

**Kuskokwim River Middle Mile Fiber Technical Feasibility Study
RD-RU-COOP-25-09**

Cable Landing Sites Field Report

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United States Department of Agriculture
Rural Utility Service

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Summary

The desktop feasibility study performed as part of this project is enhanced by data collected through field validation. This field feasibility assessment was completed in May 2026 for proposed landing sites along the Kuskokwim River corridor. The assessment was performed to evaluate the constructability and suitability of future fiber optic cable landings utilizing Horizontal Directional Drilling (HDD) methods in each community. Site visits conducted as part of the field study included the assessment of landing station location viability, construction risk identification, preliminary engineering validation. Sites were chosen based on a desktop survey of the areas with shore approaches near existing utility infrastructure, existing barge landing sites, and boat ramps that would provide access to the community. Where available, multiple site candidates were evaluated within the community with each individual site fielded and graded separately.

No fielding in McGrath was performed as part of the field evaluation. This is a result of the desktop analysis finding that the community of McGrath was not technically or economically feasible for construction.

The field verification of landing site viability consisted of on-site inspections, aerial drone footage, photographic documentation, GPS ground truth verification, constructability scoring, and preliminary HDD suitability reviews for each proposed landing site. These on-site inspections took place immediately following break-up of the Kuskokwim River ice to facilitate the best possible understanding of high water, ice scouring and seasonal transition conditions at each location.

Field teams evaluated each location using a standardized HDD Beach Approach Site Grading Form, with scoring based on:

- Site accessibility
- Beach geometry and work area suitability
- Riverbank stability
- Surface and subsurface soil suitability
- Seasonal flooding and ice scour impacts
- HDD entry/exit feasibility
- Equipment access and staging locations
- Environmental and permitting considerations
- Long-term constructability
- Site visit approach and methodology

The fielding effort was led by a Meridian Management, Inc Construction Manager and included an HDD Subject Matter Expert. The HDD SME was an important element of the field team and their role was to validate shore the approach with a focus on determining whether each community landing site could reasonably support HDD installation and infrastructure.

Remote Access Logistics

The locations visited are extremely remote communities within western Alaska. Transportation methods used included:

- Charter and regional air service to gain access to the community – all communities
- ATVs where road and trail systems existed – Aniak, Crooked Creek, Chuathbaluk
- Walking reconnaissance when ATVs were not available (Sleetmute, Red Devil, Stony River)

Field Engineering Review

The same set of evaluation tasks were performed at each location. These tasks are listed below:

- GPS coordinate verification
- Riverbank and beach geometry observations
- HDD entry/exit corridor assessment
- Preliminary bore alignment feasibility
- River stage observations during spring break-up/high water
- Constructability constraints review
- Risk identification and mitigation planning
- Aerial drone video capture

Special emphasis was placed on spring ice break-up conditions, as the field visits were intentionally scheduled to occur during the seasonal transition period. This period provides visual evidence of elevated water levels and ice scouring and aids in quantifying potential worst-case seasonal impacts.

Constructability Scoring

The suitability of each landing site was scored against a standard criteria set with numeric rating scale. Some of the desktop survey candidate sites were fielded and deemed infeasible. Those locations are not included in this report.

Category	Evaluation Focus
Beach Width and Work Area	Ability to Stage Drill spread and Support Equipment
Soil Suitability	Likelihood of adverse soil conditions and Best Drilling Practices
Erosion/Stability	Long term stability and risk
Equipment Access	Ability to mobilize drill, excavator, mud system, and Conduit.
Environmental Sensitivity	Permitting constraints
Bore feasibility	Reasonable length, depth, and alignment for drill capable of being moved to the community.
Assumed Land Ownership	DOT, FAA, Community owned,etc

Table 1. Key considerations for landing site scoring

The results of the landing site scoring are summarized in Table 2.

Community / Site	Score	Rating	Feasibility Preference
Aniak Site 1	82	4.1	Strong candidate
Aniak Site 2	68	3.4	Has moderate constraints
Aniak Site 3	80	4.0	Strong candidate
Chuathbaluk Site 1	68	3.4	Has moderate constraints, only feasible site
Crooked Creek Site 1	79	4.0	Preferred candidate
Crooked Creek Site 2	77	3.9	Favorable candidate
Red Devil Site 1	86	4.3	Singular candidate site
Sleetmute Site 1	83	4.2	Strong candidate
Sleetmute Site 2	90	4.5	Preferred candidate
Stony River Site1	68	3.4	Has moderate constraints
Stony River Site 2	85	4.3	Strong Candidate

Table 2. Site visit candidate landing site scoring and preference

Construction Risks

Site visits were also used to identify the most common construction risks when possible. A number of consistently present risks were observed within the communities visited.

Seasonal high water levels and ice scour

Most locations showed observable evidence of spring breakup impacts. These included flood elevations, or ice scour damage. Timing of HDD work will require careful planning to avoid the break-up and retain sufficient time to complete the work during the open water season..

Barge mobilization requirements

Construction of a river-based fiber optic cable requires river barge transport of drilling equipment and material staging. Support of this riverine material movement requires viable barge landing locations and offloading sites to be identified. The seasonal shoreline changes could cause locations identified in this field report to become infeasible in the future.

Limited existing utility tie-in option

The rurality of the communities visited leads to limited to no utility access in preferred landing areas. The absence of utility tie-in capabilities increases the project cost through the requirement for underground and / or pole line extension to interface with existing power and communications infrastructure within the community.

Geotechnical site verification

The field evaluations did not include soil sampling, HDD bore path profiling or river sonar sounding data collection. All of these elements are critical to ensuring that any design is constructable and feasible. These data were not collected at the time of the field visit due to cost and value considerations. Should the project be further funded these data are recommended for collection early in the detailed design process.

Horizontal Directional Drilling SME Recommendations

Directional drilling from the landing location within each community to the flowing river is a critical component of the construction and long-term operation of any fiber system placed in the Kuskokwim River. Field observations and scoring results suggest that project next steps should include:

- Pre-select high-scoring candidate sites for preliminary engineering of the HDD path.
- Perform geotechnical investigations of soil conditions and suitability at preferred landings locations.
- Complete bathymetric sounding and river profile review to confirm bore depths and river side bore exit feasibility. Consider the use of low-cost consumer grade sonar systems as part of any experimental phase to demonstrate or disprove their use in the construction of cable systems in arctic rivers.
- Sequence construction around low-water summer windows to minimize breakup-related risk.
- Develop community-specific logistics plans for barge, aircraft, and material staging.

Conclusion

The field site visits successfully establish the feasibility of fiber construction by validating that landing station locations within each community are practically achievable. While several

locations present seasonal and logistical challenges typical of remote Alaska construction, the sites listed in this report are technically feasible for HDD-based fiber installation. Select locations show strong potential for advancement into the detailed design and environmental permitting stage if project funding is secured for Phase 1. The field study supports continued project development in the areas of preliminary detailed engineering, cost estimating, and construction grant-ready documentation for Phase 1 of the Kuskokwim River fiber network.

Individual Field Reports/Scoring Cards in the Appendices

The appendices that follow provide a photographs of the communities visited. Relevant locations such as candidate landing station locations and other details are included in each section.

Appendix A. Aniak Site 1

Figure A1. Aniak Site 1 Overview

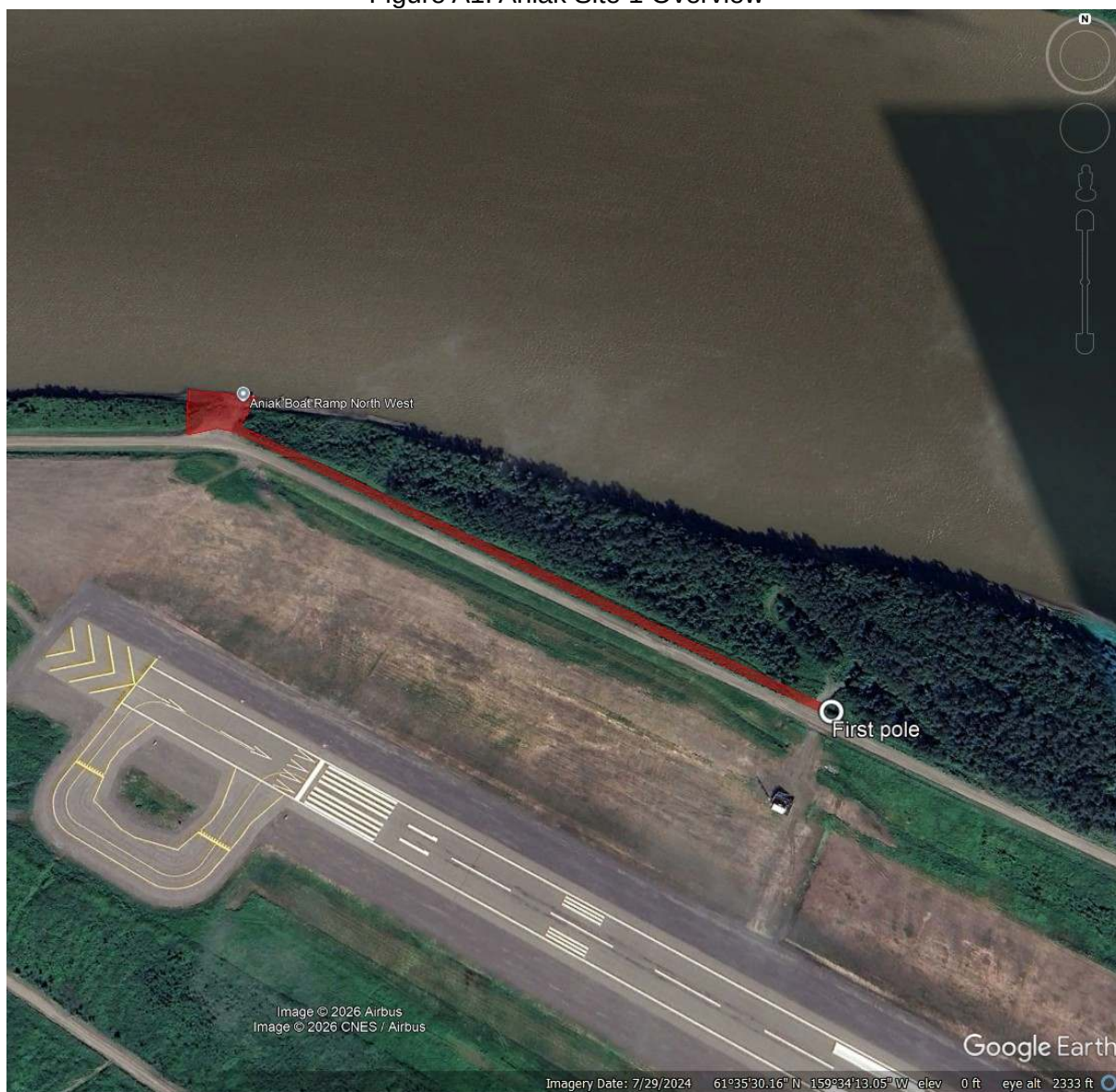


Figure A2. Aniak Site 1 Field Report

Figure A3. Aniak Site 1 Photos



Appendix B. Aniak Site 2

Figure B1. Aniak Site 2 Overview



Figure B2. Aniak Site 2 Field Report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Aniak Site 2
River / Waterbody		Aniak Slough
Date		5/13/2026
Inspector / CM		David Tucker/Josh Hubbard
GPS Coordinates		61°34'26.70"N/159°31'45.76"W
Weather		Sun and Windy
River Stage		High Water/ Post major ice damming event
Access Method		Flights and ATV
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	2	Area above high water was significantly smaller than google earth imagery. High water cam all the way up to the treeline
Slope from upland to river	3	Hard to see water was very high
Bank stability / erosion risk	3	Erosion evident
Evidence of seasonal flooding / ice scour	3	Significant ice damage
Soil type suitable for HDD	4	Soil and Loamy consisten with freshly eroded land, and slough. Low gravel content observed
Cobbles / boulders / bedrock risk	5	Low risk
Feasible HDD entry pit location	3	Good Entry locations
Feasible HDD exit location below riverbed	3	Needs Sounding/ Slough appears normally shallow, water was high at the time of the site visit.
Bore length reasonable	3	400' Long bank would be exposed at low water. Need to extend bore into the deepest part of the slough
Drill rig setup area available	3	Reasonable but would require clearing
Mud handling / containment area	4	Reasonable
Spoils disposal area	2	Far side of village from Dump
Access for equipment / materials	3	Equipment would have to be tracked through the village
Barge or boat landing feasibility	3	Barge could come in at high water only
Distance to fiber hut / vault location	4	350' to the nearest pole. Hut would need to be set on top of or behind the dike.
Permitting / environmental sensitivity	4	No more than elsewhere
Fish habitat / wetlands concern	4	No more than elsewhere
Cultural / land ownership concern	4	Assumes Community or ADOT ownership
Constructability in summer season	3	Need high water to access with barge
Emergency response / safety access	5	Services available at the clinic in Aniak
TOTAL SCORE	68	
AVERAGE SCORE	3.4	
3. RISK FLAGS		
Active erosion	☐	
Unstable bank	☒	Significant erosion observed
Ice scour zone	☒	Potential
Wetlands present	☒	May have different designation as a slough
Known fish habitat	☐	
Cultural resource concern	☐	
Land ownership unclear	☒	Assumes community ownership of the boat launch
Poor equipment access	☐	
Limited work pad	☐	
Bedrock likely	☐	
Large cobbles/boulders likely	☐	
High frac-out risk	☐	
Difficult mud containment	☐	
Seasonal water level concern	☒	Recommend late spring before boring
Requires helicopter support	☐	
Requires barge support	☒	Required
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		NW toSE
Estimated bore length		400
Estimated depth below riverbed		10
Entry angle		25
Exit angle		33
Recommended casing (Yes/No)	NO	
Recommended conduit size/count		Single 6"SDR 11 HDPE
Vault/hut location feasible	Yes	
COMMENTS / MITIGATIONS		
Aerial Footage not available due to airport restrictions for the DRONE		
Engineered bore profile and Soundings recommended		

Figure B3. Aniak Site 2 Photos



Appendix C. Aniak Site 3

Figure C1. Aniak Site 3 Overview

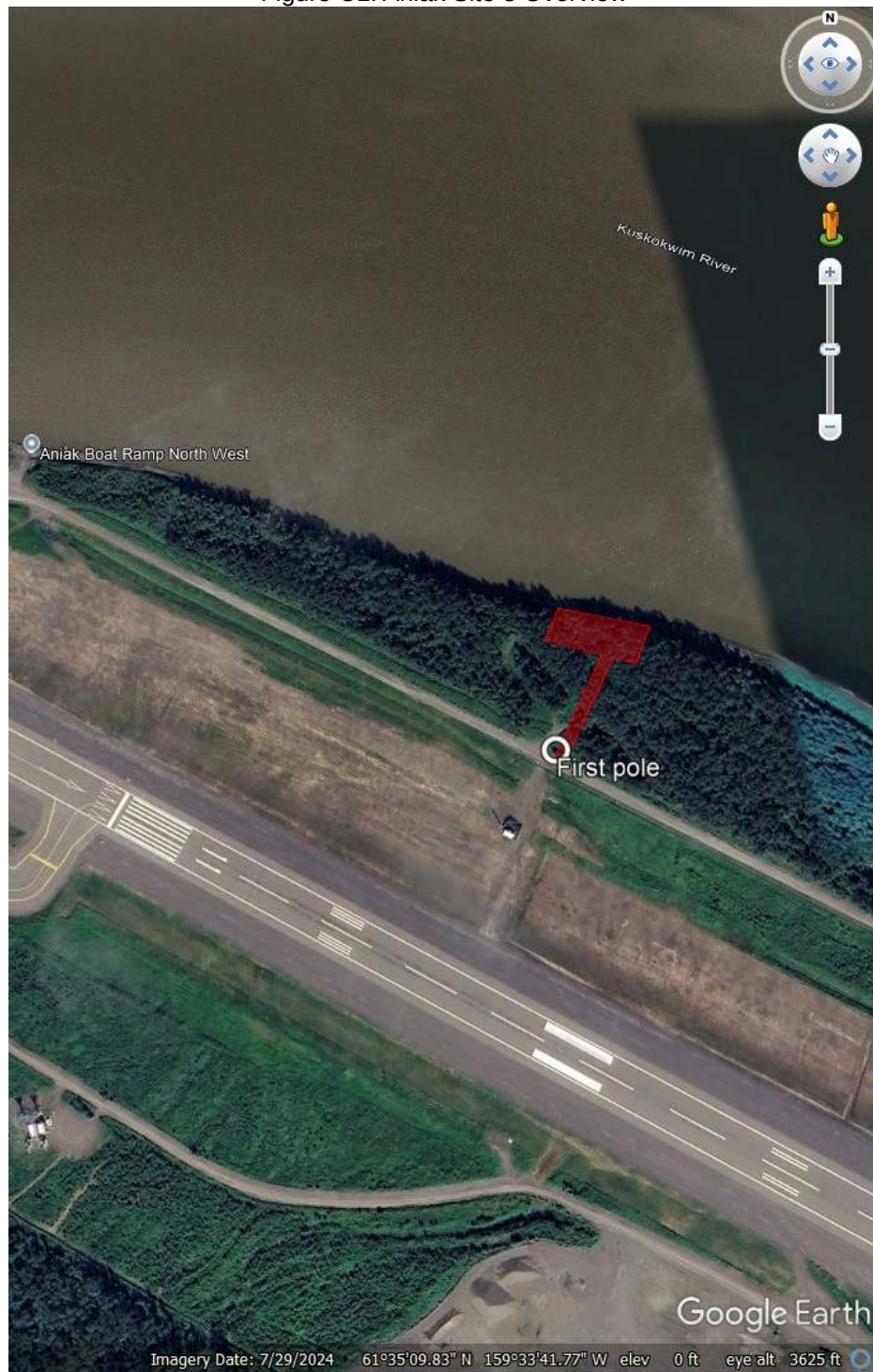


Figure C2. Aniak Site 3 Field Report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Aniak Site 3
River / Waterbody		Kuskokwim
Date		5/13/2026
Inspector / CM		David Tucker/Josh Hubbard
GPS Coordinates		61°35'11.14"N/159°33'6.20"W
Weather		Sun and Windy
River Stage		High Water/ Post major ice damming event
Access Method		Flights and ATV
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	3	Area Workable would require clearing for proper set up
Slope from upland to river	4	Dike is steep but manageable
Bank stability / erosion risk	4	Dike appears intact with old growth trees on it
Evidence of seasonal flooding / ice scour	4	Old Growth trees in the surveyed aread
Soil type suitable for HDD	4	Gravel and sandy
Cobbles / boulders / bedrock risk	4	Area is artificially raised so potential for fill materials to containg boulders.
Feasible HDD entry pit location	3	Good Entry locations
Feasible HDD exit location below riverbed	4	Channel appears to run close to the bank
Bore length reasonable	4	290' channel runs close to the bank. More of the bore would be on shore to be well behind/Below dike.
Drill rig setup area available	3	Reasonable but would require clearing
Mud handling / containment area	4	Reasonable
Spoils disposal area	4	Dump Close
Access for equipment / materials	4	Barge landing site 1500' down the road
Barge or boat landing feasibility	5	River channel close
Distance to fiber hut / vault location	5	320' to the nearest pole
Permitting / environmental sensitivity	4	No more than elsewhere
Fish habitat / wetlands concern	4	No more than elsewhere
Cultural / land ownership concern	4	Assumes Community or ADOT ownership
Constructability in summer season	4	Ground was wet at time of visit, Assume it would dry out
Emergency response / safety access	5	Services available at the clinic in Aniak
TOTAL SCORE	80	
AVERAGE SCORE	4	
3. RISK FLAGS		
Active erosion	☐	
Unstable bank	☐	
Ice scour zone	☐	
Wetlands present	☐	
Known fish habitat	☐	
Cultural resource concern	☐	
Land ownership unclear	☒	Assumes community ownership
Poor equipment access	☐	
Limited work pad	☐	
Bedrock likely	☐	
Large cobbles/boulders likely	☐	
High frac-out risk	☐	
Diffi cult mud containment	☐	
Seasonal water level concern	☒	Recommend late spring before boring
Requires helicopter support	☐	
Requires barge support	☒	Required
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		S to N
Estimated bore length		290
Estimated depth below riverbed		15' at toe of dike
Entry angle		40 (Needs to be steep to go under the dike)
Exit angle		25
Recommended casing (Yes/No)	NO	
Recommended conduit size/count		Single 6"SDR 11 HDPE
Vault/hut location feasible	Yes	
COMMENTS / MITIGATIONS		
Aerial Footage not available due to airport restrictions for the DRONE		
Engineered bore profile and Soundings recommended		

Figure C3. Aniak Site 3 Photos



Appendix D. Chuathbaluk Site1

Figure D1. Chuathbaluk Site 1 Overview

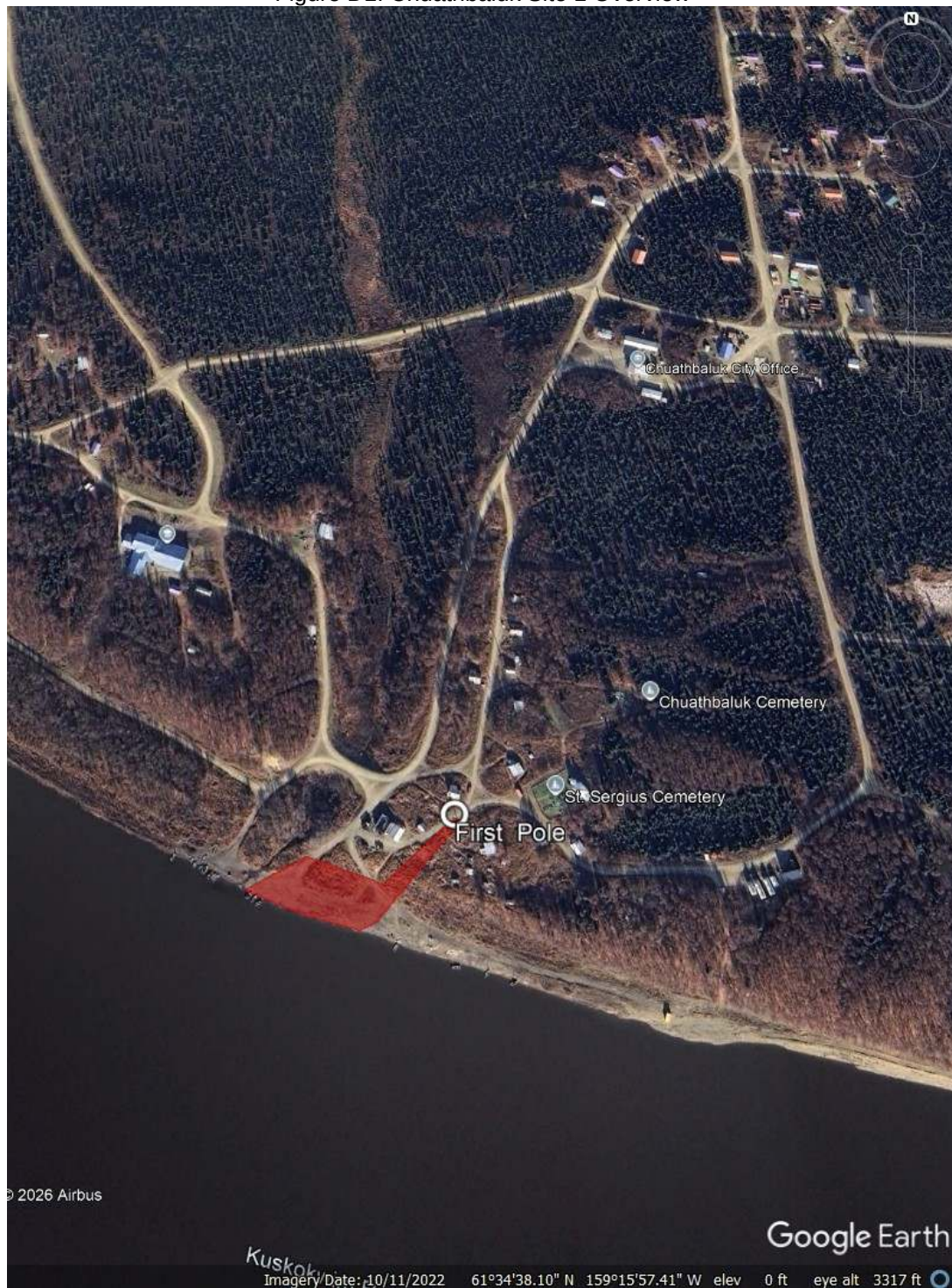


Figure D2. Chuathbaluk Site 1 Field Report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Chuathbaluk
River / Waterbody		Kuskokwim
Date		5/12/2026
Inspector / CM		David Tucker/Josh Hubbard
GPS Coordinates		61°34'15.56"N/159°14'50.62"W
Weather		Slight overcast
River Stage		High water/Breakup
Access Method		Flights and ATV
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	3	Work area is tight where the drill would have to set up well above the beach. Highwater was well above the bank that Google earth imagery shows adding distance to the bore as well
Slope from upland to river	2	Long slope from waters edge to above the high water mark.
Bank stability / erosion risk	4	Bank appears stable with old growth shrubs well below the flood plain
Evidence of seasonal flooding / ice scour	3	Landed Ice Present at time of visit
Soil type suitable for HDD	5	Sedimentary and gravel with some loamy soil
Cobbles / boulders / bedrock risk	4	Low risk
Feasible HDD entry pit location	3	Entry pit will have to be significantly up the bank
Feasible HDD exit location below riverbed	3	Unknown (Soundings Necessary)
Bore length reasonable	3	500'
Drill rig setup area available	3	Tight
Mud handling / containment area	3	Area tight
Spoils disposal area	4	Gravel Pit available
Access for equipment / materials	3	Equipment will need to be tracked up the hill
Barge or boat landing feasibility	3	high
Distance to fiber hut / vault location	2	Hut may have to be further up the hill than the first pole due to other buildings
Permitting / environmental sensitivity	4	No more than elsewhere
Fish habitat / wetlands concern	4	No more than elsewhere
Cultural / land ownership concern	3	Land ownership is not readily obvious
Constructability in summer season	5	Solid ground
Emergency response / safety access	4	Aniak is close, use local charter service
TOTAL SCORE	68	
AVERAGE SCORE	3.4	
3. RISK FLAGS		
Active erosion	☐	
Unstable bank	☐	
Ice scour zone	☐	
Wetlands present	☐	
Known fish habitat	☐	
Cultural resource concern	☐	
Land ownership unclear	☒	
Poor equipment access	☐	
Limited work pad	☒	
Bedrock likely	☐	
Large cobbles/boulders likely	☐	
High frac-out risk	☐	
Difficult mud containment	☐	
Seasonal water level concern	☒	Water level was high at the time of the site visit. Move Vault back to high ground
Requires helicopter support	☐	
Requires barge support	☒	All require Barge access
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		NE to SW
Estimated bore length		500'
Estimated depth below riverbed		10' below waters edge
Entry angle		20
Exit angle		33
Recommended casing (Yes/No)	NO	
Recommended conduit size/count		Single 6" SDR11 HDPE
Vault/hut location feasible	Yes	May need to be put somewhere else in the community then standard Fiber brought down to the BMH
COMMENTS / MITIGATIONS		
Engineered bore profile and soundings needed prior to Construction		
Aerial Drone Footage Available		
Note Gravel pit potential Site rejected due to Distance from the village and extremely steep banks with erosion issues		

Figure D3. Chuathbaluk Site 1 Photos



Figure D4. Chuathbaluk Site 1 Aerial



Appendix E. Crooked Creek Site 1

Figure E1. Crooked Creek Site 1 Overview



Figure E2. Crooked Creek Site 1 Field report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Crooked Creek Site 1
River / Waterbody		Kuskokwim River at Crooked Creek
Date		5/12/2026
Inspector / CM		David Tucker/Josh Hubbard
GPS Coordinates		61°51'40.96"N/158° 7'42.51"W
Weather		Overcast- High Ceiling
River Stage		High Water and Flood Warning
Access Method		Flights and ATV
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	5	Large wide area
Slope from upland to river	4	Minimal Slope
Bank stability / erosion risk	4	Bank appears stable with old growth shrubs growing along the bank even with the ice event.
Evidence of seasonal flooding / ice scour	3	Seasonal Flooding and Ice Debris encountered during visit
Soil type suitable for HDD	3	Ground conditions suggest Material consistent with River sediment and gravels. However, The greater area has a high likelihood of cobble and potentially rock.
Cobbles / boulders / bedrock risk	3	Quarry on crooked creek in screening to 3" minus so cobble is likely a factor. There is minimal reason to believe that the Bedrock comes all the way out to the site though there are definitely areas where bedrock is visible in the greater Crooked Creek area.
Feasible HDD entry pit location	5	Plenty of Space
Feasible HDD exit location below riverbed	4	Conditions unknown, Significant landed ice suggest river has a high volume and speed of flow. This may just be seasonal
Bore length reasonable	4	375
Drill rig setup area available	5	Good Ground with Easy access available
Mud handling / containment area	4	Reasonable area
Spoils disposal area	2	Assume the Village dump. ADOT sites too far away to be effective
Access for equipment / materials	5	Well maintained Barge Ramp
Barge or boat landing feasibility	5	Well maintained Barge Ramp
Distance to fiber hut / vault location	3	Hut and Vault should be located out of active loading and unloading zone at the ramp, increases distance from shoreline.
Permitting / environmental sensitivity	4	No more than anywhere else on the River
Fish habitat / wetlands concern	4	No more than anywhere else on the River
Cultural / land ownership concern	3	Land ownership may be the Power Utility.
Constructability in summer season	5	
Emergency response / safety access	4	Use local carrier on Call
TOTAL SCORE	79	
AVERAGE SCORE	3.95	
3. RISK FLAGS		
Active erosion	☐	
Unstable bank	☐	
Ice scour zone	☒	Potential Scoring, Significant landed ice at time of visit
Wetlands present	☐	
Known fish habitat	☐	
Cultural resource concern	☐	
Land ownership unclear	☒	Land ownership assumed as power plant
Poor equipment access	☐	
Limited work pad	☐	
Bedrock likely	☐	
Large cobbles/boulders likely	☒	Cobble likely due to proximity to the hills. Gravel pit has 3"-screening happening.
High frac-out risk	☐	
Difficult mud containment	☐	
Seasonal water level concern	☒	Spring high water dammed bridge at crooked creek year of the site visit
Requires helicopter support	☐	
Requires barge support	☒	All sites require barge support
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		WNW to ESE
Estimated bore length		375
Estimated depth below riverbed		15
Entry angle		25
Exit angle		25
Recommended casing (Yes/No)	NO	
Recommended conduit size/count		Single 6" SDR11 HDPE
Vault/hut location feasible	YES	
COMMENTS / MITIGATIONS		
Soundings and Engineered Bore Profile required prior to Construction		
Aerial Drone Footage Shot on site and available		

Figure E3. Crooked Creek Site 1 Photos



Figure E3. Crooked Creek Site 1 Aerial



Appendix F. Crooked Creek Site 2

Figure F1. Crooked Creek Site 2 Overview



Figure F2. Crooked Creek Site 2 Field Report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Crooked Creek Site 2
River / Waterbody		Kuskokwim River at Crooked Creek
Date		5/12/2026
Inspector / CM		David Tucker/Josh Hubbard
GPS Coordinates		61°52'8.10"N/158°6'44.47"W
Weather		Overcast- High Ceiling
River Stage		High Water and Flood Warning
Access Method		Flights and ATV
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	5	Large wide area
Slope from upland to river	4	Minimal Slope
Bank stability / erosion risk	4	Bank appears stable with old growth shrubs growing along the bank even with the ice event.
Evidence of seasonal flooding / ice scour	3	Seasonal Flooding and Ice Debris encountered during visit
Soil type suitable for HDD	3	Ground conditions suggest Material consistent with River sediment and gravels. However, The greater area has a high likelihood of cobble and potentially rock.
Cobbles / boulders / bedrock risk	3	Quarry on crooked creek in screening to 3" minus so cobble is likely a factor. There is minimal reason to believe that the Bedrock comes all the way out to the site though there are definitely areas where bedrock is visible in the greater Crooked Creek area.
Feasible HDD entry pit location	5	Plenty of Space
Feasible HDD exit location below riverbed	4	Conditions unknown, Significant landed ice suggest river has a high volume and speed of flow. This may just be seasonal
Bore length reasonable	5	355'
Drill rig setup area available	5	Good Ground with Easy access available
Mud handling / containment area	4	Reasonable area
Spoils disposal area	4	Potential to dump at Quarry north east
Access for equipment / materials	2	Small Boat ramp, Barge would need to land at Barge ramp down river and equipment tracked a significant distance to the crooked creek bridge to cross crooked creek then back down to the beach
Barge or boat landing feasibility	2	Small Boat ramp, Barge would need to land at Barge ramp down river and equipment tracked a significant distance to the crooked creek bridge to cross crooked creek then back down to the beach
Distance to fiber hut / vault location	4	Hut and Vault can be set near Diesel Storage facility near boat ramp
Permitting / environmental sensitivity	4	No more than anywhere else on the River
Fish habitat / wetlands concern	4	No more than anywhere else on the River
Cultural / land ownership concern	3	Land ownership should be the community
Constructability in summer season	5	
Emergency response / safety access	4	Use local carrier on Call
TOTAL SCORE	77	
AVERAGE SCORE	3.85	
3. RISK FLAGS		
Active erosion	☐	
Unstable bank	☐	
Ice scour zone	☒	Potential Scoring, Significant landed ice at time of visit
Wetlands present	☐	
Known fish habitat	☐	
Cultural resource concern	☐	
Land ownership unclear	☒	Land ownership assumed as power plant
Poor equipment access	☐	
Limited work pad	☐	
Bedrock likely	☐	
Large cobbles/boulders likely	☒	Cobble likely due to proximity to the hills. Gravel pit has 3"-screening happening.
High frac-out risk	☐	
Difficult mud containment	☐	
Seasonal water level concern	☒	Spring high water dammed bridge at crooked creek year of the site visit
Requires helicopter support	☐	
Requires barge support	☒	All sites require barge support
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		N to S
Estimated bore length		355'
Estimated depth below riverbed		15
Entry angle		25
Exit angle		25
Recommended casing (Yes/No)	NO	
Recommended conduit size/count		Single 6" SDR11 HDPE
Vault/hut location feasible	YES	
COMMENTS / MITIGATIONS		
Soundings and Engineered Bore Profile required prior to Construction		
Aerial Drone Footage Shot on site and available		

Figure F3. Crooked Creek Site 2 Aerial



Appendix G. Red Devil Site 1

Figure G1. Red Devil Site 1 Overview

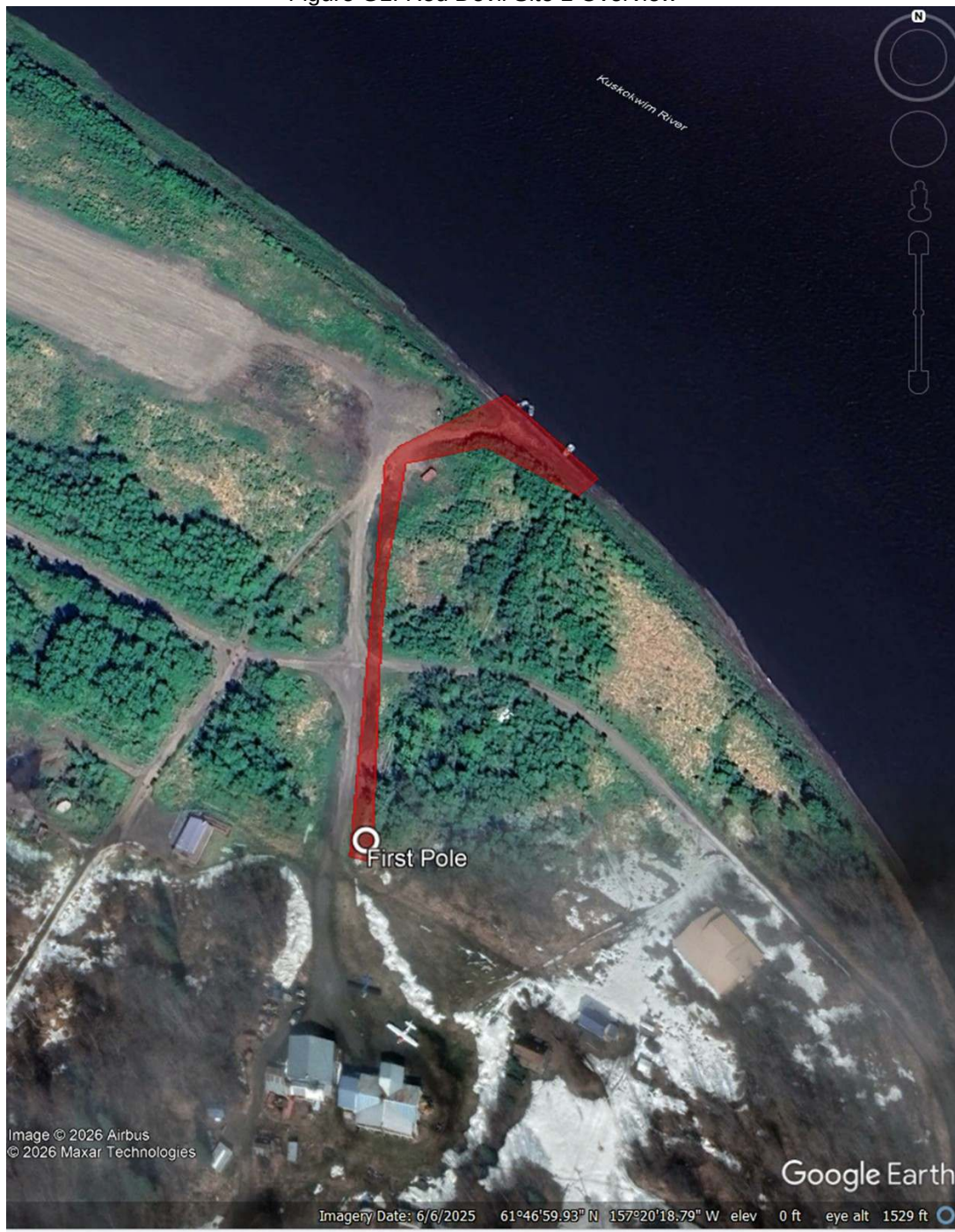


Figure G2. Red Devil Site 1 Field Report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Red Devil
River / Waterbody		Kuskokwim River
Date		5/12/2026
Inspector / CM		David Tucker/ Josh Hubbard
GPS Coordinates		61°47'2.42"N/157°20'7.71"W
Weather		Overcast ceiling of about 2000'
River Stage		High/ Spring breakup
Access Method		Charter Flight and Walking
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	5	Large open area for site
Slope from upland to river	4	Minimal Slope
Bank stability / erosion risk	4	Ice present at time of visit
Evidence of seasonal flooding / ice scour	4	High water and ice at time fo visit
Soil type suitable for HDD	4	Consolidated gravel both on bank and shore line
Cobbles / boulders / bedrock risk	5	None observed either on site or flyover
Feasible HDD entry pit location	5	Plenty of space
Feasible HDD exit location below riverbed	5	Reasonable wide part of the river, Flow rate high at time of visit
Bore length reasonable	4	410'
Drill rig setup area available	5	Large open area for site
Mud handling / containment area	4	Proximity to river and slope to beach/ recommendd BMPs
Spoils disposal area	4	ADOT runway
Access for equipment / materials	5	Space available and active loading and offloading barge ramp
Barge or boat landing feasibility	5	Space available and active loading and offloading barge ramp
Distance to fiber hut / vault location	3	Due to active runway constraints recommend vault at beach with hut near first pole
Permitting / environmental sensitivity	4	No more than any other site
Fish habitat / wetlands concern	4	No more than any other site
Cultural / land ownership concern	3	Land ownership needs to be verified prior to construction/Assume ADOT Ownership
Constructability in summer season	5	Good Dry Ground and clear visibility to water
Emergency response / safety access	4	Recommend local carrier on call
TOTAL SCORE	86	
AVERAGE SCORE	4.3	
3. RISK FLAGS		
Active erosion	☐	
Unstable bank	☐	
Ice scour zone	☐	
Wetlands present	☐	
Known fish habitat	☐	
Cultural resource concern	☒	Needs SHPO
Land ownership unclear	☒	Assume ADOT
Poor equipment access	☐	
Limited work pad	☐	
Bedrock likely	☐	
Large cobbles/boulders likely	☐	
High frac-out risk	☐	
Diffi cult mud containment	☐	
Seasonal water level concern	☐	
Requires helicopter support	☐	
Requires barge support	☒	All sites require barge support
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		W to E
Estimated bore length		410'd
Estimated depth below riverbed		10'
Entry angle		20
Exit angle		20
Recommended casing (Yes/No)	NO	
Recommended conduit size/count		6" SDR11 HDPE
Vault/hut location feasible	YES	
COMMENTS / MITIGATIONS		
Soundings and Engineered Bore Profile needed prior to Construction		
Aerial Drone footage shot on site and Available		

Figure G3. Red Devil Site 1 Photos



Figure G4. Red Devil Site 1 Aerial



Appendix H. Sleetmute Site 1

Figure H1. Sleetmute Site 1 Overview



Figure H2. Sleetmute Site 1 Field Report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Sleetmute Site 1
River / Waterbody		Kuskokwim River
Date		5/12/2026
Inspector / CM		David Tucker/Josh Hubbard
GPS Coordinates		61°42'24.27"N/157°10'11.87"W
Weather		Overcast/Low ceiling
River Stage		High post break up
Access Method		Flights and walking
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	5	Plenty of Space, DOT Quarry
Slope from upland to river	4	Low gradient
Bank stability / erosion risk	4	Bank appears stable with old growth vegetation going down to the high water mark.
Evidence of seasonal flooding / ice scour	3	Potential
Soil type suitable for HDD	5	Sand and Gravel and river silt consistent with the glacial plain
Cobbles / boulders / bedrock risk	4	None observed
Feasible HDD entry pit location	4	
Feasible HDD exit location below riverbed	4	
Bore length reasonable	4	340'
Drill rig setup area available	5	Large flat area plenty of space
Mud handling / containment area	5	"
Spoils disposal area	4	Need Permission from ADOT for Disposal
Access for equipment / materials	5	Quarry area Barge can land on site
Barge or boat landing feasibility	5	Quarry area Barge can land on site
Distance to fiber hut / vault location	2	500' plus to first pole. Hut site could be closer but recommend placement of the hut outside active quarry area
Permitting / environmental sensitivity	3	Ownership of Quarry is unknown at time of visit
Fish habitat / wetlands concern	5	No more than any other site
Cultural / land ownership concern	3	Ownership of Quarry is unknown at time of visit
Constructability in summer season	5	Ground appears firm and stable
Emergency response / safety access	4	Use local carrier on Call
TOTAL SCORE	83	
AVERAGE SCORE	4.15	
3. RISK FLAGS		
Active erosion	☐	
Unstable bank	☐	
Ice scour zone	☐	
Wetlands present	☐	
Known fish habitat	☐	
Cultural resource concern	☐	
Land ownership unclear	☒	
Poor equipment access	☐	
Limited work pad	☐	
Bedrock likely	☐	
Large cobbles/boulders likely	☐	
High frac-out risk	☐	
Difficult mud containment	☐	
Seasonal water level concern	☒	Recommend mid to late summer due to high flow water
Requires helicopter support	☐	
Requires barge support	☒	All sites require barge support
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		NE to SW
Estimated bore length		340'
Estimated depth below riverbed		15' at the high water mark
Entry angle		25
Exit angle		25
Recommended casing (Yes/No)	NO	
Recommended conduit size/count		single 6" SDR11 HDPE Conduit (Recommend welded sticks not roll pipe)
Vault/hut location feasible	YES	Consideration should be taken to place hut on edge of active work area to avoid future conflict with the quarry and community use
COMMENTS / MITIGATIONS		
Additional soundings and engineered bore path required		
Aerial Drone Footageshot on site and Available		

Figure H3. Sleetmute Site 1 Photos



Figure H4. Sleetmute Site 1 Aerial



Appendix I. Sleetmute Site 2

Figure I1. Sleetmute Site 2 Overview



Figure 12. Sleetmute Site 2 Field Report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Sleetmute Site 2
River / Waterbody		Kuskokwim River
Date		5/13/2026
Inspector / CM		David Tucker/Josh Hubbard
GPS Coordinates		61°42'6.17"N/157°10'24.48"W
Weather		Overcast/Low ceiling
River Stage		High post break up
Access Method		Flights and walking
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	5	Plenty of space, existing power and fuel storage facility
Slope from upland to river	4	Low gradient
Bank stability / erosion risk	4	Bank appears stable with significant structures near the bank
Evidence of seasonal flooding / ice scour	3	Potential
Soil type suitable for HDD	5	Muddy and loamy consistent with Clay,Gravel and river sediment
Cobbles / boulders / bedrock risk	4	None observed
Feasible HDD entry pit location	5	Location has large area
Feasible HDD exit location below riverbed	5	
Bore length reasonable	4	428'
Drill rig setup area available	5	Large flat area plenty of space
Mud handling / containment area	5	"
Spoils disposal area	4	Need Permission from ADOT or community for Disposal
Access for equipment / materials	5	Barge landing ramp at this location
Barge or boat landing feasibility	5	Barge landing ramp at this location
Distance to fiber hut / vault location	5	Vault/hut location can be place with existing community infrastructure and is 180' from the nearest pole
Permitting / environmental sensitivity	4	Low probability as it is an active barge ramp
Fish habitat / wetlands concern	5	No more than any other site
Cultural / land ownership concern	4	Ownership of fuel dock and ramp assumed Community
Constructability in summer season	5	Ground appears firm and stable
Emergency response / safety access	4	Use local carrier on Call
TOTAL SCORE	90	
AVERAGE SCORE	4.5	
3. RISK FLAGS		
Active erosion	☐	
Unstable bank	☐	
Ice scour zone	☐	
Wetlands present	☐	
Known fish habitat	☐	
Cultural resource concern	☐	
Land ownership unclear	☐ X	
Poor equipment access	☐	
Limited work pad	☐	
Bedrock likely	☐	
Large cobbles/boulders likely	☐	
High frac-out risk	☐	
Difficult mud containment	☐	
Seasonal water level concern	☐ X	Recommend mid to late summer due to high flow water
Requires helicopter support	☐	
Requires barge support	☐ X	All sites require barge support
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		NE to SW
Estimated bore length		430'
Estimated depth below riverbed		15' at the high water mark
Entry angle		25
Exit angle		25
Recommended casing (Yes/No)	NO	
Recommended conduit size/count		single 6" SDR11 HDPE Conduit (Recommend welded sticks not roll pipe)
Vault/hut location feasible	YES	Consideration should be taken to place hut on edge of active work area to avoid future conflict general store and community use
COMMENTS / MITIGATIONS		
Aerial Drone Footage shot on site and available		
Additional soundings and engineered bore path required		

Figure I3. Sleetmute Site 2 Photos



Figure I4. Sleetmute Site 2 Aerial



Appendix J. Stony River Site 1

Figure J1. Stony River Site 1 Overview



Figure J2. Stony River Site 1 Field Report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Stony River Site 1
River / Waterbody		Kuskokwim
Date		5/12/2026
Inspector / CM		David Tucker/Josh Hubbard
GPS Coordinates		61°42'6.22"N/157°10'25.09"W
Weather		Overcast
River Stage		High water/ Post break up-Water borne ice in the flow, Broken ice on the bank
Access Method		Yute Air and Walking
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	5	Area is immediately adjacent Barge landing with plenty of room
Slope from upland to river	5	Minimal/ Bank approximatly 5' fom high water mark/ 45deg slope
Bank stability / erosion risk	3	Bank has active erosion and sedimentation but appears stable
Evidence of seasonal flooding / ice scour	3	Seasonal flooding may occur but proximity to the runway makes this location relatively safe as DOT actively maintains the bank here
Soil type suitable for HDD	4	Material consistent with glacial till/ gravel and sand, Recommend mud products/ Polymers consistent with Running Gravels
Cobbles / boulders / bedrock risk	5	Minimal Risk
Feasible HDD entry pit location	5	BMH placement would be in DOT ROW for Runway, Consideration should be taken to aquire proper permits. May be additional FAA requirements etc
Feasible HDD exit location below riverbed	4	Unknown but reasonable
Bore length reasonable	5	394 feet from 70 feet from high water mark to apparent Channel
Drill rig setup area available	3	Plenty of space, coordination with active runway may be diffi cult or require additional effort to make safe
Mud handling / containment area	5	Containment should follow best practice
Spoils disposal area	3	Disposal may require additional permitting or DOT Permissions
Access for equipment / materials	5	Materials, Equipment can be unloaded directly on site
Barge or boat landing feasibility	5	At existin Landing
Distance to Existing Comm Infrastructure	3	500' feet from the first Pole
Permitting / environmental sensitivity	4	Active Runway may dictate additional consideration
Fish habitat / wetlands concern	5	No more than anywhere else on the river
Cultural / land ownership concern	4	Should Be ADOT ROW
Constructability in summer season	5	Ground I dry with good access and solid base
Emergency response / safety access	4	Very remote work location, recommend having a local air carrier on call
TOTAL SCORE	85	
AVERAGE SCORE	4.25	
3. RISK FLAGS		
Active erosion	☐	
Unstable bank	☐	
Ice scour zone	☐	
Wetlands present	☐	
Known fish habitat	☐	
Cultural resource concern	☐	
Land ownership unclear	☐	
Poor equipment access	☐	
Limited work pad	☐	
Bedrock likely	☐	
Large cobbles/boulders likely	☐	
High frac-out risk	☒	Gravel and sand have a higher risk of frac-out, mud plan should consider these issues
Diffi cult mud containment	☐	
Seasonal water level concern	☒	Site was visited at high water- Spring Flooding is always a potential
Requires helicopter support	☐	
Requires barge support	☒	All sites will require barge access
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		NE to SW
Estimated bore length		394'
Estimated depth below riverbed		15' depth at toe of bank/High water mark
Entry angle		25
Exit angle		25
Recommended casing (Yes/No)	NO	
Recommended conduit size/count	Yes	6" SDR11 HDPE Conduit
Vault/hut location feasible	Yes	Recommend at nearest pole line.
COMMENTS / MITIGATIONS		
Additional soundings and engineered bore path required		
Aerial Drone footage shot on site and available		

Figure J3. Stony River Site 1 Photos



Figure J4. Stony River Site 1 Aerial



Appendix K. Stony River Site 2

Figure K1. Stony River Site 2 Overview



Figure K2. Stony River Site 2 Field Report

HDD BEACH APPROACH SITE GRADING FORM		
1. SITE INFORMATION		
Project		RD-RU-COOP-25-09
Community / Landing Site		Stony River Site 2
River / Waterbody		North Fork Kuskokwim/ Stony River
Date		5/12/2026
Inspector / CM		David Tucker/ Josh Hubbard
GPS Coordinates		61°47'25.36"N/156°35'1.10"W
Weather		Overcast
River Stage		High water/High Flow
Access Method		Yute Air and Walkin
2. SCORING CRITERIA		
Category	Score (1-5)	Notes
Beach width / available work area	2	Small area, private property may be an issue
Slope from upland to river	3	Bank steep, would make locating difficult
Bank stability / erosion risk	2	Bank actively eroding
Evidence of seasonal flooding / ice scour	2	landed ice from breakup present at time of site visit
Soil type suitable for HDD	5	Glacial till, Gravel, sand with loamy soil present, recommend mud products consistent with running gravel and clay.
Cobbles / boulders / bedrock risk	4	No boulders visible, low likelihood of bedrock
Feasible HDD entry pit location	3	Minimal space for setup, Entry pit would be small
Feasible HDD exit location below riverbed	4	Thwaleg appears close to the bank
Bore length reasonable	5	200'
Drill rig setup area available	2	Minimal space. Doable but tight
Mud handling / containment area	2	Minimal space. Doable but tight
Spoils disposal area	3	Disposal may require additional permitting or DOT Permissions
Access for equipment / materials	3	Materials and equipment would have to be moved across town from the barge landing site
Barge or boat landing feasibility	2	Barge may have trouble navigating the north Fork to position
Distance to fiber hut / vault location	5	Hut site recommended at first pole location
Permitting / environmental sensitivity	4	Land ownership may be an issue
Fish habitat / wetlands concern	5	No more than elsewhere
Cultural / land ownership concern	3	Ownership of land unknown at site, appears to be public use
Constructability in summer season	5	Ground dry and stable
Emergency response / safety access	4	Recommend keeping local carrier flights on call
TOTAL SCORE	68	
AVERAGE SCORE	3.4	
3. RISK FLAGS		
Active erosion	☒ x	Bank actively undercut
Unstable bank	☒ x	Bank actively undercut
Ice scour zone	☐	Unknown
Wetlands present	☐	
Known fish habitat	☐	
Cultural resource concern	☐	
Land ownership unclear	☒ x	Unknown boundary
Poor equipment access	☐	
Limited work pad	☒ x	Small work area
Bedrock likely	☐	
Large cobbles/boulders likely	☐	
High frac-out risk	☒ x	Gravel and sand have a higher risk of frac-out, mud plan should consider these issues
Difficult mud containment	☐	
Seasonal water level concern	☒ x	Site was visited at high water- Spring Flooding is always a potential
Requires helicopter support	☐	
Requires barge support	☒ x	Require access
4. CM / ENGINEER RECOMMENDATION		
Preferred alignment		SW- to NE
Estimated bore length		194'
Estimated depth below riverbed		10'
Entry angle		33
Exit angle		33
Recommended casing (Yes/No)	NO	
Recommended conduit size/count		6" SDR11 HDPE Conduit
Vault/hut location feasible	Maybe	BMH and Hut have limited space
COMMENTS / MITIGATIONS		
Additional soundings and engineered bore path required		
Aerial Drone Footage shot on site and Available		

Figure K3. Stony River Site 2 Photos



Figure K4. Stony River Site 2 Aerial

