:34 07/01/24
	Client: NRG	Designed by: Mikko Ahola, PE

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
04									
L3				1	1	1			
127.104-101.437									
L4				1	1	1			
101.437-75.812									
L5				1	1	1			
75.812-38.562									
L6				1	1	1			
38.562-0.000									

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
152.771	Miscl	A	NRG	179.900	2.57%	15000.000	0.111	223.957	164.042	0.000	0.000	100%
		B	0.030125	179.900	2.57%	15000.000	0.111	223.957	164.042	0.000	0.000	100%
		C	NRG	179.900	2.57%	15000.000	0.111	223.957	164.042	0.000	0.000	100%
		D	0.030125	179.900	2.57%	15000.000	0.111	223.957	164.042	0.000	0.000	100%
			NRG									
			0.030125									
			NRG									
			0.030125									
127.104	Miscl	A	NRG	179.900	2.57%	15000.000	0.111	194.647	147.638	0.000	0.000	100%
		B	0.030125	179.900	2.57%	15000.000	0.111	194.647	147.638	0.000	0.000	100%
		C	NRG	179.900	2.57%	15000.000	0.111	194.647	147.638	0.000	0.000	100%
		D	0.030125	179.900	2.57%	15000.000	0.111	194.647	147.638	0.000	0.000	100%
			NRG									
			0.030125									
			NRG									
			0.030125									
101.437	Miscl	A	NRG	179.900	2.57%	15000.000	0.111	178.872	147.638	0.000	0.000	100%
		B	0.030125	179.900	2.57%	15000.000	0.111	178.872	147.638	0.000	0.000	100%
		C	NRG	179.900	2.57%	15000.000	0.111	178.872	147.638	0.000	0.000	100%
		D	0.030125	179.900	2.57%	15000.000	0.111	178.872	147.638	0.000	0.000	100%
			NRG									
			0.030125									
			NRG									
			0.030125									
75.812	Miscl	A	NRG	179.900	2.57%	15000.000	0.111	151.199	131.234	0.000	0.000	100%
		B	0.030125	179.900	2.57%	15000.000	0.111	151.199	131.234	0.000	0.000	100%
		C	NRG	179.900	2.57%	15000.000	0.111	151.199	131.234	0.000	0.000	100%
		D	0.030125	179.900	2.57%	15000.000	0.111	151.199	131.234	0.000	0.000	100%
			NRG									
			0.030125									
			NRG									
			0.030125									

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38.562	Miscl	A	NRG	179.900	2.57%	15000.000	0.111	136.466	131.234	0.000	0.000	100%
		B	0.030125	179.900	2.57%	15000.000	0.111	136.466	131.234	0.000	0.000	100%
		C	NRG	179.900	2.57%	15000.000	0.111	136.466	131.234	0.000	0.000	100%
		D	0.030125	179.900	2.57%	15000.000	0.111	136.466	131.234	0.000	0.000	100%
			NRG									
			0.030125									
			NRG									
			0.030125									

Guy Data*(cont'd)*

Guy Elevation ft	*Mount Type*	*Torque-Arm Spread ft*	*Torque-Arm Leg Angle °*	*Torque-Arm Style*	*Torque-Arm Grade*	*Torque-Arm Type*	*Torque-Arm Size*
152.771	Corner						
127.104	Corner						
101.437	Corner						
75.812	Corner						
38.562	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	*Diagonal Grade*	*Diagonal Type*	*Upper Diagonal Size*	*Lower Diagonal Size*	*Is Strap.*	*Pull-Off Grade*	*Pull-Off Type*	*Pull-Off Size*
152.771	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
127.104	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
101.437	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
75.812	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
38.562	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	

Guy Data *(cont'd)*

Guy Elevation ft	*Cable Weight A lb*	*Cable Weight B lb*	*Cable Weight C lb*	*Cable Weight D lb*	*Tower Intercept A ft*	*Tower Intercept B ft*	*Tower Intercept C ft*	*Tower Intercept D ft*
152.771	30.939	30.939	30.939	30.939	18.222 7.4 sec/pulse	18.222 7.4 sec/pulse	18.222 7.4 sec/pulse	18.222 7.4 sec/pulse
127.104	36.418	36.418	36.418	36.418	18.523 7.4 sec/pulse	18.523 7.4 sec/pulse	18.523 7.4 sec/pulse	18.523 7.4 sec/pulse
101.437	25.467	25.467	25.467	25.467	12.191 6.0 sec/pulse	12.191 6.0 sec/pulse	12.191 6.0 sec/pulse	12.191 6.0 sec/pulse
75.812	21.459	21.459	21.459	21.459	8.767	8.767	8.767	8.767

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Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
38.562	29.963	29.963	29.963	29.963	5.1 sec/pulse 11.131 5.8 sec/pulse	5.1 sec/pulse 11.131 5.8 sec/pulse	5.1 sec/pulse 11.131 5.8 sec/pulse	5.1 sec/pulse 11.131 5.8 sec/pulse

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
152.771	No	No			1	1	1	1
127.104	No	No			1	1	1	1
101.437	No	No			1	1	1	1
75.812	No	No			1	1	1	1
38.562	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
152.771	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
127.104	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
101.437	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
75.812	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
38.562	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75

Guy Insulator Data

Guy Elevation ft	#	Length in	Diameter in	Weight lb		Equivalent Unit Weight plf	Equivalent Diameter in	Equivalent Diameter w/Ice in
152.771	13	3.500	6.000	0.500	A	0.138	0.313	1.487
					B	0.138	0.313	1.487
					C	0.138	0.313	1.487
					D	0.138	0.313	1.487
127.104	1	21.000	21.000	15.000	A	0.187	0.374	1.599
					B	0.187	0.374	1.599
					C	0.187	0.374	1.599
					D	0.187	0.374	1.599

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101.437	12	3.500	6.000	0.500	A	0.142	0.323	1.467
					B	0.142	0.323	1.467
					C	0.142	0.323	1.467
					D	0.142	0.323	1.467
75.812	10	3.500	6.000	0.500	A	0.142	0.322	1.437
					B	0.142	0.322	1.437
					C	0.142	0.322	1.437
					D	0.142	0.322	1.437
38.562	1	21.000	21.000	15.000	A	0.220	0.426	1.588
					B	0.220	0.426	1.588
					C	0.220	0.426	1.588
					D	0.220	0.426	1.588

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z ksf	q_z Ice ksf	Ice Thickness in
152.771	A	76.386	0.069	0.019	0.590
	B	76.386	0.069	0.019	0.590
	C	76.386	0.069	0.019	0.590
	D	76.386	0.069	0.019	0.590
127.104	A	63.552	0.067	0.018	0.615
	B	63.552	0.067	0.018	0.615
	C	63.552	0.067	0.018	0.615
	D	63.552	0.067	0.018	0.615
101.437	A	50.719	0.064	0.018	0.576
	B	50.719	0.064	0.018	0.576
	C	50.719	0.064	0.018	0.576
	D	50.719	0.064	0.018	0.576
75.812	A	37.906	0.061	0.017	0.561
	B	37.906	0.061	0.017	0.561
	C	37.906	0.061	0.017	0.561
	D	37.906	0.061	0.017	0.561
38.562	A	19.281	0.053	0.015	0.583
	B	19.281	0.053	0.015	0.583
	C	19.281	0.053	0.015	0.583
	D	19.281	0.053	0.015	0.583

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
152.771	A	43.021	200.996 179.900	-98.181	145.328	-98.181	-34.254	0.000	34.254
	B	43.021	200.996 179.900	98.181	145.328	-98.181	-34.254	0.000	-34.254
	C	43.021	200.996 179.900	98.181	145.328	98.181	34.254	0.000	-34.254
	D	43.021	200.996 179.900	-98.181	145.328	98.181	34.254	0.000	34.254
			Sum:	0.000	581.313	0.000	0.000	0.000	0.000
127.104	A	40.790	203.671 179.900	-102.276	143.390	-102.276	-33.797	0.000	33.797

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	Client: NRG	Designed by: Mikko Ahola, PE

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
	B	40.790	203.671 179.900	102.276	143.390	-102.276	-33.797	0.000	-33.797
	C	40.790	203.671 179.900	102.276	143.390	102.276	33.797	0.000	-33.797
	D	40.790	203.671 179.900	-102.276	143.390	102.276	33.797	0.000	33.797
			Sum:	0.000	573.561	0.000	0.000	0.000	0.000
101.437	A	34.552	194.333 179.897	-108.747	118.800	-108.747	-28.002	0.000	28.002
	B	34.552	194.333 179.897	108.747	118.800	-108.747	-28.002	0.000	-28.002
	C	34.552	194.333 179.897	108.747	118.800	108.747	28.002	0.000	-28.002
	D	34.552	194.333 179.897	-108.747	118.800	108.747	28.002	0.000	28.002
			Sum:	0.000	475.201	0.000	0.000	0.000	0.000
75.812	A	30.093	190.257 179.501	-112.933	103.391	-112.933	-30.462	0.000	30.462
	B	30.093	190.257 179.501	112.933	103.391	-112.933	-30.462	0.000	-30.462
	C	30.093	190.257 179.501	112.933	103.391	112.933	30.462	0.000	-30.462
	D	30.093	190.257 179.501	-112.933	103.391	112.933	30.462	0.000	30.462
			Sum:	0.000	413.563	0.000	0.000	0.000	0.000
38.562	A	16.424	188.363 179.900	-124.485	66.991	-124.485	-19.737	0.000	19.737
	B	16.424	188.363 179.900	124.485	66.991	-124.485	-19.737	0.000	-19.737
	C	16.424	188.363 179.900	124.485	66.991	124.485	19.737	0.000	-19.737
	D	16.424	188.363 179.900	-124.485	66.991	124.485	19.737	0.000	19.737
			Sum:	0.000	267.965	0.000	0.000	0.000	0.000

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
152.771	A	43.021	646.731 542.822	-305.339	481.453	-305.339	-113.480	0.000	113.480
	B	43.021	646.731 542.822	305.339	481.453	-305.339	-113.480	0.000	-113.480
	C	43.021	646.731 542.822	305.339	481.453	305.339	113.480	0.000	-113.480
	D	43.021	646.731 542.822	-305.339	481.453	305.339	113.480	0.000	113.480
			Sum:	0.000	1925.813	0.000	0.000	0.000	0.000
127.104	A	40.790	634.026 532.412	-309.832	458.255	-309.832	-108.012	0.000	108.012
	B	40.790	634.026	309.832	458.255	-309.832	-108.012	0.000	-108.012

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	Client: NRG	Designed by: Mikko Ahola, PE

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
			532.412						
	C	40.790	634.026	309.832	458.255	309.832	108.012	0.000	-108.012
			532.412						
	D	40.790	634.026	-309.832	458.255	309.832	108.012	0.000	108.012
			532.412						
			Sum:	0.000	1833.019	0.000	0.000	0.000	0.000
101.437	A	34.552	577.844	-315.617	366.981	-315.617	-86.498	0.000	86.498
			511.654						
	B	34.552	577.844	315.617	366.981	-315.617	-86.498	0.000	-86.498
			511.654						
	C	34.552	577.844	315.617	366.981	315.617	86.498	0.000	-86.498
			511.654						
	D	34.552	577.844	-315.617	366.981	315.617	86.498	0.000	86.498
			511.654						
			Sum:	0.000	1467.924	0.000	0.000	0.000	0.000
75.812	A	30.093	527.557	-306.890	299.924	-306.890	-88.366	0.000	88.366
			479.825						
	B	30.093	527.557	306.890	299.924	-306.890	-88.366	0.000	-88.366
			479.825						
	C	30.093	527.557	306.890	299.924	306.890	88.366	0.000	-88.366
			479.825						
	D	30.093	527.557	-306.890	299.924	306.890	88.366	0.000	88.366
			479.825						
			Sum:	0.000	1199.695	0.000	0.000	0.000	0.000
38.562	A	16.424	512.372	-335.665	192.829	-335.665	-56.813	0.000	56.813
			482.803						
	B	16.424	512.372	335.665	192.829	-335.665	-56.813	0.000	-56.813
			482.803						
	C	16.424	512.372	335.665	192.829	335.665	56.813	0.000	-56.813
			482.803						
	D	16.424	512.372	-335.665	192.829	335.665	56.813	0.000	56.813
			482.803						
			Sum:	0.000	771.317	0.000	0.000	0.000	0.000

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
152.771	A	43.021	200.996	-98.181	145.328	-98.181	-34.254	0.000	34.254
			179.900						
	B	43.021	200.996	98.181	145.328	-98.181	-34.254	0.000	-34.254
			179.900						
	C	43.021	200.996	98.181	145.328	98.181	34.254	0.000	-34.254
			179.900						
	D	43.021	200.996	-98.181	145.328	98.181	34.254	0.000	34.254
			179.900						
			Sum:	0.000	581.313	0.000	0.000	0.000	0.000
127.104	A	40.790	203.671	-102.276	143.390	-102.276	-33.797	0.000	33.797
			179.900						
	B	40.790	203.671	102.276	143.390	-102.276	-33.797	0.000	-33.797
			179.900						

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	Client: NRG	Designed by: Mikko Ahola, PE

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
	C	40.790	203.671 179.900	102.276	143.390	102.276	33.797	0.000	-33.797
	D	40.790	203.671 179.900	-102.276	143.390	102.276	33.797	0.000	33.797
			Sum:	0.000	573.561	0.000	0.000	0.000	0.000
101.437	A	34.552	194.333 179.897	-108.747	118.800	-108.747	-28.002	0.000	28.002
	B	34.552	194.333 179.897	108.747	118.800	-108.747	-28.002	0.000	-28.002
	C	34.552	194.333 179.897	108.747	118.800	108.747	28.002	0.000	-28.002
	D	34.552	194.333 179.897	-108.747	118.800	108.747	28.002	0.000	28.002
			Sum:	0.000	475.201	0.000	0.000	0.000	0.000
75.812	A	30.093	190.257 179.501	-112.933	103.391	-112.933	-30.462	0.000	30.462
	B	30.093	190.257 179.501	112.933	103.391	-112.933	-30.462	0.000	-30.462
	C	30.093	190.257 179.501	112.933	103.391	112.933	30.462	0.000	-30.462
	D	30.093	190.257 179.501	-112.933	103.391	112.933	30.462	0.000	30.462
			Sum:	0.000	413.563	0.000	0.000	0.000	0.000
38.562	A	16.424	188.363 179.900	-124.485	66.991	-124.485	-19.737	0.000	19.737
	B	16.424	188.363 179.900	124.485	66.991	-124.485	-19.737	0.000	-19.737
	C	16.424	188.363 179.900	124.485	66.991	124.485	19.737	0.000	-19.737
	D	16.424	188.363 179.900	-124.485	66.991	124.485	19.737	0.000	19.737
			Sum:	0.000	267.965	0.000	0.000	0.000	0.000

Guy-Tensioning Information

Guy Elevation		H	V	Temperature At Time Of Tensioning: 0 F Initial Tension	0 F Intercept	20 F Initial Tension	20 F Intercept	40 F Initial Tension	40 F Intercept	60 F Initial Tension	60 F Intercept	80 F Initial Tension	80 F Intercept	100 F Initial Tension	100 F Intercept	120 F Initial Tension	120 F Intercept
ft		ft	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft
152.771	A	163.71	152.77	208.611	15.82	197.519	16.67	188.548	17.43	179.900	18.22	171.990	19.02	164.899	19.79	158.130	20.59
	B	163.71	152.77	208.611	15.82	197.519	16.67	188.548	17.43	179.900	18.22	171.990	19.02	164.899	19.79	158.130	20.59
	C	163.71	152.77	208.611	15.82	197.519	16.67	188.548	17.43	179.900	18.22	171.990	19.02	164.899	19.79	158.130	20.59
	D	163.71	152.77	208.611	15.82	197.519	16.67	188.548	17.43	179.900	18.22	171.990	19.02	164.899	19.79	158.130	20.59
127.104	A	147.30	127.10	202.355	16.57	194.550	17.20	187.057	17.85	179.900	18.52	173.715	19.15	167.917	19.77	162.529	20.39
	B	147.30	127.10	202.355	16.57	194.550	17.20	187.057	17.85	179.900	18.52	173.715	19.15	167.917	19.77	162.529	20.39
	C	147.30	127.10	202.355	16.57	194.550	17.20	187.057	17.85	179.900	18.52	173.715	19.15	167.917	19.77	162.529	20.39
	D	147.30	127.10	202.355	16.57	194.550	17.20	187.057	17.85	179.900	18.52	173.715	19.15	167.917	19.77	162.529	20.39
101.437	A	147.30	101.44	221.503	9.96	205.901	10.70	192.152	11.44	179.900	12.19	169.430	12.92	160.286	13.63	151.863	14.35
	B	147.30	101.44	221.503	9.96	205.901	10.70	192.152	11.44	179.900	12.19	169.430	12.92	160.286	13.63	151.863	14.35
	C	147.30	101.44	221.503	9.96	205.901	10.70	192.152	11.44	179.900	12.19	169.430	12.92	160.286	13.63	151.863	14.35
	D	147.30	101.44	221.503	9.96	205.901	10.70	192.152	11.44	179.900	12.19	169.430	12.92	160.286	13.63	151.863	14.35
75.812	A	130.82	75.81	233.605	6.79	212.798	7.44	194.834	8.11	179.900	8.77	166.165	9.47	154.849	10.15	144.738	10.83
	B	130.82	75.81	233.605	6.79	212.798	7.44	194.834	8.11	179.900	8.77	166.165	9.47	154.849	10.15	144.738	10.83
	C	130.82	75.81	233.605	6.79	212.798	7.44	194.834	8.11	179.900	8.77	166.165	9.47	154.849	10.15	144.738	10.83
	D	130.82	75.81	233.605	6.79	212.798	7.44	194.834	8.11	179.900	8.77	166.165	9.47	154.849	10.15	144.738	10.83
38.562	A	130.82	38.56	212.634	9.44	199.544	10.05	189.342	10.58	179.900	11.13	171.471	11.67	163.423	12.24	156.937	12.73
	B	130.82	38.56	212.634	9.44	199.544	10.05	189.342	10.58	179.900	11.13	171.471	11.67	163.423	12.24	156.937	12.73
	C	130.82	38.56	212.634	9.44	199.544	10.05	189.342	10.58	179.900	11.13	171.471	11.67	163.423	12.24	156.937	12.73

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	Client: NRG	Designed by: Mikko Ahola, PE

			Temperature At Time Of Tensioning													
			0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation	H	V	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept
ft	ft	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft
D	130.82	38.56	212.634	9.44	199.544	10.05	189.342	10.58	179.900	11.13	171.471	11.67	163.423	12.24	156.937	12.73

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Cat5 (0.473" Dia.)	C	No	Yes	Inside Pole	165.604 - 0.000	14	No Ice	0.000	0.150
							1/2" Ice	0.000	0.150

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	165.604-152.771	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	26.949
		D	0.000	0.000	0.000	0.000	0.000
L2	152.771-127.104	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	53.901
		D	0.000	0.000	0.000	0.000	0.000
L3	127.104-101.437	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	53.901
		D	0.000	0.000	0.000	0.000	0.000
L4	101.437-75.812	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	53.812
		D	0.000	0.000	0.000	0.000	0.000
L5	75.812-38.562	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	78.225
		D	0.000	0.000	0.000	0.000	0.000
L6	38.562-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	80.980
		D	0.000	0.000	0.000	0.000	0.000

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
L1	165.604-152.771	A	0.586	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	26.949
		D		0.000	0.000	0.000	0.000	0.000
L2	152.771-127.104	A	0.580	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	53.901
		D		0.000	0.000	0.000	0.000	0.000
L3	127.104-101.437	A	0.571	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	53.901
		D		0.000	0.000	0.000	0.000	0.000
L4	101.437-75.812	A	0.559	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	53.812
		D		0.000	0.000	0.000	0.000	0.000
L5	75.812-38.562	A	0.538	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	78.225
		D		0.000	0.000	0.000	0.000	0.000
L6	38.562-0.000	A	0.487	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	80.980
		D		0.000	0.000	0.000	0.000	0.000

Antenna Pole Forces *Lightning Rod*

Length of Pole ft	Ix in⁴	Iy in⁴	Modulus E ksi		Antenna Pole C_AA_A ft²/ft	Antenna Pole Weight plf	Length of Beacon ft	Beacon C_AA_A ft²	Beacon Weight lb
5.000	1000.000	1000.000	29000.000	No Ice	0.010	0.000	0.000	0.000	0.000
				With Ice	0.020	0.000		0.000	0.000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight lb
**********									
Propellor Anemometer/Wind Vane	C	From Leg	7.920 0.000 0.000	0.000	167.979	No Ice 1/2" Ice	0.350 0.500	0.350 0.500	2.200 5.000
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.000	164.979	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000
**********									
NRG #40C Anemometer	C	From Leg	7.920	0.000	162.402	No Ice	0.200	0.250	0.200

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.000 0.000			1/2" Ice	0.350	0.350	0.500
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.000	159.402	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000
NRG #40C Anemometer	A	From Leg	7.920 0.000 0.000	0.000	162.402	No Ice 1/2" Ice	0.200 0.350	0.250 0.350	0.200 0.500
95" Boom Mount	A	From Leg	0.000 0.000 0.000	0.000	159.402	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000
***									
21" Dia. Aircraft Marker Ball (Orange)	A	From Leg	0.000 0.000 0.000	0.000	145.997	No Ice 1/2" Ice	1.130 1.241	1.130 1.241	15.000 20.000
21" Dia. Aircraft Marker Ball (Orange)	B	From Leg	0.000 0.000 0.000	0.000	145.997	No Ice 1/2" Ice	1.130 1.241	1.130 1.241	15.000 20.000
21" Dia. Aircraft Marker Ball (Orange)	C	From Leg	0.000 0.000 0.000	0.000	145.997	No Ice 1/2" Ice	1.130 1.241	1.130 1.241	15.000 20.000
21" Dia. Aircraft Marker Ball (Orange)	D	From Leg	0.000 0.000 0.000	0.000	145.997	No Ice 1/2" Ice	1.130 1.241	1.130 1.241	15.000 20.000
***									
NRG #40C Anemometer	C	From Leg	7.920 0.000 0.000	0.000	130.577	No Ice 1/2" Ice	0.200 0.350	0.250 0.350	0.200 0.500
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.000	127.577	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000
NRG #40C Anemometer	A	From Leg	7.920 0.000 0.000	0.000	130.577	No Ice 1/2" Ice	0.200 0.350	0.250 0.350	0.200 0.500
95" Boom Mount	A	From Leg	0.000 0.000 0.000	0.000	127.577	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000
***									
NRG #40C Anemometer	C	From Leg	7.920 0.000 0.000	0.000	105.315	No Ice 1/2" Ice	0.200 0.350	0.250 0.350	0.200 0.500
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.000	102.315	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000
NRG #40C Anemometer	A	From Leg	7.920 0.000 0.000	0.000	105.315	No Ice 1/2" Ice	0.200 0.350	0.250 0.350	0.200 0.500
95" Boom Mount	A	From Leg	0.000 0.000 0.000	0.000	102.315	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000
***									
NRG 200P Wind Vane	C	From Leg	7.920 0.000 0.000	0.000	156.496	No Ice 1/2" Ice	0.200 0.350	0.250 0.350	0.250 0.500
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.000	153.496	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
NRG #40C Anemometer	A	From Leg	7.920 0.000 0.000	0.000	156.496	No Ice 1/2" Ice	0.200 0.350	0.250 0.350	0.200 0.500
95" Boom Mount	A	From Leg	0.000 0.000 0.000	0.000	153.496	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000
***									
NRG 200P Wind Vane	C	From Leg	7.920 0.000 0.000	0.000	111.220	No Ice 1/2" Ice	0.200 0.350	0.250 0.350	0.250 0.500
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.000	108.220	No Ice 1/2" Ice	0.250 0.350	1.000 1.250	8.000 10.000
***									
Data Logger	C	From Leg	0.000 0.000 0.000	0.000	4.920	No Ice 1/2" Ice	4.000 4.250	4.000 4.250	50.000 55.000
Temperature Sensor	C	From Leg	0.000 0.000 0.000	0.000	49.213	No Ice 1/2" Ice	0.250 0.350	0.250 0.350	10.000 15.000
*****									
Temperature Sensor	C	From Leg	0.000 0.000 0.000	0.000	140.420	No Ice 1/2" Ice	0.250 0.350	0.250 0.350	5.000 10.000
Relative Humidity Sensor	A	From Leg	0.000 0.000 0.000	0.000	140.420	No Ice 1/2" Ice	0.350 0.500	0.350 0.500	5.000 10.000
Barometric Pressure Sensor	B	From Leg	0.000 0.000 0.000	0.000	140.420	No Ice 1/2" Ice	0.350 0.500	0.350 0.500	2.500 5.000

222-H Verification Constants

Constant	Value
K_d	0.95
Ice Thickness Importance Factor	0.8
Z_g	900
α	9.5
K_{zmin}	0.85
K_c	1
K_t	0.43
f	1.25
K_e	0.915

222-H Section Verification ArRr By Element

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Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft²	A_r w/Ice ft²	A_rR_r ft²	A_rR_r w/Ice ft²
L1 165.604-152.771	2	Guyed Pole 8" OD	119.253	71.327		1	1	8.555	9.808	8.555	9.808
							Sum:	8.555	9.808	8.555	9.808
L2 152.771-127.104	3	Guyed Pole 8" OD	118.166	70.589		1	1	17.111	19.592	17.111	19.592
							Sum:	17.111	19.592	17.111	19.592
L3 127.104-101.437	4	Guyed Pole 8" OD	116.364	69.372		1	1	17.111	19.552	17.111	19.552
							Sum:	17.111	19.552	17.111	19.552
L4 101.437-75.812	5	Guyed Pole 10" OD	142.475	82.64		1	1	21.354	23.740	21.354	23.740
							Sum:	21.354	23.740	21.354	23.740
L5 75.812-38.562	6	Guyed Pole 10" OD	137.146	79.25		1	1	31.042	34.380	31.042	34.380
							Sum:	31.042	34.380	31.042	34.380
L6 38.562-0.000	7	Guyed Pole 10" OD	123.791	70.874		1	1	32.135	35.263	32.135	35.263
							Sum:	32.135	35.263	32.135	35.263

222-H Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft²
L1 165.604-152.771	159.188		1.396	1.142	1.895		0.078		1	8.555
L2 152.771-127.104	139.938		1.358	1.124	1.912		0.076		1	17.111
L3 127.104-101.437	114.271		1.302	1.1	1.935		0.074		1	17.111
L4 101.437-75.812	88.625		1.234	1.077	1.958		0.071		1	21.354
L5 75.812-38.562	57.467		1.126	1.049	1.988		0.066		1	31.042
L6 38.562-0.000	19.894		0.901	1.017	2.025		0.054		1	32.135

222-H Section Verification Tables - Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft²
L1 165.604-152.771	159.188	159.188	1.396	1.142	1.895	0.586	0.021		1	9.808
L2 152.771-127.104	139.938	139.938	1.358	1.124	1.912	0.580	0.021		1	19.592
L3 127.104-101.437	114.271	114.271	1.302	1.1	1.935	0.571	0.020		1	19.552
L4 101.437-75.812	88.625	88.625	1.234	1.077	1.958	0.559	0.019		1	23.740
L5 75.812-38.562	57.467	57.187	1.126	1.049	1.988	0.538	0.018		1	34.380
L6 38.562-0.000	19.894	19.281	0.901	1.017	2.025	0.487	0.015		1	35.263

222-H Section Verification Tables - Service

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	Client: NRG	Designed by: Mikko Ahola, PE

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft²
L1 165.604-152.771	159.188		1.396	1.142	1.895		0.019		1	8.555
L2 152.771-127.104	139.938		1.358	1.124	1.912		0.019		1	17.111
L3 127.104-101.437	114.271		1.302	1.1	1.935		0.018		1	17.111
L4 101.437-75.812	88.625		1.234	1.077	1.958		0.017		1	21.354
L5 75.812-38.562	57.467		1.126	1.049	1.988		0.016		1	31.042
L6 38.562-0.000	19.894		0.901	1.017	2.025		0.013		1	32.135

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	26.949	103.024	A	1	0.6	0.078	1	1	8.555	439.402	34.240	D
165.604-152.7			B	1	0.6		1	1	8.555			
71			C	1	0.6		1	1	8.555			
			D	1	0.6		1	1	8.555			
L2	53.901	206.055	A	1	0.6	0.076	1	1	17.111	862.897	33.619	D
152.771-127.1			B	1	0.6		1	1	17.111			
04			C	1	0.6		1	1	17.111			
			D	1	0.6		1	1	17.111			
L3	53.901	206.055	A	1	0.6	0.074	1	1	17.111	836.786	32.602	D
127.104-101.4			B	1	0.6		1	1	17.111			
37			C	1	0.6		1	1	17.111			
			D	1	0.6		1	1	17.111			
L4	53.812	268.511	A	1	0.6	0.071	1	1	21.354	1001.919	39.099	D
101.437-75.81			B	1	0.6		1	1	21.354			
2			C	1	0.6		1	1	21.354			
			D	1	0.6		1	1	21.354			
L5	78.225	390.323	A	1	0.6	0.066	1	1	31.042	1345.147	36.111	D
75.812-38.562			B	1	0.6		1	1	31.042			
			C	1	0.6		1	1	31.042			
			D	1	0.6		1	1	31.042			
L6	80.980	404.071	A	1	0.6	0.054	1	1	32.135	1152.718	29.893	D
38.562-0.000			B	1	0.6		1	1	32.135			
			C	1	0.6		1	1	32.135			
			D	1	0.6		1	1	32.135			
Sum Weight:	347.768	1578.039								5638.869		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	26.949	103.024	A	1	0.6	0.078	1	1	8.555	439.402	34.240	D
165.604-152.7			B	1	0.6		1	1	8.555			
71			C	1	0.6		1	1	8.555			
			D	1	0.6		1	1	8.555			
L2	53.901	206.055	A	1	0.6	0.076	1	1	17.111	862.897	33.619	D

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	Client: NRG	Designed by: Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
152.771-127.104			B	1	0.6		1	1	17.111			
			C	1	0.6		1	1	17.111			
			D	1	0.6		1	1	17.111			
L3 127.104-101.437	53.901	206.055	A	1	0.6	0.074	1	1	17.111	836.786	32.602	D
			B	1	0.6		1	1	17.111			
			C	1	0.6		1	1	17.111			
			D	1	0.6		1	1	17.111			
L4 101.437-75.812	53.812	268.511	A	1	0.6	0.071	1	1	21.354	1001.919	39.099	D
			B	1	0.6		1	1	21.354			
			C	1	0.6		1	1	21.354			
			D	1	0.6		1	1	21.354			
L5 75.812-38.562	78.225	390.323	A	1	0.6	0.066	1	1	31.042	1345.147	36.111	D
			B	1	0.6		1	1	31.042			
			C	1	0.6		1	1	31.042			
			D	1	0.6		1	1	31.042			
L6 38.562-0.000	80.980	404.071	A	1	0.6	0.054	1	1	32.135	1152.718	29.893	D
			B	1	0.6		1	1	32.135			
			C	1	0.6		1	1	32.135			
			D	1	0.6		1	1	32.135			
Sum Weight:	347.768	1578.039								5638.869		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 165.604-152.771	26.949	181.843	A	1	1.2	0.021	1	1	9.808	274.239	21.370	D
			B	1	1.2		1	1	9.808			
			C	1	1.2		1	1	9.808			
			D	1	1.2		1	1	9.808			
L2 152.771-127.104	53.901	362.059	A	1	1.2	0.021	1	1	19.592	537.880	20.956	D
			B	1	1.2		1	1	19.592			
			C	1	1.2		1	1	19.592			
			D	1	1.2		1	1	19.592			
L3 127.104-101.437	53.901	359.404	A	1	1.2	0.020	1	1	19.552	520.550	20.281	D
			B	1	1.2		1	1	19.552			
			C	1	1.2		1	1	19.552			
			D	1	1.2		1	1	19.552			
L4 101.437-75.812	53.812	453.168	A	1	1.2	0.019	1	1	23.740	606.411	23.665	D
			B	1	1.2		1	1	23.740			
			C	1	1.2		1	1	23.740			
			D	1	1.2		1	1	23.740			
L5 75.812-38.562	78.225	648.210	A	1	1.2	0.018	1	1	34.380	811.092	21.774	D
			B	1	1.2		1	1	34.380			
			C	1	1.2		1	1	34.380			
			D	1	1.2		1	1	34.380			
L6 38.562-0.000	80.980	644.554	A	1	1.2	0.015	1	1	35.263	688.661	17.859	D
			B	1	1.2		1	1	35.263			
			C	1	1.2		1	1	35.263			
			D	1	1.2		1	1	35.263			
Sum Weight:	347.768	2649.238								3438.833		

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 16 of 32
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	Client: NRG	Designed by: Mikko Ahola, PE

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	26.949	181.843	A	1	1.2	0.021	1	1	9.808	274.239	21.370	D
165.604-152.7			B	1	1.2		1	1	9.808			
71			C	1	1.2		1	1	9.808			
			D	1	1.2		1	1	9.808			
L2	53.901	362.059	A	1	1.2	0.021	1	1	19.592	537.880	20.956	D
152.771-127.1			B	1	1.2		1	1	19.592			
04			C	1	1.2		1	1	19.592			
			D	1	1.2		1	1	19.592			
L3	53.901	359.404	A	1	1.2	0.020	1	1	19.552	520.550	20.281	D
127.104-101.4			B	1	1.2		1	1	19.552			
37			C	1	1.2		1	1	19.552			
			D	1	1.2		1	1	19.552			
L4	53.812	453.168	A	1	1.2	0.019	1	1	23.740	606.411	23.665	D
101.437-75.81			B	1	1.2		1	1	23.740			
2			C	1	1.2		1	1	23.740			
			D	1	1.2		1	1	23.740			
L5	78.225	648.210	A	1	1.2	0.018	1	1	34.380	811.092	21.774	D
75.812-38.562			B	1	1.2		1	1	34.380			
			C	1	1.2		1	1	34.380			
			D	1	1.2		1	1	34.380			
L6	80.980	644.554	A	1	1.2	0.015	1	1	35.263	688.661	17.859	D
38.562-0.000			B	1	1.2		1	1	35.263			
			C	1	1.2		1	1	35.263			
			D	1	1.2		1	1	35.263			
Sum Weight:	347.768	2649.238								3438.833		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	26.949	103.024	A	1	0.752	0.019	1	1	8.555	134.165	10.455	D
165.604-152.7			B	1	0.752		1	1	8.555			
71			C	1	0.752		1	1	8.555			
			D	1	0.752		1	1	8.555			
L2	53.901	206.055	A	1	0.759	0.019	1	1	17.111	265.895	10.359	D
152.771-127.1			B	1	0.759		1	1	17.111			
04			C	1	0.759		1	1	17.111			
			D	1	0.759		1	1	17.111			
L3	53.901	206.055	A	1	0.771	0.018	1	1	17.111	261.841	10.201	D
127.104-101.4			B	1	0.771		1	1	17.111			
37			C	1	0.771		1	1	17.111			
			D	1	0.771		1	1	17.111			
L4	53.812	268.511	A	1	0.63	0.017	1	1	21.354	256.057	9.992	D
101.437-75.81			B	1	0.63		1	1	21.354			
2			C	1	0.63		1	1	21.354			
			D	1	0.63		1	1	21.354			
L5	78.225	390.323	A	1	0.654	0.016	1	1	31.042	357.132	9.587	D

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 17 of 32
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	Client: NRG	Designed by: Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
75.812-38.562			B	1	0.654		1	1	31.042			
			C	1	0.654		1	1	31.042			
			D	1	0.654		1	1	31.042			
L6	80.980	404.071	A	1	0.725	0.013	1	1	32.135	339.062	8.793	D
38.562-0.000			B	1	0.725		1	1	32.135			
			C	1	0.725		1	1	32.135			
			D	1	0.725		1	1	32.135			
Sum Weight:	347.768	1578.039								1614.150		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	26.949	103.024	A	1	0.752	0.019	1	1	8.555	134.165	10.455	D
165.604-152.7			B	1	0.752		1	1	8.555			
71			C	1	0.752		1	1	8.555			
			D	1	0.752		1	1	8.555			
L2	53.901	206.055	A	1	0.759	0.019	1	1	17.111	265.895	10.359	D
152.771-127.1			B	1	0.759		1	1	17.111			
04			C	1	0.759		1	1	17.111			
			D	1	0.759		1	1	17.111			
L3	53.901	206.055	A	1	0.771	0.018	1	1	17.111	261.841	10.201	D
127.104-101.4			B	1	0.771		1	1	17.111			
37			C	1	0.771		1	1	17.111			
			D	1	0.771		1	1	17.111			
L4	53.812	268.511	A	1	0.63	0.017	1	1	21.354	256.057	9.992	D
101.437-75.81			B	1	0.63		1	1	21.354			
2			C	1	0.63		1	1	21.354			
			D	1	0.63		1	1	21.354			
L5	78.225	390.323	A	1	0.654	0.016	1	1	31.042	357.132	9.587	D
75.812-38.562			B	1	0.654		1	1	31.042			
			C	1	0.654		1	1	31.042			
			D	1	0.654		1	1	31.042			
L6	80.980	404.071	A	1	0.725	0.013	1	1	32.135	339.062	8.793	D
38.562-0.000			B	1	0.725		1	1	32.135			
			C	1	0.725		1	1	32.135			
			D	1	0.725		1	1	32.135			
Sum Weight:	347.768	1578.039								1614.150		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	1578.039			
Bracing Weight	0.000			

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 18 of 32
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	Client: NRG	Designed by: Mikko Ahola, PE

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Total Member Self-Weight	1578.039			
Guy Weight	576.985			
Total Weight	2719.392			
Wind 0 deg - No Ice		0.000	-7324.152	410.134
Wind 45 deg - No Ice		5178.958	-5178.958	570.206
Wind 90 deg - No Ice		7324.152	0.000	396.260
Wind 135 deg - No Ice		5178.958	5178.958	-9.810
Wind 180 deg - No Ice		0.000	7324.152	-410.134
Wind 225 deg - No Ice		-5178.958	5178.958	-570.206
Wind 270 deg - No Ice		-7324.152	0.000	-396.260
Wind 315 deg - No Ice		-5178.958	-5178.958	9.810
Member Ice	1071.200			
Guy Ice	2123.596			
Total Weight Ice	5990.891			
Wind 0 deg - Ice		0.000	-4017.747	155.778
Wind 45 deg - Ice		2840.976	-2840.976	216.306
Wind 90 deg - Ice		4017.747	0.000	150.124
Wind 135 deg - Ice		2840.976	2840.976	-3.998
Wind 180 deg - Ice		0.000	4017.747	-155.778
Wind 225 deg - Ice		-2840.976	2840.976	-216.306
Wind 270 deg - Ice		-4017.747	0.000	-150.124
Wind 315 deg - Ice		-2840.976	-2840.976	3.998
Total Weight	2719.392			
Wind 0 deg - Service		0.000	-2024.614	99.891
Wind 45 deg - Service		1431.618	-1431.618	138.878
Wind 90 deg - Service		2024.614	0.000	96.512
Wind 135 deg - Service		1431.618	1431.618	-2.389
Wind 180 deg - Service		0.000	2024.614	-99.891
Wind 225 deg - Service		-1431.618	1431.618	-138.878
Wind 270 deg - Service		-2024.614	0.000	-96.512
Wind 315 deg - Service		-1431.618	-1431.618	2.389

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.0 Wind 45 deg - No Ice+1.0 Guy
4	1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy
5	1.2 Dead+1.0 Wind 135 deg - No Ice+1.0 Guy
6	1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy
7	1.2 Dead+1.0 Wind 225 deg - No Ice+1.0 Guy
8	1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy
9	1.2 Dead+1.0 Wind 315 deg - No Ice+1.0 Guy
10	1.2 Dead+1.0 Ice+Guy
11	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Guy
12	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Guy
13	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Guy
14	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Guy
15	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Guy
16	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Guy
17	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Guy
18	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Guy

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 19 of 32
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	Client: NRG	Designed by: Mikko Ahola, PE

Comb. No.	Description
19	Dead+Wind 0 deg - Service+Guy
20	Dead+Wind 45 deg - Service+Guy
21	Dead+Wind 90 deg - Service+Guy
22	Dead+Wind 135 deg - Service+Guy
23	Dead+Wind 180 deg - Service+Guy
24	Dead+Wind 225 deg - Service+Guy
25	Dead+Wind 270 deg - Service+Guy
26	Dead+Wind 315 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	165.604 - 152.771	Pole	Max Tension	5	0.398	-10.313	-10.057
			Max. Compression	10	-302.793	-37.217	-37.240
			Max. Mx	4	-152.142	-6329.101	-54.897
			Max. My	6	-152.147	-57.033	-6329.083
			Max. Vy	4	998.750	-6329.101	-54.897
			Max. Vx	6	998.764	-57.033	-6329.083
			Max. Torque	3			-278.513
		Pole Antenna	Max Tension	5	4.040	-0.064	-2.969
			Max. Compression	12	-0.240	13.102	9.471
			Max. Mx	2	0.167	-51.694	-1.574
			Max. My	8	0.215	-1.448	-49.678
			Max. Vy	2	-20.676	-51.694	-1.574
			Max. Vx	8	-19.869	-1.448	-49.678
			Max. Torque	6			0.000
L2	152.771 - 127.104	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	13	-6543.403	-2953.497	-22.791
			Max. Mx	4	-5895.394	-5402.847	-61.533
			Max. My	6	-5895.337	-63.949	-5402.832
			Max. Vy	8	-697.702	4992.490	-43.864
			Max. Vx	2	-697.664	-46.011	4993.047
			Max. Torque	3			-256.307
		Guy A	Bottom Tension	5	4010.946		
			Top Tension	5	4029.750		
			Top Cable Vert	5	2823.018		
			Top Cable Norm	5	2875.667		
			Top Cable Tan	5	0.003		
			Bot Cable Vert	5	-2609.936		
			Bot Cable Norm	5	3045.640		
			Bot Cable Tan	5	0.003		
		Guy B	Bottom Tension	7	4008.714		
			Top Tension	7	4027.519		
			Top Cable Vert	7	2821.523		
			Top Cable Norm	7	2874.007		
			Top Cable Tan	7	0.037		
			Bot Cable Vert	7	-2608.442		
			Bot Cable Norm	7	3043.980		
			Bot Cable Tan	7	0.037		
		Guy C	Bottom Tension	9	4008.227		
			Top Tension	9	4027.032		
			Top Cable Vert	9	2821.197		
			Top Cable Norm	9	2873.645		
			Top Cable Tan	9	0.005		
			Bot Cable Vert	9	-2608.116		

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 20 of 32
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	Client: NRG	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Norm	9	3043.618		
			Bot Cable Tan	9	0.005		
		Guy D	Bottom Tension	3	4008.804		
			Top Tension	3	4027.610		
			Top Cable Vert	3	2821.584		
			Top Cable Norm	3	2874.075		
			Top Cable Tan	3	0.029		
			Bot Cable Vert	3	-2608.502		
			Bot Cable Norm	3	3044.048		
			Bot Cable Tan	3	0.029		
L3	127.104 - 101.437	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	13	-11679.589	-4309.427	-11.796
			Max. Mx	4	-11052.515	-5849.436	-41.726
			Max. My	6	-11052.490	-43.476	-5849.502
			Max. Vy	8	-615.403	5848.720	-41.673
			Max. Vx	2	-615.368	-43.423	5848.645
			Max. Torque	3			-430.829
		Guy A	Bottom Tension	5	2825.258		
			Top Tension	5	2847.594		
			Top Cable Vert	5	1944.007		
			Top Cable Norm	5	2080.776		
			Top Cable Tan	5	0.000		
			Bot Cable Vert	5	-1734.188		
			Bot Cable Norm	5	2230.398		
			Bot Cable Tan	5	0.000		
		Guy B	Bottom Tension	7	2826.145		
			Top Tension	7	2848.481		
			Top Cable Vert	7	1944.579		
			Top Cable Norm	7	2081.455		
			Top Cable Tan	7	0.054		
			Bot Cable Vert	7	-1734.760		
			Bot Cable Norm	7	2231.077		
			Bot Cable Tan	7	0.054		
		Guy C	Bottom Tension	9	2826.800		
			Top Tension	9	2849.135		
			Top Cable Vert	9	1945.001		
			Top Cable Norm	9	2081.956		
			Top Cable Tan	9	0.002		
			Bot Cable Vert	9	-1735.183		
			Bot Cable Norm	9	2231.578		
			Bot Cable Tan	9	0.002		
		Guy D	Bottom Tension	3	2826.094		
			Top Tension	3	2848.430		
			Top Cable Vert	3	1944.546		
			Top Cable Norm	3	2081.416		
			Top Cable Tan	3	0.052		
			Bot Cable Vert	3	-1734.727		
			Bot Cable Norm	3	2231.038		
			Bot Cable Tan	3	0.052		
L4	101.437 - 75.812	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	13	-15622.832	-4265.920	-6.497
			Max. Mx	8	-14516.965	6567.278	-35.952
			Max. My	2	-14516.974	-37.349	6567.092
			Max. Vy	8	-444.794	6567.278	-35.952
			Max. Vx	2	-444.790	-37.349	6567.092
			Max. Torque	3			-420.346
		Guy A	Bottom Tension	5	2110.464		
			Top Tension	5	2124.403		
			Top Cable Vert	5	1261.452		

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 21 of 32
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	Client: NRG	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Cable Norm	5	1709.335		
			Top Cable Tan	5	0.001		
			Bot Cable Vert	5	-1127.477		
			Bot Cable Norm	5	1784.056		
			Bot Cable Tan	5	0.001		
		Guy B	Bottom Tension	7	2111.434		
			Top Tension	7	2125.373		
			Top Cable Vert	7	1261.997		
			Top Cable Norm	7	1710.138		
			Top Cable Tan	7	0.041		
			Bot Cable Vert	7	-1128.023		
			Bot Cable Norm	7	1784.859		
			Bot Cable Tan	7	0.041		
		Guy C	Bottom Tension	9	2111.766		
			Top Tension	9	2125.704		
			Top Cable Vert	9	1262.183		
			Top Cable Norm	9	1710.412		
			Top Cable Tan	9	0.001		
			Bot Cable Vert	9	-1128.209		
			Bot Cable Norm	9	1785.133		
			Bot Cable Tan	9	0.001		
		Guy D	Bottom Tension	3	2111.392		
			Top Tension	3	2125.330		
			Top Cable Vert	3	1261.973		
			Top Cable Norm	3	1710.103		
			Top Cable Tan	3	0.041		
			Bot Cable Vert	3	-1127.999		
			Bot Cable Norm	3	1784.823		
			Bot Cable Tan	3	0.041		
L5	75.812 - 38.562	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	13	-19039.266	-215.522	-1.099
			Max. Mx	8	-16988.165	6139.853	-35.505
			Max. My	2	-16988.173	-36.884	6139.670
			Max. Vy	4	-852.585	-6138.081	-35.517
			Max. Vx	6	-852.584	-36.897	-6138.265
			Max. Torque	3			-418.095
		Guy A	Bottom Tension	5	2040.195		
			Top Tension	5	2050.680		
			Top Cable Vert	5	1066.760		
			Top Cable Norm	5	1751.374		
			Top Cable Tan	5	0.001		
			Bot Cable Vert	5	-974.254		
			Bot Cable Norm	5	1792.548		
			Bot Cable Tan	5	0.001		
		Guy B	Bottom Tension	7	2040.308		
			Top Tension	7	2050.792		
			Top Cable Vert	7	1066.816		
			Top Cable Norm	7	1751.471		
			Top Cable Tan	7	0.032		
			Bot Cable Vert	7	-974.310		
			Bot Cable Norm	7	1792.645		
			Bot Cable Tan	7	0.032		
		Guy C	Bottom Tension	9	2040.302		
			Top Tension	9	2050.786		
			Top Cable Vert	9	1066.813		
			Top Cable Norm	9	1751.466		
			Top Cable Tan	9	0.000		
			Bot Cable Vert	9	-974.307		
			Bot Cable Norm	9	1792.640		
			Bot Cable Tan	9	0.000		

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	Client: NRG	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Guy D	Bottom Tension	3	2040.307		
			Top Tension	3	2050.791		
			Top Cable Vert	3	1066.816		
			Top Cable Norm	3	1751.471		
			Top Cable Tan	3	0.033		
			Bot Cable Vert	3	-974.309		
			Bot Cable Norm	3	1792.644		
			Bot Cable Tan	3	0.033		
L6	38.562 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	13	-21286.093	-0.013	3.299
			Max. Mx	4	-19212.861	9492.713	30.777
			Max. My	6	-19212.853	31.509	9492.722
			Max. Vy	8	-1057.041	0.010	13.331
			Max. Vx	2	-1057.041	13.782	0.010
			Max. Torque	3			-506.206
		Guy A	Bottom Tension	5	1968.176		
			Top Tension	5	1976.561		
			Top Cable Vert	5	582.770		
			Top Cable Norm	5	1888.696		
			Top Cable Tan	5	0.000		
			Bot Cable Vert	5	-526.635		
			Bot Cable Norm	5	1896.411		
			Bot Cable Tan	5	0.000		
		Guy B	Bottom Tension	7	1966.889		
			Top Tension	7	1975.273		
			Top Cable Vert	7	582.409		
			Top Cable Norm	7	1887.459		
			Top Cable Tan	7	0.014		
			Bot Cable Vert	7	-526.275		
			Bot Cable Norm	7	1895.174		
			Bot Cable Tan	7	0.014		
		Guy C	Bottom Tension	9	1965.852		
			Top Tension	9	1974.237		
			Top Cable Vert	9	582.119		
			Top Cable Norm	9	1886.464		
			Top Cable Tan	9	0.000		
			Bot Cable Vert	9	-525.985		
			Bot Cable Norm	9	1894.179		
			Bot Cable Tan	9	0.000		
		Guy D	Bottom Tension	3	1966.899		
			Top Tension	3	1975.283		
			Top Cable Vert	3	582.412		
			Top Cable Norm	3	1887.469		
			Top Cable Tan	3	0.013		
			Bot Cable Vert	3	-526.278		
			Bot Cable Norm	3	1895.184		
			Bot Cable Tan	3	0.013		

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	13	21294.697	-85.071	0.662
	Max. H_x	8	19557.715	311.891	0.219
	Max. H_z	2	19557.726	0.202	311.889
	Max. M_x	1	0.000	0.372	0.372

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	Client: NRG	Designed by: Mikko Ahola, PE

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Max. M_z	1	0.000	0.372	0.372
	Max. Torsion	7	503.424	256.820	-256.209
	Min. Vert	1	4454.768	0.372	0.372
	Min. H_x	4	19558.334	-310.519	0.218
	Min. H_z	6	19558.326	0.201	-310.522
	Min. M_x	1	0.000	0.372	0.372
	Min. M_z	1	0.000	0.372	0.372
	Min. Torsion	3	-506.481	-256.213	256.814
Guy D @ 164.042 ft Elev 0 ft Azimuth 225 deg	Max. Vert	24	-106.636	-61.234	61.234
	Max. H_x	24	-106.636	-61.234	61.234
	Max. H_z	3	-2608.502	-2152.487	2152.446
	Min. Vert	3	-2608.502	-2152.487	2152.446
	Min. H_x	3	-2608.502	-2152.487	2152.446
	Min. H_z	24	-106.636	-61.234	61.234
Guy C @ 164.042 ft Elev 0 ft Azimuth 135 deg	Max. Vert	22	-106.592	61.200	61.200
	Max. H_x	9	-2608.116	2152.159	2152.167
	Max. H_z	9	-2608.116	2152.159	2152.167
	Min. Vert	9	-2608.116	2152.159	2152.167
	Min. H_x	22	-106.592	61.200	61.200
	Min. H_z	22	-106.592	61.200	61.200
Guy B @ 164.042 ft Elev 0 ft Azimuth 45 deg	Max. Vert	20	-106.633	61.232	-61.231
	Max. H_x	7	-2608.442	2152.393	-2152.446
	Max. H_z	20	-106.633	61.232	-61.231
	Min. Vert	7	-2608.442	2152.393	-2152.446
	Min. H_x	20	-106.633	61.232	-61.231
	Min. H_z	7	-2608.442	2152.393	-2152.446
Guy A @ 164.042 ft Elev 0 ft Azimuth -45 deg	Max. Vert	26	-106.677	-61.265	-61.265
	Max. H_x	26	-106.677	-61.265	-61.265
	Max. H_z	26	-106.677	-61.265	-61.265
	Min. Vert	5	-2609.936	-2153.590	-2153.595
	Min. H_x	5	-2609.936	-2153.590	-2153.595
	Min. H_z	5	-2609.936	-2153.590	-2153.595
Guy D @ 147.638 ft Elev 0 ft Azimuth 225 deg	Max. Vert	24	-116.318	-81.090	81.092
	Max. H_x	24	-116.318	-81.090	81.092
	Max. H_z	3	-2862.726	-2839.708	2839.577
	Min. Vert	3	-2862.726	-2839.708	2839.577
	Min. H_x	3	-2862.726	-2839.708	2839.577
	Min. H_z	24	-116.318	-81.090	81.092
Guy C @ 147.638 ft Elev 0 ft Azimuth 135 deg	Max. Vert	22	-116.359	81.128	81.128
	Max. H_x	9	-2863.391	2840.241	2840.245
	Max. H_z	9	-2863.391	2840.241	2840.245
	Min. Vert	9	-2863.391	2840.241	2840.245
	Min. H_x	22	-116.359	81.128	81.128

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	Client: NRG	Designed by: Mikko Ahola, PE

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H_z	22	-116.359	81.128	81.128
Guy B @ 147.638 ft	Max. Vert	20	-116.321	81.094	-81.093
Elev 0 ft					
Azimuth 45 deg					
	Max. H_x	7	-2862.783	2839.629	-2839.762
	Max. H_z	20	-116.321	81.094	-81.093
	Min. Vert	7	-2862.783	2839.629	-2839.762
	Min. H_x	20	-116.321	81.094	-81.093
	Min. H_z	7	-2862.783	2839.629	-2839.762
Guy A @ 147.638 ft	Max. Vert	26	-116.280	-81.056	-81.056
Elev 0 ft					
Azimuth -45 deg					
	Max. H_x	26	-116.280	-81.056	-81.056
	Max. H_z	26	-116.280	-81.056	-81.056
	Min. Vert	5	-2861.665	-2838.648	-2838.647
	Min. H_x	5	-2861.665	-2838.648	-2838.647
	Min. H_z	5	-2861.665	-2838.648	-2838.647
Guy D @ 131.234 ft	Max. Vert	24	-17.284	-64.382	64.382
Elev 0 ft					
Azimuth 225 deg					
	Max. H_x	24	-17.284	-64.382	64.382
	Max. H_z	3	-1500.587	-2607.721	2607.656
	Min. Vert	3	-1500.587	-2607.721	2607.656
	Min. H_x	3	-1500.587	-2607.721	2607.656
	Min. H_z	24	-17.284	-64.382	64.382
Guy C @ 131.234 ft	Max. Vert	22	-17.274	64.357	64.357
Elev 0 ft					
Azimuth 135 deg					
	Max. H_x	9	-1500.292	2606.974	2606.975
	Max. H_z	9	-1500.292	2606.974	2606.975
	Min. Vert	9	-1500.292	2606.974	2606.975
	Min. H_x	22	-17.274	64.357	64.357
	Min. H_z	22	-17.274	64.357	64.357
Guy B @ 131.234 ft	Max. Vert	20	-17.284	64.382	-64.382
Elev 0 ft					
Azimuth 45 deg					
	Max. H_x	7	-1500.585	2607.650	-2607.715
	Max. H_z	20	-17.284	64.382	-64.382
	Min. Vert	7	-1500.585	2607.650	-2607.715
	Min. H_x	20	-17.284	64.382	-64.382
	Min. H_z	7	-1500.585	2607.650	-2607.715
Guy A @ 131.234 ft	Max. Vert	26	-17.294	-64.406	-64.406
Elev 0 ft					
Azimuth -45 deg					
	Max. H_x	26	-17.294	-64.406	-64.406
	Max. H_z	26	-17.294	-64.406	-64.406
	Min. Vert	5	-1500.889	-2608.488	-2608.487
	Min. H_x	5	-1500.889	-2608.488	-2608.487
	Min. H_z	5	-1500.889	-2608.488	-2608.487

Tower Mast Reaction Summary

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Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead Only	4454.768	-0.372	-0.372	0.000	0.000	-0.000
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	19557.726	-0.202	-311.889	0.000	0.000	361.599
1.2 Dead+1.0 Wind 45 deg - No Ice+1.0 Guy	19142.824	256.213	-256.814	0.000	0.000	506.481
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	19558.334	310.519	-0.218	0.000	0.000	349.748
1.2 Dead+1.0 Wind 135 deg - No Ice+1.0 Guy	19143.393	255.835	255.816	0.000	0.000	-9.919
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	19558.326	-0.201	310.522	0.000	0.000	-361.589
1.2 Dead+1.0 Wind 225 deg - No Ice+1.0 Guy	19142.823	-256.820	256.209	0.000	0.000	-503.424
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	19557.715	-311.891	-0.219	0.000	0.000	-349.758
1.2 Dead+1.0 Wind 315 deg - No Ice+1.0 Guy	19142.818	-257.158	-257.167	0.000	0.000	6.857
1.2 Dead+1.0 Ice+Guy	11321.660	-0.510	-0.511	0.000	0.000	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Guy	21293.777	-0.662	-86.724	0.000	0.000	138.380
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Guy	20772.530	86.706	-88.004	0.000	0.000	193.620
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Guy	21294.697	85.071	-0.662	0.000	0.000	133.522
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Guy	20772.884	86.576	86.571	0.000	0.000	-4.221
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Guy	21294.677	-0.661	85.076	0.000	0.000	-138.376
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Guy	20772.521	-88.011	86.708	0.000	0.000	-192.059
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Guy	21293.756	-86.729	-0.663	0.000	0.000	-133.526
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Guy	20772.150	-88.141	-88.140	0.000	0.000	2.661
Dead+Wind 0 deg - Service+Guy	7948.089	-0.437	-173.782	0.000	0.000	95.897
Dead+Wind 45 deg - Service+Guy	7764.790	129.352	-130.205	0.000	0.000	133.553
Dead+Wind 90 deg - Service+Guy	7948.599	172.872	-0.438	0.000	0.000	92.694
Dead+Wind 135 deg - Service+Guy	7765.034	129.324	129.323	0.000	0.000	-2.306
Dead+Wind 180 deg - Service+Guy	7948.591	-0.437	172.872	0.000	0.000	-95.896
Dead+Wind 225 deg - Service+Guy	7764.784	-130.205	129.352	0.000	0.000	-133.477
Dead+Wind 270 deg - Service+Guy	7948.080	-173.782	-0.438	0.000	0.000	-92.695
Dead+Wind 315 deg - Service+Guy	7764.519	-130.246	-130.247	0.000	0.000	2.230

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.000	-2719.386	0.000	0.008	2719.386	0.008	0.000%

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Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
2	0.000	-3147.867	-12028.785	-0.012	3147.910	12029.446	0.005%
3	8845.378	-3147.867	-8845.378	-8845.454	3147.875	8845.453	0.001%
4	12028.785	-3147.867	0.000	-12029.444	3147.910	-0.011	0.005%
5	8845.378	-3147.867	8845.378	-8845.707	3147.901	-8845.707	0.004%
6	0.000	-3147.867	12028.785	-0.012	3147.910	-12029.444	0.005%
7	-8845.378	-3147.867	8845.378	8845.453	3147.875	-8845.454	0.001%
8	-12028.785	-3147.867	0.000	12029.446	3147.910	-0.011	0.005%
9	-8845.378	-3147.867	-8845.378	8845.707	3147.901	8845.707	0.004%
10	0.000	-6419.342	0.000	0.027	6419.341	0.026	0.001%
11	0.000	-6419.342	-9679.287	-0.002	6419.328	9679.087	0.002%
12	7236.837	-6419.342	-7236.837	-7236.726	6419.329	7236.720	0.001%
13	9679.287	-6419.342	0.000	-9679.086	6419.328	-0.002	0.002%
14	7236.837	-6419.342	7236.837	-7236.722	6419.329	-7236.722	0.001%
15	0.000	-6419.342	9679.287	-0.002	6419.328	-9679.086	0.002%
16	-7236.837	-6419.342	7236.837	7236.720	6419.329	-7236.726	0.001%
17	-9679.287	-6419.342	0.000	9679.087	6419.328	-0.002	0.002%
18	-7236.837	-6419.342	-7236.837	7236.723	6419.329	7236.723	0.001%
19	0.000	-2719.386	-3170.465	-0.001	2719.390	3170.726	0.006%
20	2324.604	-2719.386	-2324.604	-2324.749	2719.389	2324.749	0.005%
21	3170.465	-2719.386	0.000	-3170.726	2719.390	-0.001	0.006%
22	2324.604	-2719.386	2324.604	-2324.749	2719.390	-2324.749	0.005%
23	0.000	-2719.386	3170.465	-0.001	2719.390	-3170.726	0.006%
24	-2324.604	-2719.386	2324.604	2324.749	2719.389	-2324.749	0.005%
25	-3170.465	-2719.386	0.000	3170.726	2719.390	-0.001	0.006%
26	-2324.604	-2719.386	-2324.604	2324.749	2719.389	2324.749	0.005%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	13	0.00000001	0.00000001
2	Yes	29	0.00009197	0.00009029
3	Yes	35	0.00000001	0.00006963
4	Yes	29	0.00009164	0.00008671
5	Yes	32	0.00009724	0.00003794
6	Yes	29	0.00009166	0.00008991
7	Yes	35	0.00000001	0.00006909
8	Yes	29	0.00009197	0.00008709
9	Yes	32	0.00009724	0.00003741
10	Yes	13	0.00000001	0.00000001
11	Yes	35	0.00007026	0.00002507
12	Yes	33	0.00007112	0.00003302
13	Yes	35	0.00007073	0.00002433
14	Yes	33	0.00007144	0.00000780
15	Yes	35	0.00007072	0.00002526
16	Yes	33	0.00007110	0.00003270
17	Yes	35	0.00007025	0.00002413
18	Yes	33	0.00007076	0.00000761
19	Yes	28	0.00000001	0.00002851
20	Yes	30	0.00000001	0.00004387
21	Yes	28	0.00000001	0.00002817
22	Yes	30	0.00000001	0.00002120
23	Yes	28	0.00000001	0.00002856
24	Yes	30	0.00000001	0.00004384
25	Yes	28	0.00000001	0.00002811
26	Yes	30	0.00000001	0.00002114

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Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	170.604 - 165.604	12.572	21	0.894	0.196
Antenna					
L1	165.604 - 152.771	11.636	21	0.894	0.196
L2	152.771 - 127.104	9.323	21	0.771	0.179
L3	127.104 - 101.437	5.773	25	0.559	0.147
L4	101.437 - 75.812	3.499	25	0.253	0.107
L5	75.812 - 38.562	2.776	23	0.051	0.080
L6	38.562 - 0	2.749	21	0.105	0.041

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
167.979	Propellor Anemometer/Wind Vane	21	12.080	0.897	0.196	33469
164.979	95" Boom Mount	21	11.519	0.892	0.196	27357
162.402	NRG #40C Anemometer	21	11.040	0.876	0.194	13998
159.402	95" Boom Mount	21	10.489	0.848	0.190	8416
156.496	NRG 200P Wind Vane	21	9.967	0.815	0.185	6065
153.496	95" Boom Mount	21	9.446	0.779	0.180	4937
152.771	Guy	21	9.323	0.771	0.179	4812
145.997	21" Dia. Aircraft Marker Ball (Orange)	21	8.243	0.706	0.170	5023
140.420	Temperature Sensor	19	7.438	0.662	0.163	5588
130.577	NRG #40C Anemometer	25	6.177	0.589	0.151	6963
127.577	95" Boom Mount	25	5.827	0.564	0.147	7290
127.104	Guy	25	5.773	0.559	0.147	7297
111.220	NRG 200P Wind Vane	25	4.196	0.381	0.122	5141
108.220	95" Boom Mount	25	3.957	0.343	0.117	4784
105.315	NRG #40C Anemometer	25	3.746	0.304	0.112	4485
102.315	95" Boom Mount	25	3.551	0.265	0.108	4273
101.437	Guy	25	3.499	0.253	0.107	4246
75.812	Guy	23	2.776	0.051	0.080	6121
49.213	Temperature Sensor	21	2.913	0.064	0.053	5799
38.562	Guy	21	2.749	0.105	0.041	3415
4.920	Data Logger	22	0.458	0.026	0.005	24855

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	170.604 - 165.604	49.335	4	3.598	0.746
Antenna					
L1	165.604 - 152.771	45.569	4	3.598	0.746

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 28 of 32
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 08:34:34 07/01/24
	Client: NRG	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L2	152.771 - 127.104	36.233	4	3.149	0.678
L3	127.104 - 101.437	21.799	8	2.214	0.553
L4	101.437 - 75.812	13.343	8	0.864	0.401
L5	75.812 - 38.562	10.822	8	0.143	0.300
L6	38.562 - 0	10.136	4	0.391	0.155

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
167.979	Propellor Anemometer/Wind Vane	4	47.356	3.609	0.748	9806
164.979	95" Boom Mount	4	45.099	3.590	0.745	7940
162.402	NRG #40C Anemometer	4	43.170	3.535	0.737	3936
159.402	95" Boom Mount	4	40.949	3.433	0.721	2328
156.496	NRG 200P Wind Vane	4	38.843	3.312	0.703	1665
153.496	95" Boom Mount	4	36.732	3.180	0.683	1344
152.771	Guy	4	36.233	3.149	0.678	1305
145.997	21" Dia. Aircraft Marker Ball (Orange)	4	31.824	2.890	0.640	1266
140.420	Temperature Sensor	2	28.524	2.702	0.614	1300
130.577	NRG #40C Anemometer	8	23.402	2.357	0.570	1365
127.577	95" Boom Mount	8	22.011	2.235	0.555	1377
127.104	Guy	8	21.799	2.214	0.553	1376
111.220	NRG 200P Wind Vane	8	15.834	1.391	0.458	1256
108.220	95" Boom Mount	8	14.970	1.225	0.440	1234
105.315	NRG #40C Anemometer	8	14.217	1.066	0.422	1213
102.315	95" Boom Mount	8	13.528	0.909	0.406	1207
101.437	Guy	8	13.343	0.864	0.401	1212
75.812	Guy	8	10.822	0.143	0.300	2510
49.213	Temperature Sensor	4	10.912	0.265	0.198	1887
38.562	Guy	4	10.136	0.391	0.155	1165
4.920	Data Logger	4	1.632	0.091	0.020	8505

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
L2	152.771 (A) (11)	NRG 0.030125 Miscl	179.900	6999.996	4029.750	4200.000	1.000	1.042 ✔
	152.771 (B) (10)	NRG 0.030125 Miscl	179.900	6999.996	4027.520	4200.000	1.000	1.043 ✔
	152.771 (C) (9)	NRG 0.030125 Miscl	179.900	6999.996	4027.030	4200.000	1.000	1.043 ✔
	152.771 (D) (8)	NRG 0.030125 Miscl	179.900	6999.996	4027.610	4200.000	1.000	1.043 ✔
L3	127.104 (A)	NRG	179.900	6999.996	2847.590	4200.000	1.000	1.475 ✔

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 29 of 32
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	Client: NRG	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
	(15)	0.030125 Miscl						
	127.104 (B)	NRG	179.900	6999.996	2848.480	4200.000	1.000	1.474 ✔
	(14)	0.030125 Miscl						
	127.104 (C)	NRG	179.900	6999.996	2849.140	4200.000	1.000	1.474 ✔
	(13)	0.030125 Miscl						
	127.104 (D)	NRG	179.900	6999.996	2848.430	4200.000	1.000	1.474 ✔
	(12)	0.030125 Miscl						
L4	101.437 (A)	NRG	179.900	6999.996	2124.400	4200.000	1.000	1.977 ✔
	(19)	0.030125 Miscl						
	101.437 (B)	NRG	179.900	6999.996	2125.370	4200.000	1.000	1.976 ✔
	(18)	0.030125 Miscl						
	101.437 (C)	NRG	179.900	6999.996	2125.700	4200.000	1.000	1.976 ✔
	(17)	0.030125 Miscl						
	101.437 (D)	NRG	179.900	6999.996	2125.330	4200.000	1.000	1.976 ✔
	(16)	0.030125 Miscl						
L5	75.812 (A)	NRG	179.900	6999.996	2050.680	4200.000	1.000	2.048 ✔
	(23)	0.030125 Miscl						
	75.812 (B) (22)	NRG	179.900	6999.996	2050.790	4200.000	1.000	2.048 ✔
		0.030125 Miscl						
	75.812 (C) (21)	NRG	179.900	6999.996	2050.790	4200.000	1.000	2.048 ✔
		0.030125 Miscl						
	75.812 (D)	NRG	179.900	6999.996	2050.790	4200.000	1.000	2.048 ✔
	(20)	0.030125 Miscl						
L6	38.562 (A)	NRG	179.900	6999.996	1976.560	4200.000	1.000	2.125 ✔
	(27)	0.030125 Miscl						
	38.562 (B) (26)	NRG	179.900	6999.996	1975.270	4200.000	1.000	2.126 ✔
		0.030125 Miscl						
	38.562 (C) (25)	NRG	179.900	6999.996	1974.240	4200.000	1.000	2.127 ✔
		0.030125 Miscl						
	38.562 (D)	NRG	179.900	6999.996	1975.280	4200.000	1.000	2.126 ✔
	(24)	0.030125 Miscl						

Compression Checks

Pole Design Data

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 30 of 32
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	Client: NRG	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	165.604 - 152.771 (2)	Guyed Pole 8" OD	12.833	0.000	0.0	2.359	-152.147	91413.297	0.002
L2	152.771 - 127.104 (3)	Guyed Pole 8" OD	25.667	0.000	0.0	2.359	-5902.010	91413.297	0.065
L3	127.104 - 101.437 (4)	Guyed Pole 8" OD	25.667	0.000	0.0	2.359	-11052.500	91413.297	0.121
L4	101.437 - 75.812 (5)	Guyed Pole 10" OD	25.625	0.000	0.0	3.079	-14517.000	113300.000	0.128
L5	75.812 - 38.562 (6)	Guyed Pole 10" OD	37.250	0.000	0.0	3.079	-17002.199	113300.000	0.150
L6	38.562 - 0 (7)	Guyed Pole 10" OD	38.562	0.000	0.0	3.079	-19226.801	113300.000	0.170

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	165.604 - 152.771 (2)	Guyed Pole 8" OD	6329.342	18014.750	0.351	0.000	18014.750	0.000
L2	152.771 - 127.104 (3)	Guyed Pole 8" OD	5403.200	18014.750	0.300	0.000	18014.750	0.000
L3	127.104 - 101.437 (4)	Guyed Pole 8" OD	5849.667	18014.750	0.325	0.000	18014.750	0.000
L4	101.437 - 75.812 (5)	Guyed Pole 10" OD	6567.200	28837.083	0.228	0.000	28837.083	0.000
L5	75.812 - 38.562 (6)	Guyed Pole 10" OD	6139.783	28837.083	0.213	0.000	28837.083	0.000
L6	38.562 - 0 (7)	Guyed Pole 10" OD	9492.750	28837.083	0.329	0.000	28837.083	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	165.604 - 152.771 (2)	Guyed Pole 8" OD	998.766	28665.000	0.035	196.593	16627.667	0.012
L2	152.771 - 127.104 (3)	Guyed Pole 8" OD	689.166	28665.000	0.024	180.234	16627.667	0.011
L3	127.104 - 101.437 (4)	Guyed Pole 8" OD	614.524	28665.000	0.021	308.700	16641.250	0.019
L4	101.437 - 75.812 (5)	Guyed Pole 10" OD	444.795	30876.100	0.014	300.906	20674.583	0.015
L5	75.812 - 38.562 (6)	Guyed Pole 10" OD	852.537	30876.100	0.028	294.307	20674.583	0.014
L6	38.562 - 0 (7)	Guyed Pole 10" OD	31.899	30876.100	0.001	295.579	20674.583	0.014

Pole Interaction Design Data

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 31 of 32
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 08:34:34 07/01/24
	Client: NRG	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	165.604 - 152.771 (2)	0.002	0.351	0.000	0.035	0.012	0.355 ✔	1.000	✔
L2	152.771 - 127.104 (3)	0.065	0.300	0.000	0.024	0.011	0.366 ✔	1.000	✔
L3	127.104 - 101.437 (4)	0.121	0.325	0.000	0.021	0.019	0.447 ✔	1.000	✔
L4	101.437 - 75.812 (5)	0.128	0.228	0.000	0.014	0.015	0.357 ✔	1.000	✔
L5	75.812 - 38.562 (6)	0.150	0.213	0.000	0.028	0.014	0.365 ✔	1.000	✔
L6	38.562 - 0 (7)	0.170	0.329	0.000	0.001	0.014	0.499 ✔	1.000	✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	165.604 - 152.771	Pole	Guyed Pole 8" OD	2	-152.147	91413.297	35.5	Pass
L2	152.771 - 127.104	Pole	Guyed Pole 8" OD	3	-5902.010	91413.297	36.6	Pass
L3	127.104 - 101.437	Pole	Guyed Pole 8" OD	4	-11052.500	91413.297	44.7	Pass
L4	101.437 - 75.812	Pole	Guyed Pole 10" OD	5	-14517.000	113300.000	35.7	Pass
L5	75.812 - 38.562	Pole	Guyed Pole 10" OD	6	-17002.199	113300.000	36.5	Pass
L6	38.562 - 0	Pole	Guyed Pole 10" OD	7	-19226.801	113300.000	49.9	Pass
L2	152.771 - 127.104	Guy A@152.771	NRG 0.030125	11	4029.750	4200.000	95.9	Pass
L3	127.104 - 101.437	Guy A@127.104	NRG 0.030125	15	2847.590	4200.000	67.8	Pass
L4	101.437 - 75.812	Guy A@101.437	NRG 0.030125	19	2124.400	4200.000	50.6	Pass
L5	75.812 - 38.562	Guy A@75.812	NRG 0.030125	23	2050.680	4200.000	48.8	Pass
L6	38.562 - 0	Guy A@38.562	NRG 0.030125	27	1976.560	4200.000	47.1	Pass
L2	152.771 - 127.104	Guy B@152.771	NRG 0.030125	10	4027.520	4200.000	95.9	Pass
L3	127.104 - 101.437	Guy B@127.104	NRG 0.030125	14	2848.480	4200.000	67.8	Pass
L4	101.437 - 75.812	Guy B@101.437	NRG 0.030125	18	2125.370	4200.000	50.6	Pass
L5	75.812 - 38.562	Guy B@75.812	NRG 0.030125	22	2050.790	4200.000	48.8	Pass
L6	38.562 - 0	Guy B@38.562	NRG 0.030125	26	1975.270	4200.000	47.0	Pass
L2	152.771 - 127.104	Guy C@152.771	NRG 0.030125	9	4027.030	4200.000	95.9	Pass
L3	127.104 - 101.437	Guy C@127.104	NRG 0.030125	13	2849.140	4200.000	67.8	Pass
L4	101.437 - 75.812	Guy C@101.437	NRG 0.030125	17	2125.700	4200.000	50.6	Pass
L5	75.812 - 38.562	Guy C@75.812	NRG 0.030125	21	2050.790	4200.000	48.8	Pass
L6	38.562 - 0	Guy C@38.562	NRG 0.030125	25	1974.240	4200.000	47.0	Pass
L2	152.771 - 127.104	Guy D@152.771	NRG 0.030125	8	4027.610	4200.000	95.9	Pass
L3	127.104 -	Guy D@127.104	NRG 0.030125	12	2848.430	4200.000	67.8	Pass

tnxTower	Job: 165.6' (50 meters) XHD MET Tower with Standard Footprint	Page: 32 of 32
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	Client: NRG	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
	101.437							
L4	101.437 - 75.812	Guy D@101.437	NRG 0.030125	16	2125.330	4200.000	50.6	Pass
L5	75.812 - 38.562	Guy D@75.812	NRG 0.030125	20	2050.790	4200.000	48.8	Pass
L6	38.562 - 0	Guy D@38.562	NRG 0.030125	24	1975.280	4200.000	47.0	Pass
							Summary	
						Pole (L6)	49.9	Pass
						Guy A (L2)	95.9	Pass
						Guy B (L2)	95.9	Pass
						Guy C (L2)	95.9	Pass
						Guy D (L2)	95.9	Pass
						RATING =	**95.9**	**Pass**

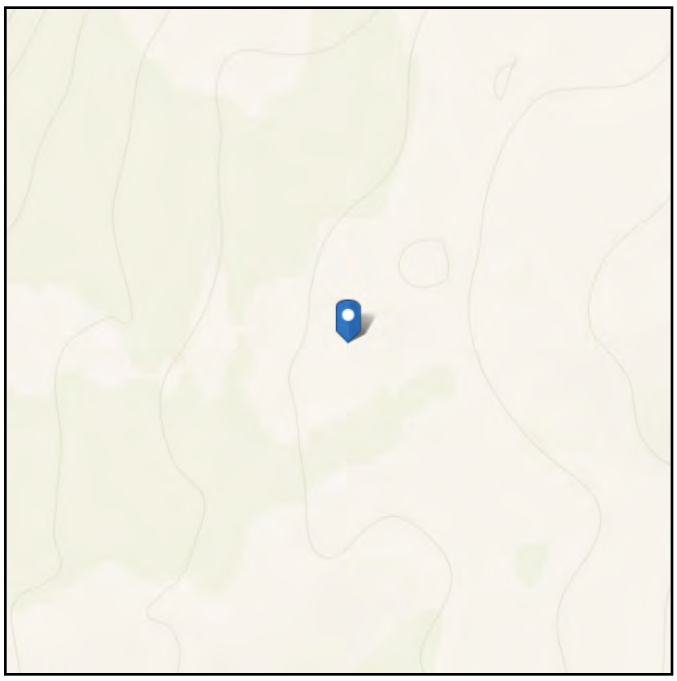
Program Version 8.2.2.0 - 10/2/2023 File:D:/New Tower/AK 50m XHD & 60m Super XHD Met Towers/tnxTower_AK_50m XHD Met Tower/50m XHD NRG_Standard Footprint Twr -0.5in Ice.eri

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: I
Soil Class: D - Default (see Section 11.4.3)

Elevation: 0 ft (NAVD 88)
Latitude: 61.473061
Longitude: -150.988809



Wind

Results:

Wind Speed	115 Vmph
10-year MRI	86 Vmph
25-year MRI	94 Vmph
50-year MRI	99 Vmph
100-year MRI	105 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1A and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Wed May 29 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 15% probability of exceedance in 50 years (annual exceedance probability = 0.00333, MRI = 300 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.618	S_{D1} :	N/A
S_1 :	0.757	T_L :	16
F_a :	1.2	PGA :	0.661
F_v :	N/A	PGA_M :	0.794
S_{MS} :	1.941	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.294	C_v :	1.424

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Wed May 29 2024

Date Source: USGS Seismic Design Maps

Ice

Results:

Ice Thickness:	0.50 in.
Concurrent Temperature:	-15 F
Gust Speed	60 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed May 29 2024

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

APPENDIX B

EQUIPMENT DETAILS

YOUNG

Products ▾ Support ▾ Applications ▾ Contact ▾

News

Home / Wind / All Wind Products / Heavy Duty Wind Monitor-HD-Alpine

Search

Heavy Duty Wind Monitor-HD-Alpine

05108-45

The Heavy Duty Wind Monitor HD-Alpine combines the features of the HD unit along with the ice resistant coating of our popular Alpine Wind Monitor. Robust, reliable, durable . . . . all words to describe the latest addition of the YOUNG family of wind monitors developed to endure the most extreme environments.

0	WIND MONITOR-HD ALPINE 3M Cable	05108-45	$1,710.00

0	WIND MONITOR-HD ALPINE 8M Cable	05108-45-8M	$1,730.00
0	WIND MONITOR-HD ALPINE 12M Cable	05108-45-12M	$1,756.00
0	SURGE PROTECTION ASSEMBLY 6 Channel	19120	$220.00
0	WIND SENSOR INTERFACE (for use with Model 05108) 0-5 VDC Outputs (recommended cable: 18446)	05608C	$526.00
0	WIND LINE DRIVER (for use with Model 05108) 4-20 mA Outputs (recommended cable: 18723)	05638C	$572.00
0	SENSOR CABLE, 5 CONDUCTOR SHIELDED 22 AWG, Per Ft.	18446	$1.24
0	SENSOR CABLE, 2 PAIR SHIELDED 22 AWG, Per Ft.	18723	$1.02
0	SENSOR CABLE, 6 CONDUCTOR SHIELDED 22 AWG, Per Ft.	18721	$1.50

Add to cart

Quantity discounts applied during checkout. Excludes sensor cables.

Categories: **All Wind Products**, **Mechanical Wind Sensors**

Description
Specifications
Brochures & Manuals
Replacement Parts

Range:	*Wind speed: 0-100 m/s (224 mph)* *Azimuth: 360° mechanical, 355° electrical (5° open)*
Accuracy:	*Wind speed: ± 0.3 m/s (0.6 mph) or 1% of reading* *Wind direction: ± 3 degrees*
Threshold: *	*Propeller: 1.0 m/s (2.2 mph)* *Vane: 1.0 m/s (2.2 mph)*
Dynamic Response: *	*Propeller distance constant (63% recovery) 2.7 m (8.9 ft)* *Vane delay distance (50% recovery) 1.3 m (4.3 ft)* *Damping ratio: 0.3* *Damped natural wavelength: 7.4 m (24.3 ft)* *Undamped natural wavelength: 7.2 m (23.6 ft)*
Signal Output:	*Wind speed: magnetically induced AC voltage, 3 pulses per revolution. 1800 rpm (90 Hz) = 15.0 m/s (33.6 mph)* *Azimuth: analog DC voltage from conductive plastic potentiometer – resistance 10K Ω , linearity 0.25%, life expectancy – 50 million revolutions*
Power Requirement:	*Potentiometer excitation: 15 VDC maximum*
Operating Temperature:	*-50 to 60°C*
Sensor Cable:	*A water tight pigtail cable is supplied for electrical connections. Available in standard lengths of 3, 8 and 12 meters.* *For longer cable lengths a user supplied junction box or connector may be used.*
Dimensions:	*Overall height: 37 cm (14.6 in)* *Overall length: 55 cm (21.7 in)* *Propeller: 18 cm (7 in) diameter* *Mounting: 34 mm (1.34 in) diameter (standard 1 inch pipe)*
Weight:	*1.0 kg (2.2 lbs)*
Shipping Weight:	*2.3 kg (5 lbs)*
Model 05608C	*Wind Sensor Interface* *Signal outputs: 0-5.00 VDC full scale* *Power requirement: 8-24 VDC (5 mA @ 12 VDC)* *Operating temperature: -50 to 60°C*
Model 05638C:	*Wind Line Driver* *Signal outputs: 4-20 mA full scale* *Power Requirement: 12-30 VDC (40 mA max.)* *Operating Temperature: -50 to 60°C*
*	*Nominal values, determined in accordance with ASTM standard procedures.*

SPECIFICATIONS

NRG #40C Anemometer

FEATURES

- The standard anemometer used in the wind energy industry
- Short distance constant
- Simple, durable design

The NRG #40C anemometer is the industry standard anemometer used worldwide. NRG #40 anemometers have recorded wind speeds of 96 m/s (214 mph). Their low moment of inertia and unique bearings permit very rapid response to gusts and lulls. Because of their output linearity, these sensors are ideal for use with various data retrieval systems. A four pole magnet induces a sine wave voltage into a coil producing an output signal with a frequency proportional to wind speed. The #40C is constructed of rugged Lexan cups molded in one piece for repeatable performance. A protective rubber terminal boot is included.

SPECIFICATIONS

Description	Sensor type	3-cup anemometer
	Applications	• wind resource assessment • meteorological studies • environmental monitoring
	Sensor range	1 m/s to 96 m/s (2.2 mph to 214 mph) (highest recorded)
	Instrument compatibility	all NRG loggers
Output signal	Signal type	low level AC sine wave, frequency linearly proportional to windspeed
	Transfer function	m/s = (Hz x 0.765) + 0.35 [miles per hour = (Hz x 1.711) + 0.78]
	Accuracy	within 0.1 m/s (0.2 mph) for the range 5 m/s to 25 m/s (11 mph to 55 mph)
	Calibration	each anemometer individually calibrated, calibration reports provided via electronic download
	Output signal range	0 Hz to 125 Hz (highest recorded)

110 Riggs Road · Hinesburg · VT 05461 USA · TEL (802) 482-2255 · FAX (802) 482-2272 · EMAIL sales@nrgsystems.com

SPECIFICATIONS

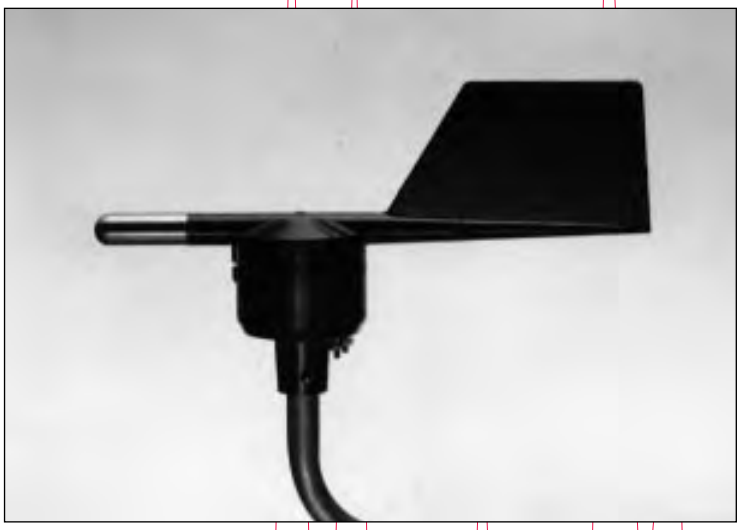
Response characteristics	Threshold	0.78 m/s (1.75 miles per hour)
	Distance constant (63% recovery)	3.0 m (10 feet)
	Moment of inertia	68 x 10^{-6} S-ft^2
	Swept diameter of rotor	190 mm (7.5 inches)
Installation	Mounting	onto a 13 mm (0.5 inch) diameter mast with cotter pin and set screw
	Tools required	0.25 inch nut driver, petroleum jelly, electrical tape
Environmental	Operating temperature range	-55 °C to 60 °C (-67 °F to 140 °F)
	Operating humidity range	0 to 100% RH
Physical	Connections	4-40 brass hex nut/post terminals
	Weight	0.14 kg (0.3 pounds)
	Dimensions	• 3 cups of conical cross-section, 51 mm (2 inches) dia. • 81 mm (3.2 inches) overall assembly height
Materials	Cups	one piece injection-molded black polycarbonate
	Body	housing is black ABS plastic
	Shaft	beryllium copper, fully hardened
	Bearing	modified Teflon, self-lubricating
	Magnet	Indox 1, 25 mm (1 inch) diameter, 13 mm (0.5 inch) long, 4 poles
	Coil	single coil, bobbin wound, 4100 turns of #40 wire, shielded for ESD protection
	Boot	protective PVC sensor terminal boot included
	Terminals	brass

200 SERIES WIND VANE

Wind Direction Sensor

NRG Systems

MEASURING THE WIND'S ENERGY



■ The 200 Series Wind Direction Vane is a professional quality sensor, originally designed for use in some of the world's largest wind power plants. Its unique qualities make it ideal for use in many other applications in environmental testing and meteorology. ■ Although moderately priced, these sensors offer a level of quality and reliability often found only at a very high premium. The thermoplastic and stainless steel components resist corrosion, and contribute to a high strength-to-weight ratio. ■ As with all NRG Systems products, the 200 Series Vane is elegantly engineered, employing a minimum number of parts while maximizing functional performance. ■ The vane is directly connected to a precision conductive plastic potentiometer located in the main body. An analog voltage output directly proportional to the wind direction is produced when a constant DC excitation voltage is applied to the potentiometer. Several different yaw vane configurations are available for wind turbine control. ■ Field proven, the #200 is the wind industry de facto standard.

NRG SYSTEMS

110 Commerce Street

Hinesburg, VT 05461 USA

(802) 482-2255

FAX (802) 482-2272

Email: sales@nrgsystems.com

200 SERIES WIND VANE
Wind Direction Sensor

APPLICATIONS
- Wind direction sensor for wind data loggers
- Yaw control on wind turbines
- Environmental monitoring instrumentation
- Meteorological studies

FEATURES
- Simple mechanical construction
- Long life, professional quality potentiometer
- No slip rings or brushes result in high reliability, low cost
- Corrosion-resistant materials
- Multiple mechanical and contact seals
- No setscrews to vibrate loose
- Very stable and smooth response to wind changes
- Fully balanced sensor vane

SPECIFICATIONS
MECHANICAL:
Range: Direction–360° mechanical, continuous rotation
Sensitivity: Approx. 1 m/s (2.2 mph)
Materials:
Direction vane and housing–black UV stabilized injection molded plastic
Balance weight–stainless steel
Terminals–three #4-40 solid brass studs with nuts
Potentiometer–stainless steel shaft in two shielded precision grade, stainless steel ball bearings, conductive plastic potentiometer element mounted in a machined aluminum housing
Hardware–all stainless steel construction
Dimensions:
Overall length–21cm (8.3")
Swept diameter–27cm (10.5")
Overall height–12cm (4.3")
Vane size–6cm high x 10cm long (2.3" x 3.8")
Main housing diameter–5cm (2")
Mounting–13mm (0.5") diameter mast with cotter pin and mast set screw
Weight: 0.1kg (0.25 lb)
Shipping Weight: 0.5kg (1 lb)
ELECTRICAL:
Range:
Direction– #200: 340° elecrical (20° open); #200P: 352° electrical (8° open)
Signal:
Analog DC voltage from conductive plastic potentiometer 1K(#200), 10K(#200P); linearity 1.0%, life expectancy of 50 million revolutions (2-6 years normal operation)
Power Requirements:
Regulated potentiometer excitation of 1 to 15 VDC

#200YZ YAW CONTROL WIND VANE
The #200YZ Vane is built with standard #200 Series vane and body with an opto-interrupter type switching system. This yaw control sensor has an open collector, sinking output. Switch points are +/- 10° right or left. Also will control wind turbine yaw at 90° out of the wind.

SPECIFICATIONS MAY CHANGE WITHOUT NOTICE.

ORDERING INFORMATION:

Wind Direction Vane–1K	Cat. No. 200
Precision Wind Direction Vane–10K	Cat. No. 200P

NRG Systems

MEASURING THE WIND'S ENERGY

110 Commerce Street
Hinesburg, VT 05461 USA
(802) 482-2255
FAX (802) 482-2272
Email: sales@nrgsystems.com

Barometric Pressure Sensors

090D
091

Barometric Pressure Sensors convert absolute atmospheric pressure into a linear, proportional voltage, which may be used in any meteorological program.

Features

- Compact size
- Weatherproof enclosure
- Remote output
- Permanent calibration
- Robust construction

These sensors are inherently stable devices that do not require periodic service or routine recalibration.

Operation

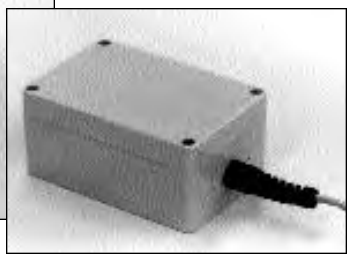
The enclosure houses a solid-state pressure transducer, with linearization and amplification electronics.

The Model 090D is housed in a heavy duty fiberglass enclosure, suitable for harsh and severe environments. A hose barb is provided to enable the connection of a 1/4" sampling tube to the outside environment.

The Model 091 is contained within a small polycarbonate enclosure, and may be mounted outside or inside a building or other enclosure. Small inlet holes allow the atmospheric pressure access to the sensing element.

The standard range of the 090D/ 091 is 26-32 in. Hg,* suitable for elevations sea level to 1500 ft. Other ranges are available.

090D



091

Specifications

Performance

Resolution:	Infinite
Temp. Operating Range:	-40°C to 65°C
Temp. Compensated Range:	-18°C to 65°C
Accuracy:	±0.04 in Hg (±1.35 mbar) or ±0.125% FS

Electrical Characteristics

Power Requirement:	11 mA @ 12 VDC, Typical
Sensor Output:	0-1 VDC, Standard 0-5 VDC, Optional

Physical Characteristics

090D	Weight:	2 lbs, 5 oz (1.05 Kg)
	Dimensions:	5.5 x 5 x 7.5 in (14 x 12 x 19 cm)
091	Weight:	8.8 oz. (250 g)
	Dimensions:	2.1 x 3.2 x 5 in (5.4 x 8.3 x 13 cm)

Ordering Information

	Specify elevation
	Specify output voltage
Cable:	#1169-xx (xx = length in feet)
	Specify length in feet

Specifications subject to change without notice.
*Conversions: 1 in. Hg = 3.3864 kPa, 1 in. Hg = 33.864 mbar, 1 in. Hg = 25.4 mm/Hg

Met One Instruments, Inc.
Corporate Sales & Service: 1600 Washington Blvd., Grants Pass, OR 97526, Phone (541) 471-7111, Fax (541) 471-7116
Distribution & Service: 3206 Main Street, Suite 106, Rowlett, TX 75088, Phone (972) 412-4747, Fax (972) 412-4716
http://www.metone.com

107 and 108
Temperature Probes

CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

The 107 and 108 are rugged, accurate probes that measure air, soil, and water temperature in a variety of applications. These probes consist of a thermistor encapsulated in an epoxy-filled aluminum housing. The housing protects the thermistor allowing the probes to be buried or submerged. The 107 measures from -35° to +50°C, the 108 from -5° to +95°C.

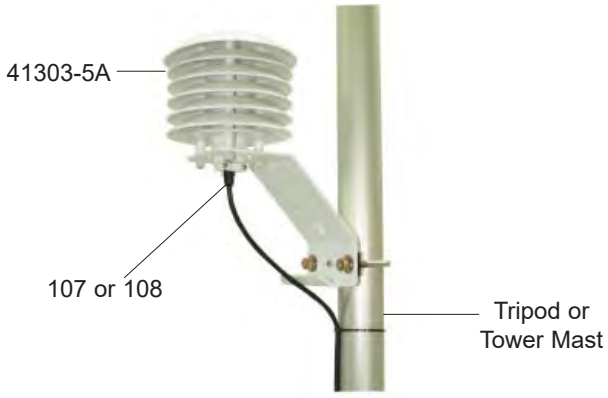
Please note that the 107 and 108 are not compatible with the CR200(X)-series dataloggers. However, a similar thermistor, the 109, has been developed specifically for our CR200(X)-series dataloggers.

Each 107 or 108 probe requires one single-ended channel for measurement.

Installation

Air Temperature

When exposed to sunlight, the 107 and 108 probes should be housed in a 41303-5A 6-plate Gill Radiation Shield. The 41303-5A's louvered construction allows air to pass freely through the shield thereby keeping the probe at or near ambient temperature. The shield's white color reflects solar radiation. The 41303-5A attaches to a crossarm, mast, or user-supplied pipe with a 1.0-in. to 2.1-in. outer diameter.



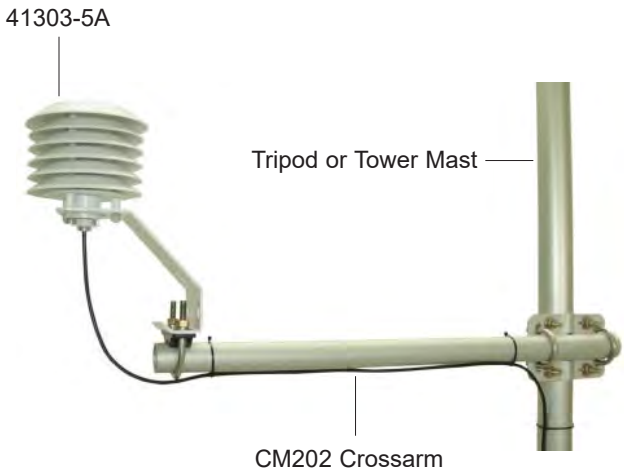
Above is a probe housed in the 41303-5A radiation shield. The U-bolt is placed in the holes on the side of the bracket to allow the 41303-5A to be attached to a mast or vertical pole.

Water Temperature

The probes can be submerged to 50 feet (21 psi). Please note that neither the 107 nor 108 is weighted. Therefore, the installer should either add a weighting system or secure the probe to a fixed, submerged object, such as a piling.

Soil Temperature

The 107 and 108 are suitable for shallow burial only. Placement of the probe's cable inside a rugged conduit may be advisable for long cable runs—especially in locations subject to digging, mowing, traffic, use of power tools, or lightning strikes.



To attach the 41303-5A to a CM202, CM204, or CM206 crossarm, place the 41303-5A's U-bolt in the bottom holes.

Recommended Cable Lengths for Air Temperature Measurements

2-m Height		Atop a tripod or tower via a 2-ft crossarm such as the CM202								
Mast/Leg	**CM202**	**CM6**	**CM106**	**CM10**	**CM110**	**CM115**	**CM120**	**UT10**	**UT20**	**UT30**
9 ft	11 ft	11 ft	14 ft	14 ft	14 ft	19 ft	24 ft	14 ft	24 ft	37 ft

Note: Add two feet to the cable length if mounting the enclosure to the leg base of a CM106, CM110, CM115, or CM120 tripod.

Ordering Information

Temperature Probes

107-L Temperature Probe (-35° to +50°C) with a user-specified cable length; enter the cable length (in feet) after the -L. Recommended cable length is shown above. Must choose a cable termination option (see below).

108-L Temperature Probe (-5° to +95°C) with a user-specified cable length; enter the cable length (in feet) after the -L. Recommended cable length is shown above. Must choose a cable termination option (see below).

Cable Termination Options (choose one)

-PT Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.

-PW Cable terminates in connector for attachment to a prewired enclosure.

Solar Radiation Shield for Air Temperature Measurements

41303-5A 6-Plate Gill Radiation Shield that houses a 107 or 108 for air temperature measurements.

Specifications

Sensor: BetaTherm 100K6A1B Thermistor

Tolerance
- **107:** ±0.2°C over 0° to 50°C range
- **108:** ±0.2°C over 0° to 70°C range

Temperature Measurement Range
- **107:** -35° to +50°C
- **108:** -5° to +95°C

Steinhart-Hart Equation Error (CRBasic loggers only): ≤±0.01°C over measurement range

Polynomial Linearization Error (Edlog loggers only)
- **107:** Typically <±0.5°C over measurement range
- **108:** Typically <±0.5°C over -5° to +90°C range

Time Constant in Air: 30 to 60 seconds in a wind speed of 5 m sec^{-1}

Maximum Cable Length: 1000 ft (305 m)

Probe Length: 4.1 in. (10.4 cm)

Probe Diameter: 0.3 in. (0.762 cm)

Weight with 10-ft cable: 5 oz (136 g)

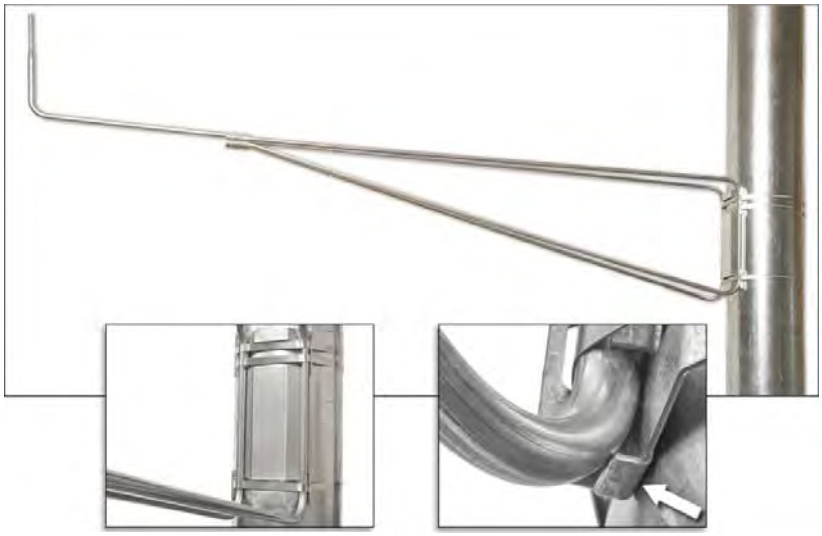
SPECIFICATIONS

NRG Side Mount Boom, 2.4 m (95")

Made of galvanized steel, the 2.4 m (95”) side mount boom resists corrosion and is designed to securely mount NRG sensors away from NRG TallTowers to minimize tower shadowing effects.

FEATURES

- For use with NRG #40C or NRG #200P sensors
- Easy to assemble
- Robust, dual-beam support structure
- Mounting bracket tabs assure proper boom installation
- Self-aligning mounting bracket assures secure, 90-degree vertical orientation
- Meets or exceeds industry IEC 61400-12-1 recommendations for tower and boom offset distances
  - » *Horizontal mast offset:* 12.38D on 8” tube; 10D on 10” tube [1]
  - » *Vertical boom offset:* 20D above boom for an NRG #40C anemometer, exceeding IEC 61400-12-1 minimum recommendation of 15D [2]



Self-orienting mounting bracket *Mounting bracket tab*

SPECIFICATIONS

Description	Boom type	Sensor mounting boom for standard NRG sensors on NRG TallTowers 8" or 10" diameter
	Applications	Wind resource assessment; for mounting NRG #40C anemometer or NRG #200P wind direction vane on NRG TallTowers
	Sensor compatibility	• NRG #40C anemometer • NRG #200P wind direction vane
	Tower compatibility	NRG TallTowers with 8" or 10" diameter tubing sections
Installation	Mounting	• Mounting bracket attaches to tower with three heavy-duty, stainless steel hose clamps • Sensor mounts to boom with set screw and cotter pin
	Tools required	• 5/16 inch hex driver or flat blade (-) screwdriver for hose clamps • Phillips head (+) screwdriver to mount sensor
	Recommended for installation	• Electric drill with 5/16 nut driver bit for tightening hose clamps • Sheet metal shears or similar for trimming hose clamps
Environmental	Lifespan	2 years +
Physical	Weight	3.6 kg (8 lbs)
	Boom diameter	15.875 mm (0.625 inch) dual beam support at mounting bracket location 19.05 mm (0.75 inch) at boom extension sleeve 12.7 mm (0.50 inch) at sensor mount location
	Offset distance	2.4 m (95 inches)
	Offset height	381 mm (15.0 inches)
Materials	Boom	15.8 mm (0.625 inch) galvanized steel tube
	Mounting bracket	Galvanized steel
Shipping	Shipping weight	3.8 kg (8.4 lbs) for one boom in one box

Note:

[1] Horizontal offset value, D refers to diameter of the tube tower. Per IEC 61400-12-1 horizontal mast offset is defined as the boom distance from the center of a tubular mast divided by the mast diameter (R/d).

[2] Vertical offset value, D refers to the diameter of the mounting boom tube directly below the sensor. Per IEC 61400-12-1 vertical boom offset is defined as the distance from top of the mounting boom tube to the centerline of anemometer cup rotor.

High Visibility Cable Balls

Introduction

These instructions will assist you in installing high visibility cable balls on TallTower guy wires. The items included are:

- 8 orange plastic cable ball ½ (part number 3814)
- 24 bolts, truss-head #10-32x5/8, stainless steel (part number 3842)
- 48 washers, stainless steel (part number 3843)
- 24 nuts, #10-32 stainless steel Nylock (part number 3844)
- 1/4″ cable kit
    - 4 short wire rope cables ¼″, 26 inches long (part number 1513) [*compatible with 3/16″ or ¼″ guy wires*]
    - 8 wire rope clips for ¼″ cable (part number 1596)

The tools required are:
(1) #2 Phillips head (+) screwdriver
(1) 3/8 inch nut driver or socket
(1) 1/2 inch nut driver or socket

Installing the Cable Balls

Balls should be installed on each guy wire 3 m (10 feet) below the guy ring on the top set of guy wires. An additional set of balls can be installed lower on the same guy wires at least 3 m (10 feet) above highest point vegetation is likely to reach.

Place one half of a cable ball (part number 3814) in position with the TallTower guy wire cable running through the two grooves molded into the plastic to accept the cable.

Position the short wire rope cable next to the tower guy wire cable (marked with white tape in the photo below) in the grooves. Electrical tape may be used to hold this cable in place (as shown in photo 1).

PHOTO 1

PHOTO 2

Position the top half of the ball over the two cables (photo 2).

Install the bolts, washers and locknuts to secure the plastic pieces together (photo 3). Use a washer under the head of each bolt and another under each locknut. Tighten only enough to secure the plastic pieces together. Avoid over-tightening because this will crack the plastic.

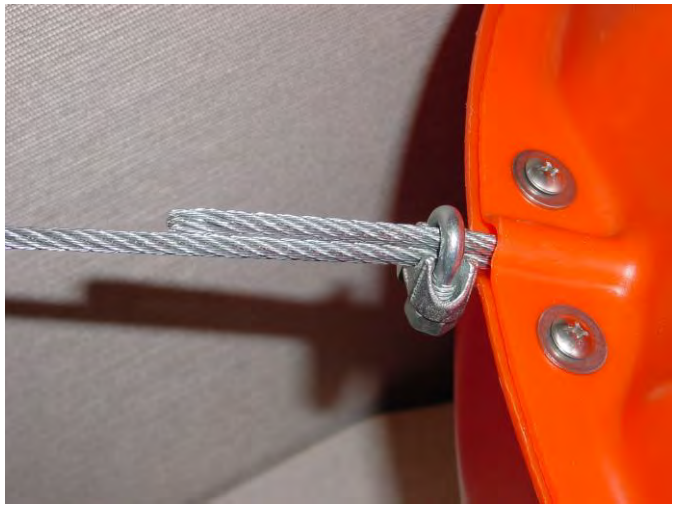


PHOTO 3

Place the u-bolt part of the wire rope clip over the 'dead' cable (the short wire rope cable). Place the saddle part of the wire rope clip over the 'live' cable (the TallTower guy wire cable) and tighten nuts. If you installed the wire rope clip correctly, the nuts will be on the same side as the TallTower guy wire cable (Photo 3). Pull the short cable tight and install another wire rope clip on the other side of the ball as described above.

CAUTION: Incorrect installation of the wire rope clip can severely weaken the cable and cause premature cable failure.

APPENDIX C

TYPICAL GUY ANCHORS AND TOWER BASE PLATE DETAIL

Appendix B: Anchoring Guidelines

B.1 DETERMINE SITE SOIL AND ANCHOR TYPE BEFORE YOU ORDER YOUR TOWER

Per ANSI/TIA-222-G, for design purposes, one can assume Class 6 soils. However, the Standard requires that soil parameters and assumptions be validated prior to installing the tower.

Before your tower is ordered, determine the soil type, preferably through soil sampling. Order the correct anchors based on the results of the soil sample.

The purpose of this section is to give you the information needed to provide suitable anchoring for your Super 60 m XHD TallTower. **Because anchor requirements are site specific, it is the responsibility of the customer to determine suitable anchors. If you are not sure what is required, seek professional guidance.**

Local utility companies can often provide useful information regarding anchoring used in the site area. Do not use rebar anchors, especially when the surface soils are loose or wet.

Table B-1: Soil Classes

Class	Common Soil Types	Geological Soil Classification
3	Dense clays, sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone
4	Medium dense sandy gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls
5	Medium dense coarse sand and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils
6	Loose to medium dense fine to coarse sand; firm to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils
7**	Loose fine sand; Alluvium; loess; soil-firm clays; varied clays; fill	Flood plain soils; lake clays; adobe; gumbo; fill

** In class 7 soils, it is advisable to place anchors deep enough to penetrate underlying class 5 or 6 soil.
Charts reproduced by permission, The A.B. Chance Company.

B.2 ANCHOR CHOICES AND OTHER CONSIDERATIONS

The choice of anchors must take into consideration soil type, maximum winds expected, icing or other weather that may affect the tower, and a safety factor suitable for the location and to meet any legal requirements. Considerations include but are not limited to: tornadoes, hurricanes or typhoons, locations where very high winds are expected, potential for flooding or periodic soaking of the soil, soil erosion, and icing events.

B.3 Screw-In Anchor Description

Screw-in anchors are the most commonly used anchors for normal clay soils without rocks. The 8 inch single helix anchors are installed by hand, using a cross bar to screw them into the earth like a corkscrew. The 8 inch twin helix anchors require machinery.

The Super 60 m XHD tower employs two (2), 8 inch diameter screw-in anchors and sixteen (12), 8 inch twin helix anchors.

Table B-2: Specifications for 203 mm (8 inches) diameter Screw-In Anchors

Length Overall:	**203 mm (8 inches) Anchor**
Helix diameter:	203 mm (8.0 inches)
Length Overall:	1.65 m (66 inches)
Rod diameter:	25 mm (1 inch)
Material:	Galvanized steel
Holding Power: (These anchors are not suitable for soils denser than class 5.)	
Class 5 soils *	44.5 kN (10000 pounds)
Class 6 soils *	31.1 kN (7000 pounds)
Class 7 soils **	17.8 kN (4000 pounds)

* See Table for soil class descriptions

** In class 7 soils, it is advisable to place anchors deep enough to penetrate underlying class 5 or 6 soil.

Table B-3: Specifications for Mid-Strength 203 mm (8 inches) diameter Twin Helix

Length Overall:	2.7 m (9 feet) (including 7 foot rod)
Helix Diameter:	203 mm (8.0 inches)
Materials:	TBD
Holding Power:	
Class 3 soils *	12700 kg (28000 pounds)
Class 4 soils *	10900 kg (24000 pounds)
Class 5 soils *	9090 kg (20000 pounds)
Class 6 soils *	6800 kg (15000 pounds)
Class 7 soils *	5450 kg (12000 pounds)

* See Table 13 for soil class descriptions

** In class 7 soils, it is advisable to place anchors deep enough to penetrate underlying class 5 or 6 soil.

MANTA RAY® EARTH ANCHOR

The Manta Ray Utility Anchor System is used by utilities worldwide. Manta Rays are driven into the ground using a jackhammer, not augured or torqued. No excavation is necessary. The anchors are driven with conventional hydraulic equipment that is readily available.

Description

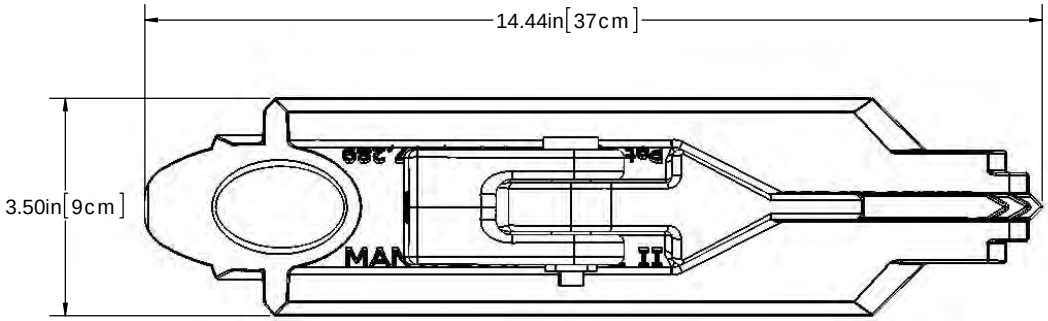
Manta Ray Anchors are RUS approved, rugged and versatile driven plate anchors for all types of soil conditions. They can be installed in extremely tough soils such as caliche, decomposed rock, glacial till, and permafrost. Larger models are also available for swamp application. Fully portable installation equipment which can fit in the back of a standard pickup truck can be used to access difficult to reach anchor locations. They can also be installed using the line truck's hydraulic system. Every anchor is proof tested during standard installation procedures for a verified tension load measurement. Manta Ray anchors are compatible with standard power hub anchor rods and eyenuts for distribution guy anchors.

Links & PDFs

Manta Ray Anchors

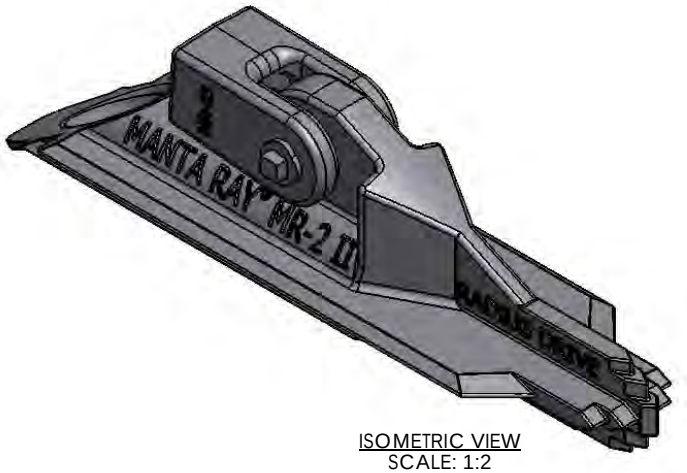
Catalog Number	Model	For PH Rod Size	Ultimate Load Rating (lbs)	Weight (lbs)
20036-UT-II	MR-1	D75 (3/4") or D100 (1")	23,000 or 36,000	13
20199-UT-II	MR-2	D75 (3/4") or D100 (1")	23,000 or 36,000	11
20210-UT-II	MR-3	D62 (5/8")	16,000	7
20229-UT-II	MR-SR	D75 (3/4") or D100 (1")	23,000 or 36,000	21

PAPER SIZE	CATALOG NUMBER
B	20199-UT-II

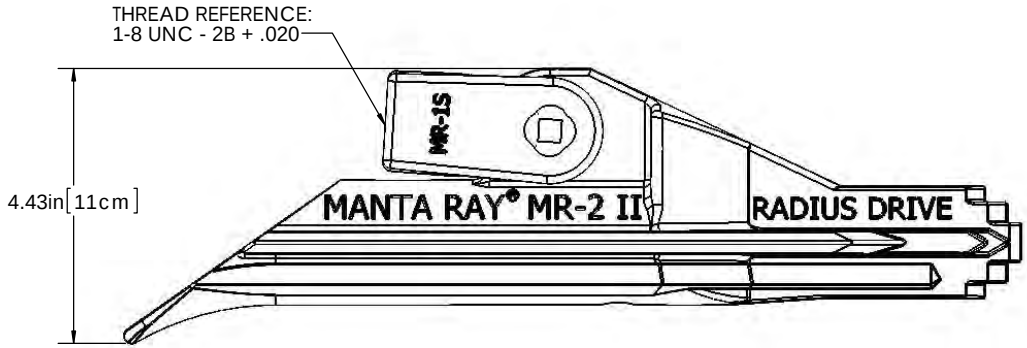


NOTES: UNLESS OTHERWISE SPECIFIED:

1) MECHANICAL ULTIMATE CAPACITY: 40,000 LBS [177.9kN]
2) MAXIMUM WORKING LOAD: UP TO 27,000 LBS [120.1 kN]
   (THIS VALUE IS SOIL AND ANCHOR ROD DEPENDANT)
3) AVERAGE WEIGHT: 10.2 LBS [4.6 kg]
4) FINISH: HOT DIP GALVANIZED



ISOMETRIC VIEW
SCALE: 1:2



ODA

OUTSIDE DISTRIBUTION APPROVED: NON-PRODUCTION DRAWING

MACLEAN POWER SYSTEMS
www.macleanpower.com

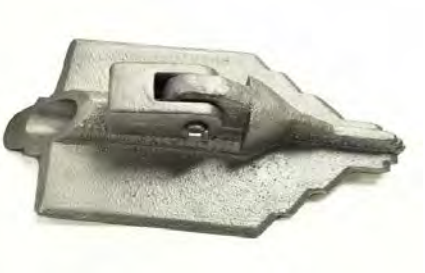
DRAWING NUMBER:	20199-UT-II
SHEET NAME: SHEET1	1 OF 1
PRODUCT DESCRIPTION	MR-2-1"-UTILITY-II ANCHOR/SHACKLE ASSEMBLY
DRAWN BY: JFD	DATE: 03/06/13

MACLEAN POWER SYSTEMS

Product Information Bulletin

#068-0
02-28-13

MANTA RAY® EARTH ANCHOR SYSTEMS



Manta Ray® anchor load ultimate tension capacity with 5/8" (16,000 lb-force), ¾" (23,000 lb-force) and 1" (36,000 lb-force) power hub anchor rods.

Manta Ray anchor ultimate load capacity with power hub anchor rods (lbs-force)

Soil Description	Standard Penetrometer Blow Count (N)	MR-1 (3/4" or 1" rod)	MR-2 (3/4" or 1" rod)	MR-3 (5/8" rod)	MR-SR (3/4" or 1" rod)
Very dense/cemented sands; coarse gravel and cobbles	60-100+	36,000 (1)	36,000 (1)	16,000 (1)	NA
Dense fine compacted sands, very hard silts or clays	45-60	36,000 (1)	28,000 (2)	16,000 (1)	36,000 (1)
Dense clays, sands and gravels, hard silts and clays	35-40	36,000 (1)	22,000 (2)	16,000 (1)	36,000 (1)
Medium dense sandy gravel, stiff to hard silts and clays	24-40	20,000 (2)	18,000 (2)	14,000 (2)	34,000 (2)
Medium dense coarse sandy gravel, stiff to very still silts and clays	14-25	20,000 (2)	12,000 (2)	9,000 (2)	24,000 (2)
Loose to medium dense fine to coarse sand: firm to stiff clays and silts	7-14	15,000 (2)	10,000 (2)	8,000 (2)	18,000 (2)
Loose fine sand, alluvium, soft clays, fine saturated silty sand	4-8	12,000 (2)	8,000 (2)	5,000 (2)	14,000 (2)
Peat, organic silts: inundates silts fly ash	0-5	8,000 (2)	5,000 (2)	2,000 (2)	12,000 (2)

Notes: (1) Manta Ray anchor holding capacity limited by rod tension strength rating
(2) Manta Ray anchor holding capacity limited by soil capacity

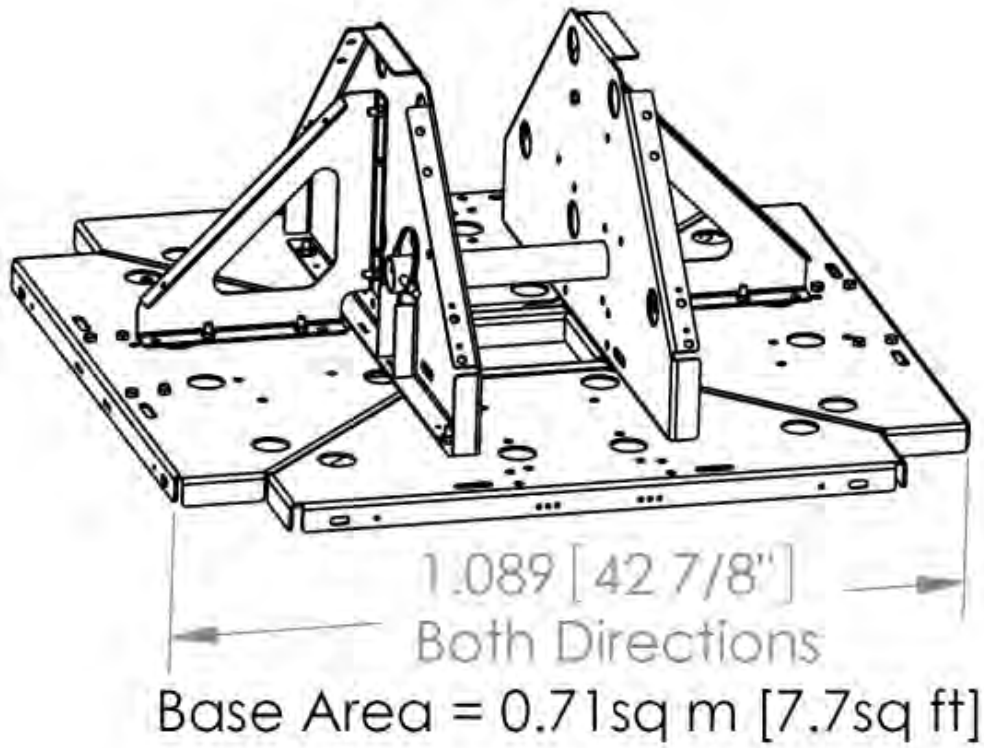
Manta Ray® anchor load ultimate tension capacity with 5/8" (71.2 kn), ¾" (102.3 kn) and 1" (160.1 kn) power hub anchor rods.

Manta Ray anchor ultimate load capacity with power hub anchor rods (kn)					
Soil Description	Standard Penetrometer Blow Count (N)	MR-1 kn	MR-2 kn	MR-3 kn	MR-SR kn
Very dense/cemented sands; coarse gravel and cobbles	60-100+	160.1 (1)	160.1 (1)	71.2 (1)	NA
Dense fine compacted sands, very hard silts or clays	45-60	160.1 (1)	124.6 (2)	71.2 (1)	160.1 (1)
Dense clays, sands and gravels, hard silts and clays	35-40	160.1 (1))	97.9 (2)	71.2 (1)	160.1 (1)
Medium dense sandy gravel, stiff to hard silts and clays	24-40	89 (2)	80.1 (2)	62.3 (2)	151.2 (2)
Medium dense coarse sandy gravel, stiff to very still silts and clays	14-25	89 (2)	53.4 (2)	40.0 (2)	106.8 (2)
Loose to medium dense fine to coarse sand: firm to stiff clays and silts	7-14	66.7 (2)	44.5 (2)	35.6 (2)	80.1 (2)
Loose fine sand, alluvium, soft clays, fine saturated silty sand	4-8	53.4 (2)	35.6 (2)	22.2 (2)	62.3 (2)
Peat, organic silts: inundates silts fly ash	0-5	35.6 (2)	22.2 (2)	8.9 (2)	53.4 (2)

Notes: (1) Manta Ray anchor holding capacity limited by rod tension strength rating
(2) Manta Ray anchor holding capacity limited by soil capacity

50m XHD with
Standard Footprint

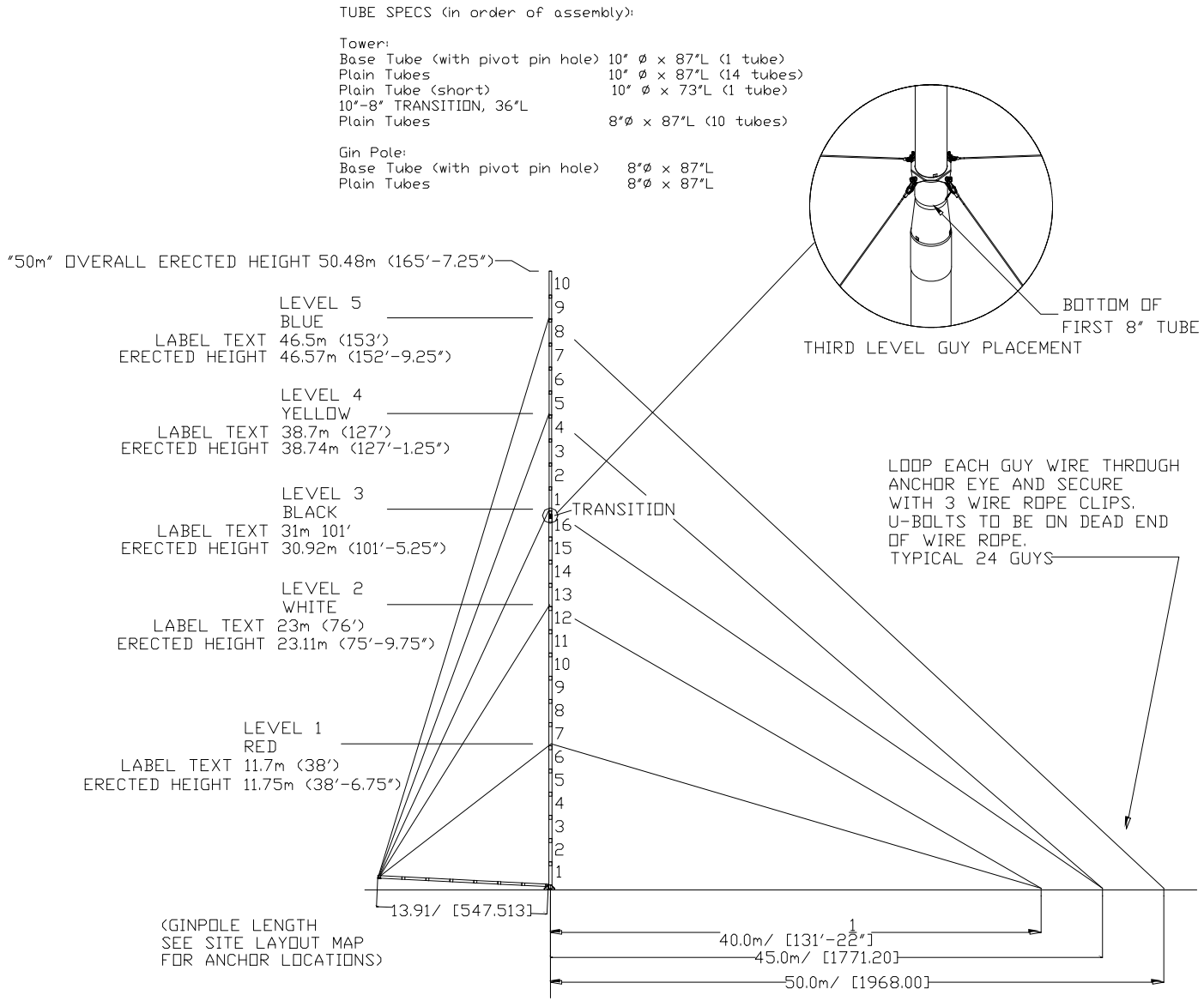
Baseplate Geometry

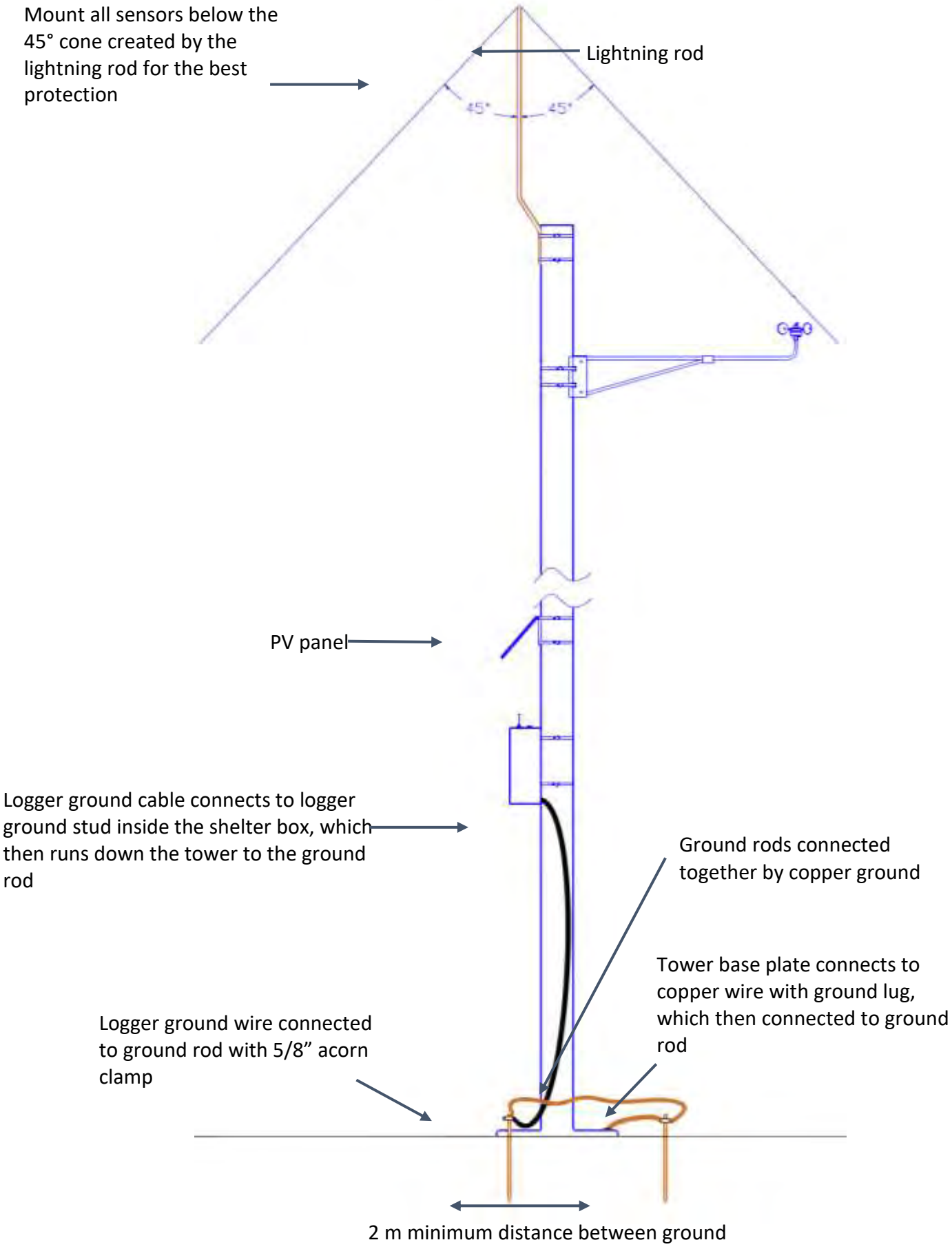


APPENDIX D

TOWER GROUNDING AND TOWER DETAILS

50m XHD with Standard Footprint

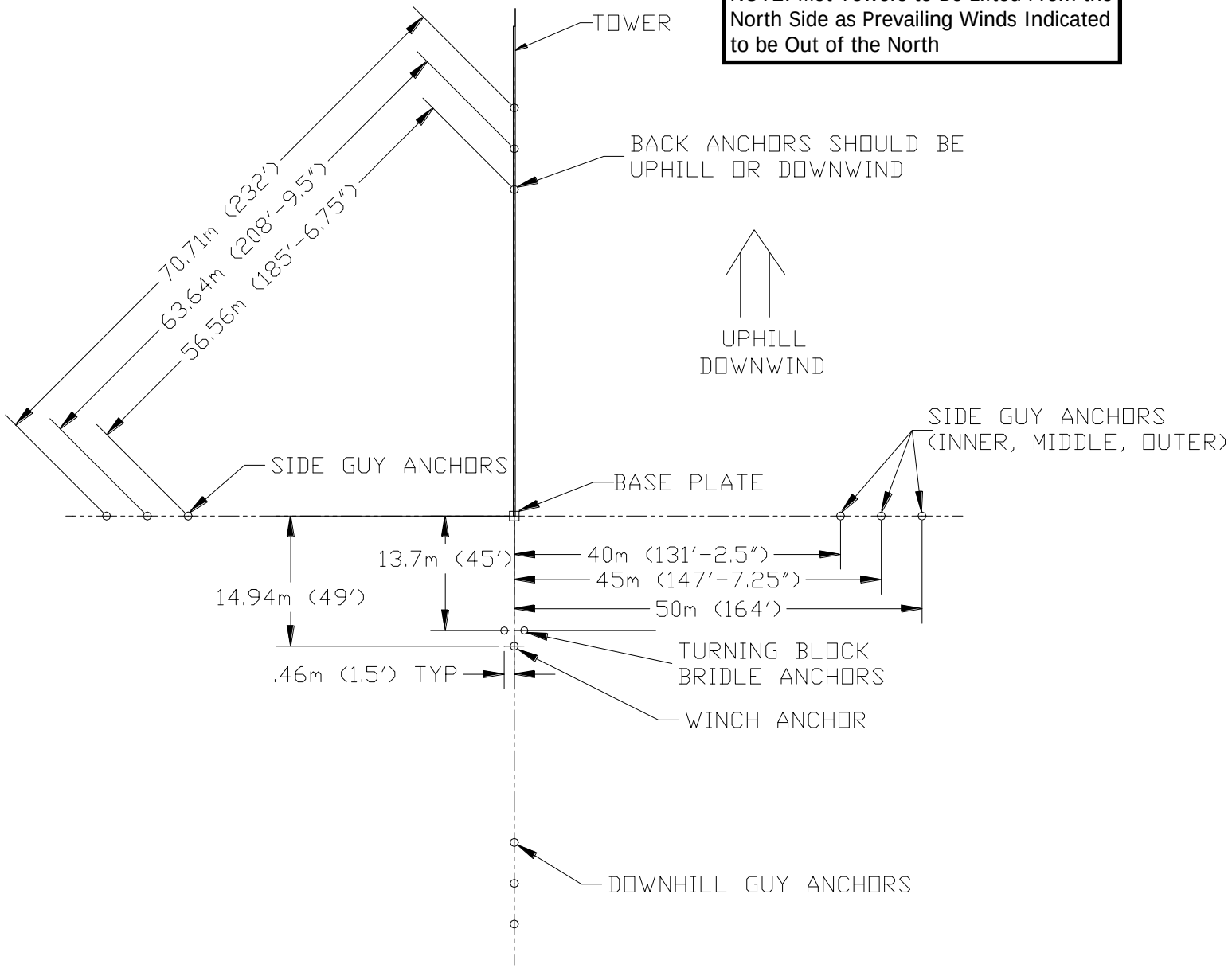



Mount all sensors below the 45° cone created by the lightning rod for the best protection
Lightning rod
45°
45°
PV panel
Logger ground cable connects to logger ground stud inside the shelter box, which then runs down the tower to the ground rod
Ground rods connected together by copper ground
Tower base plate connects to copper wire with ground lug, which then connected to ground rod
Logger ground wire connected to ground rod with 5/8” acorn clamp
2 m minimum distance between ground

50m XHD with
Standard Footprint

Site Layout

NOTE: Met Towers to Be Lifted From the North Side as Prevailing Winds Indicated to be Out of the North



APPENDIX E

PROPOSED MET TOWER SITE LOCATION MAP

NewTower Engineering LLC

Date: **July 01, 2024**

Jeff Armbruster
Longroad Energy
125 High Street
Boston, MA 02210
Phone: (857) 202-7475

Subject: **Matanuska Susitna Borough Met Tower Conditional Use Permit**

Applicant: ***Longroad Energy / Alaska Renewables***

Land Owner: ***State of Alaska***

Engineering Project No.: **Project Number:** 101-24-001

Tower Data: **(6) NRG Systems 60m Super XHD Tall Meteorological Towers Matanuska-Susitna Borough, AK**

	UTM WGS84 z5 meters		WGS84	
id	X	Y	LATITUDE	LONGITUDE
LMS 105	607144	6817133	61.47306128° N	150.98880926° W
LMS 106	612079	6817695	61.47670353° N	150.89590508° W
LMS 107	610490	6814070	61.44464000° N	150.92786700° W
LMS 108	611983	6812416	61.42937215° N	150.90087803° W
LMS 109	611119	6812558	61.43089025° N	150.91697790° W
LMS 110	610563	6811529	61.42181675° N	150.92800343° W

Dear Mr. Armbruster,

Please find enclosed the following for the subject six (6) NRG 60m Super XHD Met Tower with Standard Footprint permit application:

1. A full tower structural analysis is provided (refer attached report and Appendix A output results) in accordance with the 2021 Alaska Building Code, 2021 International Building Code, ASCE 7-16 Code, and ANSI TIA 222-Rev H, based upon an ultimate 3-second gust wind speed of 121 mph (V_{ult}), Risk Category II, and Exposure Category C including seismic analysis.
2. Refer Appendix C and the Conclusions/Recommendations for recommended Manta Ray (MR-2) guy anchor, 8" double helix (or approved equal) details and minimum pull forces required (Table 4). No soils report is available for the site. As such, anchor pull tests will be required to meet the minimum resultant anchor loads as listed in Table 4 of this report.
3. Refer Appendix D for typical tower grounding and related tower installation details.

Structural analysis prepared by: Mikko P. Ahola, PE

Respectfully submitted by:

Aaron Boonstra, PE
Professional Engineer

STATE OF ALASKA
49TH
Aaron R. Boonstra
Date 7/1/24
No. CE 198374
REGISTERED PROFESSIONAL ENGINEER

TABLE OF CONTENTS

1) INTRODUCTION

The purpose of this report is to investigate the structural adequacy of proposed (6) 60m NRG Super XHD Tall guyed pole temporary meteorological towers to be located in the Matanuska-Susitna Borough, Alaska (refer Appendix D map locations). The met towers will support wind monitoring devices. The computer plots & output based on a 3D structural analysis using tnxTOWER (Version 8.2.2) is provided in Appendix A.

The 60m tall Super NRG guyed pole MET towers are designed and manufactured by NRG Systems and are a stronger version of the standard 60m XHD NRG met towers.

The finite element program “tnxTower” used in this analysis is developed by Tower Numerics in Lexington, MA. It is a specialized 3D structural analysis program widely used and accepted in the tower industry.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the 2021 Alaska Building Code, 2021 International Building Code, and ANSI TIA-222-Rev H for the tower site locations in Alaska based upon an ultimate 3-second gust wind speed of 121 mph (V_{ult}). Exposure Category C, Risk Category II along with topographic category 2 and crest height of 1,500 feet were used in this analysis (typical for all 6 tower sites), including seismic analysis. Met towers are temporary structures (typically 1 to 3-year installation duration) and could be analyzed as Risk Category I structures and a lower 115 mph ultimate gust wind speed at the met tower site locations. Table 1 below shows the proposed MET tower loading.

Table 1 - Proposed 60m Tall Super XHD Met Tower Equipment Loading

Center Line Elevation (ft)	Number of Antennas	Antenna/Mount Manufacturer	Antenna/Mount Model	Number of Feed Lines	Feed Line Size (in)	Note
198.49 (60.5 m)	1	Young	Propellor Anemometer/ Wind Vane	1	0.14”ϕ cable	1
198.49 (60.5 m)	1	NRG Systems	NRG No. 4214 (95” Long Side Boom)	-	-	1
192.91 (58.8 m)	2	NRG Systems	NRG #40C Anemometers	2	0.14”ϕ cables	1
192.91 (58.8 m)	2	NRG Systems	NRG No. 4214 (95” Long Side Booms)	-	-	1
180.77 (55.1 m)	4	NRG Systems	21” ϕ Orange Marker Balls (3.6m From Top Guy Ring)	-	-	1
173.89 (53.0 m)	1 1 1	Campbell Scientific	Barometric Pressure Gauge Relative Humidity Sensor Temperature Sensor	3	0.14”ϕ cables	1
167.323 (51.0 m)	2	NRG Systems	Heated Anemometer	2	0.14”ϕ cables	1
167.323 (51.0 m)	2	NRG Systems	NRG No. 4214 (95” Long Side Booms)	-	-	1
160.76 (49.0 m)	1	NRG Systems	NRG 200P Wind Vane	1	0.14”ϕ cable	1
160.76 (49.0 m)	1	NRG Systems	NRG No. 4214 (95” Long Side Boom)	-	-	1
137.80 (42.0 m)	1	NRG Systems	NRG 200P Wind Vane	1	0.14”ϕ cable	1
137.80 (42.0 m)	1	NRG Systems	NRG No. 4214 (95” Long Side Boom)	-	-	1
131.23 (40.0 m)	2	NRG Systems	NRG #40C Anemometers	2	0.14”ϕ cables	1

Center Line Elevation (ft)	Number of Antennas	Antenna/Mount Manufacturer	Antenna/Mount Model	Number of Feed Lines	Feed Line Size (in)	Note
131.23 (40.0 m)	2	NRG Systems	NRG No. 4214 (95” Long Side Booms)	-	-	1
98.43 (30.0 m)	2	NRG Systems	NRG #40C Anemometers	2	0.14”ϕ cables	1
98.43 (30.0 m)	2	NRG Systems	NRG No. 4214 (95” Long Side Booms)	-	-	1
49.21 (15.0 m)	1	Unknown	Temperature Sensor	1	0.14”ϕ cable	1
4.92 (1.5 m)	1	NRG Systems	Data Logger & Modem	-	-	1

Notes: 1. Proposed Equipment

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Met Tower Equipment Loading	Anemometers, Wind Vanes, Marker Balls	06/20/2024	Longroad Energy
Super 60m XHD Tall Tower Manual	Installation & Specifications Guide	12/14/2022	NRG Systems

3.1) Analysis Method

tnxTower (version 8.2.2), a commercially available analysis software package, was used to analyze the 60m Super XHD tall MET tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1. The pole steel is 45 ksi yield.
2. The MET tower is supported by 5/16" diameter Aircraft guy wiring with breaking strength of 9.8 kips with 0.255 kips (2.6%) initial tension.
3. The proposed MET tower is temporary (typically 1 to 3-year installation duration).
4. The met tower and anchors are to be installed by a professional contractor knowledge in met tower installation and will be installed following the instructions in the NRG 60m Super XHD Tower Installation Manual & Specifications & other manufacturer specifications.

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	197.688 - 190.438	Pole	TP8.05x8x0.134	1	-99.47	134865.00	6.2	Pass
L2	190.438 - 184.021	Pole	TP8.05x7.7763x0.134	2	-7819.06	134427.00	18.5	Pass
		Guy A@189.321	NRG Guy 5/16 13MM	36	4661.95	5880.00	79.3	Pass
		Guy B@189.321	NRG Guy 5/16 13MM	35	5064.07	5880.00	86.1	Pass
		Guy C@189.321	NRG Guy 5/16 13MM	34	4663.94	5880.00	79.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Guy D@189.321	NRG Guy 5/16 13MM	33	5064.44	5880.00	86.1	Pass
L3	184.021 - 177.604	Pole	TP8.05x7.7505x0.134	3	-8368.19	134376.00	33.2	Pass
L4	177.604 - 171.187	Pole	TP8.05x7.7476x0.134	4	-8414.02	131194.00	35.7	Pass
L5	171.187 - 164.771	Pole	TP8.05x7.7472x0.134	5	-8522.15	130395.00	33.9	Pass
L6	164.771 - 158.354	Pole	TP8.05x7.7472x0.134	6	-8628.17	130394.00	21.8	Pass
L7	158.354 - 151.937	Pole	TP8.05x7.7472x0.134	7	-15025.40	131984.00	27.9	Pass
		Guy A@156.121	NRG Guy 5/16 13MM	40	4057.42	5880.00	69.0	Pass
		Guy B@156.121	NRG Guy 5/16 13MM	39	4361.66	5880.00	74.2	Pass
		Guy C@156.121	NRG Guy 5/16 13MM	38	4055.13	5880.00	69.0	Pass
		Guy D@156.121	NRG Guy 5/16 13MM	37	4361.41	5880.00	74.2	Pass
L8	151.937 - 145.521	Pole	TP8.05x7.7472x0.134	8	-15091.00	130394.00	21.1	Pass
L9	145.521 - 139.104	Pole	TP8.05x7.7472x0.134	9	-15187.00	130394.00	14.2	Pass
L10	139.104 - 132.687	Pole	TP8.05x7.7472x0.134	10	-15523.80	134370.00	19.0	Pass
L11	132.687 - 126.271	Pole	TP8.05x7.7472x0.134	11	-15637.60	134370.00	32.3	Pass
L12	126.271 - 119.854	Pole	TP8.05x7.7472x0.134	12	-20106.70	131189.00	40.4	Pass
		Guy A@125.154	NRG Guy 5/16 13MM	44	2744.11	5880.00	46.7	Pass
		Guy B@125.154	NRG Guy 5/16 13MM	43	2937.87	5880.00	50.0	Pass
		Guy C@125.154	NRG Guy 5/16 13MM	42	2744.05	5880.00	46.7	Pass
		Guy D@125.154	NRG Guy 5/16 13MM	41	2937.74	5880.00	50.0	Pass
L13	119.854 - 113.437	Pole	TP8.05x7.7472x0.134	13	-20188.90	130394.00	33.6	Pass
L14	113.437 - 107.021	Pole	TP8.05x7.7472x0.134	14	-20288.10	130394.00	27.9	Pass
L15	107.021 - 100.604	Pole	TP8.05x7.7472x0.134	15	-20459.90	134370.00	26.6	Pass
L16	100.604 - 98.4375	Pole	TP10.04x7.7472x0.109	16	-20488.80	113431.00	31.8	Pass
L17	98.4375 - 93.3959	Pole	TP10.04x9.0259x0.134	17	-20614.50	165931.00	25.7	Pass
		Guy A@94.4376	NRG Guy 5/16 13MM	48	2205.98	5880.00	37.5	Pass
		Guy B@94.4376	NRG Guy 5/16 13MM	47	2302.03	5880.00	39.2	Pass
		Guy C@94.4376	NRG Guy 5/16 13MM	46	2206.74	5880.00	37.5	Pass
		Guy D@94.4376	NRG Guy 5/16 13MM	45	2302.06	5880.00	39.2	Pass
L18	93.3959 - 87.1876	Pole	TP10.04x9.5983x0.134	18	-23925.90	162443.00	25.6	Pass
L19	87.1876 - 80.9793	Pole	TP10.04x9.7085x0.134	19	-24052.80	164052.00	18.0	Pass
L20	80.9793 - 74.771	Pole	TP10.04x9.7244x0.134	20	-24103.50	167880.00	15.5	Pass
L21	74.771 - 68.5627	Pole	TP10.04x9.7267x0.134	21	-24231.90	167883.00	20.1	Pass
L22	68.5627 - 62.3544	Pole	TP10.04x9.727x0.134	22	-26459.20	167364.00	27.2	Pass
		Guy A@64.4294	NRG Guy 5/16 13MM	52	2022.88	5880.00	34.4	Pass
		Guy B@64.4294	NRG Guy 5/16 13MM	51	2024.51	5880.00	34.4	Pass
		Guy C@64.4294	NRG Guy 5/16 13MM	50	2022.78	5880.00	34.4	Pass
		Guy D@64.4294	NRG Guy 5/16 13MM	49	2024.53	5880.00	34.4	Pass
L23	62.3544 - 56.1461	Pole	TP10.04x9.727x0.134	23	-26513.80	164322.00	23.9	Pass
L24	56.1461 - 49.9378	Pole	TP10.04x9.727x0.134	24	-26950.00	167884.00	25.2	Pass
L25	49.9378 - 43.7295	Pole	TP10.04x9.727x0.134	25	-27057.30	166604.00	27.2	Pass
L26	43.7295 - 37.5212	Pole	TP10.04x9.727x0.134	26	-27130.60	164322.00	27.5	Pass
L27	37.5212 - 31.3129	Pole	TP10.04x9.727x0.134	27	-27257.70	164322.00	23.6	Pass
		Guy A@32.3546	NRG Guy 5/16 13MM	56	1735.48	5880.00	29.5	Pass
		Guy B@32.3546	NRG Guy 5/16 13MM	55	1719.95	5880.00	29.3	Pass
		Guy C@32.3546	NRG Guy 5/16 13MM	54	1733.35	5880.00	29.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Guy D@32.3546	NRG Guy 5/16 13MM	53	1719.94	5880.00	29.3	Pass
L28	31.3129 - 25.1046	Pole	TP10.04x9.727x0.134	28	-28489.50	167884.00	27.7	Pass
L29	25.1046 - 18.8963	Pole	TP10.04x9.727x0.134	29	-28617.80	167884.00	33.5	Pass
L30	18.8963 - 12.688	Pole	TP10.04x9.727x0.134	30	-28690.30	165843.00	35.3	Pass
L31	12.688 - 6.47966	Pole	TP10.04x9.727x0.134	31	-28789.60	164322.00	35.3	Pass
L32	6.47966 - 0	Pole	TP10.04x9.727x0.134	32	-28914.60	164295.00	30.6	Pass
							Summary	
						Pole (L12)	40.4	Pass
						Guy A (L2)	79.3	Pass
						Guy B (L2)	86.1	Pass
						Guy C (L2)	79.3	Pass
						Guy D (L2)	86.1	Pass
						RATING =	**86.1**	**Pass**

Table 4 – Guy Anchor Reactions

Anchor Radius	Factored Uplift Force (Vertical)	Factored Shear Force (Horizontal)	Factored Resultant Force
Inner Anchor (Radius = 147.67 ft)	2,280 lbs	5,507 lbs	5,960 lbs
Outer Anchor (Radius = 164.04 ft)	8,165 lbs	9,137 lbs	12,253 lbs

1. Anchor reactions are factored.

4.1) Conclusions & Recommendations

The proposed 60m Super XHD MET towers with standard footprint were analyzed with the proposed new wind monitoring devices and marker balls (Refer Table 1) per the 2021 International Building Code/ASCE 7-16 Code for the typical site conditions at the 6 tower site locations in Matanuska-Susitna Borough, AK based upon an ultimate 3-second gust wind speed of 121 mph (V_{ult}). Exposure Category C, Risk Category II along with topographic category 2 and crest height of 1,312 feet were used in this analysis. Seismic loading was also included in the analysis.

The analysis results show that:

1. The overall tower pole structure and guy wires are structurally adequate to support the proposed equipment. A maximum tower steel usage of 86.1% was computed (Refer Table 3).

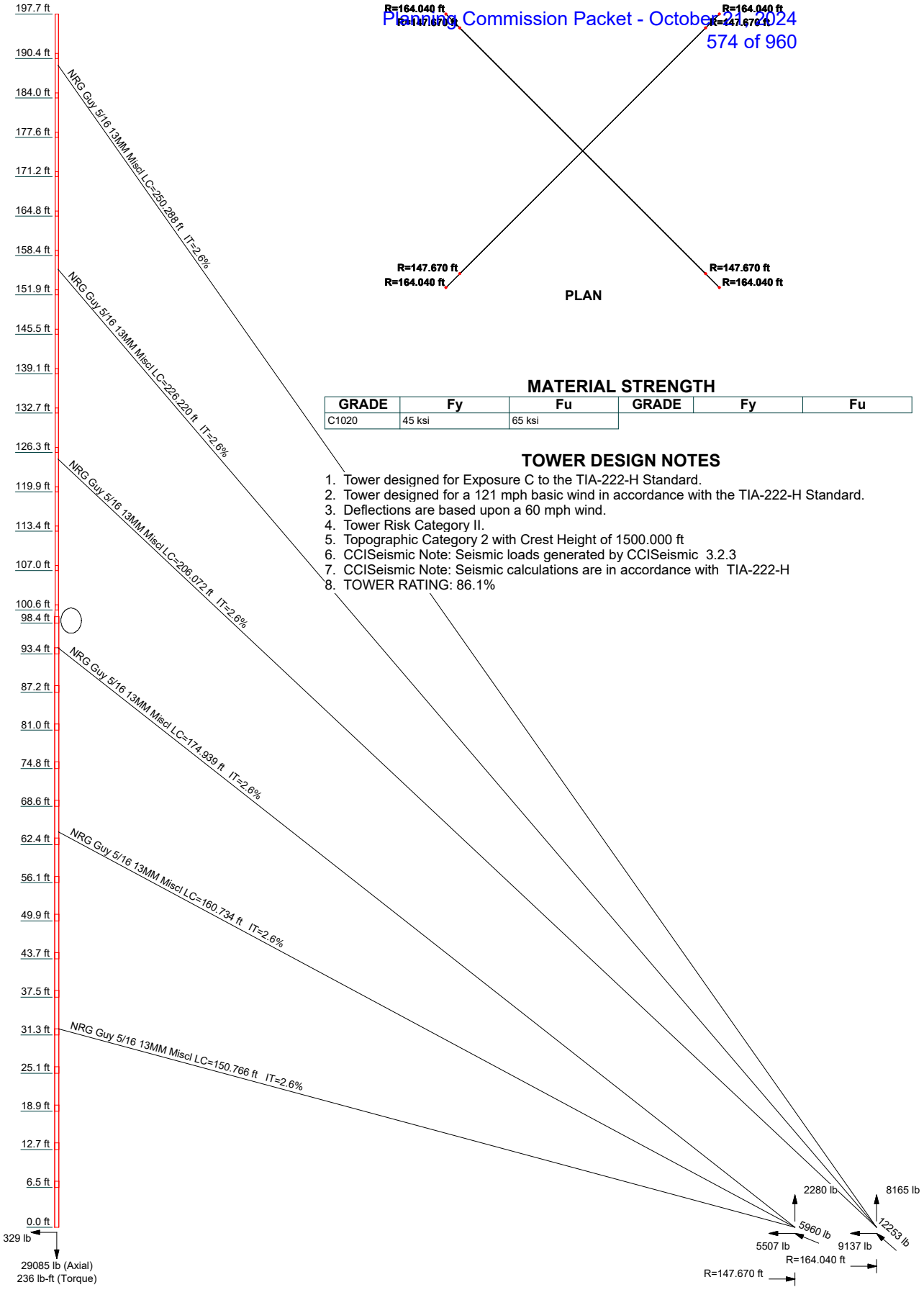
2. The maximum factored guy anchor resultant force computed was 12,253 lbs (Refer Table 4). The Manta Ray Earth Anchor (Model MR-2) has holding capacities up to 36,000 lbs (depending on soil type – Refer Appendix C earth anchor details & ultimate capacites) and would be adequate to secure the guy anchors in place under the wind loads shown in this analysis. However, no soils report was available to confirm the soil type at the proposed location of the towers. As such, a standard pull test will be required to ensure they meet the minimum factored resultant anchor loads in Table 4 above.

3. The maximum factored axial compression force at the base of the met tower is computed to be 29,085 lbs. Per the NRG tower specs, the 60m Super XHD steel base plate has a surface area of 19.5 ft^2. Thus, the maximum soil bearing stress is computed to be 1,492 psf and within the generally accepted 1,500 psf allowable soil bearing stress per the IBC code, even though the tower reactions are factored loads.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Length (ft)	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.000	6.083	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.250	7.521
Number of Sides	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Thickness (in)	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1090	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340	0.1340
Socket Length (ft)		1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	1.042	
Top Dia (in)	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7257	9.0259	9.5983	9.7085	9.7244	9.7266	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270	9.7270
Bot Dia (in)	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400	10.0400
Grade	C1020																															
Weight (lb)	84.4	83.2	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	83.1	31.6	84.4	103.6	104.2	104.3	104.3	104.3	104.3	104.3	104.3	104.3	104.3	104.3	104.3	104.3	104.3	108.2



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
C1020	45 ksi	65 ksi			

TOWER DESIGN NOTES

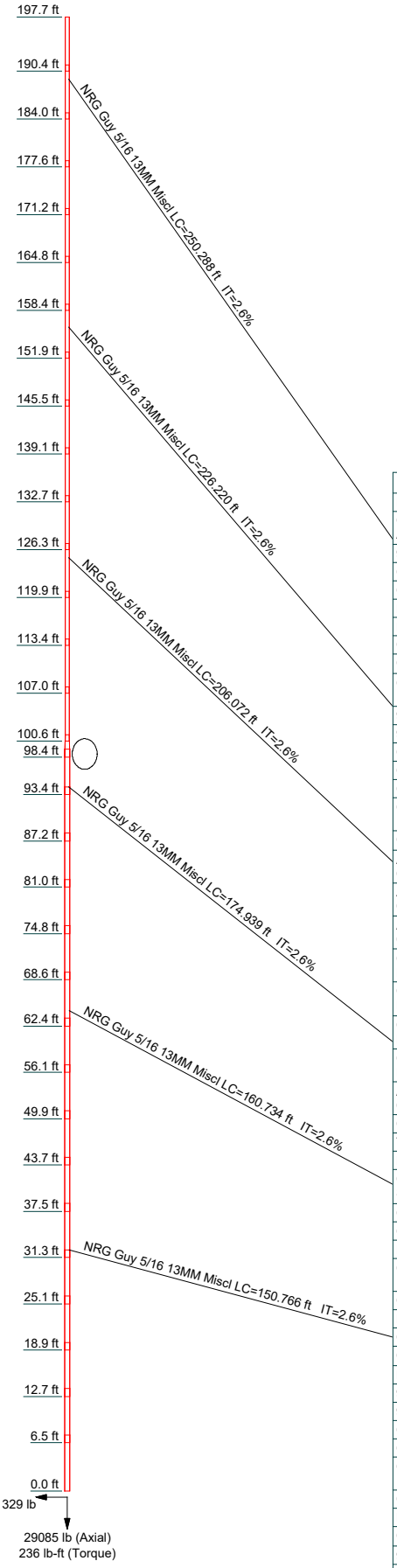
1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 121 mph basic wind in accordance with the TIA-222-H Standard.
3. Deflections are based upon a 60 mph wind.
4. Tower Risk Category II.
5. Topographic Category 2 with Crest Height of 1500.000 ft
6. CCISeismic Note: Seismic loads generated by CCISeismic 3.2.3
7. CCISeismic Note: Seismic calculations are in accordance with TIA-222-H
8. TOWER RATING: 86.1%

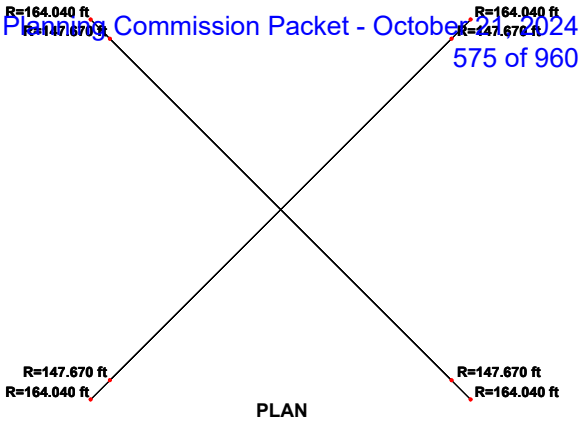
ALL REACTIONS ARE FACTORED

Ahola Engineering LLC
P.O. Box 989
Winter Park, CO 80482-0989
Phone: (719) 640-2408
FAX:

Job: ***NRG 60m Super NRG Tall Tower***			
Project: ***Matanuska-Susitna Borough, AK***			
Client: Longroad Energy	Drawn by: Mikko Ahola, PE	App'd:	
Code: TIA-222-H	Date: 07/01/24	Scale: NTS	
Path:		Dwg No. E-1	

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	7.250	1	0.1340	0.833	8.0000	8.0500	C1020	84.4
2	7.250	1	0.1340	0.833	7.7763	8.0500		83.2
3	7.250	1	0.1340	0.833	7.7505	8.0500		83.1
4	7.250	1	0.1340	0.833	7.7476	8.0500		83.1
5	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
6	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
7	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
8	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
9	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
10	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
11	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
12	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
13	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
14	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
15	7.250	1	0.1340	0.833	7.7472	8.0500		83.1
16	7.000	1	0.1340	0.842	7.7472	8.0400		81.6
17	6.083	1	0.1340	1.042	9.0259	10.0400		84.4
18	7.250	1	0.1340	1.042	9.5983	10.0400		103.6
19	7.250	1	0.1340	1.042	9.7085	10.0400		104.2
20	7.250	1	0.1340	1.042	9.7244	10.0400		104.3
21	7.250	1	0.1340	1.042	9.7266	10.0400		104.3
22	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
23	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
24	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
25	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
26	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
27	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
28	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
29	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
30	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
31	7.250	1	0.1340	1.042	9.7270	10.0400		104.3
32	7.521	1	0.1340		9.7270	10.0400		108.2
	2930.9							





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION
Properllor Anemometer/Wind Vane	198.491
CCISeismic Properllor Anemometer/Wind Vane	198.491
95" Boom Mount	196.194
CCISeismic 95" Boom Mount	196.194
CCISeismic Tower Section 1 - 1	194.062
NRG #40C Anemometer	192.913
NRG #40C Anemometer	192.913
CCISeismic NRG #40C Anemometer	192.913
CCISeismic NRG #40C Anemometer	192.913
CCISeismic (12) miscl Cat5 From 0 to 196 (188ft to196ft)	192
95" Boom Mount	190.913
95" Boom Mount	190.913
CCISeismic 95" Boom Mount	190.913
CCISeismic 95" Boom Mount	190.913
CCISeismic Tower Section 2 - 1	187.646
CCISeismic (12) miscl Cat5 From 0 to 196 (178ft to188ft)	183
CCISeismic Tower Section 3 - 1	181.229
Aircraft Marker Balls (21" Dia - Orange)	180.77
Aircraft Marker Balls (21" Dia - Orange)	180.77
Aircraft Marker Balls (21" Dia - Orange)	180.77
CCISeismic Aircraft Marker Balls (21" Dia - Orange)	180.77
CCISeismic Aircraft Marker Balls (21" Dia - Orange)	180.77
CCISeismic Aircraft Marker Balls (21" Dia - Orange)	180.77
CCISeismic Aircraft Marker Balls (21" Dia - Orange)	180.77
Aircraft Marker Balls (21" Dia - Orange)	180.77
CCISeismic Tower Section 4 - 1	174.812
Temperature Probe w/ Shield	173.885
Barometric Pressure	173.885
CCISeismic Temperature Probe w/ Shield	173.885
CCISeismic Relative Humidty Sensor	173.885
CCISeismic Barometric Pressure	173.885
Relative Humidty Sensor	173.885
CCISeismic (12) miscl Cat5 From 0 to 196 (168ft to178ft)	173
CCISeismic Tower Section 5 - 1	168.396
NRG #40C Anemometer	167.323
CCISeismic NRG 200P Wind Vane	167.323
CCISeismic NRG #40C Anemometer	167.323
NRG 200P Wind Vane	167.323
95" Boom Mount	165.323
95" Boom Mount	165.323
CCISeismic 95" Boom Mount	165.323
CCISeismic 95" Boom Mount	165.323
CCISeismic (12) miscl Cat5 From 0 to 196 (158ft to168ft)	163
CCISeismic Tower Section 6 - 1	161.979
NRG 200P Wind Vane	160.761
CCISeismic NRG 200P Wind Vane	160.761
95" Boom Mount	158.761
CCISeismic 95" Boom Mount	158.761
CCISeismic Tower Section 7 - 1	155.562
CCISeismic (12) miscl Cat5 From 0 to 196 (148ft to158ft)	153
CCISeismic Tower Section 8 - 1	149.146
CCISeismic (12) miscl Cat5 From 0 to 196 (138ft to148ft)	143

TYPE	ELEVATION
CCISeismic Tower Section 9 - 1	142.729
NRG 200P Wind Vane	137.795
CCISeismic NRG 200P Wind Vane	137.795
CCISeismic Tower Section 10 - 1	136.312
95" Boom Mount	135.795
CCISeismic 95" Boom Mount	135.795
CCISeismic (12) miscl Cat5 From 0 to 196 (128ft to138ft)	133
NRG #40C Anemometer	131.234
NRG #40C Anemometer	131.234
CCISeismic NRG #40C Anemometer	131.234
CCISeismic NRG #40C Anemometer	131.234
CCISeismic Tower Section 11 - 1	129.896
95" Boom Mount	129.234
CCISeismic 95" Boom Mount	129.234
CCISeismic 95" Boom Mount	129.234
95" Boom Mount	129.234
CCISeismic Tower Section 12 - 1	123.479
CCISeismic (12) miscl Cat5 From 0 to 196 (118ft to128ft)	123
CCISeismic Tower Section 13 - 1	117.062
CCISeismic (12) miscl Cat5 From 0 to 196 (108ft to118ft)	113
CCISeismic Tower Section 14 - 1	110.646
CCISeismic Tower Section 15 - 1	104.229
CCISeismic (12) miscl Cat5 From 0 to 196 (98ft to108ft)	103
CCISeismic Tower Section 16 - 1	99.9375
NRG #40C Anemometer	98.425
NRG #40C Anemometer	98.425
CCISeismic NRG #40C Anemometer	98.425
CCISeismic NRG #40C Anemometer	98.425
CCISeismic Tower Section 17 - 1	96.4375
95" Boom Mount	96.425
CCISeismic 95" Boom Mount	96.425
CCISeismic 95" Boom Mount	96.425
95" Boom Mount	96.425
CCISeismic (12) miscl Cat5 From 0 to 196 (88ft to98ft)	93
CCISeismic Tower Section 18 - 1	90.8126
CCISeismic Tower Section 19 - 1	84.6043
CCISeismic (12) miscl Cat5 From 0 to 196 (78ft to88ft)	83
CCISeismic Tower Section 20 - 1	78.396
CCISeismic (12) miscl Cat5 From 0 to 196 (68ft to78ft)	73
CCISeismic Tower Section 21 - 1	72.1877
CCISeismic Tower Section 22 - 1	65.9794
CCISeismic (12) miscl Cat5 From 0 to 196 (58ft to68ft)	63
CCISeismic Tower Section 23 - 1	59.7711
CCISeismic Tower Section 24 - 1	53.5628
CCISeismic (12) miscl Cat5 From 0 to 196 (48ft to58ft)	53
CCISeismic Temperature Probe w/ Shield	49.2
Temperature Probe w/ Shield	49.2
CCISeismic Tower Section 25 - 1	47.3545
CCISeismic (12) miscl Cat5 From 0 to 196 (38ft to48ft)	43
CCISeismic Tower Section 26 - 1	41.1462
CCISeismic Tower Section 27 - 1	34.9379
CCISeismic (12) miscl Cat5 From 0 to 196 (28ft to38ft)	33
CCISeismic Tower Section 28 - 1	28.7296
CCISeismic (12) miscl Cat5 From 0 to 196 (18ft to28ft)	23

Ahola Engineering LLC
P.O. Box 989
Winter Park, CO 80482-0989
Phone: (719) 640-2408
FAX:

Job: NRG 60m Super NRG Tall Tower			
Project: Matanuska-Susitna Borough, AK			
Client: Longroad Energy	Drawn by: Mikko Ahola, PE	App'd:	
Code: TIA-222-H	Date: 07/01/24	Scale: NTS	
Path:		Dwg No. E-1	

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 1 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 2461.000 ft.
Basic wind speed of 121 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 2.
Crest Height: 1500.000 ft.
Deflections calculated using a wind speed of 60 mph.
CCISeismic Note: Seismic loads generated by CCISeismic 3.2.3.
CCISeismic Note: Seismic calculations are in accordance with TIA-222-H.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Safety factor used in guy design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals		Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification		Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys	√	Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks		Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile		Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas	4_	Use TIA-222-H Tension Splice Exemption
				—	
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	197.688-190.438	7.250	0.833	Round	8.0000	8.0500	0.1340		C1020 (45 ksi)
L2	190.438-184.021	7.250	0.833	Round	7.7763	8.0500	0.1340		C1020 (45 ksi)
L3	184.021-177.604	7.250	0.833	Round	7.7505	8.0500	0.1340		C1020 (45 ksi)

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 2 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L4	177.604-171.187	7.250	0.833	Round	7.7476	8.0500	0.1340		C1020 (45 ksi)
L5	171.187-164.771	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L6	164.771-158.354	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L7	158.354-151.937	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L8	151.937-145.521	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L9	145.521-139.104	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L10	139.104-132.687	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L11	132.687-126.271	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L12	126.271-119.854	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L13	119.854-113.437	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L14	113.437-107.021	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L15	107.021-100.604	7.250	0.833	Round	7.7472	8.0500	0.1340		C1020 (45 ksi)
L16	100.604-98.437	3.000	1.042	Round	7.7472	10.0400	0.1090		C1020 (45 ksi)
L17	98.437-93.396	6.083	1.042	Round	9.0259	10.0400	0.1340		C1020 (45 ksi)
L18	93.396-87.188	7.250	1.042	Round	9.5983	10.0400	0.1340		C1020 (45 ksi)
L19	87.188-80.979	7.250	1.042	Round	9.7085	10.0400	0.1340		C1020 (45 ksi)
L20	80.979-74.771	7.250	1.042	Round	9.7244	10.0400	0.1340		C1020 (45 ksi)
L21	74.771-68.563	7.250	1.042	Round	9.7266	10.0400	0.1340		C1020 (45 ksi)
L22	68.563-62.354	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L23	62.354-56.146	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L24	56.146-49.938	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L25	49.938-43.729	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L26	43.729-37.521	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L27	37.521-31.313	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L28	31.313-25.105	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L29	25.105-18.896	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L30	18.896-12.688	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L31	12.688-6.480	7.250	1.042	Round	9.7270	10.0400	0.1340		C1020 (45 ksi)
L32	6.480-0.000	7.521		Round	9.7270	10.0400	0.1340		C1020 (45 ksi)

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 3 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	8.0000	3.3114	25.6184	2.7815	4.0000	6.4046	51.2369	1.6547	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L2	7.8077	3.2172	23.4943	2.7024	3.8881	6.0426	46.9886	1.6076	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L3	7.7850	3.2064	23.2579	2.6933	3.8753	6.0016	46.5159	1.6022	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L4	7.7823	3.2051	23.2309	2.6922	3.8738	5.9969	46.4618	1.6016	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L5	7.7820	3.2050	23.2278	2.6921	3.8736	5.9964	46.4555	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L6	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4548	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L7	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4547	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L8	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4547	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L9	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4547	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L10	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4547	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L11	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4547	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L12	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4547	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L13	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4547	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L14	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4547	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L15	7.7820	3.2050	23.2274	2.6921	3.8736	5.9963	46.4547	1.6015	0.0000	0
	8.0500	3.3324	26.1100	2.7991	4.0250	6.4870	52.2200	1.6652	0.0000	0
L16	8.3841	2.6156	19.0786	2.7008	3.8736	4.9253	38.1572	1.3070	0.0000	0
	10.0400	3.4007	41.9293	3.5114	5.0200	8.3525	83.8586	1.6993	0.0000	0
L17	9.1995	3.7432	37.0034	3.1441	4.5129	8.1994	74.0068	1.8705	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L18	9.6618	3.9842	44.6193	3.3465	4.7992	9.2973	89.2386	1.9909	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L19	9.7562	4.0306	46.1959	3.3854	4.8543	9.5166	92.3918	2.0141	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L20	9.7697	4.0373	46.4255	3.3910	4.8622	9.5483	92.8509	2.0174	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L21	9.7717	4.0383	46.4585	3.3918	4.8633	9.5528	92.9170	2.0179	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L22	9.7720	4.0384	46.4633	3.3920	4.8635	9.5535	92.9265	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L23	9.7720	4.0384	46.4639	3.3920	4.8635	9.5536	92.9279	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L24	9.7720	4.0384	46.4640	3.3920	4.8635	9.5536	92.9281	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L25	9.7720	4.0384	46.4641	3.3920	4.8635	9.5536	92.9281	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L26	9.7720	4.0384	46.4641	3.3920	4.8635	9.5536	92.9281	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L27	9.7720	4.0384	46.4641	3.3920	4.8635	9.5536	92.9281	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L28	9.7720	4.0384	46.4641	3.3920	4.8635	9.5536	92.9281	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L29	9.7720	4.0384	46.4641	3.3920	4.8635	9.5536	92.9281	2.0180	0.0000	0

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L30	9.7720	4.0384	46.4641	3.3920	4.8635	9.5536	92.9281	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L31	9.7720	4.0384	46.4641	3.3920	4.8635	9.5536	92.9281	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0
L32	9.7704	4.0384	46.4641	3.3920	4.8635	9.5536	92.9281	2.0180	0.0000	0
	10.0400	4.1702	51.1610	3.5026	5.0200	10.1914	102.3220	2.0838	0.0000	0

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 197.688-190.438				1	1	1.03			
L2 190.438-184.021				1	1	1.03			
L3 184.021-177.604				1	1	1.03			
L4 177.604-171.187				1	1	1.03			
L5 171.187-164.771				1	1	1.03			
L6 164.771-158.354				1	1	1.03			
L7 158.354-151.937				1	1	1.03			
L8 151.937-145.521				1	1	1.03			
L9 145.521-139.104				1	1	1.03			
L10 139.104-132.687				1	1	1.03			
L11 132.687-126.271				1	1	1.03			
L12 126.271-119.854				1	1	1.03			
L13 119.854-113.437				1	1	1.03			
L14 113.437-107.021				1	1	1.03			
L15 107.021-100.604				1	1	1.03			
L16 100.604-98.437				1	1	1.03			

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L17 98.437-93.396				1	1	1.03			
L18 93.396-87.188				1	1	1.03			
L19 87.188-80.979				1	1	1.03			
L20 80.979-74.771				1	1	1.03			
L21 74.771-68.563				1	1	1.03			
L22 68.563-62.354				1	1	1.03			
L23 62.354-56.146				1	1	1.03			
L24 56.146-49.938				1	1	1.03			
L25 49.938-43.729				1	1	1.03			
L26 43.729-37.521				1	1	1.03			
L27 37.521-31.313				1	1	1.03			
L28 31.313-25.105				1	1	1.03			
L29 25.105-18.896				1	1	1.03			
L30 18.896-12.688				1	1	1.03			
L31 12.688-6.480				1	1	1.03			
L32 6.480-0.000				1	1	1.03			

Guy Data

Guy Elevation ft	Guy Grade	Guy	Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
189.321	Miscl	A	NRG Guy 5/16 13MM	254.80	2.6%	13000	0.173	250.292	164.040	0.0000	0.000	100%
		B	NRG Guy 5/16 13MM	254.80	2.6%	13000	0.173	250.292	164.040	0.0000	0.000	100%
		C	NRG Guy 5/16 13MM	254.80	2.6%	13000	0.173	250.292	164.040	0.0000	0.000	100%
		D	NRG Guy 5/16 13MM	254.80	2.6%	13000	0.173	250.292	164.040	0.0000	0.000	100%
156.121	Miscl	A	NRG Guy 5/16 13MM	254.80	2.6%	13000	0.173	226.226	164.040	0.0000	0.000	100%
		B	NRG Guy 5/16 13MM	254.80	2.6%	13000	0.173	226.226	164.040	0.0000	0.000	100%
		C	NRG Guy 5/16 13MM	254.80	2.6%	13000	0.173	226.226	164.040	0.0000	0.000	100%
		D	NRG Guy 5/16 13MM	254.80	2.6%	13000	0.173	226.226	164.040	0.0000	0.000	100%

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

125.154	Miscl	A NRG Guy	254.80	2.6%	13000	0.173	206.081	164.040	0.0000	0.000	100%
		B 5/16 13MM	254.80	2.6%	13000	0.173	206.081	164.040	0.0000	0.000	100%
		C NRG Guy	254.80	2.6%	13000	0.173	206.081	164.040	0.0000	0.000	100%
		D 5/16 13MM	254.80	2.6%	13000	0.173	206.081	164.040	0.0000	0.000	100%
		NRG Guy									
		5/16 13MM									
		NRG Guy									
		5/16 13MM									
94.4376	Miscl	A NRG Guy	254.80	2.6%	13000	0.173	174.932	147.670	0.0000	0.000	100%
		B 5/16 13MM	254.80	2.6%	13000	0.173	174.932	147.670	0.0000	0.000	100%
		C NRG Guy	254.80	2.6%	13000	0.173	174.932	147.670	0.0000	0.000	100%
		D 5/16 13MM	254.80	2.6%	13000	0.173	174.932	147.670	0.0000	0.000	100%
		NRG Guy									
		5/16 13MM									
		NRG Guy									
		5/16 13MM									
64.4294	Miscl	A NRG Guy	254.80	2.6%	13000	0.173	160.729	147.670	0.0000	0.000	100%
		B 5/16 13MM	254.80	2.6%	13000	0.173	160.729	147.670	0.0000	0.000	100%
		C NRG Guy	254.80	2.6%	13000	0.173	160.729	147.670	0.0000	0.000	100%
		D 5/16 13MM	254.80	2.6%	13000	0.173	160.729	147.670	0.0000	0.000	100%
		NRG Guy									
		5/16 13MM									
		NRG Guy									
		5/16 13MM									
32.3546	Miscl	A NRG Guy	254.80	2.6%	13000	0.173	150.764	147.670	0.0000	0.000	100%
		B 5/16 13MM	254.80	2.6%	13000	0.173	150.764	147.670	0.0000	0.000	100%
		C NRG Guy	254.80	2.6%	13000	0.173	150.764	147.670	0.0000	0.000	100%
		D 5/16 13MM	254.80	2.6%	13000	0.173	150.764	147.670	0.0000	0.000	100%
		NRG Guy									
		5/16 13MM									
		NRG Guy									
		5/16 13MM									

Guy Data *(cont'd)*

Guy Elevation ft	*Mount Type*	*Torque-Arm Spread ft*	*Torque-Arm Leg Angle °*	*Torque-Arm Style*	*Torque-Arm Grade*	*Torque-Arm Type*	*Torque-Arm Size*
189.321	Corner						
156.121	Corner						
125.154	Corner						
94.4376	Corner						
64.4294	Corner						
32.3546	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	*Diagonal Grade*	*Diagonal Type*	*Upper Diagonal Size*	*Lower Diagonal Size*	*Is Strap.*	*Pull-Off Grade*	*Pull-Off Type*	*Pull-Off Size*
189.321	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
156.121	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	

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Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
125.154	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
94.438	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
64.429	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
32.355	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
189.321	43.30	43.30	43.30	43.30	20.012 7.7 sec/pulse	20.012 7.7 sec/pulse	20.012 7.7 sec/pulse	20.012 7.7 sec/pulse
156.121	39.14	39.14	39.14	39.14	16.523 7.0 sec/pulse	16.523 7.0 sec/pulse	16.523 7.0 sec/pulse	16.523 7.0 sec/pulse
125.154	35.65	35.65	35.65	35.65	13.850 6.4 sec/pulse	13.850 6.4 sec/pulse	13.850 6.4 sec/pulse	13.850 6.4 sec/pulse
94.4376	30.26	30.26	30.26	30.26	10.078 5.5 sec/pulse	10.078 5.5 sec/pulse	10.078 5.5 sec/pulse	10.078 5.5 sec/pulse
64.4294	27.81	27.81	27.81	27.81	8.593 5.1 sec/pulse	8.593 5.1 sec/pulse	8.593 5.1 sec/pulse	8.593 5.1 sec/pulse
32.3546	26.08	26.08	26.08	26.08	7.642 4.8 sec/pulse	7.642 4.8 sec/pulse	7.642 4.8 sec/pulse	7.642 4.8 sec/pulse

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
189.321	No	No			1	1	1	1
156.121	No	No			1	1	1	1
125.154	No	No			1	1	1	1
94.4376	No	No			1	1	1	1
64.4294	No	No			1	1	1	1
32.3546	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
189.321	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
156.121	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
125.154	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
94.4376	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
64.4294	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
32.3546	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
189.321	A	94.660	80		
	B	94.660	80		
	C	94.660	80		
	D	94.660	80		
156.121	A	78.060	77		
	B	78.060	77		
	C	78.060	77		
	D	78.060	77		
125.154	A	62.577	74		
	B	62.577	74		
	C	62.577	74		
	D	62.577	74		
94.4376	A	47.219	70		
	B	47.219	70		
	C	47.219	70		
	D	47.219	70		
64.4294	A	32.215	65		
	B	32.215	65		
	C	32.215	65		
	D	32.215	65		
32.3546	A	16.177	57		
	B	16.177	57		
	C	16.177	57		
	D	16.177	57		

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
189.321	A	49.1488	287.73 255.00	-125.19	226.82	-125.19	-52.46	0.00	52.46
	B	49.1488	287.73 255.00	125.19	226.82	-125.19	-52.46	0.00	-52.46

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
	C	49.1488	287.73 255.00	125.19	226.82	125.19	52.46	0.00	-52.46
	D	49.1488	287.73 255.00	-125.19	226.82	125.19	52.46	0.00	52.46
			Sum:	0.00	907.28	0.00	0.00	0.00	0.00
156.121	A	43.6404	281.80 254.80	-136.99	204.64	-136.99	-47.48	0.00	47.48
	B	43.6404	281.80 254.80	136.99	204.64	-136.99	-47.48	0.00	-47.48
	C	43.6404	281.80 254.80	136.99	204.64	136.99	47.48	0.00	-47.48
	D	43.6404	281.80 254.80	-136.99	204.64	136.99	47.48	0.00	47.48
			Sum:	0.00	818.57	0.00	0.00	0.00	0.00
125.154	A	37.3968	275.71 254.06	-148.51	178.62	-148.51	-41.20	0.00	41.20
	B	37.3968	275.71 254.06	148.51	178.62	-148.51	-41.20	0.00	-41.20
	C	37.3968	275.71 254.06	148.51	178.62	148.51	41.20	0.00	-41.20
	D	37.3968	275.71 254.06	-148.51	178.62	148.51	41.20	0.00	41.20
			Sum:	0.00	714.48	0.00	0.00	0.00	0.00
94.4376	A	32.6722	271.13 254.80	-156.29	157.03	-156.29	-45.65	0.00	45.65
	B	32.6722	271.13 254.80	156.29	157.03	-156.29	-45.65	0.00	-45.65
	C	32.6722	271.13 254.80	156.29	157.03	156.29	45.65	0.00	-45.65
	D	32.6722	271.13 254.80	-156.29	157.03	156.29	45.65	0.00	45.65
			Sum:	0.00	628.13	0.00	0.00	0.00	0.00
64.4294	A	23.6311	265.94 254.80	-168.44	118.23	-168.44	-34.66	0.00	34.66
	B	23.6311	265.94 254.80	168.44	118.23	-168.44	-34.66	0.00	-34.66
	C	23.6311	265.94 254.80	168.44	118.23	168.44	34.66	0.00	-34.66
	D	23.6311	265.94 254.80	-168.44	118.23	168.44	34.66	0.00	34.66
			Sum:	0.00	472.92	0.00	0.00	0.00	0.00
32.3546	A	12.3921	260.40 254.80	-177.68	68.30	-177.68	-20.11	0.00	20.11
	B	12.3921	260.40 254.80	177.68	68.30	-177.68	-20.11	0.00	-20.11
	C	12.3921	260.40 254.80	177.68	68.30	177.68	20.11	0.00	-20.11
	D	12.3921	260.40 254.80	-177.68	68.30	177.68	20.11	0.00	20.11
			Sum:	0.00	273.20	0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
189.321	A	49.1488	287.73 255.00	-125.19	226.82	-125.19	-52.46	0.00	52.46
	B	49.1488	287.73 255.00	125.19	226.82	-125.19	-52.46	0.00	-52.46
	C	49.1488	287.73 255.00	125.19	226.82	125.19	52.46	0.00	-52.46
	D	49.1488	287.73 255.00	-125.19	226.82	125.19	52.46	0.00	52.46
			Sum:	0.00	907.28	0.00	0.00	0.00	0.00
156.121	A	43.6404	281.80 254.80	-136.99	204.64	-136.99	-47.48	0.00	47.48
	B	43.6404	281.80 254.80	136.99	204.64	-136.99	-47.48	0.00	-47.48
	C	43.6404	281.80 254.80	136.99	204.64	136.99	47.48	0.00	-47.48
	D	43.6404	281.80 254.80	-136.99	204.64	136.99	47.48	0.00	47.48
			Sum:	0.00	818.57	0.00	0.00	0.00	0.00
125.154	A	37.3968	275.71 254.06	-148.51	178.62	-148.51	-41.20	0.00	41.20
	B	37.3968	275.71 254.06	148.51	178.62	-148.51	-41.20	0.00	-41.20
	C	37.3968	275.71 254.06	148.51	178.62	148.51	41.20	0.00	-41.20
	D	37.3968	275.71 254.06	-148.51	178.62	148.51	41.20	0.00	41.20
			Sum:	0.00	714.48	0.00	0.00	0.00	0.00
94.4376	A	32.6722	271.13 254.80	-156.29	157.03	-156.29	-45.65	0.00	45.65
	B	32.6722	271.13 254.80	156.29	157.03	-156.29	-45.65	0.00	-45.65
	C	32.6722	271.13 254.80	156.29	157.03	156.29	45.65	0.00	-45.65
	D	32.6722	271.13 254.80	-156.29	157.03	156.29	45.65	0.00	45.65
			Sum:	0.00	628.13	0.00	0.00	0.00	0.00
64.4294	A	23.6311	265.94 254.80	-168.44	118.23	-168.44	-34.66	0.00	34.66
	B	23.6311	265.94 254.80	168.44	118.23	-168.44	-34.66	0.00	-34.66
	C	23.6311	265.94 254.80	168.44	118.23	168.44	34.66	0.00	-34.66
	D	23.6311	265.94 254.80	-168.44	118.23	168.44	34.66	0.00	34.66
			Sum:	0.00	472.92	0.00	0.00	0.00	0.00
32.3546	A	12.3921	260.40 254.80	-177.68	68.30	-177.68	-20.11	0.00	20.11
	B	12.3921	260.40 254.80	177.68	68.30	-177.68	-20.11	0.00	-20.11
	C	12.3921	260.40 254.80	177.68	68.30	177.68	20.11	0.00	-20.11
	D	12.3921	260.40 254.80	-177.68	68.30	177.68	20.11	0.00	20.11
			Sum:	0.00	273.20	0.00	0.00	0.00	0.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 11 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Cat5	C	No	Yes	Inside Pole	196.000 - 0.000	12	No Ice	0.000	0.05

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	197.688-190.438	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.34
		D	0.000	0.000	0.000	0.000	0.00
L2	190.438-184.021	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L3	184.021-177.604	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L4	177.604-171.187	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L5	171.187-164.771	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L6	164.771-158.354	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L7	158.354-151.937	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L8	151.937-145.521	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L9	145.521-139.104	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L10	139.104-132.687	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L11	132.687-126.271	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 12 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L12	126.271-119.854	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L13	119.854-113.437	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L14	113.437-107.021	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L15	107.021-100.604	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.85
		D	0.000	0.000	0.000	0.000	0.00
L16	100.604-98.437	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.30
		D	0.000	0.000	0.000	0.000	0.00
L17	98.437-93.396	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.02
		D	0.000	0.000	0.000	0.000	0.00
L18	93.396-87.188	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L19	87.188-80.979	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L20	80.979-74.771	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L21	74.771-68.563	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L22	68.563-62.354	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L23	62.354-56.146	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L24	56.146-49.938	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L25	49.938-43.729	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L26	43.729-37.521	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L27	37.521-31.313	A	0.000	0.000	0.000	0.000	0.00

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L28	31.313-25.105	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L29	25.105-18.896	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L30	18.896-12.688	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L31	12.688-6.480	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.72
		D	0.000	0.000	0.000	0.000	0.00
L32	6.480-0.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.89
		D	0.000	0.000	0.000	0.000	0.00

User Defined Loads - Seismic

Description	Elevation ft	Offset From Centroid ft	Azimuth Angle °	E_v lb	E_{hx} lb	E_{hz} lb	E_h lb
CCISeismic Tower Section 1 - 1	194.063	0.000	0.0000	21.78	0.00	0.00	102.45
CCISeismic Tower Section 2 - 1	187.646	0.000	0.0000	21.16	0.00	0.00	93.06
CCISeismic Tower Section 3 - 1	181.229	0.000	0.0000	21.09	0.00	0.00	86.51
CCISeismic Tower Section 4 - 1	174.812	0.000	0.0000	21.08	0.00	0.00	80.46
CCISeismic Tower Section 5 - 1	168.396	0.000	0.0000	21.08	0.00	0.00	74.66
CCISeismic Tower Section 6 - 1	161.979	0.000	0.0000	21.08	0.00	0.00	69.08
CCISeismic Tower Section 7 - 1	155.562	0.000	0.0000	21.08	0.00	0.00	63.71
CCISeismic Tower Section 8 - 1	149.146	0.000	0.0000	21.08	0.00	0.00	58.57
CCISeismic Tower Section 9 - 1	142.729	0.000	0.0000	21.08	0.00	0.00	53.64
CCISeismic Tower Section 10 - 1	136.312	0.000	0.0000	21.08	0.00	0.00	48.92
CCISeismic Tower Section 11 - 1	129.896	0.000	0.0000	21.08	0.00	0.00	44.42
CCISeismic Tower Section 12 - 1	123.479	0.000	0.0000	21.08	0.00	0.00	40.14
CCISeismic Tower Section 13 - 1	117.062	0.000	0.0000	21.08	0.00	0.00	36.08
CCISeismic Tower Section 14 - 1	110.646	0.000	0.0000	21.08	0.00	0.00	32.23
CCISeismic Tower Section 15 - 1	104.229	0.000	0.0000	21.08	0.00	0.00	28.60
CCISeismic Tower Section 16 - 1	99.937	0.000	0.0000	7.12	0.00	0.00	8.88
CCISeismic Tower Section 17 - 1	96.438	0.000	0.0000	20.66	0.00	0.00	24.00
CCISeismic Tower Section 18 - 1	90.813	0.000	0.0000	26.21	0.00	0.00	26.99
CCISeismic Tower Section 19 -	84.604	0.000	0.0000	26.51	0.00	0.00	23.70

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	lb	lb	lb	lb
1							
CCISeismic Tower Section 20 - 1	78.396	0.000	0.0000	26.56	0.00	0.00	20.38
CCISeismic Tower Section 21 - 1	72.188	0.000	0.0000	26.56	0.00	0.00	17.29
CCISeismic Tower Section 22 - 1	65.979	0.000	0.0000	26.57	0.00	0.00	14.44
CCISeismic Tower Section 23 - 1	59.771	0.000	0.0000	26.57	0.00	0.00	11.85
CCISeismic Tower Section 24 - 1	53.563	0.000	0.0000	26.57	0.00	0.00	9.52
CCISeismic Tower Section 25 - 1	47.354	0.000	0.0000	26.57	0.00	0.00	7.44
CCISeismic Tower Section 26 - 1	41.146	0.000	0.0000	26.57	0.00	0.00	5.62
CCISeismic Tower Section 27 - 1	34.938	0.000	0.0000	26.57	0.00	0.00	4.05
CCISeismic Tower Section 28 - 1	28.730	0.000	0.0000	26.57	0.00	0.00	2.74
CCISeismic Tower Section 29 - 1	22.521	0.000	0.0000	26.57	0.00	0.00	1.68
CCISeismic Tower Section 30 - 1	16.313	0.000	0.0000	26.57	0.00	0.00	0.88
CCISeismic Tower Section 31 - 1	10.105	0.000	0.0000	26.57	0.00	0.00	0.34
CCISeismic Tower Section 32 - 1	3.761	0.000	0.0000	27.56	0.00	0.00	0.05
CCISeismic Properllor Anemometer/Wind Vane	198.491	0.000	0.0000	0.57	0.00	0.00	2.80
CCISeismic 95" Boom Mount	196.194	0.000	0.0000	2.07	0.00	0.00	9.96
CCISeismic NRG #40C Anemometer	192.913	0.000	0.0000	0.05	0.00	0.00	0.24
CCISeismic 95" Boom Mount	190.913	0.000	0.0000	2.07	0.00	0.00	9.43
CCISeismic NRG #40C Anemometer	192.913	0.000	0.0000	0.05	0.00	0.00	0.24
CCISeismic 95" Boom Mount	190.913	0.000	0.0000	2.07	0.00	0.00	9.43
CCISeismic Aircraft Marker Balls (21" Dia - Orange)	180.770	0.000	0.0000	3.88	0.00	0.00	15.85
CCISeismic Aircraft Marker Balls (21" Dia - Orange)	180.770	0.000	0.0000	3.88	0.00	0.00	15.85
CCISeismic Aircraft Marker Balls (21" Dia - Orange)	180.770	0.000	0.0000	3.88	0.00	0.00	15.85
CCISeismic Aircraft Marker Balls (21" Dia - Orange)	180.770	0.000	0.0000	3.88	0.00	0.00	15.85
CCISeismic NRG 200P Wind Vane	167.323	0.000	0.0000	0.06	0.00	0.00	0.23
CCISeismic 95" Boom Mount	165.323	0.000	0.0000	2.07	0.00	0.00	7.07
CCISeismic NRG #40C Anemometer	167.323	0.000	0.0000	0.05	0.00	0.00	0.18
CCISeismic 95" Boom Mount	165.323	0.000	0.0000	2.07	0.00	0.00	7.07
CCISeismic Temperature Probe w/ Shield	173.885	0.000	0.0000	1.29	0.00	0.00	4.89
CCISeismic Relative Humidty Sensor	173.885	0.000	0.0000	2.59	0.00	0.00	9.78
CCISeismic Barometric Pressure	173.885	0.000	0.0000	2.59	0.00	0.00	9.78
CCISeismic NRG 200P Wind Vane	160.761	0.000	0.0000	0.06	0.00	0.00	0.21
CCISeismic 95" Boom Mount	158.761	0.000	0.0000	2.07	0.00	0.00	6.52
CCISeismic NRG 200P Wind	137.795	0.000	0.0000	0.06	0.00	0.00	0.15

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	lb	lb	lb	lb
Vane CCISeismic 95" Boom Mount	135.795	0.000	0.0000	2.07	0.00	0.00	4.77
CCISeismic NRG #40C Anemometer	131.234	0.000	0.0000	0.05	0.00	0.00	0.11
CCISeismic 95" Boom Mount	129.234	0.000	0.0000	2.07	0.00	0.00	4.32
CCISeismic NRG #40C Anemometer	131.234	0.000	0.0000	0.05	0.00	0.00	0.11
CCISeismic 95" Boom Mount	129.234	0.000	0.0000	2.07	0.00	0.00	4.32
CCISeismic NRG #40C Anemometer	98.425	0.000	0.0000	0.05	0.00	0.00	0.06
CCISeismic 95" Boom Mount	96.425	0.000	0.0000	2.07	0.00	0.00	2.40
CCISeismic NRG #40C Anemometer	98.425	0.000	0.0000	0.05	0.00	0.00	0.06
CCISeismic 95" Boom Mount	96.425	0.000	0.0000	2.07	0.00	0.00	2.40
CCISeismic Temperature Probe w/ Shield	49.200	0.000	0.0000	1.29	0.00	0.00	0.39
CCISeismic Data Logger	5.000	0.000	0.0000	12.94	0.00	0.00	0.04
CCISeismic (12) miscl Cat5 From 0 to 196 (188ft to196ft)	192.000	0.000	0.0000	1.24	0.00	0.00	5.72
CCISeismic (12) miscl Cat5 From 0 to 196 (178ft to188ft)	183.000	0.000	0.0000	1.55	0.00	0.00	6.50
CCISeismic (12) miscl Cat5 From 0 to 196 (168ft to178ft)	173.000	0.000	0.0000	1.55	0.00	0.00	5.81
CCISeismic (12) miscl Cat5 From 0 to 196 (158ft to168ft)	163.000	0.000	0.0000	1.55	0.00	0.00	5.15
CCISeismic (12) miscl Cat5 From 0 to 196 (148ft to158ft)	153.000	0.000	0.0000	1.55	0.00	0.00	4.54
CCISeismic (12) miscl Cat5 From 0 to 196 (138ft to148ft)	143.000	0.000	0.0000	1.55	0.00	0.00	3.97
CCISeismic (12) miscl Cat5 From 0 to 196 (128ft to138ft)	133.000	0.000	0.0000	1.55	0.00	0.00	3.43
CCISeismic (12) miscl Cat5 From 0 to 196 (118ft to128ft)	123.000	0.000	0.0000	1.55	0.00	0.00	2.93
CCISeismic (12) miscl Cat5 From 0 to 196 (108ft to118ft)	113.000	0.000	0.0000	1.55	0.00	0.00	2.48
CCISeismic (12) miscl Cat5 From 0 to 196 (98ft to108ft)	103.000	0.000	0.0000	1.55	0.00	0.00	2.06
CCISeismic (12) miscl Cat5 From 0 to 196 (88ft to98ft)	93.000	0.000	0.0000	1.55	0.00	0.00	1.68
CCISeismic (12) miscl Cat5 From 0 to 196 (78ft to88ft)	83.000	0.000	0.0000	1.55	0.00	0.00	1.34
CCISeismic (12) miscl Cat5 From 0 to 196 (68ft to78ft)	73.000	0.000	0.0000	1.55	0.00	0.00	1.03
CCISeismic (12) miscl Cat5 From 0 to 196 (58ft to68ft)	63.000	0.000	0.0000	1.55	0.00	0.00	0.77
CCISeismic (12) miscl Cat5 From 0 to 196 (48ft to58ft)	53.000	0.000	0.0000	1.55	0.00	0.00	0.54
CCISeismic (12) miscl Cat5 From 0 to 196 (38ft to48ft)	43.000	0.000	0.0000	1.55	0.00	0.00	0.36
CCISeismic (12) miscl Cat5 From 0 to 196 (28ft to38ft)	33.000	0.000	0.0000	1.55	0.00	0.00	0.21
CCISeismic (12) miscl Cat5 From 0 to 196 (18ft to28ft)	23.000	0.000	0.0000	1.55	0.00	0.00	0.10
CCISeismic (12) miscl Cat5 From 0 to 196 (8ft to18ft)	13.000	0.000	0.0000	1.55	0.00	0.00	0.03
CCISeismic (12) miscl Cat5 From 0 to 196 (0ft to8ft)	4.000	0.000	0.0000	1.24	0.00	0.00	0.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 16 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
***									
Properllor Anemometer/Wind Vane	A	From Leg	7.920 0.000 0.000	0.0000	198.491	No Ice	0.350	0.350	2.20
95" Boom Mount	A	From Leg	0.000 0.000 0.000	0.0000	196.194	No Ice	0.250	1.000	8.00
***									
NRG #40C Anemometer	C	From Leg	7.920 0.000 0.000	0.0000	192.913	No Ice	0.250	0.250	0.20
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.0000	190.913	No Ice	0.250	1.000	8.00
NRG #40C Anemometer	A	From Leg	7.920 0.000 0.000	0.0000	192.913	No Ice	0.250	0.250	0.20
95" Boom Mount	A	From Leg	0.000 0.000 0.000	0.0000	190.913	No Ice	0.250	1.000	8.00
***									
Aircraft Marker Balls (21" Dia - Orange)	A	From Leg	0.000 0.000 0.000	0.0000	180.770	No Ice	1.130	1.130	15.00
Aircraft Marker Balls (21" Dia - Orange)	B	From Leg	0.000 0.000 0.000	0.0000	180.770	No Ice	1.130	1.130	15.00
Aircraft Marker Balls (21" Dia - Orange)	C	From Leg	0.000 0.000 0.000	0.0000	180.770	No Ice	1.130	1.130	15.00
Aircraft Marker Balls (21" Dia - Orange)	D	From Leg	0.000 0.000 0.000	0.0000	180.770	No Ice	1.130	1.130	15.00
****									
NRG 200P Wind Vane	A	From Leg	7.920 0.000 0.000	0.0000	167.323	No Ice	0.250	0.250	0.25
95" Boom Mount	A	From Leg	0.000 0.000 0.000	0.0000	165.323	No Ice	0.250	1.000	8.00
NRG #40C Anemometer	C	From Leg	7.920 0.000 0.000	0.0000	167.323	No Ice	0.250	0.250	0.20
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.0000	165.323	No Ice	0.250	1.000	8.00
****									
Temperature Probe w/ Shield	A	From Leg	0.000 0.000 0.000	0.0000	173.885	No Ice	0.250	0.250	5.00
Relative Humidty Sensor	B	From Leg	0.000 0.000 0.000	0.0000	173.885	No Ice	0.450	0.450	10.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 17 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.000						
Barometric Pressure	C	From Leg	0.000 0.000 0.000	0.0000	173.885	No Ice	0.500	0.500	10.00
****									
NRG 200P Wind Vane	C	From Leg	7.920 0.000 0.000	0.0000	160.761	No Ice	0.250	0.250	0.25
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.0000	158.761	No Ice	0.250	1.000	8.00
****									
NRG 200P Wind Vane	C	From Leg	7.920 0.000 0.000	0.0000	137.795	No Ice	0.250	0.250	0.25
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.0000	135.795	No Ice	0.250	1.000	8.00
****									
NRG #40C Anemometer	C	From Leg	7.920 0.000 0.000	0.0000	131.234	No Ice	0.250	0.250	0.20
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.0000	129.234	No Ice	0.250	1.000	8.00
NRG #40C Anemometer	A	From Leg	7.920 0.000 0.000	0.0000	131.234	No Ice	0.250	0.250	0.20
95" Boom Mount	A	From Leg	0.000 0.000 0.000	0.0000	129.234	No Ice	0.250	1.000	8.00
***									
NRG #40C Anemometer	C	From Leg	7.920 0.000 0.000	0.0000	98.425	No Ice	0.250	0.250	0.20
95" Boom Mount	C	From Leg	0.000 0.000 0.000	0.0000	96.425	No Ice	0.250	1.000	8.00
NRG #40C Anemometer	A	From Leg	7.920 0.000 0.000	0.0000	98.425	No Ice	0.250	0.250	0.20
95" Boom Mount	A	From Leg	0.000 0.000 0.000	0.0000	96.425	No Ice	0.250	1.000	8.00
****									
Temperature Probe w/ Shield	C	From Leg	0.000 0.000 0.000	0.0000	49.200	No Ice	0.250	0.250	5.00
***									
Data Logger	C	From Leg	0.000 0.000 0.000	0.0000	5.000	No Ice	4.000	4.000	50.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 18 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

222-H Verification Constants

Constant	Value
K_d	0.95
Ice Thickness Importance Factor	1
Z_g	900
α	9.5
K_{zmin}	0.85
K_c	1
K_t	0.43
f	1.25
K_e	0.915

222-H Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
L1 197.688-190.438	1	TP8.05x8x0.134	127.511	63.229		1	1	4.848	4.848	4.848	4.848
							Sum:	4.848	4.848	4.848	4.848
L2 190.438-184.021	2	TP8.05x7.7763x0.134	125.451	62.207		1	1	4.240	4.240	4.240	4.240
							Sum:	4.240	4.240	4.240	4.240
L3 184.021-177.604	3	TP8.05x7.7505x0.134	124.968	61.968		1	1	4.234	4.234	4.234	4.234
							Sum:	4.234	4.234	4.234	4.234
L4 177.604-171.187	4	TP8.05x7.7476x0.134	124.651	61.81		1	1	4.233	4.233	4.233	4.233
							Sum:	4.233	4.233	4.233	4.233
L5 171.187-164.771	5	TP8.05x7.7472x0.134	124.338	61.655		1	1	4.233	4.233	4.233	4.233
							Sum:	4.233	4.233	4.233	4.233
L6 164.771-158.354	6	TP8.05x7.7472x0.134	124.009	61.492		1	1	4.233	4.233	4.233	4.233
							Sum:	4.233	4.233	4.233	4.233
L7 158.354-151.937	7	TP8.05x7.7472x0.134	123.662	61.32		1	1	4.233	4.233	4.233	4.233
							Sum:	4.233	4.233	4.233	4.233
L8 151.937-145.521	8	TP8.05x7.7472x0.134	123.294	61.138		1	1	4.233	4.233	4.233	4.233
							Sum:	4.233	4.233	4.233	4.233
L9 145.521-139.104	9	TP8.05x7.7472x0.134	122.904	60.944		1	1	4.233	4.233	4.233	4.233
							Sum:	4.233	4.233	4.233	4.233
L10 139.104-132.687	10	TP8.05x7.7472x0.134	122.49	60.739		1	1	4.233	4.233	4.233	4.233
							Sum:	4.233	4.233	4.233	4.233

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 19 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
L11	11	TP8.05x7.7472x0.134	122.049	60.52		1	1	4.233	4.233	4.233	4.233
132.687-126.271											
							Sum:	4.233	4.233	4.233	4.233
L12	12	TP8.05x7.7472x0.134	121.579	60.287		1	1	4.233	4.233	4.233	4.233
126.271-119.854											
							Sum:	4.233	4.233	4.233	4.233
L13	13	TP8.05x7.7472x0.134	121.077	60.038		1	1	4.233	4.233	4.233	4.233
119.854-113.437											
							Sum:	4.233	4.233	4.233	4.233
L14	14	TP8.05x7.7472x0.134	120.539	59.771		1	1	4.233	4.233	4.233	4.233
113.437-107.021											
							Sum:	4.233	4.233	4.233	4.233
L15	15	TP8.05x7.7472x0.134	119.961	59.485		1	1	4.233	4.233	4.233	4.233
107.021-100.604											
							Sum:	4.233	4.233	4.233	4.233
L16	16	TP10.04x7.7472x0.109	134.609	66.748		1	1	1.663	1.663	1.663	1.663
100.604-98.437											
							Sum:	1.663	1.663	1.663	1.663
L17	17	TP10.04x9.0259x0.134	143.848	71.33		1	1	4.042	4.042	4.042	4.042
98.437-93.396											
							Sum:	4.042	4.042	4.042	4.042
L18	18	TP10.04x9.5983x0.134	147.426	73.104		1	1	5.096	5.096	5.096	5.096
93.396-87.188											
							Sum:	5.096	5.096	5.096	5.096
L19	19	TP10.04x9.7085x0.134	147.364	73.073		1	1	5.121	5.121	5.121	5.121
87.188-80.979											
							Sum:	5.121	5.121	5.121	5.121
L20	20	TP10.04x9.7244x0.134	146.513	72.651		1	1	5.124	5.124	5.124	5.124
80.979-74.771											
							Sum:	5.124	5.124	5.124	5.124
L21	21	TP10.04x9.7267x0.134	145.47	72.134		1	1	5.125	5.125	5.125	5.125
74.771-68.563											
							Sum:	5.125	5.125	5.125	5.125
L22	22	TP10.04x9.727x0.134	144.307	71.557		1	1	5.125	5.125	5.125	5.125
68.563-62.354											
							Sum:	5.125	5.125	5.125	5.125
L23	23	TP10.04x9.727x0.134	143.016	70.917		1	1	5.125	5.125	5.125	5.125
62.354-56.146											
							Sum:	5.125	5.125	5.125	5.125
L24	24	TP10.04x9.727x0.134	141.572	70.201		1	1	5.125	5.125	5.125	5.125
56.146-49.938											
							Sum:	5.125	5.125	5.125	5.125
L25	25	TP10.04x9.727x0.134	139.939	69.391		1	1	5.125	5.125	5.125	5.125
49.938-43.729											
							Sum:	5.125	5.125	5.125	5.125
L26	26	TP10.04x9.727x0.134	138.069	68.464		1	1	5.125	5.125	5.125	5.125
43.729-37.521											
							Sum:	5.125	5.125	5.125	5.125
L27	27	TP10.04x9.727x0.134	135.885	67.381		1	1	5.125	5.125	5.125	5.125
37.521-31.313											
							Sum:	5.125	5.125	5.125	5.125
L28	28	TP10.04x9.727x0.134	133.272	66.085		1	1	5.125	5.125	5.125	5.125
31.313-25.105											
							Sum:	5.125	5.125	5.125	5.125
L29	29	TP10.04x9.727x0.13	130.027	64.476		1	1	5.125	5.125	5.125	5.125

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 20 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
25.105-18.896		4									
							Sum:	5.125	5.125	5.125	5.125
L30 18.896-12.688	30	TP10.04x9.727x0.134	125.757	62.359		1	1	5.125	5.125	5.125	5.125
							Sum:	5.125	5.125	5.125	5.125
L31 12.688-6.480	31	TP10.04x9.727x0.134	125.365	62.165		1	1	5.125	5.125	5.125	5.125
							Sum:	5.125	5.125	5.125	5.125
L32 6.480-0.000	32	TP10.04x9.727x0.134	125.564	62.263		1	1	5.349	5.349	5.349	5.349
							Sum:	5.349	5.349	5.349	5.349

222-H Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
L1 197.688-190.438	194.059		1.455	1.176	1.865		88		1	4.848
L2 190.438-184.021	187.213		1.444	1.169	1.871		88		1	4.240
L3 184.021-177.604	180.795		1.434	1.163	1.877		88		1	4.234
L4 177.604-171.187	174.378		1.423	1.156	1.882		87		1	4.233
L5 171.187-164.771	167.961		1.412	1.15	1.887		87		1	4.233
L6 164.771-158.354	161.544		1.4	1.144	1.893		86		1	4.233
L7 158.354-151.937	155.128		1.388	1.138	1.898		86		1	4.233
L8 151.937-145.521	148.711		1.376	1.132	1.904		85		1	4.233
L9 145.521-139.104	142.294		1.363	1.126	1.91		85		1	4.233
L10 139.104-132.687	135.878		1.35	1.12	1.915		84		1	4.233
L11 132.687-126.271	129.461		1.336	1.114	1.921		84		1	4.233
L12 126.271-119.854	123.044		1.322	1.108	1.927		83		1	4.233
L13 119.854-113.437	116.628		1.307	1.102	1.933		82		1	4.233
L14 113.437-107.021	110.211		1.292	1.096	1.938		82		1	4.233
L15 107.021-100.604	103.794		1.276	1.09	1.944		81		1	4.233
L16 100.604-98.437	99.488		1.264	1.086	1.948		80		1	1.663
L17 98.437-93.396	95.880		1.254	1.083	1.952		80		1	4.042
L18 93.396-87.188	90.272		1.239	1.078	1.957		79		1	5.096
L19 87.188-80.979	84.069		1.22	1.073	1.963		78		1	5.121
L20 80.979-74.771	77.861		1.201	1.067	1.968		77		1	5.124
L21 74.771-68.563	71.653		1.18	1.062	1.974		76		1	5.125
L22 68.563-62.354	65.445		1.158	1.056	1.98		75		1	5.125
L23 62.354-56.146	59.236		1.134	1.051	1.986		73		1	5.125
L24 56.146-49.938	53.028		1.107	1.045	1.992		72		1	5.125
L25 49.938-43.729	46.820		1.079	1.04	1.998		70		1	5.125
L26 43.729-37.521	40.611		1.047	1.034	2.004		68		1	5.125
L27 37.521-31.313	34.403		1.011	1.029	2.01		66		1	5.125
L28 31.313-25.105	28.195		0.97	1.024	2.016		64		1	5.125
L29 25.105-18.896	21.986		0.92	1.018	2.023		61		1	5.125
L30 18.896-12.688	15.778		0.858	1.013	2.029		57		1	5.125
L31 12.688-6.480	9.570		0.85	1.008	2.035		56		1	5.125
L32 6.480-0.000	3.225		0.85	1.003	2.042		57		1	5.349

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 21 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

222-H Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
L1 197.688-190.438	194.059		1.455	1.176	1.865		19		1	4.848
L2 190.438-184.021	187.213		1.444	1.169	1.871		19		1	4.240
L3 184.021-177.604	180.795		1.434	1.163	1.877		19		1	4.234
L4 177.604-171.187	174.378		1.423	1.156	1.882		19		1	4.233
L5 171.187-164.771	167.961		1.412	1.15	1.887		19		1	4.233
L6 164.771-158.354	161.544		1.4	1.144	1.893		19		1	4.233
L7 158.354-151.937	155.128		1.388	1.138	1.898		19		1	4.233
L8 151.937-145.521	148.711		1.376	1.132	1.904		19		1	4.233
L9 145.521-139.104	142.294		1.363	1.126	1.91		19		1	4.233
L10 139.104-132.687	135.878		1.35	1.12	1.915		19		1	4.233
L11 132.687-126.271	129.461		1.336	1.114	1.921		18		1	4.233
L12 126.271-119.854	123.044		1.322	1.108	1.927		18		1	4.233
L13 119.854-113.437	116.628		1.307	1.102	1.933		18		1	4.233
L14 113.437-107.021	110.211		1.292	1.096	1.938		18		1	4.233
L15 107.021-100.604	103.794		1.276	1.09	1.944		18		1	4.233
L16 100.604-98.437	99.488		1.264	1.086	1.948		18		1	1.663
L17 98.437-93.396	95.880		1.254	1.083	1.952		18		1	4.042
L18 93.396-87.188	90.272		1.239	1.078	1.957		17		1	5.096
L19 87.188-80.979	84.069		1.22	1.073	1.963		17		1	5.121
L20 80.979-74.771	77.861		1.201	1.067	1.968		17		1	5.124
L21 74.771-68.563	71.653		1.18	1.062	1.974		17		1	5.125
L22 68.563-62.354	65.445		1.158	1.056	1.98		16		1	5.125
L23 62.354-56.146	59.236		1.134	1.051	1.986		16		1	5.125
L24 56.146-49.938	53.028		1.107	1.045	1.992		16		1	5.125
L25 49.938-43.729	46.820		1.079	1.04	1.998		15		1	5.125
L26 43.729-37.521	40.611		1.047	1.034	2.004		15		1	5.125
L27 37.521-31.313	34.403		1.011	1.029	2.01		15		1	5.125
L28 31.313-25.105	28.195		0.97	1.024	2.016		14		1	5.125
L29 25.105-18.896	21.986		0.92	1.018	2.023		13		1	5.125
L30 18.896-12.688	15.778		0.858	1.013	2.029		12		1	5.125
L31 12.688-6.480	9.570		0.85	1.008	2.035		12		1	5.125
L32 6.480-0.000	3.225		0.85	1.003	2.042		12		1	5.349

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	194.059	1.455	88	4.848	A	0.000	4.848	4.848	100.00	0.000	0.000
197.688-190.4					B	0.000	4.848		100.00	0.000	0.000
38					C	0.000	4.848		100.00	0.000	0.000
					D	0.000	4.848		100.00	0.000	0.000
L2	187.213	1.444	88	4.240	A	0.000	4.240	4.240	100.00	0.000	0.000
190.438-184.0					B	0.000	4.240		100.00	0.000	0.000
21					C	0.000	4.240		100.00	0.000	0.000
					D	0.000	4.240		100.00	0.000	0.000
L3	180.795	1.434	88	4.234	A	0.000	4.234	4.234	100.00	0.000	0.000
184.021-177.6					B	0.000	4.234		100.00	0.000	0.000
04					C	0.000	4.234		100.00	0.000	0.000
					D	0.000	4.234		100.00	0.000	0.000

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 22 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L4	174.378	1.423	87	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
177.604-171.1					B	0.000	4.233		100.00	0.000	0.000
87					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L5	167.961	1.412	87	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
171.187-164.7					B	0.000	4.233		100.00	0.000	0.000
71					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L6	161.544	1.4	86	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
164.771-158.3					B	0.000	4.233		100.00	0.000	0.000
54					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L7	155.128	1.388	86	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
158.354-151.9					B	0.000	4.233		100.00	0.000	0.000
37					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L8	148.711	1.376	85	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
151.937-145.5					B	0.000	4.233		100.00	0.000	0.000
21					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L9	142.294	1.363	85	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
145.521-139.1					B	0.000	4.233		100.00	0.000	0.000
04					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L10	135.878	1.35	84	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
139.104-132.6					B	0.000	4.233		100.00	0.000	0.000
87					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L11	129.461	1.336	84	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
132.687-126.2					B	0.000	4.233		100.00	0.000	0.000
71					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L12	123.044	1.322	83	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
126.271-119.8					B	0.000	4.233		100.00	0.000	0.000
54					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L13	116.628	1.307	82	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
119.854-113.4					B	0.000	4.233		100.00	0.000	0.000
37					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L14	110.211	1.292	82	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
113.437-107.0					B	0.000	4.233		100.00	0.000	0.000
21					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L15	103.794	1.276	81	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
107.021-100.6					B	0.000	4.233		100.00	0.000	0.000
04					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L16	99.488	1.264	80	1.663	A	0.000	1.663	1.663	100.00	0.000	0.000
100.604-98.43					B	0.000	1.663		100.00	0.000	0.000
7					C	0.000	1.663		100.00	0.000	0.000
					D	0.000	1.663		100.00	0.000	0.000
L17	95.880	1.254	80	4.042	A	0.000	4.042	4.042	100.00	0.000	0.000
98.437-93.396					B	0.000	4.042		100.00	0.000	0.000
					C	0.000	4.042		100.00	0.000	0.000
					D	0.000	4.042		100.00	0.000	0.000
L18	90.272	1.239	79	5.096	A	0.000	5.096	5.096	100.00	0.000	0.000
93.396-87.188					B	0.000	5.096		100.00	0.000	0.000
					C	0.000	5.096		100.00	0.000	0.000
					D	0.000	5.096		100.00	0.000	0.000

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 23 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L19	84.069	1.22	78	5.121	A	0.000	5.121	5.121	100.00	0.000	0.000
87.188-80.979					B	0.000	5.121		100.00	0.000	0.000
					C	0.000	5.121		100.00	0.000	0.000
					D	0.000	5.121		100.00	0.000	0.000
L20	77.861	1.201	77	5.124	A	0.000	5.124	5.124	100.00	0.000	0.000
80.979-74.771					B	0.000	5.124		100.00	0.000	0.000
					C	0.000	5.124		100.00	0.000	0.000
					D	0.000	5.124		100.00	0.000	0.000
L21	71.653	1.18	76	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
74.771-68.563					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L22	65.445	1.158	75	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
68.563-62.354					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L23	59.236	1.134	73	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
62.354-56.146					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L24	53.028	1.107	72	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
56.146-49.938					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L25	46.820	1.079	70	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
49.938-43.729					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L26	40.611	1.047	68	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
43.729-37.521					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L27	34.403	1.011	66	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
37.521-31.313					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L28	28.195	0.97	64	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
31.313-25.105					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L29	21.986	0.92	61	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
25.105-18.896					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L30	15.778	0.858	57	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
18.896-12.688					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L31	9.570	0.85	56	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
12.688-6.480					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L32	3.225	0.85	57	5.349	A	0.000	5.349	5.349	100.00	0.000	0.000
6.480-0.000					B	0.000	5.349		100.00	0.000	0.000
					C	0.000	5.349		100.00	0.000	0.000
					D	0.000	5.349		100.00	0.000	0.000

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 24 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	194.059	1.455	19	4.848	A	0.000	4.848	4.848	100.00	0.000	0.000
197.688-190.4					B	0.000	4.848		100.00	0.000	0.000
38					C	0.000	4.848		100.00	0.000	0.000
					D	0.000	4.848		100.00	0.000	0.000
L2	187.213	1.444	19	4.240	A	0.000	4.240	4.240	100.00	0.000	0.000
190.438-184.0					B	0.000	4.240		100.00	0.000	0.000
21					C	0.000	4.240		100.00	0.000	0.000
					D	0.000	4.240		100.00	0.000	0.000
L3	180.795	1.434	19	4.234	A	0.000	4.234	4.234	100.00	0.000	0.000
184.021-177.6					B	0.000	4.234		100.00	0.000	0.000
04					C	0.000	4.234		100.00	0.000	0.000
					D	0.000	4.234		100.00	0.000	0.000
L4	174.378	1.423	19	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
177.604-171.1					B	0.000	4.233		100.00	0.000	0.000
87					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L5	167.961	1.412	19	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
171.187-164.7					B	0.000	4.233		100.00	0.000	0.000
71					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L6	161.544	1.4	19	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
164.771-158.3					B	0.000	4.233		100.00	0.000	0.000
54					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L7	155.128	1.388	19	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
158.354-151.9					B	0.000	4.233		100.00	0.000	0.000
37					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L8	148.711	1.376	19	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
151.937-145.5					B	0.000	4.233		100.00	0.000	0.000
21					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L9	142.294	1.363	19	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
145.521-139.1					B	0.000	4.233		100.00	0.000	0.000
04					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L10	135.878	1.35	19	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
139.104-132.6					B	0.000	4.233		100.00	0.000	0.000
87					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L11	129.461	1.336	18	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
132.687-126.2					B	0.000	4.233		100.00	0.000	0.000
71					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L12	123.044	1.322	18	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
126.271-119.8					B	0.000	4.233		100.00	0.000	0.000
54					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L13	116.628	1.307	18	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
119.854-113.4					B	0.000	4.233		100.00	0.000	0.000
37					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L14	110.211	1.292	18	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
113.437-107.0					B	0.000	4.233		100.00	0.000	0.000

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 25 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
21					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L15	103.794	1.276	18	4.233	A	0.000	4.233	4.233	100.00	0.000	0.000
107.021-100.6					B	0.000	4.233		100.00	0.000	0.000
04					C	0.000	4.233		100.00	0.000	0.000
					D	0.000	4.233		100.00	0.000	0.000
L16	99.488	1.264	18	1.663	A	0.000	1.663	1.663	100.00	0.000	0.000
100.604-98.43					B	0.000	1.663		100.00	0.000	0.000
7					C	0.000	1.663		100.00	0.000	0.000
					D	0.000	1.663		100.00	0.000	0.000
L17	95.880	1.254	18	4.042	A	0.000	4.042	4.042	100.00	0.000	0.000
98.437-93.396					B	0.000	4.042		100.00	0.000	0.000
					C	0.000	4.042		100.00	0.000	0.000
					D	0.000	4.042		100.00	0.000	0.000
L18	90.272	1.239	17	5.096	A	0.000	5.096	5.096	100.00	0.000	0.000
93.396-87.188					B	0.000	5.096		100.00	0.000	0.000
					C	0.000	5.096		100.00	0.000	0.000
					D	0.000	5.096		100.00	0.000	0.000
L19	84.069	1.22	17	5.121	A	0.000	5.121	5.121	100.00	0.000	0.000
87.188-80.979					B	0.000	5.121		100.00	0.000	0.000
					C	0.000	5.121		100.00	0.000	0.000
					D	0.000	5.121		100.00	0.000	0.000
L20	77.861	1.201	17	5.124	A	0.000	5.124	5.124	100.00	0.000	0.000
80.979-74.771					B	0.000	5.124		100.00	0.000	0.000
					C	0.000	5.124		100.00	0.000	0.000
					D	0.000	5.124		100.00	0.000	0.000
L21	71.653	1.18	17	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
74.771-68.563					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L22	65.445	1.158	16	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
68.563-62.354					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L23	59.236	1.134	16	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
62.354-56.146					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L24	53.028	1.107	16	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
56.146-49.938					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L25	46.820	1.079	15	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
49.938-43.729					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L26	40.611	1.047	15	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
43.729-37.521					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L27	34.403	1.011	15	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
37.521-31.313					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L28	28.195	0.97	14	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
31.313-25.105					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L29	21.986	0.92	13	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
25.105-18.896					B	0.000	5.125		100.00	0.000	0.000

tnxTower	Job: NRG 60m Super NRG Tall Tower	
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L30	15.778	0.858	12	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
18.896-12.688					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L31	9.570	0.85	12	5.125	A	0.000	5.125	5.125	100.00	0.000	0.000
12.688-6.480					B	0.000	5.125		100.00	0.000	0.000
					C	0.000	5.125		100.00	0.000	0.000
					D	0.000	5.125		100.00	0.000	0.000
L32	3.225	0.85	12	5.349	A	0.000	5.349	5.349	100.00	0.000	0.000
6.480-0.000					B	0.000	5.349		100.00	0.000	0.000
					C	0.000	5.349		100.00	0.000	0.000
					D	0.000	5.349		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	3.34	84.41	A	1	0.6	88	1	1	4.848	282.93	39.02	D
197.688-190.4			B	1	0.6		1	1	4.848			
38			C	1	0.6		1	1	4.848			
			D	1	0.6		1	1	4.848			
L2	3.85	83.21	A	1	0.6	88	1	1	4.240	246.30	38.38	D
190.438-184.0			B	1	0.6		1	1	4.240			
21			C	1	0.6		1	1	4.240			
			D	1	0.6		1	1	4.240			
L3	3.85	83.08	A	1	0.6	88	1	1	4.234	244.85	38.16	D
184.021-177.6			B	1	0.6		1	1	4.234			
04			C	1	0.6		1	1	4.234			
			D	1	0.6		1	1	4.234			
L4	3.85	83.06	A	1	0.6	87	1	1	4.233	243.66	37.97	D
177.604-171.1			B	1	0.6		1	1	4.233			
87			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L5	3.85	83.06	A	1	0.6	87	1	1	4.233	242.44	37.78	D
171.187-164.7			B	1	0.6		1	1	4.233			
71			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L6	3.85	83.06	A	1	0.6	86	1	1	4.233	241.16	37.58	D
164.771-158.3			B	1	0.6		1	1	4.233			
54			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L7	3.85	83.06	A	1	0.6	86	1	1	4.233	239.82	37.37	D
158.354-151.9			B	1	0.6		1	1	4.233			
37			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L8	3.85	83.06	A	1	0.6	85	1	1	4.233	238.39	37.15	D
151.937-145.5			B	1	0.6		1	1	4.233			
21			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L9	3.85	83.06	A	1	0.6	85	1	1	4.233	236.89	36.92	D
145.521-139.1			B	1	0.6		1	1	4.233			
04			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			

tnxTower
Ahola Engineering LLC
P.O. Box 989
Winter Park, CO 80482-0989
Phone: (719) 640-2408
FAX:

Job	Page
NRG 60m Super NRG Tall Tower	27 of 71
Project	**Date**
Matanuska-Susitna Borough, AK	09:27:06 07/01/24
Client	**Designed by**
Longroad Energy	Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L10	3.85	83.06	A	1	0.6	84	1	1	4.233	235.29	36.67	D
139.104-132.6			B	1	0.6		1	1	4.233			
87			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L11	3.85	83.06	A	1	0.6	84	1	1	4.233	233.60	36.41	D
132.687-126.2			B	1	0.6		1	1	4.233			
71			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L12	3.85	83.06	A	1	0.6	83	1	1	4.233	231.81	36.13	D
126.271-119.8			B	1	0.6		1	1	4.233			
54			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L13	3.85	83.06	A	1	0.6	82	1	1	4.233	229.89	35.83	D
119.854-113.4			B	1	0.6		1	1	4.233			
37			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L14	3.85	83.06	A	1	0.6	82	1	1	4.233	227.86	35.51	D
113.437-107.0			B	1	0.6		1	1	4.233			
21			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L15	3.85	83.06	A	1	0.6	81	1	1	4.233	225.68	35.17	D
107.021-100.6			B	1	0.6		1	1	4.233			
04			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L16	1.30	31.63	A	1	0.6	80	1	1	1.663	88.07	40.65	D
100.604-98.43			B	1	0.6		1	1	1.663			
7			C	1	0.6		1	1	1.663			
			D	1	0.6		1	1	1.663			
L17	3.02	84.36	A	1	0.6	80	1	1	4.042	212.71	42.19	D
98.437-93.396			B	1	0.6		1	1	4.042			
			C	1	0.6		1	1	4.042			
			D	1	0.6		1	1	4.042			
L18	3.72	103.60	A	1	0.6	79	1	1	5.096	265.54	42.77	D
93.396-87.188			B	1	0.6		1	1	5.096			
			C	1	0.6		1	1	5.096			
			D	1	0.6		1	1	5.096			
L19	3.72	104.19	A	1	0.6	78	1	1	5.121	263.62	42.46	D
87.188-80.979			B	1	0.6		1	1	5.121			
			C	1	0.6		1	1	5.121			
			D	1	0.6		1	1	5.121			
L20	3.72	104.28	A	1	0.6	77	1	1	5.124	260.35	41.94	D
80.979-74.771			B	1	0.6		1	1	5.124			
			C	1	0.6		1	1	5.124			
			D	1	0.6		1	1	5.124			
L21	3.72	104.29	A	1	0.6	76	1	1	5.125	256.62	41.34	D
74.771-68.563			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L22	3.72	104.29	A	1	0.6	75	1	1	5.125	252.53	40.68	D
68.563-62.354			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L23	3.72	104.29	A	1	0.6	73	1	1	5.125	248.03	39.95	D
62.354-56.146			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L24	3.72	104.29	A	1	0.6	72	1	1	5.125	243.05	39.15	D
56.146-49.938			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			

tnxTower	Job: NRG 60m Super NRG Tall Tower	
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L25	3.72	104.29	A	1	0.6	70	1	1	5.125	237.47	38.25	D
49.938-43.729			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L26	3.72	104.29	A	1	0.6	68	1	1	5.125	231.17	37.24	D
43.729-37.521			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L27	3.72	104.29	A	1	0.6	66	1	1	5.125	223.91	36.07	D
37.521-31.313			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L28	3.72	104.29	A	1	0.6	64	1	1	5.125	215.38	34.69	D
31.313-25.105			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L29	3.72	104.29	A	1	0.6	61	1	1	5.125	205.02	33.02	D
25.105-18.896			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L30	3.72	104.29	A	1	0.6	57	1	1	5.125	191.78	30.89	D
18.896-12.688			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L31	3.72	104.29	A	1	0.6	56	1	1	5.125	190.59	30.70	D
12.688-6.480			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L32	3.89	108.19	A	1	0.6	57	1	1	5.349	199.53	30.79	D
6.480-0.000			B	1	0.6		1	1	5.349			
			C	1	0.6		1	1	5.349			
			D	1	0.6		1	1	5.349			
Sum Weight:	117.60	2930.86								7385.95		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	3.34	84.41	A	1	0.6	88	1	1	4.848	282.93	39.02	D
197.688-190.4			B	1	0.6		1	1	4.848			
38			C	1	0.6		1	1	4.848			
			D	1	0.6		1	1	4.848			
L2	3.85	83.21	A	1	0.6	88	1	1	4.240	246.30	38.38	D
190.438-184.0			B	1	0.6		1	1	4.240			
21			C	1	0.6		1	1	4.240			
			D	1	0.6		1	1	4.240			
L3	3.85	83.08	A	1	0.6	88	1	1	4.234	244.85	38.16	D
184.021-177.6			B	1	0.6		1	1	4.234			
04			C	1	0.6		1	1	4.234			
			D	1	0.6		1	1	4.234			
L4	3.85	83.06	A	1	0.6	87	1	1	4.233	243.66	37.97	D
177.604-171.1			B	1	0.6		1	1	4.233			

tnxTower
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Job	Page
NRG 60m Super NRG Tall Tower	29 of 71
Project	**Date**
Matanuska-Susitna Borough, AK	09:27:06 07/01/24
Client	**Designed by**
Longroad Energy	Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
87			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L5	3.85	83.06	A	1	0.6	87	1	1	4.233	242.44	37.78	D
171.187-164.7			B	1	0.6		1	1	4.233			
71			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L6	3.85	83.06	A	1	0.6	86	1	1	4.233	241.16	37.58	D
164.771-158.3			B	1	0.6		1	1	4.233			
54			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L7	3.85	83.06	A	1	0.6	86	1	1	4.233	239.82	37.37	D
158.354-151.9			B	1	0.6		1	1	4.233			
37			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L8	3.85	83.06	A	1	0.6	85	1	1	4.233	238.39	37.15	D
151.937-145.5			B	1	0.6		1	1	4.233			
21			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L9	3.85	83.06	A	1	0.6	85	1	1	4.233	236.89	36.92	D
145.521-139.1			B	1	0.6		1	1	4.233			
04			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L10	3.85	83.06	A	1	0.6	84	1	1	4.233	235.29	36.67	D
139.104-132.6			B	1	0.6		1	1	4.233			
87			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L11	3.85	83.06	A	1	0.6	84	1	1	4.233	233.60	36.41	D
132.687-126.2			B	1	0.6		1	1	4.233			
71			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L12	3.85	83.06	A	1	0.6	83	1	1	4.233	231.81	36.13	D
126.271-119.8			B	1	0.6		1	1	4.233			
54			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L13	3.85	83.06	A	1	0.6	82	1	1	4.233	229.89	35.83	D
119.854-113.4			B	1	0.6		1	1	4.233			
37			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L14	3.85	83.06	A	1	0.6	82	1	1	4.233	227.86	35.51	D
113.437-107.0			B	1	0.6		1	1	4.233			
21			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L15	3.85	83.06	A	1	0.6	81	1	1	4.233	225.68	35.17	D
107.021-100.6			B	1	0.6		1	1	4.233			
04			C	1	0.6		1	1	4.233			
			D	1	0.6		1	1	4.233			
L16	1.30	31.63	A	1	0.6	80	1	1	1.663	88.07	40.65	D
100.604-98.43			B	1	0.6		1	1	1.663			
7			C	1	0.6		1	1	1.663			
			D	1	0.6		1	1	1.663			
L17	3.02	84.36	A	1	0.6	80	1	1	4.042	212.71	42.19	D
98.437-93.396			B	1	0.6		1	1	4.042			
			C	1	0.6		1	1	4.042			
			D	1	0.6		1	1	4.042			
L18	3.72	103.60	A	1	0.6	79	1	1	5.096	265.54	42.77	D
93.396-87.188			B	1	0.6		1	1	5.096			
			C	1	0.6		1	1	5.096			
			D	1	0.6		1	1	5.096			
L19	3.72	104.19	A	1	0.6	78	1	1	5.121	263.62	42.46	D
87.188-80.979			B	1	0.6		1	1	5.121			

tnxTower	Job: NRG 60m Super NRG Tall Tower	
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	1	0.6		1	1	5.121			
			D	1	0.6		1	1	5.121			
L20	3.72	104.28	A	1	0.6	77	1	1	5.124	260.35	41.94	D
80.979-74.771			B	1	0.6		1	1	5.124			
			C	1	0.6		1	1	5.124			
			D	1	0.6		1	1	5.124			
L21	3.72	104.29	A	1	0.6	76	1	1	5.125	256.62	41.34	D
74.771-68.563			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L22	3.72	104.29	A	1	0.6	75	1	1	5.125	252.53	40.68	D
68.563-62.354			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L23	3.72	104.29	A	1	0.6	73	1	1	5.125	248.03	39.95	D
62.354-56.146			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L24	3.72	104.29	A	1	0.6	72	1	1	5.125	243.05	39.15	D
56.146-49.938			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L25	3.72	104.29	A	1	0.6	70	1	1	5.125	237.47	38.25	D
49.938-43.729			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L26	3.72	104.29	A	1	0.6	68	1	1	5.125	231.17	37.24	D
43.729-37.521			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L27	3.72	104.29	A	1	0.6	66	1	1	5.125	223.91	36.07	D
37.521-31.313			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L28	3.72	104.29	A	1	0.6	64	1	1	5.125	215.38	34.69	D
31.313-25.105			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L29	3.72	104.29	A	1	0.6	61	1	1	5.125	205.02	33.02	D
25.105-18.896			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L30	3.72	104.29	A	1	0.6	57	1	1	5.125	191.78	30.89	D
18.896-12.688			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L31	3.72	104.29	A	1	0.6	56	1	1	5.125	190.59	30.70	D
12.688-6.480			B	1	0.6		1	1	5.125			
			C	1	0.6		1	1	5.125			
			D	1	0.6		1	1	5.125			
L32	3.89	108.19	A	1	0.6	57	1	1	5.349	199.53	30.79	D
6.480-0.000			B	1	0.6		1	1	5.349			
			C	1	0.6		1	1	5.349			
			D	1	0.6		1	1	5.349			
Sum Weight:	117.60	2930.86								7385.95		

tnxTower
Ahola Engineering LLC
P.O. Box 989
Winter Park, CO 80482-0989
Phone: (719) 640-2408
FAX:

Job	Page
NRG 60m Super NRG Tall Tower	31 of 71
Project	**Date**
Matanuska-Susitna Borough, AK	09:27:06 07/01/24
Client	**Designed by**
Longroad Energy	Mikko Ahola, PE

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	3.34	84.41	A	1	0.74	19	1	1	4.848	76.79	10.59	D
197.688-190.4			B	1	0.74		1	1	4.848			
38			C	1	0.74		1	1	4.848			
			D	1	0.74		1	1	4.848			
L2	3.85	83.21	A	1	0.751	19	1	1	4.240	67.81	10.57	D
190.438-184.0			B	1	0.751		1	1	4.240			
21			C	1	0.751		1	1	4.240			
			D	1	0.751		1	1	4.240			
L3	3.85	83.08	A	1	0.754	19	1	1	4.234	67.66	10.54	D
184.021-177.6			B	1	0.754		1	1	4.234			
04			C	1	0.754		1	1	4.234			
			D	1	0.754		1	1	4.234			
L4	3.85	83.06	A	1	0.755	19	1	1	4.233	67.50	10.52	D
177.604-171.1			B	1	0.755		1	1	4.233			
87			C	1	0.755		1	1	4.233			
			D	1	0.755		1	1	4.233			
L5	3.85	83.06	A	1	0.757	19	1	1	4.233	67.33	10.49	D
171.187-164.7			B	1	0.757		1	1	4.233			
71			C	1	0.757		1	1	4.233			
			D	1	0.757		1	1	4.233			
L6	3.85	83.06	A	1	0.759	19	1	1	4.233	67.15	10.47	D
164.771-158.3			B	1	0.759		1	1	4.233			
54			C	1	0.759		1	1	4.233			
			D	1	0.759		1	1	4.233			
L7	3.85	83.06	A	1	0.762	19	1	1	4.233	66.96	10.44	D
158.354-151.9			B	1	0.762		1	1	4.233			
37			C	1	0.762		1	1	4.233			
			D	1	0.762		1	1	4.233			
L8	3.85	83.06	A	1	0.764	19	1	1	4.233	66.76	10.40	D
151.937-145.5			B	1	0.764		1	1	4.233			
21			C	1	0.764		1	1	4.233			
			D	1	0.764		1	1	4.233			
L9	3.85	83.06	A	1	0.766	19	1	1	4.233	66.55	10.37	D
145.521-139.1			B	1	0.766		1	1	4.233			
04			C	1	0.766		1	1	4.233			
			D	1	0.766		1	1	4.233			
L10	3.85	83.06	A	1	0.769	19	1	1	4.233	66.33	10.34	D
139.104-132.6			B	1	0.769		1	1	4.233			
87			C	1	0.769		1	1	4.233			
			D	1	0.769		1	1	4.233			
L11	3.85	83.06	A	1	0.772	18	1	1	4.233	66.09	10.30	D
132.687-126.2			B	1	0.772		1	1	4.233			
71			C	1	0.772		1	1	4.233			
			D	1	0.772		1	1	4.233			
L12	3.85	83.06	A	1	0.775	18	1	1	4.233	65.84	10.26	D
126.271-119.8			B	1	0.775		1	1	4.233			
54			C	1	0.775		1	1	4.233			
			D	1	0.775		1	1	4.233			
L13	3.85	83.06	A	1	0.778	18	1	1	4.233	65.56	10.22	D
119.854-113.4			B	1	0.778		1	1	4.233			
37			C	1	0.778		1	1	4.233			
			D	1	0.778		1	1	4.233			
L14	3.85	83.06	A	1	0.781	18	1	1	4.233	65.27	10.17	D
113.437-107.0			B	1	0.781		1	1	4.233			
21			C	1	0.781		1	1	4.233			
			D	1	0.781		1	1	4.233			
L15	3.85	83.06	A	1	0.785	18	1	1	4.233	64.96	10.12	D

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 32 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
107.021-100.604			B	1	0.785		1	1	4.233			
			C	1	0.785		1	1	4.233			
			D	1	0.785		1	1	4.233			
L16	1.30	31.63	A	1	0.677	18	1	1	1.663	21.86	10.09	D
100.604-98.437			B	1	0.677		1	1	1.663			
			C	1	0.677		1	1	1.663			
			D	1	0.677		1	1	1.663			
L17	3.02	84.36	A	1	0.65	18	1	1	4.042	50.71	10.06	D
98.437-93.396			B	1	0.65		1	1	4.042			
			C	1	0.65		1	1	4.042			
			D	1	0.65		1	1	4.042			
L18	3.72	103.60	A	1	0.638	17	1	1	5.096	62.13	10.01	D
93.396-87.188			B	1	0.638		1	1	5.096			
			C	1	0.638		1	1	5.096			
			D	1	0.638		1	1	5.096			
L19	3.72	104.19	A	1	0.639	17	1	1	5.121	61.76	9.95	D
87.188-80.979			B	1	0.639		1	1	5.121			
			C	1	0.639		1	1	5.121			
			D	1	0.639		1	1	5.121			
L20	3.72	104.28	A	1	0.643	17	1	1	5.124	61.35	9.88	D
80.979-74.771			B	1	0.643		1	1	5.124			
			C	1	0.643		1	1	5.124			
			D	1	0.643		1	1	5.124			
L21	3.72	104.29	A	1	0.647	17	1	1	5.125	60.91	9.81	D
74.771-68.563			B	1	0.647		1	1	5.125			
			C	1	0.647		1	1	5.125			
			D	1	0.647		1	1	5.125			
L22	3.72	104.29	A	1	0.653	16	1	1	5.125	60.42	9.73	D
68.563-62.354			B	1	0.653		1	1	5.125			
			C	1	0.653		1	1	5.125			
			D	1	0.653		1	1	5.125			
L23	3.72	104.29	A	1	0.658	16	1	1	5.125	59.88	9.65	D
62.354-56.146			B	1	0.658		1	1	5.125			
			C	1	0.658		1	1	5.125			
			D	1	0.658		1	1	5.125			
L24	3.72	104.29	A	1	0.665	16	1	1	5.125	59.28	9.55	D
56.146-49.938			B	1	0.665		1	1	5.125			
			C	1	0.665		1	1	5.125			
			D	1	0.665		1	1	5.125			
L25	3.72	104.29	A	1	0.673	15	1	1	5.125	58.59	9.44	D
49.938-43.729			B	1	0.673		1	1	5.125			
			C	1	0.673		1	1	5.125			
			D	1	0.673		1	1	5.125			
L26	3.72	104.29	A	1	0.682	15	1	1	5.125	57.81	9.31	D
43.729-37.521			B	1	0.682		1	1	5.125			
			C	1	0.682		1	1	5.125			
			D	1	0.682		1	1	5.125			
L27	3.72	104.29	A	1	0.693	15	1	1	5.125	56.90	9.16	D
37.521-31.313			B	1	0.693		1	1	5.125			
			C	1	0.693		1	1	5.125			
			D	1	0.693		1	1	5.125			
L28	3.72	104.29	A	1	0.707	14	1	1	5.125	55.80	8.99	D
31.313-25.105			B	1	0.707		1	1	5.125			
			C	1	0.707		1	1	5.125			
			D	1	0.707		1	1	5.125			
L29	3.72	104.29	A	1	0.724	13	1	1	5.125	54.44	8.77	D
25.105-18.896			B	1	0.724		1	1	5.125			
			C	1	0.724		1	1	5.125			
			D	1	0.724		1	1	5.125			
L30	3.72	104.29	A	1	0.749	12	1	1	5.125	52.65	8.48	D

tnxTower	Job: NRG 60m Super NRG Tall Tower	
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
18.896-12.688			B	1	0.749		1	1	5.125			
			C	1	0.749		1	1	5.125			
			D	1	0.749		1	1	5.125			
L31	3.72	104.29	A	1	0.751	12	1	1	5.125	52.49	8.45	D
12.688-6.480			B	1	0.751		1	1	5.125			
			C	1	0.751		1	1	5.125			
			D	1	0.751		1	1	5.125			
L32	3.89	108.19	A	1	0.75	12	1	1	5.349	54.87	8.47	D
6.480-0.000			B	1	0.75		1	1	5.349			
			C	1	0.75		1	1	5.349			
			D	1	0.75		1	1	5.349			
Sum Weight:	117.60	2930.86								1950.43		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	3.34	84.41	A	1	0.74	19	1	1	4.848	76.79	10.59	D
197.688-190.4			B	1	0.74		1	1	4.848			
38			C	1	0.74		1	1	4.848			
			D	1	0.74		1	1	4.848			
L2	3.85	83.21	A	1	0.751	19	1	1	4.240	67.81	10.57	D
190.438-184.0			B	1	0.751		1	1	4.240			
21			C	1	0.751		1	1	4.240			
			D	1	0.751		1	1	4.240			
L3	3.85	83.08	A	1	0.754	19	1	1	4.234	67.66	10.54	D
184.021-177.6			B	1	0.754		1	1	4.234			
04			C	1	0.754		1	1	4.234			
			D	1	0.754		1	1	4.234			
L4	3.85	83.06	A	1	0.755	19	1	1	4.233	67.50	10.52	D
177.604-171.1			B	1	0.755		1	1	4.233			
87			C	1	0.755		1	1	4.233			
			D	1	0.755		1	1	4.233			
L5	3.85	83.06	A	1	0.757	19	1	1	4.233	67.33	10.49	D
171.187-164.7			B	1	0.757		1	1	4.233			
71			C	1	0.757		1	1	4.233			
			D	1	0.757		1	1	4.233			
L6	3.85	83.06	A	1	0.759	19	1	1	4.233	67.15	10.47	D
164.771-158.3			B	1	0.759		1	1	4.233			
54			C	1	0.759		1	1	4.233			
			D	1	0.759		1	1	4.233			
L7	3.85	83.06	A	1	0.762	19	1	1	4.233	66.96	10.44	D
158.354-151.9			B	1	0.762		1	1	4.233			
37			C	1	0.762		1	1	4.233			
			D	1	0.762		1	1	4.233			
L8	3.85	83.06	A	1	0.764	19	1	1	4.233	66.76	10.40	D
151.937-145.5			B	1	0.764		1	1	4.233			
21			C	1	0.764		1	1	4.233			
			D	1	0.764		1	1	4.233			
L9	3.85	83.06	A	1	0.766	19	1	1	4.233	66.55	10.37	D
145.521-139.1			B	1	0.766		1	1	4.233			
04			C	1	0.766		1	1	4.233			

tnxTower
Ahola Engineering LLC
P.O. Box 989
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Job	Page
NRG 60m Super NRG Tall Tower	34 of 71
Project	**Date**
Matanuska-Susitna Borough, AK	09:27:06 07/01/24
Client	**Designed by**
Longroad Energy	Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			D	1	0.766		1	1	4.233			
L10	3.85	83.06	A	1	0.769	19	1	1	4.233	66.33	10.34	D
139.104-132.6			B	1	0.769		1	1	4.233			
87			C	1	0.769		1	1	4.233			
			D	1	0.769		1	1	4.233			
L11	3.85	83.06	A	1	0.772	18	1	1	4.233	66.09	10.30	D
132.687-126.2			B	1	0.772		1	1	4.233			
71			C	1	0.772		1	1	4.233			
			D	1	0.772		1	1	4.233			
L12	3.85	83.06	A	1	0.775	18	1	1	4.233	65.84	10.26	D
126.271-119.8			B	1	0.775		1	1	4.233			
54			C	1	0.775		1	1	4.233			
			D	1	0.775		1	1	4.233			
L13	3.85	83.06	A	1	0.778	18	1	1	4.233	65.56	10.22	D
119.854-113.4			B	1	0.778		1	1	4.233			
37			C	1	0.778		1	1	4.233			
			D	1	0.778		1	1	4.233			
L14	3.85	83.06	A	1	0.781	18	1	1	4.233	65.27	10.17	D
113.437-107.0			B	1	0.781		1	1	4.233			
21			C	1	0.781		1	1	4.233			
			D	1	0.781		1	1	4.233			
L15	3.85	83.06	A	1	0.785	18	1	1	4.233	64.96	10.12	D
107.021-100.6			B	1	0.785		1	1	4.233			
04			C	1	0.785		1	1	4.233			
			D	1	0.785		1	1	4.233			
L16	1.30	31.63	A	1	0.677	18	1	1	1.663	21.86	10.09	D
100.604-98.43			B	1	0.677		1	1	1.663			
7			C	1	0.677		1	1	1.663			
			D	1	0.677		1	1	1.663			
L17	3.02	84.36	A	1	0.65	18	1	1	4.042	50.71	10.06	D
98.437-93.396			B	1	0.65		1	1	4.042			
			C	1	0.65		1	1	4.042			
			D	1	0.65		1	1	4.042			
L18	3.72	103.60	A	1	0.638	17	1	1	5.096	62.13	10.01	D
93.396-87.188			B	1	0.638		1	1	5.096			
			C	1	0.638		1	1	5.096			
			D	1	0.638		1	1	5.096			
L19	3.72	104.19	A	1	0.639	17	1	1	5.121	61.76	9.95	D
87.188-80.979			B	1	0.639		1	1	5.121			
			C	1	0.639		1	1	5.121			
			D	1	0.639		1	1	5.121			
L20	3.72	104.28	A	1	0.643	17	1	1	5.124	61.35	9.88	D
80.979-74.771			B	1	0.643		1	1	5.124			
			C	1	0.643		1	1	5.124			
			D	1	0.643		1	1	5.124			
L21	3.72	104.29	A	1	0.647	17	1	1	5.125	60.91	9.81	D
74.771-68.563			B	1	0.647		1	1	5.125			
			C	1	0.647		1	1	5.125			
			D	1	0.647		1	1	5.125			
L22	3.72	104.29	A	1	0.653	16	1	1	5.125	60.42	9.73	D
68.563-62.354			B	1	0.653		1	1	5.125			
			C	1	0.653		1	1	5.125			
			D	1	0.653		1	1	5.125			
L23	3.72	104.29	A	1	0.658	16	1	1	5.125	59.88	9.65	D
62.354-56.146			B	1	0.658		1	1	5.125			
			C	1	0.658		1	1	5.125			
			D	1	0.658		1	1	5.125			
L24	3.72	104.29	A	1	0.665	16	1	1	5.125	59.28	9.55	D
56.146-49.938			B	1	0.665		1	1	5.125			
			C	1	0.665		1	1	5.125			

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 35 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			D	1	0.665		1	1	5.125			
L25	3.72	104.29	A	1	0.673	15	1	1	5.125	58.59	9.44	D
49.938-43.729			B	1	0.673		1	1	5.125			
			C	1	0.673		1	1	5.125			
			D	1	0.673		1	1	5.125			
L26	3.72	104.29	A	1	0.682	15	1	1	5.125	57.81	9.31	D
43.729-37.521			B	1	0.682		1	1	5.125			
			C	1	0.682		1	1	5.125			
			D	1	0.682		1	1	5.125			
L27	3.72	104.29	A	1	0.693	15	1	1	5.125	56.90	9.16	D
37.521-31.313			B	1	0.693		1	1	5.125			
			C	1	0.693		1	1	5.125			
			D	1	0.693		1	1	5.125			
L28	3.72	104.29	A	1	0.707	14	1	1	5.125	55.80	8.99	D
31.313-25.105			B	1	0.707		1	1	5.125			
			C	1	0.707		1	1	5.125			
			D	1	0.707		1	1	5.125			
L29	3.72	104.29	A	1	0.724	13	1	1	5.125	54.44	8.77	D
25.105-18.896			B	1	0.724		1	1	5.125			
			C	1	0.724		1	1	5.125			
			D	1	0.724		1	1	5.125			
L30	3.72	104.29	A	1	0.749	12	1	1	5.125	52.65	8.48	D
18.896-12.688			B	1	0.749		1	1	5.125			
			C	1	0.749		1	1	5.125			
			D	1	0.749		1	1	5.125			
L31	3.72	104.29	A	1	0.751	12	1	1	5.125	52.49	8.45	D
12.688-6.480			B	1	0.751		1	1	5.125			
			C	1	0.751		1	1	5.125			
			D	1	0.751		1	1	5.125			
L32	3.89	108.19	A	1	0.75	12	1	1	5.349	54.87	8.47	D
6.480-0.000			B	1	0.75		1	1	5.349			
			C	1	0.75		1	1	5.349			
			D	1	0.75		1	1	5.349			
Sum Weight:	117.60	2930.86								1950.43		

Mast Vectors - No Ice

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
L1	197.688-190.438	0	Wind Normal	282.93	0.00	-282.93	-54905.19	0.00	0.00
		45	Wind 45	282.93	200.06	-200.06	-38823.83	-38823.83	0.00
		90	Wind Normal	282.93	282.93	0.00	0.00	-54905.19	0.00
		135	Wind 45	282.93	200.06	200.06	38823.83	-38823.83	0.00
		180	Wind Normal	282.93	0.00	282.93	54905.19	0.00	0.00
		225	Wind 45	282.93	-200.06	200.06	38823.83	38823.83	0.00
		270	Wind Normal	282.93	-282.93	0.00	0.00	54905.19	0.00
		315	Wind 45	282.93	-200.06	-200.06	-38823.83	38823.83	0.00
L2	190.438-184.021	0	Wind Normal	246.30	0.00	-246.30	-46110.43	0.00	0.00
		45	Wind 45	246.30	174.16	-174.16	-32605.00	-32605.00	0.00
		90	Wind Normal	246.30	246.30	0.00	0.00	-46110.43	0.00
		135	Wind 45	246.30	174.16	174.16	32605.00	-32605.00	0.00
		180	Wind Normal	246.30	0.00	246.30	46110.43	0.00	0.00
		225	Wind 45	246.30	-174.16	174.16	32605.00	32605.00	0.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 36 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
		270	Wind Normal	246.30	-246.30	0.00	0.00	46110.43	0.00
		315	Wind 45	246.30	-174.16	-174.16	-32605.00	32605.00	0.00
L3	184.021-177.604	0	Wind Normal	244.85	0.00	-244.85	-44267.76	0.00	0.00
		45	Wind 45	244.85	173.14	-173.14	-31302.03	-31302.03	0.00
		90	Wind Normal	244.85	244.85	0.00	0.00	-44267.76	0.00
		135	Wind 45	244.85	173.14	173.14	31302.03	-31302.03	0.00
		180	Wind Normal	244.85	0.00	244.85	44267.76	0.00	0.00
		225	Wind 45	244.85	-173.14	173.14	31302.03	31302.03	0.00
		270	Wind Normal	244.85	-244.85	0.00	0.00	44267.76	0.00
		315	Wind 45	244.85	-173.14	-173.14	-31302.03	31302.03	0.00
L4	177.604-171.187	0	Wind Normal	243.66	0.00	-243.66	-42488.74	0.00	0.00
		45	Wind 45	243.66	172.29	-172.29	-30044.07	-30044.07	0.00
		90	Wind Normal	243.66	243.66	0.00	0.00	-42488.74	0.00
		135	Wind 45	243.66	172.29	172.29	30044.07	-30044.07	0.00
		180	Wind Normal	243.66	0.00	243.66	42488.74	0.00	0.00
		225	Wind 45	243.66	-172.29	172.29	30044.07	30044.07	0.00
		270	Wind Normal	243.66	-243.66	0.00	0.00	42488.74	0.00
		315	Wind 45	243.66	-172.29	-172.29	-30044.07	30044.07	0.00
L5	171.187-164.771	0	Wind Normal	242.44	0.00	-242.44	-40720.83	0.00	0.00
		45	Wind 45	242.44	171.43	-171.43	-28793.97	-28793.97	0.00
		90	Wind Normal	242.44	242.44	0.00	0.00	-40720.83	0.00
		135	Wind 45	242.44	171.43	171.43	28793.97	-28793.97	0.00
		180	Wind Normal	242.44	0.00	242.44	40720.83	0.00	0.00
		225	Wind 45	242.44	-171.43	171.43	28793.97	28793.97	0.00
		270	Wind Normal	242.44	-242.44	0.00	0.00	40720.83	0.00
		315	Wind 45	242.44	-171.43	-171.43	-28793.97	28793.97	0.00
L6	164.771-158.354	0	Wind Normal	241.16	0.00	-241.16	-38958.64	0.00	0.00
		45	Wind 45	241.16	170.53	-170.53	-27547.92	-27547.92	0.00
		90	Wind Normal	241.16	241.16	0.00	0.00	-38958.64	0.00
		135	Wind 45	241.16	170.53	170.53	27547.92	-27547.92	0.00
		180	Wind Normal	241.16	0.00	241.16	38958.64	0.00	0.00
		225	Wind 45	241.16	-170.53	170.53	27547.92	27547.92	0.00
		270	Wind Normal	241.16	-241.16	0.00	0.00	38958.64	0.00
		315	Wind 45	241.16	-170.53	-170.53	-27547.92	27547.92	0.00
L7	158.354-151.937	0	Wind Normal	239.82	0.00	-239.82	-37202.03	0.00	0.00
		45	Wind 45	239.82	169.58	-169.58	-26305.81	-26305.81	0.00
		90	Wind Normal	239.82	239.82	0.00	0.00	-37202.03	0.00
		135	Wind 45	239.82	169.58	169.58	26305.81	-26305.81	0.00
		180	Wind Normal	239.82	0.00	239.82	37202.03	0.00	0.00
		225	Wind 45	239.82	-169.58	169.58	26305.81	26305.81	0.00
		270	Wind Normal	239.82	-239.82	0.00	0.00	37202.03	0.00
		315	Wind 45	239.82	-169.58	-169.58	-26305.81	26305.81	0.00
L8	151.937-145.521	0	Wind Normal	238.39	0.00	-238.39	-35451.48	0.00	0.00
		45	Wind 45	238.39	168.57	-168.57	-25067.98	-25067.98	0.00
		90	Wind Normal	238.39	238.39	0.00	0.00	-35451.48	0.00
		135	Wind 45	238.39	168.57	168.57	25067.98	-25067.98	0.00
		180	Wind Normal	238.39	0.00	238.39	35451.48	0.00	0.00
		225	Wind 45	238.39	-168.57	168.57	25067.98	25067.98	0.00
		270	Wind Normal	238.39	-238.39	0.00	0.00	35451.48	0.00
		315	Wind 45	238.39	-168.57	-168.57	-25067.98	25067.98	0.00
L9	145.521-139.104	0	Wind Normal	236.89	0.00	-236.89	-33707.55	0.00	0.00
		45	Wind 45	236.89	167.50	-167.50	-23834.84	-23834.84	0.00
		90	Wind Normal	236.89	236.89	0.00	0.00	-33707.55	0.00
		135	Wind 45	236.89	167.50	167.50	23834.84	-23834.84	0.00
		180	Wind Normal	236.89	0.00	236.89	33707.55	0.00	0.00
		225	Wind 45	236.89	-167.50	167.50	23834.84	23834.84	0.00
		270	Wind Normal	236.89	-236.89	0.00	0.00	33707.55	0.00
		315	Wind 45	236.89	-167.50	-167.50	-23834.84	23834.84	0.00
L10	139.104-132.687	0	Wind Normal	235.29	0.00	-235.29	-31970.91	0.00	0.00
		45	Wind 45	235.29	166.38	-166.38	-22606.84	-22606.84	0.00
		90	Wind Normal	235.29	235.29	0.00	0.00	-31970.91	0.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 37 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
		135	Wind 45	235.29	166.38	166.38	22606.84	-22606.84	0.00
		180	Wind Normal	235.29	0.00	235.29	31970.91	0.00	0.00
		225	Wind 45	235.29	-166.38	166.38	22606.84	22606.84	0.00
		270	Wind Normal	235.29	-235.29	0.00	0.00	31970.91	0.00
		315	Wind 45	235.29	-166.38	-166.38	-22606.84	22606.84	0.00
L11	132.687-126.271	0	Wind Normal	233.60	0.00	-233.60	-30242.24	0.00	0.00
		45	Wind 45	233.60	165.18	-165.18	-21384.49	-21384.49	0.00
		90	Wind Normal	233.60	233.60	0.00	0.00	-30242.24	0.00
		135	Wind 45	233.60	165.18	165.18	21384.49	-21384.49	0.00
		180	Wind Normal	233.60	0.00	233.60	30242.24	0.00	0.00
		225	Wind 45	233.60	-165.18	165.18	21384.49	21384.49	0.00
		270	Wind Normal	233.60	-233.60	0.00	0.00	30242.24	0.00
		315	Wind 45	233.60	-165.18	-165.18	-21384.49	21384.49	0.00
L12	126.271-119.854	0	Wind Normal	231.81	0.00	-231.81	-28522.32	0.00	0.00
		45	Wind 45	231.81	163.91	-163.91	-20168.32	-20168.32	0.00
		90	Wind Normal	231.81	231.81	0.00	0.00	-28522.32	0.00
		135	Wind 45	231.81	163.91	163.91	20168.32	-20168.32	0.00
		180	Wind Normal	231.81	0.00	231.81	28522.32	0.00	0.00
		225	Wind 45	231.81	-163.91	163.91	20168.32	20168.32	0.00
		270	Wind Normal	231.81	-231.81	0.00	0.00	28522.32	0.00
		315	Wind 45	231.81	-163.91	-163.91	-20168.32	20168.32	0.00
L13	119.854-113.437	0	Wind Normal	229.89	0.00	-229.89	-26811.99	0.00	0.00
		45	Wind 45	229.89	162.56	-162.56	-18958.94	-18958.94	0.00
		90	Wind Normal	229.89	229.89	0.00	0.00	-26811.99	0.00
		135	Wind 45	229.89	162.56	162.56	18958.94	-18958.94	0.00
		180	Wind Normal	229.89	0.00	229.89	26811.99	0.00	0.00
		225	Wind 45	229.89	-162.56	162.56	18958.94	18958.94	0.00
		270	Wind Normal	229.89	-229.89	0.00	0.00	26811.99	0.00
		315	Wind 45	229.89	-162.56	-162.56	-18958.94	18958.94	0.00
L14	113.437-107.021	0	Wind Normal	227.86	0.00	-227.86	-25112.18	0.00	0.00
		45	Wind 45	227.86	161.12	-161.12	-17756.99	-17756.99	0.00
		90	Wind Normal	227.86	227.86	0.00	0.00	-25112.18	0.00
		135	Wind 45	227.86	161.12	161.12	17756.99	-17756.99	0.00
		180	Wind Normal	227.86	0.00	227.86	25112.18	0.00	0.00
		225	Wind 45	227.86	-161.12	161.12	17756.99	17756.99	0.00
		270	Wind Normal	227.86	-227.86	0.00	0.00	25112.18	0.00
		315	Wind 45	227.86	-161.12	-161.12	-17756.99	17756.99	0.00
L15	107.021-100.604	0	Wind Normal	225.68	0.00	-225.68	-23423.93	0.00	0.00
		45	Wind 45	225.68	159.58	-159.58	-16563.22	-16563.22	0.00
		90	Wind Normal	225.68	225.68	0.00	0.00	-23423.93	0.00
		135	Wind 45	225.68	159.58	159.58	16563.22	-16563.22	0.00
		180	Wind Normal	225.68	0.00	225.68	23423.93	0.00	0.00
		225	Wind 45	225.68	-159.58	159.58	16563.22	16563.22	0.00
		270	Wind Normal	225.68	-225.68	0.00	0.00	23423.93	0.00
		315	Wind 45	225.68	-159.58	-159.58	-16563.22	16563.22	0.00
L16	100.604-98.437	0	Wind Normal	88.07	0.00	-88.07	-8761.93	0.00	0.00
		45	Wind 45	88.07	62.27	-62.27	-6195.62	-6195.62	0.00
		90	Wind Normal	88.07	88.07	0.00	0.00	-8761.93	0.00
		135	Wind 45	88.07	62.27	62.27	6195.62	-6195.62	0.00
		180	Wind Normal	88.07	0.00	88.07	8761.93	0.00	0.00
		225	Wind 45	88.07	-62.27	62.27	6195.62	6195.62	0.00
		270	Wind Normal	88.07	-88.07	0.00	0.00	8761.93	0.00
		315	Wind 45	88.07	-62.27	-62.27	-6195.62	6195.62	0.00
L17	98.437-93.396	0	Wind Normal	212.71	0.00	-212.71	-20394.18	0.00	0.00
		45	Wind 45	212.71	150.41	-150.41	-14420.86	-14420.86	0.00
		90	Wind Normal	212.71	212.71	0.00	0.00	-20394.18	0.00
		135	Wind 45	212.71	150.41	150.41	14420.86	-14420.86	0.00
		180	Wind Normal	212.71	0.00	212.71	20394.18	0.00	0.00
		225	Wind 45	212.71	-150.41	150.41	14420.86	14420.86	0.00
		270	Wind Normal	212.71	-212.71	0.00	0.00	20394.18	0.00
		315	Wind 45	212.71	-150.41	-150.41	-14420.86	14420.86	0.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 38 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
L18	93.396-87.188	0	Wind Normal	265.54	0.00	-265.54	-23971.13	0.00	0.00
		45	Wind 45	265.54	187.77	-187.77	-16950.15	-16950.15	0.00
		90	Wind Normal	265.54	265.54	0.00	0.00	-23971.13	0.00
		135	Wind 45	265.54	187.77	187.77	16950.15	-16950.15	0.00
		180	Wind Normal	265.54	0.00	265.54	23971.13	0.00	0.00
		225	Wind 45	265.54	-187.77	187.77	16950.15	16950.15	0.00
		270	Wind Normal	265.54	-265.54	0.00	0.00	23971.13	0.00
		315	Wind 45	265.54	-187.77	-187.77	-16950.15	16950.15	0.00
L19	87.188-80.979	0	Wind Normal	263.62	0.00	-263.62	-22162.49	0.00	0.00
		45	Wind 45	263.62	186.41	-186.41	-15671.25	-15671.25	0.00
		90	Wind Normal	263.62	263.62	0.00	0.00	-22162.49	0.00
		135	Wind 45	263.62	186.41	186.41	15671.25	-15671.25	0.00
		180	Wind Normal	263.62	0.00	263.62	22162.49	0.00	0.00
		225	Wind 45	263.62	-186.41	186.41	15671.25	15671.25	0.00
		270	Wind Normal	263.62	-263.62	0.00	0.00	22162.49	0.00
		315	Wind 45	263.62	-186.41	-186.41	-15671.25	15671.25	0.00
L20	80.979-74.771	0	Wind Normal	260.35	0.00	-260.35	-20271.08	0.00	0.00
		45	Wind 45	260.35	184.10	-184.10	-14333.82	-14333.82	0.00
		90	Wind Normal	260.35	260.35	0.00	0.00	-20271.08	0.00
		135	Wind 45	260.35	184.10	184.10	14333.82	-14333.82	0.00
		180	Wind Normal	260.35	0.00	260.35	20271.08	0.00	0.00
		225	Wind 45	260.35	-184.10	184.10	14333.82	14333.82	0.00
		270	Wind Normal	260.35	-260.35	0.00	0.00	20271.08	0.00
		315	Wind 45	260.35	-184.10	-184.10	-14333.82	14333.82	0.00
L21	74.771-68.563	0	Wind Normal	256.62	0.00	-256.62	-18387.76	0.00	0.00
		45	Wind 45	256.62	181.46	-181.46	-13002.11	-13002.11	0.00
		90	Wind Normal	256.62	256.62	0.00	0.00	-18387.76	0.00
		135	Wind 45	256.62	181.46	181.46	13002.11	-13002.11	0.00
		180	Wind Normal	256.62	0.00	256.62	18387.76	0.00	0.00
		225	Wind 45	256.62	-181.46	181.46	13002.11	13002.11	0.00
		270	Wind Normal	256.62	-256.62	0.00	0.00	18387.76	0.00
		315	Wind 45	256.62	-181.46	-181.46	-13002.11	13002.11	0.00
L22	68.563-62.354	0	Wind Normal	252.53	0.00	-252.53	-16526.72	0.00	0.00
		45	Wind 45	252.53	178.57	-178.57	-11686.15	-11686.15	0.00
		90	Wind Normal	252.53	252.53	0.00	0.00	-16526.72	0.00
		135	Wind 45	252.53	178.57	178.57	11686.15	-11686.15	0.00
		180	Wind Normal	252.53	0.00	252.53	16526.72	0.00	0.00
		225	Wind 45	252.53	-178.57	178.57	11686.15	11686.15	0.00
		270	Wind Normal	252.53	-252.53	0.00	0.00	16526.72	0.00
		315	Wind 45	252.53	-178.57	-178.57	-11686.15	11686.15	0.00
L23	62.354-56.146	0	Wind Normal	248.03	0.00	-248.03	-14692.35	0.00	0.00
		45	Wind 45	248.03	175.38	-175.38	-10389.06	-10389.06	0.00
		90	Wind Normal	248.03	248.03	0.00	0.00	-14692.35	0.00
		135	Wind 45	248.03	175.38	175.38	10389.06	-10389.06	0.00
		180	Wind Normal	248.03	0.00	248.03	14692.35	0.00	0.00
		225	Wind 45	248.03	-175.38	175.38	10389.06	10389.06	0.00
		270	Wind Normal	248.03	-248.03	0.00	0.00	14692.35	0.00
		315	Wind 45	248.03	-175.38	-175.38	-10389.06	10389.06	0.00
L24	56.146-49.938	0	Wind Normal	243.05	0.00	-243.05	-12888.24	0.00	0.00
		45	Wind 45	243.05	171.86	-171.86	-9113.36	-9113.36	0.00
		90	Wind Normal	243.05	243.05	0.00	0.00	-12888.24	0.00
		135	Wind 45	243.05	171.86	171.86	9113.36	-9113.36	0.00
		180	Wind Normal	243.05	0.00	243.05	12888.24	0.00	0.00
		225	Wind 45	243.05	-171.86	171.86	9113.36	9113.36	0.00
		270	Wind Normal	243.05	-243.05	0.00	0.00	12888.24	0.00
		315	Wind 45	243.05	-171.86	-171.86	-9113.36	9113.36	0.00
L25	49.938-43.729	0	Wind Normal	237.47	0.00	-237.47	-11118.46	0.00	0.00
		45	Wind 45	237.47	167.92	-167.92	-7861.94	-7861.94	0.00
		90	Wind Normal	237.47	237.47	0.00	0.00	-11118.46	0.00
		135	Wind 45	237.47	167.92	167.92	7861.94	-7861.94	0.00
		180	Wind Normal	237.47	0.00	237.47	11118.46	0.00	0.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 39 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
		225	Wind 45	237.47	-167.92	167.92	7861.94	7861.94	0.00
		270	Wind Normal	237.47	-237.47	0.00	0.00	11118.46	0.00
		315	Wind 45	237.47	-167.92	-167.92	-7861.94	7861.94	0.00
L26	43.729-37.521	0	Wind Normal	231.17	0.00	-231.17	-9388.03	0.00	0.00
		45	Wind 45	231.17	163.46	-163.46	-6638.34	-6638.34	0.00
		90	Wind Normal	231.17	231.17	0.00	0.00	-9388.03	0.00
		135	Wind 45	231.17	163.46	163.46	6638.34	-6638.34	0.00
		180	Wind Normal	231.17	0.00	231.17	9388.03	0.00	0.00
		225	Wind 45	231.17	-163.46	163.46	6638.34	6638.34	0.00
		270	Wind Normal	231.17	-231.17	0.00	0.00	9388.03	0.00
		315	Wind 45	231.17	-163.46	-163.46	-6638.34	6638.34	0.00
L27	37.521-31.313	0	Wind Normal	223.91	0.00	-223.91	-7703.31	0.00	0.00
		45	Wind 45	223.91	158.33	-158.33	-5447.06	-5447.06	0.00
		90	Wind Normal	223.91	223.91	0.00	0.00	-7703.31	0.00
		135	Wind 45	223.91	158.33	158.33	5447.06	-5447.06	0.00
		180	Wind Normal	223.91	0.00	223.91	7703.31	0.00	0.00
		225	Wind 45	223.91	-158.33	158.33	5447.06	5447.06	0.00
		270	Wind Normal	223.91	-223.91	0.00	0.00	7703.31	0.00
		315	Wind 45	223.91	-158.33	-158.33	-5447.06	5447.06	0.00
L28	31.313-25.105	0	Wind Normal	215.38	0.00	-215.38	-6072.67	0.00	0.00
		45	Wind 45	215.38	152.30	-152.30	-4294.03	-4294.03	0.00
		90	Wind Normal	215.38	215.38	0.00	0.00	-6072.67	0.00
		135	Wind 45	215.38	152.30	152.30	4294.03	-4294.03	0.00
		180	Wind Normal	215.38	0.00	215.38	6072.67	0.00	0.00
		225	Wind 45	215.38	-152.30	152.30	4294.03	4294.03	0.00
		270	Wind Normal	215.38	-215.38	0.00	0.00	6072.67	0.00
		315	Wind 45	215.38	-152.30	-152.30	-4294.03	4294.03	0.00
L29	25.105-18.896	0	Wind Normal	205.02	0.00	-205.02	-4507.73	0.00	0.00
		45	Wind 45	205.02	144.97	-144.97	-3187.45	-3187.45	0.00
		90	Wind Normal	205.02	205.02	0.00	0.00	-4507.73	0.00
		135	Wind 45	205.02	144.97	144.97	3187.45	-3187.45	0.00
		180	Wind Normal	205.02	0.00	205.02	4507.73	0.00	0.00
		225	Wind 45	205.02	-144.97	144.97	3187.45	3187.45	0.00
		270	Wind Normal	205.02	-205.02	0.00	0.00	4507.73	0.00
		315	Wind 45	205.02	-144.97	-144.97	-3187.45	3187.45	0.00
L30	18.896-12.688	0	Wind Normal	191.78	0.00	-191.78	-3025.93	0.00	0.00
		45	Wind 45	191.78	135.61	-135.61	-2139.65	-2139.65	0.00
		90	Wind Normal	191.78	191.78	0.00	0.00	-3025.93	0.00
		135	Wind 45	191.78	135.61	135.61	2139.65	-2139.65	0.00
		180	Wind Normal	191.78	0.00	191.78	3025.93	0.00	0.00
		225	Wind 45	191.78	-135.61	135.61	2139.65	2139.65	0.00
		270	Wind Normal	191.78	-191.78	0.00	0.00	3025.93	0.00
		315	Wind 45	191.78	-135.61	-135.61	-2139.65	2139.65	0.00
L31	12.688-6.480	0	Wind Normal	190.59	0.00	-190.59	-1823.87	0.00	0.00
		45	Wind 45	190.59	134.76	-134.76	-1289.67	-1289.67	0.00
		90	Wind Normal	190.59	190.59	0.00	0.00	-1823.87	0.00
		135	Wind 45	190.59	134.76	134.76	1289.67	-1289.67	0.00
		180	Wind Normal	190.59	0.00	190.59	1823.87	0.00	0.00
		225	Wind 45	190.59	-134.76	134.76	1289.67	1289.67	0.00
		270	Wind Normal	190.59	-190.59	0.00	0.00	1823.87	0.00
		315	Wind 45	190.59	-134.76	-134.76	-1289.67	1289.67	0.00
L32	6.480-0.000	0	Wind Normal	199.53	0.00	-199.53	-643.52	0.00	0.00
		45	Wind 45	199.53	141.09	-141.09	-455.03	-455.03	0.00
		90	Wind Normal	199.53	199.53	0.00	0.00	-643.52	0.00
		135	Wind 45	199.53	141.09	141.09	455.03	-455.03	0.00
		180	Wind Normal	199.53	0.00	199.53	643.52	0.00	0.00
		225	Wind 45	199.53	-141.09	141.09	455.03	455.03	0.00
		270	Wind Normal	199.53	-199.53	0.00	0.00	643.52	0.00
		315	Wind 45	199.53	-141.09	-141.09	-455.03	455.03	0.00

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Mast Totals - No Ice

Wind Azimuth °	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
0	0.00	-7385.95	-742235.59	0.00	0.00
45	5222.65	-5222.65	-524839.82	-524839.82	0.00
90	7385.95	0.00	0.00	-742235.59	0.00
135	5222.65	5222.65	524839.82	-524839.82	0.00
180	0.00	7385.95	742235.59	0.00	0.00
225	-5222.65	5222.65	524839.82	524839.82	0.00
270	-7385.95	0.00	0.00	742235.59	0.00
315	-5222.65	-5222.65	-524839.82	524839.82	0.00

Mast Vectors - Service

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
L1	197.688-190.438	0	Wind Normal	76.79	0.00	-76.79	-14901.16	0.00	0.00
		45	Wind 45	76.79	54.30	-54.30	-10536.71	-10536.71	0.00
		90	Wind Normal	76.79	76.79	0.00	0.00	-14901.16	0.00
		135	Wind 45	76.79	54.30	54.30	10536.71	-10536.71	0.00
		180	Wind Normal	76.79	0.00	76.79	14901.16	0.00	0.00
		225	Wind 45	76.79	-54.30	54.30	10536.71	10536.71	0.00
		270	Wind Normal	76.79	-76.79	0.00	0.00	14901.16	0.00
		315	Wind 45	76.79	-54.30	-54.30	-10536.71	10536.71	0.00
L2	190.438-184.021	0	Wind Normal	67.81	0.00	-67.81	-12694.54	0.00	0.00
		45	Wind 45	67.81	47.95	-47.95	-8976.39	-8976.39	0.00
		90	Wind Normal	67.81	67.81	0.00	0.00	-12694.54	0.00
		135	Wind 45	67.81	47.95	47.95	8976.39	-8976.39	0.00
		180	Wind Normal	67.81	0.00	67.81	12694.54	0.00	0.00
		225	Wind 45	67.81	-47.95	47.95	8976.39	8976.39	0.00
		270	Wind Normal	67.81	-67.81	0.00	0.00	12694.54	0.00
		315	Wind 45	67.81	-47.95	-47.95	-8976.39	8976.39	0.00
L3	184.021-177.604	0	Wind Normal	67.66	0.00	-67.66	-12232.01	0.00	0.00
		45	Wind 45	67.66	47.84	-47.84	-8649.34	-8649.34	0.00
		90	Wind Normal	67.66	67.66	0.00	0.00	-12232.01	0.00
		135	Wind 45	67.66	47.84	47.84	8649.34	-8649.34	0.00
		180	Wind Normal	67.66	0.00	67.66	12232.01	0.00	0.00
		225	Wind 45	67.66	-47.84	47.84	8649.34	8649.34	0.00
		270	Wind Normal	67.66	-67.66	0.00	0.00	12232.01	0.00
		315	Wind 45	67.66	-47.84	-47.84	-8649.34	8649.34	0.00
L4	177.604-171.187	0	Wind Normal	67.50	0.00	-67.50	-11770.09	0.00	0.00
		45	Wind 45	67.50	47.73	-47.73	-8322.71	-8322.71	0.00
		90	Wind Normal	67.50	67.50	0.00	0.00	-11770.09	0.00
		135	Wind 45	67.50	47.73	47.73	8322.71	-8322.71	0.00
		180	Wind Normal	67.50	0.00	67.50	11770.09	0.00	0.00
		225	Wind 45	67.50	-47.73	47.73	8322.71	8322.71	0.00
		270	Wind Normal	67.50	-67.50	0.00	0.00	11770.09	0.00
		315	Wind 45	67.50	-47.73	-47.73	-8322.71	8322.71	0.00
L5	171.187-164.771	0	Wind Normal	67.33	0.00	-67.33	-11308.74	0.00	0.00
		45	Wind 45	67.33	47.61	-47.61	-7996.48	-7996.48	0.00
		90	Wind Normal	67.33	67.33	0.00	0.00	-11308.74	0.00
		135	Wind 45	67.33	47.61	47.61	7996.48	-7996.48	0.00
		180	Wind Normal	67.33	0.00	67.33	11308.74	0.00	0.00

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
		225	Wind 45	67.33	-47.61	47.61	7996.48	7996.48	0.00
		270	Wind Normal	67.33	-67.33	0.00	0.00	11308.74	0.00
		315	Wind 45	67.33	-47.61	-47.61	-7996.48	7996.48	0.00
L6	164.771-158.354	0	Wind Normal	67.15	0.00	-67.15	-10848.00	0.00	0.00
		45	Wind 45	67.15	47.48	-47.48	-7670.70	-7670.70	0.00
		90	Wind Normal	67.15	67.15	0.00	0.00	-10848.00	0.00
		135	Wind 45	67.15	47.48	47.48	7670.70	-7670.70	0.00
		180	Wind Normal	67.15	0.00	67.15	10848.00	0.00	0.00
		225	Wind 45	67.15	-47.48	47.48	7670.70	7670.70	0.00
		270	Wind Normal	67.15	-67.15	0.00	0.00	10848.00	0.00
		315	Wind 45	67.15	-47.48	-47.48	-7670.70	7670.70	0.00
L7	158.354-151.937	0	Wind Normal	66.96	0.00	-66.96	-10387.96	0.00	0.00
		45	Wind 45	66.96	47.35	-47.35	-7345.39	-7345.39	0.00
		90	Wind Normal	66.96	66.96	0.00	0.00	-10387.96	0.00
		135	Wind 45	66.96	47.35	47.35	7345.39	-7345.39	0.00
		180	Wind Normal	66.96	0.00	66.96	10387.96	0.00	0.00
		225	Wind 45	66.96	-47.35	47.35	7345.39	7345.39	0.00
		270	Wind Normal	66.96	-66.96	0.00	0.00	10387.96	0.00
		315	Wind 45	66.96	-47.35	-47.35	-7345.39	7345.39	0.00
L8	151.937-145.521	0	Wind Normal	66.76	0.00	-66.76	-9928.66	0.00	0.00
		45	Wind 45	66.76	47.21	-47.21	-7020.63	-7020.63	0.00
		90	Wind Normal	66.76	66.76	0.00	0.00	-9928.66	0.00
		135	Wind 45	66.76	47.21	47.21	7020.63	-7020.63	0.00
		180	Wind Normal	66.76	0.00	66.76	9928.66	0.00	0.00
		225	Wind 45	66.76	-47.21	47.21	7020.63	7020.63	0.00
		270	Wind Normal	66.76	-66.76	0.00	0.00	9928.66	0.00
		315	Wind 45	66.76	-47.21	-47.21	-7020.63	7020.63	0.00
L9	145.521-139.104	0	Wind Normal	66.55	0.00	-66.55	-9470.21	0.00	0.00
		45	Wind 45	66.55	47.06	-47.06	-6696.45	-6696.45	0.00
		90	Wind Normal	66.55	66.55	0.00	0.00	-9470.21	0.00
		135	Wind 45	66.55	47.06	47.06	6696.45	-6696.45	0.00
		180	Wind Normal	66.55	0.00	66.55	9470.21	0.00	0.00
		225	Wind 45	66.55	-47.06	47.06	6696.45	6696.45	0.00
		270	Wind Normal	66.55	-66.55	0.00	0.00	9470.21	0.00
		315	Wind 45	66.55	-47.06	-47.06	-6696.45	6696.45	0.00
L10	139.104-132.687	0	Wind Normal	66.33	0.00	-66.33	-9012.67	0.00	0.00
		45	Wind 45	66.33	46.90	-46.90	-6372.92	-6372.92	0.00
		90	Wind Normal	66.33	66.33	0.00	0.00	-9012.67	0.00
		135	Wind 45	66.33	46.90	46.90	6372.92	-6372.92	0.00
		180	Wind Normal	66.33	0.00	66.33	9012.67	0.00	0.00
		225	Wind 45	66.33	-46.90	46.90	6372.92	6372.92	0.00
		270	Wind Normal	66.33	-66.33	0.00	0.00	9012.67	0.00
		315	Wind 45	66.33	-46.90	-46.90	-6372.92	6372.92	0.00
L11	132.687-126.271	0	Wind Normal	66.09	0.00	-66.09	-8556.15	0.00	0.00
		45	Wind 45	66.09	46.73	-46.73	-6050.11	-6050.11	0.00
		90	Wind Normal	66.09	66.09	0.00	0.00	-8556.15	0.00
		135	Wind 45	66.09	46.73	46.73	6050.11	-6050.11	0.00
		180	Wind Normal	66.09	0.00	66.09	8556.15	0.00	0.00
		225	Wind 45	66.09	-46.73	46.73	6050.11	6050.11	0.00
		270	Wind Normal	66.09	-66.09	0.00	0.00	8556.15	0.00
		315	Wind 45	66.09	-46.73	-46.73	-6050.11	6050.11	0.00
L12	126.271-119.854	0	Wind Normal	65.84	0.00	-65.84	-8100.75	0.00	0.00
		45	Wind 45	65.84	46.55	-46.55	-5728.10	-5728.10	0.00
		90	Wind Normal	65.84	65.84	0.00	0.00	-8100.75	0.00
		135	Wind 45	65.84	46.55	46.55	5728.10	-5728.10	0.00
		180	Wind Normal	65.84	0.00	65.84	8100.75	0.00	0.00
		225	Wind 45	65.84	-46.55	46.55	5728.10	5728.10	0.00
		270	Wind Normal	65.84	-65.84	0.00	0.00	8100.75	0.00
		315	Wind 45	65.84	-46.55	-46.55	-5728.10	5728.10	0.00
L13	119.854-113.437	0	Wind Normal	65.56	0.00	-65.56	-7646.58	0.00	0.00
		45	Wind 45	65.56	46.36	-46.36	-5406.95	-5406.95	0.00

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
		90	Wind Normal	65.56	65.56	0.00	0.00	-7646.58	0.00
		135	Wind 45	65.56	46.36	46.36	5406.95	-5406.95	0.00
		180	Wind Normal	65.56	0.00	65.56	7646.58	0.00	0.00
		225	Wind 45	65.56	-46.36	46.36	5406.95	5406.95	0.00
		270	Wind Normal	65.56	-65.56	0.00	0.00	7646.58	0.00
		315	Wind 45	65.56	-46.36	-46.36	-5406.95	5406.95	0.00
L14	113.437-107.021	0	Wind Normal	65.27	0.00	-65.27	-7193.77	0.00	0.00
		45	Wind 45	65.27	46.15	-46.15	-5086.77	-5086.77	0.00
		90	Wind Normal	65.27	65.27	0.00	0.00	-7193.77	0.00
		135	Wind 45	65.27	46.15	46.15	5086.77	-5086.77	0.00
		180	Wind Normal	65.27	0.00	65.27	7193.77	0.00	0.00
		225	Wind 45	65.27	-46.15	46.15	5086.77	5086.77	0.00
		270	Wind Normal	65.27	-65.27	0.00	0.00	7193.77	0.00
		315	Wind 45	65.27	-46.15	-46.15	-5086.77	5086.77	0.00
L15	107.021-100.604	0	Wind Normal	64.96	0.00	-64.96	-6742.47	0.00	0.00
		45	Wind 45	64.96	45.93	-45.93	-4767.64	-4767.64	0.00
		90	Wind Normal	64.96	64.96	0.00	0.00	-6742.47	0.00
		135	Wind 45	64.96	45.93	45.93	4767.64	-4767.64	0.00
		180	Wind Normal	64.96	0.00	64.96	6742.47	0.00	0.00
		225	Wind 45	64.96	-45.93	45.93	4767.64	4767.64	0.00
		270	Wind Normal	64.96	-64.96	0.00	0.00	6742.47	0.00
		315	Wind 45	64.96	-45.93	-45.93	-4767.64	4767.64	0.00
L16	100.604-98.437	0	Wind Normal	21.86	0.00	-21.86	-2174.72	0.00	0.00
		45	Wind 45	21.86	15.46	-15.46	-1537.76	-1537.76	0.00
		90	Wind Normal	21.86	21.86	0.00	0.00	-2174.72	0.00
		135	Wind 45	21.86	15.46	15.46	1537.76	-1537.76	0.00
		180	Wind Normal	21.86	0.00	21.86	2174.72	0.00	0.00
		225	Wind 45	21.86	-15.46	15.46	1537.76	1537.76	0.00
		270	Wind Normal	21.86	-21.86	0.00	0.00	2174.72	0.00
		315	Wind 45	21.86	-15.46	-15.46	-1537.76	1537.76	0.00
L17	98.437-93.396	0	Wind Normal	50.71	0.00	-50.71	-4862.06	0.00	0.00
		45	Wind 45	50.71	35.86	-35.86	-3438.00	-3438.00	0.00
		90	Wind Normal	50.71	50.71	0.00	0.00	-4862.06	0.00
		135	Wind 45	50.71	35.86	35.86	3438.00	-3438.00	0.00
		180	Wind Normal	50.71	0.00	50.71	4862.06	0.00	0.00
		225	Wind 45	50.71	-35.86	35.86	3438.00	3438.00	0.00
		270	Wind Normal	50.71	-50.71	0.00	0.00	4862.06	0.00
		315	Wind 45	50.71	-35.86	-35.86	-3438.00	3438.00	0.00
L18	93.396-87.188	0	Wind Normal	62.13	0.00	-62.13	-5608.79	0.00	0.00
		45	Wind 45	62.13	43.93	-43.93	-3966.01	-3966.01	0.00
		90	Wind Normal	62.13	62.13	0.00	0.00	-5608.79	0.00
		135	Wind 45	62.13	43.93	43.93	3966.01	-3966.01	0.00
		180	Wind Normal	62.13	0.00	62.13	5608.79	0.00	0.00
		225	Wind 45	62.13	-43.93	43.93	3966.01	3966.01	0.00
		270	Wind Normal	62.13	-62.13	0.00	0.00	5608.79	0.00
		315	Wind 45	62.13	-43.93	-43.93	-3966.01	3966.01	0.00
L19	87.188-80.979	0	Wind Normal	61.76	0.00	-61.76	-5192.03	0.00	0.00
		45	Wind 45	61.76	43.67	-43.67	-3671.32	-3671.32	0.00
		90	Wind Normal	61.76	61.76	0.00	0.00	-5192.03	0.00
		135	Wind 45	61.76	43.67	43.67	3671.32	-3671.32	0.00
		180	Wind Normal	61.76	0.00	61.76	5192.03	0.00	0.00
		225	Wind 45	61.76	-43.67	43.67	3671.32	3671.32	0.00
		270	Wind Normal	61.76	-61.76	0.00	0.00	5192.03	0.00
		315	Wind 45	61.76	-43.67	-43.67	-3671.32	3671.32	0.00
L20	80.979-74.771	0	Wind Normal	61.35	0.00	-61.35	-4777.06	0.00	0.00
		45	Wind 45	61.35	43.38	-43.38	-3377.89	-3377.89	0.00
		90	Wind Normal	61.35	61.35	0.00	0.00	-4777.06	0.00
		135	Wind 45	61.35	43.38	43.38	3377.89	-3377.89	0.00
		180	Wind Normal	61.35	0.00	61.35	4777.06	0.00	0.00
		225	Wind 45	61.35	-43.38	43.38	3377.89	3377.89	0.00
		270	Wind Normal	61.35	-61.35	0.00	0.00	4777.06	0.00

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 43 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
		315	Wind 45	61.35	-43.38	-43.38	-3377.89	3377.89	0.00
L21	74.771-68.563	0	Wind Normal	60.91	0.00	-60.91	-4364.37	0.00	0.00
		45	Wind 45	60.91	43.07	-43.07	-3086.08	-3086.08	0.00
		90	Wind Normal	60.91	60.91	0.00	0.00	-4364.37	0.00
		135	Wind 45	60.91	43.07	43.07	3086.08	-3086.08	0.00
		180	Wind Normal	60.91	0.00	60.91	4364.37	0.00	0.00
		225	Wind 45	60.91	-43.07	43.07	3086.08	3086.08	0.00
		270	Wind Normal	60.91	-60.91	0.00	0.00	4364.37	0.00
		315	Wind 45	60.91	-43.07	-43.07	-3086.08	3086.08	0.00
L22	68.563-62.354	0	Wind Normal	60.42	0.00	-60.42	-3954.28	0.00	0.00
		45	Wind 45	60.42	42.72	-42.72	-2796.10	-2796.10	0.00
		90	Wind Normal	60.42	60.42	0.00	0.00	-3954.28	0.00
		135	Wind 45	60.42	42.72	42.72	2796.10	-2796.10	0.00
		180	Wind Normal	60.42	0.00	60.42	3954.28	0.00	0.00
		225	Wind 45	60.42	-42.72	42.72	2796.10	2796.10	0.00
		270	Wind Normal	60.42	-60.42	0.00	0.00	3954.28	0.00
		315	Wind 45	60.42	-42.72	-42.72	-2796.10	2796.10	0.00
L23	62.354-56.146	0	Wind Normal	59.88	0.00	-59.88	-3547.13	0.00	0.00
		45	Wind 45	59.88	42.34	-42.34	-2508.20	-2508.20	0.00
		90	Wind Normal	59.88	59.88	0.00	0.00	-3547.13	0.00
		135	Wind 45	59.88	42.34	42.34	2508.20	-2508.20	0.00
		180	Wind Normal	59.88	0.00	59.88	3547.13	0.00	0.00
		225	Wind 45	59.88	-42.34	42.34	2508.20	2508.20	0.00
		270	Wind Normal	59.88	-59.88	0.00	0.00	3547.13	0.00
		315	Wind 45	59.88	-42.34	-42.34	-2508.20	2508.20	0.00
L24	56.146-49.938	0	Wind Normal	59.28	0.00	-59.28	-3143.30	0.00	0.00
		45	Wind 45	59.28	41.91	-41.91	-2222.65	-2222.65	0.00
		90	Wind Normal	59.28	59.28	0.00	0.00	-3143.30	0.00
		135	Wind 45	59.28	41.91	41.91	2222.65	-2222.65	0.00
		180	Wind Normal	59.28	0.00	59.28	3143.30	0.00	0.00
		225	Wind 45	59.28	-41.91	41.91	2222.65	2222.65	0.00
		270	Wind Normal	59.28	-59.28	0.00	0.00	3143.30	0.00
		315	Wind 45	59.28	-41.91	-41.91	-2222.65	2222.65	0.00
L25	49.938-43.729	0	Wind Normal	58.59	0.00	-58.59	-2743.30	0.00	0.00
		45	Wind 45	58.59	41.43	-41.43	-1939.81	-1939.81	0.00
		90	Wind Normal	58.59	58.59	0.00	0.00	-2743.30	0.00
		135	Wind 45	58.59	41.43	41.43	1939.81	-1939.81	0.00
		180	Wind Normal	58.59	0.00	58.59	2743.30	0.00	0.00
		225	Wind 45	58.59	-41.43	41.43	1939.81	1939.81	0.00
		270	Wind Normal	58.59	-58.59	0.00	0.00	2743.30	0.00
		315	Wind 45	58.59	-41.43	-41.43	-1939.81	1939.81	0.00
L26	43.729-37.521	0	Wind Normal	57.81	0.00	-57.81	-2347.73	0.00	0.00
		45	Wind 45	57.81	40.88	-40.88	-1660.10	-1660.10	0.00
		90	Wind Normal	57.81	57.81	0.00	0.00	-2347.73	0.00
		135	Wind 45	57.81	40.88	40.88	1660.10	-1660.10	0.00
		180	Wind Normal	57.81	0.00	57.81	2347.73	0.00	0.00
		225	Wind 45	57.81	-40.88	40.88	1660.10	1660.10	0.00
		270	Wind Normal	57.81	-57.81	0.00	0.00	2347.73	0.00
		315	Wind 45	57.81	-40.88	-40.88	-1660.10	1660.10	0.00
L27	37.521-31.313	0	Wind Normal	56.90	0.00	-56.90	-1957.38	0.00	0.00
		45	Wind 45	56.90	40.23	-40.23	-1384.07	-1384.07	0.00
		90	Wind Normal	56.90	56.90	0.00	0.00	-1957.38	0.00
		135	Wind 45	56.90	40.23	40.23	1384.07	-1384.07	0.00
		180	Wind Normal	56.90	0.00	56.90	1957.38	0.00	0.00
		225	Wind 45	56.90	-40.23	40.23	1384.07	1384.07	0.00
		270	Wind Normal	56.90	-56.90	0.00	0.00	1957.38	0.00
		315	Wind 45	56.90	-40.23	-40.23	-1384.07	1384.07	0.00
L28	31.313-25.105	0	Wind Normal	55.80	0.00	-55.80	-1573.30	0.00	0.00
		45	Wind 45	55.80	39.46	-39.46	-1112.49	-1112.49	0.00
		90	Wind Normal	55.80	55.80	0.00	0.00	-1573.30	0.00
		135	Wind 45	55.80	39.46	39.46	1112.49	-1112.49	0.00

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Section Elevation ft	Wind Azimuth °	Directionality	F lb	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
		180	Wind Normal	55.80	0.00	55.80	1573.30	0.00	0.00
		225	Wind 45	55.80	-39.46	39.46	1112.49	1112.49	0.00
		270	Wind Normal	55.80	-55.80	0.00	0.00	1573.30	0.00
		315	Wind 45	55.80	-39.46	-39.46	-1112.49	1112.49	0.00
L29	25.105-18.896	0	Wind Normal	54.44	0.00	-54.44	-1197.00	0.00	0.00
		45	Wind 45	54.44	38.50	-38.50	-846.41	-846.41	0.00
		90	Wind Normal	54.44	54.44	0.00	0.00	-1197.00	0.00
		135	Wind 45	54.44	38.50	38.50	846.41	-846.41	0.00
		180	Wind Normal	54.44	0.00	54.44	1197.00	0.00	0.00
		225	Wind 45	54.44	-38.50	38.50	846.41	846.41	0.00
		270	Wind Normal	54.44	-54.44	0.00	0.00	1197.00	0.00
		315	Wind 45	54.44	-38.50	-38.50	-846.41	846.41	0.00
L30	18.896-12.688	0	Wind Normal	52.65	0.00	-52.65	-830.80	0.00	0.00
		45	Wind 45	52.65	37.23	-37.23	-587.46	-587.46	0.00
		90	Wind Normal	52.65	52.65	0.00	0.00	-830.80	0.00
		135	Wind 45	52.65	37.23	37.23	587.46	-587.46	0.00
		180	Wind Normal	52.65	0.00	52.65	830.80	0.00	0.00
		225	Wind 45	52.65	-37.23	37.23	587.46	587.46	0.00
		270	Wind Normal	52.65	-52.65	0.00	0.00	830.80	0.00
		315	Wind 45	52.65	-37.23	-37.23	-587.46	587.46	0.00
L31	12.688-6.480	0	Wind Normal	52.49	0.00	-52.49	-502.33	0.00	0.00
		45	Wind 45	52.49	37.12	-37.12	-355.20	-355.20	0.00
		90	Wind Normal	52.49	52.49	0.00	0.00	-502.33	0.00
		135	Wind 45	52.49	37.12	37.12	355.20	-355.20	0.00
		180	Wind Normal	52.49	0.00	52.49	502.33	0.00	0.00
		225	Wind 45	52.49	-37.12	37.12	355.20	355.20	0.00
		270	Wind Normal	52.49	-52.49	0.00	0.00	502.33	0.00
		315	Wind 45	52.49	-37.12	-37.12	-355.20	355.20	0.00
L32	6.480-0.000	0	Wind Normal	54.87	0.00	-54.87	-176.97	0.00	0.00
		45	Wind 45	54.87	38.80	-38.80	-125.14	-125.14	0.00
		90	Wind Normal	54.87	54.87	0.00	0.00	-176.97	0.00
		135	Wind 45	54.87	38.80	38.80	125.14	-125.14	0.00
		180	Wind Normal	54.87	0.00	54.87	176.97	0.00	0.00
		225	Wind 45	54.87	-38.80	38.80	125.14	125.14	0.00
		270	Wind Normal	54.87	-54.87	0.00	0.00	176.97	0.00
		315	Wind 45	54.87	-38.80	-38.80	-125.14	125.14	0.00

Mast Totals - Service

Wind Azimuth °	V_x lb	V_z lb	OTM_x lb-ft	OTM_z lb-ft	Torque lb-ft
0	0.00	-1950.43	-199746.33	0.00	0.00
45	1379.16	-1379.16	-141241.98	-141241.98	0.00
90	1950.43	0.00	0.00	-199746.33	0.00
135	1379.16	1379.16	141241.98	-141241.98	0.00
180	0.00	1950.43	199746.33	0.00	0.00
225	-1379.16	1379.16	141241.98	141241.98	0.00
270	-1950.43	0.00	0.00	199746.33	0.00
315	-1379.16	-1379.16	-141241.98	141241.98	0.00

Force Totals (Does not include forces on guys)

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	2930.86			
Bracing Weight	0.00			
Total Member Self-Weight	2930.86			
Guy Weight	808.96			
Total Weight	4089.77			
Wind 0 deg - No Ice		0.00	-9115.23	181.00
Wind 45 deg - No Ice		6718.27	-6718.27	252.87
Wind 90 deg - No Ice		9115.23	0.00	160.82
Wind 135 deg - No Ice		6172.62	6172.62	-14.27
Wind 180 deg - No Ice		0.00	9115.23	-181.00
Wind 225 deg - No Ice		-6718.27	6718.27	-252.87
Wind 270 deg - No Ice		-9115.23	0.00	-160.82
Wind 315 deg - No Ice		-6172.62	-6172.62	14.27
Total Weight	4089.77			
Wind 0 deg - Service		0.00	-2330.88	39.82
Wind 45 deg - Service		1708.20	-1708.20	55.63
Wind 90 deg - Service		2330.88	0.00	35.38
Wind 135 deg - Service		1588.16	1588.16	-3.14
Wind 180 deg - Service		0.00	2330.88	-39.82
Wind 225 deg - Service		-1708.20	1708.20	-55.63
Wind 270 deg - Service		-2330.88	0.00	-35.38
Wind 315 deg - Service		-1588.16	-1588.16	3.14
Seismic Vertical	834.47			
Seismic Horizontal 0 deg		0.00	-1301.39	0.00
Seismic Horizontal 45 deg		920.22	-920.22	0.00
Seismic Horizontal 90 deg		1301.39	0.00	0.00
Seismic Horizontal 135 deg		920.22	920.22	0.00
Seismic Horizontal 180 deg		0.00	1301.39	0.00
Seismic Horizontal 225 deg		-920.22	920.22	0.00
Seismic Horizontal 270 deg		-1301.39	0.00	0.00
Seismic Horizontal 315 deg		-920.22	-920.22	0.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.0 Wind 45 deg - No Ice+1.0 Guy
4	1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy
5	1.2 Dead+1.0 Wind 135 deg - No Ice+1.0 Guy
6	1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy
7	1.2 Dead+1.0 Wind 225 deg - No Ice+1.0 Guy
8	1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy
9	1.2 Dead+1.0 Wind 315 deg - No Ice+1.0 Guy
10	Dead+Wind 0 deg - Service+Guy
11	Dead+Wind 45 deg - Service+Guy
12	Dead+Wind 90 deg - Service+Guy
13	Dead+Wind 135 deg - Service+Guy
14	Dead+Wind 180 deg - Service+Guy
15	Dead+Wind 225 deg - Service+Guy
16	Dead+Wind 270 deg - Service+Guy
17	Dead+Wind 315 deg - Service+Guy
18	1.2 Dead+1.0 Ev+1.0 Eh 0 deg+1.0 Guy

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Comb. No.	Description
19	1.2 Dead+1.0 Ev+1.0 Eh 45 deg+1.0 Guy
20	1.2 Dead+1.0 Ev+1.0 Eh 90 deg+1.0 Guy
21	1.2 Dead+1.0 Ev+1.0 Eh 135 deg+1.0 Guy
22	1.2 Dead+1.0 Ev+1.0 Eh 180 deg+1.0 Guy
23	1.2 Dead+1.0 Ev+1.0 Eh 225 deg+1.0 Guy
24	1.2 Dead+1.0 Ev+1.0 Eh 270 deg+1.0 Guy
25	1.2 Dead+1.0 Ev+1.0 Eh 315 deg+1.0 Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	197.688 - 190.438	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-131.47	-237.50	-237.49
			Max. Mx	8	-100.10	1451.23	14.85
			Max. My	2	-100.10	14.38	1451.23
			Max. Vy	8	-395.42	1451.23	14.85
			Max. Vx	2	-395.42	14.38	1451.23
			Max. Torque	3			314.51
L2	190.438 - 184.021	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-8201.56	14.35	-3159.65
			Max. Mx	4	-8200.16	3195.30	13.09
			Max. My	6	-8199.93	14.40	3194.77
			Max. Vy	4	-1104.66	-1347.39	15.02
			Max. Vx	6	-1104.56	13.60	-1347.48
			Max. Torque	7			-315.06
		Guy A	Bottom Tension	5	4632.83		
			Top Tension	5	4661.95		
			Top Cable Vert	5	3635.31		
			Top Cable Norm	5	2918.61		
			Top Cable Tan	5	0.00		
			Bot Cable Vert	5	-3335.80		
			Bot Cable Norm	5	3214.90		
			Bot Cable Tan	5	0.00		
		Guy B	Bottom Tension	7	5035.30		
			Top Tension	7	5064.07		
			Top Cable Vert	7	3934.82		
			Top Cable Norm	7	3187.79		
			Top Cable Tan	7	0.02		
			Bot Cable Vert	7	-3635.31		
			Bot Cable Norm	7	3484.08		
			Bot Cable Tan	7	0.02		
		Guy C	Bottom Tension	9	4634.82		
			Top Tension	9	4663.94		
			Top Cable Vert	9	3636.79		
			Top Cable Norm	9	2919.94		
			Top Cable Tan	9	0.00		
			Bot Cable Vert	9	-3337.28		
			Bot Cable Norm	9	3216.23		
			Bot Cable Tan	9	0.00		
		Guy D	Bottom Tension	3	5035.67		
			Top Tension	3	5064.44		
			Top Cable Vert	3	3935.09		
			Top Cable Norm	3	3188.03		
			Top Cable Tan	3	0.02		
			Bot Cable Vert	3	-3635.58		

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Norm	3	3484.32		
			Bot Cable Tan	3	0.02		
L3	184.021 - 177.604	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-8369.48	14.78	-7123.91
			Max. Mx	4	-8368.19	7158.87	11.46
			Max. My	6	-8367.96	14.83	7157.72
			Max. Vy	4	-885.00	3950.79	12.81
			Max. Vx	2	885.01	13.97	-3915.10
			Max. Torque	7			-315.12
L4	177.604 - 171.187	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-8494.40	8.92	-7061.42
			Max. Mx	4	-8436.62	7499.62	10.06
			Max. My	6	-8436.39	13.79	7498.16
			Max. Vy	4	248.32	7090.80	10.30
			Max. Vx	6	248.40	8.97	7094.72
			Max. Torque	7			-315.25
L5	171.187 - 164.771	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-8586.35	4.41	-4360.38
			Max. Mx	4	-8515.05	6862.50	9.50
			Max. My	6	-8514.83	7.85	6866.35
			Max. Vy	4	605.02	4385.80	6.20
			Max. Vx	6	605.13	4.45	4389.06
			Max. Torque	7			-307.52
L6	164.771 - 158.354	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-8693.25	-1.44	1180.66
			Max. Mx	4	-8621.20	3796.97	5.08
			Max. My	6	-8620.98	3.08	3800.12
			Max. Vy	4	1015.92	-1165.00	1.52
			Max. Vx	6	1016.07	-1.41	-1162.62
			Max. Torque	7			-307.56
L7	158.354 - 151.937	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-15228.45	-2290.45	-3.91
			Max. Mx	8	-8752.76	4607.27	-5.68
			Max. My	2	-8752.99	-9.41	4609.17
			Max. Vy	4	1180.76	-4601.44	-5.67
			Max. Vx	6	1180.92	-9.39	-4599.54
			Max. Torque	7			-86.28
		Guy A	Bottom Tension	5	4032.38		
			Top Tension	5	4057.42		
			Top Cable Vert	5	2893.99		
			Top Cable Norm	5	2843.85		
			Top Cable Tan	5	0.00		
			Bot Cable Vert	5	-2648.44		
			Bot Cable Norm	5	3040.70		
			Bot Cable Tan	5	0.00		
		Guy B	Bottom Tension	7	4336.77		
			Top Tension	7	4361.66		
			Top Cable Vert	7	3101.14		
			Top Cable Norm	7	3067.08		
			Top Cable Tan	7	0.02		
			Bot Cable Vert	7	-2855.58		
			Bot Cable Norm	7	3263.93		
			Bot Cable Tan	7	0.02		
		Guy C	Bottom Tension	9	4030.08		
			Top Tension	9	4055.13		
			Top Cable Vert	9	2892.43		

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Cable Norm	9	2842.17		
			Top Cable Tan	9	0.00		
			Bot Cable Vert	9	-2646.87		
			Bot Cable Norm	9	3039.02		
			Bot Cable Tan	9	0.00		
		Guy D	Bottom Tension	3	4336.52		
			Top Tension	3	4361.41		
			Top Cable Vert	3	3100.97		
			Top Cable Norm	3	3066.90		
			Top Cable Tan	3	0.01		
			Bot Cable Vert	3	-2855.41		
			Bot Cable Norm	3	3263.75		
			Bot Cable Tan	3	0.01		
L8	151.937 - 145.521	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-15323.80	-642.58	-1.97
			Max. Mx	8	-15250.47	2005.50	-3.09
			Max. My	2	-15250.56	-5.71	2007.35
			Max. Vy	8	337.83	2005.50	-3.09
			Max. Vx	2	337.86	-5.71	2007.35
			Max. Torque	7			-86.29
L9	145.521 - 139.104	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-15419.91	-450.70	-2.06
			Max. Mx	8	-15346.09	539.36	-0.83
			Max. My	2	-15346.18	-2.20	540.89
			Max. Vy	8	115.78	539.36	-0.83
			Max. Vx	2	115.84	-2.20	540.89
			Max. Torque	7			-86.29
L10	139.104 - 132.687	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-15523.75	-4.70	1956.54
			Max. Mx	4	-15523.75	-1960.89	-3.77
			Max. My	6	-15523.67	-4.70	-1960.38
			Max. Vy	4	390.10	-1960.89	-3.77
			Max. Vx	6	390.21	-4.70	-1960.38
			Max. Torque	3			-137.09
L11	132.687 - 126.271	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-15637.74	-11.36	5459.60
			Max. Mx	4	-15637.73	-5465.78	-9.85
			Max. My	6	-15637.64	-11.37	-5465.94
			Max. Vy	4	726.78	-5465.78	-9.85
			Max. Vx	6	726.90	-11.37	-5465.94
			Max. Torque	3			-137.08
L12	126.271 - 119.854	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-20158.87	-4808.20	-8.91
			Max. Mx	4	-15676.57	-6911.49	-12.32
			Max. My	6	-15676.48	-14.15	-6911.86
			Max. Vy	4	770.40	-6911.49	-12.32
			Max. Vx	6	770.51	-14.15	-6911.86
			Max. Torque	3			-136.99
		Guy A	Bottom Tension	5	2723.21		
			Top Tension	5	2744.11		
			Top Cable Vert	5	1746.40		
			Top Cable Norm	5	2116.66		
			Top Cable Tan	5	0.00		
			Bot Cable Vert	5	-1557.01		
			Bot Cable Norm	5	2234.18		
			Bot Cable Tan	5	0.00		

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Guy B	Bottom Tension	7	2917.03		
			Top Tension	7	2937.87		
			Top Cable Vert	7	1863.03		
			Top Cable Norm	7	2271.61		
			Top Cable Tan	7	0.02		
			Bot Cable Vert	7	-1673.64		
			Bot Cable Norm	7	2389.13		
			Bot Cable Tan	7	0.02		
		Guy C	Bottom Tension	9	2723.15		
			Top Tension	9	2744.05		
			Top Cable Vert	9	1746.36		
			Top Cable Norm	9	2116.61		
			Top Cable Tan	9	0.00		
			Bot Cable Vert	9	-1556.98		
			Bot Cable Norm	9	2234.13		
			Bot Cable Tan	9	0.00		
		Guy D	Bottom Tension	3	2916.89		
			Top Tension	3	2937.74		
			Top Cable Vert	3	1862.95		
			Top Cable Norm	3	2271.50		
			Top Cable Tan	3	0.02		
			Bot Cable Vert	3	-1673.56		
			Bot Cable Norm	3	2389.03		
			Bot Cable Tan	3	0.02		
L13	119.854 - 113.437	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-20257.55	-3223.85	-6.19
			Max. Mx	4	-20181.30	-4555.17	-7.03
			Max. My	6	-20181.28	-7.51	-4555.68
			Max. Vy	8	302.08	4548.07	-7.02
			Max. Vx	2	302.10	-7.52	4547.55
			Max. Torque	3			-132.69
L14	113.437 - 107.021	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-20358.06	-2601.68	-5.51
			Max. Mx	4	-20280.40	-3085.90	-5.26
			Max. My	6	-20280.38	-5.22	-3086.55
			Max. Vy	4	-159.72	-3085.90	-5.26
			Max. Vx	6	-159.70	-5.22	-3086.55
			Max. Torque	3			-132.64
L15	107.021 - 100.604	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-20459.89	-3020.71	-6.44
			Max. Mx	4	-20459.89	-3020.71	-6.44
			Max. My	6	-20459.87	-6.85	-3021.36
			Max. Vy	8	-149.61	3016.27	-6.44
			Max. Vx	2	-149.62	-6.84	3015.62
			Max. Torque	3			-132.62
L16	100.604 - 98.4375	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-20496.05	-3355.03	-6.98
			Max. Mx	4	-20496.05	-3355.03	-6.98
			Max. My	6	-20496.03	-7.58	-3355.64
			Max. Vy	8	-204.93	3351.31	-6.97
			Max. Vx	2	-204.94	-7.57	3350.70
			Max. Torque	3			-132.60
L17	98.4375 - 93.3959	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-20614.57	-5181.54	-9.27
			Max. Mx	4	-20614.57	-5181.54	-9.27
			Max. My	6	-20614.55	-10.60	-5182.03

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	8	-527.15	5179.83	-9.26
			Max. Vx	2	-527.17	-10.59	5179.33
			Max. Torque	3			-132.60
		Guy A	Bottom Tension	5	2189.98		
			Top Tension	5	2205.98		
			Top Cable Vert	5	1248.73		
			Top Cable Norm	5	1818.52		
			Top Cable Tan	5	0.00		
			Bot Cable Vert	5	-1114.73		
			Bot Cable Norm	5	1885.05		
			Bot Cable Tan	5	0.00		
		Guy B	Bottom Tension	7	2286.05		
			Top Tension	7	2302.03		
			Top Cable Vert	7	1300.21		
			Top Cable Norm	7	1899.68		
			Top Cable Tan	7	0.01		
			Bot Cable Vert	7	-1166.22		
			Bot Cable Norm	7	1966.20		
			Bot Cable Tan	7	0.01		
		Guy C	Bottom Tension	9	2190.74		
			Top Tension	9	2206.74		
			Top Cable Vert	9	1249.13		
			Top Cable Norm	9	1819.16		
			Top Cable Tan	9	0.00		
			Bot Cable Vert	9	-1115.14		
			Bot Cable Norm	9	1885.69		
			Bot Cable Tan	9	0.00		
		Guy D	Bottom Tension	3	2286.08		
			Top Tension	3	2302.06		
			Top Cable Vert	3	1300.23		
			Top Cable Norm	3	1899.71		
			Top Cable Tan	3	0.01		
			Bot Cable Vert	3	-1166.24		
			Bot Cable Norm	3	1966.23		
			Bot Cable Tan	3	0.01		
L18	93.3959 - 87.1876	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-24007.69	-7.19	1658.58
			Max. Mx	4	-23916.92	-4097.01	-9.71
			Max. My	6	-23916.88	-11.12	-4097.51
			Max. Vy	8	565.77	4095.10	-9.71
			Max. Vx	2	565.77	-11.10	4094.61
			Max. Torque	3			-129.50
L19	87.1876 - 80.9793	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-24135.76	-5.57	111.49
			Max. Mx	4	-24043.76	-1292.88	-7.41
			Max. My	6	-24043.73	-8.34	-1293.32
			Max. Vy	8	333.94	1290.64	-7.40
			Max. Vx	2	333.94	-8.33	1290.21
			Max. Torque	3			-129.50
L20	80.9793 - 74.771	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-24264.15	-5.11	176.16
			Max. Mx	3	-24103.52	-321.09	307.90
			Max. My	7	-24103.49	308.20	-321.12
			Max. Vy	8	-140.68	176.39	-4.61
			Max. Vx	2	-140.70	-5.11	176.16
			Max. Torque	3			-129.50
L21	74.771 - 68.5627	Pole	Max Tension	1	0.00	0.00	0.00

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	2	-24392.76	-5.59	1825.39
			Max. Mx	4	-24392.48	-1827.53	-4.90
			Max. My	6	-24392.45	-5.59	-1827.62
			Max. Vy	8	-387.44	1825.48	-4.90
			Max. Vx	2	-387.46	-5.59	1825.39
			Max. Torque	3			-129.49
L22	68.5627 - 62.3544	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-26692.06	-5.92	3109.71
			Max. Mx	4	-24503.26	-4297.02	-5.65
			Max. My	6	-24503.23	-6.62	-4296.98
			Max. Vy	4	-829.57	-3946.51	-6.47
			Max. Vx	6	-829.58	-7.60	-3946.48
			Max. Torque	3			-129.49
		Guy A	Bottom Tension	5	2011.86		
			Top Tension	5	2022.88		
			Top Cable Vert	5	846.23		
			Top Cable Norm	5	1837.37		
			Top Cable Tan	5	0.00		
			Bot Cable Vert	5	-765.27		
			Bot Cable Norm	5	1860.63		
			Bot Cable Tan	5	0.00		
		Guy B	Bottom Tension	7	2013.49		
			Top Tension	7	2024.51		
			Top Cable Vert	7	846.88		
			Top Cable Norm	7	1838.87		
			Top Cable Tan	7	0.01		
			Bot Cable Vert	7	-765.91		
			Bot Cable Norm	7	1862.12		
			Bot Cable Tan	7	0.01		
		Guy C	Bottom Tension	9	2011.76		
			Top Tension	9	2022.78		
			Top Cable Vert	9	846.19		
			Top Cable Norm	9	1837.28		
			Top Cable Tan	9	0.00		
			Bot Cable Vert	9	-765.23		
			Bot Cable Norm	9	1860.54		
			Bot Cable Tan	9	0.00		
		Guy D	Bottom Tension	3	2013.51		
			Top Tension	3	2024.53		
			Top Cable Vert	3	846.89		
			Top Cable Norm	3	1838.89		
			Top Cable Tan	3	0.01		
			Bot Cable Vert	3	-765.92		
			Bot Cable Norm	3	1862.15		
			Bot Cable Tan	3	0.01		
L23	62.3544 - 56.1461	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-26820.72	-2.38	-1091.17
			Max. Mx	4	-26728.08	-2307.11	-5.20
			Max. My	6	-26728.04	-6.12	-2307.08
			Max. Vy	4	-755.69	-2307.11	-5.20
			Max. Vx	6	-755.70	-6.12	-2307.08
			Max. Torque	3			-127.41
L24	56.1461 - 49.9378	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-26950.31	0.18	-3669.69
			Max. Mx	4	-26950.05	3670.86	0.30
			Max. My	6	-26950.01	0.18	3670.94
			Max. Vy	4	-507.49	1645.06	-2.04
			Max. Vx	6	-507.49	-2.49	1645.12

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Torque	3			-127.40
L25	49.9378 - 43.7295	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-27085.07	0.29	-4324.57
			Max. Mx	8	-27066.51	-4354.99	-0.01
			Max. My	2	-27066.55	0.02	-4354.90
			Max. Vy	4	-216.52	3926.67	0.34
			Max. Vx	6	-216.53	0.21	3926.75
			Max. Torque	3			-135.36
L26	43.7295 - 37.5212	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-27212.69	1.62	-3072.54
			Max. Mx	8	-27121.45	-4242.70	0.38
			Max. My	2	-27121.50	0.45	-4242.61
			Max. Vy	8	-343.96	-3072.63	1.46
			Max. Vx	2	-343.96	1.62	-3072.54
			Max. Torque	3			-135.35
L27	37.5212 - 31.3129	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-27339.91	2.51	-108.68
			Max. Mx	4	-27248.67	2687.57	1.67
			Max. My	6	-27248.63	1.85	2687.67
			Max. Vy	8	-599.91	-108.77	2.31
			Max. Vx	2	-599.91	2.51	-108.68
			Max. Torque	3			-135.35
		Guy A	Bottom Tension	5	1729.91		
			Top Tension	5	1735.48		
			Top Cable Vert	5	390.39		
			Top Cable Norm	5	1691.00		
			Top Cable Tan	5	0.00		
			Bot Cable Vert	5	-351.02		
			Bot Cable Norm	5	1693.92		
			Bot Cable Tan	5	0.00		
		Guy B	Bottom Tension	7	1714.38		
			Top Tension	7	1719.95		
			Top Cable Vert	7	387.07		
			Top Cable Norm	7	1675.83		
			Top Cable Tan	7	0.01		
			Bot Cable Vert	7	-347.71		
			Bot Cable Norm	7	1678.74		
			Bot Cable Tan	7	0.01		
		Guy C	Bottom Tension	9	1727.78		
			Top Tension	9	1733.35		
			Top Cable Vert	9	389.93		
			Top Cable Norm	9	1688.92		
			Top Cable Tan	9	0.00		
			Bot Cable Vert	9	-350.57		
			Bot Cable Norm	9	1691.84		
			Bot Cable Tan	9	0.00		
		Guy D	Bottom Tension	3	1714.37		
			Top Tension	3	1719.94		
			Top Cable Vert	3	387.07		
			Top Cable Norm	3	1675.82		
			Top Cable Tan	3	0.01		
			Bot Cable Vert	3	-347.71		
			Bot Cable Norm	3	1678.74		
			Bot Cable Tan	3	0.01		
L28	31.3129 - 25.1046	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-28489.52	4319.33	8.96
			Max. Mx	4	-28489.52	4319.33	8.96

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	6	-28489.47	9.41	4319.42
			Max. Vy	4	-733.30	1069.65	3.64
			Max. Vx	6	-733.30	3.91	1069.74
			Max. Torque	3			-134.35
L29	25.1046 - 18.8963	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-28617.87	6604.89	14.18
			Max. Mx	4	-28617.87	6604.89	14.18
			Max. My	6	-28617.82	14.75	6604.97
			Max. Vy	4	-462.59	4832.34	10.05
			Max. Vx	6	-462.59	10.55	4832.42
			Max. Torque	3			-134.35
L30	18.8963 - 12.688	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-28744.75	6972.00	17.74
			Max. Mx	4	-28708.47	7069.42	16.90
			Max. My	6	-28708.43	17.51	7069.48
			Max. Vy	4	-155.38	6801.83	15.04
			Max. Vx	6	-155.37	15.63	6801.90
			Max. Torque	3			-134.34
L31	12.688 - 6.47966	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-28869.77	5432.83	19.41
			Max. Mx	4	-28780.74	6845.07	18.29
			Max. My	6	-28780.70	18.88	6845.12
			Max. Vy	8	-391.23	-5399.70	19.40
			Max. Vx	2	-391.22	19.92	-5399.66
			Max. Torque	3			-134.33
L32	6.47966 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-29070.89	-0.14	3.54
			Max. Mx	4	-28905.43	4996.21	19.60
			Max. My	6	-28905.39	20.12	4996.24
			Max. Vy	8	-945.02	0.14	3.53
			Max. Vx	2	-945.02	3.92	0.14
			Max. Torque	3			-235.92

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	4	29085.07	-261.30	0.59
	Max. H_x	8	29084.94	262.71	0.59
	Max. H_z	2	29084.98	0.57	262.71
	Max. M_x	1	0.00	0.43	0.43
	Max. M_z	1	0.00	0.43	0.43
	Max. Torsion	7	233.98	228.58	-227.38
	Min. Vert	1	7096.49	0.43	0.43
	Min. H_x	4	29085.07	-261.30	0.59
	Min. H_z	6	29085.03	0.57	-261.30
	Min. M_x	1	0.00	0.43	0.43
	Min. M_z	1	0.00	0.43	0.43
	Min. Torsion	3	-235.97	-227.38	228.58
Guy D @ 164.04 ft Elev 0 ft Azimuth 225 deg	Max. Vert	23	-268.05	-246.69	246.69

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 54 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Max. H_x	15	-368.87	-205.15	205.15
	Max. H_z	3	-8164.55	-6460.91	6460.90
	Min. Vert	3	-8164.55	-6460.91	6460.90
	Min. H_x	3	-8164.55	-6460.91	6460.90
	Min. H_z	15	-368.87	-205.15	205.15
Guy C @ 164.04 ft Elev 0 ft Azimuth 135 deg	Max. Vert	21	-268.05	246.68	246.68
	Max. H_x	9	-7541.13	6002.89	6002.90
	Max. H_z	9	-7541.13	6002.89	6002.90
	Min. Vert	9	-7541.13	6002.89	6002.90
	Min. H_x	13	-384.05	215.94	215.94
	Min. H_z	13	-384.05	215.94	215.94
Guy B @ 164.04 ft Elev 0 ft Azimuth 45 deg	Max. Vert	19	-268.05	246.69	-246.69
	Max. H_x	7	-8164.53	6460.93	-6460.95
	Max. H_z	11	-368.87	205.15	-205.15
	Min. Vert	7	-8164.53	6460.93	-6460.95
	Min. H_x	11	-368.87	205.15	-205.15
	Min. H_z	7	-8164.53	6460.93	-6460.95
Guy A @ 164.04 ft Elev 0 ft Azimuth -45 deg	Max. Vert	25	-268.06	-246.70	-246.70
	Max. H_x	17	-384.03	-215.94	-215.94
	Max. H_z	17	-384.03	-215.94	-215.94
	Min. Vert	5	-7541.25	-6003.18	-6003.18
	Min. H_x	5	-7541.25	-6003.18	-6003.18
	Min. H_z	5	-7541.25	-6003.18	-6003.18
Guy D @ 147.67 ft Elev 0 ft Azimuth 225 deg	Max. Vert	15	-55.31	-167.12	167.12
	Max. H_x	15	-55.31	-167.12	167.12
	Max. H_z	2	-2155.65	-3544.93	3982.76
	Min. Vert	3	-2279.87	-3894.14	3894.11
	Min. H_x	4	-2155.42	-3982.69	3544.82
	Min. H_z	15	-55.31	-167.12	167.12
Guy C @ 147.67 ft Elev 0 ft Azimuth 135 deg	Max. Vert	13	-55.93	167.69	167.69
	Max. H_x	8	-2155.39	3982.20	3544.34
	Max. H_z	2	-2155.37	3544.33	3982.20
	Min. Vert	9	-2230.94	3845.29	3845.29
	Min. H_x	13	-55.93	167.69	167.69
	Min. H_z	13	-55.93	167.69	167.69
Guy B @ 147.67 ft Elev 0 ft Azimuth 45 deg	Max. Vert	11	-55.31	167.12	-167.12
	Max. H_x	8	-2155.61	3982.73	-3544.90
	Max. H_z	11	-55.31	167.12	-167.12
	Min. Vert	7	-2279.84	3894.07	-3894.10
	Min. H_x	11	-55.31	167.12	-167.12
	Min. H_z	6	-2155.38	3544.79	-3982.66
Guy A @ 147.67 ft	Max. Vert	17	-55.97	-167.82	-167.82

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Elev 0 ft Azimuth -45 deg					
	Max. H_x	17	-55.97	-167.82	-167.82
	Max. H_z	17	-55.97	-167.82	-167.82
	Min. Vert	5	-2231.02	-3846.38	-3846.37
	Min. H_x	4	-2155.65	-3983.22	-3545.38
	Min. H_z	6	-2155.66	-3545.38	-3983.22

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	7096.49	-0.43	-0.43	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	29084.98	-0.57	-262.71	0.00	0.00	167.48
1.2 Dead+1.0 Wind 45 deg - No Ice+1.0 Guy	28842.28	227.38	-228.58	0.00	0.00	235.97
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	29085.07	261.30	-0.59	0.00	0.00	150.88
1.2 Dead+1.0 Wind 135 deg - No Ice+1.0 Guy	28222.83	231.11	231.10	0.00	0.00	-12.60
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	29085.03	-0.57	261.30	0.00	0.00	-167.48
1.2 Dead+1.0 Wind 225 deg - No Ice+1.0 Guy	28842.23	-228.58	227.38	0.00	0.00	-233.98
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	29084.94	-262.71	-0.59	0.00	0.00	-150.88
1.2 Dead+1.0 Wind 315 deg - No Ice+1.0 Guy	28222.69	-232.48	-232.49	0.00	0.00	11.05
Dead+Wind 0 deg - Service+Guy	11597.92	-0.48	-151.35	0.00	0.00	38.77
Dead+Wind 45 deg - Service+Guy	11390.49	113.01	-113.95	0.00	0.00	54.26
Dead+Wind 90 deg - Service+Guy	11597.98	150.39	-0.48	0.00	0.00	34.60
Dead+Wind 135 deg - Service+Guy	11263.72	113.64	113.64	0.00	0.00	-2.97
Dead+Wind 180 deg - Service+Guy	11597.96	-0.48	150.39	0.00	0.00	-38.77
Dead+Wind 225 deg - Service+Guy	11390.47	-113.95	113.01	0.00	0.00	-54.23
Dead+Wind 270 deg - Service+Guy	11597.89	-151.35	-0.48	0.00	0.00	-34.60
Dead+Wind 315 deg - Service+Guy	11263.60	-114.61	-114.61	0.00	0.00	2.94
1.2 Dead+1.0 Ev+1.0 Eh 0 deg+1.0 Guy	9368.40	-0.53	5.97	0.00	0.00	-0.04
1.2 Dead+1.0 Ev+1.0 Eh 45 deg+1.0 Guy	9235.14	-5.33	4.21	0.00	0.00	-0.05
1.2 Dead+1.0 Ev+1.0 Eh 90 deg+1.0 Guy	9368.27	-7.25	-0.56	0.00	0.00	-0.04
1.2 Dead+1.0 Ev+1.0 Eh 135 deg+1.0 Guy	9235.05	-5.33	-5.33	0.00	0.00	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 180 deg+1.0 Guy	9368.22	-0.56	-7.24	0.00	0.00	0.04
1.2 Dead+1.0 Ev+1.0 Eh 225	9235.08	4.21	-5.33	0.00	0.00	0.06

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
deg+1.0 Guy 1.2 Dead+1.0 Ev+1.0 Eh 270 deg+1.0 Guy	9368.35	5.97	-0.53	0.00	0.00	0.03
1.2 Dead+1.0 Ev+1.0 Eh 315 deg+1.0 Guy	9235.18	4.10	4.10	0.00	0.00	-0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-4089.76	0.00	-0.00	4089.76	-0.00	0.000%
2	0.00	-4745.92	-15694.24	-0.01	4745.92	15694.20	0.000%
3	11796.40	-4745.92	-11796.40	-11796.45	4745.92	11796.44	0.000%
4	15694.24	-4745.92	0.00	-15694.20	4745.92	-0.01	0.000%
5	11250.74	-4745.92	11250.74	-11250.85	4745.93	-11250.85	0.001%
6	0.00	-4745.92	15694.24	-0.01	4745.92	-15694.20	0.000%
7	-11796.40	-4745.92	11796.40	11796.44	4745.92	-11796.45	0.000%
8	-15694.24	-4745.92	0.00	15694.20	4745.92	-0.01	0.000%
9	-11250.74	-4745.92	-11250.74	11250.85	4745.93	11250.85	0.001%
10	0.00	-4089.76	-3778.27	-0.00	4089.76	3778.26	0.000%
11	2825.40	-4089.76	-2825.40	-2825.40	4089.76	2825.40	0.000%
12	3778.27	-4089.76	0.00	-3778.26	4089.76	-0.00	0.000%
13	2705.36	-4089.76	2705.36	-2705.36	4089.76	-2705.36	0.000%
14	0.00	-4089.76	3778.27	-0.00	4089.76	-3778.26	0.000%
15	-2825.40	-4089.76	2825.40	2825.40	4089.76	-2825.40	0.000%
16	-3778.27	-4089.76	0.00	3778.26	4089.76	-0.00	0.000%
17	-2705.36	-4089.76	-2705.36	2705.36	4089.76	2705.36	0.000%
18	0.00	-5580.39	-1301.39	0.00	5580.41	1301.37	0.000%
19	920.22	-5580.39	-920.22	-920.22	5580.39	920.22	0.000%
20	1301.39	-5580.39	0.00	-1301.39	5580.39	0.00	0.000%
21	920.22	-5580.39	920.22	-920.22	5580.39	-920.22	0.000%
22	0.00	-5580.39	1301.39	0.00	5580.39	-1301.39	0.000%
23	-920.22	-5580.39	920.22	920.22	5580.39	-920.22	0.000%
24	-1301.39	-5580.39	0.00	1301.37	5580.41	0.00	0.000%
25	-920.22	-5580.39	-920.22	920.21	5580.41	920.21	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00004509
2	Yes	9	0.00005938	0.00007161
3	Yes	9	0.00000001	0.00004907
4	Yes	9	0.00005958	0.00005915
5	Yes	8	0.00005417	0.00002458
6	Yes	9	0.00005959	0.00007185
7	Yes	9	0.00000001	0.00004836
8	Yes	9	0.00005940	0.00005898
9	Yes	8	0.00005386	0.00002358
10	Yes	5	0.00000001	0.00008192
11	Yes	5	0.00000001	0.00008096
12	Yes	5	0.00000001	0.00006783

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13	Yes	5	0.00000001	0.00001553
14	Yes	5	0.00000001	0.00008260
15	Yes	5	0.00000001	0.00008081
16	Yes	5	0.00000001	0.00006734
17	Yes	5	0.00000001	0.00001516
18	Yes	5	0.00000001	0.00001922
19	Yes	5	0.00000001	0.00001680
20	Yes	5	0.00000001	0.00001538
21	Yes	5	0.00000001	0.00001677
22	Yes	5	0.00000001	0.00001537
23	Yes	5	0.00000001	0.00001679
24	Yes	5	0.00000001	0.00001921
25	Yes	5	0.00000001	0.00002037

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	197.688 - 190.438	8.492	10	0.1986	0.0062
L2	191.271 - 184.021	8.272	10	0.1883	0.0050
L3	184.854 - 177.604	8.071	10	0.1841	0.0095
L4	178.437 - 171.187	7.815	12	0.2699	0.0155
L5	172.021 - 164.771	7.422	12	0.3829	0.0215
L6	165.604 - 158.354	6.889	14	0.4741	0.0273
L7	159.187 - 151.937	6.277	14	0.4965	0.0322
L8	152.771 - 145.521	5.695	14	0.4398	0.0338
L9	146.354 - 139.104	5.163	14	0.4233	0.0353
L10	139.937 - 132.687	4.634	14	0.4303	0.0368
L11	133.521 - 126.271	4.095	14	0.4296	0.0356
L12	127.104 - 119.854	3.582	14	0.3811	0.0329
L13	120.687 - 113.437	3.165	14	0.2876	0.0303
L14	114.271 - 107.021	2.832	16	0.2319	0.0276
L15	107.854 - 100.604	2.540	16	0.2066	0.0250
L16	101.437 - 98.4375	2.280	16	0.1752	0.0223
L17	99.4792 - 93.3959	2.210	16	0.1633	0.0217
L18	94.4376 - 87.1876	2.053	16	0.1290	0.0205
L19	88.2293 - 80.9793	1.908	10	0.0964	0.0192
L20	82.021 - 74.771	1.792	10	0.0828	0.0180
L21	75.8127 - 68.5627	1.689	10	0.0753	0.0167
L22	69.6044 - 62.3544	1.598	12	0.0613	0.0155
L23	63.3961 - 56.1461	1.536	12	0.0494	0.0142
L24	57.1878 - 49.9378	1.508	12	0.0488	0.0129
L25	50.9795 - 43.7295	1.479	12	0.0311	0.0117
L26	44.7712 - 37.5212	1.431	13	0.0570	0.0104
L27	38.5629 - 31.3129	1.383	13	0.0821	0.0090
L28	32.3546 - 25.1046	1.293	13	0.0933	0.0077
L29	26.1463 - 18.8963	1.172	13	0.1115	0.0064
L30	19.938 - 12.688	1.000	13	0.1603	0.0051
L31	13.7297 - 6.47966	0.757	13	0.2162	0.0037
L32	7.52136 - 0	0.445	13	0.2653	0.0024

Critical Deflections and Radius of Curvature - Service Wind

tnxTower	Job: NRG 60m Super NRG Tall Tower	
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
198.491	Properllor Anemometer/Wind Vane	10	8.492	0.1986	0.0062	16566
196.194	95" Boom Mount	10	8.439	0.1971	0.0051	16566
194.063	CCISeismic Tower Section 1 - 1	10	8.365	0.1944	0.0050	16566
192.913	NRG #40C Anemometer	10	8.326	0.1923	0.0050	16566
192.000	CCISeismic (12) miscl Cat5 From 0 to 196 (188ft to196ft)	10	8.295	0.1902	0.0050	16503
190.913	95" Boom Mount	10	8.260	0.1872	0.0052	18889
189.321	Guy	10	8.211	0.1822	0.0062	41635
187.646	CCISeismic Tower Section 2 - 1	10	8.160	0.1785	0.0072	21784
183.000	CCISeismic (12) miscl Cat5 From 0 to 196 (178ft to188ft)	10	8.007	0.2003	0.0114	5206
181.229	CCISeismic Tower Section 3 - 1	12	7.939	0.2237	0.0130	4109
180.770	Aircraft Marker Balls (21" Dia - Orange)	12	7.920	0.2308	0.0134	3917
174.812	CCISeismic Tower Section 4 - 1	12	7.612	0.3343	0.0189	3208
173.885	Temperature Probe w/ Shield	12	7.552	0.3507	0.0197	3263
173.000	CCISeismic (12) miscl Cat5 From 0 to 196 (168ft to178ft)	12	7.492	0.3661	0.0206	3337
168.396	CCISeismic Tower Section 5 - 1	14	7.136	0.4399	0.0248	4073
167.323	NRG 200P Wind Vane	14	7.043	0.4543	0.0258	4453
165.323	95" Boom Mount	14	6.863	0.4769	0.0276	5894
163.000	CCISeismic (12) miscl Cat5 From 0 to 196 (158ft to168ft)	14	6.644	0.4945	0.0296	13021
161.979	CCISeismic Tower Section 6 - 1	14	6.545	0.4987	0.0304	27857
160.761	NRG 200P Wind Vane	14	6.428	0.5003	0.0313	40824
158.761	95" Boom Mount	14	6.236	0.4942	0.0324	11900
156.121	Guy	14	5.991	0.4718	0.0332	8251
155.562	CCISeismic Tower Section 7 - 1	14	5.940	0.4661	0.0333	8059
153.000	CCISeismic (12) miscl Cat5 From 0 to 196 (148ft to158ft)	14	5.714	0.4415	0.0337	8452
149.146	CCISeismic Tower Section 8 - 1	14	5.391	0.4244	0.0345	18739
143.000	CCISeismic (12) miscl Cat5 From 0 to 196 (138ft to148ft)	14	4.888	0.4262	0.0363	42328
142.729	CCISeismic Tower Section 9 - 1	14	4.866	0.4265	0.0364	41588
137.795	NRG 200P Wind Vane	14	4.454	0.4328	0.0367	100368
136.312	CCISeismic Tower Section 10 - 1	14	4.330	0.4334	0.0365	52595
135.795	95" Boom Mount	14	4.286	0.4333	0.0363	39145
133.000	CCISeismic (12) miscl Cat5 From 0 to 196 (128ft to138ft)	14	4.052	0.4279	0.0354	13115
131.234	NRG #40C Anemometer	14	3.905	0.4194	0.0347	8084
129.896	CCISeismic Tower Section 11 - 1	14	3.797	0.4100	0.0341	6155
129.234	95" Boom Mount	14	3.744	0.4043	0.0339	5543
125.154	Guy	14	3.444	0.3537	0.0321	4232
123.479	CCISeismic Tower Section 12 - 1	14	3.333	0.3279	0.0314	4318
123.000	CCISeismic (12) miscl Cat5 From 0 to 196 (118ft to128ft)	14	3.303	0.3206	0.0312	4380
117.062	CCISeismic Tower Section 13 - 1	16	2.970	0.2513	0.0288	6411
113.000	CCISeismic (12) miscl Cat5 From 0 to 196 (108ft to118ft)	16	2.772	0.2243	0.0271	8621
110.646	CCISeismic Tower Section 14 - 1	16	2.663	0.2164	0.0261	8897
104.229	CCISeismic Tower Section 15 - 1	16	2.388	0.1903	0.0234	6797
103.000	CCISeismic (12) miscl Cat5 From 0 to 196 (98ft to108ft)	16	2.339	0.1839	0.0229	6483
99.937	CCISeismic Tower Section 16 - 1	16	2.226	0.1662	0.0218	6404
98.425	NRG #40C Anemometer	16	2.175	0.1564	0.0214	6459
96.438	CCISeismic Tower Section 17 - 1	16	2.111	0.1426	0.0209	6442
96.425	95" Boom Mount	16	2.111	0.1425	0.0209	6442
94.438	Guy	16	2.053	0.1290	0.0205	6573
93.000	CCISeismic (12) miscl Cat5 From 0 to 196 (88ft to98ft)	16	2.015	0.1199	0.0202	7000
90.813	CCISeismic Tower Section 18 - 1	16	1.963	0.1077	0.0198	8438

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Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
84.604	CCISeismic Tower Section 19 - 1	10	1.838	0.0869	0.0185	18127
83.000	CCISeismic (12) miscl Cat5 From 0 to 196 (78ft to88ft)	10	1.809	0.0842	0.0182	22365
78.396	CCISeismic Tower Section 20 - 1	10	1.730	0.0784	0.0172	36944
73.000	CCISeismic (12) miscl Cat5 From 0 to 196 (68ft to78ft)	12	1.645	0.0710	0.0161	25311
72.188	CCISeismic Tower Section 21 - 1	12	1.634	0.0693	0.0160	22406
65.979	CCISeismic Tower Section 22 - 1	12	1.558	0.0432	0.0147	12505
64.429	Guy	12	1.544	0.0466	0.0144	12326
63.000	CCISeismic (12) miscl Cat5 From 0 to 196 (58ft to68ft)	12	1.534	0.0503	0.0141	13394
59.771	CCISeismic Tower Section 23 - 1	12	1.518	0.0531	0.0135	29006
53.563	CCISeismic Tower Section 24 - 1	12	1.493	0.0336	0.0122	12763
53.000	CCISeismic (12) miscl Cat5 From 0 to 196 (48ft to58ft)	12	1.491	0.0309	0.0121	12069
49.200	Temperature Probe w/ Shield	12	1.467	0.0378	0.0113	9480
47.354	CCISeismic Tower Section 25 - 1	12	1.451	0.0455	0.0109	8953
43.000	CCISeismic (12) miscl Cat5 From 0 to 196 (38ft to48ft)	13	1.423	0.0651	0.0100	8900
41.146	CCISeismic Tower Section 26 - 1	13	1.409	0.0730	0.0096	9392
34.938	CCISeismic Tower Section 27 - 1	13	1.335	0.0895	0.0083	14566
33.000	CCISeismic (12) miscl Cat5 From 0 to 196 (28ft to38ft)	13	1.304	0.0923	0.0079	16231
32.355	Guy	13	1.293	0.0933	0.0077	16160
28.730	CCISeismic Tower Section 28 - 1	13	1.227	0.1013	0.0069	11417
23.000	CCISeismic (12) miscl Cat5 From 0 to 196 (18ft to28ft)	13	1.093	0.1354	0.0057	7282
22.521	CCISeismic Tower Section 29 - 1	13	1.079	0.1394	0.0056	7135
16.313	CCISeismic Tower Section 30 - 1	13	0.867	0.1883	0.0043	6430
13.000	CCISeismic (12) miscl Cat5 From 0 to 196 (8ft to18ft)	13	0.724	0.2264	0.0036	6675
10.105	CCISeismic Tower Section 31 - 1	13	0.583	0.2643	0.0030	7264
5.000	Data Logger	13	0.301	0.2113	0.0017	12006
4.000	CCISeismic (12) miscl Cat5 From 0 to 196 (0ft to8ft)	13	0.242	0.1770	0.0014	12006
3.761	CCISeismic Tower Section 32 - 1	13	0.228	0.1679	0.0013	12006

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	197.688 - 190.438	40.223	2	0.8838	0.0341
L2	191.271 - 184.021	39.073	2	0.8416	0.0196
L3	184.854 - 177.604	37.995	2	0.8391	0.0328
L4	178.437 - 171.187	36.646	4	1.2375	0.0600
L5	172.021 - 164.771	34.663	6	1.7471	0.0871
L6	165.604 - 158.354	32.041	6	2.1526	0.1137
L7	159.187 - 151.937	29.038	6	2.2664	0.1360
L8	152.771 - 145.521	26.125	6	2.0587	0.1433
L9	146.354 - 139.104	23.429	6	1.9685	0.1506
L10	139.937 - 132.687	20.803	6	1.9402	0.1580
L11	133.521 - 126.271	18.233	6	1.8671	0.1526
L12	127.104 - 119.854	15.859	6	1.6189	0.1408
L13	120.687 - 113.437	13.951	8	1.2195	0.1292
L14	114.271 - 107.021	12.498	8	0.9488	0.1177

tnxTower
Ahola Engineering LLC
P.O. Box 989
Winter Park, CO 80482-0989
Phone: (719) 640-2408
FAX:

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Longroad Energy	Mikko Ahola, PE

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L15	107.854 - 100.604	11.353	8	0.7654	0.1062
L16	101.437 - 98.4375	10.458	2	0.6120	0.0947
L17	99.4792 - 93.3959	10.236	2	0.5684	0.0921
L18	94.4376 - 87.1876	9.753	2	0.4573	0.0871
L19	88.2293 - 80.9793	9.319	2	0.3647	0.0816
L20	82.021 - 74.771	8.965	2	0.3424	0.0762
L21	75.8127 - 68.5627	8.621	2	0.3364	0.0708
L22	69.6044 - 62.3544	8.291	2	0.2936	0.0655
L23	63.3961 - 56.1461	8.044	4	0.1712	0.0601
L24	57.1878 - 49.9378	7.906	4	0.1223	0.0548
L25	50.9795 - 43.7295	7.727	4	0.1913	0.0496
L26	44.7712 - 37.5212	7.396	4	0.3308	0.0440
L27	38.5629 - 31.3129	6.886	4	0.4575	0.0384
L28	32.3546 - 25.1046	6.251	6	0.5115	0.0328
L29	26.1463 - 18.8963	5.547	6	0.5969	0.0272
L30	19.938 - 12.688	4.664	6	0.7858	0.0216
L31	13.7297 - 6.47966	3.504	6	1.0172	0.0160
L32	7.52136 - 0	2.049	6	1.2267	0.0105

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
198.491	Properllor Anemometer/Wind Vane	2	40.223	0.8838	0.0341	4048
196.194	95" Boom Mount	2	39.949	0.8776	0.0299	4048
194.063	CCISeismic Tower Section 1 - 1	2	39.562	0.8663	0.0239	4048
192.913	NRG #40C Anemometer	2	39.357	0.8579	0.0216	4048
192.000	CCISeismic (12) miscl Cat5 From 0 to 196 (188ft to196ft)	2	39.198	0.8495	0.0216	4059
190.913	95" Boom Mount	2	39.012	0.8372	0.0216	4743
189.321	Guy	2	38.748	0.8174	0.0216	12095
187.646	CCISeismic Tower Section 2 - 1	2	38.472	0.8042	0.0231	4719
183.000	CCISeismic (12) miscl Cat5 From 0 to 196 (178ft to188ft)	2	37.652	0.9178	0.0415	1180
181.229	CCISeismic Tower Section 3 - 1	4	37.294	1.0268	0.0490	936
180.770	Aircraft Marker Balls (21" Dia - Orange)	4	37.195	1.0590	0.0508	893
174.812	CCISeismic Tower Section 4 - 1	4	35.610	1.5288	0.0752	720
173.885	Temperature Probe w/ Shield	4	35.310	1.6026	0.0791	731
173.000	CCISeismic (12) miscl Cat5 From 0 to 196 (168ft to178ft)	4	35.010	1.6720	0.0829	745
168.396	CCISeismic Tower Section 5 - 1	6	33.249	2.0005	0.1022	919
167.323	NRG 200P Wind Vane	6	32.796	2.0645	0.1066	1006
165.323	95" Boom Mount	6	31.914	2.1651	0.1148	1315
163.000	CCISeismic (12) miscl Cat5 From 0 to 196 (158ft to168ft)	6	30.841	2.2446	0.1241	2619
161.979	CCISeismic Tower Section 6 - 1	6	30.359	2.2647	0.1278	5000
160.761	NRG 200P Wind Vane	6	29.782	2.2757	0.1318	15983
158.761	95" Boom Mount	6	28.838	2.2590	0.1369	2948
156.121	Guy	6	27.618	2.1798	0.1406	1909
155.562	CCISeismic Tower Section 7 - 1	6	27.365	2.1588	0.1412	1845
153.000	CCISeismic (12) miscl Cat5 From 0 to 196 (148ft to158ft)	6	26.225	2.0657	0.1431	1820
149.146	CCISeismic Tower Section 8 - 1	6	24.584	1.9889	0.1469	3013
143.000	CCISeismic (12) miscl Cat5 From 0 to 196 (138ft to148ft)	6	22.052	1.9536	0.1554	13565

tnxTower	Job: NRG 60m Super NRG Tall Tower	
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
142.729	CCISeismic Tower Section 9 - 1	6	21.941	1.9525	0.1557	13488
137.795	NRG 200P Wind Vane	6	19.935	1.9270	0.1576	6373
136.312	CCISeismic Tower Section 10 - 1	6	19.339	1.9130	0.1564	4756
135.795	95" Boom Mount	6	19.133	1.9066	0.1558	4281
133.000	CCISeismic (12) miscl Cat5 From 0 to 196 (128ft to138ft)	6	18.029	1.8548	0.1518	2384
131.234	NRG #40C Anemometer	6	17.349	1.8033	0.1487	1676
129.896	CCISeismic Tower Section 11 - 1	6	16.848	1.7537	0.1462	1346
129.234	95" Boom Mount	6	16.606	1.7256	0.1449	1233
125.154	Guy	6	15.224	1.5008	0.1372	973
123.479	CCISeismic Tower Section 12 - 1	8	14.718	1.3920	0.1342	987
123.000	CCISeismic (12) miscl Cat5 From 0 to 196 (118ft to128ft)	8	14.580	1.3609	0.1333	997
117.062	CCISeismic Tower Section 13 - 1	8	13.084	1.0489	0.1227	1343
113.000	CCISeismic (12) miscl Cat5 From 0 to 196 (108ft to118ft)	8	12.250	0.9080	0.1155	1744
110.646	CCISeismic Tower Section 14 - 1	8	11.819	0.8365	0.1113	1902
104.229	CCISeismic Tower Section 15 - 1	2	10.816	0.6774	0.0994	1952
103.000	CCISeismic (12) miscl Cat5 From 0 to 196 (98ft to108ft)	2	10.652	0.6481	0.0973	1967
99.937	CCISeismic Tower Section 16 - 1	2	10.286	0.5786	0.0926	2177
98.425	NRG #40C Anemometer	2	10.124	0.5446	0.0908	2291
96.438	CCISeismic Tower Section 17 - 1	2	9.929	0.4999	0.0889	2374
96.425	95" Boom Mount	2	9.928	0.4996	0.0888	2374
94.438	Guy	2	9.753	0.4573	0.0871	2500
93.000	CCISeismic (12) miscl Cat5 From 0 to 196 (88ft to98ft)	2	9.639	0.4298	0.0858	2770
90.813	CCISeismic Tower Section 18 - 1	2	9.484	0.3944	0.0839	3675
84.604	CCISeismic Tower Section 19 - 1	2	9.108	0.3460	0.0784	16023
83.000	CCISeismic (12) miscl Cat5 From 0 to 196 (78ft to88ft)	2	9.019	0.3433	0.0771	27611
78.396	CCISeismic Tower Section 20 - 1	2	8.764	0.3399	0.0731	51607
73.000	CCISeismic (12) miscl Cat5 From 0 to 196 (68ft to78ft)	2	8.466	0.3270	0.0684	8446
72.188	CCISeismic Tower Section 21 - 1	2	8.422	0.3219	0.0677	6970
65.979	CCISeismic Tower Section 22 - 1	4	8.132	0.2229	0.0623	3182
64.429	Guy	4	8.076	0.1905	0.0610	3095
63.000	CCISeismic (12) miscl Cat5 From 0 to 196 (58ft to68ft)	4	8.033	0.1646	0.0598	3344
59.771	CCISeismic Tower Section 23 - 1	4	7.959	0.1284	0.0570	7414
53.563	CCISeismic Tower Section 24 - 1	4	7.815	0.1460	0.0518	3903
53.000	CCISeismic (12) miscl Cat5 From 0 to 196 (48ft to58ft)	4	7.798	0.1540	0.0513	3636
49.200	Temperature Probe w/ Shield	4	7.650	0.2286	0.0480	2728
47.354	CCISeismic Tower Section 25 - 1	4	7.556	0.2701	0.0463	2571
43.000	CCISeismic (12) miscl Cat5 From 0 to 196 (38ft to48ft)	4	7.268	0.3721	0.0424	2651
41.146	CCISeismic Tower Section 26 - 1	4	7.119	0.4124	0.0407	2908
34.938	CCISeismic Tower Section 27 - 1	6	6.524	0.4935	0.0351	6435
33.000	CCISeismic (12) miscl Cat5 From 0 to 196 (28ft to38ft)	6	6.320	0.5069	0.0334	8129
32.355	Guy	6	6.251	0.5115	0.0328	7982
28.730	CCISeismic Tower Section 28 - 1	6	5.853	0.5486	0.0295	3869
23.000	CCISeismic (12) miscl Cat5 From 0 to 196 (18ft to28ft)	6	5.130	0.6875	0.0244	1915
22.521	CCISeismic Tower Section 29 - 1	6	5.061	0.7030	0.0240	1858
16.313	CCISeismic Tower Section 30 - 1	6	4.023	0.8984	0.0183	1553
13.000	CCISeismic (12) miscl Cat5 From 0 to 196 (8ft to18ft)	6	3.348	1.0618	0.0154	1581
10.105	CCISeismic Tower Section 31 - 1	6	2.688	1.2276	0.0130	1702
5.000	Data Logger	6	1.385	0.9747	0.0074	2789

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Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
4.000	CCISeismic (12) miscl Cat5 From 0 to 196 (0ft to8ft)	6	1.114	0.8161	0.0060	2789
3.761	CCISeismic Tower Section 32 - 1	6	1.048	0.7743	0.0056	2789

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
L2	189.321 (A) (36)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	4661.95	5880.00	1.000	1.261 ✔
	189.321 (B) (35)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	5064.07	5880.00	1.000	1.161 ✔
	189.321 (C) (34)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	4663.94	5880.00	1.000	1.261 ✔
	189.321 (D) (33)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	5064.44	5880.00	1.000	1.161 ✔
L7	156.121 (A) (40)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	4057.42	5880.00	1.000	1.449 ✔
	156.121 (B) (39)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	4361.66	5880.00	1.000	1.348 ✔
	156.121 (C) (38)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	4055.13	5880.00	1.000	1.450 ✔
	156.121 (D) (37)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	4361.41	5880.00	1.000	1.348 ✔
L12	125.154 (A) (44)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	2744.11	5880.00	1.000	2.143 ✔
	125.154 (B) (43)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	2937.87	5880.00	1.000	2.001 ✔
	125.154 (C) (42)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	2744.05	5880.00	1.000	2.143 ✔
	125.154 (D) (41)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	2937.74	5880.00	1.000	2.002 ✔
L17	94.438 (A) (48)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	2205.98	5880.00	1.000	2.665 ✔
	94.438 (B) (47)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	2302.03	5880.00	1.000	2.554 ✔
	94.438 (C) (46)	NRG Guy 5/16 13MM Miscl	254.80	9800.00	2206.74	5880.00	1.000	2.665 ✔
	94.438 (D) (45)	NRG Guy 5/16 13MM	254.80	9800.00	2302.06	5880.00	1.000	2.554 ✔

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Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
L22	64.429 (A) (52)	Miscl NRG Guy 5/16 13MM Miscl	254.80	9800.00	2022.88	5880.00	1.000	2.907 ✔
	64.429 (B) (51)	Miscl NRG Guy 5/16 13MM Miscl	254.80	9800.00	2024.51	5880.00	1.000	2.904 ✔
	64.429 (C) (50)	Miscl NRG Guy 5/16 13MM Miscl	254.80	9800.00	2022.78	5880.00	1.000	2.907 ✔
	64.429 (D) (49)	Miscl NRG Guy 5/16 13MM Miscl	254.80	9800.00	2024.53	5880.00	1.000	2.904 ✔
L27	32.355 (A) (56)	Miscl NRG Guy 5/16 13MM Miscl	254.80	9800.00	1735.48	5880.00	1.000	3.388 ✔
	32.355 (B) (55)	Miscl NRG Guy 5/16 13MM Miscl	254.80	9800.00	1719.95	5880.00	1.000	3.419 ✔
	32.355 (C) (54)	Miscl NRG Guy 5/16 13MM Miscl	254.80	9800.00	1733.35	5880.00	1.000	3.392 ✔
	32.355 (D) (53)	Miscl NRG Guy 5/16 13MM Miscl	254.80	9800.00	1719.94	5880.00	1.000	3.419 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	197.688 - 190.438 (1)	TP8.05x8x0.134	7.250	0.000	0.0	3.3300	-99.47	134865.00	0.001
L2	190.438 - 184.021 (2)	TP8.05x7.7763x0.134	7.250	0.000	0.0	3.3192	-7819.06	134427.00	0.058
L3	184.021 - 177.604 (3)	TP8.05x7.7505x0.134	7.250	0.000	0.0	3.3179	-8368.19	134376.00	0.062
L4	177.604 - 171.187 (4)	TP8.05x7.7476x0.134	7.250	0.000	0.0	3.2394	-8414.02	131194.00	0.064
L5	171.187 - 164.771 (5)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.2196	-8522.15	130395.00	0.065
L6	164.771 - 158.354 (6)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.2196	-8628.17	130394.00	0.066
L7	158.354 - 151.937 (7)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.2589	-15025.40	131984.00	0.114
L8	151.937 - 145.521 (8)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.2196	-15091.00	130394.00	0.116
L9	145.521 - 139.104 (9)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.2196	-15187.00	130394.00	0.116
L10	139.104 - 132.687 (10)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.3178	-15523.80	134370.00	0.116

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L11	132.687 - 126.271 (11)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.3178	-15637.60	134370.00	0.116
L12	126.271 - 119.854 (12)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.2392	-20106.70	131189.00	0.153
L13	119.854 - 113.437 (13)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.2196	-20188.90	130394.00	0.155
L14	113.437 - 107.021 (14)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.2196	-20288.10	130394.00	0.156
L15	107.021 - 100.604 (15)	TP8.05x7.7472x0.134	7.250	0.000	0.0	3.3178	-20459.90	134370.00	0.152
L16	100.604 - 98.4375 (16)	TP10.04x7.7472x0.109	3.000	0.000	0.0	2.8337	-20488.80	113431.00	0.181
L17	98.4375 - 93.3959 (17)	TP10.04x9.0259x0.134	6.083	0.000	0.0	4.0971	-20614.50	165931.00	0.124
L18	93.3959 - 87.1876 (18)	TP10.04x9.5983x0.134	7.250	0.000	0.0	4.0110	-23925.90	162443.00	0.147
L19	87.1876 - 80.9793 (19)	TP10.04x9.7085x0.134	7.250	0.000	0.0	4.0507	-24052.80	164052.00	0.147
L20	80.9793 - 74.771 (20)	TP10.04x9.7244x0.134	7.250	0.000	0.0	4.1511	-24103.50	167880.00	0.144
L21	74.771 - 68.5627 (21)	TP10.04x9.7267x0.134	7.250	0.000	0.0	4.1512	-24231.90	167883.00	0.144
L22	68.5627 - 62.3544 (22)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.1325	-26459.20	167364.00	0.158
L23	62.3544 - 56.1461 (23)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.0573	-26513.80	164322.00	0.161
L24	56.1461 - 49.9378 (24)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.1512	-26950.00	167884.00	0.161
L25	49.9378 - 43.7295 (25)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.1137	-27057.30	166604.00	0.162
L26	43.7295 - 37.5212 (26)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.0573	-27130.60	164322.00	0.165
L27	37.5212 - 31.3129 (27)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.0573	-27257.70	164322.00	0.166
L28	31.3129 - 25.1046 (28)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.1512	-28489.50	167884.00	0.170
L29	25.1046 - 18.8963 (29)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.1512	-28617.80	167884.00	0.170
L30	18.8963 - 12.688 (30)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.0949	-28690.30	165843.00	0.173
L31	12.688 - 6.47966 (31)	TP10.04x9.727x0.134	7.250	0.000	0.0	4.0573	-28789.60	164322.00	0.175
L32	6.47966 - 0 (32)	TP10.04x9.727x0.134	7.521	0.000	0.0	4.0567	-28914.60	164295.00	0.176

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	197.688 - 190.438 (1)	TP8.05x8x0.134	1613.54	26719.42	0.060	0.00	26719.42	0.000
L2	190.438 - 184.021 (2)	TP8.05x7.7763x0.134	3349.26	26560.00	0.126	0.00	26560.00	0.000
L3	184.021 - 177.604 (3)	TP8.05x7.7505x0.134	7158.88	26541.75	0.270	0.00	26541.75	0.000

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page 65 of 71
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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L4	177.604 - 171.187 (4)	TP8.05x7.7476x0.134	7425.23	25399.50	0.292	0.00	25399.50	0.000
L5	171.187 - 164.771 (5)	TP8.05x7.7472x0.134	6866.35	25116.50	0.273	0.00	25116.50	0.000
L6	164.771 - 158.354 (6)	TP8.05x7.7472x0.134	3800.12	25116.25	0.151	0.00	25116.25	0.000
L7	158.354 - 151.937 (7)	TP8.05x7.7472x0.134	4246.15	25680.83	0.165	0.00	25680.83	0.000
L8	151.937 - 145.521 (8)	TP8.05x7.7472x0.134	2398.98	25116.25	0.096	0.00	25116.25	0.000
L9	145.521 - 139.104 (9)	TP8.05x7.7472x0.134	642.61	25116.25	0.026	0.00	25116.25	0.000
L10	139.104 - 132.687 (10)	TP8.05x7.7472x0.134	1960.89	26539.33	0.074	0.00	26539.33	0.000
L11	132.687 - 126.271 (11)	TP8.05x7.7472x0.134	5465.96	26539.33	0.206	0.00	26539.33	0.000
L12	126.271 - 119.854 (12)	TP8.05x7.7472x0.134	6369.46	25397.75	0.251	0.00	25397.75	0.000
L13	119.854 - 113.437 (13)	TP8.05x7.7472x0.134	4555.69	25116.25	0.181	0.00	25116.25	0.000
L14	113.437 - 107.021 (14)	TP8.05x7.7472x0.134	3086.56	25116.25	0.123	0.00	25116.25	0.000
L15	107.021 - 100.604 (15)	TP8.05x7.7472x0.134	3021.37	26539.33	0.114	0.00	26539.33	0.000
L16	100.604 - 98.4375 (16)	TP10.04x7.7472x0.109	3150.65	22918.42	0.137	0.00	22918.42	0.000
L17	98.4375 - 93.3959 (17)	TP10.04x9.0259x0.134	5182.04	39206.83	0.132	0.00	39206.83	0.000
L18	93.3959 - 87.1876 (18)	TP10.04x9.5983x0.134	4097.53	37687.50	0.109	0.00	37687.50	0.000
L19	87.1876 - 80.9793 (19)	TP10.04x9.7085x0.134	1293.34	38384.75	0.034	0.00	38384.75	0.000
L20	80.9793 - 74.771 (20)	TP10.04x9.7244x0.134	445.09	40175.08	0.011	0.00	40175.08	0.000
L21	74.771 - 68.5627 (21)	TP10.04x9.7267x0.134	2271.76	40177.58	0.057	0.00	40177.58	0.000
L22	68.5627 - 62.3544 (22)	TP10.04x9.727x0.134	4522.28	39839.92	0.114	0.00	39839.92	0.000
L23	62.3544 - 56.1461 (23)	TP10.04x9.727x0.134	2963.18	38502.33	0.077	0.00	38502.33	0.000
L24	56.1461 - 49.9378 (24)	TP10.04x9.727x0.134	3670.94	40178.00	0.091	0.00	40178.00	0.000
L25	49.9378 - 43.7295 (25)	TP10.04x9.727x0.134	4331.52	39503.50	0.110	0.00	39503.50	0.000
L26	43.7295 - 37.5212 (26)	TP10.04x9.727x0.134	4242.61	38502.42	0.110	0.00	38502.42	0.000
L27	37.5212 - 31.3129 (27)	TP10.04x9.727x0.134	2687.67	38502.42	0.070	0.00	38502.42	0.000
L28	31.3129 - 25.1046 (28)	TP10.04x9.727x0.134	4319.43	40178.00	0.108	0.00	40178.00	0.000
L29	25.1046 - 18.8963 (29)	TP10.04x9.727x0.134	6604.98	40178.00	0.164	0.00	40178.00	0.000
L30	18.8963 - 12.688 (30)	TP10.04x9.727x0.134	7035.27	39168.42	0.180	0.00	39168.42	0.000
L31	12.688 - 6.47966 (31)	TP10.04x9.727x0.134	6845.15	38502.42	0.178	0.00	38502.42	0.000
L32	6.47966 - 0 (32)	TP10.04x9.727x0.134	4996.28	38490.33	0.130	0.00	38490.33	0.000

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	197.688 - 190.438 (1)	TP8.05x8x0.134	431.91	40459.60	0.011	314.51	28137.83	0.011
L2	190.438 - 184.021 (2)	TP8.05x7.7763x0.134	934.98	40112.40	0.023	0.73	27955.17	0.000
L3	184.021 - 177.604 (3)	TP8.05x7.7505x0.134	232.40	40077.00	0.006	213.42	27934.25	0.008
L4	177.604 - 171.187 (4)	TP8.05x7.7476x0.134	81.00	39358.20	0.002	213.45	26626.75	0.008
L5	171.187 - 164.771 (5)	TP8.05x7.7472x0.134	341.61	39356.90	0.009	199.07	26303.33	0.008
L6	164.771 - 158.354 (6)	TP8.05x7.7472x0.134	810.41	39356.80	0.021	199.16	26303.08	0.008
L7	158.354 - 151.937 (7)	TP8.05x7.7472x0.134	505.60	39595.30	0.013	84.83	26948.58	0.003
L8	151.937 - 145.521 (8)	TP8.05x7.7472x0.134	380.76	39118.20	0.010	84.85	26303.08	0.003
L9	145.521 - 139.104 (9)	TP8.05x7.7472x0.134	162.83	39118.20	0.004	84.86	26303.08	0.003
L10	139.104 - 132.687 (10)	TP8.05x7.7472x0.134	390.10	40310.90	0.010	80.03	27931.50	0.003
L11	132.687 - 126.271 (11)	TP8.05x7.7472x0.134	726.91	40310.90	0.018	97.94	27931.50	0.004
L12	126.271 - 119.854 (12)	TP8.05x7.7472x0.134	391.87	39595.30	0.010	94.72	26624.83	0.004
L13	119.854 - 113.437 (13)	TP8.05x7.7472x0.134	301.96	39356.70	0.008	94.64	26303.08	0.004
L14	113.437 - 107.021 (14)	TP8.05x7.7472x0.134	159.70	39356.70	0.004	94.60	26303.08	0.004
L15	107.021 - 100.604 (15)	TP8.05x7.7472x0.134	149.24	40072.40	0.004	94.57	27931.50	0.003
L16	100.604 - 98.4375 (16)	TP10.04x7.7472x0.109	204.53	34429.10	0.006	94.56	23928.67	0.004
L17	98.4375 - 93.3959 (17)	TP10.04x9.0259x0.134	526.71	48642.40	0.011	94.55	42593.67	0.002
L18	93.3959 - 87.1876 (18)	TP10.04x9.5983x0.134	565.72	48733.00	0.012	92.32	40822.17	0.002
L19	87.1876 - 80.9793 (19)	TP10.04x9.7085x0.134	333.93	49215.70	0.007	92.31	41634.75	0.002
L20	80.9793 - 74.771 (20)	TP10.04x9.7244x0.134	171.86	50435.50	0.003	127.52	43724.17	0.003
L21	74.771 - 68.5627 (21)	TP10.04x9.7267x0.134	413.95	50437.20	0.008	127.51	43727.08	0.003
L22	68.5627 - 62.3544 (22)	TP10.04x9.727x0.134	790.13	50209.20	0.016	127.41	43332.75	0.003
L23	62.3544 - 56.1461 (23)	TP10.04x9.727x0.134	718.79	49296.70	0.015	127.41	41771.83	0.003
L24	56.1461 - 49.9378 (24)	TP10.04x9.727x0.134	314.88	50209.30	0.006	90.77	43727.58	0.002
L25	49.9378 - 43.7295 (25)	TP10.04x9.727x0.134	42.48	49981.20	0.001	96.40	42939.92	0.002
L26	43.7295 - 37.5212 (26)	TP10.04x9.727x0.134	146.26	49296.70	0.003	96.39	41771.92	0.002
L27	37.5212 - 31.3129 (27)	TP10.04x9.727x0.134	432.60	49296.70	0.009	96.39	41771.92	0.002
L28	31.3129 - 25.1046 (28)	TP10.04x9.727x0.134	556.44	50209.30	0.011	95.64	43727.58	0.002

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L29	25.1046 - 18.8963 (29)	TP10.04x9.727x0.134	255.62	50209.30	0.005	95.63	43727.58	0.002
L30	18.8963 - 12.688 (30)	TP10.04x9.727x0.134	102.18	49524.90	0.002	95.63	42548.83	0.002
L31	12.688 - 6.47966 (31)	TP10.04x9.727x0.134	186.37	49296.70	0.004	95.63	41771.92	0.002
L32	6.47966 - 0 (32)	TP10.04x9.727x0.134	481.30	49518.20	0.010	95.63	41757.83	0.002

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	197.688 - 190.438 (1)	0.001	0.060	0.000	0.011	0.011	0.062	1.000	✔
L2	190.438 - 184.021 (2)	0.058	0.126	0.000	0.023	0.000	0.185	1.000	✔
L3	184.021 - 177.604 (3)	0.062	0.270	0.000	0.006	0.008	0.332	1.000	✔
L4	177.604 - 171.187 (4)	0.064	0.292	0.000	0.002	0.008	0.357	1.000	✔
L5	171.187 - 164.771 (5)	0.065	0.273	0.000	0.009	0.008	0.339	1.000	✔
L6	164.771 - 158.354 (6)	0.066	0.151	0.000	0.021	0.008	0.218	1.000	✔
L7	158.354 - 151.937 (7)	0.114	0.165	0.000	0.013	0.003	0.279	1.000	✔
L8	151.937 - 145.521 (8)	0.116	0.096	0.000	0.010	0.003	0.211	1.000	✔
L9	145.521 - 139.104 (9)	0.116	0.026	0.000	0.004	0.003	0.142	1.000	✔
L10	139.104 - 132.687 (10)	0.116	0.074	0.000	0.010	0.003	0.190	1.000	✔
L11	132.687 - 126.271 (11)	0.116	0.206	0.000	0.018	0.004	0.323	1.000	✔
L12	126.271 - 119.854 (12)	0.153	0.251	0.000	0.010	0.004	0.404	1.000	✔
L13	119.854 - 113.437 (13)	0.155	0.181	0.000	0.008	0.004	0.336	1.000	✔
L14	113.437 - 107.021 (14)	0.156	0.123	0.000	0.004	0.004	0.279	1.000	✔
L15	107.021 - 100.604 (15)	0.152	0.114	0.000	0.004	0.003	0.266	1.000	✔
L16	100.604 - 98.4375 (16)	0.181	0.137	0.000	0.006	0.004	0.318	1.000	✔
L17	98.4375 - 93.3959 (17)	0.124	0.132	0.000	0.011	0.002	0.257	1.000	✔
L18	93.3959 - 87.1876 (18)	0.147	0.109	0.000	0.012	0.002	0.256	1.000	✔

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Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L19	87.1876 - 80.9793 (19)	0.147	0.034	0.000	0.007	0.002	0.180	1.000	✔
L20	80.9793 - 74.771 (20)	0.144	0.011	0.000	0.003	0.003	0.155	1.000	✔
L21	74.771 - 68.5627 (21)	0.144	0.057	0.000	0.008	0.003	0.201	1.000	✔
L22	68.5627 - 62.3544 (22)	0.158	0.114	0.000	0.016	0.003	0.272	1.000	✔
L23	62.3544 - 56.1461 (23)	0.161	0.077	0.000	0.015	0.003	0.239	1.000	✔
L24	56.1461 - 49.9378 (24)	0.161	0.091	0.000	0.006	0.002	0.252	1.000	✔
L25	49.9378 - 43.7295 (25)	0.162	0.110	0.000	0.001	0.002	0.272	1.000	✔
L26	43.7295 - 37.5212 (26)	0.165	0.110	0.000	0.003	0.002	0.275	1.000	✔
L27	37.5212 - 31.3129 (27)	0.166	0.070	0.000	0.009	0.002	0.236	1.000	✔
L28	31.3129 - 25.1046 (28)	0.170	0.108	0.000	0.011	0.002	0.277	1.000	✔
L29	25.1046 - 18.8963 (29)	0.170	0.164	0.000	0.005	0.002	0.335	1.000	✔
L30	18.8963 - 12.688 (30)	0.173	0.180	0.000	0.002	0.002	0.353	1.000	✔
L31	12.688 - 6.47966 (31)	0.175	0.178	0.000	0.004	0.002	0.353	1.000	✔
L32	6.47966 - 0 (32)	0.176	0.130	0.000	0.010	0.002	0.306	1.000	✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	197.688 - 190.438	Pole	TP8.05x8x0.134	1	-99.47	134865.00	6.2	Pass
L2	190.438 - 184.021	Pole	TP8.05x7.7763x0.134	2	-7819.06	134427.00	18.5	Pass
		Guy A@189.321	NRG Guy 5/16 13MM	36	4661.95	5880.00	79.3	Pass
		Guy B@189.321	NRG Guy 5/16 13MM	35	5064.07	5880.00	86.1	Pass
		Guy C@189.321	NRG Guy 5/16 13MM	34	4663.94	5880.00	79.3	Pass
		Guy D@189.321	NRG Guy 5/16 13MM	33	5064.44	5880.00	86.1	Pass
L3	184.021 - 177.604	Pole	TP8.05x7.7505x0.134	3	-8368.19	134376.00	33.2	Pass
L4	177.604 - 171.187	Pole	TP8.05x7.7476x0.134	4	-8414.02	131194.00	35.7	Pass
L5	171.187 - 164.771	Pole	TP8.05x7.7472x0.134	5	-8522.15	130395.00	33.9	Pass
L6	164.771 -	Pole	TP8.05x7.7472x0.134	6	-8628.17	130394.00	21.8	Pass

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	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
	158.354							
L7	158.354 - 151.937	Pole	TP8.05x7.7472x0.134	7	-15025.40	131984.00	27.9	Pass
		Guy A@156.121	NRG Guy 5/16 13MM	40	4057.42	5880.00	69.0	Pass
		Guy B@156.121	NRG Guy 5/16 13MM	39	4361.66	5880.00	74.2	Pass
		Guy C@156.121	NRG Guy 5/16 13MM	38	4055.13	5880.00	69.0	Pass
		Guy D@156.121	NRG Guy 5/16 13MM	37	4361.41	5880.00	74.2	Pass
L8	151.937 - 145.521	Pole	TP8.05x7.7472x0.134	8	-15091.00	130394.00	21.1	Pass
L9	145.521 - 139.104	Pole	TP8.05x7.7472x0.134	9	-15187.00	130394.00	14.2	Pass
L10	139.104 - 132.687	Pole	TP8.05x7.7472x0.134	10	-15523.80	134370.00	19.0	Pass
L11	132.687 - 126.271	Pole	TP8.05x7.7472x0.134	11	-15637.60	134370.00	32.3	Pass
L12	126.271 - 119.854	Pole	TP8.05x7.7472x0.134	12	-20106.70	131189.00	40.4	Pass
		Guy A@125.154	NRG Guy 5/16 13MM	44	2744.11	5880.00	46.7	Pass
		Guy B@125.154	NRG Guy 5/16 13MM	43	2937.87	5880.00	50.0	Pass
		Guy C@125.154	NRG Guy 5/16 13MM	42	2744.05	5880.00	46.7	Pass
		Guy D@125.154	NRG Guy 5/16 13MM	41	2937.74	5880.00	50.0	Pass
L13	119.854 - 113.437	Pole	TP8.05x7.7472x0.134	13	-20188.90	130394.00	33.6	Pass
L14	113.437 - 107.021	Pole	TP8.05x7.7472x0.134	14	-20288.10	130394.00	27.9	Pass
L15	107.021 - 100.604	Pole	TP8.05x7.7472x0.134	15	-20459.90	134370.00	26.6	Pass
L16	100.604 - 98.4375	Pole	TP10.04x7.7472x0.109	16	-20488.80	113431.00	31.8	Pass
L17	98.4375 - 93.3959	Pole	TP10.04x9.0259x0.134	17	-20614.50	165931.00	25.7	Pass
		Guy A@94.4376	NRG Guy 5/16 13MM	48	2205.98	5880.00	37.5	Pass
		Guy B@94.4376	NRG Guy 5/16 13MM	47	2302.03	5880.00	39.2	Pass
		Guy C@94.4376	NRG Guy 5/16 13MM	46	2206.74	5880.00	37.5	Pass
		Guy D@94.4376	NRG Guy 5/16 13MM	45	2302.06	5880.00	39.2	Pass
L18	93.3959 - 87.1876	Pole	TP10.04x9.5983x0.134	18	-23925.90	162443.00	25.6	Pass
L19	87.1876 - 80.9793	Pole	TP10.04x9.7085x0.134	19	-24052.80	164052.00	18.0	Pass
L20	80.9793 - 74.771	Pole	TP10.04x9.7244x0.134	20	-24103.50	167880.00	15.5	Pass
L21	74.771 - 68.5627	Pole	TP10.04x9.7267x0.134	21	-24231.90	167883.00	20.1	Pass
L22	68.5627 - 62.3544	Pole	TP10.04x9.727x0.134	22	-26459.20	167364.00	27.2	Pass
		Guy A@64.4294	NRG Guy 5/16 13MM	52	2022.88	5880.00	34.4	Pass
		Guy B@64.4294	NRG Guy 5/16 13MM	51	2024.51	5880.00	34.4	Pass
		Guy C@64.4294	NRG Guy 5/16 13MM	50	2022.78	5880.00	34.4	Pass
		Guy D@64.4294	NRG Guy 5/16 13MM	49	2024.53	5880.00	34.4	Pass
L23	62.3544 - 56.1461	Pole	TP10.04x9.727x0.134	23	-26513.80	164322.00	23.9	Pass
L24	56.1461 - 49.9378	Pole	TP10.04x9.727x0.134	24	-26950.00	167884.00	25.2	Pass
L25	49.9378 - 43.7295	Pole	TP10.04x9.727x0.134	25	-27057.30	166604.00	27.2	Pass
L26	43.7295 - 37.5212	Pole	TP10.04x9.727x0.134	26	-27130.60	164322.00	27.5	Pass
L27	37.5212 - 31.3129	Pole	TP10.04x9.727x0.134	27	-27257.70	164322.00	23.6	Pass
		Guy A@32.3546	NRG Guy 5/16 13MM	56	1735.48	5880.00	29.5	Pass
		Guy B@32.3546	NRG Guy 5/16 13MM	55	1719.95	5880.00	29.3	Pass
		Guy C@32.3546	NRG Guy 5/16 13MM	54	1733.35	5880.00	29.5	Pass
		Guy D@32.3546	NRG Guy 5/16 13MM	53	1719.94	5880.00	29.3	Pass

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 70 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L28	31.3129 - 25.1046	Pole	TP10.04x9.727x0.134	28	-28489.50	167884.00	27.7	Pass
L29	25.1046 - 18.8963	Pole	TP10.04x9.727x0.134	29	-28617.80	167884.00	33.5	Pass
L30	18.8963 - 12.688	Pole	TP10.04x9.727x0.134	30	-28690.30	165843.00	35.3	Pass
L31	12.688 - 6.47966	Pole	TP10.04x9.727x0.134	31	-28789.60	164322.00	35.3	Pass
L32	6.47966 - 0	Pole	TP10.04x9.727x0.134	32	-28914.60	164295.00	30.6	Pass
							Summary	
						Pole (L12)	40.4	Pass
						Guy A (L2)	79.3	Pass
						Guy B (L2)	86.1	Pass
						Guy C (L2)	79.3	Pass
						Guy D (L2)	86.1	Pass
						RATING =	**86.1**	**Pass**

Element Map

Section No.	Section Elevation ft	Component Type	Element List
L1	197.688-190.438	Pole	1
L2	190.438-184.021	Pole	2
		Guy A	36
		Guy B	35
		Guy C	34
		Guy D	33
L3	184.021-177.604	Pole	3
L4	177.604-171.187	Pole	4
L5	171.187-164.771	Pole	5
L6	164.771-158.354	Pole	6
L7	158.354-151.937	Pole	7
		Guy A	40
		Guy B	39
		Guy C	38
		Guy D	37
L8	151.937-145.521	Pole	8
L9	145.521-139.104	Pole	9
L10	139.104-132.687	Pole	10
L11	132.687-126.271	Pole	11
L12	126.271-119.854	Pole	12
		Guy A	44
		Guy B	43
		Guy C	42
		Guy D	41
L13	119.854-113.43	Pole	13

tnxTower	Job: NRG 60m Super NRG Tall Tower	Page: 71 of 71
Ahola Engineering LLC P.O. Box 989 Winter Park, CO 80482-0989 Phone: (719) 640-2408 FAX:	Project: Matanuska-Susitna Borough, AK	Date: 09:27:06 07/01/24
	Client: Longroad Energy	Designed by: Mikko Ahola, PE

Section No.	Section Elevation ft	Component Type	Element List
	7		
L14	113.437-107.021	Pole	14
L15	107.021-100.604	Pole	15
L16	100.604-98.437	Pole	16
L17	98.437-93.396	Pole	17
		Guy A	48
		Guy B	47
		Guy C	46
		Guy D	45
L18	93.396-87.188	Pole	18
L19	87.188-80.979	Pole	19
L20	80.979-74.771	Pole	20
L21	74.771-68.563	Pole	21
L22	68.563-62.354	Pole	22
		Guy A	52
		Guy B	51
		Guy C	50
		Guy D	49
L23	62.354-56.146	Pole	23
L24	56.146-49.938	Pole	24
L25	49.938-43.729	Pole	25
L26	43.729-37.521	Pole	26
L27	37.521-31.313	Pole	27
		Guy A	56
		Guy B	55
		Guy C	54
		Guy D	53
L28	31.313-25.105	Pole	28
L29	25.105-18.896	Pole	29
L30	18.896-12.688	Pole	30
L31	12.688-6.480	Pole	31
L32	6.480-0.000	Pole	32
			Total number of elements: 56

BU:	LMS 105 thru 110	Structure:	D
WO:	anuska Susitna Borough		
Order:	Longroad Energy	Rev:	H

Location

	Decimal Degrees		Deg	Min	Sec
Lat:	61.473061	+	61	28	23.02
Long:	-150.988808	-	150	59	19.71

Code and Site Parameters

Seismic Design Code:	TIA-222-H	
Site Soil:	D (Default)	Default
Risk Category:	II	

USGS Seismic Reference		
S_S:	1.6180	g
S_1:	0.7570	g
T_L:	16	s

Seismic Design Category Determination

Importance Factor, I_e:	1
Acceleration-based site coefficient, F_a:	1.2000
Velocity-based site coefficient, F_v:	1.7000

Design spectral response acceleration short period, S_{DS}:	1.2944	g
Design spectral response acceleration 1 s period, S_{D1}:	0.8579	g

Seismic Design Category Based on S_{DS}:	D
Seismic Design Category Based on S_{D1}:	D
Seismic Design Category Based on S_1:	E
Controlling Seismic Design Category:	E

CROWN CASTLE

BU:	LMS 105 thru 110	Structure:	D
WO:	atanuska Susitna Borough		
Order:	Longroad Energy	Rev:	H

Tower Details

Tower Type:	Tapered Monopole		
Height, h:	198	ft	
Effective Seismic Weight, W:	3.22	kips	
Amplification Factor, A_s:	1.0		2.7.8.1

Seismic Base Shear

Response Modification Factor, R:	1.5		
Discrete Appurtenance Weight in Top 1/3 of Structure, W_u:	0.14455	kips	
W_L:	3.078835518	kips	
E:	29000.0	ksi	
g:	386.088	in/s^2	
Average Moment of Inertia, I_{avg}:	36.87798227	in^4	
F_a:	0.051819005	hz	
Approximate Fundamental Period Monopole, T_a:	19.2979	s	2.7.7.1.3.3
Seismic Response Coefficient, C_s	0.8629		2.7.7.1.1
Seismic Response Coefficient Max 1, C_{smax}	N/A		2.7.7.1.1
Seismic Response Coefficient Max 2, C_{smax}	0.024573126		2.7.7.1.1
Seismic Response Coefficient Min 1, C_{smin}	0.0570		2.7.7.1.1
Seismic Response Coefficient Min 2, C_{smin}	0.4037		2.7.7.1.1
Controlling Seismic Response Coefficient, C_{sc}	0.4037		
Seismic Base Shear, V	1.301	kips	2.7.7.1.1

Vertical Distribution Factors

Period Related Exponent, k:	2.000		2.7.7.1.2
Sum of $w_i h_i^k$	40253.99		2.7.7.1.2

Tower Section Loads								
Section Number	Length	Top Height	Mid Height, h_x	Section Weight, w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
1 - 1	7.25	197.69	194.06	0.0841	3168.84	0.0787	0.1024	0.0218
2 - 1	7.25	191.27	187.65	0.0817	2878.48	0.0715	0.0931	0.0212
3 - 1	7.25	184.85	181.23	0.0815	2675.94	0.0665	0.0865	0.0211
4 - 1	7.25	178.44	174.81	0.0814	2488.84	0.0618	0.0805	0.0211
5 - 1	7.25	172.02	168.40	0.0814	2309.38	0.0574	0.0747	0.0211
6 - 1	7.25	165.60	161.98	0.0814	2136.73	0.0531	0.0691	0.0211
7 - 1	7.25	159.19	155.56	0.0814	1970.79	0.0490	0.0637	0.0211
8 - 1	7.25	152.77	149.15	0.0814	1811.56	0.0450	0.0586	0.0211
9 - 1	7.25	146.35	142.73	0.0814	1659.04	0.0412	0.0536	0.0211
10 - 1	7.25	139.94	136.31	0.0814	1513.22	0.0376	0.0489	0.0211
11 - 1	7.25	133.52	129.90	0.0814	1374.11	0.0341	0.0444	0.0211
12 - 1	7.25	127.10	123.48	0.0814	1241.70	0.0308	0.0401	0.0211
13 - 1	7.25	120.69	117.06	0.0814	1116.00	0.0277	0.0361	0.0211
14 - 1	7.25	114.27	110.65	0.0814	997.01	0.0248	0.0322	0.0211
15 - 1	7.25	107.85	104.23	0.0814	884.73	0.0220	0.0286	0.0211
16 - 1	3.00	101.44	99.94	0.0275	274.67	0.0068	0.0089	0.0071
17 - 1	6.08	99.48	96.44	0.0798	742.25	0.0184	0.0240	0.0207
18 - 1	7.25	94.44	90.81	0.1012	834.92	0.0207	0.0270	0.0262
19 - 1	7.25	88.23	84.60	0.1024	733.10	0.0182	0.0237	0.0265
20 - 1	7.25	82.02	78.40	0.1026	630.50	0.0157	0.0204	0.0266
21 - 1	7.25	75.81	72.19	0.1026	534.72	0.0133	0.0173	0.0266
22 - 1	7.25	69.60	65.98	0.1026	446.72	0.0111	0.0144	0.0266
23 - 1	7.25	63.40	59.77	0.1026	366.61	0.0091	0.0119	0.0266
24 - 1	7.25	57.19	53.56	0.1026	294.41	0.0073	0.0095	0.0266
25 - 1	7.25	50.98	47.35	0.1026	230.11	0.0057	0.0074	0.0266
26 - 1	7.25	44.77	41.15	0.1026	173.73	0.0043	0.0056	0.0266
27 - 1	7.25	38.56	34.94	0.1026	125.26	0.0031	0.0040	0.0266
28 - 1	7.25	32.35	28.73	0.1026	84.70	0.0021	0.0027	0.0266
29 - 1	7.25	26.15	22.52	0.1026	52.05	0.0013	0.0017	0.0266
30 - 1	7.25	19.94	16.31	0.1026	27.31	0.0007	0.0009	0.0266
31 - 1	7.25	13.73	10.10	0.1026	10.48	0.0003	0.0003	0.0266
32 - 1	7.52	7.52	3.76	0.1065	1.51	0.0000	0.0000	0.0276
			Sum	2.8734	33789.42			

Discrete Loads						
Name	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
Properllor Anemometer/Wind Vane	198.49	0.0022	86.68	0.0022	0.0028	0.0006
95" Boom Mount	196.19	0.0080	307.94	0.0076	0.0100	0.0021
NRG #40C Anemometer	192.91	0.0002	7.44	0.0002	0.0002	0.0001
95" Boom Mount	190.91	0.0080	291.58	0.0072	0.0094	0.0021
NRG #40C Anemometer	192.91	0.0002	7.44	0.0002	0.0002	0.0001
95" Boom Mount	190.91	0.0080	291.58	0.0072	0.0094	0.0021
Aircraft Marker Balls (21" Dia - Orange)	180.77	0.0150	490.17	0.0122	0.0158	0.0039
Aircraft Marker Balls (21" Dia - Orange)	180.77	0.0150	490.17	0.0122	0.0158	0.0039
Aircraft Marker Balls (21" Dia - Orange)	180.77	0.0150	490.17	0.0122	0.0158	0.0039
Aircraft Marker Balls (21" Dia - Orange)	180.77	0.0150	490.17	0.0122	0.0158	0.0039
NRG 200P Wind Vane	167.32	0.0003	7.00	0.0002	0.0002	0.0001
95" Boom Mount	165.32	0.0080	218.65	0.0054	0.0071	0.0021
NRG #40C Anemometer	167.32	0.0002	5.60	0.0001	0.0002	0.0001
95" Boom Mount	165.32	0.0080	218.65	0.0054	0.0071	0.0021
Temperature Probe w/ Shield	173.89	0.0050	151.18	0.0038	0.0049	0.0013
Relative Humidty Sensor	173.89	0.0100	302.36	0.0075	0.0098	0.0026
Barometric Pressure	173.89	0.0100	302.36	0.0075	0.0098	0.0026
NRG 200P Wind Vane	160.76	0.0003	6.46	0.0002	0.0002	0.0001
95" Boom Mount	158.76	0.0080	201.64	0.0050	0.0065	0.0021
NRG 200P Wind Vane	137.80	0.0003	4.75	0.0001	0.0002	0.0001
95" Boom Mount	135.80	0.0080	147.52	0.0037	0.0048	0.0021
NRG #40C Anemometer	131.23	0.0002	3.44	0.0001	0.0001	0.0001
95" Boom Mount	129.23	0.0080	133.61	0.0033	0.0043	0.0021
NRG #40C Anemometer	131.23	0.0002	3.44	0.0001	0.0001	0.0001
95" Boom Mount	129.23	0.0080	133.61	0.0033	0.0043	0.0021
NRG #40C Anemometer	98.43	0.0002	1.94	0.0000	0.0001	0.0001
95" Boom Mount	96.43	0.0080	74.38	0.0018	0.0024	0.0021
NRG #40C Anemometer	98.43	0.0002	1.94	0.0000	0.0001	0.0001
95" Boom Mount	96.43	0.0080	74.38	0.0018	0.0024	0.0021
Temperature Probe w/ Shield	49.20	0.0050	12.10	0.0003	0.0004	0.0013
Data Logger	5.00	0.0500	1.25	0.0000	0.0000	0.0129
	Sum	0.2324	4959.61			

Linear Loads								
Name	Start Height	End Height	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
(12) miscl Cat5 From 0 to 196	188.00	196.00	192.00	0.0048	176.95	0.0044	0.0057	0.0012
(12) miscl Cat5 From 0 to 196	178.00	188.00	183.00	0.0060	200.93	0.0050	0.0065	0.0016
(12) miscl Cat5 From 0 to 196	168.00	178.00	173.00	0.0060	179.57	0.0045	0.0058	0.0016
(12) miscl Cat5 From 0 to 196	158.00	168.00	163.00	0.0060	159.41	0.0040	0.0052	0.0016
(12) miscl Cat5 From 0 to 196	148.00	158.00	153.00	0.0060	140.45	0.0035	0.0045	0.0016
(12) miscl Cat5 From 0 to 196	138.00	148.00	143.00	0.0060	122.69	0.0030	0.0040	0.0016
(12) miscl Cat5 From 0 to 196	128.00	138.00	133.00	0.0060	106.13	0.0026	0.0034	0.0016
(12) miscl Cat5 From 0 to 196	118.00	128.00	123.00	0.0060	90.77	0.0023	0.0029	0.0016
(12) miscl Cat5 From 0 to 196	108.00	118.00	113.00	0.0060	76.61	0.0019	0.0025	0.0016
(12) miscl Cat5 From 0 to 196	98.00	108.00	103.00	0.0060	63.65	0.0016	0.0021	0.0016
(12) miscl Cat5 From 0 to 196	88.00	98.00	93.00	0.0060	51.89	0.0013	0.0017	0.0016
(12) miscl Cat5 From 0 to 196	78.00	88.00	83.00	0.0060	41.33	0.0010	0.0013	0.0016
(12) miscl Cat5 From 0 to 196	68.00	78.00	73.00	0.0060	31.97	0.0008	0.0010	0.0016
(12) miscl Cat5 From 0 to 196	58.00	68.00	63.00	0.0060	23.81	0.0006	0.0008	0.0016
(12) miscl Cat5 From 0 to 196	48.00	58.00	53.00	0.0060	16.85	0.0004	0.0005	0.0016
(12) miscl Cat5 From 0 to 196	38.00	48.00	43.00	0.0060	11.09	0.0003	0.0004	0.0016
(12) miscl Cat5 From 0 to 196	28.00	38.00	33.00	0.0060	6.53	0.0002	0.0002	0.0016
(12) miscl Cat5 From 0 to 196	18.00	28.00	23.00	0.0060	3.17	0.0001	0.0001	0.0016
(12) miscl Cat5 From 0 to 196	8.00	18.00	13.00	0.0060	1.01	0.0000	0.0000	0.0016
(12) miscl Cat5 From 0 to 196	0.00	8.00	4.00	0.0048	0.08	0.0000	0.0000	0.0012
			Sum	0.1176	1504.96			

BU:	LMS 105 thru 110	Structure:	D
WO:	atanuska Susitna Borough		
Order:	Longroad Energy	Rev:	H

Tower Details

Tower Type:	Tapered Monopole		
Height, h:	198	ft	
Effective Seismic Weight, W:	3.22	kips	
Amplification Factor, A_s:	1.0		2.7.8.1

Seismic Base Shear

Response Modification Factor, R:	1.5		
Discrete Appurtenance Weight in Top 1/3 of Structure, W_u:	0.14455	kips	
W_L:	3.078835518	kips	
E:	29000.0	ksi	
g:	386.088	in/s^2	
Average Moment of Inertia, I_{avg}:	36.87798227	in^4	
F_a:	0.051819005	hz	
Approximate Fundamental Period Monopole, T_a:	19.2979	s	2.7.7.1.3.3
Seismic Response Coefficient, C_s	0.8629		2.7.7.1.1
Seismic Response Coefficient Max 1, C_{smax}	N/A		2.7.7.1.1
Seismic Response Coefficient Max 2, C_{smax}	0.024573126		2.7.7.1.1
Seismic Response Coefficient Min 1, C_{smin}	0.0570		2.7.7.1.1
Seismic Response Coefficient Min 2, C_{smin}	0.4037		2.7.7.1.1
Controlling Seismic Response Coefficient, C_{sc}	0.4037		
Seismic Base Shear, V	1.301	kips	2.7.7.1.1

Vertical Distribution Factors

Period Related Exponent, k:	2.000		2.7.7.1.2
Sum of $w_i h_i^k$	40253.99		2.7.7.1.2

Tower Section Loads								
Section Number	Length	Top Height	Mid Height, h_x	Section Weight, w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
1 - 1	7.25	197.69	194.06	0.0841	3168.84	0.0787	0.1024	0.0218
2 - 1	7.25	191.27	187.65	0.0817	2878.48	0.0715	0.0931	0.0212
3 - 1	7.25	184.85	181.23	0.0815	2675.94	0.0665	0.0865	0.0211
4 - 1	7.25	178.44	174.81	0.0814	2488.84	0.0618	0.0805	0.0211
5 - 1	7.25	172.02	168.40	0.0814	2309.38	0.0574	0.0747	0.0211
6 - 1	7.25	165.60	161.98	0.0814	2136.73	0.0531	0.0691	0.0211
7 - 1	7.25	159.19	155.56	0.0814	1970.79	0.0490	0.0637	0.0211
8 - 1	7.25	152.77	149.15	0.0814	1811.56	0.0450	0.0586	0.0211
9 - 1	7.25	146.35	142.73	0.0814	1659.04	0.0412	0.0536	0.0211
10 - 1	7.25	139.94	136.31	0.0814	1513.22	0.0376	0.0489	0.0211
11 - 1	7.25	133.52	129.90	0.0814	1374.11	0.0341	0.0444	0.0211
12 - 1	7.25	127.10	123.48	0.0814	1241.70	0.0308	0.0401	0.0211
13 - 1	7.25	120.69	117.06	0.0814	1116.00	0.0277	0.0361	0.0211
14 - 1	7.25	114.27	110.65	0.0814	997.01	0.0248	0.0322	0.0211
15 - 1	7.25	107.85	104.23	0.0814	884.73	0.0220	0.0286	0.0211
16 - 1	3.00	101.44	99.94	0.0275	274.67	0.0068	0.0089	0.0071
17 - 1	6.08	99.48	96.44	0.0798	742.25	0.0184	0.0240	0.0207
18 - 1	7.25	94.44	90.81	0.1012	834.92	0.0207	0.0270	0.0262
19 - 1	7.25	88.23	84.60	0.1024	733.10	0.0182	0.0237	0.0265
20 - 1	7.25	82.02	78.40	0.1026	630.50	0.0157	0.0204	0.0266
21 - 1	7.25	75.81	72.19	0.1026	534.72	0.0133	0.0173	0.0266
22 - 1	7.25	69.60	65.98	0.1026	446.72	0.0111	0.0144	0.0266
23 - 1	7.25	63.40	59.77	0.1026	366.61	0.0091	0.0119	0.0266
24 - 1	7.25	57.19	53.56	0.1026	294.41	0.0073	0.0095	0.0266
25 - 1	7.25	50.98	47.35	0.1026	230.11	0.0057	0.0074	0.0266
26 - 1	7.25	44.77	41.15	0.1026	173.73	0.0043	0.0056	0.0266
27 - 1	7.25	38.56	34.94	0.1026	125.26	0.0031	0.0040	0.0266
28 - 1	7.25	32.35	28.73	0.1026	84.70	0.0021	0.0027	0.0266
29 - 1	7.25	26.15	22.52	0.1026	52.05	0.0013	0.0017	0.0266
30 - 1	7.25	19.94	16.31	0.1026	27.31	0.0007	0.0009	0.0266
31 - 1	7.25	13.73	10.10	0.1026	10.48	0.0003	0.0003	0.0266
32 - 1	7.52	7.52	3.76	0.1065	1.51	0.0000	0.0000	0.0276
			Sum	2.8734	33789.42			

Discrete Loads						
Name	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
Properllor Anemometer/Wind Vane	198.49	0.0022	86.68	0.0022	0.0028	0.0006
95" Boom Mount	196.19	0.0080	307.94	0.0076	0.0100	0.0021
NRG #40C Anemometer	192.91	0.0002	7.44	0.0002	0.0002	0.0001
95" Boom Mount	190.91	0.0080	291.58	0.0072	0.0094	0.0021
NRG #40C Anemometer	192.91	0.0002	7.44	0.0002	0.0002	0.0001
95" Boom Mount	190.91	0.0080	291.58	0.0072	0.0094	0.0021
Aircraft Marker Balls (21" Dia - Orange)	180.77	0.0150	490.17	0.0122	0.0158	0.0039
Aircraft Marker Balls (21" Dia - Orange)	180.77	0.0150	490.17	0.0122	0.0158	0.0039
Aircraft Marker Balls (21" Dia - Orange)	180.77	0.0150	490.17	0.0122	0.0158	0.0039
Aircraft Marker Balls (21" Dia - Orange)	180.77	0.0150	490.17	0.0122	0.0158	0.0039
NRG 200P Wind Vane	167.32	0.0003	7.00	0.0002	0.0002	0.0001
95" Boom Mount	165.32	0.0080	218.65	0.0054	0.0071	0.0021
NRG #40C Anemometer	167.32	0.0002	5.60	0.0001	0.0002	0.0001
95" Boom Mount	165.32	0.0080	218.65	0.0054	0.0071	0.0021
Temperature Probe w/ Shield	173.89	0.0050	151.18	0.0038	0.0049	0.0013
Relative Humidty Sensor	173.89	0.0100	302.36	0.0075	0.0098	0.0026
Barometric Pressure	173.89	0.0100	302.36	0.0075	0.0098	0.0026
NRG 200P Wind Vane	160.76	0.0003	6.46	0.0002	0.0002	0.0001
95" Boom Mount	158.76	0.0080	201.64	0.0050	0.0065	0.0021
NRG 200P Wind Vane	137.80	0.0003	4.75	0.0001	0.0002	0.0001
95" Boom Mount	135.80	0.0080	147.52	0.0037	0.0048	0.0021
NRG #40C Anemometer	131.23	0.0002	3.44	0.0001	0.0001	0.0001
95" Boom Mount	129.23	0.0080	133.61	0.0033	0.0043	0.0021
NRG #40C Anemometer	131.23	0.0002	3.44	0.0001	0.0001	0.0001
95" Boom Mount	129.23	0.0080	133.61	0.0033	0.0043	0.0021
NRG #40C Anemometer	98.43	0.0002	1.94	0.0000	0.0001	0.0001
95" Boom Mount	96.43	0.0080	74.38	0.0018	0.0024	0.0021
NRG #40C Anemometer	98.43	0.0002	1.94	0.0000	0.0001	0.0001
95" Boom Mount	96.43	0.0080	74.38	0.0018	0.0024	0.0021
Temperature Probe w/ Shield	49.20	0.0050	12.10	0.0003	0.0004	0.0013
Data Logger	5.00	0.0500	1.25	0.0000	0.0000	0.0129
	Sum	0.2324	4959.61			

Linear Loads								
Name	Start Height	End Height	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
(12) miscl Cat5 From 0 to 196	188.00	196.00	192.00	0.0048	176.95	0.0044	0.0057	0.0012
(12) miscl Cat5 From 0 to 196	178.00	188.00	183.00	0.0060	200.93	0.0050	0.0065	0.0016
(12) miscl Cat5 From 0 to 196	168.00	178.00	173.00	0.0060	179.57	0.0045	0.0058	0.0016
(12) miscl Cat5 From 0 to 196	158.00	168.00	163.00	0.0060	159.41	0.0040	0.0052	0.0016
(12) miscl Cat5 From 0 to 196	148.00	158.00	153.00	0.0060	140.45	0.0035	0.0045	0.0016
(12) miscl Cat5 From 0 to 196	138.00	148.00	143.00	0.0060	122.69	0.0030	0.0040	0.0016
(12) miscl Cat5 From 0 to 196	128.00	138.00	133.00	0.0060	106.13	0.0026	0.0034	0.0016
(12) miscl Cat5 From 0 to 196	118.00	128.00	123.00	0.0060	90.77	0.0023	0.0029	0.0016
(12) miscl Cat5 From 0 to 196	108.00	118.00	113.00	0.0060	76.61	0.0019	0.0025	0.0016
(12) miscl Cat5 From 0 to 196	98.00	108.00	103.00	0.0060	63.65	0.0016	0.0021	0.0016
(12) miscl Cat5 From 0 to 196	88.00	98.00	93.00	0.0060	51.89	0.0013	0.0017	0.0016
(12) miscl Cat5 From 0 to 196	78.00	88.00	83.00	0.0060	41.33	0.0010	0.0013	0.0016
(12) miscl Cat5 From 0 to 196	68.00	78.00	73.00	0.0060	31.97	0.0008	0.0010	0.0016
(12) miscl Cat5 From 0 to 196	58.00	68.00	63.00	0.0060	23.81	0.0006	0.0008	0.0016
(12) miscl Cat5 From 0 to 196	48.00	58.00	53.00	0.0060	16.85	0.0004	0.0005	0.0016
(12) miscl Cat5 From 0 to 196	38.00	48.00	43.00	0.0060	11.09	0.0003	0.0004	0.0016
(12) miscl Cat5 From 0 to 196	28.00	38.00	33.00	0.0060	6.53	0.0002	0.0002	0.0016
(12) miscl Cat5 From 0 to 196	18.00	28.00	23.00	0.0060	3.17	0.0001	0.0001	0.0016
(12) miscl Cat5 From 0 to 196	8.00	18.00	13.00	0.0060	1.01	0.0000	0.0000	0.0016
(12) miscl Cat5 From 0 to 196	0.00	8.00	4.00	0.0048	0.08	0.0000	0.0000	0.0012
			Sum	0.1176	1504.96			

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 0 ft (NAVD 88)
Latitude: 61.473061
Longitude: -150.988809

Wind

Results:

Wind Speed	121 Vmph
10-year MRI	86 Vmph
25-year MRI	94 Vmph
50-year MRI	99 Vmph
100-year MRI	105 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Wed May 29 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.618	S_{D1} :	N/A
S_1 :	0.757	T_L :	16
F_a :	1.2	PGA :	0.661
F_v :	N/A	PGA_M :	0.794
S_{MS} :	1.941	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.294	C_v :	1.424

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Wed May 29 2024

Date Source: USGS Seismic Design Maps

Ice

Results:

Ice Thickness:	0.50 in.
Concurrent Temperature:	-15 F
Gust Speed	60 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed May 29 2024

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

APPENDIX B

EQUIPMENT DETAILS

YOUNG

Products ▾ Support ▾ Applications ▾ Contact ▾

News

Home / Wind / All Wind Products / Heavy Duty Wind Monitor-HD-Alpine

Search

Heavy Duty Wind Monitor-HD-Alpine

05108-45

The Heavy Duty Wind Monitor HD-Alpine combines the features of the HD unit along with the ice resistant coating of our popular Alpine Wind Monitor. Robust, reliable, durable . . . . all words to describe the latest addition of the YOUNG family of wind monitors developed to endure the most extreme environments.

0	WIND MONITOR-HD ALPINE 3M Cable	05108-45	$1,710.00

0	WIND MONITOR-HD ALPINE 8M Cable	05108-45-8M	$1,730.00
0	WIND MONITOR-HD ALPINE 12M Cable	05108-45-12M	$1,756.00
0	SURGE PROTECTION ASSEMBLY 6 Channel	19120	$220.00
0	WIND SENSOR INTERFACE (for use with Model 05108) 0-5 VDC Outputs (recommended cable: 18446)	05608C	$526.00
0	WIND LINE DRIVER (for use with Model 05108) 4-20 mA Outputs (recommended cable: 18723)	05638C	$572.00
0	SENSOR CABLE, 5 CONDUCTOR SHIELDED 22 AWG, Per Ft.	18446	$1.24
0	SENSOR CABLE, 2 PAIR SHIELDED 22 AWG, Per Ft.	18723	$1.02
0	SENSOR CABLE, 6 CONDUCTOR SHIELDED 22 AWG, Per Ft.	18721	$1.50

Add to cart

Quantity discounts applied during checkout. Excludes sensor cables.

Categories: **All Wind Products**, **Mechanical Wind Sensors**

Description
Specifications
Brochures & Manuals
Replacement Parts

Range:	*Wind speed: 0-100 m/s (224 mph)* *Azimuth: 360° mechanical, 355° electrical (5° open)*
Accuracy:	*Wind speed: ± 0.3 m/s (0.6 mph) or 1% of reading* *Wind direction: ± 3 degrees*
Threshold: *	*Propeller: 1.0 m/s (2.2 mph)* *Vane: 1.0 m/s (2.2 mph)*
Dynamic Response: *	*Propeller distance constant (63% recovery) 2.7 m (8.9 ft)* *Vane delay distance (50% recovery) 1.3 m (4.3 ft)* *Damping ratio: 0.3* *Damped natural wavelength: 7.4 m (24.3 ft)* *Undamped natural wavelength: 7.2 m (23.6 ft)*
Signal Output:	*Wind speed: magnetically induced AC voltage, 3 pulses per revolution. 1800 rpm (90 Hz) = 15.0 m/s (33.6 mph)* *Azimuth: analog DC voltage from conductive plastic potentiometer – resistance 10K Ω , linearity 0.25%, life expectancy – 50 million revolutions*
Power Requirement:	*Potentiometer excitation: 15 VDC maximum*
Operating Temperature:	*-50 to 60°C*
Sensor Cable:	*A water tight pigtail cable is supplied for electrical connections. Available in standard lengths of 3, 8 and 12 meters.* *For longer cable lengths a user supplied junction box or connector may be used.*
Dimensions:	*Overall height: 37 cm (14.6 in)* *Overall length: 55 cm (21.7 in)* *Propeller: 18 cm (7 in) diameter* *Mounting: 34 mm (1.34 in) diameter (standard 1 inch pipe)*
Weight:	*1.0 kg (2.2 lbs)*
Shipping Weight:	*2.3 kg (5 lbs)*
Model 05608C	*Wind Sensor Interface* *Signal outputs: 0-5.00 VDC full scale* *Power requirement: 8-24 VDC (5 mA @ 12 VDC)* *Operating temperature: -50 to 60°C*
Model 05638C:	*Wind Line Driver* *Signal outputs: 4-20 mA full scale* *Power Requirement: 12-30 VDC (40 mA max.)* *Operating Temperature: -50 to 60°C*
*	*Nominal values, determined in accordance with ASTM standard procedures.*

SPECIFICATIONS

NRG #40C Anemometer

FEATURES

- The standard anemometer used in the wind energy industry
- Short distance constant
- Simple, durable design

The NRG #40C anemometer is the industry standard anemometer used worldwide. NRG #40 anemometers have recorded wind speeds of 96 m/s (214 mph). Their low moment of inertia and unique bearings permit very rapid response to gusts and lulls. Because of their output linearity, these sensors are ideal for use with various data retrieval systems. A four pole magnet induces a sine wave voltage into a coil producing an output signal with a frequency proportional to wind speed. The #40C is constructed of rugged Lexan cups molded in one piece for repeatable performance. A protective rubber terminal boot is included.

SPECIFICATIONS

Description	Sensor type	3-cup anemometer
	Applications	• wind resource assessment • meteorological studies • environmental monitoring
	Sensor range	1 m/s to 96 m/s (2.2 mph to 214 mph) (highest recorded)
	Instrument compatibility	all NRG loggers
Output signal	Signal type	low level AC sine wave, frequency linearly proportional to windspeed
	Transfer function	m/s = (Hz x 0.765) + 0.35 [miles per hour = (Hz x 1.711) + 0.78]
	Accuracy	within 0.1 m/s (0.2 mph) for the range 5 m/s to 25 m/s (11 mph to 55 mph)
	Calibration	each anemometer individually calibrated, calibration reports provided via electronic download
	Output signal range	0 Hz to 125 Hz (highest recorded)

110 Riggs Road · Hinesburg · VT 05461 USA · TEL (802) 482-2255 · FAX (802) 482-2272 · EMAIL sales@nrgsystems.com

SPECIFICATIONS

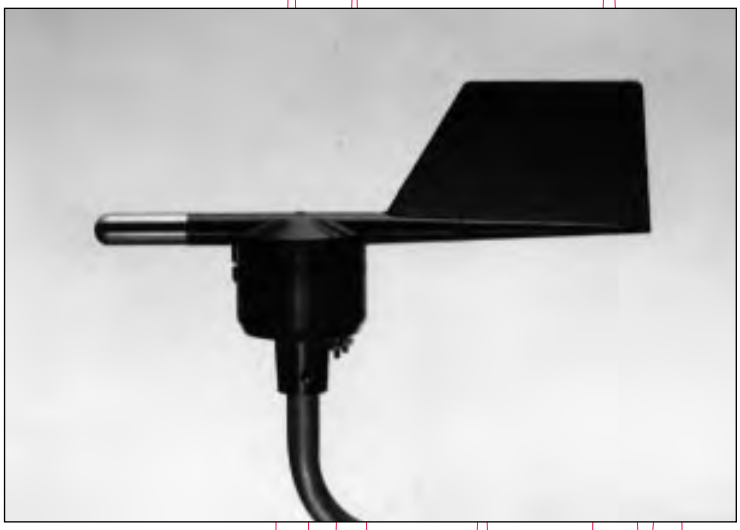
Response characteristics	Threshold	0.78 m/s (1.75 miles per hour)
	Distance constant (63% recovery)	3.0 m (10 feet)
	Moment of inertia	68 x 10^{-6} S-ft^2
	Swept diameter of rotor	190 mm (7.5 inches)
Installation	Mounting	onto a 13 mm (0.5 inch) diameter mast with cotter pin and set screw
	Tools required	0.25 inch nut driver, petroleum jelly, electrical tape
Environmental	Operating temperature range	-55 °C to 60 °C (-67 °F to 140 °F)
	Operating humidity range	0 to 100% RH
Physical	Connections	4-40 brass hex nut/post terminals
	Weight	0.14 kg (0.3 pounds)
	Dimensions	• 3 cups of conical cross-section, 51 mm (2 inches) dia. • 81 mm (3.2 inches) overall assembly height
Materials	Cups	one piece injection-molded black polycarbonate
	Body	housing is black ABS plastic
	Shaft	beryllium copper, fully hardened
	Bearing	modified Teflon, self-lubricating
	Magnet	Indox 1, 25 mm (1 inch) diameter, 13 mm (0.5 inch) long, 4 poles
	Coil	single coil, bobbin wound, 4100 turns of #40 wire, shielded for ESD protection
	Boot	protective PVC sensor terminal boot included
	Terminals	brass

200 SERIES WIND VANE

Wind Direction Sensor

NRG Systems

MEASURING THE WIND'S ENERGY



■ The 200 Series Wind Direction Vane is a professional quality sensor, originally designed for use in some of the world's largest wind power plants. Its unique qualities make it ideal for use in many other applications in environmental testing and meteorology. ■ Although moderately priced, these sensors offer a level of quality and reliability often found only at a very high premium. The thermoplastic and stainless steel components resist corrosion, and contribute to a high strength-to-weight ratio. ■ As with all NRG Systems products, the 200 Series Vane is elegantly engineered, employing a minimum number of parts while maximizing functional performance. ■ The vane is directly connected to a precision conductive plastic potentiometer located in the main body. An analog voltage output directly proportional to the wind direction is produced when a constant DC excitation voltage is applied to the potentiometer. Several different yaw vane configurations are available for wind turbine control. ■ Field proven, the #200 is the wind industry de facto standard.

NRG SYSTEMS

110 Commerce Street

Hinesburg, VT 05461 USA

(802) 482-2255

FAX (802) 482-2272

Email: sales@nrgsystems.com

200 SERIES WIND VANE
Wind Direction Sensor

APPLICATIONS
- Wind direction sensor for wind data loggers
- Yaw control on wind turbines
- Environmental monitoring instrumentation
- Meteorological studies

FEATURES
- Simple mechanical construction
- Long life, professional quality potentiometer
- No slip rings or brushes result in high reliability, low cost
- Corrosion-resistant materials
- Multiple mechanical and contact seals
- No setscrews to vibrate loose
- Very stable and smooth response to wind changes
- Fully balanced sensor vane

SPECIFICATIONS
MECHANICAL:
Range: Direction–360° mechanical, continuous rotation
Sensitivity: Approx. 1 m/s (2.2 mph)
Materials:
Direction vane and housing–black UV stabilized injection molded plastic
Balance weight–stainless steel
Terminals–three #4-40 solid brass studs with nuts
Potentiometer–stainless steel shaft in two shielded precision grade, stainless steel ball bearings, conductive plastic potentiometer element mounted in a machined aluminum housing
Hardware–all stainless steel construction
Dimensions:
Overall length–21cm (8.3")
Swept diameter–27cm (10.5")
Overall height–12cm (4.3")
Vane size–6cm high x 10cm long (2.3" x 3.8")
Main housing diameter–5cm (2")
Mounting–13mm (0.5") diameter mast with cotter pin and mast set screw
Weight: 0.1kg (0.25 lb)
Shipping Weight: 0.5kg (1 lb)
ELECTRICAL:
Range:
Direction– #200: 340° elecrical (20° open); #200P: 352° electrical (8° open)
Signal:
Analog DC voltage from conductive plastic potentiometer 1K(#200), 10K(#200P); linearity 1.0%, life expectancy of 50 million revolutions (2-6 years normal operation)
Power Requirements:
Regulated potentiometer excitation of 1 to 15 VDC

#200YZ YAW CONTROL WIND VANE
The #200YZ Vane is built with standard #200 Series vane and body with an opto-interrupter type switching system. This yaw control sensor has an open collector, sinking output. Switch points are +/- 10° right or left. Also will control wind turbine yaw at 90° out of the wind.

SPECIFICATIONS MAY CHANGE WITHOUT NOTICE.

ORDERING INFORMATION:

Wind Direction Vane–1K	Cat. No. 200
Precision Wind Direction Vane–10K	Cat. No. 200P

NRG Systems

MEASURING THE WIND'S ENERGY

110 Commerce Street
Hinesburg, VT 05461 USA
(802) 482-2255
FAX (802) 482-2272
Email: sales@nrgsystems.com

Barometric Pressure Sensors

090D
091

Barometric Pressure Sensors convert absolute atmospheric pressure into a linear, proportional voltage, which may be used in any meteorological program.

Features

- Compact size
- Weatherproof enclosure
- Remote output
- Permanent calibration
- Robust construction

These sensors are inherently stable devices that do not require periodic service or routine recalibration.

Operation

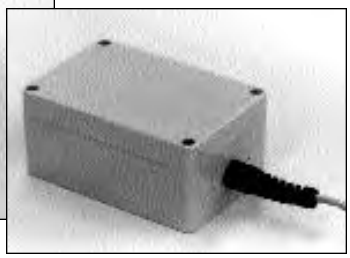
The enclosure houses a solid-state pressure transducer, with linearization and amplification electronics.

The Model 090D is housed in a heavy duty fiberglass enclosure, suitable for harsh and severe environments. A hose barb is provided to enable the connection of a 1/4" sampling tube to the outside environment.

The Model 091 is contained within a small polycarbonate enclosure, and may be mounted outside or inside a building or other enclosure. Small inlet holes allow the atmospheric pressure access to the sensing element.

The standard range of the 090D/ 091 is 26-32 in. Hg,* suitable for elevations sea level to 1500 ft. Other ranges are available.

090D



091

Specifications

Performance

Resolution:	Infinite
Temp. Operating Range:	-40°C to 65°C
Temp. Compensated Range:	-18°C to 65°C
Accuracy:	±0.04 in Hg (±1.35 mbar) or ±0.125% FS

Electrical Characteristics

Power Requirement:	11 mA @ 12 VDC, Typical
Sensor Output:	0-1 VDC, Standard 0-5 VDC, Optional

Physical Characteristics

090D	Weight:	2 lbs, 5 oz (1.05 Kg)
	Dimensions:	5.5 x 5 x 7.5 in (14 x 12 x 19 cm)
091	Weight:	8.8 oz. (250 g)
	Dimensions:	2.1 x 3.2 x 5 in (5.4 x 8.3 x 13 cm)

Ordering Information

	Specify elevation
	Specify output voltage
Cable:	#1169-xx (xx = length in feet)
	Specify length in feet

Specifications subject to change without notice.
*Conversions: 1 in. Hg = 3.3864 kPa, 1 in. Hg = 33.864 mbar, 1 in. Hg = 25.4 mm/Hg

Met One Instruments, Inc.
Corporate Sales & Service: 1600 Washington Blvd., Grants Pass, OR 97526, Phone (541) 471-7111, Fax (541) 471-7116
Distribution & Service: 3206 Main Street, Suite 106, Rowlett, TX 75088, Phone (972) 412-4747, Fax (972) 412-4716
http://www.metone.com

107 and 108
Temperature Probes

CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

The 107 and 108 are rugged, accurate probes that measure air, soil, and water temperature in a variety of applications. These probes consist of a thermistor encapsulated in an epoxy-filled aluminum housing. The housing protects the thermistor allowing the probes to be buried or submerged. The 107 measures from -35° to +50°C, the 108 from -5° to +95°C.

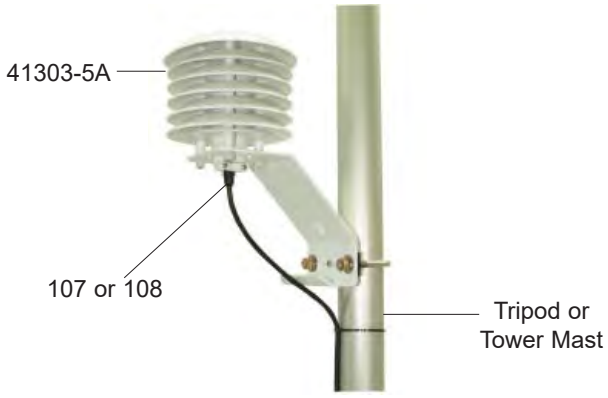
Please note that the 107 and 108 are not compatible with the CR200(X)-series dataloggers. However, a similar thermistor, the 109, has been developed specifically for our CR200(X)-series dataloggers.

Each 107 or 108 probe requires one single-ended channel for measurement.

Installation

Air Temperature

When exposed to sunlight, the 107 and 108 probes should be housed in a 41303-5A 6-plate Gill Radiation Shield. The 41303-5A's louvered construction allows air to pass freely through the shield thereby keeping the probe at or near ambient temperature. The shield's white color reflects solar radiation. The 41303-5A attaches to a crossarm, mast, or user-supplied pipe with a 1.0-in. to 2.1-in. outer diameter.



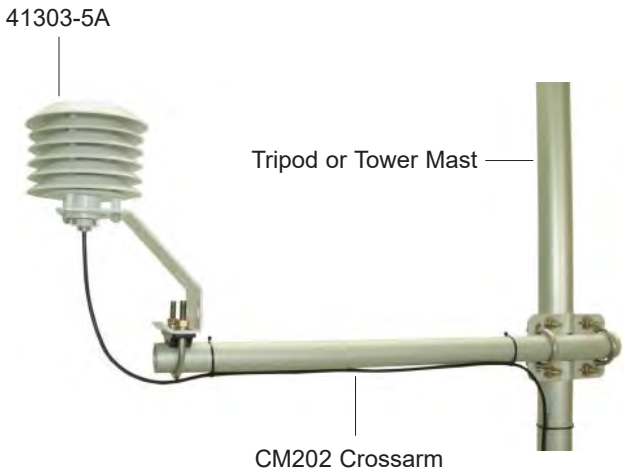
Above is a probe housed in the 41303-5A radiation shield. The U-bolt is placed in the holes on the side of the bracket to allow the 41303-5A to be attached to a mast or vertical pole.

Water Temperature

The probes can be submerged to 50 feet (21 psi). Please note that neither the 107 nor 108 is weighted. Therefore, the installer should either add a weighting system or secure the probe to a fixed, submerged object, such as a piling.

Soil Temperature

The 107 and 108 are suitable for shallow burial only. Placement of the probe's cable inside a rugged conduit may be advisable for long cable runs—especially in locations subject to digging, mowing, traffic, use of power tools, or lightning strikes.



To attach the 41303-5A to a CM202, CM204, or CM206 crossarm, place the 41303-5A's U-bolt in the bottom holes.

Recommended Cable Lengths for Air Temperature Measurements

2-m Height		Atop a tripod or tower via a 2-ft crossarm such as the CM202								
Mast/Leg	**CM202**	**CM6**	**CM106**	**CM10**	**CM110**	**CM115**	**CM120**	**UT10**	**UT20**	**UT30**
9 ft	11 ft	11 ft	14 ft	14 ft	14 ft	19 ft	24 ft	14 ft	24 ft	37 ft

Note: Add two feet to the cable length if mounting the enclosure to the leg base of a CM106, CM110, CM115, or CM120 tripod.

Ordering Information

Temperature Probes

107-L Temperature Probe (-35° to +50°C) with a user-specified cable length; enter the cable length (in feet) after the -L. Recommended cable length is shown above. Must choose a cable termination option (see below).

108-L Temperature Probe (-5° to +95°C) with a user-specified cable length; enter the cable length (in feet) after the -L. Recommended cable length is shown above. Must choose a cable termination option (see below).

Cable Termination Options (choose one)

-PT Cable terminates in stripped and tinned leads for direct connection to a datalogger's terminals.

-PW Cable terminates in connector for attachment to a prewired enclosure.

Solar Radiation Shield for Air Temperature Measurements

41303-5A 6-Plate Gill Radiation Shield that houses a 107 or 108 for air temperature measurements.

Specifications

Sensor: BetaTherm 100K6A1B Thermistor

Tolerance
- **107:** ±0.2°C over 0° to 50°C range
- **108:** ±0.2°C over 0° to 70°C range

Temperature Measurement Range
- **107:** -35° to +50°C
- **108:** -5° to +95°C

Steinhart-Hart Equation Error (CRBasic loggers only): ≤±0.01°C over measurement range

Polynomial Linearization Error (Edlog loggers only)
- **107:** Typically <±0.5°C over measurement range
- **108:** Typically <±0.5°C over -5° to +90°C range

Time Constant in Air: 30 to 60 seconds in a wind speed of 5 m sec^{-1}

Maximum Cable Length: 1000 ft (305 m)

Probe Length: 4.1 in. (10.4 cm)

Probe Diameter: 0.3 in. (0.762 cm)

Weight with 10-ft cable: 5 oz (136 g)

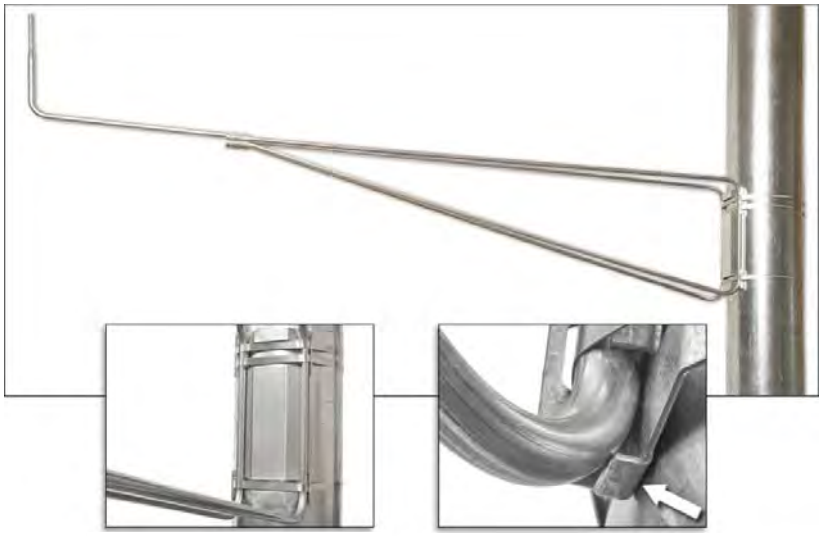
SPECIFICATIONS

NRG Side Mount Boom, 2.4 m (95")

Made of galvanized steel, the 2.4 m (95”) side mount boom resists corrosion and is designed to securely mount NRG sensors away from NRG TallTowers to minimize tower shadowing effects.

FEATURES

- For use with NRG #40C or NRG #200P sensors
- Easy to assemble
- Robust, dual-beam support structure
- Mounting bracket tabs assure proper boom installation
- Self-aligning mounting bracket assures secure, 90-degree vertical orientation
- Meets or exceeds industry IEC 61400-12-1 recommendations for tower and boom offset distances
  - » *Horizontal mast offset:* 12.38D on 8” tube; 10D on 10” tube [1]
  - » *Vertical boom offset:* 20D above boom for an NRG #40C anemometer, exceeding IEC 61400-12-1 minimum recommendation of 15D [2]



Self-orienting mounting bracket *Mounting bracket tab*

SPECIFICATIONS

Description	Boom type	Sensor mounting boom for standard NRG sensors on NRG TallTowers 8" or 10" diameter
	Applications	Wind resource assessment; for mounting NRG #40C anemometer or NRG #200P wind direction vane on NRG TallTowers
	Sensor compatibility	• NRG #40C anemometer • NRG #200P wind direction vane
	Tower compatibility	NRG TallTowers with 8" or 10" diameter tubing sections
Installation	Mounting	• Mounting bracket attaches to tower with three heavy-duty, stainless steel hose clamps • Sensor mounts to boom with set screw and cotter pin
	Tools required	• 5/16 inch hex driver or flat blade (-) screwdriver for hose clamps • Phillips head (+) screwdriver to mount sensor
	Recommended for installation	• Electric drill with 5/16 nut driver bit for tightening hose clamps • Sheet metal shears or similar for trimming hose clamps
Environmental	Lifespan	2 years +
Physical	Weight	3.6 kg (8 lbs)
	Boom diameter	15.875 mm (0.625 inch) dual beam support at mounting bracket location 19.05 mm (0.75 inch) at boom extension sleeve 12.7 mm (0.50 inch) at sensor mount location
	Offset distance	2.4 m (95 inches)
	Offset height	381 mm (15.0 inches)
Materials	Boom	15.8 mm (0.625 inch) galvanized steel tube
	Mounting bracket	Galvanized steel
Shipping	Shipping weight	3.8 kg (8.4 lbs) for one boom in one box

Note:

[1] Horizontal offset value, D refers to diameter of the tube tower. Per IEC 61400-12-1 horizontal mast offset is defined as the boom distance from the center of a tubular mast divided by the mast diameter (R/d).

[2] Vertical offset value, D refers to the diameter of the mounting boom tube directly below the sensor. Per IEC 61400-12-1 vertical boom offset is defined as the distance from top of the mounting boom tube to the centerline of anemometer cup rotor.

High Visibility Cable Balls

Introduction

These instructions will assist you in installing high visibility cable balls on TallTower guy wires. The items included are:

- 8 orange plastic cable ball ½ (part number 3814)
- 24 bolts, truss-head #10-32x5/8, stainless steel (part number 3842)
- 48 washers, stainless steel (part number 3843)
- 24 nuts, #10-32 stainless steel Nylock (part number 3844)
- 1/4″ cable kit
    - 4 short wire rope cables ¼″, 26 inches long (part number 1513) [*compatible with 3/16″ or ¼″ guy wires*]
    - 8 wire rope clips for ¼″ cable (part number 1596)

The tools required are:
(1) #2 Phillips head (+) screwdriver
(1) 3/8 inch nut driver or socket
(1) 1/2 inch nut driver or socket

Installing the Cable Balls

Balls should be installed on each guy wire 3 m (10 feet) below the guy ring on the top set of guy wires. An additional set of balls can be installed lower on the same guy wires at least 3 m (10 feet) above highest point vegetation is likely to reach.

Place one half of a cable ball (part number 3814) in position with the TallTower guy wire cable running through the two grooves molded into the plastic to accept the cable.

Position the short wire rope cable next to the tower guy wire cable (marked with white tape in the photo below) in the grooves. Electrical tape may be used to hold this cable in place (as shown in photo 1).

PHOTO 1

PHOTO 2

Position the top half of the ball over the two cables (photo 2).

Install the bolts, washers and locknuts to secure the plastic pieces together (photo 3). Use a washer under the head of each bolt and another under each locknut. Tighten only enough to secure the plastic pieces together. Avoid over-tightening because this will crack the plastic.

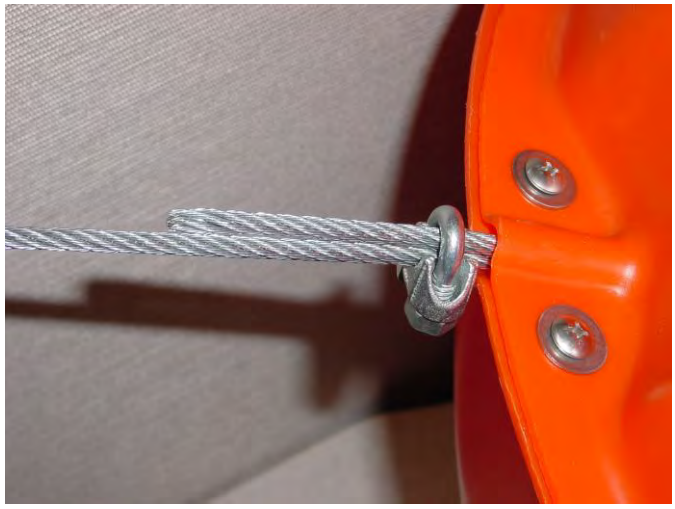


PHOTO 3

Place the u-bolt part of the wire rope clip over the 'dead' cable (the short wire rope cable). Place the saddle part of the wire rope clip over the 'live' cable (the TallTower guy wire cable) and tighten nuts. If you installed the wire rope clip correctly, the nuts will be on the same side as the TallTower guy wire cable (Photo 3). Pull the short cable tight and install another wire rope clip on the other side of the ball as described above.

CAUTION: Incorrect installation of the wire rope clip can severely weaken the cable and cause premature cable failure.

APPENDIX C

TYPICAL GUY ANCHORS AND TOWER BASE PLATE DETAIL

Appendix B: Anchoring Guidelines

B.1 DETERMINE SITE SOIL AND ANCHOR TYPE BEFORE YOU ORDER YOUR TOWER

Per ANSI/TIA-222-G, for design purposes, one can assume Class 6 soils. However, the Standard requires that soil parameters and assumptions be validated prior to installing the tower.

Before your tower is ordered, determine the soil type, preferably through soil sampling. Order the correct anchors based on the results of the soil sample.

The purpose of this section is to give you the information needed to provide suitable anchoring for your Super 60 m XHD TallTower. **Because anchor requirements are site specific, it is the responsibility of the customer to determine suitable anchors. If you are not sure what is required, seek professional guidance.**

Local utility companies can often provide useful information regarding anchoring used in the site area. Do not use rebar anchors, especially when the surface soils are loose or wet.

Table B-1: Soil Classes

Class	Common Soil Types	Geological Soil Classification
3	Dense clays, sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone
4	Medium dense sandy gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls
5	Medium dense coarse sand and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils
6	Loose to medium dense fine to coarse sand; firm to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils
7**	Loose fine sand; Alluvium; loess; soil-firm clays; varied clays; fill	Flood plain soils; lake clays; adobe; gumbo; fill

** In class 7 soils, it is advisable to place anchors deep enough to penetrate underlying class 5 or 6 soil.
Charts reproduced by permission, The A.B. Chance Company.

B.2 ANCHOR CHOICES AND OTHER CONSIDERATIONS

The choice of anchors must take into consideration soil type, maximum winds expected, icing or other weather that may affect the tower, and a safety factor suitable for the location and to meet any legal requirements. Considerations include but are not limited to: tornadoes, hurricanes or typhoons, locations where very high winds are expected, potential for flooding or periodic soaking of the soil, soil erosion, and icing events.

B.3 Screw-In Anchor Description

Screw-in anchors are the most commonly used anchors for normal clay soils without rocks. The 8 inch single helix anchors are installed by hand, using a cross bar to screw them into the earth like a corkscrew. The 8 inch twin helix anchors require machinery.

The Super 60 m XHD tower employs two (2), 8 inch diameter screw-in anchors and sixteen (12), 8 inch twin helix anchors.

Table B-2: Specifications for 203 mm (8 inches) diameter Screw-In Anchors

Length Overall:	**203 mm (8 inches) Anchor**
Helix diameter:	203 mm (8.0 inches)
Length Overall:	1.65 m (66 inches)
Rod diameter:	25 mm (1 inch)
Material:	Galvanized steel
Holding Power: (These anchors are not suitable for soils denser than class 5.)	
Class 5 soils *	44.5 kN (10000 pounds)
Class 6 soils *	31.1 kN (7000 pounds)
Class 7 soils **	17.8 kN (4000 pounds)

* See Table for soil class descriptions

** In class 7 soils, it is advisable to place anchors deep enough to penetrate underlying class 5 or 6 soil.

Table B-3: Specifications for Mid-Strength 203 mm (8 inches) diameter Twin Helix

Length Overall:	2.7 m (9 feet) (including 7 foot rod)
Helix Diameter:	203 mm (8.0 inches)
Materials:	TBD
Holding Power:	
Class 3 soils *	12700 kg (28000 pounds)
Class 4 soils *	10900 kg (24000 pounds)
Class 5 soils *	9090 kg (20000 pounds)
Class 6 soils *	6800 kg (15000 pounds)
Class 7 soils *	5450 kg (12000 pounds)

* See Table 13 for soil class descriptions

** In class 7 soils, it is advisable to place anchors deep enough to penetrate underlying class 5 or 6 soil.

Products > Anchors - Utility > Manta Ray® Earth Anchor

MANTA RAY® EARTH ANCHOR

The Manta Ray Utility Anchor System is used by utilities worldwide. Manta Rays are driven into the ground using a jackhammer, not augured or torqued. No excavation is necessary. The anchors are driven with conventional hydraulic equipment that is readily available.

Description

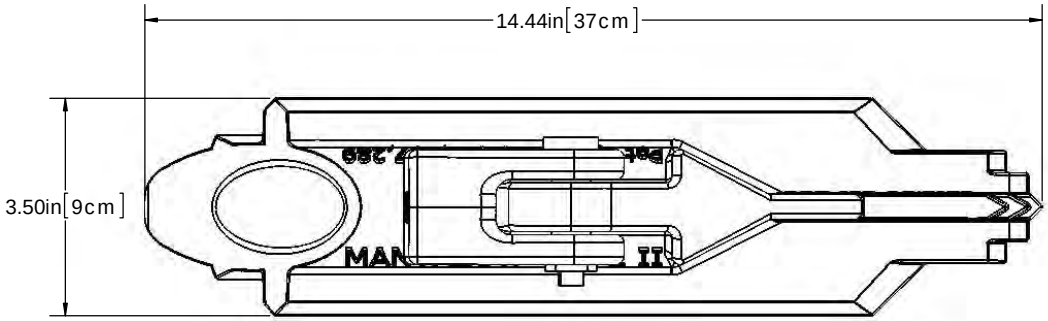
Manta Ray Anchors are RUS approved, rugged and versatile driven plate anchors for all types of soil conditions. They can be installed in extremely tough soils such as caliche, decomposed rock, glacial till, and permafrost. Larger models are also available for swamp application. Fully portable installation equipment which can fit in the back of a standard pickup truck can be used to access difficult to reach anchor locations. They can also be installed using the line truck's hydraulic system. Every anchor is proof tested during standard installation procedures for a verified tension load measurement. Manta Ray anchors are compatible with standard power hub anchor rods and eyenuts for distribution guy anchors.

Links & PDFs

Manta Ray Anchors

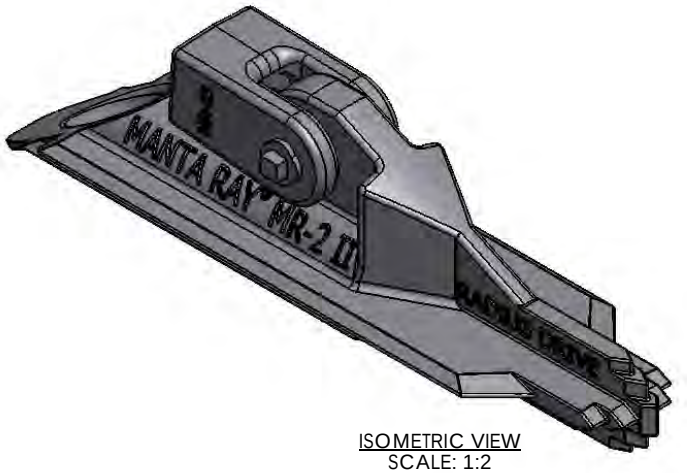
Catalog Number	Model	For PH Rod Size	Ultimate Load Rating (lbs)	Weight (lbs)
20036-UT-II	MR-1	D75 (3/4") or D100 (1")	23,000 or 36,000	13
20199-UT-II	MR-2	D75 (3/4") or D100 (1")	23,000 or 36,000	11
20210-UT-II	MR-3	D62 (5/8")	16,000	7
20229-UT-II	MR-SR	D75 (3/4") or D100 (1")	23,000 or 36,000	21

PAPER SIZE	CATALOG NUMBER
B	20199-UT-II

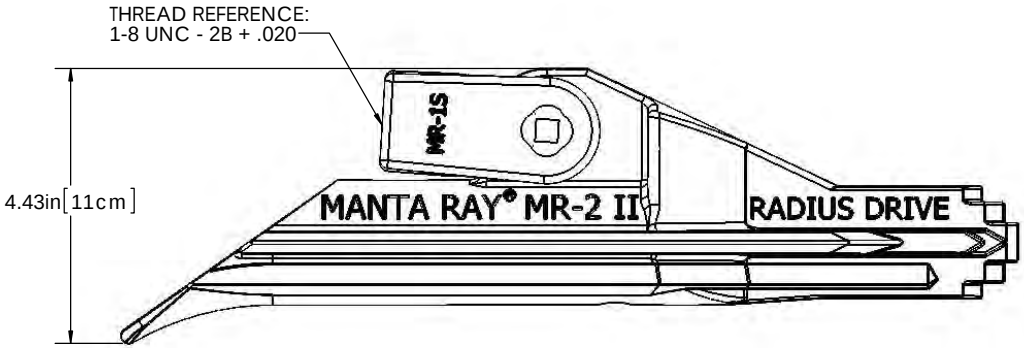


NOTES: UNLESS OTHERWISE SPECIFIED:

1) MECHANICAL ULTIMATE CAPACITY: 40,000 LBS [177.9kN]
2) MAXIMUM WORKING LOAD: UP TO 27,000 LBS [120.1 kN]
   (THIS VALUE IS SOIL AND ANCHOR ROD DEPENDANT)
3) AVERAGE WEIGHT: 10.2 LBS [4.6 kg]
4) FINISH: HOT DIP GALVANIZED



ISOMETRIC VIEW
SCALE: 1:2



ODA
OUTSIDE DISTRIBUTION APPROVED: NON-PRODUCTION DRAWING

MACLEAN POWER SYSTEMS
www.macleanpower.com

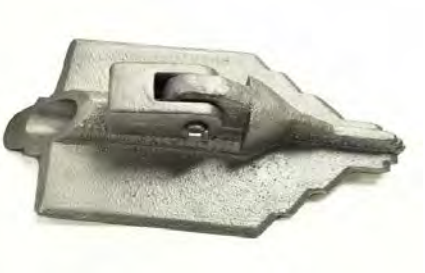
DRAWING NUMBER:	20199-UT-II
SHEET NAME: SHEET1	1 OF 1
PRODUCT DESCRIPTION	MR-2-1"-UTILITY-II ANCHOR/SHACKLE ASSEMBLY
DRAWN BY: JFD	DATE: 03/06/13

MACLEAN POWER SYSTEMS

Product Information Bulletin

#068-0
02-28-13

MANTA RAY® EARTH ANCHOR SYSTEMS



Manta Ray® anchor load ultimate tension capacity with 5/8" (16,000 lb-force), ¾" (23,000 lb-force) and 1" (36,000 lb-force) power hub anchor rods.

Manta Ray anchor ultimate load capacity with power hub anchor rods (lbs-force)

Soil Description	Standard Penetrometer Blow Count (N)	MR-1 (3/4" or 1" rod)	MR-2 (3/4" or 1" rod)	MR-3 (5/8" rod)	MR-SR (3/4" or 1" rod)
Very dense/cemented sands; coarse gravel and cobbles	60-100+	36,000 (1)	36,000 (1)	16,000 (1)	NA
Dense fine compacted sands, very hard silts or clays	45-60	36,000 (1)	28,000 (2)	16,000 (1)	36,000 (1)
Dense clays, sands and gravels, hard silts and clays	35-40	36,000 (1)	22,000 (2)	16,000 (1)	36,000 (1)
Medium dense sandy gravel, stiff to hard silts and clays	24-40	20,000 (2)	18,000 (2)	14,000 (2)	34,000 (2)
Medium dense coarse sandy gravel, stiff to very still silts and clays	14-25	20,000 (2)	12,000 (2)	9,000 (2)	24,000 (2)
Loose to medium dense fine to coarse sand: firm to stiff clays and silts	7-14	15,000 (2)	10,000 (2)	8,000 (2)	18,000 (2)
Loose fine sand, alluvium, soft clays, fine saturated silty sand	4-8	12,000 (2)	8,000 (2)	5,000 (2)	14,000 (2)
Peat, organic silts: inundates silts fly ash	0-5	8,000 (2)	5,000 (2)	2,000 (2)	12,000 (2)

Notes: (1) Manta Ray anchor holding capacity limited by rod tension strength rating
(2) Manta Ray anchor holding capacity limited by soil capacity

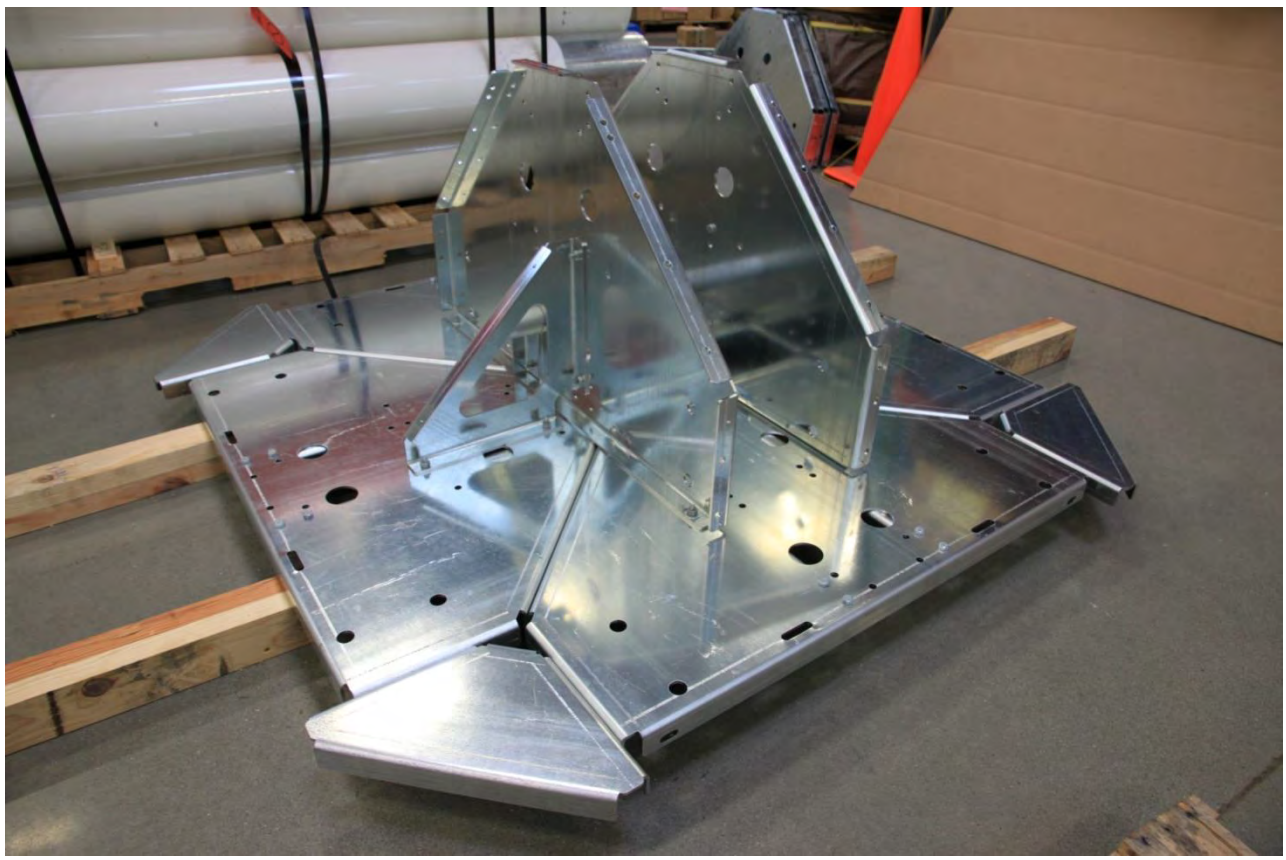
Manta Ray® anchor load ultimate tension capacity with 5/8" (71.2 kn), ¾" (102.3 kn) and 1" (160.1 kn) power hub anchor rods.

Manta Ray anchor ultimate load capacity with power hub anchor rods (kn)					
Soil Description	Standard Penetrometer Blow Count (N)	MR-1 kn	MR-2 kn	MR-3 kn	MR-SR kn
Very dense/cemented sands; coarse gravel and cobbles	60-100+	160.1 (1)	160.1 (1)	71.2 (1)	NA
Dense fine compacted sands, very hard silts or clays	45-60	160.1 (1)	124.6 (2)	71.2 (1)	160.1 (1)
Dense clays, sands and gravels, hard silts and clays	35-40	160.1 (1))	97.9 (2)	71.2 (1)	160.1 (1)
Medium dense sandy gravel, stiff to hard silts and clays	24-40	89 (2)	80.1 (2)	62.3 (2)	151.2 (2)
Medium dense coarse sandy gravel, stiff to very still silts and clays	14-25	89 (2)	53.4 (2)	40.0 (2)	106.8 (2)
Loose to medium dense fine to coarse sand: firm to stiff clays and silts	7-14	66.7 (2)	44.5 (2)	35.6 (2)	80.1 (2)
Loose fine sand, alluvium, soft clays, fine saturated silty sand	4-8	53.4 (2)	35.6 (2)	22.2 (2)	62.3 (2)
Peat, organic silts: inundates silts fly ash	0-5	35.6 (2)	22.2 (2)	8.9 (2)	53.4 (2)

Notes: (1) Manta Ray anchor holding capacity limited by rod tension strength rating
(2) Manta Ray anchor holding capacity limited by soil capacity

Appendix G: ANSI/TIA-222-G Foundation Considerations

Baseplate Geometry (with ground surface area of 19.5 ft^2)



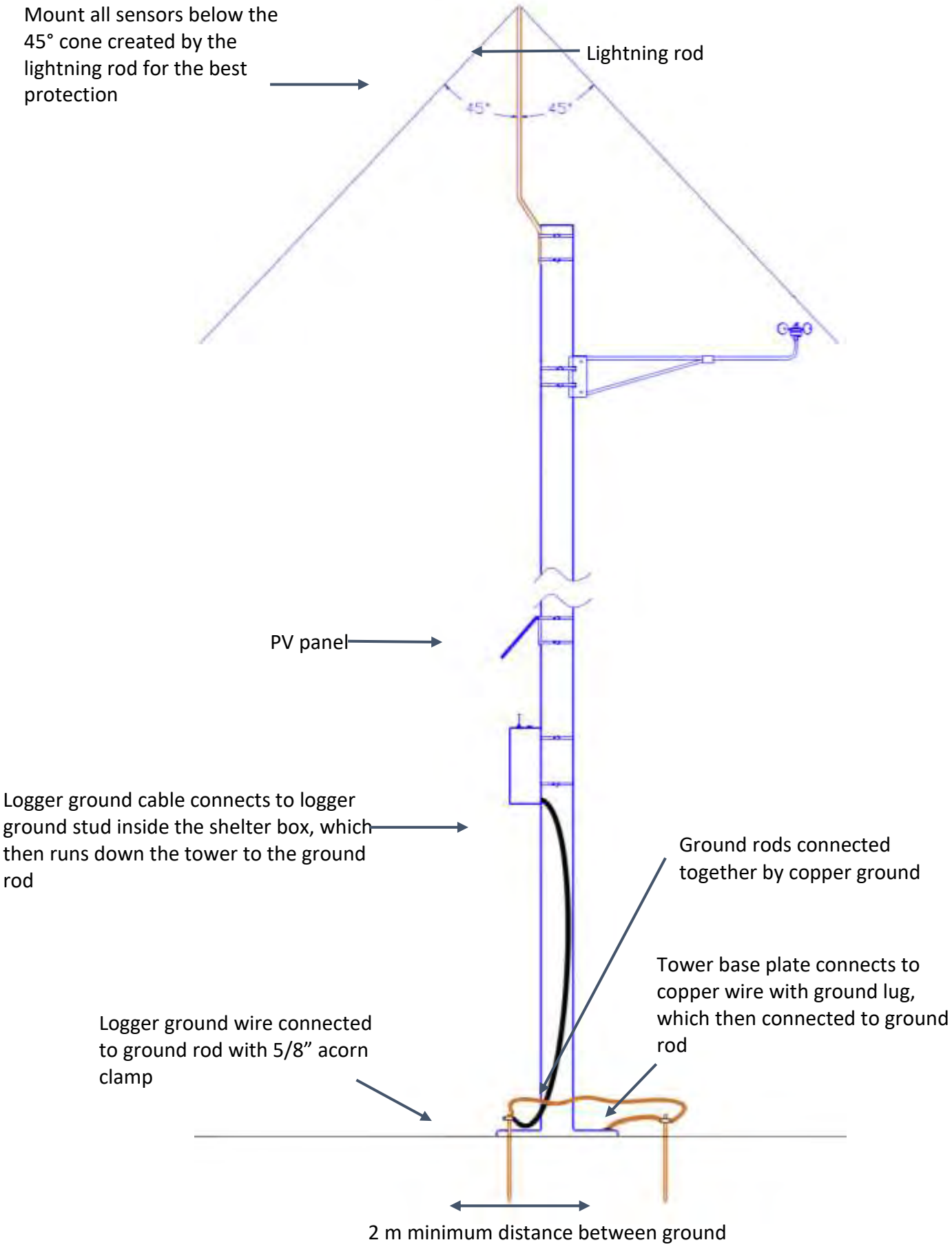
Picture H-1: Baseplate

Per
ANSI/TIA-222-G, for design purposes, one can assume Class 6 (Clay) soils. However, the Standard requires that soil parameters and assumptions be validated prior to installing the tower. Prior to tower installation, determine the soil type, preferably through soil sampling.

The baseplate cross-sectional area is 19.5 ft^2. The cross-sectional area was sized to ensure the factored resistance of Clay soil is greater than the reactions from the factored load combinations listed in section 2.3.2 of ANSI/TIA-222-G. The presumptive soil parameters per ANSI/TIA-222-G assume dry soil conditions. If your soil can develop a significant ice lens (due to poor soil drainage) during freezing, it may be necessary to provide a foundation to ensure adequate bearing strength. Foundation details must be approved for the specific application and site by a qualified professional.

APPENDIX D

TOWER GROUNDING AND TOWER DETAILS

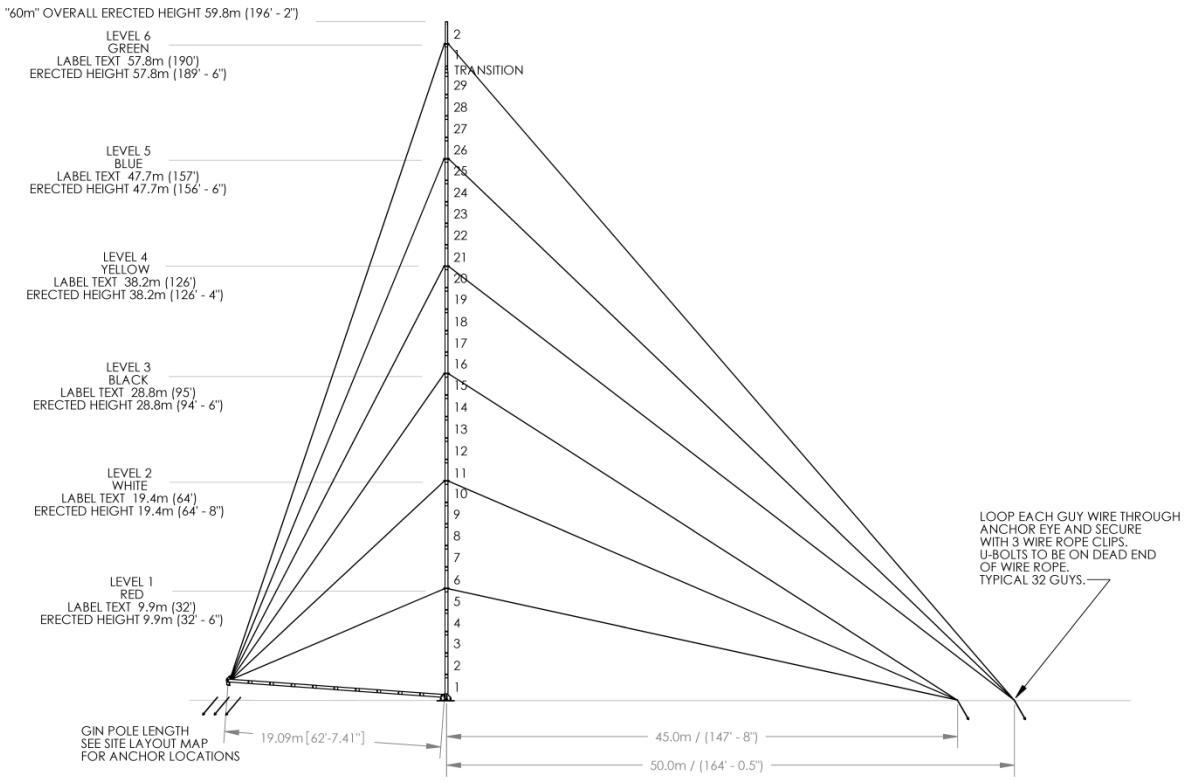

Mount all sensors below the 45° cone created by the lightning rod for the best protection
Lightning rod
45°
45°
PV panel
Logger ground cable connects to logger ground stud inside the shelter box, which then runs down the tower to the ground rod
Ground rods connected together by copper ground
Tower base plate connects to copper wire with ground lug, which then connected to ground rod
Logger ground wire connected to ground rod with 5/8” acorn clamp
2 m minimum distance between ground

Appendix A: Super 60 m XHD TallTower with Standard Footprint Tower Layout

TUBE SPECS (in order of assmbly):

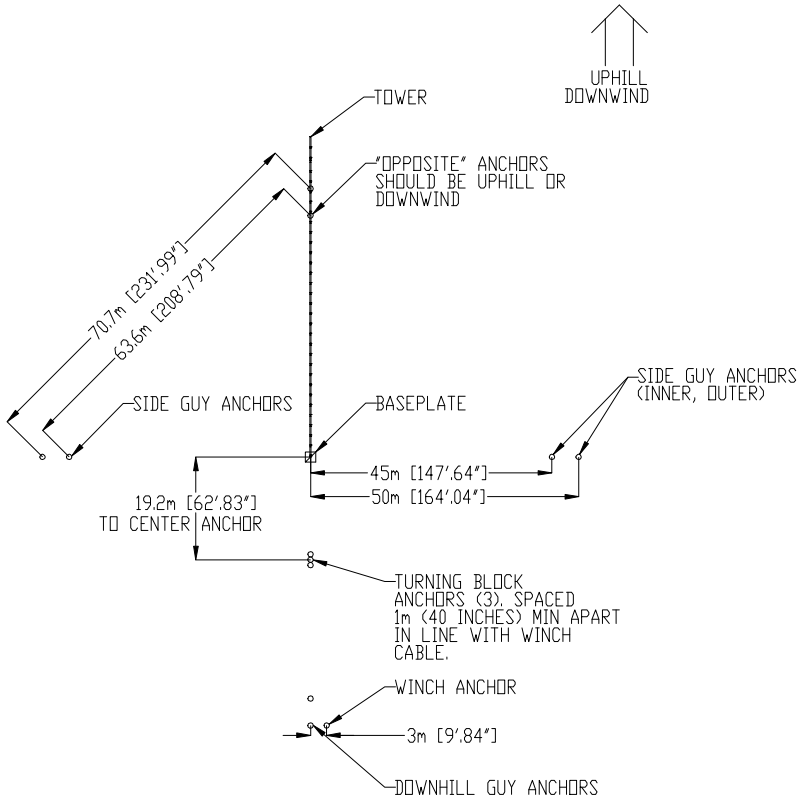
Tower:
Base Tube (with pivot pin hole) 10" Ø x 87"L (1 tube)
Plain Tubes 10" Ø x 87"L (28 tubes)
10" - 8" Transition, 36"L
Plain Tubes 8" Ø x 87"L (2 tubes)

Gin Pole:
Base Tube (with pivot pin hole) 10" Ø x 87"L (1 tube)
Plain Tubes 10" Ø x 87"L (8 tubes)
Top Tube 10" Ø x 87"L (1 tube)



Picture A-1: Super 60 m XHD TallTower Layout

SITE LAYOUT



Picture A-2: Super 60m Site Layout

APPENDIX E

PROPOSED MET TOWER SITE LOCATION MAP

Federal Aviation Administration

« OE/AAA

The FAA is currently experiencing delays in processing off-airport aeronautical studies. These delays are currently resulting in an approximate 15 additional days in processing time. The FAA will continue to work aeronautical studies on a first come, first served basis. Please take this possible delay into consideration when determining when to submit your case. If your submitted aeronautical study requires priority and 60 days has elapsed since submission, please contact the OEG Specialist for your state with the rationale for your request and it will be reviewed for escalation. The issue causing these delays is actively being mitigated and is expected to be resolved around August.

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

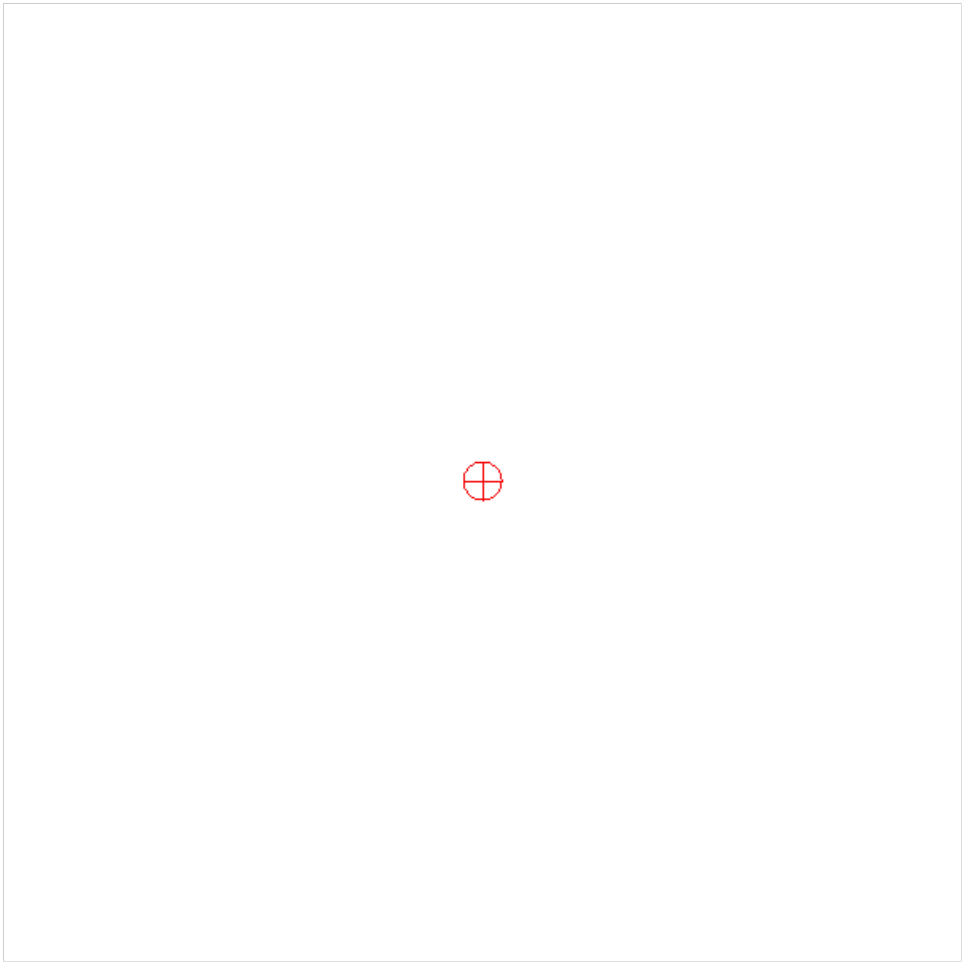
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	TOWER | Met Tower Please select structure type and complete location point information.
Latitude:	61 Deg 28 M 23.02 S N
Longitude:	150 Deg 59 M 19.71 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	2466 (nearest foot)
Structure Height :	199 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.



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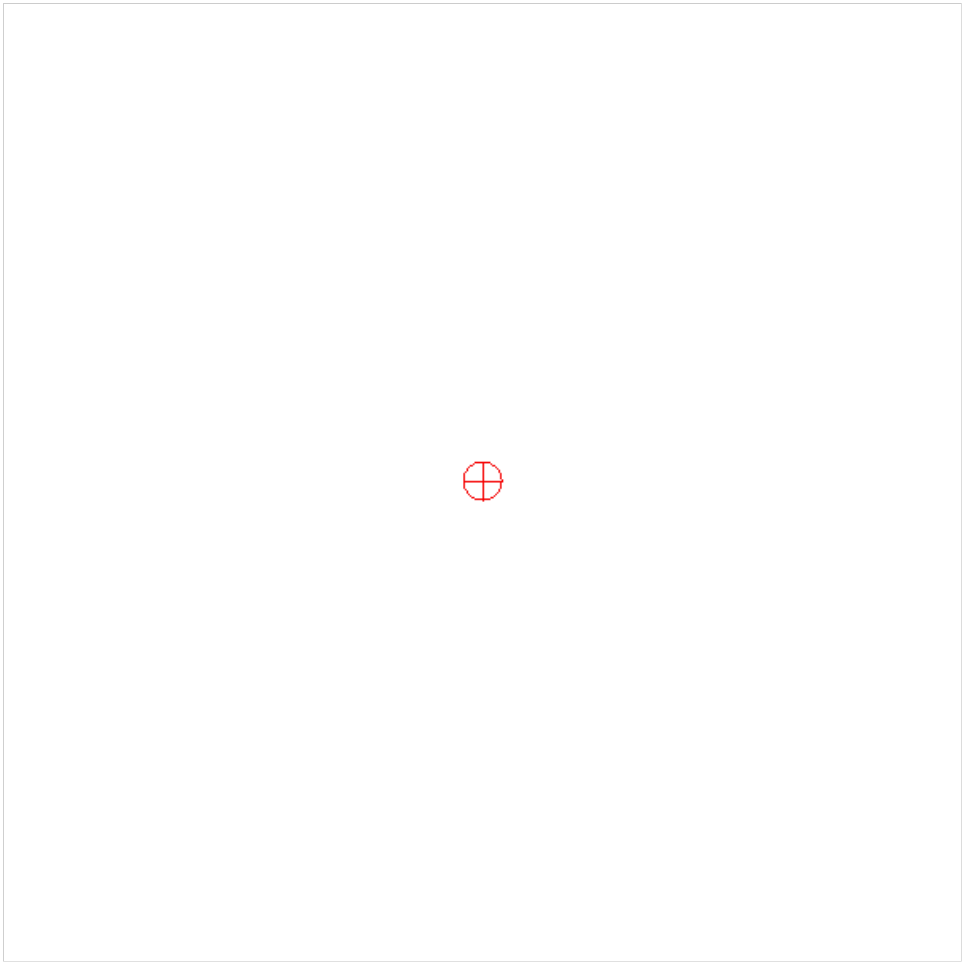
The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	TOWER | Met Tower Please select structure type and complete location point information.
Latitude:	61 Deg 28 M 36.13 S N
Longitude:	150 Deg 53 M 45.26 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	2200 (nearest foot)
Structure Height :	199 (nearest foot)
Is structure on airport:	(•) No ( ) Yes

Results

You do not exceed Notice Criteria.



Federal Aviation Administration

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« OE/AAA

Notice Criteria Tool

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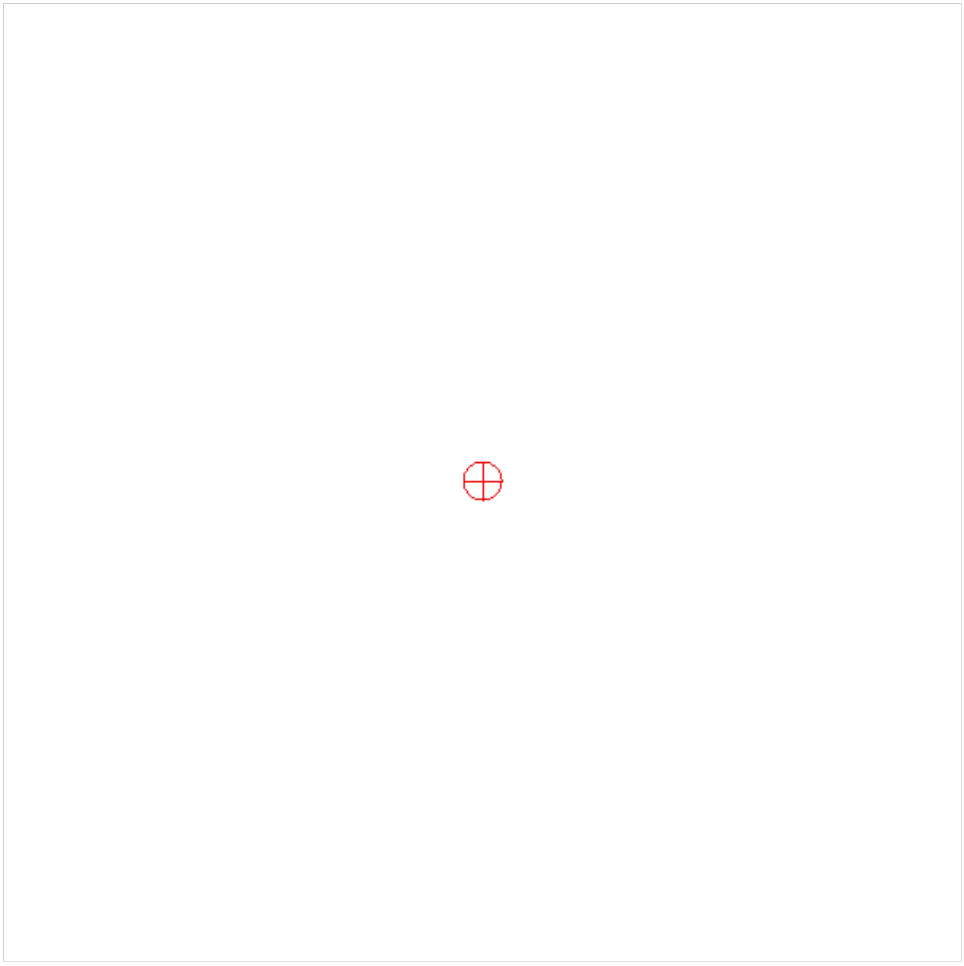
The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	TOWER | Met Tower Please select structure type and complete location point information.
Latitude:	61 Deg 26 M 40.70 S N
Longitude:	150 Deg 55 M 40.32 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	2339 (nearest foot)
Structure Height :	199 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.



Federal Aviation Administration

The FAA is currently experiencing delays in processing off-airport aeronautical studies. These delays are currently resulting in an approximate 15 additional days in processing time. The FAA will continue to work aeronautical studies on a first come, first served basis. Please take this possible delay into consideration when determining when to submit your case. If your submitted aeronautical study requires priority and 60 days has elapsed since submission, please contact the OEG Specialist for your state with the rationale for your request and it will be reviewed for escalation. The issue causing these delays is actively being mitigated and is expected to be resolved around August.

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

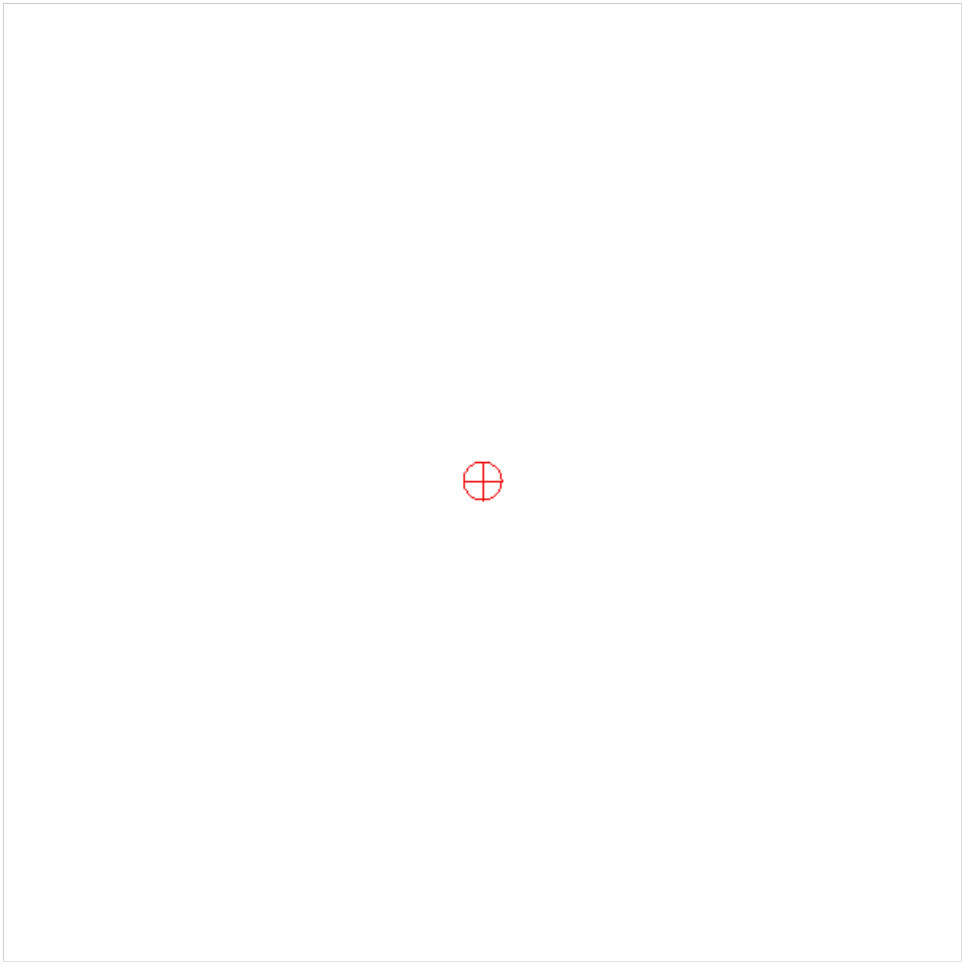
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	TOWER | Met Tower Please select structure type and complete location point information.
Latitude:	61 Deg 25 M 45.74 S N
Longitude:	150 Deg 54 M 03.16 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	1934 (nearest foot)
Structure Height :	199 (nearest foot)
Is structure on airport:	(•) No ( ) Yes

Results

You do not exceed Notice Criteria.



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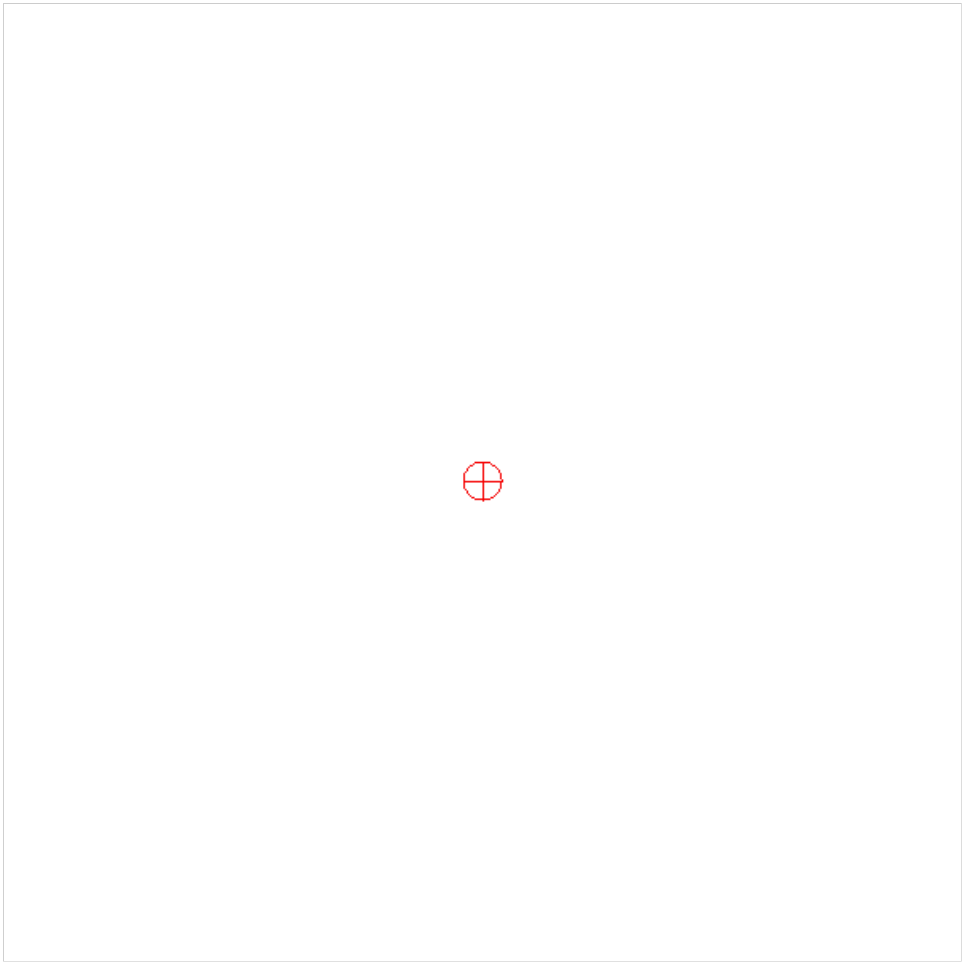
The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	TOWER | Met Tower Please select structure type and complete location point information.
Latitude:	61 Deg 25 M 51.20 S N
Longitude:	150 Deg 55 M 01.12 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	2037 (nearest foot)
Structure Height :	199 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.



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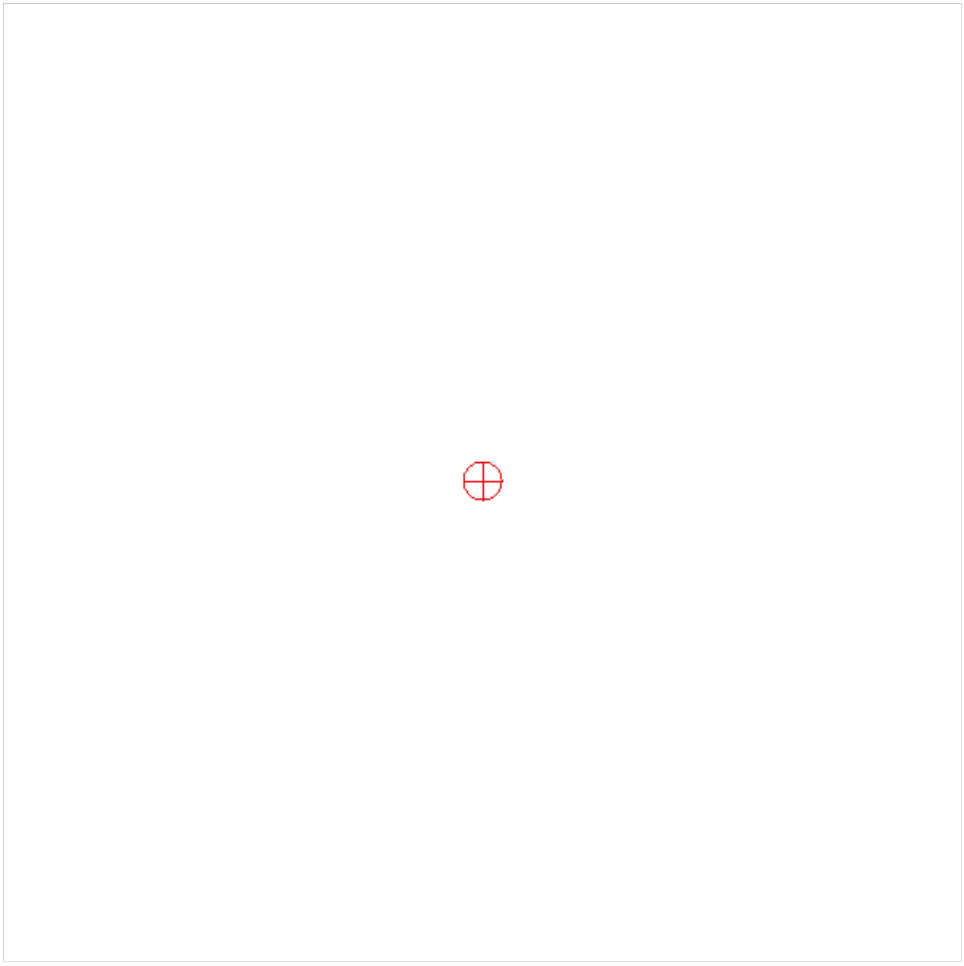
The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	TOWER | Met Tower Please select structure type and complete location point information.
Latitude:	61 Deg 25 M 18.54 S N
Longitude:	150 Deg 55 M 40.81 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	1903 (nearest foot)
Structure Height :	199 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.



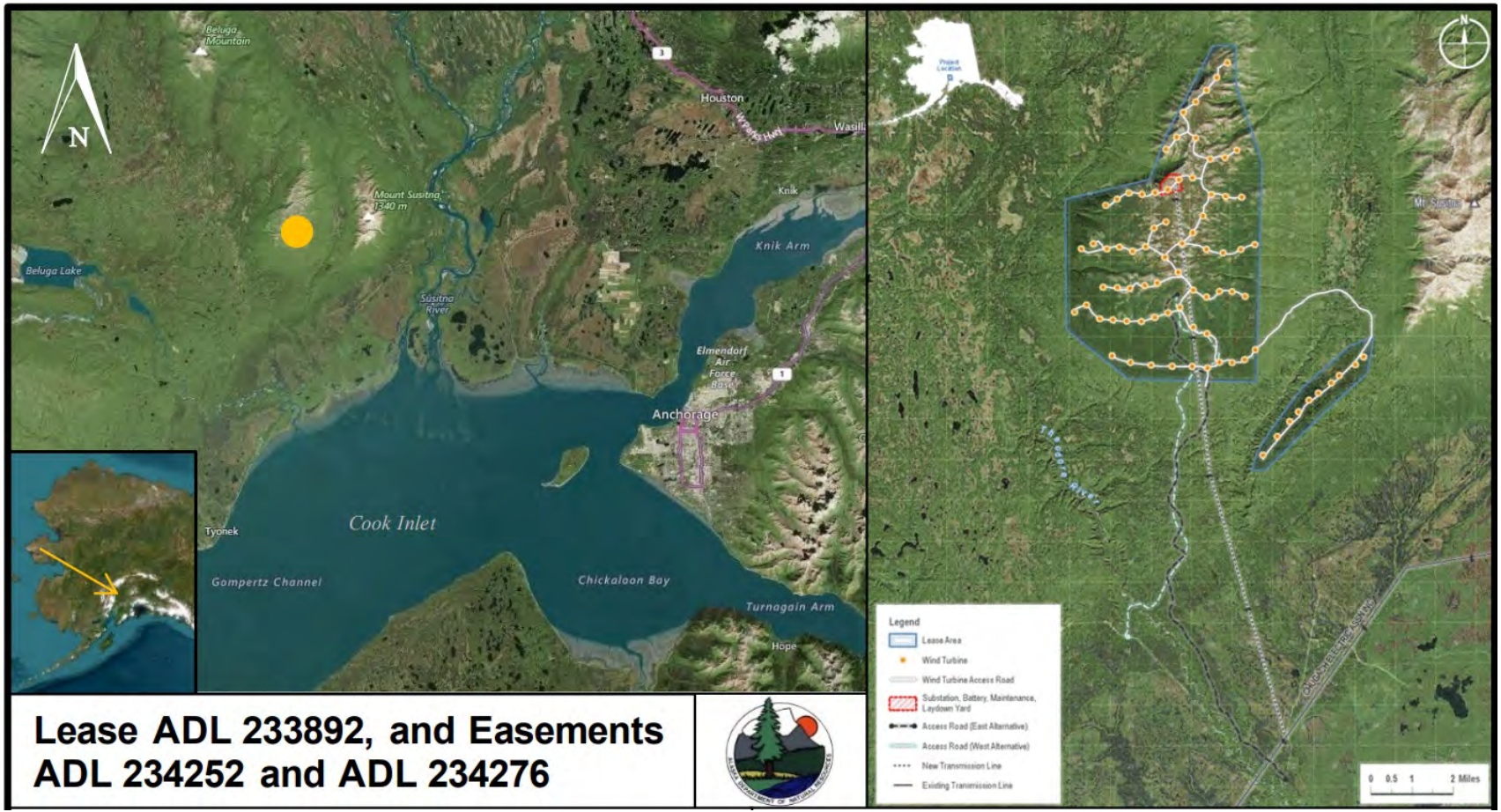
ALASKA RENEWABLES

longroad ENERGY

Our motivation

- Locally driven sustainable energy solutions
- Reducing energy costs for Alaska
- Increase energy security
- Building a sustainable economy

Little Mount Susitna Wind Project



Meteorological Towers

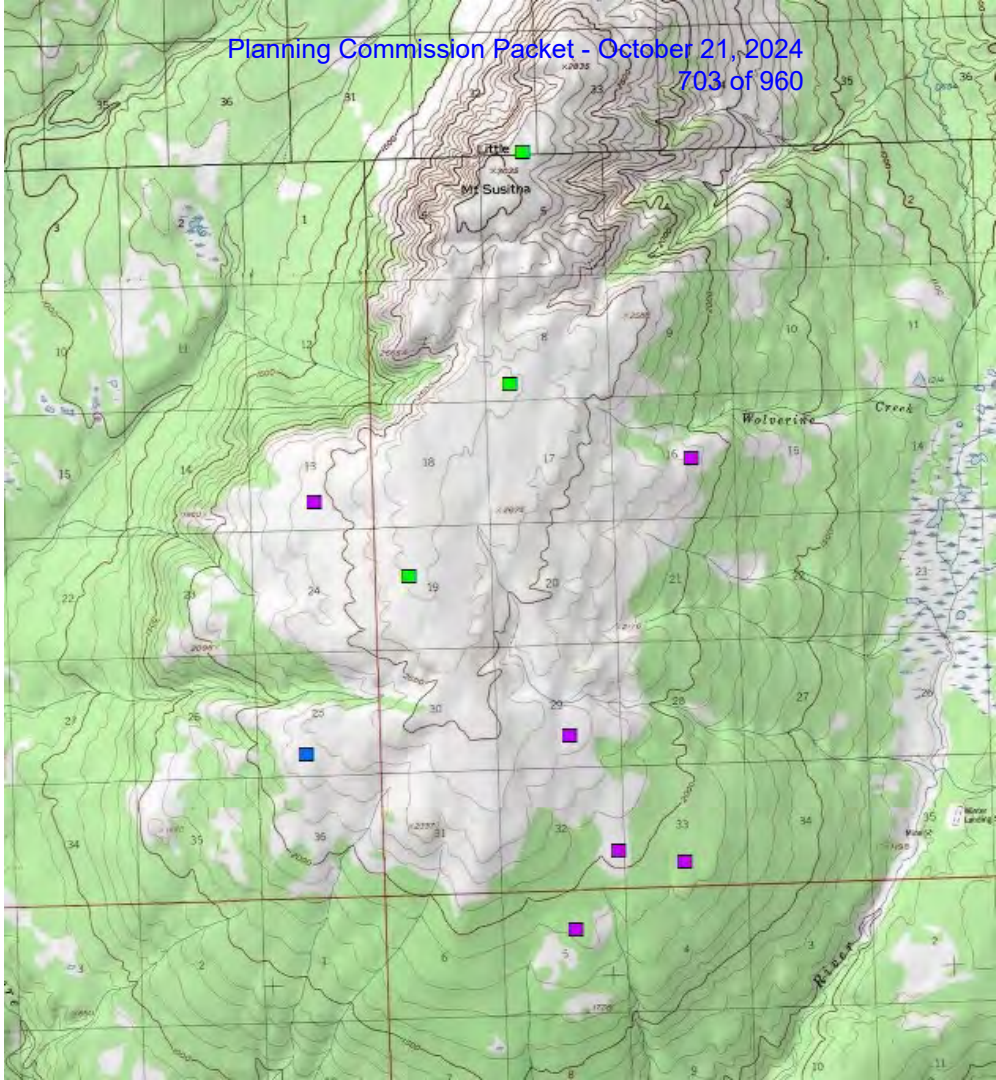
- Used to measure wind speed and direction for resource assessment
- Each tower is 50-60m (164-197 ft.) tall with 4 sets of guy wires
- Painted with FAA-compliant paint, and marked with guy guards and marker balls
- No lighting required
- Towers are engineered for harsh climates

Meteorological Campaign

- Currently 3 meteorological towers installed on Little Mt. Susitna (Green Points)

- Permitting 6 additional tower locations (Purple Points) to collect additional wind data

- MSB Chapter 17.67 requires a permit for tall towers over 85 feet



Proposed Meteorological Tower Locations

Latitude/Longitude (WGS84)

61.473061N, 150.988809W

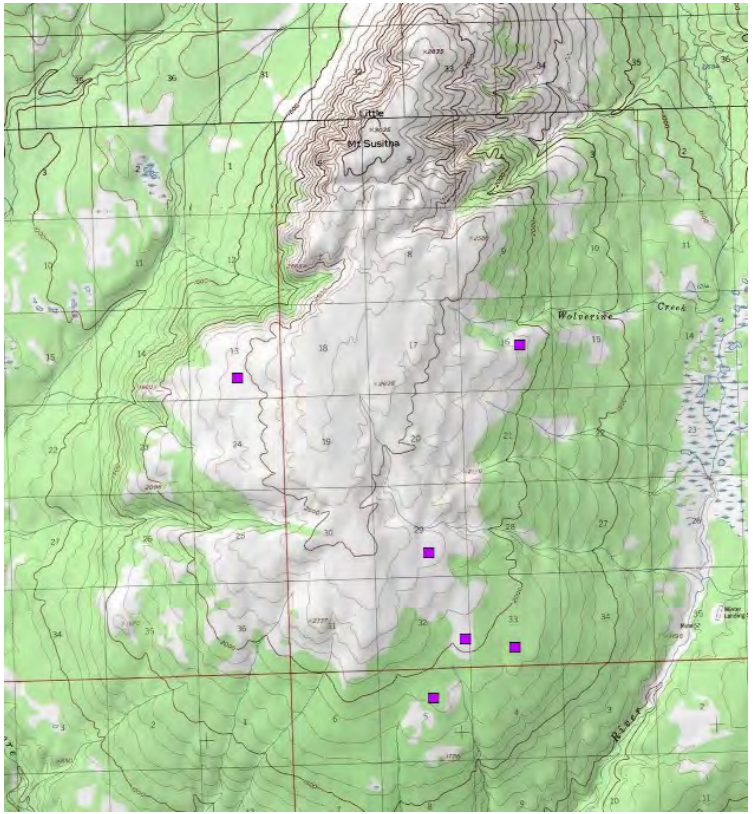
61.476704N, 150.895905W

61.444640N, 150.927867W

61.429372N, 150.900878W

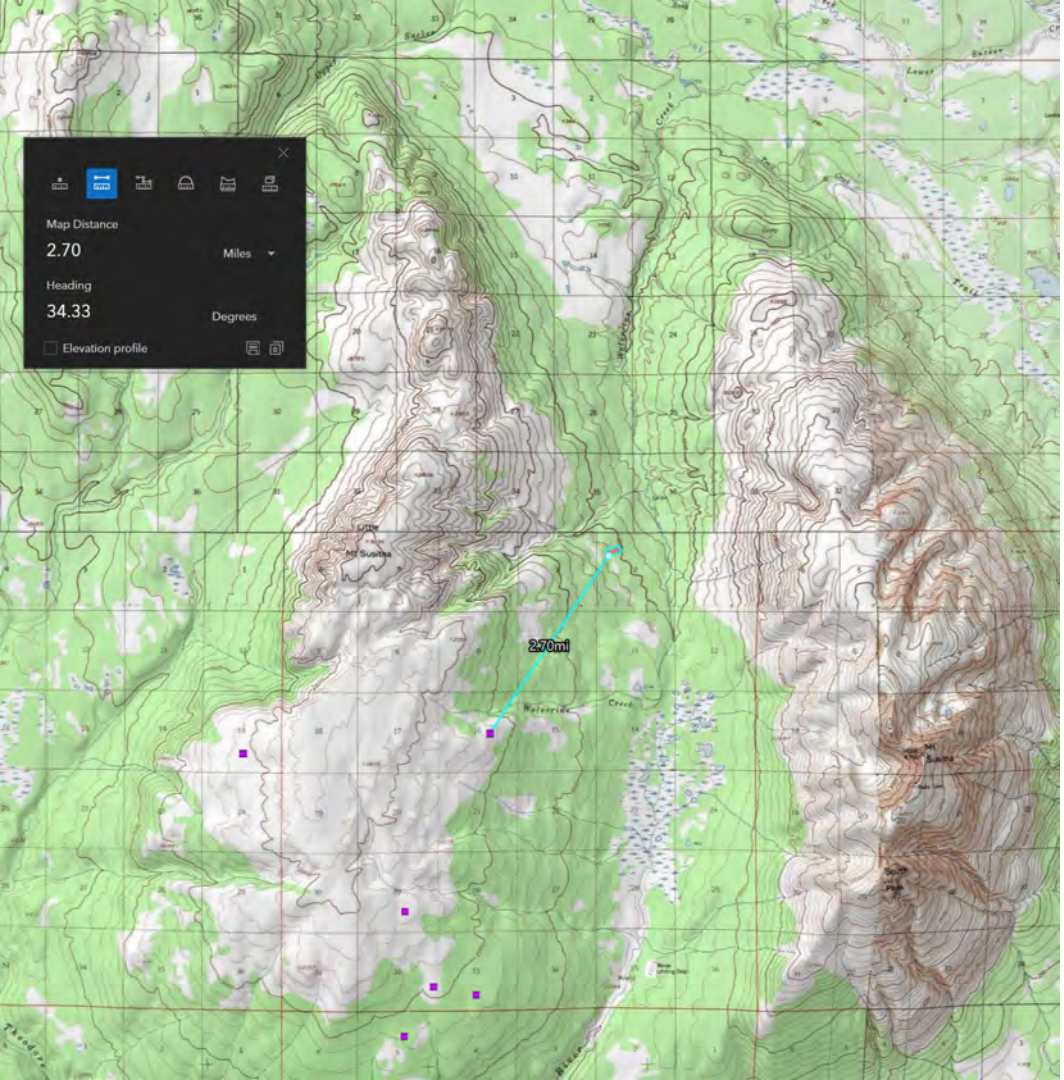
61.430890N, 150.916978W

61.421817N, 150.928003W



Visibility

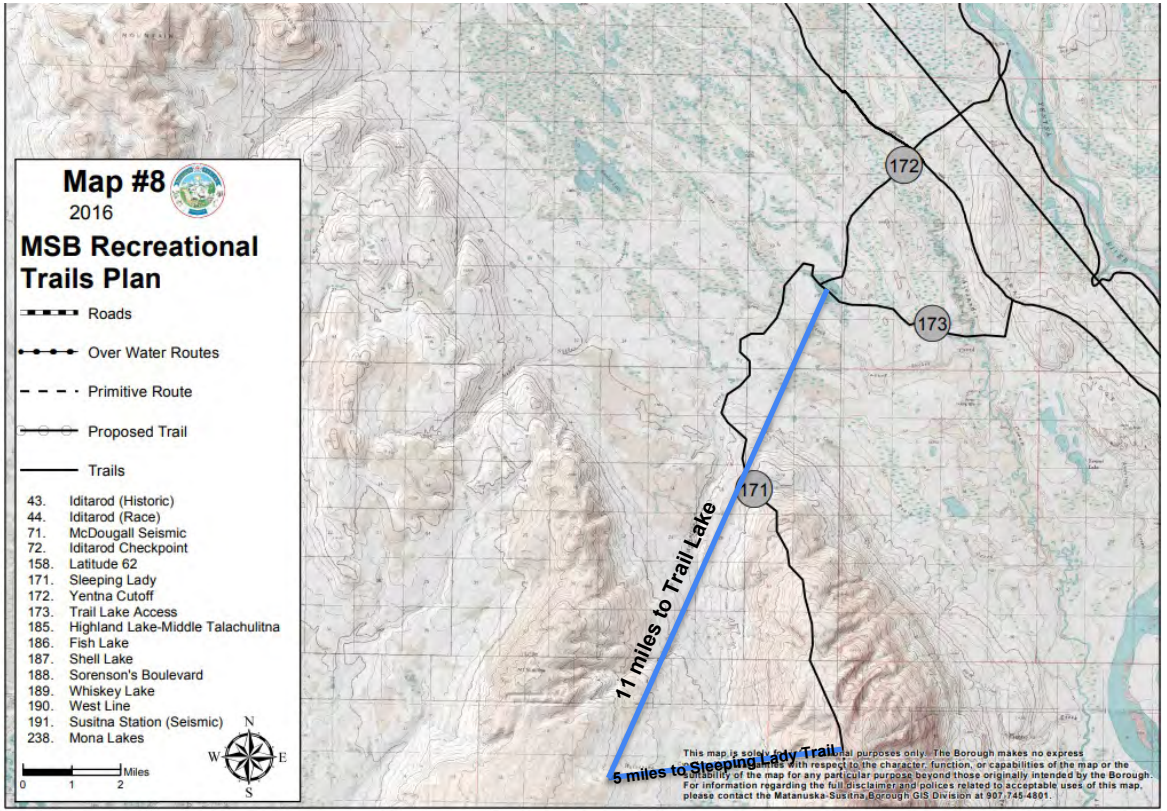
Nearest Property



- The nearest private property is 2.7 miles away from the northeasternmost tower site
- Towers are not expected to be visible from this location
- One tower may be barely visible from Trail Lake, at a distance of over 11 miles

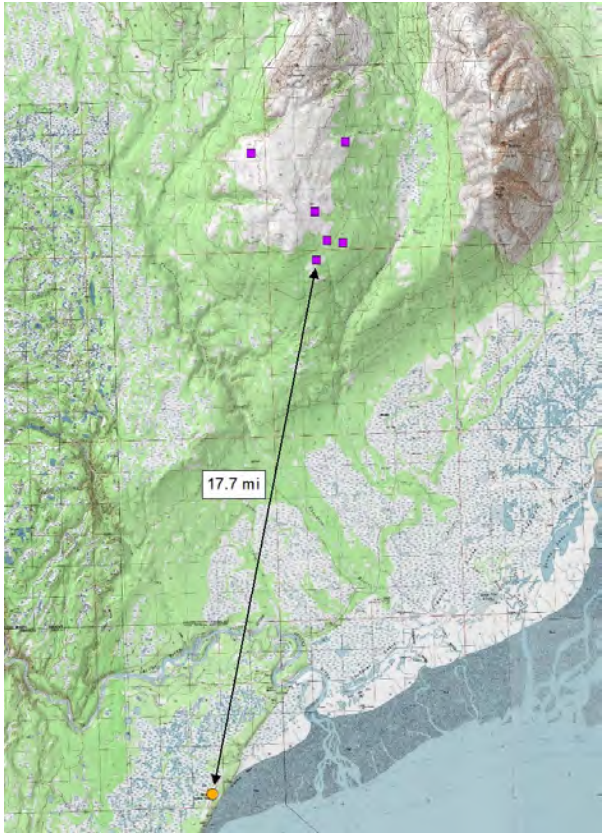
Nearest Recreation Site

- 5 miles to the nearest trail (Sleeping Lady)
- 11 miles from the named lake (Trail Lake)



Nearest Airport

- 17.7 miles from the Beluga Airport
- Compliant with FAA criteria



Questions?

hello@alaskarenewables.com

Written Community Meeting Report

06/3/2024

1. **Written Meeting Summary**
2. **Notice Letter**
3. **Certificate of Mailings**
4. **Comments Received**
5. **Response to Written Comments**
6. **Meeting Roster**

Written Summary of Community Meeting

Hosts: Andrew McDonnell + Jeremy Vander Meer from Alaska Renewables,

representing Little Mount Susitna Wind LLC

Willow Community Center

6/3/2024, 5:30-6:45pm

Little Mount Susitna Wind LLC sent out 110 notices to the tax parcels identified by Rick Benedict, Current Planner at the Matanuska-Susitna Borough (see notice letter and certificate of mailings below). Additionally, as a courtesy, Little Mount Susitna Wind LLC notified Mike Williams, although he falls outside of the mandated contact area. Three people attended the meeting, and one person submitted a written comment. All attendees requested to receive updates via email.

Meeting Attendees:

1. Allen and Cindi Thomas: Owners of a remote cabin above Wolverine Creek, approximately 5.5 miles NNE of the northeastern-most proposed tower location. They also attended last year's meeting for the 2023 CUP. The Thomas' had seen the existing towers last fall when they were still on the ground but not yet erected. During the meeting, we shared photos and additional information about the existing towers, and reviewed plans for the new towers, including materials from the slide deck. We discussed the likely lack of visibility of the towers from their property, using line-of-sight analysis in ArcGIS Earth. They had no opposition to the project or towers but were interested in learning more and suggested the utility of installing an electric bear fence to protect equipment. They also invited project personnel to visit their cabin.

2. Taunnie Boothby: A Willow resident and MSB employee (Planner, focusing on floodplains and natural hazards). Little Mount Susitna Wind LLC provided her with a full walkthrough of the slide deck, answered questions, and discussed various topics, including the potential use of wind data to understand weather-related risks in the borough and the nature of wind energy. Taunnie inquired about the impact of wind turbines on birds, and we provided a verbal response based on current scientific data regarding birds and wind turbines.

Written Comment:

Mike Williams expressed concerns that the Little Mount Susitna Wind project is being rushed without sufficient study, particularly in terms of wind patterns and actual benefits. He worries the wind farm could interfere with low-level military training, which is becoming increasingly important as the U.S. military expands its Arctic presence. Williams also raised safety concerns due to the project's location in a busy airspace

used by both military and private aircraft, especially during bad weather. His environmental concerns include the proximity to fault lines and volcanoes, potential impacts on wildlife such as moose and migratory birds, and possible disturbance to bat habitats. He feels the local population, including his family, would bear the negative consequences without benefiting from the project. Additionally, he questions why alternative sites haven't been explored. Williams is also concerned about the potential for property value declines and the destruction of culturally significant areas. He criticized the lack of sufficient local consultation and called for a more balanced, fact-based approach to the project.

Response to Written Comment:

Little Mount Susitna Wind LLC responded to Williams' concerns via email. They acknowledged his concerns and emphasized their commitment to understanding the local area and addressing potential issues. The developers clarified that the project is still in the data-gathering phase, with additional meteorological towers planned to further assess wind conditions. They assured Williams that military operations and private aviation routes have been considered in the planning process, with filings already submitted to the Department of Defense and the FAA to ensure aviation safety. The response also addressed concerns about seismic risks, wildlife impacts, and cultural heritage, noting that the company is working with relevant agencies to mitigate these risks. While recognizing local economic concerns, the developers are exploring ways to benefit nearby communities and remain open to further dialogue to ensure that all voices are heard. The letter concluded by reaffirming their commitment to transparency and collaboration as the project progresses.

Little Mount Susitna Wind LLC
MSB CUP for Tall Towers Community Meeting
6/3/2024 | 530pm-630pm

Sign in Sheet

	Name	Email	Address	Sign up for Newsletter?
1	Allen + Cindi Thomas	alaskallen2@hotmail.com	P.O. Box 693 Willow, AK 99688	✓
2	TAUNNIE Boothby	tlboothby@gmail.com	PO Box 962 willow, AK 99688	✓
3				
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20				

From: Faith Tyson
To: eagle@eaglesongalaska.com
Cc: Rick Benedict
Subject: Re: FW: Little Mount Susitna Wind Farm Public Comment
Date: Monday, September 16, 2024 9:13:29 AM
Attachments: 20240912 - LMS - CUP #2 - Response to Mike Williams (1).pdf

---

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
Dear Mr. Williams,

Thank you for your written comment. Please find Little Mount Susitna Wind's response attached.

Best,

Faith Tyson (she/they)
Community Engagement and Accountability Manager
Alaska Renewables LLC
[c] +1-907-202-0507 [e] faith@alaskarenewables.com

Alaska Renewables LLC occupies the ancestral, traditional, and contemporary lands of Alaska Native people that have resided, occupied, and called this land home. I recognize the historic Indigenous individuals and communities who live here now and those who were forcibly removed from their homes. In offering this land acknowledgement, I affirm Indigenous sovereignty, history and experiences.

On Mon, Jun 3, 2024 at 10:01 AM Rick Benedict <Rick.Benedict@matsugov.us> wrote:

> Hello,
>
> Comments were received concerning the proposed Little Mount Susitna Wind project for tonight's community meeting.
>
> Respectfully,
>
> Rick Benedict – Current Planner
>
> Development Services Division
>
> Matanuska-Susitna Borough
>
> (907)861-8527 direct

From: Permit Center <Permit.Center@matsugov.us>
Sent: Monday, June 3, 2024 8:32 AM
To: Peggy Horton <Peggy.Horton@matsugov.us>; Rick Benedict <Rick.Benedict@matsugov.us>
Subject: FW: Little Mount Susitna Wind Farm Public Comment

Good morning. Is this for one of you, or someone else?

Thanks.

Brandon Tucker

Permit Technician

Matanuska-Susitna Borough Permit Center

350 E Dahlia Ave

Palmer AK 99645

P (907) 861-7871

F (907) 861-8158

From: eagle@eaglesongalaska.com <eagle@eaglesongalaska.com>
Sent: Sunday, June 2, 2024 10:34 AM
To: Permit Center <Permit.Center@matsugov.us>
Subject: Little Mount Susitna Wind Farm Public Comment

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]

Please find attached comments for the community meeting to be held at the Willow Area Community Center, June 3, 2024.

The location and short notice of the Willow meeting make it impossible for my family to attend. We would hope that those remote stakeholders living in the vicinity of the wind farm project will have an opportunity to comment in a more direct manner in days to come. Might I suggest the Mat-Su Borough Development Services Division and Planning and Land Use Department offer an online meeting opportunity to take public comment.

Regards,

Michael W. Williams

EagleSong Peony Farm

200 W. 34th Ave. Ste 295

Anchorage, AK 99503

(907) 521-0034

eaglesongalaska.com

Instagram.com/eaglesongalaska

facebook.com/eaglesongalaska

www.tiktok.com/@alaskapeony

youtube.com/eaglesongalaska

September 12, 2024

Dear Mr. Williams,

Thank you for sharing your detailed concerns with Matanuska Susitna Borough regarding the proposed Little Mount Susitna Wind Project. I appreciate your deep connection to the land and the thoughtfulness with which you've approached this matter. As developers, we strive to consider the impact of our projects on the local community and environment, and your input is invaluable in this process.

Firstly, I want to address your concern that our company lacks sufficient knowledge of the Little Mt. Susitna area. While it is true that our company was founded in Fairbanks, we are committed to understanding the unique characteristics of the regions where we work. Our visit to your home and the subsequent conversations were part of our efforts to gather local insights and ensure that our plans are informed by those who know the area best.

The development of a wind farm is indeed a complex process and every step is being taken with careful consideration and thorough study. The meteorological towers installed last year are just the beginning of a comprehensive process to gather data over multiple seasons before any concrete conclusions are drawn. The additional meteorological towers that we seek to permit and install would build on that effort to expand our understanding of the weather conditions at additional locations across the project site.

We are aware of the regular low-level military operations west of the Susitna River involving the Army, Air Force, and Alaska National Guard, particularly around Mt. Susitna, Little Mt. Susitna, and Beluga Mountain. The proximity of these training areas to Joint Base Elmendorf-Richardson is crucial, and we have factored this into our planning process.

Additionally, we recognize Little Mount Susitna as a popular route for private pilots, especially during challenging weather conditions. Safety is paramount, and our wind farm design considers these flight patterns. We have completed the initial Department of Defense (DoD) screening and initiated a filing with the FAA, ensuring that all regulatory requirements for aviation safety are being adhered to. Little Mount Susitna Wind remains fully committed to the safety of all airspace users, including both military and civilian aircraft.

Regarding the project's proximity to the Castle Mountain Fault and Mt. Spur, these factors have been taken into account in our initial assessments and are an important part of our ongoing work. It is standard practice in the wind energy industry to conduct

detailed meteorological, geotechnical and mechanical engineering studies in order to quantify the expected forces on the turbines and identify the appropriate design considerations for these conditions. The field and engineering studies we are currently conducting will provide the appropriate design basis to ensure project infrastructure is resilient to potential seismic events.

The potential impact on wildlife, including moose, ptarmigan, and migratory birds, is another area where we are proceeding with caution. We have engaged with the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS) to develop appropriate wildlife impact assessments and mitigation strategies. This includes measures to minimize disruptions to migratory patterns and protect critical habitats.

It is important to note that the construction of any energy infrastructure involves a balance between the need for energy and the preservation of local ecosystems. We are committed to implementing best practices and mitigation measures to reduce the impact on wildlife and their habitats.

Your concern about the economic impact on the local community is reasonable. We recognize that large-scale projects can bring significant changes, and we are working to ensure that these changes are positive. While the primary beneficiaries of the power generated may be in the Anchorage area, we are exploring ways to provide direct benefits to the communities like yours that are nearest to the project site. Our visit to your home was a first step in developing an understanding of what those benefits might look like, and we will continue to consider your input on the matter.

We are also committed to ongoing dialogue with residents, including those who may not have been able to attend meetings in Willow. We are open to organizing additional meetings closer to the Little Mt. Susitna area to ensure that all voices are heard.

The presence of any artifacts and the cultural significance of the area is an issue we take very seriously. As part of the project permitting process, we have begun consultations with cultural and historical experts, agencies, and tribes, and initiated archaeological field work to identify any historically important sites within the project area. Through this work we are committed to design the project to in a way that avoids and minimizes impacts and complies will all relevant laws and regulations.

We understand that no project of this magnitude is without its challenges and concerns. Our aim is to ensure that the Little Mt. Susitna Wind Project is developed in a way that respects the environment, honors the local community, and contributes positively to Alaska’s renewable energy future. We are committed to transparency and collaboration as we move forward, and we welcome continued dialogue with you and other stakeholders.

Thank you again for your feedback. We look forward to working together to find the best possible outcomes for this project and the community.

Sincerely,

Faith Tyson

On behalf of Little Mount Susitna Wind LLC

Faith@alaskarenewables.com

Matanuska-Susitna Borough
Planning & Land Use Department
Development Services Division
350 East Dahlia Avenue
Palmer, Alaska 99645

FIRST CLASS MAIL

A community meeting will be conducted regarding the following new tall structure/cell tower:

Name of Company: Little Mount Susitna Wind LLC
Height of Tower: 60 meters
Tower Design: The meteorological towers are 60m tubular structures with multiple guy wires. The towers have FAA-compliant industrial paint, guy guards, and marker balls. Painting is with alternate bands of aviation orange and white paint. High visibility guy guards (yellow plastic sleeves) will be placed around the base of the guy wires. Four high visibility aviation orange marker balls will be placed on the top-level guy wires within approximately 10m of the top of the tower.
Lighting: N/A
Site Access: The site will be accessed by helicopter.
Proposed Service: The purpose of these installations is to allow for the quantitative assessment of the wind resources to enable the development of a future utility-scale wind energy generation project that would provide reliable, low-cost renewable energy to Southcentral Alaska.

A community meeting will be held on **June 3, 2024, from 5:30-6:30pm at the Willow Area Community Center, located at Mile 69 South Parks Highway, Willow Alaska.** Please come to the meeting to obtain more information and give feedback about this proposed project.

For additional information regarding the proposed tower please contact:

Faith Tyson
907-202-0507
3300 Arctic Blvd
Suite 201, PMB 1451
Anchorage, AK 99503

If you would like to submit comments, this form may be used for your convenience by filling in the information below and mailing it to the Matanuska-Susitna Borough, Development Services Division, 350 E. Dahlia Avenue, Palmer, AK 99745. You may e-mail to permitcenter@matsugov.us. Comments must be received by **June 3, 2024.**

Name: Michael W. Williams ***Address:*** 200 W. 34th Ave. Ste 295, Anchorage, AK 99503

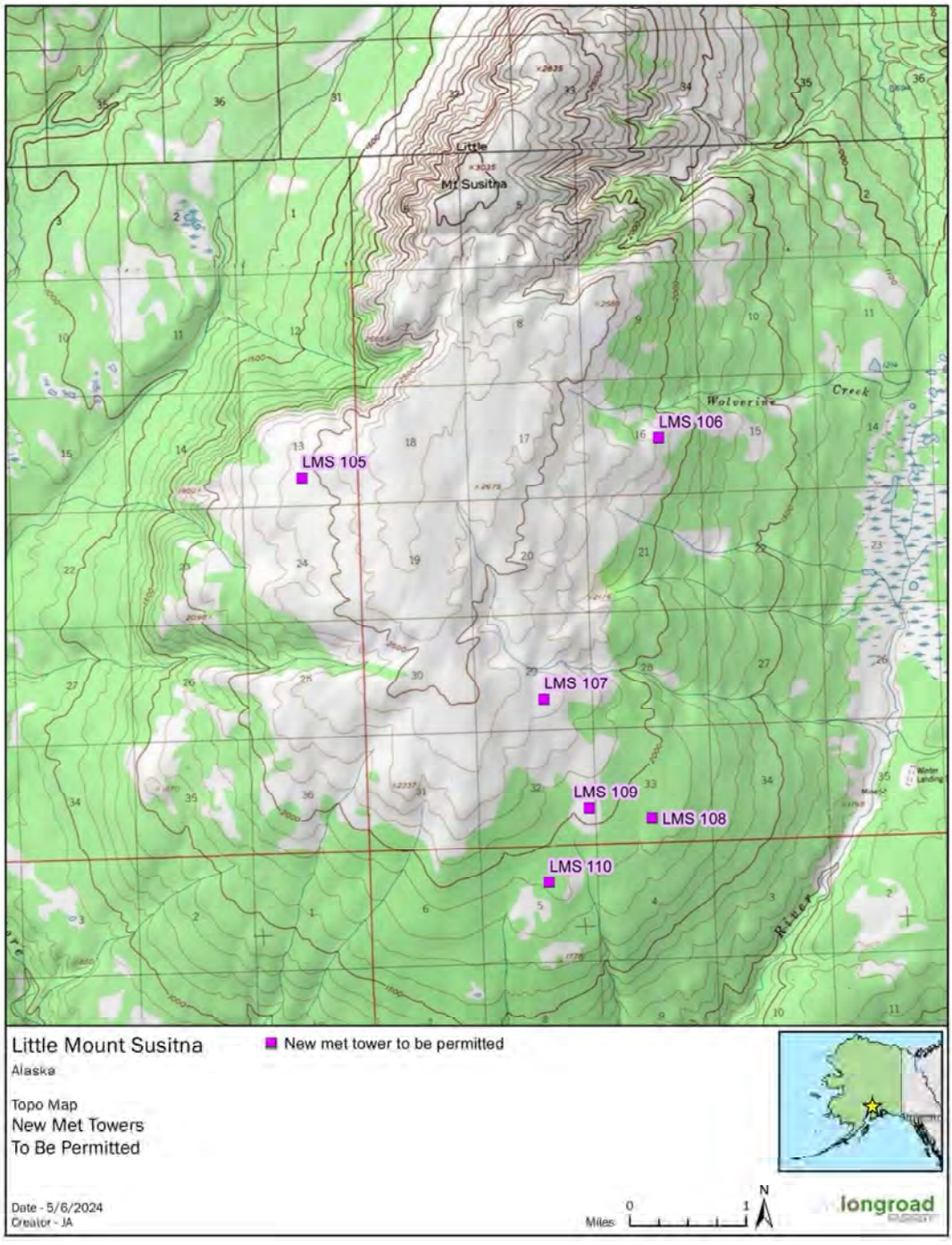
Location/Legal Description of your property: Tract D & E, ASL77-149, Trail Lake, AK (Alexander Creek Drainage)

Comments: See attached

Note: Vicinity Map Located on Reverse Side

Detailed topographic map of the meteorological tower sites proposed on Little Mt Susitna

Site Name	Lat/Lon (WGS84)	Elevation (ft)	MTRS
LMS_105	61.473061N, 150.988809W	2466	S016N010W13
LMS_106	61.476704N, 150.895905W	2200	S016N009W16
LMS_107	61.444640N, 150.927867W	2339	S016N009W29
LMS_108	61.429372N, 150.900878W	1934	S016N009W33
LMS_109	61.430890N, 150.916978W	2037	S016N009W32
LMS_110	61.421817N, 150.928003W	1903	S015N009W05



To: Mat-Su Borough, Planning and Land Use Department June 2, 2024

Subject: Little Mt. Susitna Wind Farm Project Comments

My family has lived at the northeast base of Little Mt. Susitna for the past 31 years. I look out the picture windows of my log cabin farm home and gaze upon Little Mt. Susitna every day. I think I can safely say there are few Alaskans alive today that have spent more time on and around that mountain than me. We built a successful peony farm after losing the prolific Alexander Creek drainage salmon runs to northern pike and closing our 15-year business as EagleSong Lodge.

I recently read an opinion piece written by New Energy Alaska. In that article it was stated that had the Little Mt. Susitna Wind Farm project been operational that up to 20% of the electric demand could have been met reducing natural gas demand during an extreme cold snap in the Anchorage area this past winter. This was a statement created by Alaska Renewable Inc., the developers of the proposed Little Mt. Susitna Wind Farm.

I am concerned with the apparent rush to develop the Little Mt. Susitna Wind Farm without looking at all sides of the picture. Claims like this project could have off-set a potential shortage in Cook Inlet natural gas this winter is a sound bite created to sway the public without any basis in fact and prey on public fear. How do I know? Alaska Renewable Inc. (wind farm developers) constructed 3 meteorological towers in October 2023 to study wind patterns. It is not possible to draw conclusions in such a short period of time. That is a statement made before the facts are even known.

The owners of Alaska Renewable Inc. flew out and visited me last August. We sat in my yard on the shores of Trail Lake and looked directly at Little Mt. Susitna while we discussed the project for more than 2 hours. From that conversation I noted several issues.

- First, this Fairbanks owned company appears to know very little about the area they picked to pursue their project. In their own words they revealed that their job was to get the project started and then, if successful, pass it on to an international company to finance, build, own, and operate. Alaska Renewable Inc. will hype the project with a goal of a big payday and a residual that should make their lives quite comfortable.
- The proposed wind farm project sets directly on top of the active Castle Mountain Fault and its juncture with the Beluga Fault. In the event of a significant seismic event when the rail belt could need reliable power the most it may not be available from this site. Keep in mind we had a 7.1 earthquake in November 2018 centered just 25 miles east of the proposed site. Why would one build such an important and expensive wind farm directly on top of a seismic fault line? At a minimum it will significantly increase costs to try and build to withstand significant earthquakes. "It's the only active fault that comes to the surface in southcentral Alaska," said geologist Peter Haeussler, a leading earthquake researcher with the U.S. Geological Survey in Anchorage. "I'd personally try to avoid living within six miles of this thing," Haeussler said. "You wouldn't want to put any critical facilities on top of it."(Associated Press, Dec 29, 2002)
- The proposed site is less than 35 miles from the active volcano Mt. Spur. It last erupted June 27, 1992 after being quiet for 39 years. It is considered one of the most active volcanoes in Alaska

and last rumbled awake in 2012. Does it make sense to locate a critical energy production facility so close?

- The Army, Air Force and Alaska National Guard conduct low level (nap of the earth) operations west of the Susitna River. Mt. Susitna, Little Mt. Susitna and Beluga Mountain experience almost weekly helicopter and fixed wing training activities. Helicopters conduct low level operations and landings all over Little Mt. Susitna and the proposed wind farm site. At a time when the U.S. military is increasing a significant arctic presence in Alaska it stands to lose a training area within minutes of Joint Base Elmendorf/Richardson. We even see significant presence of the massive twin rotor Chinook helicopters stationed in the Fairbanks area. Their presence was last noted on June 1st.
- The impact on wildlife will likely be significant. At this moment Alaska Department of Fish and Game (ADF&G) is imposing restrictions on moose hunting in game management unit 16B. ADF&G has eliminated the permit and youth hunts for the coming year. They have indicated they will narrowly approve a fall general and subsistence hunt for the region. ADF&G established a minimum population of 6000 moose for a sustained hunt. In January they counted under 6200 moose. The population continues to decline for a variety of reasons. This is the second crash of the moose population in 20 years. Little Mt. Susitna is significant summer habitat for moose. The wind farm is asking for over 19,000 acres (lease) to build up to 80 wind turbines. That essentially consumes Little Mt. Susitna and the critical habitat for moose survival.
- The impact on moose is not the only wildlife issue. There are significant flocks of ptarmigan that call Little Mt. Susitna home. The wind farm project will be located less than 3 miles from the Susitna Flats Game Refuge. The Susitna Flats State Game Refuge encompasses approximately 300,800 acres and supports spectacular spring and fall concentrations of migrating waterfowl and shorebirds. The massive wind turbines will be in the direct migratory flight path of Upper Cook Inlet. U.S. Fish and Wildlife Service in their comments expressed concerns about the impact of the wind turbines, flashing navigation lighting and miles of roads, transmission lines and wind turbine sites on migratory birds. USFWS called for development of appropriate bird (and bat) strike mitigation strategies to ensure compliance with the Migratory Bird Treaty Act. This includes bird diversion measures on the guy wires. The three current towers and the proposed towers do not have or address this issue.
- Little is known about bats in Alaska. EagleSong Farm is currently working with Alaska Dept of Fish and Game to install audio monitoring equipment and conduct census counts as it is thought our farm may support a bat nursery. No one knows where these bats currently winter over. It is very possible Mt. Susitna, Little Mt. Susitna and Beluga Mountain offers winter refuge to Alaska's tiny brown bats.
- Little Mt. Susitna sees significant private air traffic in addition to the military air traffic identified above. It is a popular area to fly and land for ski and wheel planes. Small planes often transit between the north and south side of Mt. Susitna during inclement weather conditions trying to get to/from the Anchorage area. The wind farm site is in direct line of pilots trying to navigate the weather that Mt. Susitna often generates. Various Alaska aviation organizations have already sent correspondence to their members warning of the 3 meteorological towers that currently stand there.
- The West Susitna region covers 14,150 square miles. It is larger than 9 U.S. states. In all this vastness according to a demographer from the Alaska Department of Labor and Workforce Development the population (fulltime) in the immediate vicinity of Little Mt. Susitna is approximately 70 people. We are a group so small that we are insignificant in the political world. The area is extremely poor…especially so after the invasion of northern pike and loss of

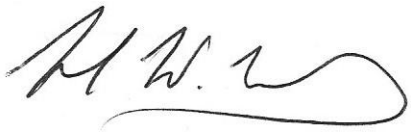
the once prolific salmon runs. We often don't even qualify as an afterthought, especially by developers and politicians. We are the ones that will experience the negative results of this project but appear to be of little concern to Alaska Renewables or our local and state governments. It appears this project will drive the immediate area further into poverty.

- Alaska Renewable Inc. highlights the fact that "Anchorage" will not see the wind turbines. That has become a key selling point to the Rail Belt audience. What about those west of the Susitna River? We don't even get the benefit of the power it will generate. When I pressed Alaska Renewable Inc. representatives to give me one positive outcome for our region, they admitted there were none they could think of. I guess this is a case of the sacrifice of a few for the betterment of the many. I estimate after 31 years of building our lives and business here we stand to lose over $200,000 in value by this project's development after a lifetime of work. Let's be honest, what Alaskan wants to live in the shadow of 80 wind turbines. It was a fight to get the wind turbines constructed on Fire Island and that was just off the end of Ted Stevens Anchorage Intl. Airport. That was an area teeming with development. People don't want to see them.
- Alaska Renewable Inc. indicated they had an alternate site to the south by the village of Tyonek. It doesn't appear they are doing any real evaluation of alternate sites. The average person doesn't understand the massive heavy industrial road system that will have to be built, the rivers it will span or the amount of gravel that will have to be mined to support the massive, specialized equipment that will be needed to move and construct the towers.
- Over the years we have discovered artifacts on Little Mt. Susitna that the University of Alaska estimate to be over 11,000 years old. It is believed Mt. Susitna, Little Mt. Susitna and Beluga Mountain was the only land overlooking the glaciers that covered the southern Susitna Valley at that time. What is likely to be destroyed if Little Mt. Susitna has its top ripped off?
- When it comes to wildfire and wildfire suppression the project proposes to brush the entire project area annually. That is a massive and expensive undertaking. It will impact wildlife, especially the flocks of ptarmigan that call that mountain home.
- The current project development plan submitted to Department of Natural Resources supporting Alaska Renewables land use request only identifies the Lewis and Theodore Rivers as potential impacted waterways. If the request for these new towers is approved a portion of them will potentially impact Wolverine, Sucker and Alexander Creeks on the northeast side of the mountain. These drainages have not been identified in the current development plan.
- I would like to direct the Mat-Su Borough Planning and Land Use Department to the Department of Natural Resources "Preliminary Decision" document dated 5/22/2024. In that document numerous issues have been identified by several state and federal agencies with this project. The meteorological towers already constructed and the new ones proposed are being constructed before any of these issues are addressed.
- We are not aware of any meeting previously held by the Mat-Su Borough Planning and Land Use Department for the three towers currently on Little Mt. Susitna. If there was no meeting, why? It appears the three existing towers were constructed prior to Mat-Su Borough approval.
- Finally, the community meeting being held in Willow ignores the fact that the majority of stakeholders that will be directly impacted by construction of the towers are being ignored. Most stakeholders in the vicinity of Little Mt. Susitna cannot make it to a meeting held 40 miles away in Willow.

My family is not anti-development but feel it must be a measured and fact-based approach. We are very much in favor of Alaska's move to renewable energy.

Let's not lose sight of the fact that development of the West Susitna Access Road, Little Mt. Susitna Wind Farm, coal power plant, Donlin gas line, mining, drilling and other projects will require the destruction of the lower west Susitna Valley. A valley that to this point has been little touched by civilization. It will require us to destroy a region that is still in its natural state. Is it worth the price? Are the Alaskans that call this place home to be tossed aside? Once it happens there is no going back.

Does my family and I have a bias regarding these projects? Of course we do, this has been our home for over 31 years. I am approaching my 70th birthday and hope to retire someday, but that may not be possible if the wilderness that enticed us to come here is turned into an industrial park. Our hope is this wind farm, and the other projects are measured by their pros and cons and decisions are based on merit, but that rarely happens today does it. The Little Mt. Susitna Wind Farm project is not a benign project. Let's make sure the benefit is worth the sacrifice.



Michael W. Williams
General Partner

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(907) 521-0034
eagle@eaglesongalaska.com

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Landowner
8420 Ruth Dr
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Landowner
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Landowner
1920 6th St #347
Santa Monica, CA 90405

Landowner
850 Howard St TRLR 41
Raymond, WA 98577-1500

Landowner
130 Woodland Ave
Reno, NV 89523

Landowner
229 E Commonwealth #235
Fullerton, CA 92832

Landowner
Po box 1047
Willow, AK 99688

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26994 Johansen Dr
Kasilof, AK 99610

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Cantwell, AK 99729

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Sterling, AK 99672

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Tacoma, WI 98405

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550 7th Ave
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Willow, AK 99688

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Seattle, AK 98109

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Landowner(s)
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Landowner(s)
478 Lewis & Clark Trail

Bozeman, MT 59718

Matanuska-Susitna Borough
Planning & Land Use Department
Development Services Division
350 East Dahlia Avenue
Palmer, Alaska 99645

FIRST CLASS MAIL

A community meeting will be conducted regarding the following new tall structure/cell tower:

Name of Company: Little Mount Susitna Wind LLC
Height of Tower: 60 meters
Tower Design: The meteorological towers are 60m tubular structures with multiple guy wires. The towers have FAA-compliant industrial paint, guy guards, and marker balls. Painting is with alternate bands of aviation orange and white paint. High visibility guy guards (yellow plastic sleeves) will be placed around the base of the guy wires. Four high visibility aviation orange marker balls will be placed on the top-level guy wires within approximately 10m of the top of the tower.
Lighting: N/A
Site Access: The site will be accessed by helicopter.
Proposed Service: The purpose of these installations is to allow for the quantitative assessment of the wind resources to enable the development of a future utility-scale wind energy generation project that would provide reliable, low-cost renewable energy to Southcentral Alaska.

A community meeting will be held on **June 3, 2024, from 5:30-6:30pm at the Willow Area Community Center, located at Mile 69 South Parks Highway, Willow Alaska.** Please come to the meeting to obtain more information and give feedback about this proposed project.

For additional information regarding the proposed tower please contact:

Faith Tyson
907-202-0507
3300 Arctic Blvd
Suite 201, PMB 1451
Anchorage, AK 99503

If you would like to submit comments, this form may be used for your convenience by filling in the information below and mailing it to the Matanuska-Susitna Borough, Development Services Division, 350 E. Dahlia Avenue, Palmer, AK 99745. You may e-mail to permitcenter@matsugov.us. Comments must be received by **June 3, 2024.**

Name: _____ ***Address:*** _____

Location/Legal Description of your property: _____

Comments: _____

_____

_____

_____

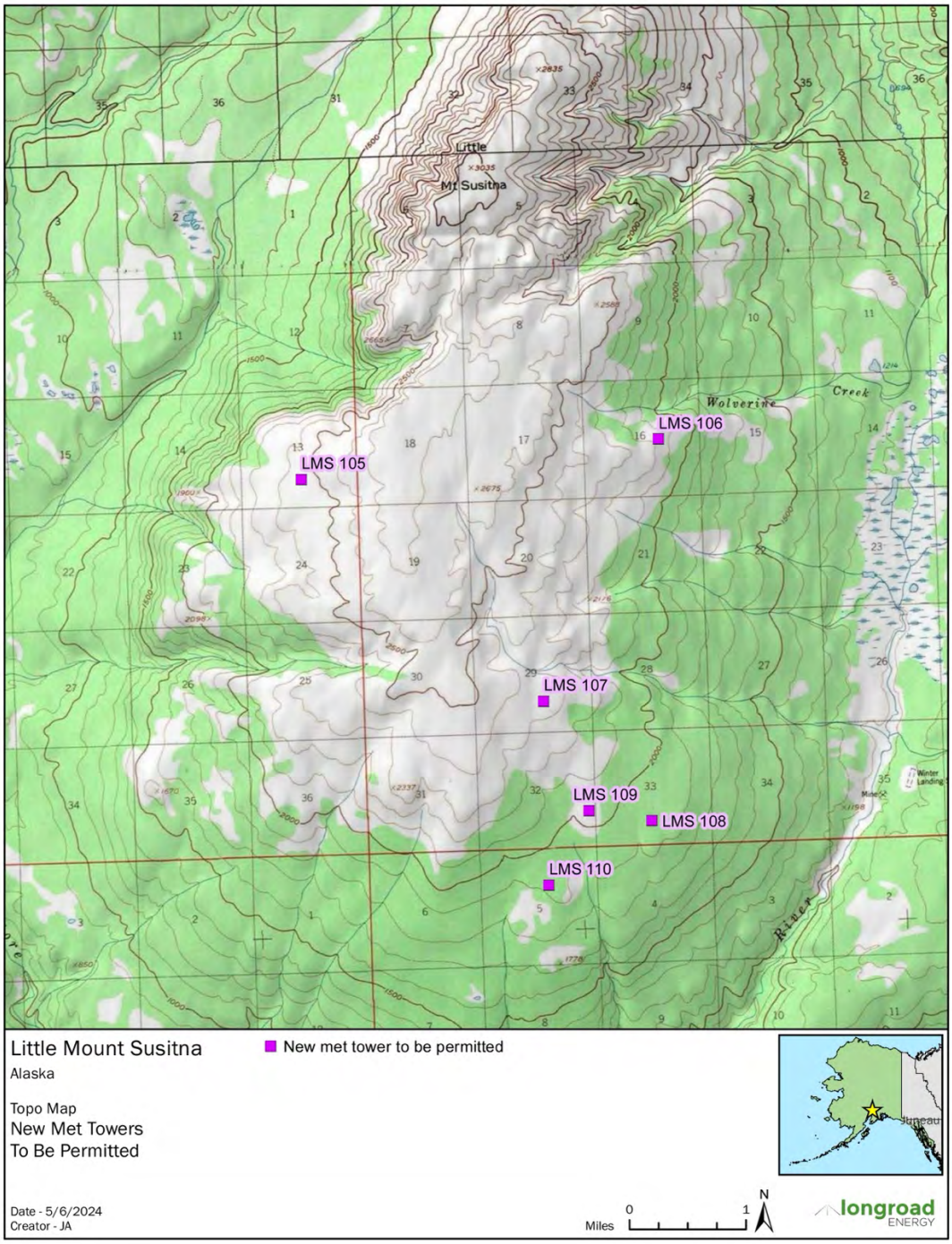
_____

_____

Note: Vicinity Map Located on Reverse Side

Detailed topographic map of the meteorological tower sites proposed on Little Mt Susitna

Site Name	Lat/Lon (WGS84)	Elevation (ft)	MTRS
LMS_105	61.473061N, 150.988809W	2466	S016N010W13
LMS_106	61.476704N, 150.895905W	2200	S016N009W16
LMS_107	61.444640N, 150.927867W	2339	S016N009W29
LMS_108	61.429372N, 150.900878W	1934	S016N009W33
LMS_109	61.430890N, 150.916978W	2037	S016N009W32
LMS_110	61.421817N, 150.928003W	1903	S015N009W05



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Landowner(s)
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Anchorage, AK 99518

Postmark Here

ANCHORAGE AK
MAY 16 2024
99502-9998 USPS

PS Form **3817**, April 2007 PSN 7530-02-000-9065

UNITED STATE
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This form may be used for domestic and intern

ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

UNITED STATES POSTAL SERVICE

RDC 99

U.S. POSTAGE PAID
FCM LETTER
ANCHORAGE, AK
99530
MAY 16, 24
AMOUNT
$2.00
R2304M110467-04

Postmark Here

To:

Landowner(s)
130 Woodland Ave

Reno, NV 89523

MAY 16 2024
USPS

PS Form 3817, April 2007 PSN 7530-02-000-0000

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3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

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ANCHORAGE, AK
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AMOUNT
$2.00
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To:

Landowner
Po box 415
Girdwood, AK 99587

Postmark Here

ANCHORAGE AK
99530-9998 USPS
MAY 16 2024

PS Form 3817, April 2007 PSN 7530-02-000-9065

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

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MAY 16, 24
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To:

Landowner(s)
Po box 261

Seward, AK 99664

ANCHORAGE AK
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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

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To:

Landowner(s)
Po box 310

Laguna Beach, CA 92652

Postmark Here

ANCHORAGE AK
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PS Form [illegible], April 2007 PSN 7530-02-000-9065

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

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To

Landowner(s)
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Chugiak, AK 99567

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To:

Po box 617

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To:

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Po box 8485

Nikiski, AK 99635

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UNITED STATES POSTAL SERVICE

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

To:

Landowner(s)
Po box 873594

Wasilla, AK 99687

Postmark Here

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Suite 201 PMB 1451
Anchorage, AK 99503

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To:

Landowner(s)
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Wasilla, AK 99687

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From:

ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

To:

Landowner(s)
Po box 92224

Anchorage, AK 99509

PS Form 3817, April 2007 PSN 7530-02-000-9065

Certificate Of Mailing

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

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To:

Landowner(s)
11202 W Granada Dr

Sun City, AZ 85373

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To pay fee, affix stamps or

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Suite 201 PMB 1451
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MAY 16, 24
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Landowner(s)
11508 N Greenwood Ave, Unit B3

Seattle, WA 98133

MAY 16 2024
ANCHORAGE AK
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PS Form 3817, April 2007 PSN 7530-02-000-9065

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This form may be used for domestic and internation

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

UNITED STATES POSTAL SERVICE

RDC 99

To:

Landowner(s)
7031 Clairmont Cir

Anchorage, AK 99507

PS Form 3817, April 2007 PSN 7530-02-000-9065

ANCHORAGE AK
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UNITED STATES
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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

To:

Landowner(s)
7302 Oakmont Dr

Santa Rosa, CA 95409

Postmark Here

ANCHORAGE AK
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PS Form 3817, April 2007 PSN 7530-02-000-9065

UNITED STATES POSTAL SERVICE

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From:

ALASKA RENEWABLES
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Lar
8050 Pioneer Dr, #602

Anchorage, AK 99504

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ANC 99530-9998 USPS

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UNITED STATES POSTAL SERVICE

This Certificate of Mailing provides evidence that mail has been presented to USPS for mailing.
This form may be used for domestic and international mail.

U.S. POSTAGE PAID
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ANCHORAGE, AK
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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

To:

Landowner(s)
8126 Trilakes ST

Anchorage, AK 99502

Postmark Here

ANCHORAGE AK
MAY 16 2024
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PS Form 3817, April 2007 PSN 7530-02-000-9065

UNITED STATES POSTAL SERVICE

Certificate Of Mailing

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From:

ALASKA RENEWABLES
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Anchorage, AK 99503

UNITED STATES POSTAL SERVICE

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U.S. POSTAGE PAID
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ANCHORAGE, AK
99530
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To:

Landowner
1920 6th St #347
Santa Monica, CA 90405

Postmark Here
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PS Form 3817, April 2007 PSN 7530-02-000-9065

UNITED STATES POSTAL SERVICE

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This form may be used for

ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

To: Landowne
26994 Johansen Dr
Kasilof, AK 99610

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ALASKA RENEWABLES
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To:
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37830 Luscombe Cir
Sterling, AK 99672

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ANCHORAGE AK
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PS Form 3817, April 2007 PSN 7530-02-000-9065

UNITED STATES POSTAL SERVICE

This Certificate of Mailing provides evidence that
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Suite 201 PMB 1451
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To:

Landowner
402A W Palm Valley Blvd #153
Round Rock, TX 78664

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PS Form 3817, April 2007 PSN 7530-02-000-9065

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10.

ACS Internet Inc
ATTN: Tax Dept
600 Telephone Ave
Anchorage, AK 99503

Postmark Here

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PS Form 3817, April 2007 PSN 7530-02-000-9065

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ALASKA RENEWABLES
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ANCHORAGE, AK
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To:

State of AK - ATTN: DNR
550 7th Ave
Anchorage AK 99501

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PS Form 3817, April 2007

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

To:

Landowner
8420 Ruth Dr
Eagle River, AK 99577

Postmark Here

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PS Form 3817, April 2007 PSN 7530-02-000-9065

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To:

Landowner

6215 Kanan-Dume Rd

Malibu, CA 90265

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UNITED STATES POSTAL SERVICE

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

To:
Landowner
Po box 1047
Willow, AK 99688

Postmark Here

ANCHORAGE AK
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PS Form **3817**, April 2007 PSN 7530-02-000-9065

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This Certificate of Mailing provides evidence that mail has been
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From:

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Raymond, WA 98577-1500

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From:

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3300 Arctic Blvd
Suite 201 PMB 1451
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ANCHORAGE AK
MAY 16 2024
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Landowner
Po box 167
Cantwell, AK 99729

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This form may be used for domestic and Int

From:

ALASKA RENEWABLES
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ANCHORAGE AK
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99530-9998 USPS

To:

Landowner
17409 Four Corner Rd
Prairie Grove, AR 72753-9765

PS Form 3817, April 2007 PSN 7530-02-000-9065

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3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

To: Landowner
229 E Commonwealth #235
Fullerton, CA 92832

Postmark Here

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

To:

Landowner
3810 Wildrose Ave
Kenai, AK 99611-8400

ANCHORAGE AK
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3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

UNITED STATES POSTAL SERVICE

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To:
Landowner
Po box 4225
Fort Eustis, VA 23604

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Po box 693
Willow, AK 99688

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PS Form 3817, April 2007 PSN 7530-02-000-9065

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To:

Land owner
Po box 661
Whittier, AK 99693

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ANCHORAGE AK
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PS Form 3817, April 2007 PSN 7530-02-000-9065

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Suite 201 PMB 1451
Anchorage, AK 99503

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Suite 201 PMB 1451
Anchorage, AK 99503

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To:

Landowner
11340 Elmore Rd
Anchorage, AK 99516

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

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To:
Landowner
130 Woodland Ave
Reno, NV 89523

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ANCHORAGE AK
99530-9998 USPS
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From:

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3300 Arctic Blvd
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Anchorage, AK 99503

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Landowner
13030 Admiralty Pl
Anchorage, AK 99515

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PS Form 3817, April 2007 PSN 7530-02-000-9065

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

UNITED STATES POSTAL SERVICE

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To:

Landowner
13301 E Jensen Ave
Palmer, AK 99645

PS Form **3817**, April 2007 PSN 7530-02-000-0000

ANCHORAGE AK 99530 USPS
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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

UNITED STATES POSTAL SERVICE

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To:

Landowi
1510 Oceanview Dr
Anchorage, AK 99515

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PS Form **3817**, April 2007 PSN 7530-02-000-9065

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ALASKA RENEWABLES
3300 Arctic Blvd
Suite 201 PMB 1451
Anchorage, AK 99503

UNITED STATES POSTAL SERVICE

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To:

Landowner
1948 Champion Cir
Virginia Beach, VA 23456

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PS Form **3817**, April 2007 PSN 7530-02-000-9065

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ALASKA RENEWABLES
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Suite 201 PMB 1451
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To:

Landowner
21017 Scenic Dr
Chugiak, AK 99567

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To:

Landowner
21786 425th Ave
Clitherall, MN 56524

ANCHORAGE AK 99530-9998
MAY 16 2024

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To:

Ruth Wendula Couillard, c/o Bente
Schnellstr, 24, 22765
Hamburg, Germany

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To:

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Tacoma, WA 98405

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To:

Landowner(s)
28323 Eagle River Rd

Eagle River, AK 99577

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To:

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Seattle, WA 98109

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To:

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267 Meiggs Backus Rd

Sandwich, MA 02563

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31441 28th Pl SW
Federal Way, WA 98023

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Po box 1027
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To:

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20632 David Ave

Eagle River, AK 99577

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225 Bishop Hill Rd

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To:

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To:

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To:

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90480 Peter Johnson Rd

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654 S Red Mountain Blvd

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To:

Landowner(s)
9621 SW 77th Ave

Miami, FL 33156

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THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Natural Resources
DIVISION OF MINING, LAND & WATER
Southcentral Regional Land Office

550 W. 7th Ave., Suite 900C
Anchorage, Alaska 99501-3577
Main: (907) 269-8503
TTY: 711 or 880.770.8973
Fax: (907) 269-8913

NOTICE TO THE PUBLIC AND REQUEST FOR INFORMATION
AMENDMENT TO LAS 34057
LITTLE MOUNT SUSITNA WIND LLC

Subject to AS 38.05.850, the Southcentral Regional Land Office has received an amendment application for the following:

APPLICANT: Little Mount Susitna Wind LLC

PROJECT NAME: LAS 34057 (Amendment)

GEOGRAPHIC LOCATION: Located on Little Mount Susitna, approx. 37 miles northwest of Anchorage.

LEGAL DESCRIPTION:
LMS_105: Section 13, Township 16 North, Range 10 West, Seward Meridian
61.473061N, 150.988809W
LMS_106: Section 16, Township 16 North, Range 9 West, Seward Meridian
61.476704N, 150.895905W
LMS_107: Section 29, Township 16 North, Range 9 West, Seward Meridian
61.444640N, 150.927867W
LMS_108: Section 33, Township 16 North, Range 9 West, Seward Meridian
61.429372N, 150.900878W
LMS_109: Section 32, Township 16 North, Range 9 West, Seward Meridian
61.430890N, 150.916978W
LMS_110: Section 5, Township 15 North, Range 9 West, Seward Meridian
61.421817N, 150.928003W

REQUESTED ACTIVITY: Applicant Little Mount Susitna Wind LLC is requesting to amend land use permit LAS 34057 to add six additional meteorological tower sites on Little Mount Susitna. If approved, the amendment would bring the total number of towers to ten, although only three towers are currently deployed as of June 2024. The towers are used to gather meteorological data and on-site wind conditions in support of a long-term wind farm. Each tower requires a footprint of approximately two square acres, is between 60 - 80 meters in height, and is supported by three sets of guy wires at different intervals. Each tower would also utilize a small ground-based LIDAR unit secured within the site's footprint.

PROPOSED DATES OF USE:
Start: June 2024
End: May 31, 2027

DEADLINE FOR COMMENTS: June 26, 2024

The public is invited to comment on this activity. The purpose of this notice is to gather input before a decision is made on this activity. To ensure consideration, written or emailed comments must be received by the Division of Mining, Land and Water at the Southcentral Regional Land Office, 550 W. 7th Ave., Suite 900C, Anchorage, AK 99501-3577 on or before 5:00 PM on the date noted above. Questions concerning this activity or requests to view the full application packet should be directed to John Forbes, Telephone: (907)269-5032; Fax: (907) 269-8913 or e-mail: john.forbes@alaska.gov.

After review and adjudication, we may issue an authorization with stipulations for the activity. The activity may be modified during the review and adjudication process.

DNR-DMLW complies with Title II of the Americans with Disabilities Act of 1990. Individuals with disabilities who may need auxiliary aids, services or special modifications to comment should contact Alaska Relay at 711 or 800-770-8973 for TTY services.

The DMLW reserves the right to waive technical defects in this notice.

LAS 34057 - Permit Amendment - Additional Met Towers on Little Mount Susitna

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AMENDMENT TO LAS 34057

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LMS_107: Section 29, Township 16 North, Range 9 West, Seward Meridian

61.444640N, 150.927867W

LMS_108: Section 33, Township 16 North, Range 9 West, Seward Meridian

61.429372N, 150.900878W

LMS_109: Section 32, Township 16 North, Range 9 West, Seward Meridian

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Attachments, History, Details

Attachments

LAS 34057 - Amendment Map.pdf

LAS 34057 - Public Notice (2024 Amendment).pdf

Revision History

Created 6/12/2024 9:15:39 AM by jrforbes

Details

Department:	Natural Resources
Category:	Public Notices
Sub-Category:	
Location(s):	Anchorage, Palmer, Southcentral Region, Statewide
Project/Regulation #:	
Publish Date:	6/12/2024
Archive Date:	6/27/2024
Events/Deadlines:	

STATE OF ALASKA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINING, LAND AND WATER
SOUTHCENTRAL REGIONAL LAND OFFICE

PRELIMINARY DECISION

Little Mount Susitna Wind, LLC
ADL 233892: Negotiated Lease - AS 38.05.070
ADL 234252: Public Access Easement - AS 38.05.850
ADL 234276: Public Utility Easement - AS 38.05.850

This Preliminary Decision (PD) is the initial determination on a proposed disposal of interest in state land and is subject to comments received during the public notice period. The public is invited to comment on this PD. The deadline for commenting is **11:59 p.m. July 8, 2024**. Please see the Comments section of this decision for details on how and where to send comments for consideration. Only the applicant and those who comment have the right to appeal the Final Finding and Decision (FFD).

Proposed Action:

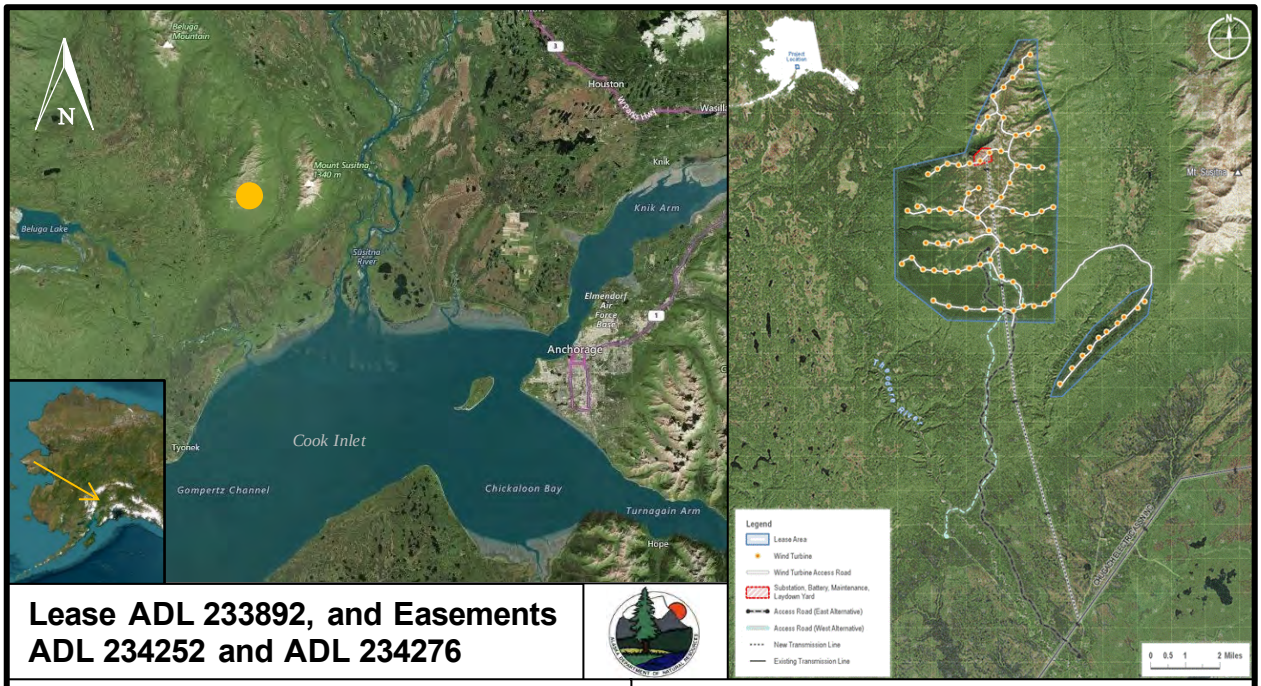
The Department of Natural Resources (DNR), Division of Mining, Land and Water (DMLW), Southcentral Regional Land Office (SCRO) has received a request from Little Mount Susitna Wind, LLC (LMSW, applicant) for a 40-year lease authorization to be located in the area of Little Mount Susitna, approximately 37 miles northwest of Anchorage, Alaska. LMSW has requested to lease up to 450 acres of land within an overall project area of approximately 19,000 acres. LMSW is proposing to use this site for the construction, operation, and maintenance of a long-term wind farm. The project proposes the following:

- Up to 80 wind turbines divided between individual lease parcels within the project area. Once constructed, individual lease parcels would be approximately 330 feet by 460 feet, occupying approximately 3.5 acres each. In no event will an individual turbine site exceed 5 acres;
- Four meteorological towers (METs) (currently authorized by the Land Use Permit serialized as LAS 34057);
- Yard, maintenance facility and substation on a parcel up to 50 acres;
- A public access easement 100 feet wide encompassing roads up to approximately 55 feet in width, and an as yet undetermined final length. The segment from the existing Beluga road system to the substation would be up to 16 miles long. The public access easement would connect each lease parcel to the substation; this length will depend on final layout and parcel configuration.

- A public utility easement between 30 and 300 feet wide, and an unknown final length. The segment from the Beluga intertie (ADL 201672) to the substation would be up to 15 miles long. The easement would connect each lease parcel to the substation; this length will depend on final layout and parcel configuration. This easement would authorize both the electrical transmission lines and communications cables. Those portions of the easement between the substation and the individual parcels will likely substantially overlap with the public access easement.

This application is in response to a request from Chugach Electric Association (CEA), which serves the greater Anchorage area, encouraging alternative energy development to reduce environmental impacts of its current operations and transition to a more affordable, reliable, and more environmentally friendly energy portfolio. LMSW proposes that the project's maximum electrical output could be up to 272 megawatts.

Figure 1: Overview Map of Project Area



Lease ADL 233892, and Easements ADL 234252 and ADL 234276

The application location for ADLs 233892, 234252, and 234276 is located on Little Mount Susitna, approximately 37 miles northwest of Anchorage, Alaska. The site encompasses 19,000 acres, more or less.

NOTE: The image above was provided by the applicant and can be found in the attached development plan. This map provides a graphical representation of the proposed authorizations and has only been provided as a general reference. The exact location of the lease and easements may be adjusted prior to authorization. This map is not intended for navigational purposes.

SCRO is considering the issuance of a 40-year lease under AS 38.05.070(c) and associated indefinite public access and public utility easements under AS 38.05.850 to LMSW for the construction, operation, and maintenance of the proposed wind farm as described in the attached

Development Plan (Attachment A). SCRO would issue an Entry Authorization (EA) for construction of the project prior to lease and easement issuance. The proposed term of the public utility easement and the public access easement is indefinite.

Scope of Decision:

The scope of this decision is to determine if it is in the State's best interest to issue a 40-year lease (ADL 233892) and associated indefinite public access and public utility easements (ADL 234252 and ADL 234276 respectively).

Authority:

These applications are being adjudicated pursuant to AS 38.05.035(b)(1) and AS 38.05.035(e) Powers and Duties of the Director; AS 38.05.070 Generally; AS 38.05.075 Leasing Procedures; AS 38.05.850 Permits; and AS 38.05.945 Notice.

The authority to execute the PD, FFD, the EA, easements, and the lease has been delegated to the Regional Managers of DMLW, and may be further redelegated.

The authority to determine if a water body is public or navigable has been delegated to the Public Access Assertions and Defense Section.

Administrative Record:

The administrative record for the proposed action consists of the Constitution of the State of Alaska, the Alaska Land Act as amended, applicable statutes and regulations referenced here-in, the 2011 Susitna Matanuska Area Plan and other classification references described herein, and the casefiles for the applications serialized by DNR as ADL 233892, ADL 234252, and ADL 234276.

Legal Description, Location, and Geographical Features:

The State land where this proposed project is located is described as follows:

- **Lease Legal Description:** A tract of land including all or portions of:
  - Sections 1-2, 4-12, 14-16, 21 and 22 Township 15 North, Range 9 West, Seward Meridian, Alaska;
  - Sections 1, 2 and 12, Township 15 North, Range 10 West, Seward Meridian, Alaska;
  - Sections 4-9, 16-21, and 28-33, Township 16 North, Range 9 West, Seward Meridian, Alaska;
  - Sections 13-15, 22-27, and 34-36, Township 16 North, Range 10 West, Seward Meridian, Alaska;
  - Sections 28, 32, and 33, Township 17 North, Range 9 West, Seward Meridian, Alaska;

- **Public Access Easement Legal Description:** A tract of land including all or portions of:
  - Sections 6-8, 17, 20-21, 27-28, Township 14 North, Range 9 West, Seward Meridian, Alaska;
  - Sections 1, 12, Township 14 North, Range 10 West, Seward Meridian, Alaska;
  - Sections 5-8, 17-19, 30-31, Township 15 North, Range 9 West, Seward Meridian, Alaska;
  - Sections 30, 32, Township 16 North, Range 9 West, Seward Meridian, Alaska;
- **Public Utility Easement Legal Description:** A tract of land including all or portions of:
  - Sections 4, 9, 15-16, 22, Township 14 North, Range 9 West, Seward Meridian, Alaska;
  - Sections 5, 8, 17, 20, 29, 32-33, Township 15 North, Range 9 West, Seward Meridian, Alaska;
  - Sections 18-19, 30-32, Township 16 North, Range 9 West, Seward Meridian, Alaska.
- **Geographical Location:** Little Mount Susitna
- **Approximate Lat/Long:** 61° 28' 42" N, 150° 56' 37" W
- **Area Geographical Features:** This project encompasses lands ranging from the lowlands surrounding Cook Inlet to the top of Little Mount Susitna with alpine tundra and shrubs.
- **Municipality/Borough:** Matanuska-Susitna Borough
- **Native Corporations/Federally Recognized Tribes:** Cook Inlet Region Inc.
- **Size:** Approximately 450 acres of land within an overall project area of approximately 19,000 acres, more or less

Title:

Multiple DNR Title Reports (RPTs 23155, 23156, 23157, 23158, 23160), issued on October 19, 2023, October 23, 2023 and October 24, 2023, from DMLW's Realty Services Section attest that the State of Alaska holds title to the lands associated with ADL 233892, ADL 234252, and ADL 234276 under a series of US Patents, specifically:

- Applicable portions of Sections 4-9,16-21, and 28-33, Township 16 North, Range 9 West, Seward Meridian, per US Patent 50-66-0311, dated February 24, 1966. The associated DNR selection casefile is GS 217.
- Applicable portions of Sections 1, 2 and 12, Township 15 North, Range 10 West, Seward Meridian, per US Patent 50-66-0310, dated February 4, 1966. The associated DNR selection casefile is GS 235.
- Applicable portions of Sections 1-12, 14-22, 28-33, Township 15 North, Range 9 West, Seward Meridian, per US Patent 50-66-0212, dated November 10, 1965. The associated DNR selection casefile is GS 215.
- Applicable portions of Sections 13-15, 22-27, and 34-36, Township 16 North, Range 10 West, Seward Meridian, per US Patent 50-66-0313, dated February 4, 1966. The associated DNR selection casefile is GS 308.

- Applicable portions of Sections 28, 32, and 33, Township 17 North, Range 9 West, Seward Meridian, per US Patent 50-66-0120, dated February 24, 1966. The associated DNR selection casefile is GS 220.
- Applicable portions of Sections 3-10, 15-18, 20-22, 27-29, 33-34, Township 14 North, Range 9 West, Seward Meridian, per US patent 50-66-0319, dated February 7, 1966. The associated DNR selection casefile is GS 103. Sections 28, 33, and 34 were originally subject to the mining rights from valid mining claims serialized as AA-59857; these claims were terminated by BLM on April 27, 1993.
- Applicable portions of Sections 1-2, 11-14, Township 14 North, Range 10 West, Seward Meridian, Per US Patent 50-66-0293 dated January 19, 1966. The associated DNR selection casefile is GS 407.

All the above patents include the standard reservations for ditches, canals, railroads, and telegraph and telephone lines. There are no other reservations within the proposed leasehold and easement location.

Due to recent updates to the development plan, SCRO is requesting an additional title report from DMLW's Realty Services Section. Should the additional title report note any major changes, they will be addressed in the FFD.

Third Party Interests:

A portion of Donlin Gold, LLC's Pipeline Right-of-Way Lease, and private non-exclusive easement EA, serialized as ADL 231908 and ADL 232368, respectively, bisects a portion of the proposed leasehold.

In addition to these authorizations, the proposed public access and public utility easements cross or intersect with the following authorizations:

- ADL 421297, a conditional lease issued to the Alaska Gasline Development Corporation;
- ADL 216878, a lease for a gas pipeline issued to the Alaska Pipeline Company;
- ADL 28471 and ADL 201672, public utility easements issued to Chugach Electric Association;
- ADL 33939, a public access easement issued to Hilcorp Alaska, LLC;
- ADL 229279, an easement for a gas pipeline issued to Hilcorp Alaska, LLC;
- ADL 231908 a lease for a natural gas pipeline issued to Donlin Gold, LLC;
- ADL 232368, a private non-exclusive easement issued to Donlin Gold, LLC; and
- LAS 34011, a permit for two microwave repeater towers issued to Spurr Mountain, LLC.

Solicitation of Interest:

Per the requirements of AS 38.05.070, before a lease application under this statutory authority can begin a negotiated lease process, a solicitation of interest must be made by SCRO to determine if any competitive interest exists in a site. On May 25, 2022, a 30-day solicitation of interest was

posted to the State of Alaska Online Public Notice website as well as post offices in Houston, Wasilla, and Willow. During the 30-day solicitation, no competitive interest in the proposed lease site was received. Conducting the solicitation does not guarantee LMSW a lease, but simply the ability to proceed with a negotiated lease process per AS 38.05.070(d).

Classification and Planning:

The lease and easements project areas are within two Area Plans, the Susitna Matanuska Area Plan, and the Southeast Susitna Area Plan.

The proposed lease project area is located solely within the 2011 Susitna Matanuska Area Plan (SMAP), Mount Susitna Region, Management Units M-1, M-7, M-12 (map number 3-6).
M-1: This unit is dual designated for Habitat and Water Resources (Classified Wildlife Habitat and Water Resources). This unit is to be managed to protect habitat, hydrological values, and existing access resources. Chapter 2 notes that one of the primary objectives for Habitat lands is to "ensure access to public lands and waters and promote or enhance the responsible public use and enjoyment of fish and wildlife resources". Management intent for the designations of both Habitat and Water Resources both state that utilities and roads both may be appropriate if habitat and hydrologic functions respectively can be maintained.

This project will greatly enhance access to public lands, waters, and fish and wildlife resources in this area. Currently, access to the top of Little Mount Susitna is primarily through aircraft; this project will allow for vehicular access on constructed routes which will minimize impacts to the wetlands and anadromous and other fish bearing streams.

M-7: This unit is designated for Forestry (classified Forestry). The roads associated with this project will provide increased all season access to this resource base for future forestry activities.

M-12: This unit is designated for Recreation-Dispersed (classified Public Use Recreation). The management intent for the area is with a focus on managing for recreational uses and habitat values.

While each lease parcel will be subject to significant construction activity, the sites are dispersed within a large area. Once the initial construction is complete, we anticipate limited additional disturbance related to maintenance of the facilities. Further, dispersed recreation will be enhanced by the project as noted above; within the lease parcels, only a small border around each wind turbine will be fenced for safety reasons, leaving most of the leased area open to public access and wildlife migration.

Chapter 2 also notes that timber with commercial or personal use value should be salvaged from lands that are to be cleared for uses such as roads, transmission lines, and material sites.

Once the final route for the road and transmission line are determined, SCRO will work with the Division of Forestry to determine if there is sufficient commercial timber value to warrant a salvage sale. At this time, SCRO believes it is unlikely there will be sufficient commercial value from two approximately 100-foot-wide corridors to support a salvage sale: in this event, SCRO will require the applicant to deck timber greater than 6-inch diameter at breast height (dbh) to be made available for personal use firewood permits.

The lower portion of the public utility easement for the transmission line and the public access easement would be within the 2008 Southeast Susitna Area Plan (SSAP). This plan notes the area is to be managed by specific management plans, in this case the plan for the Susitna Flats State Game Refuge (SFSGR), and subject to the 1988 SFSGR plan and limitations contained within the enabling legislation AS 16.20.036. SFSGR was established to protect, preserve, and enhance fish and wildlife habitat and populations, as well as to protect, maintain, and enhance public use of these resources as well as general recreation of the area. In Section II under Objectives, the plan sets out the goal of maintaining, and where appropriate enhancing, public access in the refuge. In Section III under Multiple Use Activities, it requires proposals be evaluated on a case-by-case basis to determine compatibility with the goals and other objectives of the plan, and that compatible activities are to be allowed under terms and conditions consistent with the plan goals. The plan specifically requires encouraging the continued public use and maintenance of the Beluga road system, and also allows that new utilities may be authorized if there are no feasible alternatives and where consistent with the refuge goals and objectives.

The applicant is working with ADF&G to minimize impacts to the refuge and will be required to obtain a Special Area Permit from ADF&G for any construction work within the refuge boundary. There is no feasible alternative for the transmission lines to connect this wind project with the existing electrical grid. The roads for this project will connect to the Beluga road system, and will provide enhanced constructed access within the refuge, but also to lands outside the refuge. Given the challenges and expense of transporting motorized vehicles to the Beluga road system, it is unlikely that expanding the road network will significantly increase overall user numbers; rather, by providing access to a new area, it may reduce user concentration along the currently existing road system. For these reasons, SCRO believes this project is consistent with, and will further the objectives of, the SFSGR legislative intent and plan.

With all aspects of the management designation and intent taken into consideration and in accordance with 11 AAC 55.040(c), this project does not conflict with the existing plans and classifications.

Traditional Use Findings:

The proposed site is located within the Matanuska-Susitna Borough. Pursuant to AS 38.05.830 a traditional use finding is not required.

Access:

The proposed Public Access Easement, ADL 234252, in conjunction with the existing road system will provide legal and physical access to the proposed lease site.

Access Along Navigable and Public Waters:

AS 38.05.127 requires that when the Department is considering a disposal of interest in state land, that the Department determine what waterbodies are public, navigable, or neither. Additionally access easements must be reserved unless they are not necessary to ensure access to and along all public and navigable waterbodies.

The DMLW Public Access Assertion and Defense Section has determined the following waterbodies are pubic or navigable as noted, within the project corridor for ADL 234252 and ADL 234276:

Navigable Waters:

- The Theodore River, AWC Code 247-30-10080
- Lewis River, AWC Code 247-30-10070

Public Waters:

- Unnamed tributary, AWC Code 247-30-10080-2310
- Unnamed tributary, AWC Code 247-30-10080-2325
- Unnamed tributary, AWC Code 247-30-10080-2031
- Unnamed tributary, AWC Code 247-30-10080-2065
- Unnamed tributary, AWC Code 247-30-10080-2057
- Unnamed tributary, AWC Code 247-30-10080-2021
- Interconnected spawning grounds in the Theodore drainage
- Unnamed tributary, AWC Code 247-30-10070-2121
- Unnamed tributary, AWC Code 247-30-10070-2121-3101

There are no other Public or Navigable waters within the boundaries of the overall project, including within the lease project area.

Pursuant to AS 38.5.127, SCRO must consider whether an easement to or along public or navigable waters is required to ensure continued or future public access. There are no public or navigable waters within the lease boundaries. The proposed easements will not impair or restrict access to or along any of the public or navigable waters; therefore, an easement pursuant to AS 38.05.127 is not necessary and shall not be created or reserved pursuant to this decision.

Agency Review:

An agency review was conducted on August 25, 2022. The deadline for agency comments was September 26, 2022, and at the request of an agency, the deadline was extended 10 days to October 10, 2022.

The following agencies were included in the review:

- DNR DMLW Land Conveyance Section

- DNR DMLW Mining Section
- DNR DMLW Public Access Assertion and Defense Section
- DNR DMLW Realty Services Section
- DNR DMLW Survey Section
- DNR DMLW Water Resources Section
- DNR Natural Resource Conservation and Development Board
- DNR Oil and Gas
- DNR Oil and Gas – State Pipeline Coordinator's Section (SPCS)
- DNR Parks & Outdoor Recreation
- DNR Parks & Outdoor Recreation - Office of History and Archaeology/State Historic Preservation Office (SHPO)
- DNR Division of Forestry
- Department of Commerce, Community and Economic Development
- Department of Environmental Conservation
- Department of Fish and Game - Habitat
- Department of Fish and Game - Wildlife Conservation
- Department of Transportation and Public Facilities
- U.S. Army Corps of Engineers
- U.S. Bureau of Land Management
- U.S. Coast Guard
- U.S. Environmental Protection Agency
- U.S. Fish & Wildlife Service
- U.S. National Park Service
- U.S. National Oceanic and Atmospheric Administration - Habitat Conservation

Agency Review Summary:

During the agency review SCRO received the following comments:

DNR DMLW Land Conveyance Section Comment:

No objection.

Department of Transportation and Public Facilities:

"Little Mount Susitna Wind, LLC (LMSW) proposes to construct a portion of electric transmission line across the 400-foot-wide State highway corridor that exists between Point Mackenzie and the community of Tyonek. While no highway has been constructed to date within the corridor and routing may be subject to change following a pre-construction design process, the corridor represents both a best-fit alignment from the 1970s planning effort that led to its creation and the starting place for a future design effort due to the preservation of the 400-foot corridor in dual State-held easement and fee simple interests. The terms of the 1978 easement provide that DNR DMLW retains the authority to create third-party interests within the corridor until DOT&PF

initiates highway development. While DOT&PF permitting is therefore not applicable to LMSW's proposed utility crossing of the corridor, DOT&PF third-party non-objection is predicated on the following conditions:

- The proposed transmission line must cross the highway easement at or near to a right angle.
- Transmission line angle points must be located outside of the 400-foot-wide corridor.
- DOT&PF Central Region Utilities shall have an opportunity to review LMSW's project plans at the 35% and 95% stages.
- Any road development by LMSW that may occur in or near the 400-foot reserved corridor shall be coordinated in advance with DOT&PF.
- Vertical clearances above native ground level in the 400-foot corridor shall be maximized to the extent reasonably feasible. Standard DOT&PF clearances for new construction are 20 feet or greater above road surface.
- Towers shall be sited outside the 400-foot corridor. If it is reasonably infeasible to site towers entirely outside of the 400-foot corridor, tower placement will be made as close as practical to the outer edges of the 400-foot corridor."

SCRO Response:
This decision will serve as notification to LMSW of the above comments from DOT&PF. LMSW should contact DOT& PF at their earliest convenience to ensure compliance with any DOT&PF requirements.

DNR Division of Forestry Comment:
"Due to the remote nature of the area, I suggest that special attention be paid to minimizing the potential for introduction of invasive plants to this region during all phases of this project. I suggest including both prevention measures pre-construction, as well as monitoring and eradication requirements post construction."

SCRO Response:
This decision will serve as notification to LMSW of the above comments from the Division of Forestry. SCRO recommends LMSW coordinate with the Division of Forestry to facilitate the incorporation of prevention, monitoring, and eradication methods for potential invasive species.

DNR Parks & Outdoor Recreation - Office of History and Archaeology/SHPO Comment:
"State law requires all activities requiring licensing or permitting from the State of Alaska to comply with the Alaska Historic Preservation Act, which prohibits the removal or destruction of cultural resources (historic, prehistoric, and archaeological sites, locations, remains, or objects) on land owned or controlled by the State. This also includes reporting of historic and archaeological sites on lands covered under contract with or licensed by the State or governmental agency of the State.

Upon review of the Alaska Heritage Resources Survey (AHRS) database, there are several known cultural resource sites within or adjacent to the proposed project area that may be affected by proposed project activities. We recommend that the project area be archaeologically surveyed by a qualified cultural resource professional and investigated for other properties of significance to tribes. A list of contractors that can perform these services can be found on our website or provided upon request."

SCRO Response:
This decision will serve as notification to LMSW of the above comments from OHA. LMSW will be required to comply with all aspects of the Alaska Historic Preservation Act and any additional requirements from OHA.

SAIL Comment: Several topics were raised by this agency comment:

1. *Secondary Containment:* The development plan doesn't speak to the amount or size of batteries that will be on site. Will secondary containment be used for these batteries along with any fuels that will be brought out to the site during road and project construction?
2. *Wildland Fire Considerations:* The plan does not discuss wildland fire considerations. Will the project have any kind of alert system? Will there be regular inspections and brushing to reduce fuels (if needed)?
3. *Term and Reclamation:* How long will this lease be? The reclamation portion of the development plan doesn't explain if the road will be removed or not. Does the region have a preference? Additionally, it would be good to understand if by fully decommissioned, recycled and disposed of the applicant means disposed of-off site. Not creating a disposal site on state land.
4. *Access Restrictions:* Will there be any access restrictions to the new roads that are developed such as gates or fences?

SCRO Response:
This decision will serve as notification to LMSW of the above comments from SAIL.

1. Standard stipulations include stipulations addressing secondary containment of hazardous substances. LMSW will be required to adhere to all DEC requirements regarding hazardous substances.
2. Standard stipulations include stipulations addressing fire suppression and response. The applicant does intend to brush within their lease parcels annually to reduce fire risk. Additional stipulations may be included to address unusual fire hazards.
3. LMSW has requested a 40-year lease term. They have not requested any type of landfill or waste disposal site associated with this project. The proposed Public Access Easement would be issued indefinetly, and so reclaimation is not contemplated. If a vacation request was received, road reclaimation requirements would be contemplated at that time.

4. While not specifically requested, it is likely that the applicant will need to control access along the requested road easements during construction of the project. Post-construction, access restrictions along the easement are not anticipated.

DNR Oil and Gas – State Pipeline Coordinator's Section Comment:
The SPCS comments pointed out specific AS 38.35 pipeline right-of-way leases that may overlap with the LMSW proposed lease and easements. These include ADL 421297, Alaska LNG Mainline Pipeline (AKLNG Mainline), ADL 231908, and ADL 232368 for Donlin Gold. SPCS suggests that LMSW coordinate with other authorization holders prior to development.

SCRO Response:
DMLW will ask LMSW to coordinate with AKLNG Mainline and Donlin Gold on potential project overlap. However, based on the proposed development plan, it appears that only aspects of the proposed easements will overlap with the AKLNG Mainline and Donlin Gold projects. Only Donlin Gold authorizations/applications ADL 231908 and ADL 232368 pass through a portion of the project area and, based on the proposed development, will not overlap with any turbine locations. SCRO is not proposing to lease all lands within the project area boundary. Individual lease parcels will be located within the project area and connected by a public access easement.

USFWS Comment:
The USFWS comments noted that the project may affect:

- Eagles and other birds, including vulnerable species. These bird populations utilize the area year-round for foraging, breeding, nesting, migrating, and stopovers, and are likely impacted by the proximity to two Important Bird Areas (IBAs) / State Game Refuges, Susitna Flats IBA and Palmer Hay Flats IBA used as feeding areas during migration.
- The little brown bat which may utilize the subject area for migration, maternity roosts, and hibernacula.
- Andromous fish are also found in this area, including three species of salmon that utilize the Lewis River, Theodore River and tributaries, and Beluga Slough and tributaries for rearing and other habitat.
- Invasive plant species caused by construction activities impact biodiversity and species loss.
- Wildlife due to the potential impacts of wind turbines resulting in displacement (indirect habitat loss through avoidance), barrier effects (long-term changes to migratory paths to avoid turbines and other infrastructure), and collision risks and mortality.

The USFWS comments included three main categories of best management practices (BMPs) recommendations to mitigate potential effects on wildlife and habitat, briefly summarized below:

1. Habitat loss, fragmentation, and degradation: Recommendations include guidance on project area sizing, avoiding high-value habitat areas and bat roosts, providing alternatives for fish passage, erosion control, and minimizing the spread of invasive species.

2. Construction-related incidental take of migratory birds, eagles, and their nests: Recommendations include guidance on timing and duration of project activities to avoid impacting habitat, migration, and nesting. Short-term eagle take permits should be submitted at least 60 days in advance of any ground-breaking activities.
3. Displacement and barrier effects from wind turbine operations: Recommendations include utilizing USFWS and Avian Power Line Interaction Committee guidance documents, modifying siting and infrastructure layout, using bird diverters, consider plans for lighting, decommissioning deprecated infrastructure, research current methods of strike mitigation, adjust operating times during active wildlife periods, prepare a Bird and Bat Conservation Strategy along with comprehensive pre-construction surveys, and obtain Long-term Eagle Take Permits and an Eagle Conservation Plan.

SCRO Response:

The comments from USFWS have been forwarded to the applicant.

1. SCRO will require the applicant to work with USFWS to develop site-specific BMP's on developing strategies to avoid habitat loss or degradation and the spread of invasive species.
2. SCRO will require the applicant to work with the USFWS on mitigating construction-related impacts on birds and other wildlife, with particular consideration of eagles and their nests according to the Eagle Act.
3. SCRO will require the applicant to work with the USFWS to develop appropriate bird (and bat) strike mitigation strategies to ensure compliance with the Migratory Bird Treaty Act. SCRO approval of this plan will be required prior to turbine pad construction.

The applicant must meet all applicable USFWS requirements and obtain any applicable permits as necessary. In addition, SCRO is requiring the coordination of this project with USFWS to minimize impacts on wildlife and habitat and may incorporate additional stipulations to any issued authorizations.

Alaska Department of Fish and Game (ADF&G) Comments:

ADF&G has concerns with how this project may impact some wildlife species or habitats. Of concern are impacts to wildlife and habitat for Chinook salmon, beluga whales, Tule greater white-fronted geese, trumpeter swans, bats, ptarmigan, and other avian species including raptors, passerines, and shorebirds. The project area is primarily above moose habitat, and is unlikely to significantly impact moose, Dall sheep, caribou, and small game / furbearers. ADF&G provided advisories, suggested research, and requested lease stipulations in their comments, which are summarized below:

- Co-locate utility and road corridors with the Donlin Mine gas line easement to minimize wildlife and fish habitat impacts.
- Obtain a required permit for areas of the project that fall within the Susitna Flats State Game Refuge.

- Be aware of local subsistence harvest of birds, mammals, and fish occurring during the spring-summer and fall-winter regulatory seasons, as well as the potential for bear conflicts. Bear denning locations should be included in the pre-construction site survey.
- Utilize BMP tiered guidance from USFWS and the Avian Power Line Committee
- Develop a research plan between the applicant, state and federal agencies, and other non-governmental organizations to reduce or mitigate impacts to wildlife. Include pre- and post- development survey and assessment of wildlife populations, habitats, and mortalities.
- Limit operation activities during high migration periods and when visibility is poor. Modify turbine lighting to reduce disorientation and impacts during breeding and migration seasons.
- Paint turbine blades black and adjust turbine speed triggers to >6m/s between late July and early October.

In addition, ADF&G noted that salmon stocks of concern have been identified under 5 AAC 39.222 in the following areas:

- Lewis River (under consideration for removal from area of concern)
- Theodore River

SCRO Response:
This decision will serve as notification to LMSW of the above comments from ADF&G. In addition, SCRO will require the applicant work with ADF&G to incorporate site-specific advisories, research, and guidance to reduce and prevent impacts on wildlife and habitat as much as possible. and may incorporate additional stipulations to any issued authorizations.

SCRO will require the coordination of this project with ADF&G to minimize impacts on wildlife and habitat. The applicant must meet all applicable ADF&G requirements and obtain any applicable permits as necessary.

While SCRO recognizes that there may be potential benefits of co-locating the proposed public access easement and public utility easement with the existing rights-of-way and easements granted to Donlin Gold, LLC, SCRO has evaluated the project as applied for and the contemplation of alternative routes is outside of the scope of this decision. SCRO would support the coordination between the applicant and Donlin Gold, LLC, and would consider any alternative routes proposed should the applicant choose to explore such alternative routes.

Discussion:
Lease: LMSW has applied for a 40-year lease authorization to be located in the area of Little Mount Susitna, approximately 37 miles northwest of Anchorage, Alaska. LMSW has requested to lease up to 450 acres of land within an overall project area of approximately 19,000 acres. LMSW is proposing to use this site for construction, operation, and maintenance of a long-term wind farm.

The project would consist of between 10 and 80 wind turbines, each with their own lease footprint of up to five acres. The project area would be accessed by the proposed Public Access Easement, ADL 234252 and each individual lease is to be connected by the same easement. LMSW is in the process of installing MET towers to determine specific turbine numbers and locations.

The proposed lease will be subject to the terms of SCRO's standard lease document (available for review upon request), and any stipulations based, in part, upon the following considerations.

Easements: LMSW has applied for a public access easement (ADL 234252) and a public utility easement (ADL 234276). ADL 234252 would serve both as access to the project area from the existing Beluga road system, as well as access from the substation to the individual lease parcels. The public access easement will be 100 feet wide encompassing roads 30 feet wide up to approximately 55 feet as necessary in specific locations. The segment from the existing Beluga road system to the substation would be up to 16 miles long, although the final length is undetermined at this time. The construction authorization would be issued to LMSW, but the easement would be issued to the Division.

LMSW has applied for a public utility easement (ADL 234276) for a transmission line connecting the wind farm to the existing electrical grid. We are expanding the scope of this easement to also include the communications and power collection systems between the substation and the individual lease parcels. It is anticipated that this portion of ADL 234276 will be substantially co-located with the turbine access roads proposed under ADL 234252 and will be a width of approximately 30 feet in this location.

Between the Beluga intertie and project substation, the applicant is proposing 2-3 parallel transmission lines within a single corridor. This configuration will provide adequate interconnection redundancy between the project and the existing grid, while minimizing the environmental impacts by limiting disturbance to a single corridor. However, two or three separate lines are highly desirable to allow for continued operation due to the risk from a combination of wind and icing or scheduled maintenance. Each line requires a 100-foot width, thus two parallel lines would require 200 feet, while three lines would require 300 feet.

SCRO proposes to issue a 40-year negotiated lease, public access easement, and public utility easement to Little Mount Susitna Wind, LLC for the construction, operation, and maintenance of a wind farm which will provide the following benefits:
1. This project will diversify the CEA power generation portfolio and will contribute to meeting the State's benchmarks for renewable energy generation;
2. This project will increase locally produced power, lowering costs to the community and improving electrical grid stability in the region;
3. The project contemplates associated infrastructure such as roads which will enhance access to public lands, waters, and fish and wildlife resources in this area and allow for vehicular access on

constructed routes which will minimize impacts to the wetlands and anadromous and other fish bearing streams;
4. Project construction and operations will provide jobs and economic opportunities in the State; and
5. Leasing fees from the commercial use of this state land will provide an ongoing revenue stream.

The proposed lease and easements will include stipulations for access and wildlife considerations and will require the applicant to comply with all laws and regulations that exist for the protection of wildlife.

For the reasons stated above, it is in the best interest of the State to issue a 40-year non-competitive negotiated lease and public easement to Little Mount Susitna Wind, LLC. The term of the lease will reasonably align with the lifespan of the proposed infrastructure. The proposed lease will be subject to the terms of SCRO's standard lease and easement documents effective at the time of signature. The lease and easement may also be subject to additional stipulations based on site specific considerations that are identified in the adjudication process and referenced in this document.

Under AS 38.05.035, DMLW is obligated to lease land at no less than fair market value (FMV). Given the current goals set by the State to facilitate renewable energy, compensation under the lease shall be set at fair market value of the lands to be leased. Compensation is discussed further below.

Development Plan:

The Development Plan (DP) attached to this decision (Attachment A) and dated January 26, 2022, is under consideration by SCRO. Should the proposed lease be granted, it is anticipated that the DP will need to be updated throughout the life of the lease as activities and/or infrastructure are added or subtracted. All updates must be approved, in writing, by SCRO before any construction, deconstruction, replacement of infrastructure, or change in activity. SCRO reserves the right to require additional agency review and/or public notice for changes that are deemed by SCRO to be beyond the scope of this decision.

Specific location and plans have not been finalized for the access and public utility easements. Between the existing Beluga infrastructure and the project substation, the applicant is considering two routes for both the transmission lines and roads; specific route selection, and location within the route, will be developed in consultation with ADF&G as co-manager of the Susitna Flats State Game Refuge, as well as the U.S. Army Corps of Engineers from whom a wetlands fill permit will likely be required. Final plans, including construction plans, must be approved by SCRO, to ensure compliance with stipulations and objectives outlined in this decision. To allow for location flexibility within each route based on final design considerations, the "project area" for each route is defined as 0.5 miles each side of the application centerline.

Hazardous Materials and Potential Contaminants:

Hazardous materials, including lubricant oil and lithium batteries, will be stored within the proposed leasehold. Stipulations will be included in the Entry Authorization and lease to ensure proper handling and storage.

The use and storage of all hazardous substances must be done in accordance with existing federal, state, and local laws. Debris (such as soil) contaminated with used motor oil, solvents, or other chemicals may be classified as a hazardous substance and must be removed from the lease site and disposed of in accordance with state and federal law.

Lease Performance Guaranty (bonding):

In accordance with AS 38.05.035 and AS 38.05.860, LMSW will be required to submit a performance guaranty for the lease site.

- **Performance Bond:** Once the final design is completed, LMSW will be required to provide an estimate of the cost to safely remove all infrastructure. A performance guarantee in this amount strikes the appropriate balance of ensuring public safety while incentivizing overall compliance with all terms and conditions of the authorizations. The bond will remain in place for the life of the proposed lease. The bond amount is based upon the level of development, amounts of hazardous material and/or substances on site, and the perceived liability to the State. Additionally, this bond will be used to ensure the applicant's compliance with the terms and conditions of the lease issued for the project. This bond amount will be subject to periodic adjustments and may be adjusted upon approval of any amendments, assignments, reappraisals, changes in the DP, changes in the activities conducted, or changes in the performance of operations conducted on the authorized premises, and as a result of any violations to one or more of the authorizations associated with this project. The performance guaranty must be provided prior to beginning construction.

- **Reclamation Bond:** SCRO is reserving the right to require a reclamation bond due to noncompliance issues during the term of the lease or near the end of the life of the project.

Insurance:

Consistent with AS 38.05.035(a) in order to protect the State from liability associated with the use of the site, the applicant shall provide and maintain a comprehensive general liability insurance policy with the State of Alaska named as an additional insured party per the stipulations of the authorization. The applicant shall secure or purchase at its own expense and maintain in force at all times during the term of this lease, liability coverage and limits consistent with what is professionally recommended as adequate to protect the applicant and the State, its officers, agents

and employees from the liability exposures of ALL the insured's operations on state land. The insurance requirement may be adjusted periodically.

Survey:

Lease: In accordance with AS 38.04.045, the applicant must complete an approved survey according to the requirements and standards of DMLW's Survey Section prior to lease issuance. If the submitted survey is accepted by DMLW, the measurements identified will be used to accurately calculate the total acreage. The survey must be performed by an Alaskan registered Land Surveyor under survey instructions issued by the DMLW Land Survey Section. The applicant is responsible for the cost of the survey. The applicant shall submit an initial draft of the survey at least one year prior to the expiration of the EA.

Easement: A DMLW-approved as-built survey is required to determine the proper location and acreage of installed improvements and the associated easement on State-owned, DMLW-managed lands. The survey must be produced in accordance with survey instructions provided by the DMLW Survey Section and stamped by a Professional Land Surveyor registered in the State of Alaska. A final easement will not be issued until the as-built survey has been approved by DMLW. The applicant is required to submit a preliminary draft as-built survey a minimum of one year prior to the expiration of the entry authorization to allow adequate time for DMLW's review and approval of a final as-built survey.

Entry Authorization:

SCRO is proposing to authorize LMSW entry onto state land through the issuance of an EA while they are completing the required surveys, and, for the lease site, the appraisal. The term of this EA will be 5 years. The proposed EA cannot be issued until after the FFD goes into effect. The effective date of the EA will be the start of the total lease term length. Substantial construction under this EA cannot commence until final design plans have been reviewed by SCRO for compliance with terms and conditions outlined in this decision and the EA.

Compensation and Appraisal:

Lease Compensation (ADL 233892)

A Minimum Rent Determination for the proposed leasehold, issued on September 14, 2022, determined that an appraisal is needed for this lease. In accordance with AS 38.05.840, state-owned land may only be leased if it has been appraised within two years before lease issuance. The applicant will be required to provide an appraisal of the proposed leasehold before the lease is issued. Once the appraisal has been approved by DMLW, the annual lease fee will be set at the Fair Market Value (FMV) of the proposed leasehold. Furthermore, in accordance with AS 38.05.105, the proposed EA and Lease will be subject to reappraisal at five-year intervals after the issuance of the proposed authorization.

Coordination with the DMLW Appraisals Section indicates FMV rental likely exceeds the minimum rent of $1,000 per lease, and thus an appraisal will be required. During the term of the EA, the applicant will pay an interim amount of $1,000 for each of the maximum 81 parcels requested by the applicant. After appraisal, any overages will be credited to the applicant's account, and any shortfalls must be paid prior to lease issuance.

Easement Compensation

Public Access Easement (ADL 234252)

Prior to issuance of the easement, the applicant shall pay a one-time Public Access Easement fee of $120.00 per acre or fraction thereof, as calculated on the approved as-built survey, set by 11 AAC 05.070(d)(2)(B) and Director's Fee Order No. 3. These fees may be adjusted if regulations pertaining to the fees change during the term of the entry authorization and/or easement and will be subject to non-sufficient fund and late payment penalty fees. Additionally, the applicant shall pay applicable document recording fees prior to DMLW's execution and recordation of the easement document.

During the EA term, there is an annual fee. This fee is $120.00 per acre or fraction thereof, with a $240.00 minimum, set by 11 AAC 05.070(d)(2)(I) and Director's Fee Order No. 3. The EA fee for this easement will be determined based on the final design plans, which must depict/calculate both estimated length and width of the easement and will begin accruing on the date the EA is executed, not the date the final plans are provided. Accrued fees must be paid prior to commencement of construction, and on the annual anniversary of EA issuance thereafter.

Public Utility Easement (ADL 234276)

Prior to issuance of the easement, the applicant shall pay a one-time Public Utility Easement fee of $0.56 per lineal foot, as calculated on the approved as-built survey, set by 11 AAC 05.070(d)(2)(C) and Director's Fee Order No. 3. These fees may be adjusted if regulations pertaining to the fees change during the term of the entry authorization and/or easement and will be subject to non-sufficient fund and late payment penalty fees. Additionally, the applicant shall pay applicable document recording fees prior to DMLW's execution and recordation of the easement document.

During the EA term, there is an annual fee. This fee is $120.00 per acre or fraction thereof, with a $240.00 minimum, set by 11 AAC 05.070(d)(2)(I) and Director's Fee Order No. 3. The EA fee for this easement will be determined based on the final design plans, which must depict/calculate both estimated length and width of the easement and will begin accruing on the date the EA is executed, not the date the final plans are provided. Accrued fees must be paid prior to commencement of construction, and on the annual anniversary of EA issuance thereafter.

These fees are charged concurrently with the lease fee as well as any other land use fees that may be described herein.

Subleasing:
Subleasing is permissible through AS 38.05.095, if the proposed lease is approved. A sublease is defined as improvements not owned by the lessee that are located within the leasehold on the land or located on structures owned by the lessee. A sublease pertaining to the proposed lease includes but is not limited to, user agreements, license agreements, communication site agreements, or any contracts between the lessee and other commercial entities. All potential subleases must first be approved in writing by SCRO. Depending on the activity of any potential subleases, SCRO is reserving the right to reevaluate the need for further agency review and/or public notice before making a determination on the appropriateness of the proposed sublease. Sublease compensation to the State will be determined by SCRO according to AS 38.05.073(m), under the authority of AS 38.05.075(a) Leasing Procedures. In any case, the sublease fee for commercial activities will not be less than 25% of the annual fee paid to leaseholder by the sublessee.

Assignments:
The proposed authorizations, if issued, may be transferred or assigned to another individual or corporation only with written approval from the DMLW. An authorization will not be assigned to an entity if that entity does not meet the statutory requirements of the authorization, or if the authorization is considered not to be in "good standing" with DMLW or any other agency authorization. DMLW reserves the right to amend the terms of authorizations prior to assignment.

Reclamation:
In accordance with AS 38.05.090(b), all lessees must restore their lease site to a "good and marketable condition" within 120 days after termination of the lease. What level of reclamation constitutes as being "good and marketable" is at the discretion of SCRO.

Public Notice of the Preliminary Decision:
Pursuant to AS 38.05.945, this PD will be advertised for a 45-day public comment period. Notice will be posted on the Alaska Online Public Notice System at http://aws.state.ak.us/OnlinePublicNotices/Default.aspx and the post offices located in Anchorage, Chugiak, Big Lake, Eagle River, Elmendorf, Fort Richardson, Hope, Houston, Kenai, Nikiski, Palmer, Skwentna, Talkeetna, Tyonek, Wasilla, and Willow. Courtesy notices will also be mailed or emailed to neighboring property owners, permit/lease holders, and other interested parties on May 22, 2024, for a 45-day public comment period.

Comment(s):
This decision is subject to both public and agency comments, and all comments received by the comment deadline will be considered in the FFD. Only those who comment and the applicant have the right to appeal the FFD.

Written comments about this project must be received in this office no later than

11:59 p.m. on July 8, 2024 to be considered.

To submit comments, please choose one of the following methods:

Postal: Department of Natural Resources
Division of Mining, Land and Water
Southcentral Regional Land Office
ATTN: ADL 233892 Public Notice
550 West 7th Avenue, Suite 900C
Anchorage, AK 99501-3577
Email: comments.scro.leasing@alaska.gov
Fax: (907) 269-8913

Questions about the lease portion of this project can be directed to Todd Derks at (907) 269-8549.

If public comments result in significant changes to the Preliminary Decision, additional public notice will be given. To be eligible to appeal the Final Finding and Decision, a person must provide written comments during the Preliminary Decision comment period per AS 38.05.035(i)-(m).

Signature page follows

Recommendation:

SCRO has completed a review of the information provided by the applicant, examined the relevant land management documents, and has found that this project is consistent with all applicable statutes and regulations. SCRO considered three criteria to determine if this project provided the best interest to the State and the development and use of its natural resources. The criteria include direct economic benefit to the State, indirect economic benefit to the State, and encouragement of the development of the State's resources. This authorization provides a direct economic benefit to the State with the collection of fees and an indirect economic benefit through the encouragement and development of the State's renewable resources. The proposed project has the potential to help contribute to Railbelt Utilities' renewable energy production. As there are no competing projects which are incompatible with the proposed lease, and in consideration of the benefits described above, SCRO finds granting the proposed authorizations provides the greatest benefit to the State. The proposed action may be in the State's best interest and SCRO recommends proceeding with public notice of the proposed 40-year lease, an indefinite public access easement, and an indefinite public utility easement to LMSW.

5/22/2024

Todd Derks, Natural Resource Specialist 3 Date
Division of Mining, Land and Water, Southcentral Regional Land Office

Preliminary Decision:

It is the determination of the Division of Mining, Land and Water that it may be in the State's best interest to issue a 40-year non-competitive negotiated land lease, public access easement, and public utility easement to Little Mount Susitna Wind, LLC, as described above. The issuance of this lease and easements support the production of local energy which provides a benefit to the local community and the State. This Preliminary Decision shall now proceed to public notice.

5/22/2024

Joni Sweetman, Leasing Unit Manager Date
Division of Mining, Land and Water, Southcentral Regional Land Office

Attachments

Attachment A – Development Plan
Attachment B – Location Map

Attachment A
Development Plan

Little Mount Susitna Wind Energy Project
Development Plan

Little Mount Susitna Wind LLC
Submitted to Alaska Department of Natural Resources

Background

In late 2021, Chugach Electric Association (CEA) released a Request for Proposals encouraging energy development teams to propose low-cost, reliable, and sustainable energy generation projects as part of its commitment to reduce the environmental impact of its current operations. Fairbanks-based Alaska Renewables LLC (AKR) submitted the Little Mount Susitna Wind proposal for a wind energy facility with an optional battery energy storage system in response to this call and other future renewable energy development opportunities. The Project aims to meet the needs and goals of the Railbelt Utilities, their member-owners, and by extension the greater Alaska community. This proposed project is designed to enable a transition to a more affordable, reliable, and more environmentally friendly energy mix.

Little Mount Susitna Wind LLC (LMSW) is a project under development by AKR. Although AKR has conducted a preliminary evaluation of the feasibility for a wind project at this site, the project remains early on in its development, and significant work remains to fully evaluate its benefits, impacts, design, sizing, and community acceptance, as well as any mitigation measures that may be necessary to minimize impacts and maximize the benefits for all stakeholders. AKR and its partners are committed to engaging with all interested stakeholders and putting together a renewable energy project that maximizes the benefits for the entire community.

Project Summary

Site Description, Terrain, and Ground Cover

The proposed Little Mount Susitna Wind Energy Project would be located approximately 37 miles NW of Anchorage, Alaska. The project would be sited atop a broad elevated plateau of Little Mount Susitna (*Henq'edishla)* at elevations of approximately 2,000 to 3,100 feet above sea level. Much of the project is at higher elevations characterized by low shrubs, alpine vegetation and bare ground. The surface geology is characterized primarily by granitic rock and glacial deposits. No specific wildlife populations of concern or critical habitat have been identified in the proposed lease area.

The land is owned and managed by the State of Alaska and the Department of Natural Resources (DNR), and located within MTRS parcel IDs listed in Appendix A. The proposed

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Development Plan

Figure 1. Aerial photographs of the proposed project site looking E (top), SE (middle), and NW (bottom).

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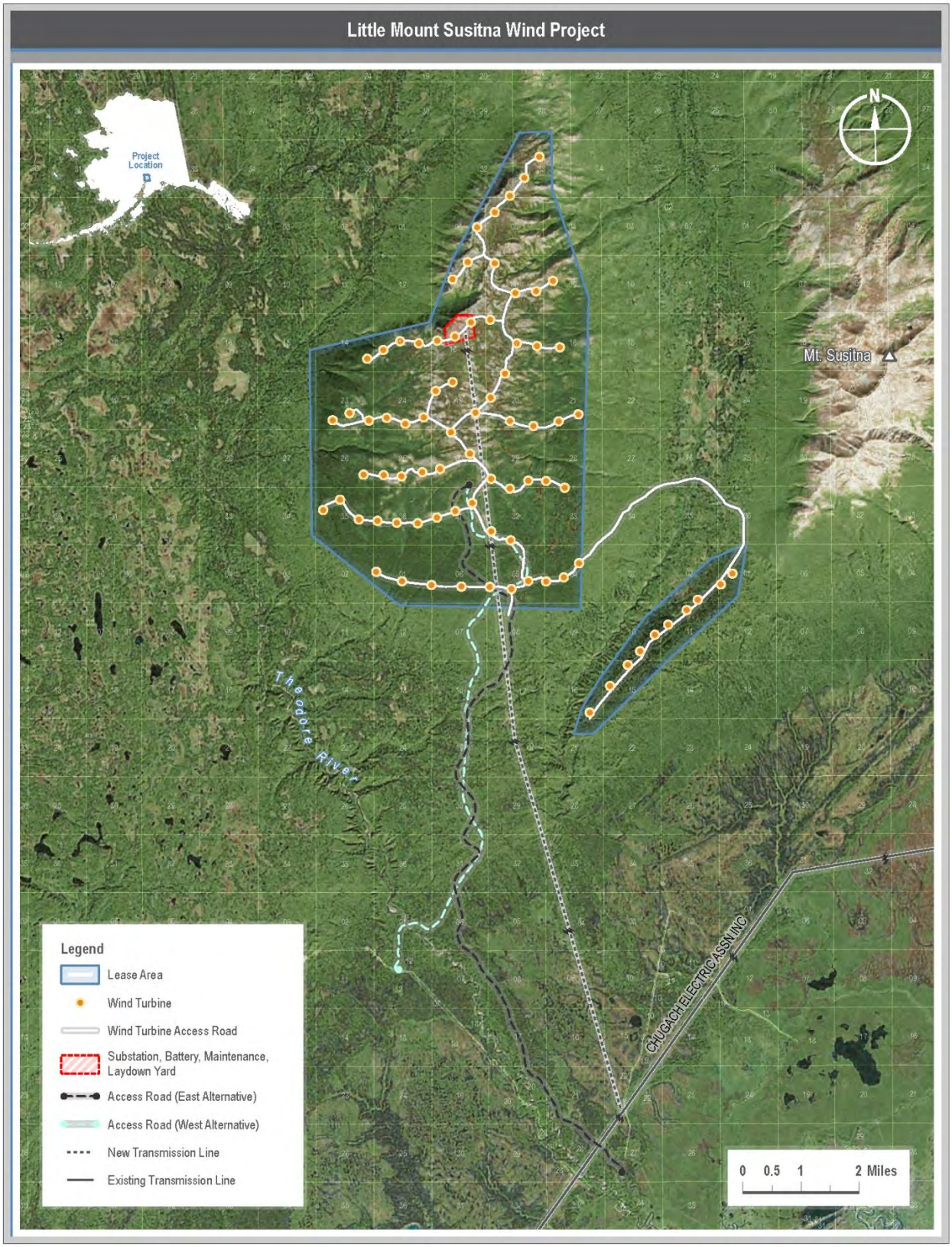

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lease areas encompass approximately 19,196 acres, of which up to approximately 450 acres would be developed and leased for wind turbine pads, maintenance buildings and yards, meteorological towers, communications facilities, an electrical substation, and a battery energy storage facility. Additional land use would include easements for access roads and electrical transmission lines, collector lines, and communications cables.

There are presently no major roads or trails in the area. The nearest road is located in the lowlands approximately 7 miles south of the proposed project site, and these roads are for oil and gas development and not connected to the State's main road system.
The project site was selected in large part because of its consistent and strong winds that can support cost-effective and reliable renewable energy generation. Site access would require a new road to the existing oil and gas roads to the south, which in turn would be accessed by barge from Cook Inlet or by air. The project would be connected to an existing and robust electrical transmission corridor that passes approximately 10 miles south of the project, connecting the Beluga power plant with the population centers to the east. Both the road and new electrical connections would require easements.

If developed, the proposed lease area would contain a network of access roads, electrical collector cables, communication cables and towers, meteorological towers, turbine pads, and wind turbine generators across the broad apex of the Little Mount Susitna highlands.

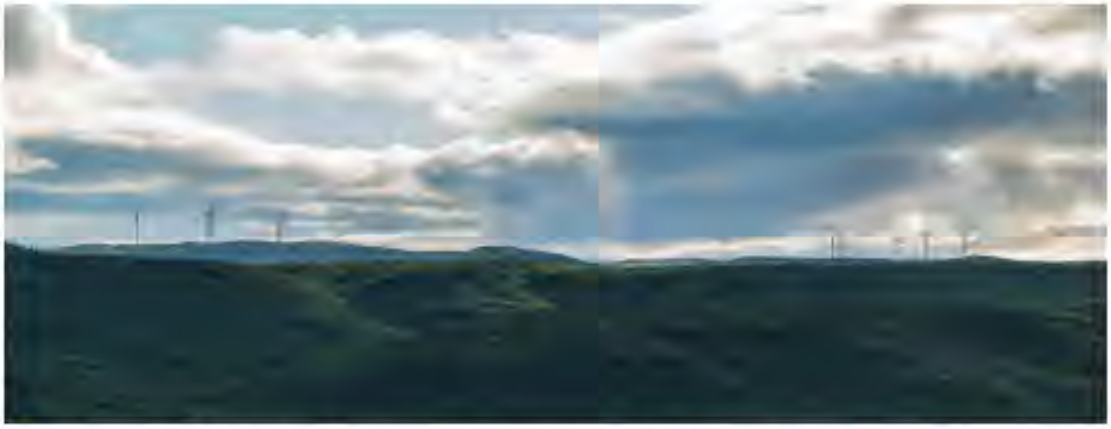

Figure 3. View of the existing Eva Creek Wind Farm (est. 2011) operated by Golden Valley Electric Association outside of Healy, AK. The proposed Little Mount Susitna Wind development would have many attributes in common with this existing, albeit smaller project.

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Project Scope

The exact extent and scale of the proposed project would depend on the energy offtake agreement(s) that might ultimately be reached between the Project and CEA and/or any other potential offtaker(s) of the produced energy. The proposed Little Mount Susitna Wind Project would consist of up to 80 wind turbines, corresponding to a total electrical output ranging up to 272 MW. We have sized the development plan to allow for multiple potential phases to take advantage of the economy of scale in order to further reduce the cost of wind energy and the carbon dioxide emissions of the broader grid. The footprint also allows for additional flexibility in the site design, layout, and engineering stages of the project as the project moves through the different phases of study, design, and permitting.

Meteorological Towers

Meteorological observations lasting at least two years will be required in order to determine the feasibility, economics, and financeability of the proposed project. The Project has installed and will continue to maintain/add 50 to 80 m tall meteorological towers and ground-based LIDAR systems to monitor the wind and other meteorological variables. Located within the proposed lease area, this provides detailed information on the spatial variability of the wind resource throughout the project area. Several permanent hub height meteorological towers may also be installed on the project site for use throughout the operational phase of the project, each occupying approximately 2 acres each.

Turbines, Turbine Pads, and Foundations

Once the project is constructed, each turbine pad would be approximately 5 acres, with sufficient space for a crane to enable the delivery, staging, and installation of all turbine and tower components. Within that pad area, a foundation would be built for the turbine towers according to the manufacturer's requirements. Turbines would be spaced apart in a layout optimized to best capture the prevailing winds from the north and southeast. The potential turbine locations, size, and number, as well as all other project elements are only preliminary, as the layout will be optimized based on further wind resource characterization, terrain, geotechnical attributes, environmental considerations, utility interest in wind energy procurement, as well as stakeholder input.

The specification and supplier of the turbines themselves are subject to change; however preliminary planning involves consideration of wind turbine generators ranging from 3-7 megawatts each with hub heights between 80 and 120m and rotor diameters between 117 and 170m. The turbines would be outfitted with cold weather modifications to ensure reliable performance in Interior Alaska's climate.

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Yard: Laydown, Collector System, Substation, and Buildings

The yard (or multiple smaller yards) would serve as the site for the laydown of turbine components during construction, as a site for an enclosed main maintenance and control building, and the electrical equipment to collect power from the wind farm and interconnect it with the transmission grid. A potential battery energy storage system may also be sited here next to the substation. The yard would be an area of up to about 50 acres. While the yard would likely be situated somewhere near the center of the project as built, there may also be multiple smaller yards, and the exact siting is only preliminary and would be dependent on further engineering, design, and land use considerations.

Access

The project would be accessed by a new road built extending and climbing northward from the existing oil and gas development roads along the northern rim of Cook Inlet. This new site access road will be approximately 9 miles long, and the turbine access roads within the lease area would be up to an additional 26 miles long, depending on the project capacity.

Public access and use of the area would be maintained and improved with this development, much in the way that it is at the Eva Creek Wind site located on State of Alaska land near Healy, Alaska. These new access roads have the potential to enhance access to the surrounding State lands and the diverse resources they hold.

The turbine access road surfaces would be approximately 52 feet wide to accommodate the erection crane traveling between turbine pads, with minor widening anticipated on the curves. The goal is to find a route with design grades and a horizontal alignment that can safely accommodate access and maintenance for the wind energy project construction and operation. Temporary parking will be provided for workers; long-term limited parking will be established for the small maintenance staff at key locations along the access roads.

Electrical Interconnection

The project would be connected to the existing transmission grid with new high voltage transmission lines along a new easement to the south. Within the project and adjacent to the turbine access roads, there would be buried electrical lines to collect power from the turbines and deliver it to the project substation.

Special Site Considerations

AKR has reviewed this proposed project with the Alaska Department of Natural Resources. AKR's goal is to design and refine the project in a manner that attempts to maximize the project benefits while minimizing potential impacts. Further, AKR is sensitive to the diverse public

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values and potential mitigations required to ensure the project results in the greatest good for the community's health, economy, jobs, recreation, subsistence, and sustainability. Several key site considerations that were identified in our preliminary review of the site are listed below, as well as possible mitigations and approaches. This is not an exhaustive list, and we continue to learn more about other uses and site considerations through the ongoing public engagement phase, and design in ways to address the identified issues. AKR intends to make any reasonable and cost-effective adjustments as necessary to respond to these considerations and improve the overall project outcomes.

- First and foremost, we acknowledge that the project would be located on the traditional lands of the Dena'ina people and adjacent to the native village of Tyonek. Alaska's indigenous peoples have stewarded these lands since time immemorial and maintain deep cultural, subsistence, and substantive connections with their lands. In deference to this history and stewardship, AKR is committed to taking a transparent, collaborative, and consultative approach by engaging with Native communities and organizations to ensure the project benefits indigenous communities and is consistent with indigenous values and land use practices. We embrace the practice of Free, Prior and Informed Consent (FPIC) and aim to implement this practice throughout the development of this project.

- The lease area is designated for Public Recreation-Dispersed in the 2011 Susitna Matanuska Area Plan adopted by DNR. However, owing to its remote and generally inaccessible location, the area is seldom accessed for this or any purpose. During the pre-application discussions, DNR did not identify any active recreational uses. Generally the entire area is open to oil, gas, and coal development, though none of those resources are known to be held in the proposed project area. It appears the area's wind resources were not considered in the potential uses of the land when the Area Plan was developed. The Public Recreation-Dispersed designation does indicate that "utilities and roads may be appropriate with appropriate design if recreation functions can be maintained." The vast majority of the project area would remain accessible to the public. In many cases, access opportunities would be improved for the benefit of the public. Access to the space immediately beneath and adjacent to the wind turbines and associated electrical equipment will be restricted and/or signed to minimize risk to the public, but this represents only a few percent of the total proposed lease area.

- Local aviators utilize parts of the proposed project area as unimproved landing areas.

- No privately owned lands are within or immediately adjacent to the proposed lease area. There are 4 nearby private lots to the East and Northeast of the project lease area along Wolverine Creek at distances of more than 1.7 miles. Other remote private lots in the

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broader area that may incur visual impacts from the proposed project include the remote properties along Trail Lake (8 miles NE), Sucker Lake (8.5 miles to the N), and the Super Cub Subdivision (4.8 miles to the W).

- Once constructed, portions of the project may be visible from the surrounding landscape. Most of the impacted developments are 8-40 miles away from the project. A full visual impact study will be completed as the project proceeds.
- There are no known mining interests in this area.
- There are no known oil, gas, coal or mineral resources at the project site. Ongoing oil and gas production and development takes place in the Cook Inlet basin approximately 10 miles to the south of the project, but no conflicting uses are anticipated.
- There is presently a microwave repeater tower (permitted under LAS 31531) located in the southern portion of the proposed lease area which is used as a communications link between Anchorage and a remote wilderness lodge located near Judd Lake, 21 miles to the WNW of the repeater. The project owner will collaborate with the owners of that equipment to ensure their communication needs are maintained or enhanced as a result of this project.
- The gas line easement (ADL 232152) for the proposed Donlin Gold project follows a similar alignment to the proposed site access road and crosses through the SE corner of the main lease area for the proposed wind energy project. In addition, the Alaska Gasline Development Corporation has a lease (ADL 421297) for a proposed gas line with an alignment that runs along the southern flank of the project near the start of the proposed Little Mount Susitna site access road. Little Mount Susitna Wind infrastructure would be sited in a way that is compatible with the operation and maintenance of that prospective infrastructure.

Other Environmental Considerations

Wind farms generate negligible waste (e.g. used lubricating oil, which is changed periodically and will be disposed of properly). Water use will be required and sourced on site for construction and operations. End-of-life disposal, recycling, and reuse best practices will be followed to ensure that the environmental values of the project consider material and waste life cycles. The project owner will work with the Department of Environmental Conservation and other relevant agencies to obtain the necessary permits for these activities.

Wind Project Development Stages

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The following is a discussion of the critical stages in the grid-scale wind project development process. Each project, site, and community are unique, so there is no "one size fits all" template or blueprint for successful development.

The following segments represent the critical steps to develop a successful, grid-scale wind project.

Site Identification and Wind Resource Assessment

Successful development of a grid-scale wind power project is founded on identifying a site suitable for hosting a wind project, often called a wind farm. Key characteristics of an attractive wind site include:

- Above average but consistent wind resource, minimizing gusts and shear
- Access roads that can be graded to 8% grade or less
- Access to electricity grid infrastructure (transmission lines and/or substations)
- No impingement on protected, sensitive or conservation areas
- Minimal to no wetland or floodplain impacts
- Minimal to no impact on protected ecosystems and organisms
- Minimal to no impact on cultural or archaeological resources
- Ability to secure land access and long-term rights from the landowner
- A location where wind development provides net gains to the local community and grid

In an initial review, AKR has investigated each key characteristic identified above and made a preliminary determination that this site meets all requirements for a successful wind farm. Further study and stakeholder engagement is still required to verify this preliminary determination and implement all reasonable and cost-effective measures for mitigating impacts and maximizing the net benefits of the project.

Local Outreach

One of the most challenging aspects of the grid-scale wind development process is securing the required approvals. Additionally, being a good neighbor is essential to developing a quality wind project and requires working closely with nearby residents, businesses and industries, indigenous communities, government authorities, and the community at large to ensure all questions and concerns are addressed. The success of a grid-scale wind project often hinges on a developer's ability to build strong relationships with all stakeholders throughout the development process and the project's lifetime. At this early stage in the project development process, AKR has initiated many of these relationships and looks forward to expanding the engagement over the coming years before the project is finalized.

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Site Environmental Review and Cultural Assessment

Grid-scale wind projects require additional highly-detailed studies to ensure the project has limited to no negative impacts on existing ecosystems, threatened or endangered species, or cultural and archaeological resources. Soil conditions and topography ("geotechnical conditions") are also evaluated to ensure the project can be constructed efficiently.

While no rezoning is required and there are no threatened or endangered species identified within the project area, extensive environmental assessment and permitting is required. This process, which can take around 2 to 4 years, involves significant investment of time and resources from the developer. During this period, professional teams have been and will continue to be on site for the required field studies and observations.

Grid Access and Interconnection Management

The next step in the wind project development process involves securing rights for a connection to the electric grid through either high voltage or medium voltage. Proper connection with the electric grid is crucial to a successful wind project, especially given the unique dynamics of power flow and load balancing for CEA and other Railbelt utilities. AKR's team of interconnection engineers will work with the offtaker to assess connection prospects at the project site, assemble the Interconnect Application and other necessary applications, and complete the appropriate studies. Due to the advances in reliability and cost with wind turbine technology, energy storage (battery) technologies, and other modern software, this project can increase the reliability for the Railbelt and reduce system cost over its 30 to 40 year operating lifetime. Chugach Electric has completed this step.

Energy Sales/Offtake Agreement

Arranging in advance for the sale of electricity generated by a wind project is essential to a project's success. By securing a long-term contract in advance for the purchase of the energy from a wind facility, a project developer can guarantee the levelized cost of energy that reduces the cost of energy to consumers. AKR has been awarded a PPA by Chugach Electric.

Project Financing

Grid-scale wind energy projects require significant upfront investment. This investment takes the form of both equity and project debt, supported by predictable revenues generated under a PPA or other energy offtake arrangement. The more predictable the project's revenue stream, the lower the risk and cost of capital required to build the facility. There is a robust global market for wind project equity and debt investments, which reduces the cost of ownership and capital, thereby reducing the cost of carbon-free, renewable electricity to consumers. This will bring

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low-cost capital into the region and ensure that utilities and their members only pay for the project if it delivers according to contract terms, as opposed to other financial structures where the debt is owed regardless of power plant performance.

Engineering, Design, and Procurement

Early in the project development process, preliminary engineering layout and design work was done to appropriately size and tailor the proposed project layout for the particular site and circumstances. As the project moves forward and the development team finalizes the energy offtake arrangement, the engineering efforts become more detailed to produce a viable plan that can be financed and built. Simultaneously, procurement efforts are undertaken to evaluate and negotiate equipment supply agreements (wind turbine generators, energy storage equipment, substation equipment, collector and transmission cabling, transport logistics, etc.) and construction agreements.

Construction

The development process is complete when:

- The site is secured
- Permits are granted
- Full permission to connect to the grid is granted
- Final engineering and procurement plans are complete
- Offtake provisions for the power or the project are negotiated
- Financing is arranged

At this point, often called "Notice to Proceed" (NTP), the project is "shovel ready" and construction can begin. From design to final delivery of the completed and operational energy generation facility, a wind project developer must select and deploy a capable construction management crew to direct skilled tradespeople for safe, efficient, and precise plant construction. Depending on the size of the project, construction should be completed within 18 to 36 months. During this period, project construction generates a significant number of local jobs across many trades (civil works, electrical, mechanical, labor, etc.), at times employing over 300 workers.

Ongoing Operations & Maintenance

Once a grid-scale wind project is tested, approved, and accepted by the electric utility or other offtaker, it is placed in service and begins delivering electricity to the grid. During its operational lifetime of up to 40 years, the project requires very little in terms of operations and maintenance ("O&M") to efficiently deliver renewable energy to consumers through the grid. Significant technical advances have occurred in the reliability of these platforms over the past decade,

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especially for established major vendors like GE, Siemens, and others. Moreover, remote monitoring and predictive maintenance software is now mainstream, significantly decreasing the uncertainty in O&M planning, cost, and burden.

In many cases, a separate O&M provider will be engaged who will hire local employees to perform ongoing maintenance, monitor and optimize production, and maintain the grounds. If the land is leased, the project will generate a recurring lease or royalty payment to the landowner. Compared to other generation sources, the total cost and time invested in a wind farm is very low, making the wind farm a good neighbor, quietly producing affordable, carbon-free, renewable energy and delivering benefits to the landowner, local community, and the environment.

Closure Plan

Wind farms operate for a minimum of 20 years, but now have extension plans available for purchase from the manufacturer to extend life up to 40 years. Following that, projects are often "repowered" with new, higher efficiency equipment installed on the original tower, which can last indefinitely. Much of the installed infrastructure including roads, electrical lines and substations, buildings, and even wind turbine foundations and towers are durable if well maintained. As the long-term fuel cost for this project is free wind resource, it is expected the project would be extended multiple times. However, the project will have cash reserves as part of the overall financing to be fully and appropriately decommissioned, recycled and disposed of at the end of its operational life. The road infrastructure as well as underground foundations and buried electrical and communications infrastructure will be left in place to minimize disturbance and maximize the site's utility for future uses.

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Appendix A. MRTS parcel ID's involved in the proposed project

mtrs
S017N009W28
S017N009W33
S015N009W27
S014N009W11
S014N009W03
S014N009W10
S015N009W34
S016N009W20
S016N009W28
S015N009W21
S015N009W03
S015N010W12
S015N009W11
S016N009W04
S016N010W25
S016N009W32
S016N009W34
S015N009W01
S015N009W08
S016N010W27
S016N009W16
S016N010W36
S015N009W12
S016N010W35
S015N010W02
S016N010W14
S015N009W09
S015N009W10
S015N010W01
S016N009W29

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S016N010W24
S016N009W33
S015N009W22
S015N009W16
S015N009W15
S015N009W28
S014N009W02
S015N009W04
S015N009W33
S015N009W05
S015N009W14
S015N009W02
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S016N009W09
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S016N009W21
S016N010W22
S016N009W05
S016N009W08
S016N009W30
S015N009W07
S015N009W06
S016N009W18
S016N009W31
S016N009W19
S016N009W06
S016N009W07

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Appendix B. Preliminary locations of the proposed Little Mount Susitna Wind Energy Project turbine towers (based on an anticipated maximum project sizing).

Site	Longitude	Latitude
1	-151.0019248	61.43366847
2	-150.9438022	61.43384164
3	-150.9935725	61.43391511
4	-150.9836746	61.43416485
5	-150.9754248	61.43404331
6	-150.9681076	61.43401378
7	-150.9618605	61.43399153
8	-150.9527681	61.43399728
9	-151.0020918	61.44765077
10	-150.9940996	61.44772219
11	-150.9855567	61.44756827
12	-150.977546	61.44771317
13	-150.9696643	61.44777473
14	-150.9618249	61.4477703
15	-150.9543472	61.44770511
16	-150.9465503	61.44764119
17	-150.9387235	61.44764087
18	-150.9308855	61.4471272
19	-150.9094308	61.48876986
20	-150.9487697	61.48782222
21	-151.0181802	61.46155051
22	-151.0101716	61.46139664
23	-151.002567	61.46146099
24	-150.9951897	61.4615867
25	-150.9874291	61.46149635
26	-150.9800256	61.46151756
27	-150.9725558	61.46158754
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30	-150.9499609	61.46146829
31	-150.9425051	61.4614979
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33	-150.9282429	61.46142511
34	-150.9212314	61.46140104
35	-150.9142968	61.46139517
36	-151.0081271	61.47470186
37	-151.0011245	61.47462275
38	-150.9910263	61.47465514
39	-150.9825268	61.47465414
40	-150.9740378	61.47470038
41	-150.9654233	61.4747233
42	-150.9570302	61.47467413
43	-150.9486032	61.47463732
44	-150.9402632	61.47466515
45	-150.9315127	61.47466317
46	-150.9230031	61.47463764
47	-150.9145137	61.4746422
48	-150.9058489	61.47459978
49	-150.8969719	61.4745794
50	-150.9402165	61.48746456
51	-150.9325486	61.48849157
52	-150.9253534	61.48853853
53	-150.9173485	61.48860576
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63	-150.9942742	61.42185268

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64	-150.9874204	61.42192891
65	-150.978654	61.42192889
66	-150.9718002	61.42200512
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68	-150.9572957	61.4218526
69	-150.9486887	61.42185259
70	-150.9391253	61.42177632
71	-150.8304609	61.41432201
72	-150.8223719	61.41752495
73	-150.8373546	61.4113857
74	-150.8520982	61.40476848
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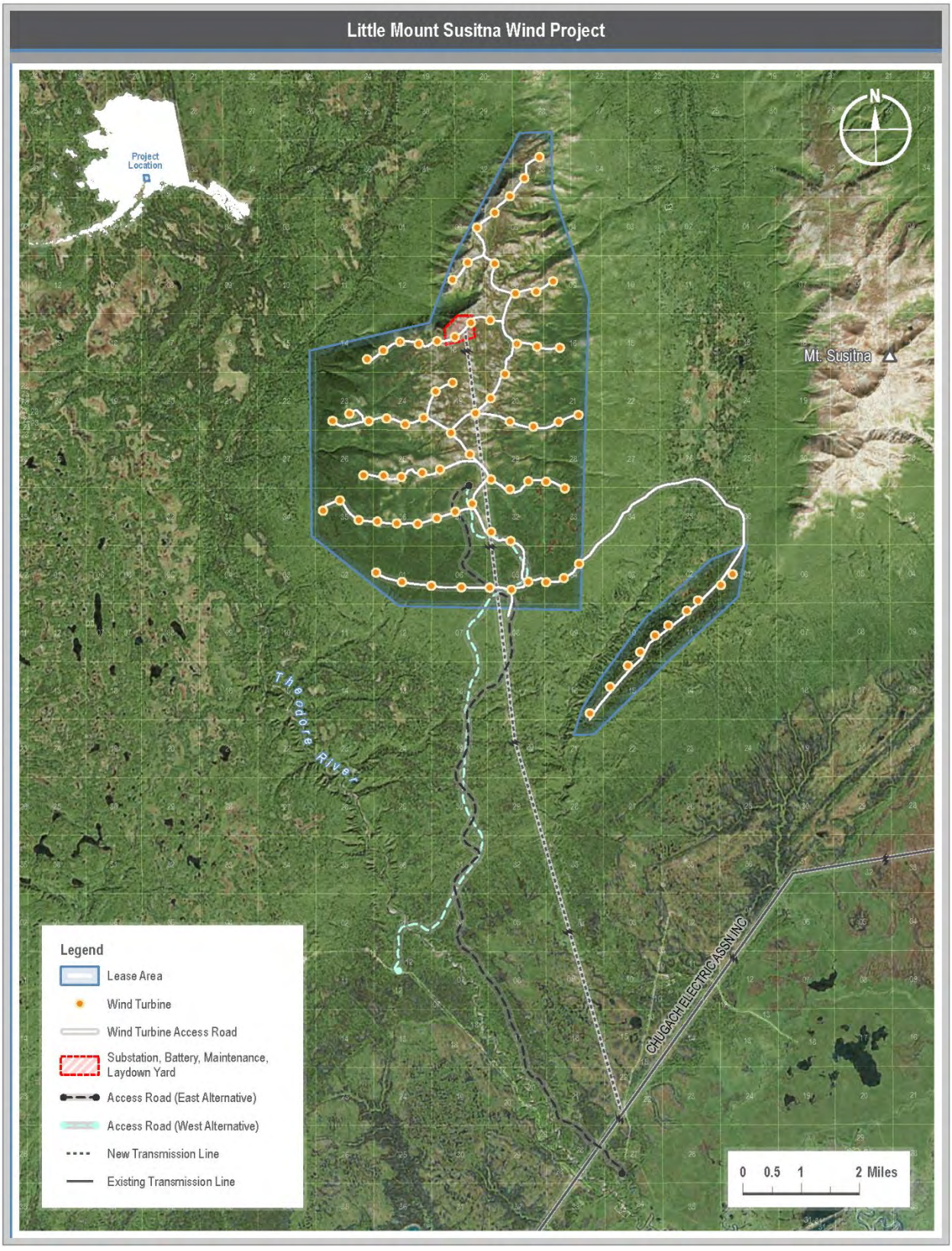
Attachment B
Location Map



Attachment B
Location Map

CORRESPONDENCE

MATANUSKA-SUSITNA BOROUGH
Planning and Land Use Department
Development Services Division
350 East Dahlia Avenue • Palmer, AK 99645
Phone (907) 861-7822
www.matsugov.us

August 22, 2024

Little Mount Susitna Wind, LLC
Attn: Chad Allen
125 High Street, Suite 1705
Boston, MA 02110

SUBJECT: **Conditional Use Permit Application – Request for Required Information**

LOCATIONS:

LMS_Met_5	61.473061N, 150.988809W	S016N010W13
LMS_Met_6	61.476704N, 150.895905W	S016N009W16
LMS_Met_7	61.444640N, 150.927867W	S016N009W29
LMS_Met_8	61.429372N, 150.900878W	S016N009W33
LMS_Met_9	61.430890N, 150.916978W	S016N009W32
LMS_Met_10	61.421817N, 150.928003W	S015N009W05

Dear Mr. Allen,

Borough staff has reviewed the application material and site plan(s) submitted on August 7, 2024, requesting a Conditional Use Permit to construct six tall structures at the above-referenced locations. The submitted application is not complete. The following information is needed to process this request:

1. MSB 17.67.080(B)(2) requires the commission to consider whether the proposed towers will be visible from public parks.
    a. The application does not identify the nearest public park to the proposed towers, and/or whether any of the proposed towers will be visible from that park. Provide a narrative clarifying this subject.

2. MSB 17.67.090(B)(1) requires a minimum of two parking spaces for emergency vehicle access.
    a. Two parking spaces are reflected on the provided site plans; however, the application narrative indicates that no parking will be provided due to the remoteness of the locations.
    b. Remove the proposed parking spaces from the site plans and provide a narrative addressing how emergency vehicles and personnel can access the site.

3. Provide a narrative detailing the timeline for the erection of each of the six proposed towers.
    a. Explain whether the locations identified in the application are final or approximate.
    b. If approximate, describe the maximum distance from each proposed tower location. It may help to provide a map identifying the radius of the area of consideration that will not be exceeded for the installation of each of the six proposed towers.

4. MSB 17.67.050(B) requires specific criteria be described in a written report in the application submittal to summarize the results of the community meeting:
    a. Summarize the public notification content, dates mailed, and numbers of mailings, including letters, meeting notices, newsletters, and other publications.
    b. A list of residents, property owners, and interested parties who have requested in writing that they be kept informed of the proposed development through notices, newsletters, or other written materials.
    c. A written summary that addresses the following:
        i. The substance of the public's written concerns, issues, and problems.
        ii. How the applicant has addressed, or intends to address, concerns, issues, and problems expressed during the process; and
        iii. Concerns, issues, and problems the applicant has not addressed or does not intend to address and why.

Once staff determines that the application is complete, they will begin the public notice process. Please contact me by phone or email if you have any questions.

Respectfully,

Rick Benedict
Current Planner
Matanuska-Susitna Borough
(907) 861-8527 direct
rick.benedict@matsugov.us

MATANUSKA-SUSITNA BOROUGH
Planning and Land Use Department
Development Services Division
350 East Dahlia Avenue • Palmer, AK 99645
Phone (907) 861-7822
www.matsugov.us

September 6, 2024

Little Mount Susitna Wind, LLC
Attn: Faith Tyson
125 High Street, Suite 1705
Boston, MA 02110

SUBJECT: **Conditional Use Permit Application – Request for Required Information**

LOCATIONS:

LMS_Met_5	61.473061N, 150.988809W	S016N010W13
LMS_Met_6	61.476704N, 150.895905W	S016N009W16
LMS_Met_7	61.444640N, 150.927867W	S016N009W29
LMS_Met_8	61.429372N, 150.900878W	S016N009W33
LMS_Met_9	61.430890N, 150.916978W	S016N009W32
LMS_Met_10	61.421817N, 150.928003W	S015N009W05

Dear Ms. Tyson,

Borough staff has reviewed the updated application materials and site plan(s) submitted on August 27, 2024, requesting a Conditional Use Permit to construct six tall structures at the above-referenced locations. The submitted application is not complete. The following information is needed to process this request:

1. MSB 17.67.050(B) requires specific criteria to be described in a written report summarizing the results of the community meeting. In your response dated August 27, 2024, you stated this criterion was provided in a dropbox folder in the original application submission. The dropbox folder has expired and the summary of the public meeting provided in the original submission on August 7, 2024, is missing the following information:
    a. The public notification content, dates mailed, and numbers of mailings, including any letters, meeting notices, newsletters, and other publications.
    b. A list of residents, property owners, and interested parties, if any, who have requested in writing that they be kept informed of the proposed development through notices, newsletters, or other written materials.
    c. Phone numbers of persons who attended the community meeting were not proved as required by MSB 17.67.050(B)(3).

d. A list of names and mailing addresses of all property owners notified via mail of the community meeting.
e. A written summary that addresses the substance of the public's written concerns, issues, and problems. Provide a narrative in the summary report.
f. A written summary that addresses how the applicant has addressed, or intends to address, concerns, issues, and problems expressed during the process. Provide a narrative in the summary report.
g. A written summary that addresses the concerns, issues, and problems the applicant has not addressed or does not intend to address and why. Provide a narrative in the summary report.

Please contact me by phone or email if you have any questions.

Respectfully,

Rick Benedict
Current Planner
Matanuska-Susitna Borough
(907) 861-8527 direct
rick.benedict@matsugov.us

From:	Rick Benedict
To:	Faith Tyson
Cc:	Matthew Perkins; Andrew McDonnell; Jeff Armbruster; Chad Allen
Subject:	RE: LMSW - Tall Tower CUP Application & Materials
Date:	Friday, September 6, 2024 1:42:00 PM
Attachments:	Little Mount Susitna Wind LLC_RFAI 9-6-2024.pdf

Hello Faith,

Thank you for the updated materials. I have attached a request letter addressing criteria not provided in the written report summarizing the community meeting. The other items in the prior request letter have been satisfied.

Respectfully,

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct

From: Faith Tyson <faith@alaskarenewables.com>
Sent: Tuesday, August 27, 2024 11:16 AM
To: Rick Benedict <Rick.Benedict@matsugov.us>
Cc: Matthew Perkins <matt@alaskarenewables.com>; Andrew McDonnell <andrew@alaskarenewables.com>; Jeff Armbruster <jeff.armbruster@longroadenergy.com>; Chad Allen <chad.allen@longroadenergy.com>
Subject: Re: LMSW - Tall Tower CUP Application & Materials

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
Hi Rick,

Thanks for getting this over! Please find the responses below.

1. MSB 17.67.080(B)(2) requires the commission to consider whether the proposed towers will
be visible from public parks.
a. The application does not identify the nearest public park to the proposed towers, and/or
whether any of the proposed towers will be visible from that park. Provide a narrative clarifying this subject.
Given the remote locations, the proposed towers are not expected to be visible from any Matanuska Susitna Borough public park (all more than 30 miles away). The nearest "trail" is on Mount Susitna, at a distance of 4.7 miles from the nearest proposed tower (see attached map). The towers may be marginally visible from these distances in

weather and lighting conditions that offer excellent visibility, but given their small diameter and the distances involved, it is unlikely that a casual observer will notice them on the landscape.

2. MSB 17.67.090(B)(1) requires a minimum of two parking spaces for emergency vehicle access.
a. Two parking spaces are reflected on the provided site plans; however, the application narrative indicates that no parking will be provided due to the remoteness of the locations.
b. Remove the proposed parking spaces from the site plans and provide a narrative addressing how emergency vehicles and personnel can access the site.
The parking spaces have been removed, and updated site plans are attached. If emergency personnel are required on the tower sites, the sites can be accessed by helicopter. Landing sites are readily available on the open tundra adjacent to all towers. On-site personnel will be trained to direct emergency helicopters to an appropriate landing spot.

3. Provide a narrative detailing the timeline for the erection of each of the six proposed towers.
a. Explain whether the locations identified in the application are final or approximate.
b. If approximate, describe the maximum distance from each proposed tower location. It may help to provide a map identifying the radius of the area of consideration that will not exceed for the installation of each of the six proposed towers.

Under this permit, we plan to install up to six towers in total, with up to two of those installed in 2024, and any remaining towers in 2025. This schedule is approximate and may be subject to changes based on operational needs.

Tower Locations: The tower sites are approximate and will be finalized when taking into account ground conditions during the installation process. The towers may be sited anywhere within their respective PLSS section boundaries, while respecting a one tower- height setback from the PLSS section boundaries. Visuals of the intended locations and the surrounding section boundaries within which the tower will be located are displayed in the engineer's site plans.

4. MSB 17.67.050(B) requires specific criteria be described in a written report in the application
submittal to summarize the results of the community meeting:
a. Summarize the public notification content, dates mailed, and numbers of mailings, including letters, meeting notices, newsletters, and other publications.
b. A list of residents, property owners, and interested parties who have requested in writing that they be kept informed of the proposed development through notices,

newsletters, or other written materials.
c. A written summary that addresses the following:
i. The substance of the public's written concerns, issues, and problems.
ii. How the applicant has addressed, or intends to address, concerns, issues, and problems expressed during the process; and
iii. Concerns, issues, and problems
In the dropbox folder that was originally submitted, there is a subfolder titled Community Meeting Materials—the specific criteria of MSB 17.67.050(B) are addressed in the report.

If more questions arise, please feel free to reach out. Thank you!

/ft

On Thu, Aug 22, 2024 at 6:01 PM Rick Benedict <Rick.Benedict@matsugov.us> wrote:

> Good afternoon all,
>
> I have attached a request for additional information for you. If you have any questions, please contact me.
>
> Respectfully,
>
> Rick Benedict – Current Planner
> Development Services Division
> Matanuska-Susitna Borough
> (907)861-8527 direct
>
> ---
>
> **From:** Faith Tyson <faith@alaskarenewables.com>
> **Sent:** Wednesday, August 7, 2024 9:54 AM
> **To:** Rick Benedict <Rick.Benedict@matsugov.us>
> **Cc:** Peggy Horton <Peggy.Horton@matsugov.us>; Chad Allen <chad.allen@longroadenergy.com>; Andrew McDonnell <andrew@alaskarenewables.com>; Jeff Armbruster <jeff.armbruster@longroadenergy.com>; Matthew Perkins <matt@alaskarenewables.com>
> **Subject:** Re: LMSW - Tall Tower CUP Application & Materials
>
> [**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
> Goodmorning Rick, happy Wednesday!
>
> I wanted to reach out to you and let you know that the check was mailed from the PNW

last Friday. The check number is 1501, and it is from Longroad Development Company. Could you confirm that you've received it?

Additionally, I wanted to follow up and see if you would be interested in meeting to review the application in depth with us. If so, please send some dates and times that work for you in the next week or so.

Talk soon!

/ft

On Tue, Jul 30, 2024 at 10:52 AM Faith Tyson <faith@alaskarenewables.com> wrote:

> Hi Rick!
>
> Happy Tuesday. The application was paid by check - the purchase order was just approved, so the check will be mailed on Thursday!
>
> Best,
> Faith
>
> /ft
>
> On Mon, Jul 29, 2024 at 12:49 PM Rick Benedict <Rick.Benedict@matsugov.us> wrote:
>
> > Hello Faith,
> >
> > How was the application fee paid? I don’t see a payment in our transaction history for online payments. If paid through the Borough’s online portal, do you know who made the payment, the date, and the amount? I will conduct another search once I have more information.
> >
> > Respectfully,
> >
> > Rick Benedict – Current Planner
> > Development Services Division
> > Matanuska-Susitna Borough
> > (907)861-8527 direct

From: Faith Tyson <faith@alaskarenewables.com>
Sent: Thursday, July 25, 2024 1:54 PM
To: Peggy Horton <Peggy.Horton@matsugov.us>; Rick Benedict <Rick.Benedict@matsugov.us>
Cc: Chad Allen <chad.allen@longroadenergy.com>; Andrew McDonnell <andrew@alaskarenewables.com>; Jeff Armbruster <jeff.armbruster@longroadenergy.com>; Matthew Perkins <matt@alaskarenewables.com>
Subject: LMSW - Tall Tower CUP Application & Materials

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
Dear Peggy & Rick,

I am writing you to officially submit a Tall Tower CUP application on behalf of Little Mount Susitna Wind LLC. Due to the size of files, I have compiled all documents in a dropbox link for download. The application fee was processed on our end as of yesterday. Please reach out with any questions or concerns. We are looking forward to working with you all!

Best,
Faith Tyson (she/they)
Community Engagement and Accountability Manager
Alaska Renewables LLC
[c] +1-907-202-0507 [e] faith@alaskarenewables.com

Alaska Renewables LLC occupies the ancestral, traditional, and contemporary lands of Alaska Native people that have resided, occupied, and called this land home. I recognize the historic Indigenous individuals and communities who live here now and those who were forcibly removed from their homes. In offering this land acknowledgement, I affirm Indigenous sovereignty, history and experiences.

From:	Rick Benedict
To:	Faith Tyson
Cc:	matt@alaskarenewables.com; Chad Allen
Subject:	FW: Oppose Conditional Use Permit Application: Chad Allen, Little Mount Susina Wind LLC
Date:	Tuesday, September 24, 2024 8:02:00 AM
Attachments:	Conditional Use Permit Application for Meteorological Towers Public Hearing Notice.pdf Conditional_Use_Permit-252-2051B01L037-Oppose.pdf

Please see the chained email from the public with comments concerning the proposed METs on Little Mount Susitna.

Respectfully,

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct

From: Emmanuel Appiah <emmanuel.appiah@outlook.com>
Sent: Monday, September 23, 2024 4:34 PM
To: Rick Benedict <Rick.Benedict@matsugov.us>
Subject: Oppose Conditional Use Permit Application: Chad Allen, Little Mount Susina Wind LLC

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]

252 2051B01L037
Emmanuel Appiah
3310 Tilley Drive,
Rosenberg, Texas 77471
September 23, 2024

Matanuska-Susitna Borough
Development Services Division
350 E. Dahlia Avenue,
Palmer, Alaska 99645

Subject: Comments on Conditional Use Permit Application for Meteorological Towers

Dear Planning Commission,

I am writing to formally oppose the Conditional Use Permit application submitted by Little Mount Susina Wind LLC for the construction of six meteorological towers.

I have several concerns regarding this proposal:

1. **Impact on Wildlife**: The construction of tall structures may disrupt local wildlife habitats and migration patterns, which could have long-term ecological consequences.
2. **Visual Impact**: The proposed towers, at heights of up to 197 feet, will significantly alter the landscape and may detract from the natural beauty of the area, impacting the quality of life for nearby inhabitants.
3. **Safety Concerns**: The height of these towers raises potential safety issues, including

hazards for low-flying aircraft, bird safety, and concerns regarding structural integrity in severe weather conditions.

4. **Community Impact**: This development could lead to increased noise in the area, which may affect the peace and tranquility of the community.

Given these considerations, I urge the Planning Commission to decline the application for the Conditional Use Permit. Thank you for considering my comments.

Sincerely,

Emmanuel Appiah

From: Rick Benedict
To: Faith Tyson
Cc: Chad Allen; Andrew McDonnell; Jeff Armbruster; Matthew Perkins
Subject: RE: LMSW - Tall Tower CUP Application & Materials
Date: Thursday, August 8, 2024 1:46:00 PM

Hello Faith,

The borough received the check, thank you for the notification.

Here are some options for meeting dates to discuss the application: Tuesday through Thursday of August 20-22, anytime between the hours of 9am and 2pm (concluding by 2), or 330 pm and 5pm (concluding by 5).

Let me know if any of these dates/times work for your team.

Respectfully,

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct

From: Faith Tyson <faith@alaskarenewables.com>
Sent: Wednesday, August 7, 2024 9:54 AM
To: Rick Benedict <Rick.Benedict@matsugov.us>
Cc: Peggy Horton <Peggy.Horton@matsugov.us>; Chad Allen <chad.allen@longroadenergy.com>; Andrew McDonnell <andrew@alaskarenewables.com>; Jeff Armbruster <jeff.armbruster@longroadenergy.com>; Matthew Perkins <matt@alaskarenewables.com>
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Additionally, I wanted to follow up and see if you would be interested in meeting to review the application in depth with us. If so, please send some dates and times that work for you in the next week or so.

Talk soon!

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> > Respectfully,
> >
> > Rick Benedict – Current Planner
> > Development Services Division
> > Matanuska-Susitna Borough
> > (907)861-8527 direct
> >
> > ---
> >
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> > **Sent:** Thursday, July 25, 2024 1:54 PM
> > **To:** Peggy Horton <Peggy.Horton@matsugov.us>; Rick Benedict <Rick.Benedict@matsugov.us>
> > **Cc:** Chad Allen <chad.allen@longroadenergy.com>; Andrew McDonnell <andrew@alaskarenewables.com>; Jeff Armbruster <jeff.armbruster@longroadenergy.com>; Matthew Perkins <matt@alaskarenewables.com>
> > **Subject:** LMSW - Tall Tower CUP Application & Materials
> >
> > [**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]

Dear Peggy & Rick,

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Best,
Faith Tyson (she/they)
Community Engagement and Accountability Manager
Alaska Renewables LLC
[c] +1-907-202-0507 [e] faith@alaskarenewables.com

Alaska Renewables LLC occupies the ancestral, traditional, and contemporary lands of Alaska Native people that have resided, occupied, and called this land home. I recognize the historic Indigenous individuals and communities who live here now and those who were forcibly removed from their homes. In offering this land acknowledgement, I affirm Indigenous sovereignty, history and experiences.

COMMENTS

From: James Christopher
To: Rick Benedict
Subject: RE: Request for Review and Comments: MSB 17.67 – Tall Structures
Date: Monday, September 16, 2024 3:41:42 PM
Attachments: MSB No Comment 17.67.pdf

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
Hello,

Please see ENSTARS attached letter with no comments.

Thank you,

Jimmy Christopher
Right of Way Agent
ENSTAR Natural Gas Company, LLC
O: (907) 334-7944
C: (614) 623-3466

From: Rick Benedict <Rick.Benedict@matsugov.us>
Sent: Thursday, September 12, 2024 3:11 PM
To: Rick Benedict <Rick.Benedict@matsugov.us>
Subject: Request for Review and Comments: MSB 17.67 – Tall Structures

APPLICANT: Chad Allen, for Little Mount Susitna Wind LLC

LOCATION: Township 15 North, Range 9 West, Section 5, Seward Meridian
Township 16 North, Range 9 West, Section 16, Seward Meridian
Township 16 North, Range 9 West, Section 29, Seward Meridian
Township 16 North, Range 9 West, Section 32, Seward Meridian
Township 16 North, Range 9 West, Section 33, Seward Meridian
Township 16 North, Range 10 West, Section 13, Seward Meridian

An application for a Conditional Use Permit under MSB 17.67 – Tall Structures. The Planning Commission will conduct a public hearing on this request on October 21, 2024.

Application materials may be viewed online at www.matsugov.us by clicking on 'All Public Notices & Announcements.' A direct link to the application material is here:

Matanuska-Susitna Borough - Public Notice - Conditional Use Permit under MSB 17.67 - Tall Structures (matsugov.us)

Comments are due on or before October 4, 2024, and will be included in the Planning Commission's packet for review and information. Please be advised that comments received after that date will not be included in the packet to the Planning Commission. Thank you for your review.

Respectfully,

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct

ENSTAR Natural Gas Company, LLC
Engineering Department, Right of Way Section
401 E. International Airport Road
P. O. Box 190288
Anchorage, Alaska 99519-0288
(907) 277-5551
FAX (907) 334-7798

September 16, 2024

Matanuska-Susitna Borough, Platting Division
350 East Dahlia Avenue
Palmer, AK 99645-6488

To whom it may concern:

ENSTAR Natural Gas Company, LLC has reviewed the following conditional use permit and has no comments or recommendations.

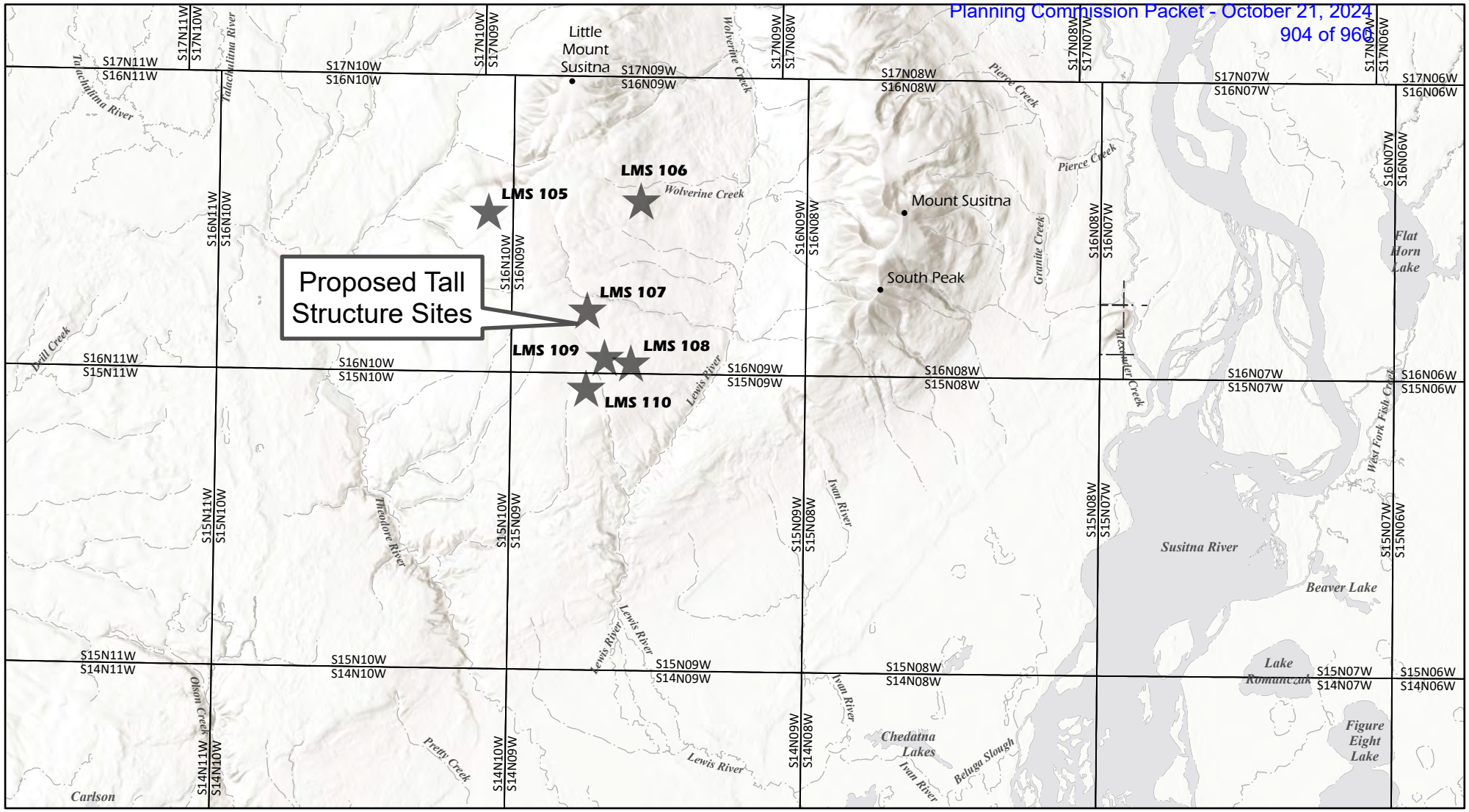
- **TALL STRUCTURES**
  (MSB 17.67)

If you have any questions, please feel free to contact me at 334-7944 or by email at james.christopher@enstarnaturalgas.com.

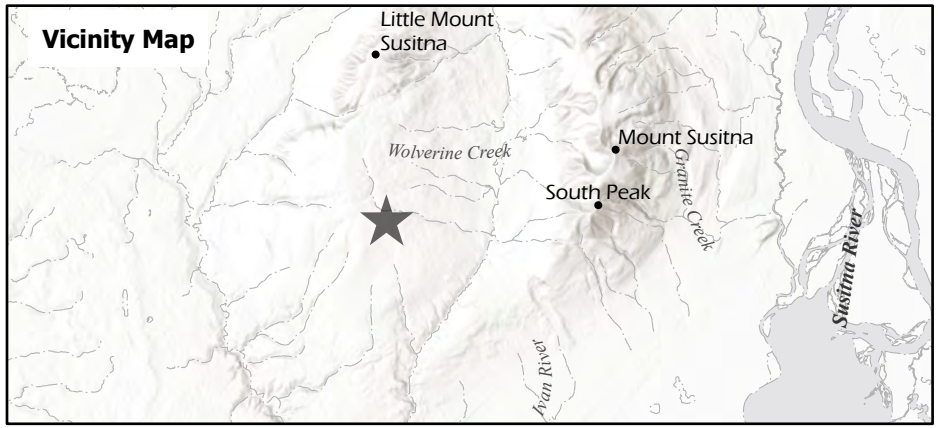
Sincerely,

James Christopher

James Christopher
Right of Way Agent
ENSTAR Natural Gas Company, LLC



LMS 105 (61.473061,-150.988809)
LMS 106 (61.47670353, -150.895905)
LMS 107 (61.44464,-150.927867)
LMS 108 (61.429372, -150.900878)
LMS 109 (61.43089, -150.916978)
LMS 110 (61.421817, -150.928003)



N

MSB Information Technology/GIS
August 13, 2024

0 1,000 Feet

Agency Comments

From:	Huling, Kristina N (DOT)
To:	Rick Benedict
Cc:	Baski, Sean M (DOT); Beckwith, Morris R (DOT); Bosin, Anna D (DOT); Brad Sworts; Rearden, Devki (DOT); Walsh, Matthew H (DOT)
Subject:	RE: Request for Review and Comments: MSB 17.67 – Tall Structures
Date:	Thursday, September 26, 2024 2:57:01 PM
Attachments:	9-26-24 CUP 10033 Comment Letter - Little Mount Susitna Wind LLC.pdf

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
Hi Rick,

Attached is the DOT&PF agency comment letter regarding this conditional use permit. We have no comments.

Thank you,

Kristina Huling
Mat-Su Area Planner | 907.269.0509
Alaska DOT&PF, Anchorage; Planning

From: Rick Benedict <Rick.Benedict@matsugov.us>
Sent: Thursday, September 12, 2024 3:11 PM
To: Rick Benedict <Rick.Benedict@matsugov.us>
Subject: Request for Review and Comments: MSB 17.67 – Tall Structures

APPLICANT: Chad Allen, for Little Mount Susitna Wind LLC

LOCATION: Township 15 North, Range 9 West, Section 5, Seward Meridian
Township 16 North, Range 9 West, Section 16, Seward Meridian
Township 16 North, Range 9 West, Section 29, Seward Meridian
Township 16 North, Range 9 West, Section 32, Seward Meridian
Township 16 North, Range 9 West, Section 33, Seward Meridian
Township 16 North, Range 10 West, Section 13, Seward Meridian

An application for a Conditional Use Permit under MSB 17.67 – Tall Structures. The Planning Commission will conduct a public hearing on this request on October 21, 2024.

Application materials may be viewed online at www.matsugov.us by clicking on 'All Public Notices & Announcements.' A direct link to the application material is here:

Matanuska-Susitna Borough - Public Notice - Conditional Use Permit under MSB 17.67 - Tall

Structures (matsugov.us)

Comments are due on or before October 4, 2024, and will be included in the Planning Commission's packet for review and information. Please be advised that comments received after that date will not be included in the packet to the Planning Commission. Thank you for your review.

Respectfully,

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct

THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Transportation and Public Facilities

Division of Project Delivery
Anchorage Field Office

4111 Aviation Avenue
P.O. Box 196900
Anchorage, AK 99519-6900
Main: 907-269-0520
Fax: 907-269-0521
dot.alaska.gov

September 26, 2024

Rick Benedict, Planner
Development Services Division
Matanuska-Susitna Borough
350 East Dahlia Avenue
Palmer, AK 99645

[Sent Electronically]

Re: Conditional Use Permit Review

Dear Mr. Benedict:

The Alaska Department of Transportation and Public Facilities (DOT&PF) Central Region has reviewed the following conditional use permits and have no comments:

- **CUP 10033 – Conditional Use Permit under MSB 17.67 – Tall Structures – Little Mount Susitna Wind LLC**

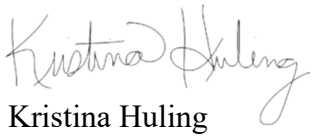
All properties accessing DOT&PF roads must apply to Right of Way for a driveway permit and/or approach road review, subject to provisions listed in 17 AAC 10.020. Any previously issued access permits become invalid once the property undergoes a platting action or change in use and must be reissued.

We recommend the petitioner verify all section line easements and DOT&PF road rights-of-way adjacent to their property. For assistance, the petitioner may contact the Engineering group within the Right of Way section in DOT&PF at (907) 269-0700. The petitioner is liable to remove any improvements within the easements and rights-of-way that impede the operation and maintenance of those facilities even if they are not shown on the plat, so it is in the petitioner's best interest to identify the exact locations and widths of any such easements or rights-of-way before they improve the property.

If any section line easements or road rights-of-way exist within the bounds of their plat, we recommend the petitioner dedicate them. If there is an existing right-of-way or easement, the petitioner is unable to develop that portion of the property yet continues to pay property taxes on it; dedicating will remove that cost to the petitioner.

If there are any questions regarding these comments please feel free to contact me at (907) 269-0509 or kristina.huling@alaska.gov.

Sincerely,



Kristina Huling
Mat-Su Area Planner, DOT&PF

cc: Sean Baski, Highway Design Chief, DOT&PF
Matt Walsh, Property Management Supervisor, Right of Way, DOT&PF
Devki Rearden, Engineering Associate, DOT&PF
Morris Beckwith, Right of Way, DOT&PF
Brad Sworts, Pre-Design & Engineering Div. Manager, MSB
Anna Bosin, Traffic & Safety Engineer, DOT&PF

From: Daniel Dahms
To: Rick Benedict
Cc: Brad Sworts; Jamie Taylor; Tammy Simmons
Subject: RE: Request for Review and Comments: MSB 17.67 – Tall Structures
Date: Tuesday, September 17, 2024 2:20:21 PM

Rick,

No comments from PD&E.

Daniel Dahms, PE
Department of Public Works
Pre-Design and Engineering Division

From: Rick Benedict <Rick.Benedict@matsugov.us>
Sent: Thursday, September 12, 2024 3:11 PM
To: Rick Benedict <Rick.Benedict@matsugov.us>
Subject: Request for Review and Comments: MSB 17.67 – Tall Structures

APPLICANT: Chad Allen, for Little Mount Susitna Wind LLC

LOCATION: Township 15 North, Range 9 West, Section 5, Seward Meridian
Township 16 North, Range 9 West, Section 16, Seward Meridian
Township 16 North, Range 9 West, Section 29, Seward Meridian
Township 16 North, Range 9 West, Section 32, Seward Meridian
Township 16 North, Range 9 West, Section 33, Seward Meridian
Township 16 North, Range 10 West, Section 13, Seward Meridian

An application for a Conditional Use Permit under MSB 17.67 – Tall Structures. The Planning Commission will conduct a public hearing on this request on October 21, 2024.

Application materials may be viewed online at www.matsugov.us by clicking on 'All Public Notices & Announcements.' A direct link to the application material is here:

Matanuska-Susitna Borough - Public Notice - Conditional Use Permit under MSB 17.67 - Tall Structures (matsugov.us)

Comments are due on or before October 4, 2024, and will be included in the Planning Commission's packet for review and information. Please be advised that comments received after that date will not be included in the packet to the Planning Commission. Thank you for your review.

Respectfully,

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct

From: Fred Wagner
To: Rick Benedict
Subject: RE: Request for Review and Comments: MSB 17.67 – Tall Structures
Date: Friday, September 13, 2024 8:43:58 AM

Platting has no comments or concerns.

Sincerely,

Fred Wagner, PLS
MSB Platting Officer
(907)861-7870 Office
(907)355-8507 Cell

From: Rick Benedict <Rick.Benedict@matsugov.us>
Sent: Thursday, September 12, 2024 3:11 PM
To: Rick Benedict <Rick.Benedict@matsugov.us>
Subject: Request for Review and Comments: MSB 17.67 – Tall Structures

APPLICANT: Chad Allen, for Little Mount Susitna Wind LLC

LOCATION: Township 15 North, Range 9 West, Section 5, Seward Meridian
Township 16 North, Range 9 West, Section 16, Seward Meridian
Township 16 North, Range 9 West, Section 29, Seward Meridian
Township 16 North, Range 9 West, Section 32, Seward Meridian
Township 16 North, Range 9 West, Section 33, Seward Meridian
Township 16 North, Range 10 West, Section 13, Seward Meridian

An application for a Conditional Use Permit under MSB 17.67 – Tall Structures. The Planning Commission will conduct a public hearing on this request on October 21, 2024.

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Matanuska-Susitna Borough - Public Notice - Conditional Use Permit under MSB 17.67 - Tall Structures (matsugov.us)

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your review.

Respectfully,

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct

From: Moore, Stephen A CIV USARMY CEPOA (USA)
To: Rick Benedict
Subject: USACE response, request for Review and Comments: MSB 17.67 – Tall Structures
Date: Friday, September 13, 2024 10:35:59 AM
Attachments: image001.png
image002.png

Good morning Rick,

Should Waters of the U.S. be located on the property, they may be impacted by the proposal. Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

The project proponent is welcome to submit a preapplication meeting request, a jurisdictional determination request, or a permit application directly to our general mailbox (regpagemaster@usace.army.mil) and will be assigned a project manager to assist. Please feel free to contact our main line if you have any questions or concerns at 907-753-2712.

V/r,

Steve Moore
Project Manager, North Section Regulatory Division
U.S. Army Corps of Engineers | Alaska District
Phone Desk: 907-753-5713
Email Stephen.A.Moore2@usace.army.mil

From: Rick Benedict <Rick.Benedict@matsugov.us>
Sent: Thursday, September 12, 2024 3:11 PM
To: Rick Benedict <Rick.Benedict@matsugov.us>
Subject: [Non-DoD Source] Request for Review and Comments: MSB 17.67 – Tall Structures

APPLICANT: Chad Allen, for Little Mount Susitna Wind LLC

LOCATION: Township 15 North, Range 9 West, Section 5, Seward Meridian
Township 16 North, Range 9 West, Section 16, Seward Meridian
Township 16 North, Range 9 West, Section 29, Seward Meridian
Township 16 North, Range 9 West, Section 32, Seward Meridian
Township 16 North, Range 9 West, Section 33, Seward Meridian
Township 16 North, Range 10 West, Section 13, Seward Meridian

An application for a Conditional Use Permit under MSB 17.67 – Tall Structures. The Planning Commission will conduct a public hearing on this request on October 21, 2024.

Application materials may be viewed online at www.matsugov.us by clicking on 'All Public Notices & Announcements.' A direct link to the application material is here:

Matanuska-Susitna Borough - Public Notice - Conditional Use Permit under MSB 17.67 - Tall Structures (matsugov.us)

Comments are due on or before October 4, 2024, and will be included in the Planning Commission's packet for review and information. Please be advised that comments received after that date will not be included in the packet to the Planning Commission. Thank you for your review.

Respectfully,

Rick Benedict – Current Planner
Development Services Division
Matanuska-Susitna Borough
(907)861-8527 direct

Public Comments

Matanuska-Susitna Borough
Development Services Division
350 E. Dahlia Avenue
Palmer, Alaska 99645

245 2051B06L008
THEIGE DAREN D
35426 CROSS ST
FRUITLAND PARK, FL 34731

Chad Allen, for Little Mount Susitna Wind LLC, applied for a Conditional Use Permit under MSB 17.67 – Tall Structures to construct six meteorological towers up to 197 feet tall. The proposed tower locations are within Township 15 North, Range 9 West, Section 5, Township 16 North, Range 9 West, Sections 16, 29, 32, and 33, and Township 16 North, Range 10 West, Section 13, Seward Meridian. There are no Tax ID numbers or addresses for the subject sites.

The Matanuska-Susitna Borough Planning Commission will conduct a public hearing concerning the application on ***Monday, October 21, 2024***, at 6:00 p.m. in the Borough Assembly Chambers at 350 E. Dahlia Avenue in Palmer. This may be the only presentation of this item before the Planning Commission, and you are invited to attend. Planning Commission members may not receive or engage in ex-parte contact with the applicant, other interested parties in the application, or members of the public concerning the application or issues presented in the application.

Application materials may be viewed online at www.matsugov.us by clicking "All Public Notices & Announcements." For additional information, you may contact Rick Benedict, Current Planner, by phone: 907-861-8527. Provide written comments by e-mail to rick.benedict@matsugov.us, or by mail to MSB Development Services Division, 350 E. Dahlia Avenue, Palmer, AK 99645.

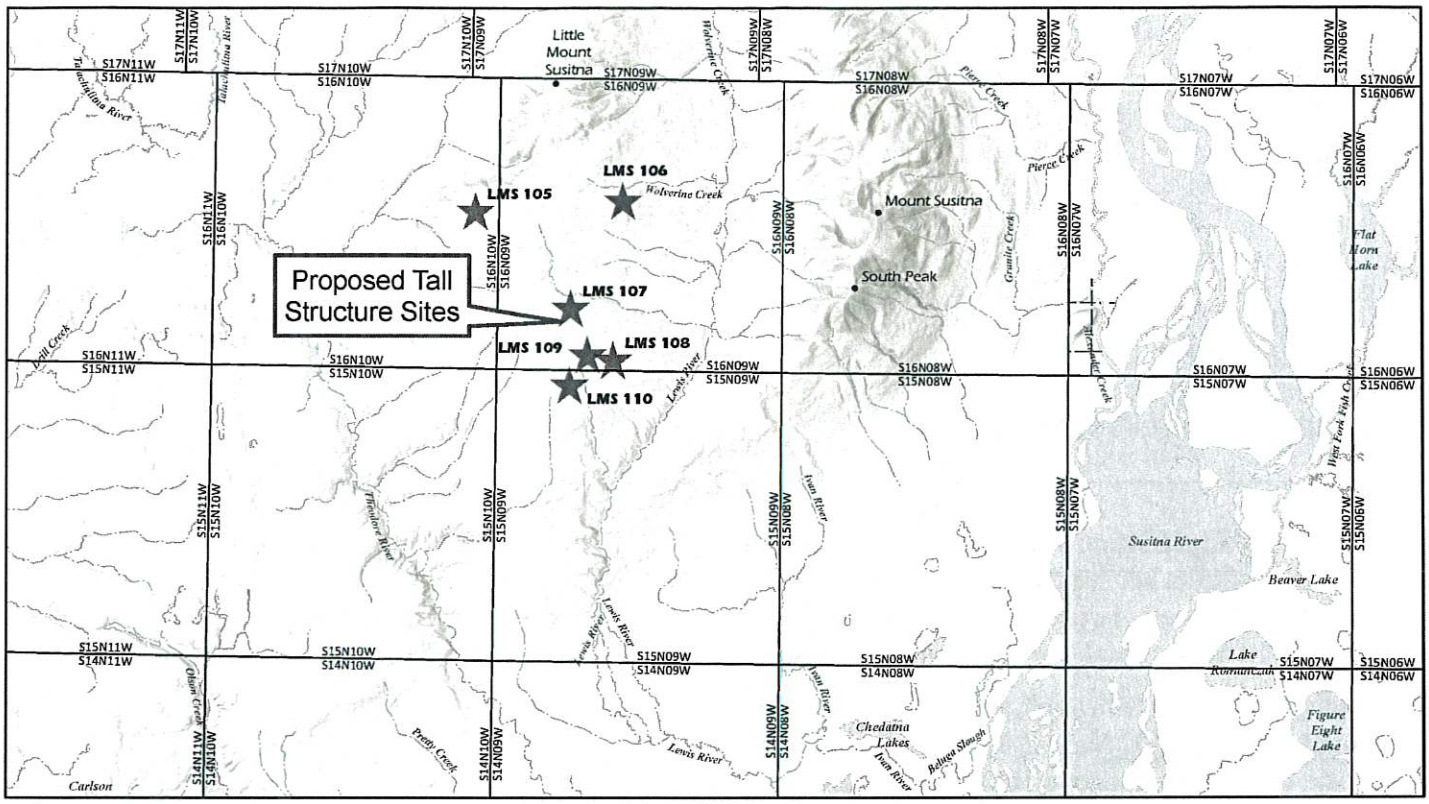
The public may provide verbal testimony at the meeting or telephonically by calling 1-855-290-3803. To be eligible to file an appeal from a decision of the Planning Commission, a person must be designated an interested party. See MSB 15.39.010 for the definition of an interested party. The procedures governing appeals to the Board of Adjustment and Appeals are contained in MSB 15.39.010-250, which is available on the Borough home page at www.matsugov.us, in the Borough Clerk's office, and at various libraries within the borough.

Comments are due on or before ***October 4, 2024***, and will be included in the Planning Commission packet. Please be advised that comments received from the public after that date will not be included in the staff report but will be provided to the Commission at the meeting.

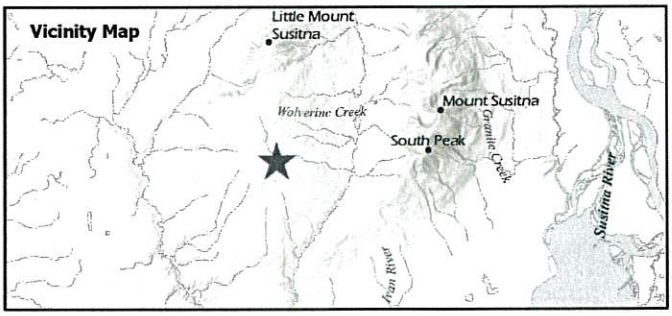
Name: DAREN D. THEIGE *Mailing Address:* 35426 CROSS ST FRUITLAND PARK, FL. 34731
Location/Legal Description of your property: SUSITNA, ALASKA LOT 8 PARCEL# AK-MS-8-6-ACWL013
Comments: I WON'T BE ABLE TO ATTEND HEARING. I HAVE NO OBJECTIONS TO THE TOWERS.

Daren D. Theige 09/28/2024

Note: Vicinity Map Located on Reverse Side



LMS 105 (61.473061,-150.988809)
LMS 106 (61.47670353, -150.895905)
LMS 107 (61.44464,-150.927867)
LMS 108 (61.429372, -150.900878)
LMS 109 (61.43089, -150.916978)
LMS 110 (61.421817, -150.928003)



This map is solely for informational purposes only. The Borough makes no express or implied warranties with respect to the character, function, or capabilities of the map or the suitability of the map for any particular purpose beyond those originally intended by the Borough. For information regarding the full disclaimer and policies related to acceptable uses of this map, please contact the Matanuska-Susitna Borough GIS Division at 907-861-7858.

MSB Information Technology/GIS
August 13, 2024

0 1,000 Feet

N

Daren Theige
35426 Cross Street
Fruitland Park, Fl. 34731

GRAND FORKS ND 582
30 SEP 2024 PM 1 L

RECEIVED
OCT 07 2024
Mat-Su Borough
Development Services

Matanuska-Susitna Borough
Development Services Division
350 E. Dahlia Avenue
Palmer, Alaska 99645

9964536488

From:	Emmanuel Appiah
To:	Rick Benedict
Subject:	Oppose Conditional Use Permit Application: Chad Allen, Little Mount Susina Wind LLC
Date:	Monday, September 23, 2024 4:35:14 PM
Attachments:	Conditional Use Permit Application for Meteorological Towers Public Hearing Notice.pdf Conditional_Use_Permit-252-2051B01L037-Oppose.pdf

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]

252 2051B01L037
Emmanuel Appiah
3310 Tilley Drive,
Rosenberg, Texas 77471
September 23, 2024

Matanuska-Susitna Borough
Development Services Division
350 E. Dahlia Avenue,
Palmer, Alaska 99645

Subject: Comments on Conditional Use Permit Application for Meteorological Towers

Dear Planning Commission,

I am writing to formally oppose the Conditional Use Permit application submitted by Little Mount Susina Wind LLC for the construction of six meteorological towers.

I have several concerns regarding this proposal:

1. **Impact on Wildlife**: The construction of tall structures may disrupt local wildlife habitats and migration patterns, which could have long-term ecological consequences.
2. **Visual Impact**: The proposed towers, at heights of up to 197 feet, will significantly alter the landscape and may detract from the natural beauty of the area, impacting the quality of life for nearby inhabitants.
3. **Safety Concerns**: The height of these towers raises potential safety issues, including hazards for low-flying aircraft, bird safety, and concerns regarding structural integrity in severe weather conditions.
4. **Community Impact**: This development could lead to increased noise in the area, which may affect the peace and tranquility of the community.

Given these considerations, I urge the Planning Commission to decline the application for the Conditional Use Permit. Thank you for considering my comments.

Sincerely,

Emmanuel Appiah

Matanuska-Susitna Borough
Development Services Division
350 E. Dahlia Avenue
Palmer, Alaska 99645

252 2051B01L037
APPIAH EMMANUEL
3310 TILLEY DR
ROSENBERG, TX 77471

Chad Allen, for Little Mount Susitna Wind LLC, applied for a Conditional Use Permit under MSB 17.67 – Tall Structures to construct six meteorological towers up to 197 feet tall. The proposed tower locations are within Township 15 North, Range 9 West, Section 5, Township 16 North, Range 9 West, Sections 16, 29, 32, and 33, and Township 16 North, Range 10 West, Section 13, Seward Meridian. There are no Tax ID numbers or addresses for the subject sites.

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Application materials may be viewed online at www.matsugov.us by clicking "All Public Notices & Announcements." For additional information, you may contact Rick Benedict, Current Planner, by phone: 907-861-8527. Provide written comments by e-mail to rick.benedict@matsugov.us, or by mail to MSB Development Services Division, 350 E. Dahlia Avenue, Palmer, AK 99645.

The public may provide verbal testimony at the meeting or telephonically by calling 1-855-290-3803. To be eligible to file an appeal from a decision of the Planning Commission, a person must be designated an interested party. See MSB 15.39.010 for the definition of an interested party. The procedures governing appeals to the Board of Adjustment and Appeals are contained in MSB 15.39.010-250, which is available on the Borough home page at www.matsugov.us, in the Borough Clerk's office, and at various libraries within the borough.

Comments are due on or before ***October 4, 2024***, and will be included in the Planning Commission packet. Please be advised that comments received from the public after that date will not be included in the staff report but will be provided to the Commission at the meeting.

*Name:*_____ ***Mailing Address:***_____

Location/Legal Description of your property:_____

*Comments:*_____

Note: Vicinity Map Located on Reverse Side

252 2051B01L037
Emmanuel Appiah
3310 Tilley Drive,
Rosenberg, Texas 77471
September 23, 2024

Matanuska-Susitna Borough
Development Services Division
350 E. Dahlia Avenue,
Palmer, Alaska 99645

Subject: Comments on Conditional Use Permit Application for Meteorological Towers

Dear Planning Commission,

I am writing to formally oppose the Conditional Use Permit application submitted by Little Mount Susina Wind LLC for the construction of six meteorological towers.

I have several concerns regarding this proposal:

1. **Impact on Wildlife**: The construction of tall structures may disrupt local wildlife habitats and migration patterns, which could have long-term ecological consequences.
2. **Visual Impact**: The proposed towers, at heights of up to 197 feet, will significantly alter the landscape and may detract from the natural beauty of the area, impacting the quality of life for nearby inhabitants.
3. **Safety Concerns**: The height of these towers raises potential safety issues, including hazards for low-flying aircraft, bird safety, and concerns regarding structural integrity in severe weather conditions.
4. **Community Impact**: This development could lead to increased noise in the area, which may affect the peace and tranquility of the community.

Given these considerations, I urge the Planning Commission to decline the application for the Conditional Use Permit. Thank you for considering my comments.

Sincerely,

Emmanuel Appiah

emmanuel.appiah@outlook.com
+1.713.493.1398

From: eagle@eaglesongalaska.com
To: Rick Benedict
Subject: Little Mt. Susitna Wind LLC Meteorological Tower Comments
Date: Tuesday, September 24, 2024 11:27:39 AM
Attachments: Wind Farm Mat-Su Comments 9-24-24.pdf

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
Please find attached my public comment to the upcoming Mat-Su Borough Planning Commission to be conducted on Oct. 21, 2024.

Regards,

Michael W. Williams
General Partner

EagleSong Peony Farm
200 W. 34th Ave. Ste 295
Anchorage, AK 99503
(907) 521-0034

eaglesongalaska.com
//Instagram.com/eaglesongalaska
facebook.com/eaglesongalaska
www.tiktok.com/@alaskapeony
youtube.com/eaglesongalaska

To: Mat-Su Borough, Planning and Land Use Department September 24, 2024

Subject: Little Mt. Susitna Wind LLC Conditional Use Permit Comments

My family has lived at the northeast base of Little Mt. Susitna for the past 31 years. I look out the picture windows of my log cabin farm home and gaze upon Little Mt. Susitna every day. I think I can safely say there are few Alaskans alive today that have spent more time on and around that mountain than me. We built a successful peony farm after losing the prolific Alexander Creek drainage salmon runs to northern pike and closing our 15-year business as EagleSong Lodge.

- The proposed wind farm meteorological towers (current & proposed) set directly on top of the active Castle Mountain Fault and its juncture with the Beluga Fault. Keep in mind we had a 7.1 earthquake in November 2018 centered just 25 miles east of the proposed site. "It's the only active fault that comes to the surface in southcentral Alaska," said geologist Peter Haeussler, a leading earthquake researcher with the U.S. Geological Survey in Anchorage. "I'd personally try to avoid living within six miles of this thing," Haeussler said. "You wouldn't want to put any critical facilities on top of it."(Associated Press, Dec 29, 2002)
- The proposed site is less than 35 miles from the active volcano Mt. Spur. It last erupted June 27, 1992 after being quiet for 39 years. It is considered one of the most active volcanoes in Alaska and last rumbled awake in 2012.
- The Army, Air Force, Alaska National Guard and its allies conduct low level (nap of the earth) operations west of the Susitna River. Mt. Susitna, Little Mt. Susitna and Beluga Mountain experience almost weekly helicopter and fixed wing training activities. Helicopters conduct low level operations and landings all over Little Mt. Susitna and the proposed wind farm site. At a time when the U.S. military is increasing a significant arctic presence in Alaska it stands to lose a training area within minutes of Joint Base Elmendorf/Richardson. We even see significant presence of the massive twin rotor Chinook helicopters stationed in the Fairbanks area.
- The impact on wildlife will likely be significant. At this moment Alaska Department of Fish and Game (ADF&G) is imposing restrictions on moose hunting in game management unit 16B. ADF&G has eliminated the permit and youth hunts for the coming year. They have indicated they will narrowly approve a fall general and subsistence hunt for the region. ADF&G established a minimum population of 6000 moose for a sustained hunt. In January they counted under 6200 moose. The population continues to decline for a variety of reasons. This is the second crash of the moose population in 20 years. Little Mt. Susitna is significant summer habitat for moose.
- There are significant flocks of ptarmigan that call Little Mt. Susitna home. The towers will be located less than 3 miles from the Susitna Flats Game Refuge. The Susitna Flats State Game Refuge encompasses approximately 300,800 acres and supports spectacular spring and fall concentrations of migrating waterfowl and shorebirds. The towers will be in the direct migratory flight path of Upper Cook Inlet. U.S. Fish and Wildlife Service in their comments expressed concerns about the impact of the towers on migratory birds. USFWS called for development of appropriate bird (and bat) strike mitigation strategies to ensure compliance with the Migratory Bird Treaty Act. This includes bird diversion measures on the guy wires. The three current towers and the proposed towers do not have or address this issue. DNR and

USFWS have indicated that one of the current towers violates minimum distance from an eagle nest at this time.

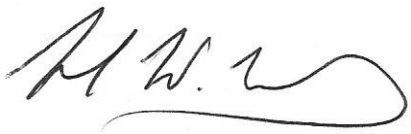
- Little is known about bats in Alaska. EagleSong Farm is currently working with Alaska Dept of Fish and Game to install audio monitoring equipment and conduct census counts as it is thought our farm may support a bat nursery. No one knows where these bats currently winter over. It is very possible Mt. Susitna, Little Mt. Susitna and Beluga Mountain offers winter refuge to Alaska's tiny brown bats.
- Little Mt. Susitna sees significant private air traffic in addition to the military air traffic identified above. It is a popular area to fly and land for ski and wheel planes. Small planes often transit between the north and south side of Mt. Susitna during inclement weather conditions trying to get to/from the Anchorage area. The tower sites are in direct line of pilots trying to navigate the weather that Mt. Susitna often generates. Various Alaska aviation organizations have already sent correspondence to their members warning of the 3 meteorological towers that currently stand there. Proposed towers of "up to 197 feet" are just 3 feet below requirements for the towers to be outfitted with navigational lights. That's cutting it a bit close! Does Little Mt. Susitna Wind LLC really care about public safety?
- The West Susitna region covers 14,150 square miles. It is larger than 9 U.S. states. In all this vastness according to a demographer from the Alaska Department of Labor and Workforce Development the population (fulltime) in the immediate vicinity of Little Mt. Susitna is approximately 70 people. We are a group so small that we are insignificant in the political world. The area is extremely poor…especially so after the invasion of northern pike and loss of the once prolific salmon runs. We often don't even qualify as an afterthought, especially by developers and politicians. We are the ones that will experience the negative results of this project but appear to be of little concern to Little Mt. Susitna Wind LLC or our local and state governments. It appears this project will drive the immediate area further into poverty.
- Little Mt. Susitna Wind LLC highlights the fact that "Anchorage" will not see the towers. That has become a key selling point to the Rail Belt audience. What about those west of the Susitna River? We don't even get the benefit of the power it will generate. People don't want to see them.
- Little Mt. Susitna Wind LLC indicated they had an alternate site to the south by the village of Tyonek. It doesn't appear they are doing any real evaluation of alternate sites.
- Over the years we have discovered artifacts on Little Mt. Susitna that the University of Alaska estimate to be over 11,000 years old. It is believed Mt. Susitna, Little Mt. Susitna and Beluga Mountain was the only land overlooking the glaciers that covered the southern Susitna Valley at that time. What is likely to be destroyed if Little Mt. Susitna has its top ripped off?
- The current project development plan submitted to Department of Natural Resources supporting Little Mt. Susitna Wind LLC land use request only identifies the Lewis and Theodore Rivers as potential impacted waterways. If the request for these new towers is approved a portion of them will potentially impact Wolverine, Sucker and Alexander Creeks on the northeast side of the mountain. These drainages have not been identified in the current development plan.
- I would like to direct the Mat-Su Borough Planning and Land Use Department to the Department of Natural Resources "Preliminary Decision" document dated 5/22/2024. In that document numerous issues have been identified by several state and federal agencies with this project. The meteorological towers already constructed and the new ones proposed are being constructed before any of these issues are addressed.

- We are not aware of any meeting previously held by the Mat-Su Borough Planning and Land Use Department for the three towers currently on Little Mt. Susitna. If there was no meeting, why? It appears the three existing towers were constructed prior to Mat-Su Borough approval.

My family is not anti-development but feel it must be a measured and fact-based approach. We are very much in favor of Alaska's move to renewable energy.

Are the Alaskans that call this place home to be tossed aside? Once it happens there is no going back.

Our hope is this wind farm project is measured by its pros and cons and decisions are based on merit, but that rarely happens today does it. The Little Mt. Susitna Wind Farm project is not a benign project. Let's make sure the benefit is worth the sacrifice.



Michael W. Williams
General Partner

EagleSong Peony Farm
200 W. 34th Ave. Ste 295
Anchorage, AK 99503
(907) 521-0034
eagle@eaglesongalaska.com

From: Tim Kelley
To: Rick Benedict
Subject: Comment on the proposed Little Mount Susitna meteorological towers and wind turbine project.
Date: Monday, September 30, 2024 10:23:56 PM

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]

September 30, 2024

Dinglishna Trust / Timothy F. Kelley
PO Box 190624, Anchorage, AK 99519
Property ID: 54124000T00B-2

Comment on the proposed Little Mount Susitna meteorological towers and wind turbine project.

I am against the meteorological tower and wind turbine project that is proposed for Little Mount Susitna.

First, I am opposed to wind turbine projects like this proposed one due to the obvious reasons: wind is an unpredictable and unreliable source of energy generation, lack of energy storage on scale, the need for federal subsidies, infrastructure made in China, high maintenance, killing of birds, small plane aviation hazards, end of life disposal issues and they are unsightly.

And then there is the issue of this project, in that it seems to be a short-sighted grab of federal subsidies that does not make long term economic sense.

For a wind farm in this area to be economical, a transmission line needs to be available. Currently there is such a transmission line, from the Beluga power plant to Knik, and on to the Intertie. The cost of maintaining this large power line is amortized in the Beluga power plant operations budget.

But as Cook Inlet gas is depleted, and gas is imported, there is the likelihood of the Beluga power plant shutting down. There will be resistance to pumping imported gas from Nikiski, under Cook Inlet for a long ways to Beluga. And then have electricity generated by that gas fed across a long transmission line back to users. This arrangement won't make economic sense. Shipping gas from Nikiski north to Anchorage (CEA) and Eklutna (MEA) power plants, which are right next to the Intertie, will be more efficient.

So with the Beluga power plant likely closing in the future, the economy of scale will be lost. Maintenance costs of a massive transmission line, that can be taken out by the Big Susitna River at any time, will then fall on the wind farm. These costs will likely reduce profits from the wind farm to the point that it is not profitable and is a fiscal burden to Southcentral electricity generation. A wind farm will have been made that is an energy liability, not an energy asset. A stranded and unprofitable wind farm.

To sum the situation up … the wind farm location at Little Mount Susitna is too far from the Intertie. It is too economically risky to build a wind farm at this location. A less economically risky place for wind turbines would be next to the Intertie north of Healy, where there are already wind turbines. And in that location, there is likely much more wind being funneled through the Alaska Range, than on a little ridge in the lower West Susitna Valley.

The main reason this Little Mount Susitna wind project is being pushed is to grab federal largesse. But if federal money is going to be squandered on wind turbines, then do it where there is a remote chance it might benefit Alaskans in the long term. Like north of Healy. Not on Little Mount Susitna.

This project, the proposed meteorological towers and the wind farm, should not go forward on Little Mount

Susitna.

From:	MELITTA WHITE
To:	Rick Benedict
Subject:	Response to: Public Notice MSB 17.67 Tall Structures Notice PC Resolution 24-30
Date:	Friday, October 4, 2024 10:02:48 AM

[**EXTERNAL EMAIL** - CAUTION: Do not open unexpected attachments or links.]
10.4.2024
Conditional Use Permit under MSB 17.67 Tall Structures
Notice
PC Resolution 24-30

Response

The idea of tall tower structures is a poor choice for the proposed impacted area. This is a large area encompassing all of the following lakes and wetlands. Starting in the east and going northerly, westerly and southerly it encompasses Goose Bay, Big Lake, Willow, Susitna River, Kroto Slough, Deshka River, Yentna River, Alexander Lake area, Mt. Susitna, Beluga Mountain, Alexander Community, Little Mt Susitna, westerly to the areas of Beluga Lake, Chakachatna River to Cook Inlet. This vast wetlands area includes Trading Bay State Game Refuge,* and the Susitna Flats State Game Refuge.*

This shelf of wetlands between Mount Susitna and the Upper Cook Inlet is prime wetlands for migratory waterfowl nesting and rearing. This wetland project impinges on a huge area for wildlife to breed, raise young, and either get ready for the fall southern migration or get prepared for what will be a grueling winter.

With the proposed project area being near the mouth of the Susitna / Yentna River system with its large and recovering salmon runs, overland transportation to service the tower system would compromise the runs of the anadromous fish, especially those that spawn near this outlet.

Fog over Cook Inlet is common because of the temperature differential between the icy waters and the warmer air above it. When a heavy layer of fog is covering the inlet, pilots are forced against the base of the mountains where the proposed towers would be. This is a dangerous obstruction and hindrance to aircraft navigation along this flight corridor.

Questions

1. The area is currently natural habitat. Will the construction materials arrive at the site by the road in the west Susitna area, the building of which is under strong contention? Alternatively, would the construction materials be helicoptered in, respecting the nesting and breeding cycle of the migratory waterfowl population?

2. Are there enough winds in the region to make this project feasible?

3. Considering these are wetlands, are the subsurface conditions adequate to

support the structures under consideration?

Conclusion

Because of the danger to wetlands, migratory waterfowl, endangered salmon runs, disturbance of this ecologically sensitive natural area by road construction, and an ever-present danger to aircraft navigation and violation of air rights, we strongly recommend this proposal be denied.

Theodore White
Melitta White
P.O. Box 975
Willow, AK 99688

*State Game Refuges are established by the State Legislature to protect and preserve the natural habitat and game populations of certain designated areas of the state (AS 16.20.020). Permits are required from the Habitat Division for any habitat altering activity or any activity which disturbs fish or wildlife other than lawful hunting, trapping and fishing activity (AS 16.20.050-060 520-530) within these areas.

Matanuska-Susitna Borough
Development Services Division
350 E. Dahlia Avenue
Palmer, Alaska 99645

246 U03733000L06
SMITH TIMOTHY E & VICKI L, EAGLEY RONALD
8251 OPAL DR
ANCHORAGE, AK 99502

Chad Allen, for Little Mount Susitna Wind LLC, applied for a Conditional Use Permit under MSB 17.67 – Tall Structures to construct six meteorological towers up to 197 feet tall. The proposed tower locations are within Township 15 North, Range 9 West, Section 5, Township 16 North, Range 9 West, Sections 16, 29, 32, and 33, and Township 16 North, Range 10 West, Section 13, Seward Meridian. There are no Tax ID numbers or addresses for the subject sites.

The Matanuska-Susitna Borough Planning Commission will conduct a public hearing concerning the application on ***Monday, October 21, 2024,*** at 6:00 p.m. in the Borough Assembly Chambers at 350 E. Dahlia Avenue in Palmer. This may be the only presentation of this item before the Planning Commission, and you are invited to attend. Planning Commission members may not receive or engage in ex-parte contact with the applicant, other interested parties in the application, or members of the public concerning the application or issues presented in the application.

Application materials may be viewed online at www.matsugov.us by clicking "All Public Notices & Announcements." For additional information, you may contact Rick Benedict, Current Planner, by phone: 907-861-8527. Provide written comments by e-mail to rick.benedict@matsugov.us, or by mail to MSB Development Services Division, 350 E. Dahlia Avenue, Palmer, AK 99645.

The public may provide verbal testimony at the meeting or telephonically by calling 1-855-290-3803. To be eligible to file an appeal from a decision of the Planning Commission, a person must be designated an interested party. See MSB 15.39.010 for the definition of an interested party. The procedures governing appeals to the Board of Adjustment and Appeals are contained in MSB 15.39.010-250, which is available on the Borough home page at www.matsugov.us, in the Borough Clerk's office, and at various libraries within the borough.

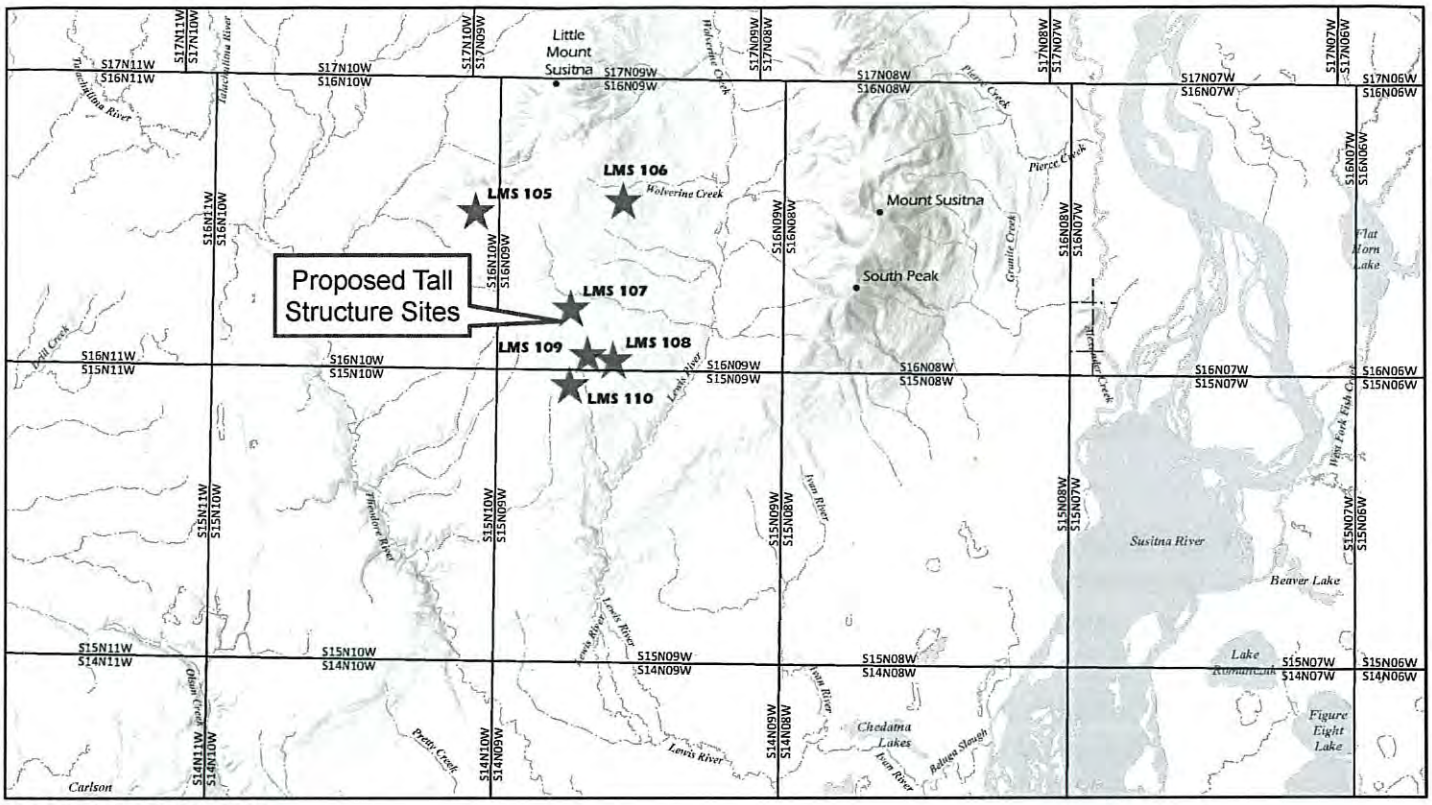
Comments are due on or before ***October 4, 2024,*** and will be included in the Planning Commission packet. Please be advised that comments received from the public after that date will not be included in the staff report but will be provided to the Commission at the meeting.

Name: Tim Smith ***Mailing Address:*** 8251 Opal dr Anch 99502

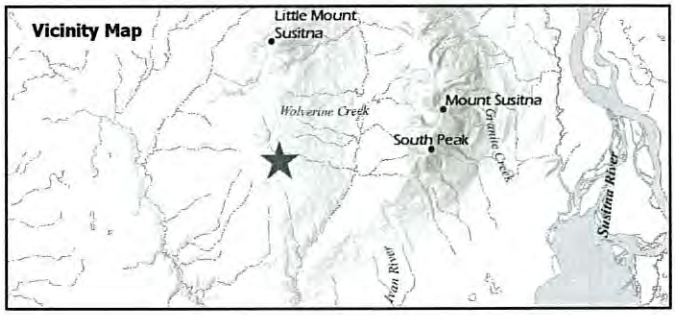
Location/Legal Description of your property: _____

Comments: very bad idea alot of small aircraft in that area on bad days it would be a big hazard

Note: Vicinity Map Located on Reverse Side



LMS 105 (61.473061,-150.988809)
LMS 106 (61.47670353, -150.895905)
LMS 107 (61.44464,-150.927867)
LMS 108 (61.429372, -150.900878)
LMS 109 (61.43089, -150.916978)
LMS 110 (61.421817, -150.928003)



MSB Information Technology/GIS
August 13, 2024

0 1,000 Feet

Tim Smith
8251 Opal Dr.
Anchorage, AK 99502

ALASKAN FRONTIER 995
25 SEP 2024 PM 1 L

Matanuska-Susitna Borough
Development Services Division
350 E. Dahlia Avenue
Palmer, Alaska
99645

99645-648699

DRAFT

PLANNING COMMISSION RESOLUTION

By: Rick Benedict
Introduced: October 7, 2024
Public Hearing: October 21, 2024
Action:

MATANUSKA-SUSITNA BOROUGH
PLANNING COMMISSION RESOLUTION NO. 24-30

A RESOLUTION OF THE MATANUSKA-SUSITNA BOROUGH PLANNING COMMISSION APPROVING A CONDITIONAL USE PERMIT IN ACCORDANCE WITH MSB 17.67 – TALL STRUCTURES, INCLUDING TELECOMMUNICATION FACILITIES, WIND ENERGY CONVERSION SYSTEMS, AND OTHER TALL STRUCTURES, FOR THE CONSTRUCTION OF SIX METEOROLOGICAL TOWERS UP TO 197 FEET TALL, LOCATED ON LITTLE MOUNT SUSITNA, WITHIN TOWNSHIP 15 NORTH, RANGE 9 WEST, SECTION 5, TOWNSHIP 16 NORTH, RANGE 9 WEST, SECTIONS 16, 29, 32 AND 33, AND TOWNSHIP 16 NORTH, RANGE 10 WEST, SECTION 13, SEWARD MERIDIAN.

WHEREAS, Little Mount Susitna Wind LLC applied for a Conditional Use Permit to construct six 197-foot tall guyed meteorological towers on Little Mount Susitna; and

WHEREAS, it is the purpose and intent of MSB Chapter 17.67 to enable the orderly built-out of wireless telecommunication infrastructure, wind energy conversion systems (WECS), and other tall structures while promoting the health, safety, and general welfare of the public; and

WHEREAS, according to MSB 17.67, tall structures exceeding 125 feet in height are only permitted upon the issuance of a Conditional Use Permit; and

WHEREAS, according to MSB 17.67, unless this type of use is maintained under and in accordance with a lawfully issued permit,

tall structures exceeding 125 feet in height are declared a public nuisance; and

WHEREAS, the Borough issued a public notice for the proposed tower project that exceeded the requirements of MSB 17.03; and

WHEREAS, the Planning Commission has reviewed this application, associated materials, and the staff report with respect to standards outlined in MSB 17.67; and

WHEREAS, according to the application material, the proposed meteorological towers are guy-wired monopole structures, each approximately 197 feet tall; and

WHEREAS, the proposed locations are not within a special land use district; and

WHEREAS, the proposed use is not within a community council boundary; and

WHEREAS, the nearest community council to the proposed tower locations is the Willow Area Community Organization; and

WHEREAS, the Willow Area Community Organization holds its meetings within the Willow Community Center; and

WHEREAS, according to the application material, the applicant held a public meeting at the Willow Community Center on June 3, 2024, from 5:30 to 6:45 p.m.; and

WHEREAS, the applicant provided the notice letter, address list, certificates of mailing, and the letters returned for the community meeting; and

WHEREAS, planning staff provided the applicant with the mailing addresses for property owners within a ten-mile radius of the proposed locations and the Willow Area Community Organization; and

WHEREAS, a certified mailing notification shows 110 notices were mailed to property owners and the Willow Area Community Organization on May 16, 2024; and

WHEREAS, the notification included a legal description and map of the proposed sites, a description of the proposed development, the date, time, and location of the informational meeting, contact name, telephone number, and address of the applicant, and a comment form created by the Borough with a deadline to submit comments and submittal options; and

WHEREAS, the application material contains a copy of the meeting sign-in sheet, a written report summarizing the comments received during the public meeting, and the applicant's detailed response; and

WHEREAS, according to the application sign-in sheet, three members of the public attended the public meeting; and

WHEREAS, according to the applicant, one written comment from a land owner in the notice area was received resulting from the public meeting notification; and

WHEREAS, the proposed tower sites are located on lands managed by the State of Alaska; and

WHEREAS, the applicant provided a land use permit for the proposed tower installations, dated August 20, 2024, permitted by the Department of Natural Resources under LAS 34057; and

WHEREAS, according to the applicant, the purpose of the meteorological towers is to allow for the quantitative assessment of wind resources in the area to enable the development of a wind farm project; and

WHEREAS, the proposed meteorological towers' remote locations and the area's lack of privately owned property provide a natural buffer that helps to minimize the visual impacts on the surrounding area; and

WHEREAS, the six proposed tower sites are surrounded by undeveloped wilderness, and the nearest privately owned land is approximately 2.7 miles northeast of site LMS_Met_6; and

WHEREAS, according to the application material, the proposed towers are not visible from public parks; and

WHEREAS, the closest recognized trail is the Sleeping Lady Trail, approximately 5 miles east of the site known as LMS_Met_6; and

WHEREAS, the closest waterbody is Trail Lake, approximately 11 miles northeast of the site known as LMS_Met_6; and

WHEREAS, according to the site plan, site LMS_Met_5 is located within Township 16 North, Range 10 West, Section 13. The east side of Section 13 is approximately 1,285 feet from the proposed site, and the north side is approximately 2,535 feet from the proposed site; and

WHEREAS, according to the site plan, site LMS_Met_6 is located within Township 16 North, Range 9 West, Section 16. The east side of Section 16 is approximately 2,592 feet from the proposed site, and the north side is approximately 1,866 feet from the proposed site; and

WHEREAS, according to the site plan, site LMS_Met_7 is located within Township 16 North, Range 9 West, Section 29. The east side of Section 29 is approximately 1,426 feet from the proposed site, and the north side is approximately 2,167 feet from the proposed site; and

WHEREAS, according to the site plan, site LMS_Met_8 is located within Township 16 North, Range 9 West, Section 33. The east side

of Section 33 is approximately 1,084 feet from the proposed site, and the south side of Section 33 is approximately 2,539 feet from the proposed site; and

WHEREAS, according to the site plan, site LMS_Met_9 is located within Township 16 North, Range 9 West, Section 32. The east side of Section 32 is approximately 1,640 feet from the proposed site, and the north side is approximately 285 feet from the proposed site; and

WHEREAS, according to the site plan, site LMS_Met_10 is located within Township 15 North, Range 9 West, Section 5. The west side of Section 5 is approximately 1,683 feet from the proposed site, and the north side is approximately 2,225 feet from the proposed site; and

WHEREAS, according to the Matanuska-Susitna Borough's Regional Aviation System Plan Study (Phase II, May 2017), Flat Horn Lake is approximately 15 miles east of the site known as LMS_Met_8; and

WHEREAS, according to the application material, the Federal Aviation Administration (FAA) online "Notice Criteria Tool" indicates the proposed meteorological towers and their corresponding locations do not exceed the FAA Notice Criteria; and

WHEREAS, according to the application material, the tower and its guy wires have been marked with FAA-compliant paint, guy guards, and marker balls; and

WHEREAS, according to the application material, the proposed meteorological towers will not be lit; and

WHEREAS, according to the application material, the proposed towers have been engineered with wind and ice load limits that meet the ANSI/TIA-222-G standards; and

WHEREAS, the applicant submitted a structural design report for the proposed towers, which contains certified drawings from Registered Professional Engineer Aaron Boonstra, licensed to practice in Alaska; and

WHEREAS, according to the application material, each site has adequate space for emergency vehicle access; and

WHEREAS, according to the application material, each site is accessible via helicopter for emergency response; and

WHEREAS, the requirements of MSB 17.67.090(A) and (C) do not apply because the proposed tall structure is a meteorological tower; and

NOW, THEREFORE, BE IT RESOLVED that the Matanuska-Susitna Borough Planning Commission hereby adopts the aforementioned

findings of fact and makes the following conclusions of law supporting approval of Planning Commission Resolution 24-30:

1. The proposed use meets the criteria to qualify for a Conditional Use Permit for the construction of six 197-foot-tall guyed meteorological towers (MSB 17.67.040(A)(1)).
2. The applicant has met the pre-application requirements for new tall structures that require a Conditional Use Permit (MSB 17.67.050).
3. The locations of the meteorological towers are such that their negative effects on the visual and scenic resources of all surrounding properties have been minimized (MSB 17.67.080(B)(1)).
4. Visibility of the proposed meteorological towers from public parks and trails has been minimized (MSB 17.67.080(B)(2)).
5. The proposed tall structures will not interfere with the approaches to any existing airport or airfield that are identified in the borough's regional aviation system plan or by the Alaska State Aviation System Plan (MSB 17.67.080(B)(3)).

6. The proposed towers will not be harmful to the public health, safety, convenience, and welfare (MSB 17.60.080(B)(4)).
7. MSB 17.67.090(A) is not applicable to the proposed meteorological towers.
8. Adequate vehicle parking has been provided (MSB 17.67.090(B)(1)).
9. MSB 17.67.090(C) is not applicable to the proposed meteorological towers.

NOW, THEREFORE, BE IT FURTHER RESOLVED, that the Matanuska-Susitna Borough Planning Commission hereby finds this application does meet the standards of MSB 17.30.060 and does hereby approve the Conditional Use Permit for six meteorological towers with the following conditions:

1. The operation shall comply with all applicable federal, state, and local regulations.

2. The facility shall be removed at the owner's expense within 90 days after abandonment or termination of the permit in accordance with MSB 17.67.130(A)(1).

3. Authorized borough representatives shall be allowed to inspect the site and related records at reasonable times to monitor compliance with all permit conditions. Upon reasonable notice from

the borough, the permittee shall provide necessary assistance to facilitate authorized inspections (MSB 17.67.300(D) & (E)).

ADOPTED by the Matanuska-Susitna Borough Planning Commission on this __ day of October 2024.

C.J. KOAN, Chair

ATTEST

Lacie Olivieri, Planning Clerk

(SEAL)

YES:

NO:

PUBLIC HEARING LEGISLATIVE

Resolution No. 24-29

Recommending Approval Of An Ordinance Amending MSB 17.73 To Clarify That Mobile Home Parks Are Not Permitted In The Matanuska-Susitna Borough

(Pages 947 - 960)

PUBLIC HEARING

By: A. Strawn
Introduced: October 7, 2024
Public Hearing: October 21, 2024
Action:

MATANUSKA-SUSITNA BOROUGH
PLANNING COMMISSION RESOLUTION NO. 24-29

A RESOLUTION OF THE MATANUSKA-SUSITNA BOROUGH PLANNING COMMISSION RECOMMENDING APPROVAL OF AN ORDINANCE AMENDING MSB 17.73 TO CLARIFY THAT MOBILE HOME PARKS ARE NOT PERMITTED IN THE MATANUSKA-SUSITNA BOROUGH.

WHEREAS, Assembly Ordinance 24-053 repealed MSB 17.48 Mobile Home Parks in its entirety, thereby eliminating the permit process and public hearing requirements for proposed mobile home parks, but did not ban mobile home parks; and

WHEREAS, because of that repeal, mobile home parks constructed on foundations can now be built in Mat-Su without giving residents a chance to voice their concerns or provide input through a public hearing; and

WHEREAS, the intent of this ordinance is to prohibit the establishment of new mobile home parks in the Mat-Su unless and until the Assembly reinstates a permit process that includes a public hearing in front of the Planning Commission; and

WHEREAS, Alaska's cold temperatures pose a challenge for mobile homes which typically have less insulation than permanent housing structures. This can lead to higher heating costs,

difficulty in maintaining a stable interior temperature, and vulnerability to freezing water lines; and

WHEREAS, mobile homes pose an increase risk to death in the event of a fire because they are typically constructed with highly flammable materials, are small and confined, and lack proper escape routes; and

WHEREAS, establishment of mobile home parks may lead to lower property values in surrounding areas.

NOW, THEREFORE, BE IT RESOLVED, that the Matanuska-Susitna Borough Planning Commission hereby recommends approval of Assembly Ordinance 24-096.

ADOPTED by the Matanuska-Susitna Borough Planning Commission this -- day of --, 2024.

C J KOAN, CHAIR

ATTEST

Lacie Olivieri
Planning Clerk

(SEAL)

YES:

NO:

MATANUSKA-SUSITNA BOROUGH INFORMATION MEMORANDUM IM No. 24-097

SUBJECT: AN ORDINANCE OF THE MATANUSKA-SUSITNA BOROUGH ASSEMBLY REPEALING MSB 17.48 MOBILE HOME PARK ORDINANCE IN ITS ENTIRETY.

AGENDA OF: May 7, 2024

ASSEMBLY ACTION: Amended and defeated with Assemblymembers Yundt, Fonov, and Bernier in support and Assemblymembers Hale, Nowers, and McKee opposed (tie vote) Passed with Mayor DeVries voting in support. 08/06/24 - BJH

AGENDA ACTION REQUESTED: Refer to Planning Commission for 90 days.

Route To	Signatures
Originator	4/17/2024 X Alex Strawn Signed by: Alex
Department Director	4/17/2024 X Alex Strawn Signed by: Alex
Finance Director	4/22/2024 X Cheyenne Heindel Signed by: Cheyenne Heindel
Borough Attorney	4/22/2024 X Nicholas Spiropoulos Signed by: Nicholas Spiropoulos
Borough Manager	4/22/2024 X Michael Brown Signed by: Michael Brown
Borough Clerk	4/25/2024 X Lonnie McKechnie Signed by: Lonnie McKechnie

ATTACHMENT(S): Ordinance Serial No. 24-053 (1 p.)
MSB Code 17.48 (6 pp)
Planning Commission Reso. 24-13 (2 pp)

SUMMARY STATEMENT: This ordinance is at the request of Assembly Member Yundt. The intent of this ordinance is to make developing a mobile home park impossible.

RECOMMENDATION OF ADMINISTRATION: Staff respectfully recommends approval of this ordinance.

CHAPTER 17.48: MOBILE HOME PARK ORDINANCE

Section

ARTICLE I. ELIGIBILITY

17.48.010 APPLICABILITY.

A mobile home park may be established in any area of the MSB except where prohibited by zoning ordinances, provided that the mobile home park meets the requirements of this chapter and is approved at a public hearing by the planning commission, except that mobile home parks within the corporate limits of the cities of Houston, Palmer and Wasilla are subject only to regulations in existence for those cities.

(Ord. 83-63, § 2 (part), 1983)

17.48.020 DEVELOPMENT PROHIBITION.

No person shall proceed with any construction work on the proposed property, including clearing, grading or excavation relating to improvements, until planning commission approval of the mobile home park plan has been obtained.

(Ord. 83-63, § 2 (part), 1983)

17.48.030 PROOF OF FINANCIAL ABILITY TO COMPLETE THE PROJECT.

Arrangement of guaranteed financing and construction of public recreational facilities and other amenities proposed within the mobile home park shall be required for approval of the mobile home park by the planning commission and prior to beginning of construction.

(Ord. 83-63, § 2 (part), 1983)

17.48.040 STANDARDS.

(A) A mobile home park shall have an area of not less than two acres nor more than ten acres. No mobile home, parking, office or service building shall be closer than 30 feet to a public use area or other property line.

(B) Individual mobile home sites shall have an area of not less than 6,000 square feet per single-wide mobile home and 6,500 square feet per double-wide mobile home, and the total number of mobile homes per gross acre will not exceed five.

(C) A minimum of a ten-foot-wide buffer, to a maximum of a 25-foot-wide buffer shall be provided along the property boundaries. Mobile home placement shall be set back ten feet from the internal edge of the buffer. The intent of the buffer is to provide a vegetated visual transition area between the mobile home park and adjacent properties.

(D) A minimum separation of 30 feet between mobile homes, including any attached entrance, lean-to, or other extension from mobile homes shall be maintained between mobile homes.

(E) A minimum of two parking spaces per mobile home will be provided.

(F) A fenced area for the storage of boats and other recreational vehicles may be required by the planning commission in mobile home parks with three or more spaces per acre.

(G) Sufficient open space is required for a common area for residents, such as playground areas for resident children.

(H) The location of the mobile home park shall be compatible with the surrounding land uses and density of

existing development. Public facilities necessary to serve the mobile home park, including roads, utilities, water, waste disposal, recreation, schools and fire protection, shall be shown to be provided or available. No mobile home park shall be located where the combined acreage of all mobile home parks within a one-mile radius exceeds ten acres.

(Ord. 90-051, § 2 (part), 1990; Ord. 83-63, § 2 (part), 1983)

ARTICLE II. PROCEDURES FOR MOBILE HOME PARK PLAN APPROVAL

17.48.050 APPLICATION REQUIREMENTS.

(A) Prior to submitting a formal application to the planning commission, the applicant shall confer with the borough planning department on the review process for the application. An appropriate filing fee as established by the assembly shall accompany the formal application.

(B) An application for approval of a mobile home park shall be submitted to the planning department and shall include a site plan containing the following information:

(1) location and size of all mobile home spaces;

(2) landscaping and buffering areas;

(3) utility layouts, including sewer and water;

(4) parking for cars and recreational vehicles;

(5) locations and development and open space;

(6) vehicular circulation and traffic patterns;

(7) name of the mobile home park and the name and address of the developer;

(8) existing topography and soils information;

(9) scale, north arrow, date and general location map.

(C) The application shall include a legal description of the property identifying property dimensions and total area, and an affidavit stating that the applicant holds controlling interest in the property and describing the ownership interest of the applicant and all other persons having an interest in the property.

(D) The review process will include a review of the site plan, other application material required in MSB 17.48.020 and the following information:

(1) the character, design and attractiveness of the proposed mobile home park and its adequacy to encourage desirable living conditions, to provide separation and screening between uses where desirable, and to preserve the natural amenities of streams and wooded areas;

(2) the adequacy of open space and recreational areas, existing and proposed, to meet the needs of the development;

(3) traffic circulation into and through the mobile home park.

(E) The planning director shall review the application for completeness and accept or reject within ten days of receipt.

(Ord. 90-051, § 2 (part), 1990; Ord. 86-47, § 13, 1986; Ord. 83-79, § 2, 1983; Ord. 83-63, § 2 (part), 1983)

17.48.060 PLANNING COMMISSION REVIEW.

Within 30 days after the mobile home park application has been approved by the planning director, the director shall schedule a public hearing before the planning commission. Any conditions attached to the mobile home park plan, staff recommendations and technical agency review comments will be presented to the planning commission.

(Ord 83-63, § 2 (part), 1983)

17.48.080 TECHNICAL REVIEW AGENCIES.

After the mobile home park plan has received pre-application approval by the planning director, the applicant or the applicant's representative shall be informed which agencies shall receive copies of the plan. The planning department shall submit the plan to the agencies to which planned unit developments are referred under MSB 17.36.

(Ord. 83-63, § 2 (part), 1983)

17.48.090 ACTION OF THE PLANNING COMMISSION.

The planning commission shall review the mobile home park plan and approve the application, give conditional approval, or deny the application. The planning commission shall render its decision and findings in writing; and if its decision is to deny the application, it shall indicate what the applicant might do to make the application acceptable. If given conditional approval, the applicant shall submit final plans meeting the conditions of the planning commission to the planning department within 30 days of such approval.

(Ord. 83-63, § 2 (part), 1983)

17.48.100 APPEAL PROCESS.

A decision of the planning commission is final unless an appeal is filed within 15 borough business days after the commission's action. Appeals shall be conducted under the provisions of MSB 15.39 as a conditional use.

(Ord. 97-026, § 2, 1997; IM 96-013, page 1 (part), presented 3-19-96; Ord. 83-63, § 2 (part), 1983)

ARTICLE III. GENERAL PROVISIONS

17.48.110 DEFINITIONS.

(A) For the purpose of this chapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

(1) “Buffer” means a means of protection against negative impacts which provides a physical separation or barrier.

(2) “Mobile home” means a detached single-family dwelling designed for long-term human habitation and having complete living facilities; capable of being transported to a location of use on its own chassis and wheels; identified by a model number and serial number by its manufacturer, and designed primarily for placement on a nonpermanent foundation. Travel trailers are not considered as mobile homes.

(3) “Mobile home parks” means any parcel, tract or lot or portion thereof where space for two or more mobile homes or travel trailers is leased, rented or held for rent for occupancy, but not including automobile or trailer sales lots on which unoccupied mobile homes are parked for inspection and sale or camper parks in which travel trailers are permitted for temporary occupancy of less than 30 days.

(4) “Travel trailers” means a motor vehicle or portable vehicular structure capable of being towed on the highways by a motor vehicle designed or intended for casual or short-term human occupancy for travel, recreational or vacation uses, identified by a model number, serial number or vehicle registration number, equipped with limited water storage and other self-contained living facilities.

(Ord. 90-051, § 2 (part), 1990; Ord. 83-63, § 2 (part), 1983)

17.48.130 NONCONFORMING MOBILE HOME PARKS.

(A) Within the borough there may exist mobile home parks as of the date of adoption of the ordinance codified in this chapter, or amendments thereto which were lawful before the effective date of applicable regulations, but which would otherwise be prohibited, regulated or restricted under this chapter. Such existing nonconforming parks are permitted to continue subject to the provisions of this section, but shall not be expanded except in accordance with this chapter.

(B) Nothing in this chapter shall require the relocation or removal of mobile home parks existing or under construction at the time of adoption of the ordinance codified in this chapter if such use was lawful at the time of its construction. No mobile home park shall be constructed or operated except in accordance with these regulations, except to the extent it was in existence or under actual construction as of the effective date of the ordinance codified in this chapter or amendment thereto. “Actual construction” is defined as the substantial

placement of construction materials and performance of labor for construction of facilities which cannot reasonably be used except in a manner which does not conform with these regulations.

(C) Mobile home parks under construction or in existence as of the date of the ordinance codified in this chapter shall apply for, and may obtain approval of, the mobile home park within 120 days of the effective date of the ordinance codified in this chapter. The planning director shall grant approval of the mobile home park if it complies with the requirements of this chapter, excepting only those facilities and improvements which were under construction or in existence prior to the effective date of the respective regulation. The mobile home park shall meet all other requirements of this chapter which are not in conflict with the pre-existing use or construction.

(D) No existing mobile home park shall be expanded in area or in number of dwelling units permitted unless the area of expansion meets the requirements of this chapter. No area of a mobile home park which is abandoned shall be used as a mobile home park unless it meets the requirements of this chapter. “Abandonment” is defined as a discontinuation of use of a mobile home park or a discrete portion or parcel thereof, or the failure to complete construction and begin use, for a continuous period of more than one year. If abandoned, the land shall not thereafter be used except in conformity with the requirements of this chapter.

(Ord. 83-78, § 3, 1983)

17.48.140 VIOLATIONS AND ENFORCEMENT.

Violations and enforcement of this chapter shall be consistent with the terms and provisions of MSB 17.56.

(Ord. 90-051, § 2 (part), 1990: Ord. 83-78, § 4, 1983)

17.48.150 APPEAL PROCEDURE.

Appeals from a decision of the planning director of a zoning enforcement action shall be filed and conducted in accordance with MSB 15.39.

(IM 96-013, page 1 (part), presented 3-19-96; Ord. 84-78, § 5, 1983)

By: A. Strawn
Introduced: June 3, 2024
Public Hearing: June 17, 2024
Action: APPROVED

MATANUSKA-SUSITNA BOROUGH
PLANNING COMMISSION RESOLUTION NO. 24-13

A RESOLUTION OF THE MATANUSKA-SUSITNA BOROUGH PLANNING COMMISSION RECOMMENDING FAILURE OF AN ORDINANCE REPEALING MSB 17.48 MOBILE HOME PARK ORDINANCE IN ITS ENTIRETY.

WHEREAS, the commission opposes the loss of public notice and ability for public hearing in front of the Planning Commission that is included with the mobile home park ordinance; and

WHEREAS, mobile home parks present unique risk to public safety based on the risk factors associated with fire entrapments and higher crime rates.

NOW, THEREFORE, BE IT RESOLVED, that the Matanuska-Susitna Borough Planning Commission hereby recommends failure of Assembly Ordinance 24-053.

BE IT FURTHER RESOLVED, that the commission recommends the Assembly direct staff to produce an ordinance that combines and streamlines MSB 17.73 and MSB 17.48, making mobile home parks a chapter within MSB 17.73 that requires a public hearing before the Planning Commission.

ADOPTED by the Matanuska-Susitna Borough Planning Commission this 17 day of June 2024.

C J KOAN, CHAIR

ATTEST

CORINNE LINDFORS
Planning Clerk

(SEAL)

YES: ALLEN, KOAN, McCABE, GLENN, SHANE

NO: Ø