HAGGITT CONSULTING

2025 Pre-Discharge Survey Report

Lutak Inlet LTF

WATER WAY: Lutak Inlet LAS 35438 POA-2024-00622

APRIL 27, 2025, FIELD SURVEY DATE

Lutak Inlet

Submitted to:

NSEA Timber Incorporated
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Chehalis, WA. 98532-8829

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Submitted On:
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Abstract

An underwater reconnaissance was conducted on April 27, 2025, at Lutak Inlet, in Haines, Alaska. The purpose of the investigation was to conduct a pre-discharge survey of a proposed Log Transfer Facility (LTF) and Log Storage Area (LSA) with an adjacent Ship Mooring Area (SMA); (LAS 35438, POA-2024-00622).

The objective was to assess the existing conditions and provide a baseline for future monitoring work. The site surveyed is located in Lutak Inlet, Alaska. This inspection was done to satisfy the bark-monitoring program and siting guidelines required by the APDES permit. The intent of the document is to satisfy the requirement for a Predischarge survey dive report to be included with the submission of the Notice of Intent to discharge under the permit authorization contained in AKG70-1000.

NSEA Timber Incorporated provided a map indicating a preferred location. The site was assessed for suitability using siting guidelines designed to minimize impacts to the marine environment. The survey used 5 radial transects at 30-degree intervals for the LTF survey and 5 parallel transects spaced 75 feet apart for the Log Storage Area. The ship moorage area exceeds the maximum depth of 60 feet MLLW required for a Predischarge survey. The sampling frequency was continuous at the LTF and LSA. A geo/time referenced video was recorded to determine suitability for each transect for future log storage activities. The survey methods remained in compliance with the standard methods that can be found in **"Required Method for Bark Monitoring Surveys under the LTF General Permits".**

The survey conducted on April 27, 2025, documented that the site is suitable for log transfer, log storage and ship moorage activities, within the boundaries proposed in the application, and as is defined in the required discharge authorization. The survey of the site noted natural habitat, however observations of sensitive or critical habitat issues were not documented. The proposed facility location does not impede navigation and has sufficient depth to prevent the grounding of bundles of logs at low tides. The location offers storm-force conditions protection, as it does for the state ferry dock, located just south of the proposed project area. Seawater currents in the inlet are well above minimum exchange rates and offer a higher natural remediation rate for mitigating the bark debris accumulation than is typically encountered in S.E. Alaska LTF installations.

The proposed discharge meets the requirements of Part III of the permit, and a waiver from Part III.B requirements is not necessary for authorization under this permit

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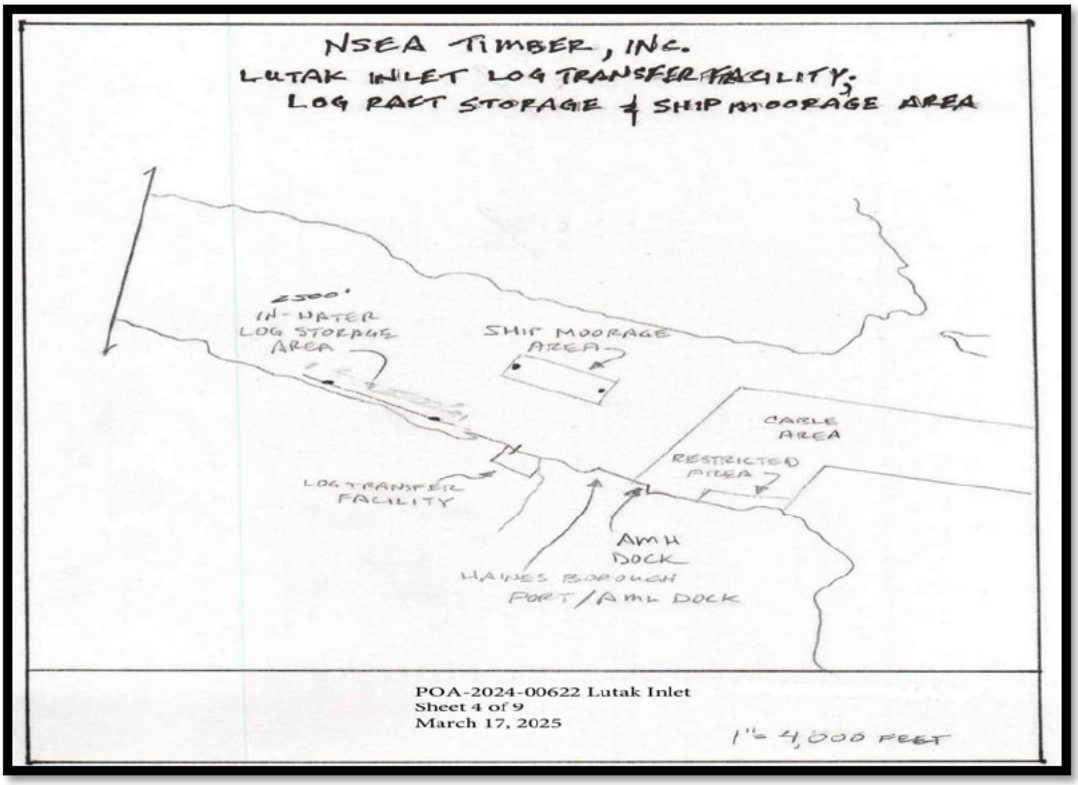
Introduction

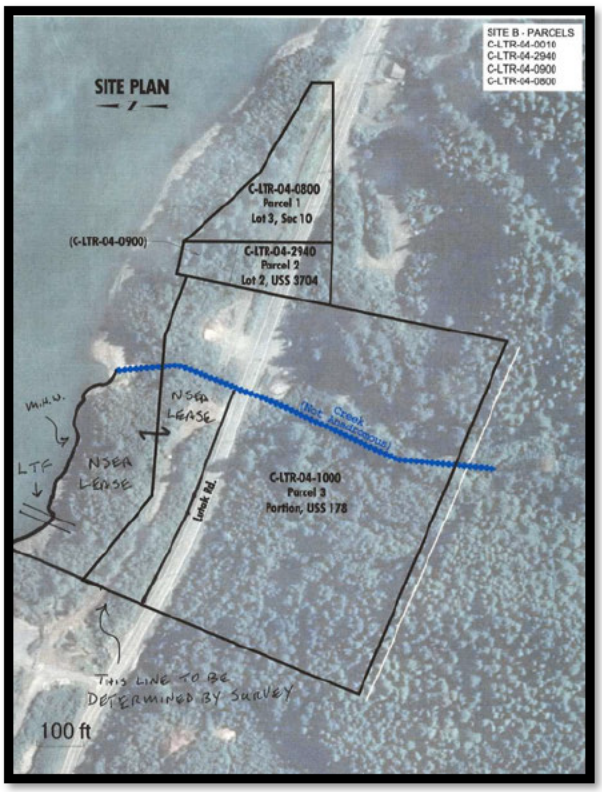
The Lutak Inlet project site was not operational at the time of the survey. The survey was conducted in one field mission. The weather conditions and underwater visibility were optimal during this assessment survey. The Lutak Inlet LSA was surveyed using a parallel pattern spaced at 75-foot intervals to determine the nature of the substrate and its suitability for use as a log storage area. The natural existing conditions were carefully noted for comparison with future bark monitoring surveys if the site(s) receive agency approval for use. The LTF was surveyed using a radial pattern of five transects spaced at 30-degree intervals.

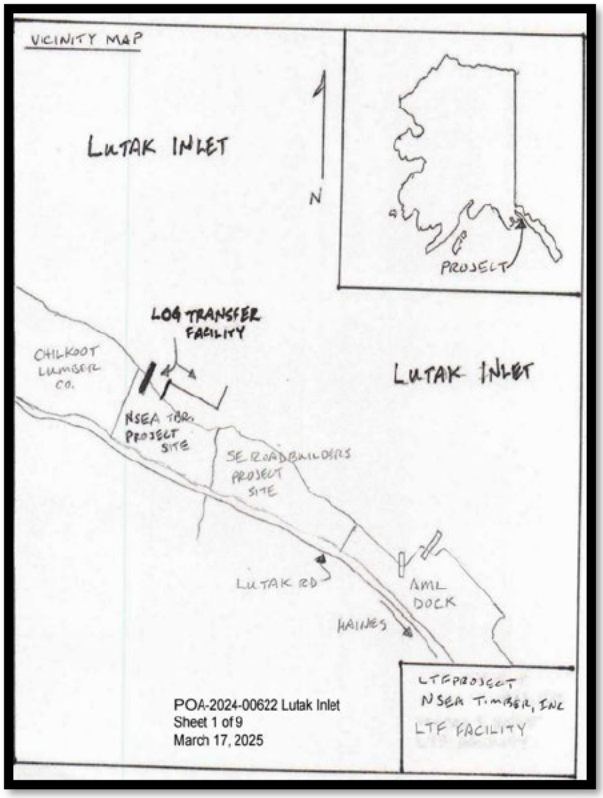
Lutak Inlet is aligned in a north direction. The primary storm forces in the region emanate from a southeast direction and as a result, Lutak Inlet affords some protection from storm forces for the storage of log bundles.

An ROV with underwater GPS and video camera along with GIS mapping software recorded the substrate at each location. The underwater areas were mapped and carefully reviewed for any conflicts with current siting guidelines.

A summary of the approach and techniques used in the Pre-Discharge survey are provided below in the Methods Section. The result of the survey is then presented together with recommendations as to the suitability of the area and viability for the intended use of the site for log transfer and storage activities.







Project Description

NSEA Timber Inc. is going to operate a State of Alaska timber sale in the Haines region of southeast Alaska. NSEA Timber plans to begin logging this timber sale in the Spring of 2025. The company plans to complete this sale by year end 2028.

Because there are no in-state purchasers for logs in the northern part of southeast Alaska, the logs produced from this sale will be sold into the export log market. Logs sold for export are transported on log ships or self-loading log barges.

Export logs purchased in Alaska are traditionally loaded out of the water, by placing rafts of bundled logs shipside then using a ship's on-board cranes to hoist the bundles and load the vessel. Log bundles are transferred from the shoreside into the water at a log transfer facility (LTF). The entry of log bundles into the water at an LTF is usually accomplished by means of a low angle slide.

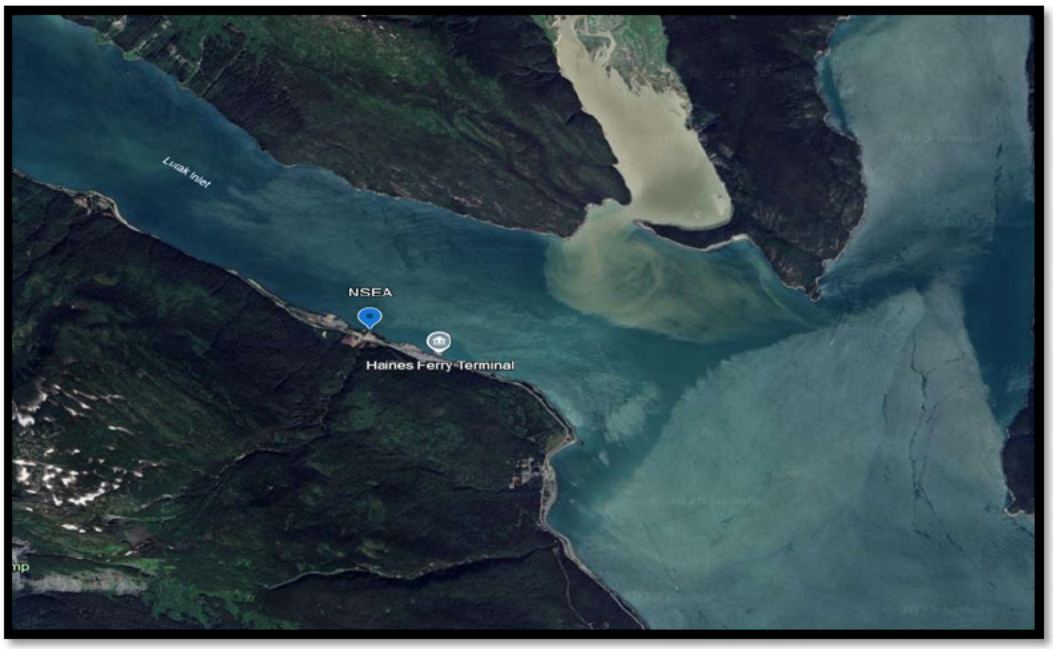
Once a log bundle is in the water, it is pushed into a log boom which consists of a closed string of boom sticks that contain the bundles. Boom sticks are precision manufactured from Sitka spruce logs and are usually 70 feet long. Boom sticks are bored on each end so they may be linked together with a short length of chain with a toggle on each end. A small boat is used to push the floating bundles into a circle of boom sticks which, when filled with bundles, becomes a log raft.

Completed log rafts are towed to a storage area. A log storage area consists of a line of boom sticks that are anchored to heavy "deadman"; called a standing boom. A standing boom is usually set up along a shoreline far enough out to float regardless of the tide state. Log rafts are tied of to the standing boom. When a log vessel arrives for loading, rafts are towed to the vessel and loaded using the ship's onboard cranes.

For this project, NSEA Timber has selected the location for its LTF land at a 12-acre site located at approximately mile 4.5 of the Lutak Road. This property is owned by the Haines based company, Southeast Road Builders. The location is an aggregation of three adjacent parcels. This site adjoins the property of the former Chilkoot Lumber Company on the north side and Haines Borough land, leased to Alaska Marine Lines, on the south side.

The actual log transfer site will be constructed at the northeast corner of the property at the shoreline of Lutak Inlet. Southeast Road Builders and NSEA will clear the vegetative cover on this parcel and grade the parcel to increase its useful area for log truck movement and log handling operations. The useful area of the parcel will be expanded with additional fill and re-grading where necessary. A one-bite wheel loader will be used to unload banded log bundles off delivering log trucks and place these bundles on the LTF slide where they will enter the water. Once in the water, a log boom boat will place each log bundle into a log raft and tow the raft to storage where it will be tied off along the standing boom. A standing boom consists of a line of boom sticks that are anchored to the bottom.

The standing boom will be installed along the shoreline starting just north of the northeast corner of the Chilkoot Lumber Company property. These boom sticks will be set in a straight line and will be anchored using in water deadmen.



Methods

Standard methods were used in this Pre-Discharge survey. The methods used can be found in the publication "Required Method for Bark Monitoring Surveys under the LTF General Permits".

Transects

The fixed hub reference point for the transects emanating from the shore were initially located by assessing maps and diagrams provided by NSEA Timber Incorporated. The hub locations were then "fixed" by DGPS coordinates. The center of the proposed LTF ramp was marked with a DGPS coordinate.

The reference hub is located as close as possible to the center of the discharge site to facilitate future reconnaissance. Transects are established, emanating from the reference hub at 30-degree intervals for radial transects and 75-foot intervals for parallel transects. Two separate magnetic compasses are compared to determine the bearings. Transect end points are recorded on DGPS to provide actual headings traveled. The transects were terminated by the requisite of beyond the area designated for the use.

Sample Points

Samples were taken continuously along each transect. The interval distance for representative sample images contained in this report used DGPS coordinates at equal intervals. At each sample point observations were noted on the abundance and type of marine organisms present, the native vegetation, and composition of the substrate. Data including the depth, current direction, and estimated current velocity also were incorporated into the field notes. Each of the sample points also included relevant observations on operational debris and existing bark debris. Video screen capture documentation was used at representative sample locations to record algal life, animal life, substrate, and debris present. Sample location depth notations are based on readings from an ROV.

Area of Bark Cover

For each survey, the percentage of bark coverage was determined by using the protocol for operating a bark-monitoring program given in the ADEC General Permit. The area calculation used in this report is outlined in the ADEC publication "Required Method for Bark Monitoring Surveys under the LTF General Permits". Area calculations were accomplished by drafting scaled transect diagrams from the sample point tables in TurboCAD Professional V17. The TurboCAD program then accomplished the area calculations. ADEC has approved the use of AutoCAD programs for area calculations.

The images in this report are representative of the sample surveyed. They are designed to illustrate the nature and character of the debris at that sample point (see permit). They are not to be used to adjust the surveyors' determination of the percentage of cover. The methods require the investigator to assess a one square meter quadrate (3ft x3ft area). The images typically are only a quarter of that

area. Because of the 30% magnification factor of seawater, the camera would need to be at approximately 6 feet from the subject area to image a full quadrate. At this distance, most images would not be clear enough to assess the nature, character or percent of cover. In addition, the format for digital images (still or video) is a rectangle, not a square. Both the images in this report and direct diver observation of the sample point require the assessment be made within 3 feet of the substrate.

The percentage of cover is determined in the field from either direct observation of the quadrate or live video observation of a nine square foot area. The results are then recorded in the data table for area calculations.

Guidance

Pre-discharge Survey.

a. **Applicability. A pre-discharge underwater survey is required for all new facility applicants (persons submitting an NOI) except offshore and Type IV shore-based s that did not have coverage under the 2000 issuance of NPDES Permit No. AK-G70-1000.**

b. **Purpose. The purpose of the pre-discharge underwater survey is to document the biological resources which may be affected by the discharge, and any existing bark and wood debris deposits.**

c. **Objectives. The pre-discharge survey shall provide adequate site-specific information to indicate whether the discharge meets the requirements of Part III of this permit, and whether a waiver from Part III.B requirements is necessary for authorization under this permit, and to document the area and depth of any existing bark and wood debris deposits. NPDES General Permit No. AK-G70-1000, Page 12, of 48, Post-1985 Log Storage Facilities**

d. **Submittal. The results of the pre-discharge underwater survey must be submitted with the NOI.**

e. **Methods. The pre-discharge survey must include a representative description of the numbers and species of marine organisms, and depths and substrate types where the organisms are found within a 300' radius of the center of the discharge site to a water depth of -60 feet MLLW. If bark is present, the pre-discharge survey must also measure and report the aerial extent and thickness of bark deposits as required in Part VI.C. The survey data for biological resources must be submitted in writing, or in the form of a narrated underwater video.**

f. **Contents of Report. The report must provide sampling data, a summary of the survey, and an evaluation of whether the discharge site meets each of the requirements of Part III.**

Lutak Inlet Pre-Discharge Video Survey

Surveyed on April 27, 2025

The survey was conducted at the request of NSEA Timber Incorporated. An underwater reconnaissance was requested to determine the representative condition of the proposed location. The survey was conducted on April 27,2025. The site surveyed is located in Lutak Inlet, Haines, Alaska.

This inspection documented findings according to the Alaska Department of Environmental Conservation (ADEC), Environmental Protection Agency (EPA) and APDES/NPDES requirements. The percentage of bark coverage was determined by using the protocol for operating a bark-monitoring program given in the ADEC General Permit. The area calculation used in this report is outlined in the ADEC publication **"Required Method for Bark Monitoring Surveys under the General Permits".**

Findings

Continuous Cover	Discontinuous Cover	Recommended Action
0.0 Acres	**0.0 Acres**	**Submit for Approval**

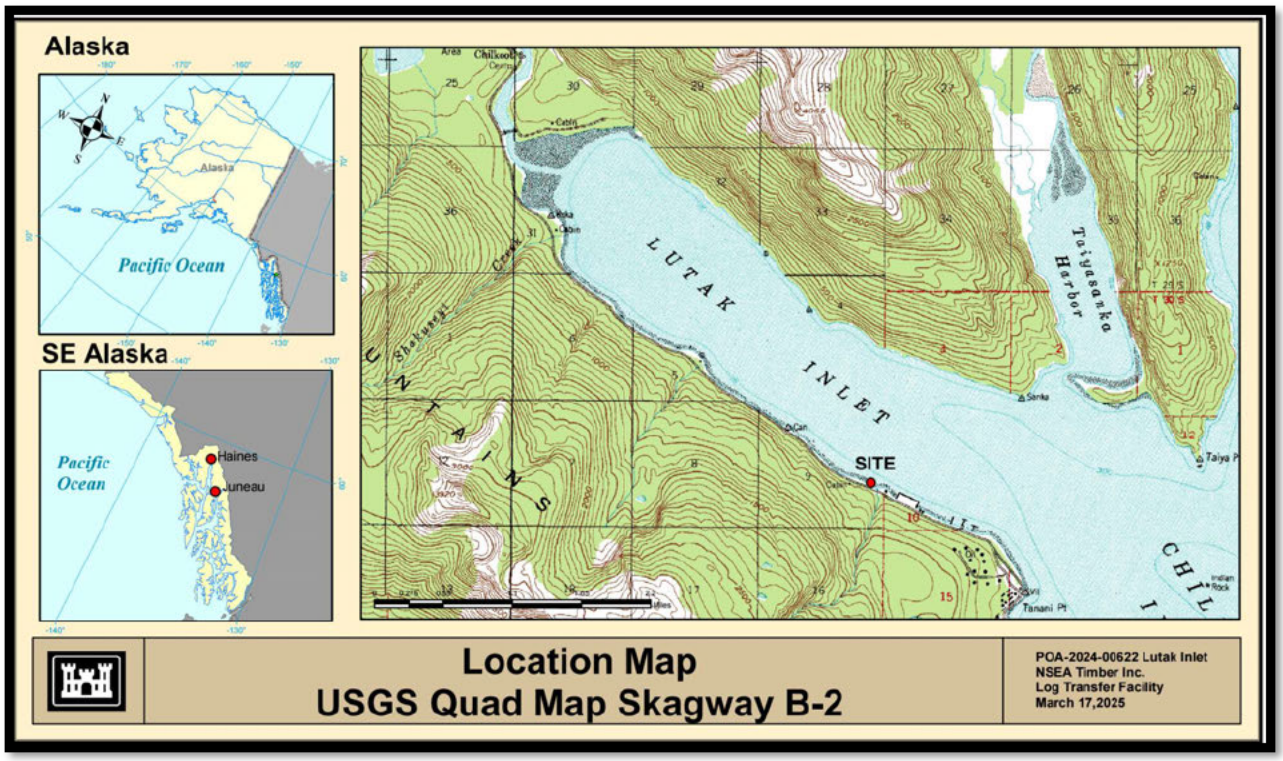
Conditions

The survey encountered the following conditions during the work. Weather conditions during the survey consisted of clear skies with winds less than 10 knots. Surveying commenced at 7:22 a.m. on April 27, 2025, during a minus 3.79-foot tide.

The tidal station (subordinate station 9452435 Haines Inlet) was used to correct depths to MLLW. The station reported a tide level of 17.64 ft at 1:37 p.m. The current conditions remained negligible. Seawater temperature was recorded at 48 degrees F. The horizontal visibility was estimated to be 15 feet.

Site conditions remained steady with winds less than 15 knots and clear skies. The survey concluded at 7:30 p.m. on April 27, 2025, at a 0.0 MLLW tide level. The tidal station (reference station 9452210) was used for depth corrections, reporting a 0.09 ft tide level at 7:30 p.m. The maximum tidal current velocity was estimated at 2.0 knots.

Haines Fery Terminal is located south of the project area.



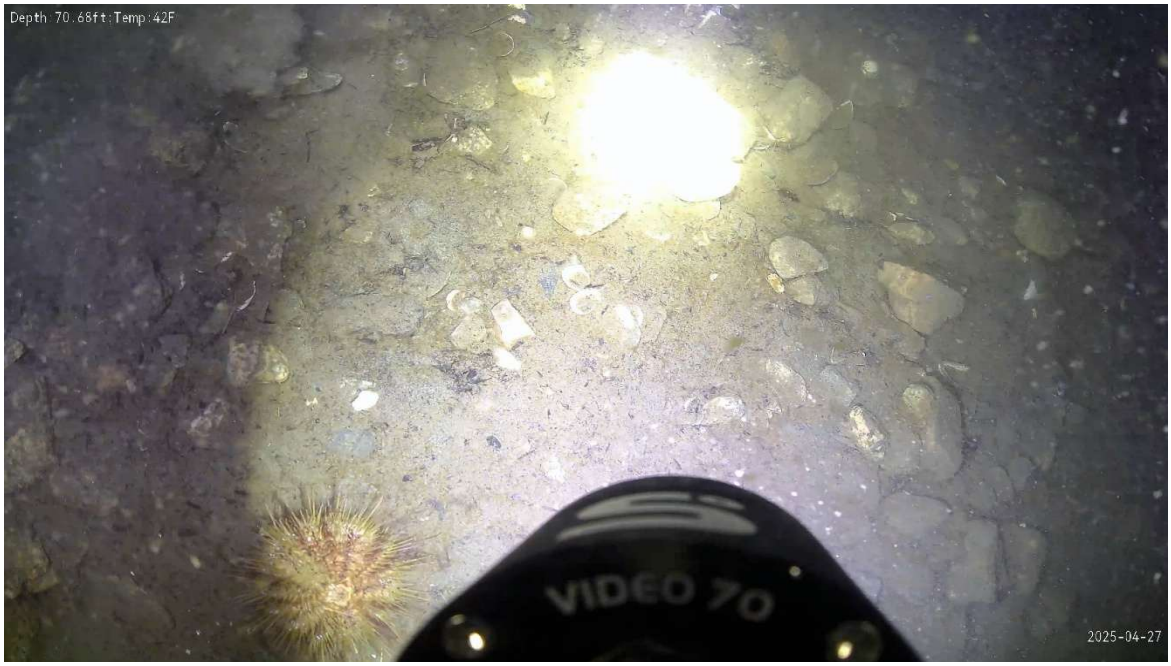
Observations

The project site is located within Section 9, T. 30 S., R. 59 E., Copper River Meridian; USGS Quad Map Skagway B-2;
Latitude 59.284842° N., Longitude 135.475832° W.; mile 4.5 Lutak Road, in Haines,
Alaska.

Lutak Inlet is aligned in a northwest direction. The primary storm forces in the region emanate from a south direction and as a result, Lutak Inlet affords protection from storm forces for the storage and rafting of log bundles. The state ferry is located just south of the proposed site for the same conditions.

The Pre-Discharge survey of the LTF site consisted of 5 transects spaced at 30-degree intervals. This pattern will best delineate the debris field in future bark monitoring work under present site conditions.

Transect T1 began at the ramp at a MLLW depth of 8.0 feet and terminated at a depth of 60.0 feet at the end. A solid rock substrate was observed with gravel and sands near the beginning and end of the transect. The bathymetry was that of a steep slope, no Eel Grass or other critical habitat observations were noted.



Transect T2 began at the ramp at a MLLW depth of 6.0 feet and terminated at a depth of 61.0 feet at the end. This transect was comprised of boulders, sand and gravel. No critical habitat or grounding issues were observed on T2.

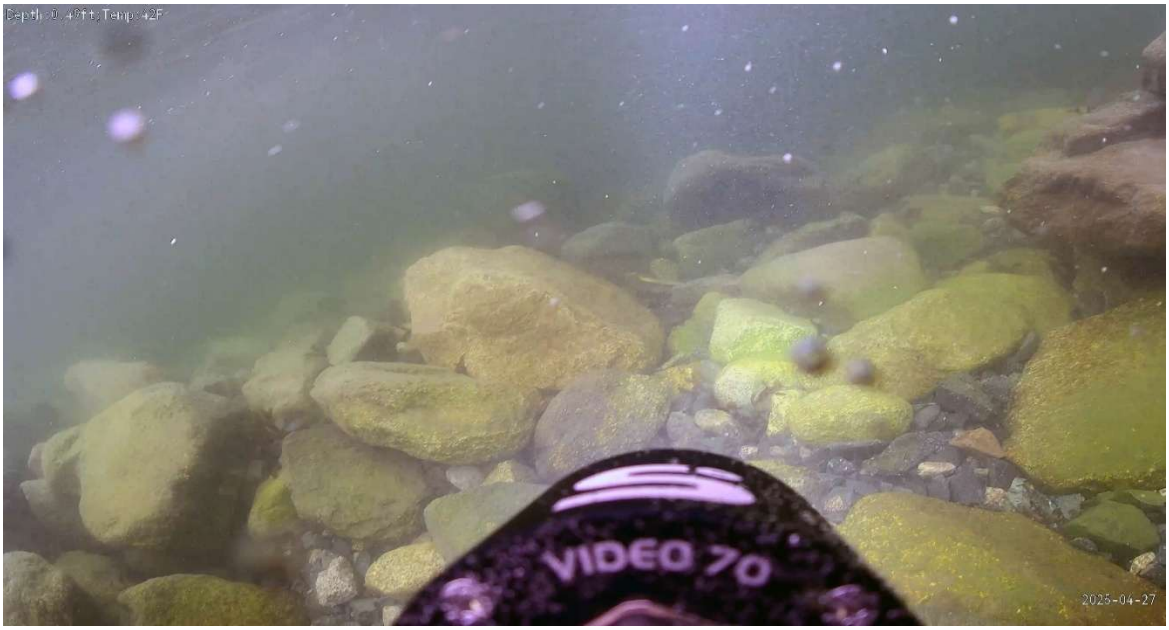
Transect T3 began at the ramp at a MLLW depth of 6 feet. It contained a substrate that was predominantly base rock, however the first three sample points did contain a thin layer of sand and gravel. This transect recorded observations of vegetation such as *Ulva* and rockweed. Eelgrass and grounding issues were not observed on this transect. The transect began at a depth of 6.0 feet and terminated at 61 feet MLLW.

Transect T4 began at the ramp at a MLLW depth of 5 feet. It contained a substrate

that was predominantly base rock, however the first three sample points did contain a thin layer of sand and gravel. This transect recorded observations of vegetation such as *Ulva* and rockweed. Eelgrass and grounding issues were not observed on this transect. The transect began at a depth of 5.0 feet and terminated at 62 feet MLLW.

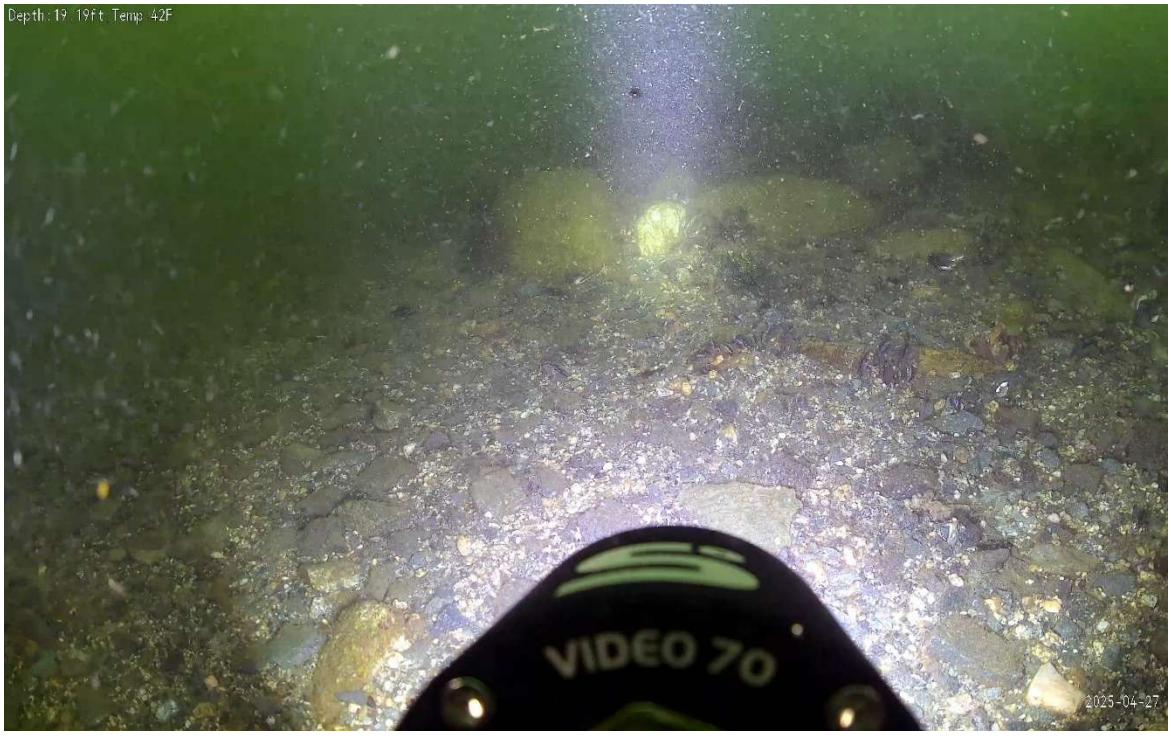
Transect T5 began at the ramp at a MLLW depth of 8 feet and contained a substrate that was predominantly base rock, however the first three sample points did contain a thin layer of sand and gravel. This transect recorded observations of vegetation such as *Ulva* and rockweed. Eelgrass and grounding issues were not observed on this transect. The transect began at a depth of 8.0 feet and terminated at 61.0 feet MLLW.

The Pre-Discharge survey of the LSA site consisted of 5 transects spaced at 75-foot intervals. This pattern will best delineate the debris field in future bark monitoring work under present site conditions.

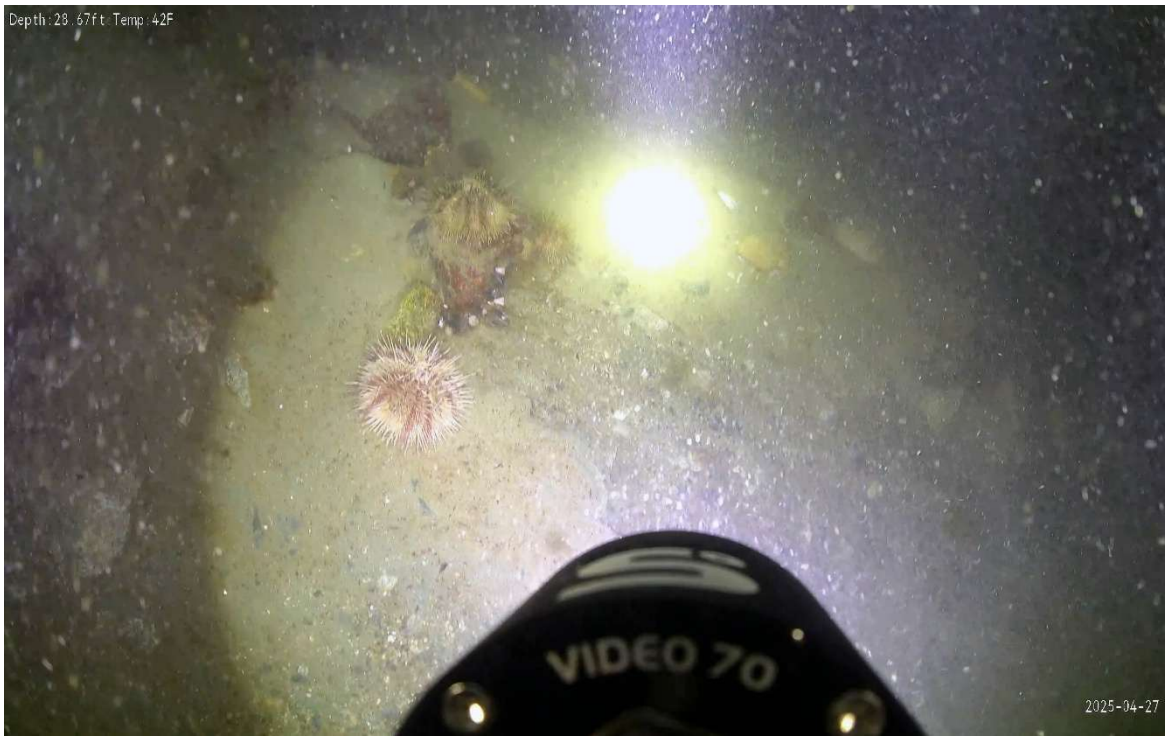


Transect T1 began at the beach at a MLLW depth of 4.0 feet and terminated at a depth of 60 feet. A solid rock substrate was observed with gravel and sands near the beginning and end of the transect. The bathymetry was that of a gradual slope, no Eel Grass or other critical habitat observations were noted.

Transect T2 began at the beach at a MLLW depth of 4.0 feet and terminated at a depth of 60 feet. This transect was comprised of sand and gravel. No critical habitat or grounding issues were observed on T2.



Transect T3 began at the beach at a MLLW depth of 4 feet. This transect recorded observations of vegetation such as *Ulva* and rockweed. Eelgrass and grounding issues were not observed on this transect. The transect began at a depth of 4.0 feet and terminated at 60 feet MLLW.



Transect T4 began at the beach at a MLLW depth of 4 feet. It contained a substrate that was predominantly base rock, This transect recorded observations of vegetation such as *Ulva* and rockweed. Eelgrass and grounding issues were not

observed on this transect. The transect began at a depth of 4.0 feet and terminated at 60 feet MLLW.

Transect T5 began at the beach at a MLLW depth of 4 feet. This transect recorded observations of vegetation such as *Ulva* and rockweed. Eelgrass and grounding issues were not observed on this transect. The transect began at a depth of 4.0 feet and terminated at 60 feet MLLW.

RECOMMENDATIONS

The Lutak Inlet water body is not listed as impaired for residue according to the most recent Integrated Water Quality Monitoring and Assessment Report.

The location is considered consistent with the siting guidelines. Marine life and critical habitat are not in significant abundance at the site. It is recommended the site be approved for storage activities as proposed by NSEA Timber Incorporated.

SUMMARY

The proposed project area for the LTF, LSA and ship moorage area is consistent with the siting guidelines and should be submitted to ADEC for review and approval.

This determination is based on the calculations derived from the transect data collected for this report only. For further assistance regarding this report, please call (907) 713-5614 or e-mail correspondence to Haggitt01@gmail.com.

Respectfully submitted,
Stephen Haggitt

Data Tables

Lutak Inlet LTF

Sample Point	Depth at MLLW	Critical Habitat	Grounding Potential	Substrate Type
T1S1	8	NO	NO	Sand/Gravel
T1S2	10	NO	NO	Sand/Gravel
T1S3	11	NO	NO	Rock/Gravel
T1S4	15	NO	NO	Rock/Gravel
T1S5	27	NO	NO	Rock/Gravel
T1S6	29	NO	NO	Rock/Gravel
T1S7	37	NO	NO	Rock/Gravel
T1S8	42	NO	NO	Rock/Gravel
T1S9	49	NO	NO	Sand/Gravel
T1S10	60	NO	NO	Sand/Gravel
T2S1	6	NO	NO	Sand/Gravel
T2S2	9	NO	NO	Sand/Gravel
T2S3	12	NO	NO	Sand/Gravel
T2S4	14	NO	NO	Sand/Gravel
T2S5	18	NO	NO	Sand/Gravel
T2S6	24	NO	NO	Sand/Gravel
T2S7	38	NO	NO	Sand/Gravel
T2S8	46	NO	NO	Sand/Gravel
T2S9	52	NO	NO	Sand/Gravel
T2S10	61	NO	NO	Sand/Gravel
T3S1	6	NO	NO	Sand/Gravel
T3S2	8	NO	NO	Sand/Gravel
T3S3	11	NO	NO	Rock/Gravel
T3S4	14	NO	NO	Rock/Gravel
T3S5	19	NO	NO	Rock/Gravel
T3S6	28	NO	NO	Rock/Gravel
T3S7	37	NO	NO	Rock/Gravel
T3S8	44	NO	NO	Rock/Gravel
T3S9	55	NO	NO	Rock/Gravel
T3S10	62	NO	NO	Rock/Gravel
T4S1	5	NO	NO	Rock/Gravel
T4S2	8	NO	NO	Rock/Gravel
T4S3	12	NO	NO	Rock/Gravel
T4S4	19	NO	NO	Rock/Gravel
T4S5	29	NO	NO	Rock/Gravel

T4S6	35	NO	NO	Rock/Gravel
T4S7	42	NO	NO	Rock/Gravel
T4S8	51	NO	NO	Rock/Gravel
T4S9	54	NO	NO	Rock/Gravel
T4S10	62	NO	NO	Rock/Gravel
T5S1	8	NO	NO	Rock/Gravel
T5S2	10	NO	NO	Rock/Gravel
T5S3	16	NO	NO	Rock/Gravel
T5S4	20	NO	NO	Rock/Gravel
T5S6	27	NO	NO	Rock/Gravel
T5S7	32	NO	NO	Rock/Gravel
T5S8	41	NO	NO	Rock/Gravel
T5S9	52	NO	NO	Rock/Gravel
T5S10	61	NO	NO	Rock/Gravel

Key:
SH=Shell, S=Sand, M=Mud, SL=Silt, R=Rock, C=Cobble, G=Gravel
*Sample Image Not Available
N/A= Not Tested

Lutak Inlet LSA

Sample Point	Depth at MLLW	Critical Habitat	Grounding Potential	Substrate Type
T1S1	4	NO	NO	Sand/Gravel
T1S2	10	NO	NO	Sand/Gravel
T1S3	11	NO	NO	Rock/Gravel
T1S4	15	NO	NO	Rock/Gravel
T1S5	27	NO	NO	Rock/Gravel
T1S6	29	NO	NO	Rock/Gravel
T1S7	37	NO	NO	Rock/Gravel
T1S8	42	NO	NO	Rock/Gravel
T1S9	49	NO	NO	Sand/Gravel
T1S10	60	NO	NO	Sand/Gravel
T2S1	4	NO	NO	Sand/Gravel
T2S2	9	NO	NO	Sand/Gravel
T2S3	12	NO	NO	Sand/Gravel
T2S4	14	NO	NO	Sand/Gravel
T2S5	18	NO	NO	Sand/Gravel
T2S6	24	NO	NO	Sand/Gravel
T2S7	38	NO	NO	Sand/Gravel
T2S8	46	NO	NO	Sand/Gravel
T2S9	52	NO	NO	Sand/Gravel
T2S10	60	NO	NO	Sand/Gravel
T3S1	4	NO	NO	Sand/Gravel
T3S2	8	NO	NO	Sand/Gravel
T3S3	11	NO	NO	Rock/Gravel
T3S4	14	NO	NO	Rock/Gravel
T3S5	19	NO	NO	Rock/Gravel
T3S6	28	NO	NO	Rock/Gravel
T3S7	37	NO	NO	Rock/Gravel
T3S8	44	NO	NO	Rock/Gravel
T3S9	55	NO	NO	Rock/Gravel
T3S10	60	NO	NO	Rock/Gravel
T4S1	4	NO	NO	Rock/Gravel
T4S2	8	NO	NO	Rock/Gravel
T4S3	12	NO	NO	Rock/Gravel
T4S4	19	NO	NO	Rock/Gravel
T4S5	29	NO	NO	Rock/Gravel
T4S6	35	NO	NO	Rock/Gravel

T4S7	42	NO	NO	Rock/Gravel
T4S8	51	NO	NO	Rock/Gravel
T4S9	54	NO	NO	Rock/Gravel
T4S10	60	NO	NO	Rock/Gravel
T5S1	4	NO	NO	Rock/Gravel
T5S2	10	NO	NO	Rock/Gravel
T5S3	16	NO	NO	Rock/Gravel
T5S4	20	NO	NO	Rock/Gravel
T5S6	27	NO	NO	Rock/Gravel
T5S7	32	NO	NO	Rock/Gravel
T5S8	41	NO	NO	Rock/Gravel
T5S9	52	NO	NO	Rock/Gravel
T5S10	60	NO	NO	Rock/Gravel

Key:
SH=Shell, S=Sand, M=Mud, SL=Silt, R=Rock, C=Cobble, G=Gravel
*Sample Image Not Available
N/A= Not Tested

Abundance Tables

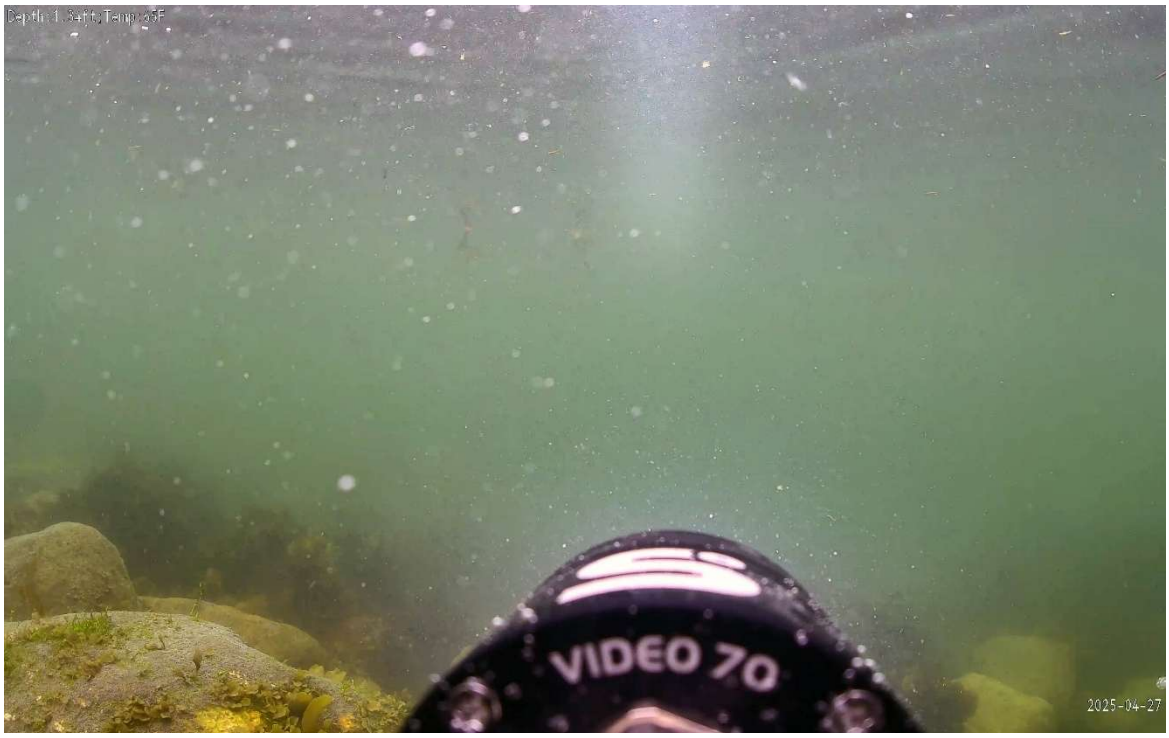
Name	Common Name	Abundance
Plants		
Lithothamnion spp.	Crustose red algae	C
Ulva/Monstroma spp.	Sea lettuce	C
Rhodophyta spp.	Red algae	A
Chrysophyta spp.	Diatom	C
Pleurophycus gardneri	Sea spatula	L
Laminaria saccharina	Suger kelp	L
Alaria fistulosa	Dragon Kelp	L
Costaria costata	Seersucker	L
Zosta Marina.	Eel grass	L
Invertebrates		
Beggiatoa spp.	White sulfur bacteria	L
Metridium spp.	Anemone	C
Urcticina spp.	Anemone	L
Phoronopsis sp.	Phoronid	L
Unidentified polychaete spp.	Tube worms	L
Thelepus crispus	Terebellid worm	L
Flabellina spp.	Nudibranch	L
Acmea mitra	Whitecap limpet	L
Fusitron oregonensis	Oregon triton	L
Gastropteron pacificum	Pacific wingfoot snail	L
Clione limacina	Sea angel	L
Polinices lewisii	Moon snail	L
Clinocardium nuttallii	Cockle	L

Tresus spp.	Horse clam	L
Solaster spp.	Sea star	L
Orhtasterias keohleri	Rainbow star	L
Evasterias troschelii	False Ochre star	L
Pycnopodia helianthoides	Sun star	C
Pisaster ochraceus	Ochre star	L
Strongylocentrotus droebachiensis	Green sea urchin	A
Parastichopus californicus	California sea cucumber	L
Paralithodes camtschaticus	King crab	L
Pandalus spp.	Shrimp	L
Balamus spp.	Barnical	C
Crangon spp.	Sand shrimp	C
Pagurus spp.	Hermit crab	C
Oregonia gracilis	Decorator crab	L
Vertebrates		
Pleuronectidae spp.	Righteye flounder	L
Cottidae spp.	Sculpin	L
Leptocottus armatus	Pacific staghorn sculpin	L

A= Abundant C= Common Abundance L= Low abundance

Photographic Representation

Lutak Inlet LTF



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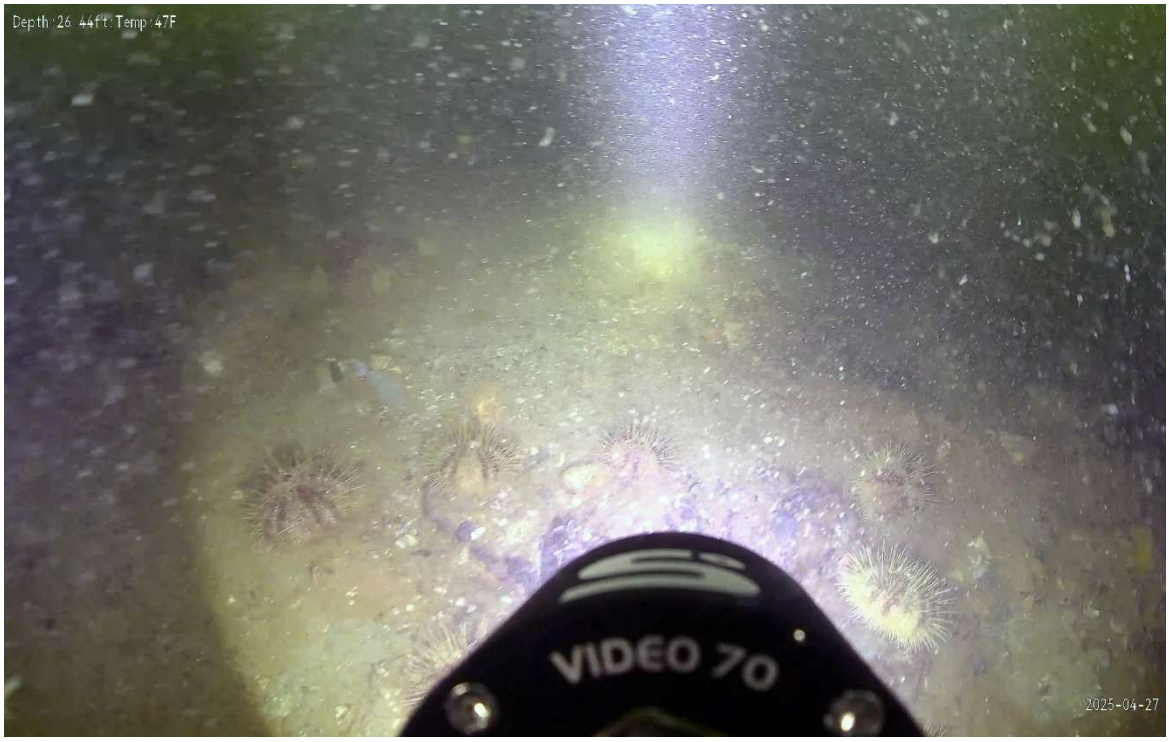

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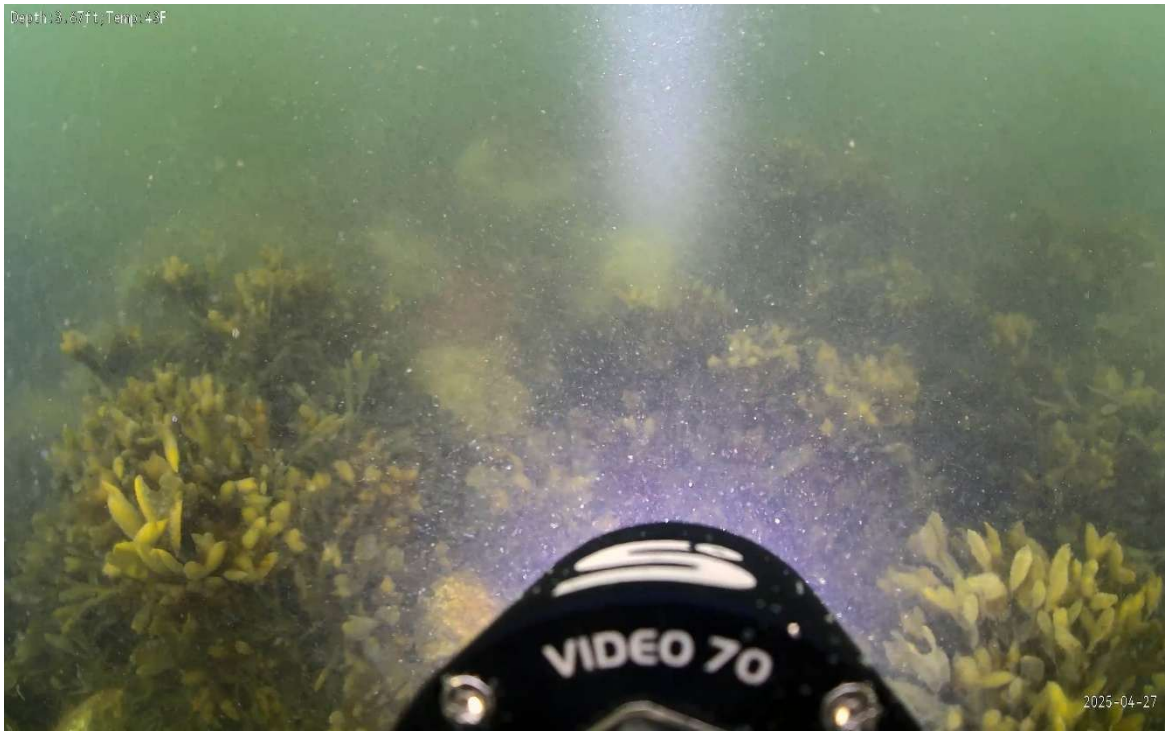

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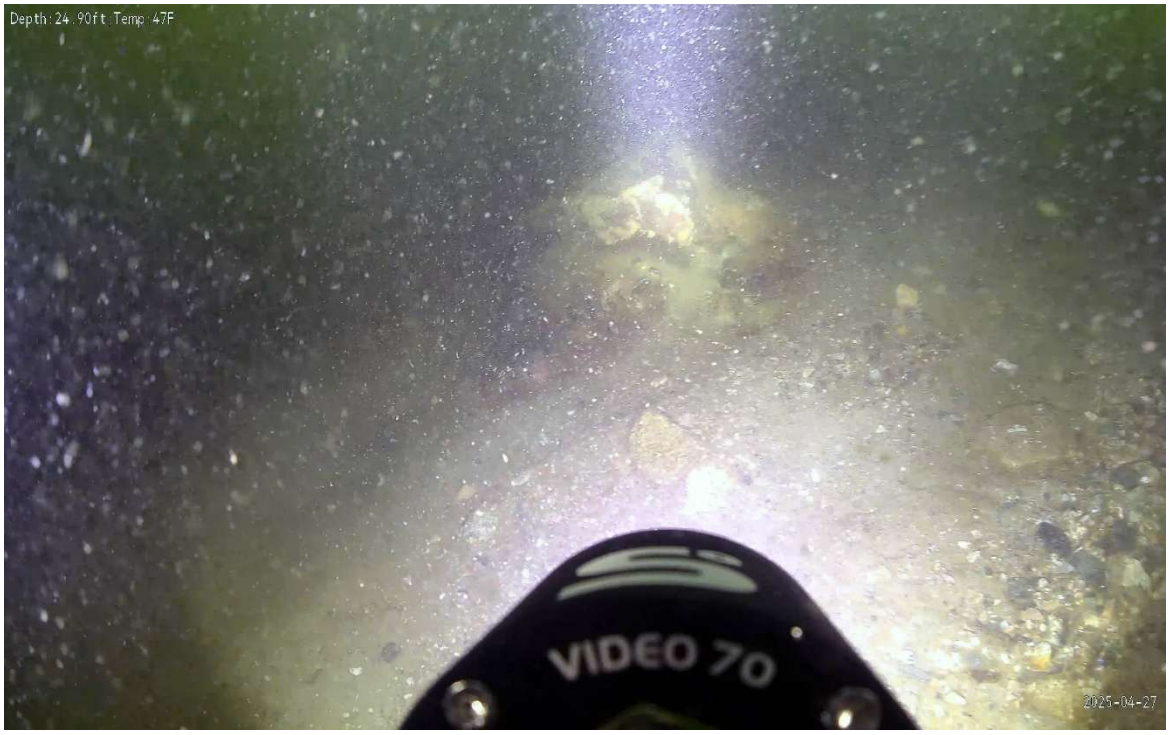

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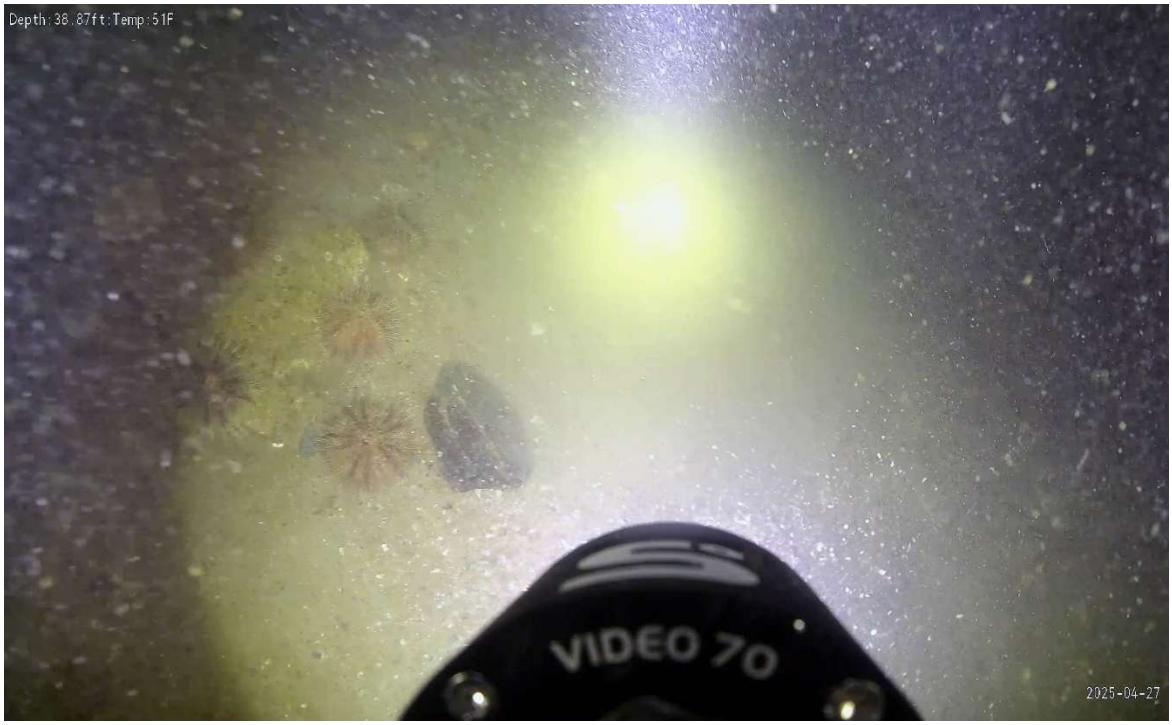

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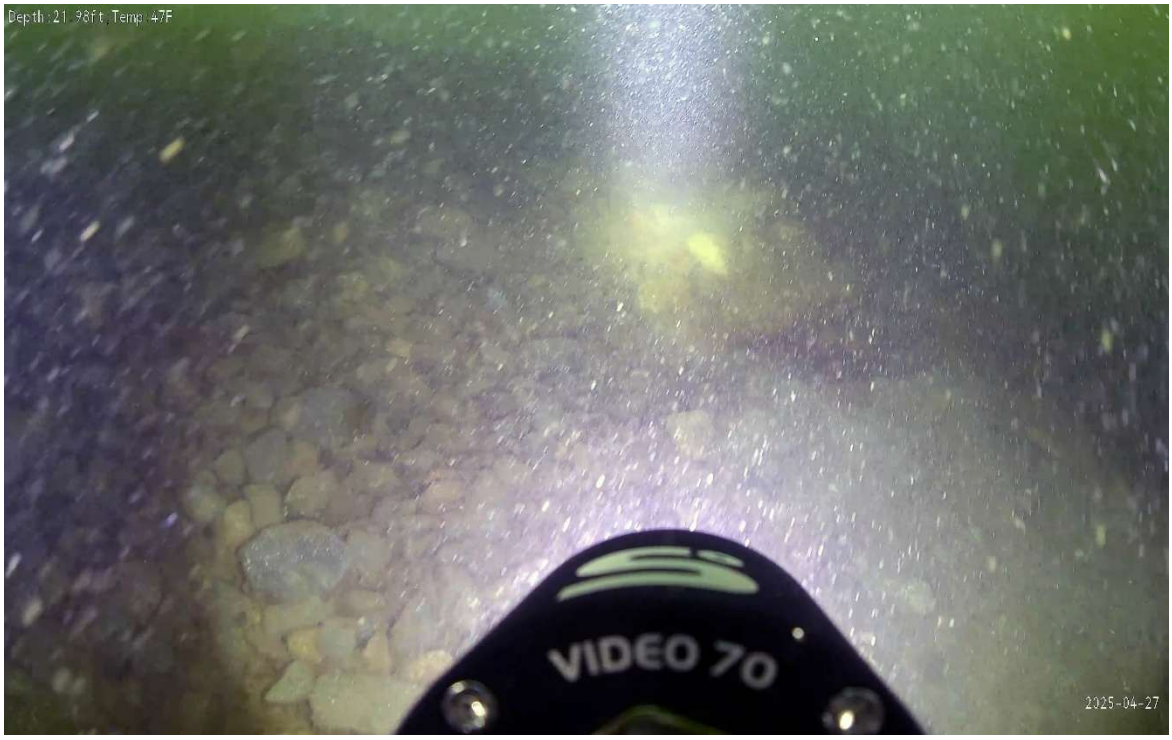

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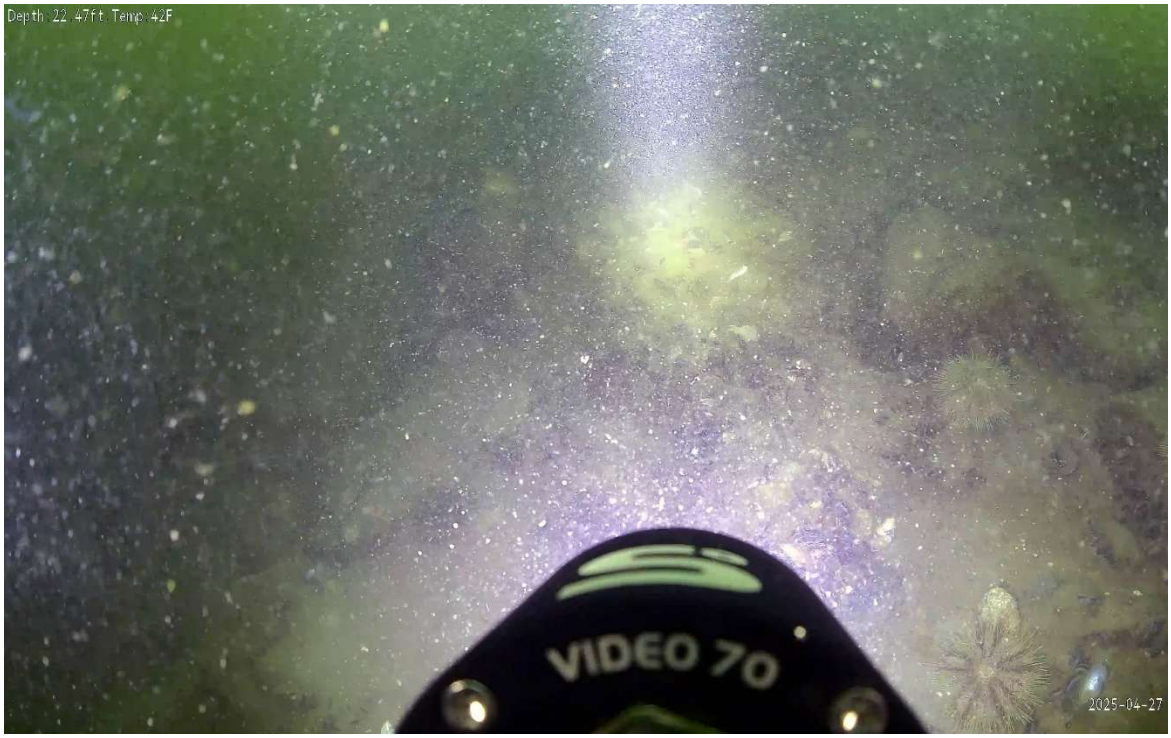

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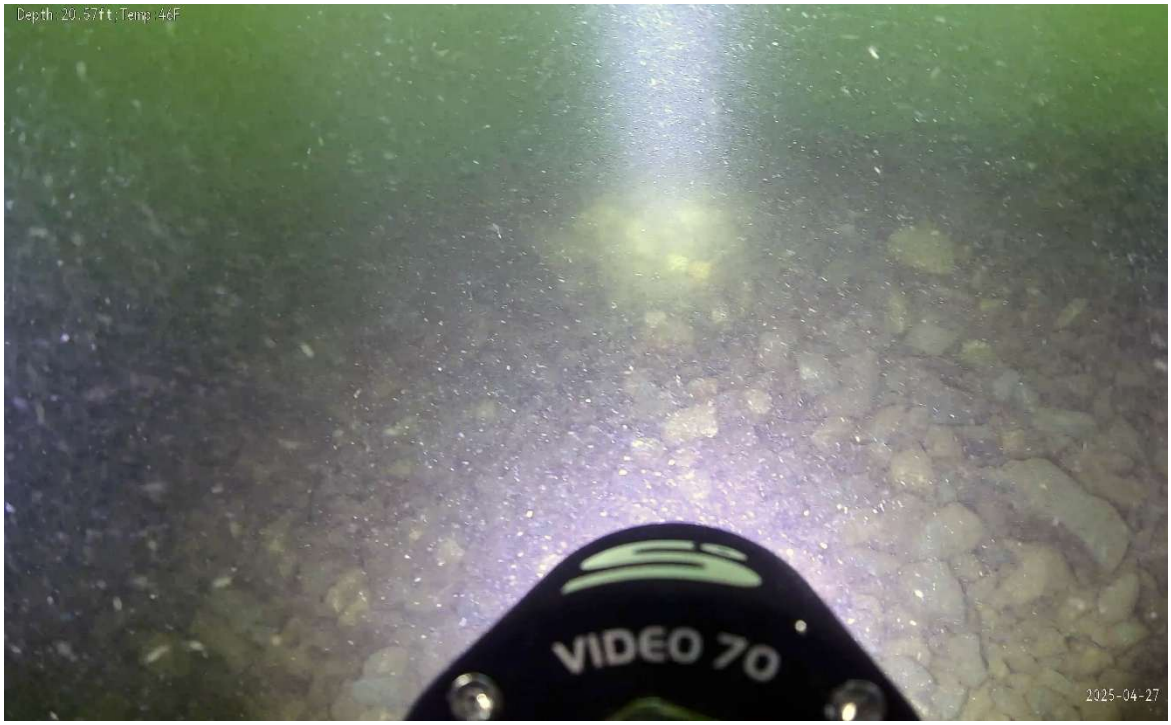

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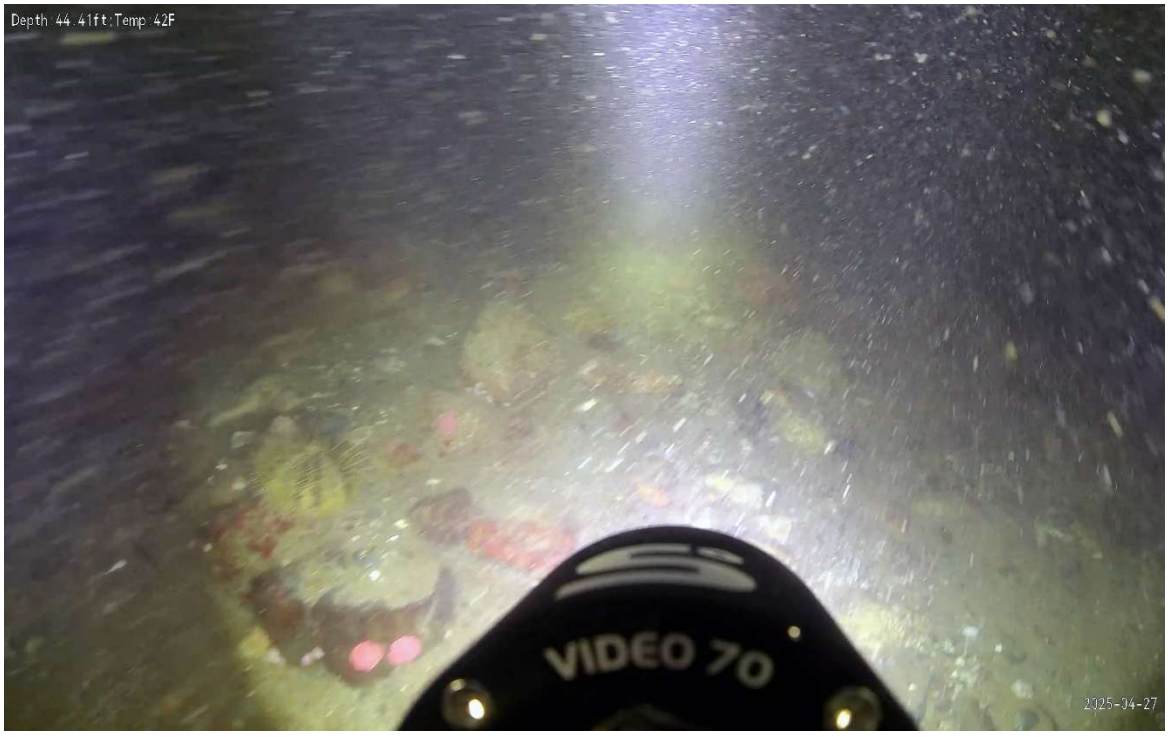

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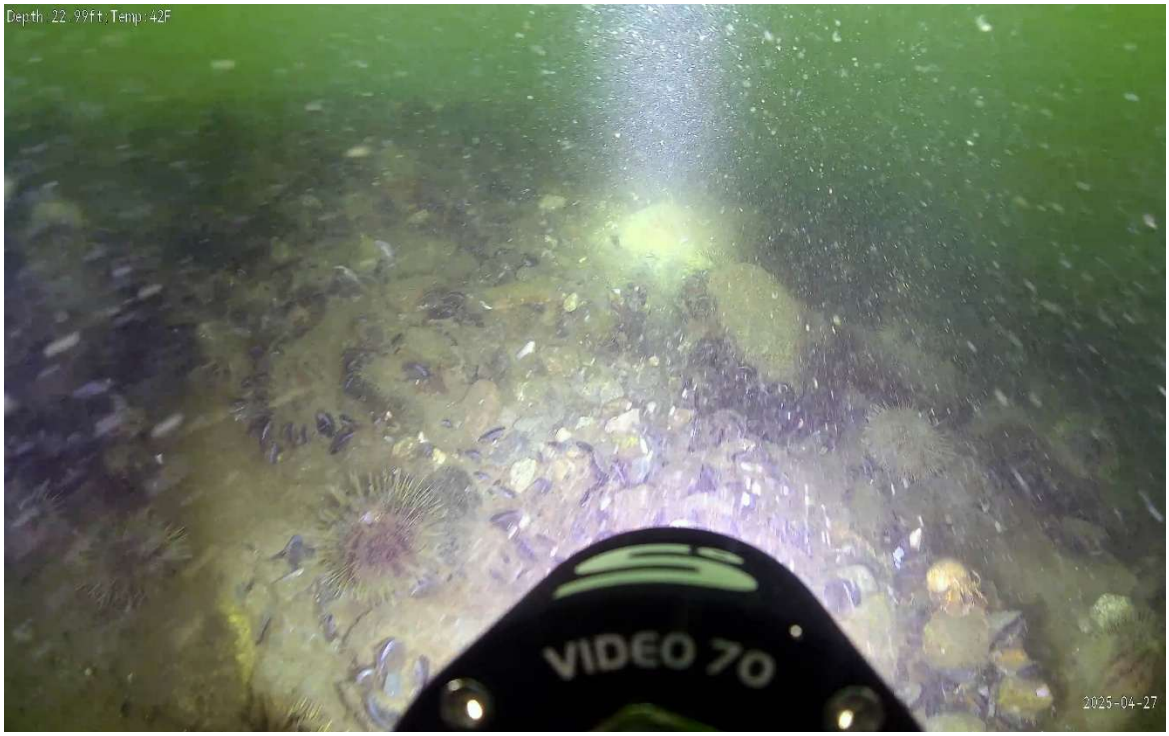

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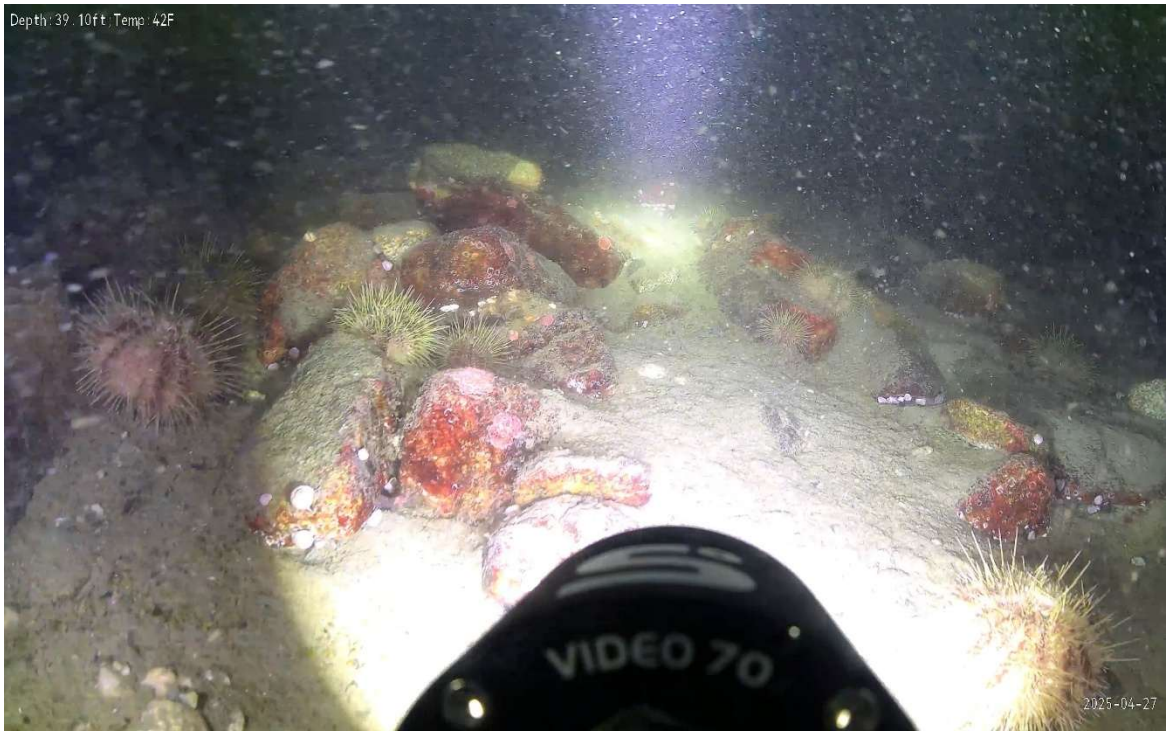

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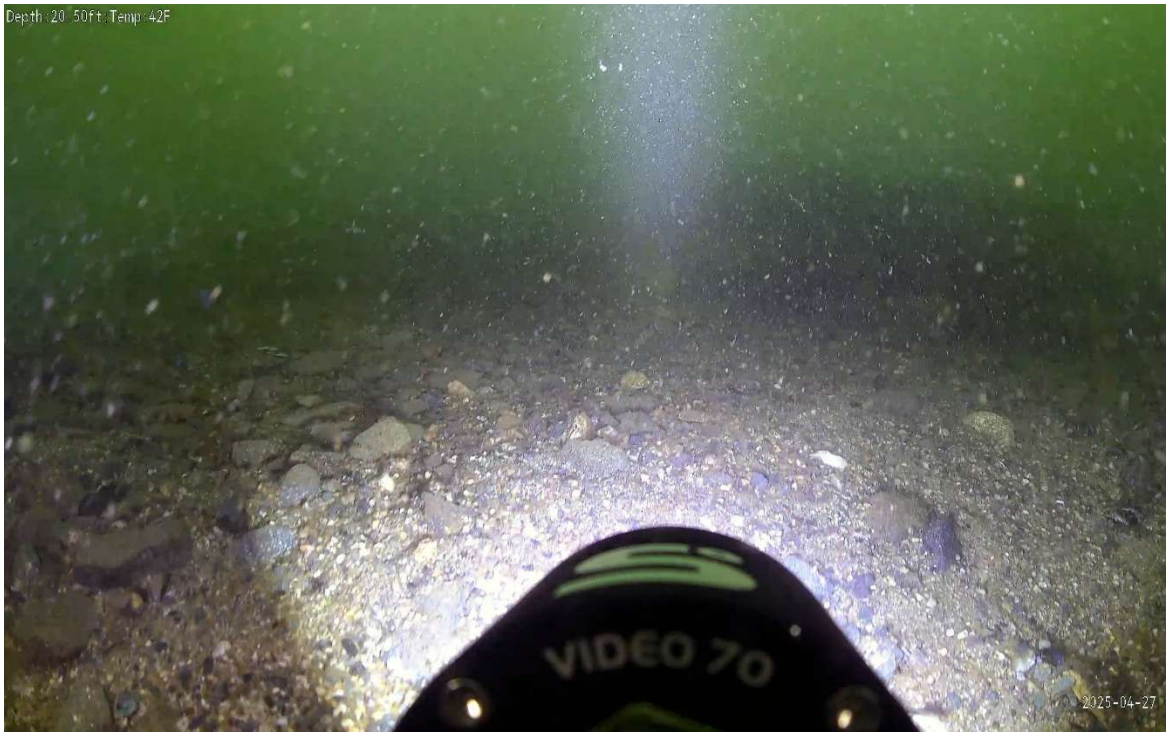

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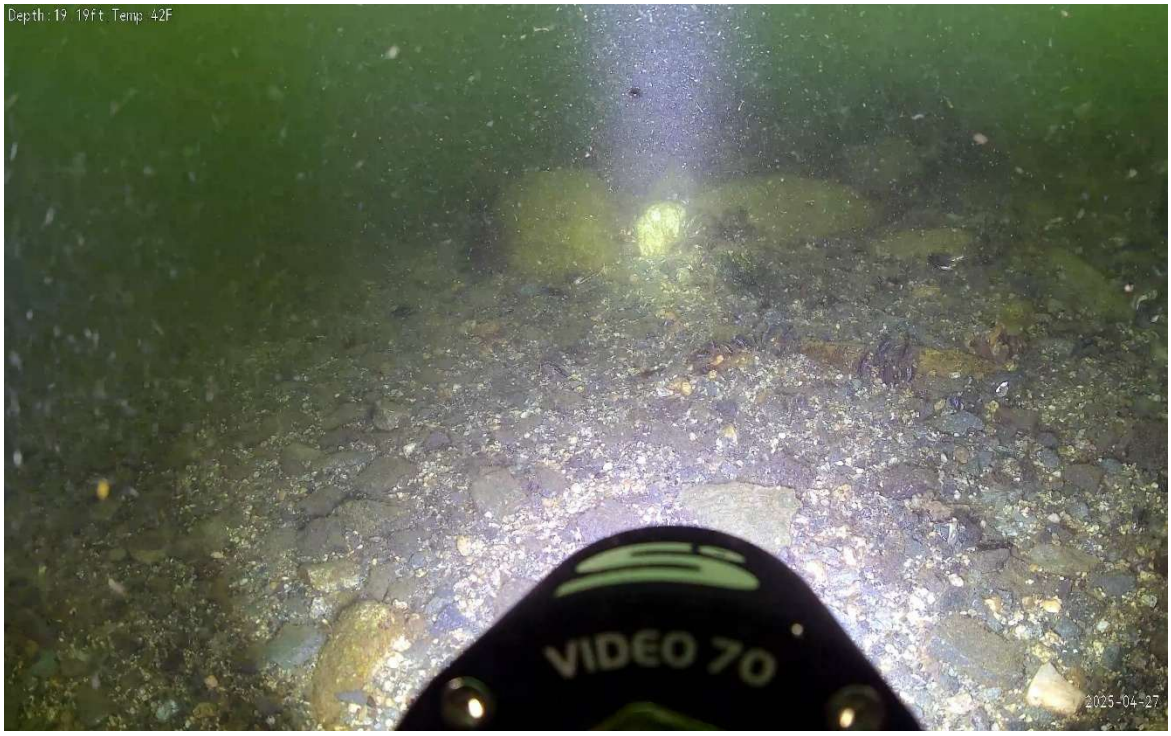

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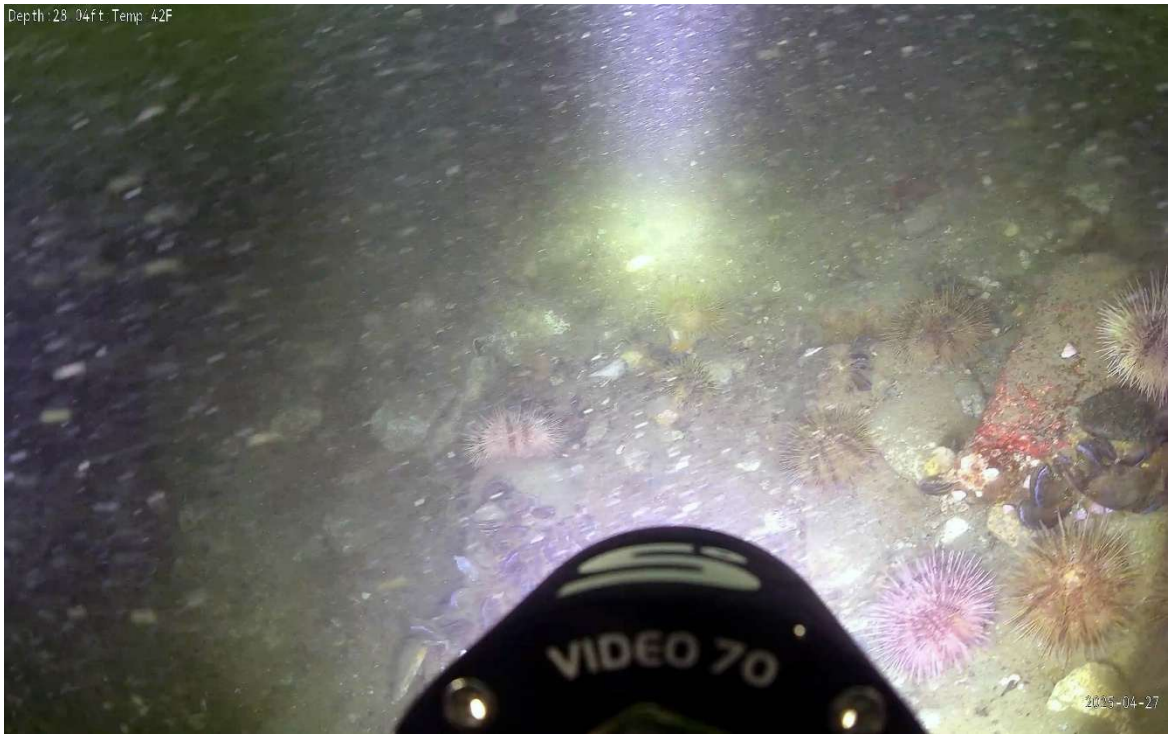

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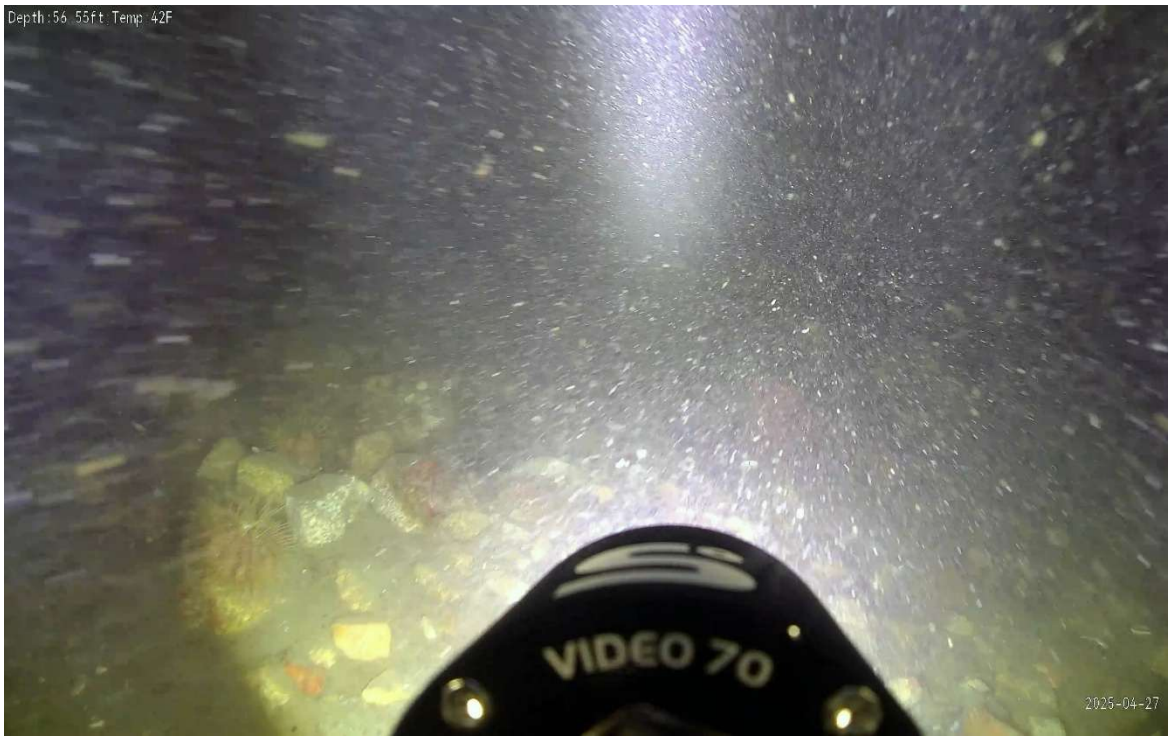

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LAS 35438/POA-2024-00622

Quality Assurance Project Plan

2025 Lutak Inlet, Haines Alaska Predischarge Seafloor Survey.

Prepared for:

NSEA Timber Inc.
Physical Address: S10, T30S, R59E, CR MERIDIAN, Haines. Mile 4.5 Lutak Rd.
Mailing Address: 283 Sommerville RD, Chehalis, WA 98532-8829

Prepared by:

Haggitt Consulting
4248 A Street SE Suite 216
Auburn WA. 98002

This quality assurance project plan (QAPP) has been prepared according to guidance provided in *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5, EPA/240/B-01/003, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, March 2001) to ensure that environmental and related data collected, compiled, and/or generated for this project are complete, accurate, and of the type, quantity, and quality required for their intended use. This QAPP and its contents are subject to the NSEA contract requirements. **QAPP Revision 23 April, 2025**

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A.1 QAPP APPROVALS:

Polly Johannsen 06/05/25

Polly Johannsen **DATE**
Owner NSEA TIMBER INC.
283 Sommerville Rd, Chehalis, WA 98532

05/15/2025

Steve Haggitt **DATE**
Principal Haggitt Consulting
DPIC/APDES Investigator
Haggitt Consulting
4248 A Street SE Suite 216, Auburn, WA. 98002

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Appendix

A.2 ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
ECD	Environmental Compliance Director
DGPS	Differential global positioning system
DQI	Data quality indicators
DQO	Data quality objectives
DO	Dissolved oxygen
HC	Haggitt Consulting
NPSI	NSEA Timber Incorporated
PM	Project Manager
PSEP	Puget Sound Estuary Program
PUC	Plan-view Underwater Camera
PVV	Plan-view Video Camera
QA	Quality assurance
QAO	Quality Assurance Officer
QAM	Quality Assurance Manager
QAPP	Quality assurance project plan
QC	Quality control
RPD	Relative percent difference
RSD	Relative standard deviation
SPI	Sediment profile imaging
TSF	Lutak Bark Facility
TOC	Total organic carbon
TVS	Total volatile solids

A.3 DISTRIBUTION LIST

This document will be distributed to the following: ADEC, ADNR, NSEA Timber Incorporated, Haggitt Consulting; and staff who are involved in this project. The Project Manager or ECD in each organization will provide the QAPP to other members of their staff who are working on the project.

Name Title	Phone Fax E-mail	Mailing Address
Alaska Department of Natural Resources		
Muriel Walatka	Muriel.walatka@alaska.gov 907-465-3937	400 Willoughby Avenue, PO Box 111020 Juneau, Alaska 99811-1020
NSEA Timber Incorporated Inc.		
Polly Johannsen	Private Information 541-398-2331	283 Sommerville Rd, Chehalis, WA 98532
Haggitt Consulting		
Steve Haggitt Project Manager	haggitt01@gmail.com 907-713-5614	Haggitt Consulting 4248 A Street SE suite 216 Auburn, WA 98002

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A.4 PROJECT/TASK ORGANIZATION

The purpose of this document is to present the quality assurance project plan (QAPP) for a Predischarge study to characterize the discharge debris, sediments and benthic communities present in the waters near the NSEA Timber Incorporated -Lutak LTF/LSA Facility located in Lutak Inlet, Alaska. This study is being completed for NSEA Timber Incorporated. The QAPP considers the most recent reports and proposes a plan and dates for the next study. This QAPP therefore may adjusted each time after the completion of the survey work to provide the most efficient plan to quantify the discharge at the facility.

One location in South-East Alaska is designated in this study: LAS35438

The NSEA Timber Incorporated – Lutak Log Transfer Facility discharge into Lutak Inlet. The mailing address for the terminal is 283 Sommerville Rd, Chehalis, WA 98532, while the physical location of the of the facility has been identified by the company as 59.2834 N 135.4793 W.

The survey will use standard permit monitoring dive practices and survey designs. The study design attached to this QAPP provides the methods that will be used; the location noted in that design is based upon actual conditions in the field. The QAPP document provides a project specific design that considers known site conditions such as the discharge area size and specific location.

The lead contractor for this study is Haggitt Consulting of Auburn, Washington.

This QAPP provides general descriptions of the work to be performed to collect and process the samples, the quality assurance (QA) and quality control (QC) standards to be met, and the procedures that will be used to ensure that the data is scientifically valid, defensible, and that uncertainty has been reduced to a known and practical minimum.

The organizational aspects of a program provide the framework for conducting tasks. The organizational structure and function can also facilitate project performance and adherence to quality control procedures and quality assurance requirements. Key project roles are filled by those people responsible for ensuring the collection of valid data, the routine assessment of the data for precision and accuracy, as well as the data users and the person(s) responsible for approving and accepting final products and deliverables. The program organizational chart is presented in Figure 1; it includes relationships and lines of communication among all participants and data users. The responsibilities of these persons are described next.

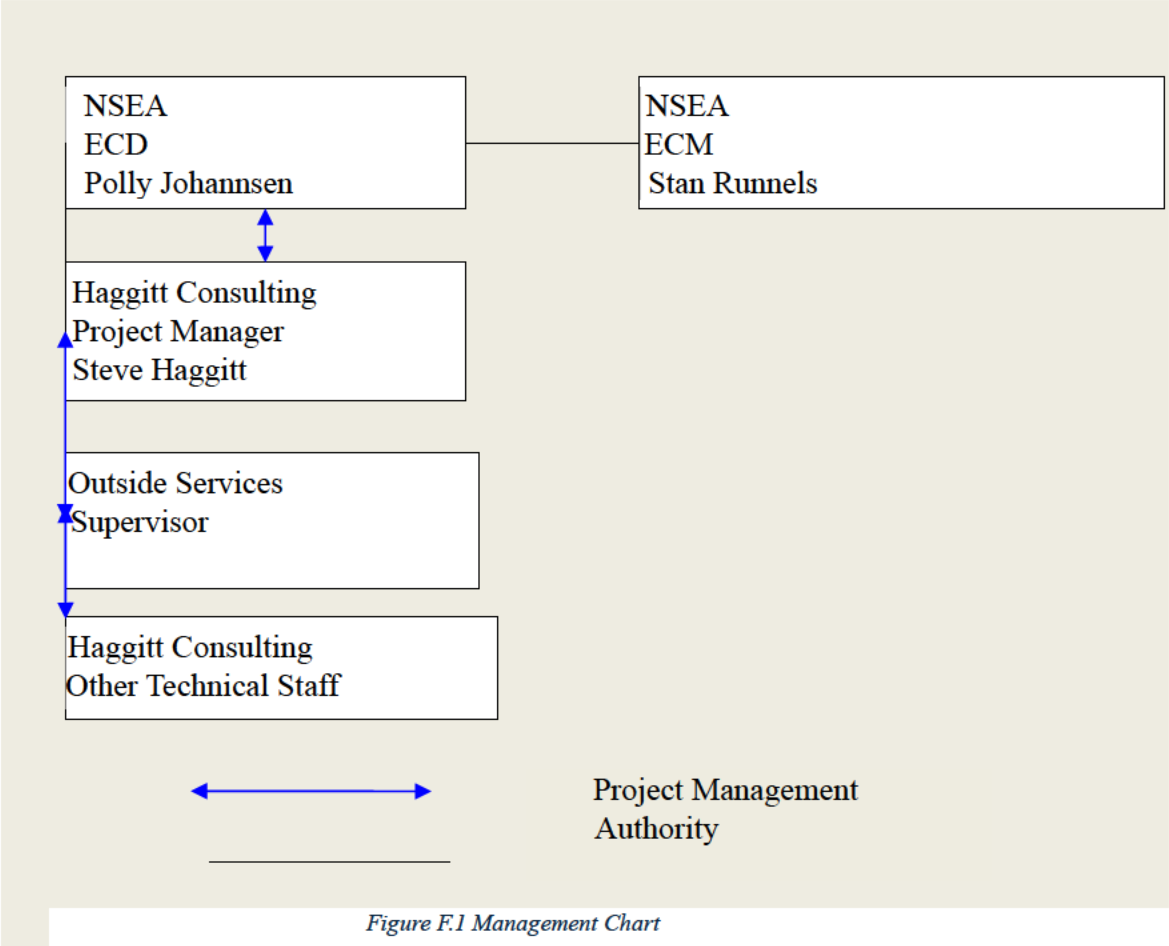

Figure F.1 Management Chart

Polly Johannsen of NSEA Timber Incorporated will be providing overall project/program oversight for this study as the Environmental Compliance Director (ECD). The NSEA Timber Incorporated ECD will have the following responsibilities:

- Providing oversight for study design, site selection, and adherence to design objectives.
- Reviewing and approving the project study design, QAPP, and other materials developed to support the project.

NSEA Timber Incorporated Environmental Compliance Manager (ECM) is Stan Runnels. Responsibilities include the following:

- Reviewing and approving the QAPP.
- Participating in NSEA Timber Incorporated QA reviews of the study.

The Haggitt Consulting PM is Steve Haggitt, who will participate in study design, QAPP development, and all other operations. Other specific responsibilities of the Haggitt Consulting PM include the following:

- Coordinating project assignments in establishing priorities and scheduling.

- Ensuring completion of all tasks, within established budgets and time schedules, and meeting all of NSEA Timber Incorporated and ADEC's requirements.

- Providing guidance, technical advice, and performance evaluations to those assigned to the project.

- Implementing corrective actions and providing professional advice to staff.

- Preparing and/or reviewing preparation of project deliverables, including the QAPP and other materials developed to support the project.

- Providing support to NSEA Timber Incorporated in interacting with the project team, technical reviewers, and others to ensure technical quality requirements are met in accordance with study design objectives.

- Developing a graphical and electronic-based navigational grid that displays all sample locations, provides boat and navigational support for all field data collection activities, and conducts assessment procedures as well as PVV.

A.5 PROBLEM DEFINITION/BACKGROUND

One location in South-central Alaska is designated for this study, the log transfer facility in the Lutak Inlet, Alaska. NSEA Timber Incorporated is required by the Alaska Department of Environmental Conservation (ADEC) to perform a Seafloor Predischarge survey as part of a Notice of Intent. The NOI requires that a survey be performed to determine the condition of the seafloor and provide a structural evaluation of the discharge system.

A.6 PROJECT/TASK DESCRIPTION

Objectives: The Predischarge survey will document existing conditions at the site. The investigation will also determine the spatial extent and location of any bark debris (residues) from discharges within the survey area.

The survey area will include all waters as described in the permit and Notice of Intent. The survey will terminate at the end of Trace coverage (less than 10% coverage in a 3' sample plot square) or at the survey boundary line. In the event detectable coverage exists beyond the survey boarders, sampling will continue until the coverage reduces to below the minimum detection limit. Contractual or other limits may also apply to transect lengths; however, those limits will be described in the report.

Project Proposal, Study Design and QAPP

Task 1: Prepare a draft and final Study Design and Quality Assurance Project Plan (QAPP). The Study Design shall describe how the survey will characterize the sediments, provide a map for all waste debris deposits in the study area and provide a latitude/longitude of the project area. The Study Design shall detail the actions necessary to ensure the objectives are accomplished. It shall also include a detailed project schedule, and methods and materials expected to be used. It will list the project team, subcontractors, and equipment to be used. The proposal will highlight the contractors experience in conducting benthic impact assessments on industrial discharges in Alaska.

Stipulation: Detail project schedule; methods; and materials required to perform the project as proposed. The study to be conducted in the waters adjacent to the discharge will use the plan-view video (PVV/DGPS) and/or other seafloor monitoring methods. Field conditions will be assessed each year, if required, to determine the safest and most robust method to characterize the discharge. Monitoring is for the purpose of assessing the conditions that exist at the site, specifically with respect to spatial coverage and quantification of impacts from waste debris residues on the seafloor. Samples for PVV work will be acquired continuously along each transect. Samples and photographs for seafloor survey methods will be taken every 30 feet along a transect. Transects will initially be spaced no further than 75 feet apart, for either diving or PVV methods, but may be refined to 30' separation depending on further required data gathering.

Deliverables: Study Design and QAPP complete by 04/23/2025 (final)

Field Work

Task 2: Haggitt Consulting will conduct field work in accordance with NSEA Timber Incorporated approved Study Design and QAPP.

Stipulation: Navigation and boat piloting in the project area and environmental diving require specialized skill and experience.

Deliverable: Digital still images will display the area of continuous, discontinuous, and trace coverage of bark waste debris. Field work shall be concluded by no later than April 2025.

Project Report

Task 3: Project report draft, followed by final project report incorporating comments. The report will include the following elements.

1. A description of the survey methods, site conditions, problems or issues encountered, and points of the Scope of Work modified or not accomplished.

2. Marine charts showing the discharge marine areas and survey grids as planned and as conducted, if different, including video sample points.

3. Landscape photographs of the discharge area looking across the water toward the shorelines.

4. A table for the survey area showing transect and sample point GPS locations and transect compass bearings as planned and as conducted.

5. A table of results for each survey indicating, for each transect and sample point, MLLW water depth, percent discrete debris surface cover, and, insofar as determined, discharge thickness, nature and condition of the debris material, and nature of the natural substrate.

6. A narrative description for the survey area of the nature and condition of debris on the bottom over each area surveyed including the nature of substrates, the intermixture of debris and substrates, the surface sediment layer, features of interest such as logs, pipes, operational debris and cables on the bottom, marine life noted, and other relevant information.

7. The printed still image taken at each sample point, with labels designating transect and station and debris percent cover and thickness. Photographs and pictures will be displayed two per page or in another suitable format. The images printed also will be delivered in *.jpg format on a standard compact disc in two copies, with file names indicating transect and sample point, e.g., TRT1S1 (Lutak Inlet- Transect 1-Sample Point 1).

8. Other information necessary to represent the conduct of the project and the results of the survey.

Stipulation: All data will be synthesized in report form.

Deliverable: Final Project Report shall be delivered to the NSEA Timber Incorporated ECD no later than May 15, 2025. The final report shall contain the Deliverables including a copy of any appendix of digital still images.

General Stipulations

1) Survey contractor must have experience conducting surveys on regulated discharges.

2) Survey contractor must have prior experience assessing industrial discharges with the methods prescribed in the ADEC discharge permits.

3) Survey contractor must not be employed by (Except in this capacity as an investigative surveyor), or have any financial interest in the industry.

Project Schedule

The time frame completion of items or events required for the project is as follows:

Item or Event	Due Date
Final Study Design and QAPP submitted	April 23, 2025
Field work conducted	April 25-27, 2025
Final Seafloor Monitoring Survey submitted	May 15, 2025

Deliverables

1. Response to the Scope of Work (Study Design and QAPP) is due to the ECD no later than April 23, 2025. An email electronic submission with attachments is acceptable.

2. The final Waste Discharge Monitoring Report shall be submitted to the ECD by no later than the due date in the following manner:
- One electronic submission shall be provided in Microsoft WORD format and as an Email attachment in .PDF format."

A.7 QUALITY OBJECTIVES AND CRITERIA

Data quality objectives (DQOs) are qualitative and quantitative statements that clarify the intended use of the data, define the type of data needed to support the decision, identify the conditions under which the data should be collected, and specify tolerable limits on the probability of making a decision error due to uncertainty in the data (if applicable). DQOs are developed by data users to specify the data quality needed to support specific decisions.

A.7.1 Project Quality Objectives

The quality of an environmental monitoring program can be evaluated in three steps: (1) establishing scientific assessment quality objectives, (2) evaluating program design for whether the objectives can be met, and (3) establishing assessment and measurement quality objectives that can be used to evaluate the appropriateness of the methods being used in the program. The quality of a particular data set is some measure of the types and amount of error associated with the data.

Sources of error or uncertainty in statistical inference are commonly grouped into two categories:

- Sampling error: The difference between sample values and in situ "true" values from unknown biases due to sampling design. Sampling error includes natural variability not specifically accounted for in a design (for design-based inference), and variability associated with model parameters or incorrect model specification (for model-based inference).

- Measurement error: The difference between sample values and in situ "true" values associated with the measurement process. Measurement error includes bias and

imprecision associated with sampling methodology, specification of the sampling unit, sample handling, storage, preservation, identification, instrumentation, etc.

The goals of this project are to:

(1) Understand the extent and nature of the natural conditions and bark debris residues in the marine area located in the Lutak Inlet.
(2) Characterize whether the benthic biological community in the marine area is impaired, and whether the impairment is related to pollutant loading from the bark debris discharges and residues.
(3) Inspect the integrity of the anchor system if installed.

The data requirements for this project encompass aspects of both analysis and data management to reduce sources of errors and uncertainty in the use of the data. Data needed for the project are listed in Table 2.

Uncertainty in the data due to sampling and measurement errors or errors introduced during data manipulation could result in identifying the potential for an effect on sediment characteristics and benthic infaunal community composition and abundance when one does not exist, or in not identifying an effect when one does exist. Reducing data uncertainty is of the highest priority.

Methods and procedures described in this document are intended to reduce the magnitude of measurement error sources and frequency of occurrence. The relevant quality objectives for this project are related to sample handling, as well as making measurements of certain parameters onsite. Project quality objectives include the following:

- Use of standardized, repeatable data and sample collection procedures.
- Use of trained personnel to perform the data and sample collection and analyses.
- Equipment for parameters to be collected on site will be calibrated to a known standard as per manufacturer's specifications.

Table T.2 Environmental Data to Be Collected for This Project.

DATA TYPE	MEASUREMENT ENDPOINT(S) OR UNITS
Physicochemical Parameters	
Differential Global Positioning System (DGPS)	latitude and longitude (decimal degrees)
Distances along SPI/PVV transect	feet (ft) , meters (m)
Spatial area	acre's, meters square (M2), square feet
Water depth	feet (ft), feet of seawater (fsw), mean lower low water (MLLW)
Biological Parameters	
Bark Debris	percent (%) of benthic cover, thickness or area surveyed (m^2), Volume of debris (CY)
Ancillary observations	standard units used for parameter of interest or specific descriptive codes or description
Chemical and Geotechnical Parameters	
Depositional layer thickness (if determinable by video methods).	inches, mm or cm

A.7.2 Measurement Performance Criteria

Measurement performance criteria are quantitative statistics that are used to interpret the degree of acceptability or utility of the data to the user. These criteria, also known as data quality indicators (DQIs), include the following:

- Precision
- Accuracy
- Representativeness
- Completeness
- Comparability

DQI's that cannot be expressed in terms of accuracy, precision, or completeness will be reported by fully describing the specified method; all other quality assurance requirements will still be fulfilled. The assessment of debris cover will include subjective analyses made of conditions present that may influence the degree of accuracy of those measurements, such as water turbidity which affects visibility and photograph quality. In such cases, alternative data gathering methodologies shall include….

HC recommends the incorporation of QC checks during the collection, generation, or analysis of environmental data; however, because of current contractual agreements, independent checks using duplicate field samples and other means while require financial renegotiations if necessary for further data parameters analysis, if required by the regulatory agency. Measurement performance criteria for data to be collected during this project are discussed in Section B5 and are shown in Table 3.

A.8 SPECIAL TRAINING/CERTIFICATION

Due to the specialized nature of the skills required for the navigation and boat piloting in the project area, environmental survey operations, PVV interpretation, Haggitt Consulting has specialized experience to perform the tasks required in this study. As the individuals selected to support this program have experience in their specialized areas, no additional training or certification is expected to be required under this scope of work.

Table T.3 Measurement Performance Criteria.

Measurement Parameter	Precision	Bias	Completeness (%)
Physicochemical Measurements			
DGPS	± 1 meters	NA	≥90
Water Depth	± 0.06 ft.	NA	

NA = not applicable.

A.9 DOCUMENTS AND RECORDS

Thorough documentation of all field sample collection and handling activities is necessary for proper processing in the laboratory and, ultimately, for the interpretation of study results. Field sample collection and handling will be documented in writing using the following forms and labels:

- Field log notebooks to record observations, sampling date, time, sampling site/location, DGPS coordinates for each sampling site, and calibration data.
- Hard copy records, and where feasible electronic records, obtained from the instruments used in the field.

The Haggitt Consulting PM will maintain files, as appropriate, as repositories for information and data used in the preparation of any reports and documents during the project and will supervise the use of materials in the project files. The following information will be included:

- Any reports and documents prepared.
- Contract and work assignment information.
- Project QAPP.
- Communications (memoranda; internal notes; telephone conversation records; letters; meeting minutes; and all written correspondence among the project team personnel, subcontractors, suppliers, or others).
- Studies, reports, documents, and newspaper articles pertaining to the project.

- Special data compilations.
- Spreadsheet data files: physical measurements, data (hardcopy and on diskette)
- All field records, including filed sampling log notebooks containing all pertinent sampling data.

Copies of the field log notebook entries and data generated during the field surveys will be supplied to Haggitt Consulting for data compilation and entry. Formal reports submitted to NSEA Timber Incorporated that are generated from the data will be maintained at Haggitt Consulting' Sitka office in the central file (diskette and hard copy). The data reports will include a summary of the types of data collected, sampling dates, and any problems or anomalies observed during sample collection.

If any change(s) in this QAPP are required during the study, a memo will be sent to each person on the distribution list describing the change(s), following approval by the appropriate persons. The memos will be attached to the QAPP.

All written records relevant to the sampling and processing of samples will be maintained at Haggitt Consulting's Auburn office. Unless other arrangements are made, records will be maintained for a maximum of 3 years following project completion.

B.1 SAMPLING PROCESS DESIGN

This section describes the strategy and procedures that will be used to collect sample information and photographs to characterize the Lutak Inlet marine area. The Project Study Design for the 2025 site investigation is included in Appendix A. A navigation and sampling point grid map (Figures 1 and 2 in Appendix A) were prepared by HC to show transects and proposed sampling points.

B.2 SAMPLING METHODS

The Predischarge Survey objective is to define and inventory the entire project area, or ADEC mapped area. This evaluation includes sub-tidal fixtures and structures. Discharge mapping from all sources that may impact the Dive Survey are completed for the project area. The survey is submitted with the Notice of Intent by an existing facility seeking coverage under AKG5210000.

Video Survey Methods; Plan View Video (PVV)/DO sampling
The system is comprised of a 12-channel satellite receiver providing DGPS and WAAS coordinates to shipboard navigation and infrared camera equipment. The satellite receiving antenna is located directly above the sample point being observed. The camera is weighted and lowered on lead line from the vessel to within 2 vertical feet of the sample point. The infrared camera records the substrate condition for at least 60 seconds, this video feed is combined with a live satellite data stream that includes; Latitude and Longitude (to the fourth decimal point), speed, heading, time (Greenwich mean time) and date. The video is then edited to the 30 second segment that includes the projected sample point location. The live data and digital media that

result from this survey are reviewed to determine the percent of coverage at each sample point. Observations of the debris viewed over the full 60 second segment are compared against the representative clip of the sample point to ensure fair portrayal of the intended sample point. Observations are recorded in data tables and a coverage map is produced. Each report includes an appendix of video still images of the sample points observed.

Parallel Transects

Transect positions are determined by the scope of work outlining sample point frequency, the physical layout of docks or structures in the area and may be field adjusted to accommodate in situ conditions. Transects are situated in a location that would provide the best survey coverage of the area used as a receiving water for the discharge. Additionally, DGPS/WAAS coordinates are acquired at the hub and each sample point along the transect to facilitate relocation. Transects are established in degrees magnetic and the transect interval distance is designated at 15, 30 and 75 feet by the study design.

Transects and sample points are pre-plotted onto an electronic chart, with coordinates. The vessel tracks on this chart using a satellite receiver that provides data for the electronic chart software to trace the vessels progress along the transect. Transect sample points and end points are recorded with DGPS/WAAS coordinates to provide actual sample points and headings traveled. The transects are terminated by the requisite of beyond the area of significant accumulation, physical barrier or the required scope of services.

Sample Points

Samples are taken at intervals of 30 linear feet along each parallel transect. This interval distance was established with the use of a rolling tape measure, the accuracy is reported as +/- 3 inches at 1000 feet. At each sample point observations will be noted on the abundance and type of marine organisms present, the native vegetation, and composition of the native substrate/bark processing residues. Data including the water depth, current direction, and estimated current velocity also will be incorporated into the field notes. Each of the sample points also will include relevant observations on operational debris and existing bark waste debris. Photographic documentation will be used at representative sample locations to record algal life, animal life, substrate, and debris present. Sample location depth notations are based on readings from a Cochran Consulting Nemeses IIA dive computer calibrated for saltwater and altitude.

Area and Volume of Debris

For each survey, the percentage of bark debris coverage will be determined by using the protocol for performing a seafloor monitoring program given in the ADEC APDES Permit and requirements of the NOI. The area calculation used in this report is outlined as a combination of the seafloor survey protocols found in the ADEC AKG52000 and AKG523000 General Permits. Area calculations are accomplished by drafting scaled transect diagrams from the sample point tables in TurboCAD Professional V17. The TurboCAD program then accomplished the area calculations. ADEC has approved the use of CAD programs for area calculations. Volume calculations will be based on all areas of continuous cover, including discontiguous areas.

Sample Point Analysis

Video: A DGPS with a fluxgate compass is used to provide location information for each still image contained in the video. The combination of multiple DGPS antennas, DGPS integrated side scan and down scan sonar, DGPS mapping software and DGPS integrated video provides accurate GIS information for each sample. Sampling is continuous in video seafloor survey work.

Samples are taken at intervals of 15 linear feet along each parallel or radial transect. The images in the report are representative of the sample surveyed. They are designed to illustrate the nature and character of the debris at that sample point (see required ADEC methods). The methods require the investigator to assess a one square meter quadrate (~3ft x3ft area). The images will attempt to capture the entire 3' by 3' area but may focus on only those areas covered in bark processing debris. Both the images in this report and direct diver observation of the sample point require the assessment be made within 3 feet of the substrate.

Percent of cover is determined in the field from either direct observation of the quadrate or live video observation of a nine square foot area. The results are then recorded in the data table for area calculations.

Area of Deposit

Only discharge as is defined in the permit at the one-half inch minimum detection limit (MDL) or over, in thickness are used to calculate the area of bark deposit. The calculated area of deposit includes all continuous, discontinuous, contiguous and noncontiguous discrete areas. Trace coverage shall be reported as those sample plot areas with less than ½" thickness, no matter the percentage of coverage; and/or those 'Trace' areas with less than 10% coverage of the sample plot. All types of noncontiguous bark deposits within the survey area meeting the MDL of one half inch in thickness are combined in the spatial extent totals and the volumetric calculations for cubic feet of coverage.

The linear distance for each transect is based on a measurement of the seafloor under the pile, not the distance over the pile. This is done to determine the accurate footprint of the pile, or the amount of seafloor space covered by the deposit. The method of correcting the distance measurement recorded by the diver of each transect over the pile to the actual distance the transect covered crossing the seafloor is as follows:

A measurement is taken of the water depth (converted to MLLW1) at each sample point (every 15 feet) along the transect. The sample point depth located at the defining edge of coverage (T4DS1; Figure 1) is compared with the sample point depth that marks the furthest edge of the coverage (T4DS11). The line between these two points is considered the native grade of the substrate. All bathymetric elevations of the bark waste pile above that grade are expressed as thickness. For an accurate determination of the spatial extent of the seafloor impacted by the discharge, it is necessary to measure the footprint of the discharge pile, or the distance across the

1 For accuracy, the time stamp in the digital sample point image is used to convert the depth reading from feet of seawater to MLLW. A computerized tide program that corrects from the nearest tide station to the coordinates of the site is used to refine this conversion.

seafloor substrate that is subject to benthic smothering. In Figure 1, the linear measured distance over the top of the pile from T4DS5 to T4DS9 is 74.39 feet. In contrast, the actual measurement of the seafloor (along the native grade) from T4DS5 to T4DS9 is 61.69 feet.

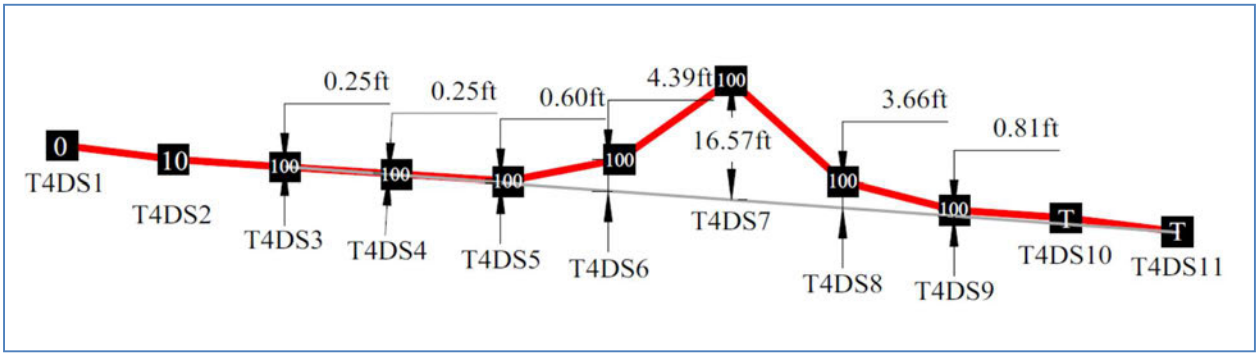

Figure 1. *Calculation of "thickness" of a debris pile based on bathymetric elevation of the pile over a linear transect located on the substrate (file drawing).*

Once the native grade of the seafloor is established on the scaled CAD drawing sheet, the actual transect distance is measured from T4DS1 to T4DS11 along the native grade. By dropping each sample point down to the native grade, the sample point interval distance is converted from apparent distance to actual distance. Note in Figure 1 that the sample point interval spacing between T4DS5 and T4DS9 increases in horizontal distance in proportion to the vertical distance traveled. The same process can be accomplished using an algorithm rather than a CAD program.

For each survey, the percentage of coverage is determined by using the protocol for operating a seafloor monitoring program in the ADEC General Permit as required. The area calculation method used in this report is outlined in the ADEC GP 523000. Area calculations are accomplished by drafting scaled transect diagrams from the recorded sample point coordinates into Turbo CAD Professional V17. The Turbo CAD program then accomplished the area calculations. ADEC has approved the use of CAD programs for area calculations. The area calculations are based on the coordinates recorded and interpreted by Turbo CAD, this process contains no known errors.

Waste Pile Thickness

The thickness of the waste pile is measured using a non-flexible ruler at designated sample points. If the thickness measurement increases to over 4 inches, the following method is used to determine thickness.

The thickness of the waste pile is determined by measuring the highest point in the water column that the waste pile achieves at each sample point. This measurement is taken by the diver using a depth gauge that is calibrated for salt water and altitude. The unit of measure is in feet of seawater (FSW). This FSW unit is converted to feet MLLW by reviewing the appropriate tide level at the time the reading was taken.

The seafloor grade is then calculated by determining the shallowest and deepest points of covered substrate along the transect that intersected the maximum height of the pile. This is done in a similar fashion to the elevation reading by recording the FSW depth/time and

converting it to MLLW depths. The distance along the transect between the beginning of the discharge pile and the maximum height of each sample point is then determined by reviewing the sample point distance intervals, observations and records. A vertical line is then drawn from the sample points MLLW elevation to the point where it intersects the grade on the seafloor. This determines the seafloor depth directly under the sample point's maximum height.

The seafloor MLLW depth is then subtracted from the maximum MLLW elevation depth of each sample point to obtain the thickness measurements. The highest reading the survey records is presented as the maximum pile thickness. If the maximum pile elevation does not align with the sample point interval (i.e. falls between two sample points), a separate reading is taken and labeled maximum thickness (MT).

B.3 ANALYTICAL METHODS

Multiple specific methods will be used in the analysis of photographs and sediment samples. All methods will adhere to the current standard of scientific analytical practices.

B.4 QUALITY CONTROL

Data quality is addressed, in part, by consistent performance of valid procedures documented in the standard operating procedures. It is enhanced by the training and experience of project staff (Section A8) and documentation of project activities (Section A9). This QAPP and other supporting materials will be distributed to all sampling personnel. The Field Survey Leader will ensure that samples are taken according to the established protocols and that all forms, checklists, and field measurements and instrument calibrations are recorded correctly during the sampling episode. Following data entry, all spreadsheets will be proofread using the original handwritten field and laboratory data sheets. This review will be performed by someone other than the data entry specialist. Calculations for data quality indicators will be performed as soon as possible.

The QA section of the Final Report will include all records as well as calculations of accuracy and precision based on independent checks, to the extent possible depending on funding limitations.
Reports prepared by any member of the Haggitt Consulting team must be edited; and photographs and data tables compared with the narrative text to ensure that they are clear, concise, and complete.

The previous QC statistics will be calculated as described in the following sections:

Precision

Precision is a measure of internal method consistency. It is demonstrated by the degree of mutual agreement between individual measurements or enumerated values of the same property of a sample, usually under demonstrated similar conditions. Precision of sampling methods is estimated by taking duplicate samples at the same sampling site at approximately 10 percent of the sites.

This QC calculation also addresses uncertainty due to natural variation and sampling error. Precision is calculated from two duplicate samples by relative percent difference (RPD) as follows:

$$RPD = \frac{|C_1 C_2|}{(C_1 + C_2)/2} x100$$

where C_1 = the larger of the two values and C_2 = the smaller of the two values. If it is to be calculated from three or more replicate samples (as is often the case of laboratory analytical work), the relative standard deviation (RSD) will be used and is calculated as

$$RS$$

where s = standard deviation and X = mean of repeated samples. The standard deviation or the standard error of a sample mean(s) is calculated as

$$SD = \sqrt{\frac{\sum_{i=1}^{n}(X_i - \overline{X})^2}{n-1}}$$

where X_1 = measured value of the replicate, X = mean of repeated sample measurements, and n = number of replicates. Precision can also be expressed in terms of the range of measurement values.

Duplicate field samples will be collected to assess precision of photographic sampling. For this PVV survey, field data recording procedures include hand written logs, audio-voice recording and photographic documentation. Non-flexible measuring devices with finely graduated scales will be used for measuring. All measuring devices used will be described and an estimate of their precision or reliability recorded.

Accuracy

Accuracy is defined as the degree of agreement between an observed value and an accepted reference or true value. Accuracy is a combination of random error (precision) and systematic error (bias), which are due to sampling and analytical operations. Bias is the systematic distortion of a measurement process that causes errors in one direction so that the expected sample measurement is always greater or lesser to the same degree than the sample's true value. *Precision* and *bias* may be used instead of accuracy.

Since accuracy is the measurement of a parameter and comparison to a "truth," and the true values of environmental physicochemical characteristics cannot be known, use of a surrogate is required. Accuracy of field measurements will be assumed to be determined through use of precision. Accuracy of data entry into the project database will be controlled by double-checking all manual data entries.

For the dive surveys, transect accuracy begins by verifying the coordinates of the previous surveys (if any). The transect hub coordinates and bearings are added onto an electronic chart. Transect bearings and distances are then established and measured. This is compared to the survey logs and pre-existing reports for accuracy. The electronic chart is then traced by an AutoCAD program, the transect angles are verified and a scale is determined. This then undergoes the addition of sample point data to provide a visual representation of the total survey area, and the zones of Continuous and Discontinuous debris. Operational debris and bathymetric information is incorporated into the final as necessary. The use of this method provides for accurate repeatability, as the sample points are based on the same nautical charts that will be used to relocate the sites' transects in a future survey.

Representativeness

Data representativeness is defined as the degree to which data accurately and precisely represents a characteristic of a population, parameter, and variations at a sampling point, a process condition, or an environmental condition. It therefore addresses the natural variability or the spatial and temporal heterogeneity of a population. The number of sampling station locations will be examined to ensure representative sample collections in each area.

HC will prepare the Level I Seafloor survey report based on field data collected in the site assessment. The environment is in a state of constant change, thus the data sets and conclusions contained in the report are only accurate as of the date of the survey. The information contained in the report is reviewed to ensure that its overall impression fairly represents the site conditions at the time of the field survey.

Completeness

Completeness is defined as the percentage of measurements made that are judged to be valid according to specific criteria and entered into the data management system. To achieve this objective, every effort is made to avoid accidental or inadvertent sample and/or data loss. Accidents during sample transport or lab activities that cause the loss of the original samples will result in irreparable loss of data. Lack of data entry into the project database will reduce the ability to perform analyses, integrate results, and prepare reports. Field personnel will assign a set of continuous identifiers to a batch of samples.

Percent completeness (*%C*) for measurement parameters can be defined as follows: $$\%C = \frac{V}{T} x100$$

where V = the number of measurements judged valid and T = the total number of measurements. For this project, sampling will be considered complete when no less than 90 percent of the samples collected during a particular sampling episode are judged valid.

Reports prepared by any member of the Haggitt Consulting team will be checked against contractual requirements to ensure they contain all of the information required.

Comparability

Two data sets are considered to be comparable when there is confidence that the two sets can be considered equivalent with respect to the measurement of a specific variable or group of variables. Comparability is dependent on the proper design of the sampling program and on adherence to accepted sampling techniques, standard operating procedures, and QA guidelines.

Each report provided by HC will be based solely on information obtained from the field survey. Comparisons to previous surveys conducted by HC will be found in the conclusions section of the report. Comparisons to previous reports conducted by other contractors will be included by request.

B.5 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

Periodic regular inspection of equipment and instruments is needed to ensure the satisfactory performance of the systems. All equipment to be used during the sampling event will be inspected and serviced according to accepted protocols. To the extent practicable, backup field equipment will be available during all field activities in the event of an equipment breakdown.

B.6 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

All field sampling instruments will be examined to certify that they are in good operating condition. This includes checking the manufacturer's operating manual and the instructions for each instrument to ensure that maintenance requirements are being observed. Calibration methods and values for all instruments will be recorded in the field log notebook.

B.7 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Supplies and consumables are those items necessary to support the sampling and analytical operation, including but not limited to bottle ware, hoses, decontamination supplies, preservatives, and various types of water (potable, deionized, organic-free, etc.). Upon delivery of supplies, the Field Survey -Leader will ensure that types and quantities of supplies received are consistent with what was ordered and with what is indicated on the packing list and invoice for the material. While preparing for sampling, the Field Survey Leader will be responsible for acquiring and inspecting materials and solutions that will be used for obtaining the samples for analytical field measurements. Only bottles that have been properly cleaned, dried, and stored with their caps on will be used.

The Field Supervisor is responsible for ensuring that all measurements and samples are collected in accordance with the QAPP. In the event of equipment failure or other problems occurring while in the field, the Field Supervisor must determine, in conjunction with NSEA Timber Incorporated, ADEC and Haggitt Consulting, whether backup equipment can be obtained quickly to continue the sampling effort. Any deviations from the planned sampling procedures must be recorded in the field log notebook and on any pertinent forms.

B.8 NONDIRECT MEASUREMENTS

Not applicable.

B.9 DATA MANAGEMENT

Samples will be documented and tracked by means of sample identification labels. The Field Survey Leader will be responsible for completing these forms. Data entered into any spreadsheet or other format will be manually checked by another person against the original source to ensure accurate data entry. If there is any indication that requirements for sample integrity or data quality have not been met (for samples or measurements collected by Haggitt Consulting), the Haggitt Consulting QAO will be notified immediately (with an accompanying explanation of the problems encountered).

Photographic images will be identified by station, time, date, and other information, both electronically and on hard copies. When appropriate, the photographic data contained in the survey report will be reduced to representative samples. The guidelines for this reduction will be established between NSEA Timber Incorporated and Haggitt Consulting on a case-by-case basis. Generally, the purpose and intent of data reduction is to mitigate duplication of similar representative samples. Each final report will be compared against the field notes to validate the data points. Every attempt will be made to disseminate the information in a succinct fashion. The report will be formatted and reproduced in a common hard copy and electronic form. All reports will be prepared in the electronic file format Microsoft Word as required by NSEA Timber Incorporated and ADEC.

Haggitt Consulting will store all computer files associated with the project in a project subdirectory (subject to regular system backups) and will copy the files to disk for archive for the 3 years subsequent to project completion (unless otherwise directed by the NSEA Timber Incorporated ECD).

C.1 ASSESSMENTS AND RESPONSE ACTIONS

The QA program under which this work assignment will operate includes implementation of preventive protocols as well as oversight and independent checks of the data obtained from sampling, analysis, and data gathering activities. The QA programs followed by subcontractors will be reviewed by the Haggitt Consulting Team to ensure that similar levels of QA/QC are attained. Each team member will work to prevent problems by training staff, ensuring equipment is calibrated and properly maintained, procedures are followed, and oversight is constant. If a problem occurs, the essential steps in the QA program are as follows:

- Identify and define the problem.
- Assign responsibility for investigating the problem.
- Investigate and determine the cause of the problem.
- Assign and accept responsibility for implementing appropriate corrective action.
- Establish effectiveness of and implement the corrective action.
- Verify that the corrective action has eliminated the problem.

Immediate corrective actions form part of normal operating procedures and are noted in records for the project. Problems not solved this way require more formalized, long-term corrective action. In the event quality problems that require attention are identified, Haggitt Consulting or the subcontractor will determine whether attainment of acceptable quality requires either short- or long-term actions. If a failure in an analytical system occurs (e.g., performance requirements are not met), the Haggitt Consulting PM or QAO will be responsible for corrective action and will immediately inform the NSEA Timber Incorporated ECD. The Haggitt Consulting PM has the primary responsibility for monitoring the activities of this project and identifying/confirming any quality problems. These problems will also be brought to the attention of the Haggitt Consulting QAO, who will initiate the corrective action system described above, documenting the nature of the problem and ensuring that the recommended corrective action is carried out. The Haggitt Consulting QAO has the authority to stop work on the project if problems affecting data quality that will require extensive effort to resolve are identified. The NSEA Timber Incorporated ECD will be notified of major corrective actions and stop work orders.

Performance audits are quantitative checks on different segments of project activities; they are most appropriate for sampling, analysis, and data processing activities. Performance audit techniques include checks on sampling equipment, volume measurements, and the analysis of data quality using QC and spiked samples. The Haggitt Consulting PM or designee is responsible for overseeing work as it is performed and periodically conducting checks during the data entry and analysis phases of the project. Field and laboratory audits will not be performed during this project.

System audits are qualitative reviews of project activity to check that the overall quality program is functioning and that the appropriate QC measures identified in the QAPP are being implemented. An internal system audit will not be conducted for this project unless specifically requested by the NSEA Timber Incorporated ECD and will consist of a separate task order to Haggitt Consulting.

C.2 REPORTS TO MANAGEMENT

A final report will be sent to the NSEA Timber Incorporated ECD that summarizes and presents the findings of the evaluation as discussed in the project objectives of this document. Original reports will be made available to ADEC upon request.

D.1 DATA REVIEW, VERIFICATION, AND VALIDATION

Data review, verification that the specified data were collected, and validation that the data were obtained by the protocols specified in the QAPP, provide a method for determining the usability and limitations of data, and provide a standardized data quality assessment. Funding is limited for these activities but will be conducted to the extent possible; however, all data will be turned over to NSEA Timber Incorporated for corporate examination. Results of the review, verification, and validation processes will be reported to the Haggitt Consulting PM and summarized in the final reports submitted to NSEA Timber Incorporated.

D.2 VERIFICATION AND VALIDATION METHODS

Field record forms, field log notebooks, and chain-of-custody records will be reviewed by the Haggitt Consulting PM for completeness and correctness. Any discrepancies in the records will be reconciled with the appropriate associated field personnel and will be reported to the NSEA Timber Incorporated ECD. Haggitt Consulting will be responsible for reviewing data entries and transmittals for completeness and adherence to QC requirements. Data quality will be assessed by comparing entered data to original data or by comparing results with the measurement performance criteria summarized in Section A7.2 to determine whether to accept, reject, or qualify the data. Analytical verification and validation will be followed per the methods and protocols established by the field staff, and are beyond the scope of this QAPP

D3. RECONCILIATION WITH USER REQUIREMENTS

As soon as possible following completion of the sample collection and analyses, precision, accuracy, and completeness measures will be assessed by Haggitt Consulting and its team members and compared with the criteria discussed in Section A7. This will represent the final determination of whether the data collected are of the correct type, quantity, and quality to support their intended use. Any problems encountered in meeting the performance criteria (or uncertainties and limitations in the use of the data) will be discussed with the NSEA Timber Incorporated ECD and will be reconciled, if possible.

REFERENCES

Haggitt Consulting. 2000-2025 Bark Monitoring Reports

USEPA. 2001. EPA Requirements for Quality Assurance Project Plans. EPA QA/R-5, EPA/240/B-01/003, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, March 2001.

ADEC-APDES Permit AK-520000

ADEC-APDES Permit AK-521000

ADEC-APDES Permit AK-528000

ADEC-Guidance Required Methods for Bark Monitoring Work 2001

ADEC- Guidance Required Methods for APDES Seafloor Surveys 2018

ADNR/NSEA/HC- Email communication record.

APPENDIX A

Study Design

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Technical Project Study Design 2025, Lutak Log Transfer Facility.

Project: APDES Predischarge Seafloor Survey

Prepared for:

NSEA Timber Incorporated

Polly Johannsen

Owner

Chehalis Washington

Prepared by:

Haggitt Consulting

Auburn Washington

Submitted on April 23, 2025

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Introduction

NSEA Timber Incorporated submitted an application for a land use and discharge permit for the purpose of operating a Log Transfer Facility and a Log Storage Area in Haines, Alaska. The ADEC discharge permit requires a dive survey be performed to document existing conditions at the LTF and LSA locations. This is a required submittal with the Notice of Intent to Discharge.

The Predischarge survey will document existing conditions at the site. The survey will include an underwater investigation of the seafloor in the vicinity of the discharge location. The survey will utilize time and date stamped geo-referenced underwater video to document conditions.

The LTF survey will use ADEC approved methods and consist of five transects spaced at 30-degree intervals. Each transect will be sampled every 15 feet. Transect lengths will be 300 feet unless conditions require the transects to be extended to document debris. The LSA survey will consist of 5 transects spaced at 75-foot intervals and arranged in a parallel array. A modification of the contract and QAPP may be necessary in such an event. The final location and bearing for transects will be determined in the field to best delineate the conditions present.

This study design and associated QAPP will address the state guidelines regarding data collection methods as is defined in Permit AK521000.

Seafloor Survey Objective

The ADEC Notice of Intent further requires that the results from the seafloor survey and assessment be included with the Notice of Intent to discharge.

Approach:

1. Records Review
2. Quality Assurance Project Plan
3. Field Inspection
4. Assessment and Reporting

The 2025 study reviews existing project records to provide a detailed Quality Assurance Project Plan that defines the objectives, scope of work, methods, and schedule. The QAPP also defines project personnel roles and lines of communication between the client, the state and the inspector. Once approved (signed) by each party, the QAPP provides field guidance for the study and ensures defined objectives are met, as well as the framework to address deviancies.

Field work to acquire the data sets contained in the N.O.I. is expected to take two days on site. All necessary equipment and supplies will be provided by this inspector to complete the tasks with the following assumptions:

1. A suitable vessel with motor must be available for use at the site to access and define the conditions present, or beach access for the same objective.

2. It is understood that because of the remote location transportation may be limited; the client will provide local transportation and access to the site if necessary.
3. Reasonable access to relevant records contained at the facility is requested. Structural plans or diagrams for the existing discharge conveyance system are requested if available. Plans for updated or future discharge systems are also requested.

Assessment of the data sets and developing the deliverables will take approximately two weeks to complete after field work. The following schedule is anticipated for your project:

Schedule

Item or Event	Due Date
Final Study Design and QAPP submitted	April 23, 2025
Field work conducted	April 25-27, 2025
Level I Seafloor Survey submitted	May 15, 2025

The field work will be scheduled immedatly after approval of the study design, at this time that schedule is anticipated to result in field work being performed April 25-27, 2025.

Prior to field work commensing, a Quality Assurance Project Plan for the survey will be availible to ADEC for review. Final reporting will be delivered to NSEA by May 15, 2025. If the results of the Predisharge survey indicate a requirement for a bark monitoring survey, that survey will consist of an additional task order and a modified QAPP.

REQUIRED APDES SEAFLOOR SURVEY METHODS

Quality Assurance Project Plan Information. The surveyor shall, prior to commencing operations, prepare a written Quality Assurance Project Plan – Monitoring Plan (QAPP-Monitoring Plan) for each site addressing the following: 1. Objectives for measurement data 2. Sampling procedures 3. Analytical procedures 4. Data reduction, validation, and reporting 5. Internal quality control checks 6. Specific routine procedures used to assess data precision, accuracy, completeness, representativeness, and comparability. Video recordings and photographs are required to be submitted electronically, or on a DVD. If feasible, the electronic copy of the report, GIS/GPS map layers, video recordings and photographs are required to be submitted at the same time or are required to be on a single DVD.

Establish Markers. A facility operator's QAPP-Monitoring Plan is required to include the establishment of at least five permanent shore-based or facility-based markers (monuments) at suitable locations, provided there is sufficient land/facility location to place five monuments. Some facilities are located over water, or the operator does not own the land the bark processing facility is located on. If the facility is located over water, the Photographic survey is required to document in the Level I Report useable permanent underwater markers (large rock outcrops, boulders, etc.), or identify why markers/monuments were not established. If permanent markers are not established the operator shall work with the surveyor to establish repeatable methods to for future surveyors to make observations and establish consistent transects. The operator's QAPP-Monitoring Plan is required to be updated to include the surveyor's established underwater markers for use in the next required seafloor survey. GPS coordinates derived using Wide Area Augmentation System (WAAS) technologies, or other equivalent technology, is required be recorded for each permanent shore or underwater marker.

Establish Transect Lines. The photographic survey is required to be completed on a 75-foot transect interval distance (75 feet between transect lines and 30 feet between photographic location sites on each transect) for the entire authorized project area ZOD. The operator's QAPP-Monitoring Plan must develop and document the methods used to establish the transect lines. Parallel transects are required to be established no more than 30 feet apart and extend in a perpendicular direction from the permanent markers. The surveyor is required to establish the number of transects necessary to encompass all bark waste coverage areas (continuous, discontinuous and/or trace) found in the Level I Report, if completed.

The permittee shall provide the surveyor a copy of the permit, the permittee's APDES Authorization that includes the mapped seafloor survey area required to be surveyed, any identified location(s) of bark waste deposits as documented through the previously conducted Seafloor Survey(s), and this Seafloor Survey Protocol. A permittee may use either a diver as a surveyor, a remotely operated vehicle (ROV) with high definition photographic capability (with still-image capture capability), or a high definition underwater video camera (with still-image capture capability) towed behind a vessel to obtain the required photographs. The photographic survey shall be completed on a 75-foot by 30-foot grid pattern (75 feet between transect lines and 30 feet between sample plot along each transect).

The permittee is required to collect continuous Wide Area Augmentation System (WAAS) enhanced Global Positioning System (GPS) location information (reported in decimal degrees, to the fifth decimal place, if available) while conducting the survey so that any vessel drift can be mapped and used comparatively in the Level II - Seafloor Dive Survey. The permittee is also required to collect continuous depth information for each sample plot location, corrected to Mean Lower Low Water (MLLW).

Photographs are required, on the designated grid spacing, and will establish the general locations of the bark deposits extending into water depths and may be used for future adjustments to the initial mapped seafloor survey area. If bark processing waste is visible farther than the initially mapped seafloor survey area, the Level I - Photographic Seafloor Survey shall continue beyond the initially mapped seafloor survey boundaries until bark processing waste is no longer visible. Current technologies exist that allow the Level I - Photographic Seafloor Survey to extend into water depths greater than -120 feet Mean Lower Low Water (MLLW).

If a neighboring facility's bark waste deposits are, or have been, documented to merge with the permittee's bark waste deposits (as depicted by a historic seafloor survey(s)), the surveyor performing the Level I - Photographic Seafloor Survey is only required to make observations 100 feet beyond their initially mapped seafloor survey area boundary (see Figure 1) in relationship to the merged bark waste deposit areas.

Seafloor Survey Report

I - Photographic Survey Report. The permittee shall submit a Level I - Photographic Survey Report to DEC containing the following information (due with the current year's Annual Report):

1. **Facility Information**
   a. Permittee Name, APDES permit number, address, and contact information.
   b. Type of waste treatment processes, product and by-product production processes.
2. **Surveyor and Survey Information**
   a. Surveyor's name, signature and contact information.
   b. Brief background of surveyor's previous work history performing photographic seafloor surveys and mapping.
   c. Date and time the survey was completed.
   d. Vessel Name, USCG number of vessel assisting in survey.
   e. Name of the receiving water where the survey was completed.
   f. Continuous Global Positioning System (GPS) location information (reported in decimal degrees, to the fifth decimal place if available) while the survey is completed.
   g. Whether there are other waste discharges occurring within 0.25-mile of the permittee's discharge locations.

h. Whether waste discharge was occurring at the time of the survey.

i. QAPP that describes the method used to:

- Establish linear transects,
- Locate sample plot's grid locations along the transects,
- Estimate percent coverage at each sample plot (photograph location), and
- Calculate the continuous and discontinuous coverage area(s) of bark waste deposits.

3. Previous Survey Information

a. Name of surveyor(s) who completed the previous survey(s).

b. Name of receiving water.

c. Date, time, and place of previous seafloor survey(s).

d. Date of completion of any previous seafloor survey report(s) and first and last name(s) of individual(s) who performed the analysis and report writing

e. A narrative of the seafloor survey(s) results that describes the methods and results of previous survey(s), including:

- Total aggregate area(s) of bark waste deposits
- Any available electronic or hard copy mapping of waste deposits found

f. Whether the permittee has performed mechanical raking or other pile reduction strategies have been implemented by the permittee at any time.

4. **Sample Plot Observations** - The photographic survey shall be completed on a 75-foot by 30-foot grid pattern (75 feet between transect lines and 30 feet between sample plots (photographic image locations) along each transect for the entire mapped seafloor survey area. Each photographic sample plot location must include the following:

a. **Digital photographs** - Digital photographs representative of the sample plots must depict the nature and coverage of bark processing waste deposit(s), if any, on the seafloor at the sample plot locations along parallel transects. Digital photographs shall capture images of natural sediment, natural sediment covering bark processing waste, if observable, and bark waste and/or bacterial mats covering the seafloor. The surveyor must document if they are able to differentiate between natural sediments or evidence of bark waste residues. Observations and photographs depicting mixed sediments may require additional testing.2. Photographs shall be of sufficient definition, clarity, and detail to clearly

2 Seafloor surveyors may be unable to differentiate between natural sediments and fine particle size bark processing waste. If this is the case, the surveyor may need to obtain sediment grab samples and determine organic enrichment.

document the seafloor's conditions and observations. Photographs shall include a digital date and time stamp. The photograph log shall include the name of the bark processor, survey date, and photographic sample plot location identifier.

b. **Deposit Type –** The facility's QAPP-Monitoring Plan is required to include the character of bark waste deposits observed (e.g., bones, ground bark waste, natural sediments (sediment sloughs, tidal sands), and/or observations of sediments burying bark waste.

1. **Amount and Type of Bark Waste Coverage -** The surveyor must estimate and record the percentage (0% to 100%, rounding to the nearest 10%) of seafloor area(s) covered by bark processing deposits. The observation at the sample plot must also include a description of the type of observed bark waste deposits.
2. **Percent Coverage.** The QAPP-Monitoring Plan shall require the surveyor to estimate and record the percentage (0% to 100%) of seafloor area covered by bark waste at the sample plot location. The photograph is required to be representative of the sample plot location along the transect and provide enough detail to estimate the percent coverage of an approximate three-foot square sample plot.
3. **Area Calculations.** A three foot by three-foot (3' x 3') sample plot represents 2,250 square feet (ft^2) of seafloor in the 75-foot by 30-foot grid. If calculations for radial transects arrays (triangles) are required, guidance is available in the ADEC publication "Required Methods for Bark Monitoring work".

The seafloor survey shall report each 3' x 3' sample plot's bark waste coverage to the nearest 10%, as follows:

a. **Trace**

Result	Report
0-9%	Trace

b. **Discontinuous Coverage** – All discontinuous coverage will be calculated and reported as follows:

Result	Report
10-14%	10%
15-24%	20%
25-34%	30%
35-44%	40%
45-54%	50%
55-64%	60%
65-74%	70%
85-94%	90%

c. **Continuous Coverage** - Transect Squares with 90% - 100% coverage will be considered Continuous Coverage. All continuous coverage will be calculated and reported as follows:

Result	Report
90-100%	100%

Calculate the spatial extent of the bark processing waste deposits with 10 – 90% coverage, as a percentage of 2,250 sq. feet.

Example Calculations:

- **Discontinuous** Areas "A" - Six sample plots that are reported as 60% coverage

$$6 * 2{,}250\ ft^2 * 0.6 = 8{,}100\ ft^2$$

- Discontinuous Areas "B" - Eight sample plots that are reported as 80% coverage

$$8 * 2{,}250\ ft^2 * 0.8 = 14{,}400\ ft^2$$

- Discontinuous Area "C" – Twelve sample plots that are reported as 30 % coverage

$$12 * 2{,}250 ft^2 * 0.3 = 8{,}100\ ft^2$$

Total 10-94% discontinuous coverage = 8100 + 14400 + 8100 = **30,600 ft²**

Report Acres: 30,600/43,560 = **0.70 acres**

Example Calculations:

- 15 transect squares times 2,250 ft² each (15 * 2250) = **33,750 ft²** of continuous coverage.

c. **Beggiatoa (or other) Mats.** Document the absence or presence, as well as size

and location of Beggiatoa, or other microbial mats observed on or near any bark waste deposits or the seafloor. All Beggiatoa, or other bacterial mat areas shall be counted as continuous coverage.

d. **Sea Flora and Fauna** Type and number of macro sea fauna (sea life) and type of aquatic vegetation observed on the seafloor during the photographic survey. Types and quantities of sea life observed adjacent to, on, or feeding on any bark processing waste deposits during videotaping, along with representative photos, with time and date stamp. Mention should be made of any indication of change in sea life behavior from any previous observation or seafloor survey reports, and any other observations relevant to the condition of the benthic community or seafloor.

e. **Substrate** Composition of substrate (soft sediments, cobble, gravels, solid rock and/or glacial silts, or ground/screened bark waste, etc.). If previous benthic assessments, dive surveys or remediation actions have documented the presence of buried bark waste this waste must be included in aggregate, continuous coverage calculations if located in or directly adjacent to (bark waste) discharge location surveyed. The surveyor has the option to obtain new core samples to document bark waste is or is not present the previously identified locations.

f. **Water depth** (adjusted to MLLW, reported in feet) must be reported with the bottom reading measured at the seafloor, or at the top of any sample plot.

g. **Mixing Zone Size** Estimated Height (rise) and length of any observed discharge plume during the photographic survey, if discharge was occurring during the survey.

h. **Water Clarity** A description of water clarity, and changes of water clarity as a result of the discharge, if occurring.

i. **Tides** Ambient tidal current velocity and direction.

5. **Sample Plot Observations Map** - A map or representative drawing (with an identified scale including a north arrow) shall be developed that depicts the facility, the seafloor area surveyed, including the 75 by 30-foot sample transect grid. Each photographic sample plot location must be identified on the map and correlated[3] to the information required in 4.a-g (above). The total aggregate area(s) of the both the continuous and discontinuous coverage area(s) areas shall be reported in square feet, and in acres to the nearest tenth of an acre. The map must include:

   a. The locations of any bark processing waste deposits, including the outer boundaries of any continuous and/or discontinuous coverage areas, in relationship to the discharge location(s), mapped seafloor survey area boundaries, the survey grid, and outfalls, including:

3 Correlating data - Portions of the information required by #4 may be identified by numbers or letters on the map. The numbers are then used to correspond to the data gathered for each sample plot location and presented in a table format or Excel spreadsheet.

i. **Continuous Coverage:** The relative location and estimated size (ft^2 and ac.) of any continuous coverage areas of bark waste.

ii. **Discontinuous Coverage:** The relative location and estimated size (ft^2 and ac.) of any discontinuous coverage areas of bark waste.

iii. **Beggiatoa (or other) Mats:** The relative location and estimated size (ft^2 and ac.) of any Beggiatoa or other bacterial mats discovered during the photographic survey.

iv. **Outfalls and Water Intakes:** Coordinates of beginning and endpoints for all outfalls/intakes (including pipes that fall within the mapped seafloor survey area but do not belong to the permittee, and the permittee's inoperative pipes), description and condition of the outfall(s), condition of cathodic protection for metal outfalls, depth of outfall(s) at MLLW, and outfall diffuser description(s), if any. Outfalls that belong to the permittee need to provide the following additional information:

a) Estimated dates and location of breaks/repairs, **b)** Outfall replacements or relocations, **c)** GIS location of each outfall terminus(s) and identification if the outfall is used by the facility as an active discharge line at any time of year, **d)** Description and condition of the outfall(s), condition of outfall pipe – noting excessive corrosion that could cause pipe failure or is allowing wastewater discharge to occur along the pipe, bends, breaks, **e)** Depth of each outfall terminus (reported in feet MLLW or OHWM), **f)** outfall diffuser (if any) description(s), and **g)** GIS location of seawater intake pipes.

v. **Permanent Markers (if any)**: The location of surface or subsurface permanent survey marker monuments, if any.

6. If select information required in the Level I - Photographic Survey Report is not obtainable using the video/camera methods described above, the Report must include an explanation as to why the information could not be obtained and submit alternate methods with the final report as to how data was obtained.

If seafloor surveys submitted by the operator, or other available evidence, are not sufficient to determine amount of coverage DEC will, in its discretion, require the operator to conduct additional surveys or other monitoring for that purpose.

APPENDIX B

Referenced Material