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Exhibit 1

Travis/Peterson Environmental Consulting, Inc.

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November, 29 2018
1610-02

National Marine Fisheries Service, Alaska Region
Post Office Box 21668
Juneau, Alaska 99802

Attention: **Jon Kurland**
Assistant Regional Administrator for Protected Resources

Dear Mr. Kurland:

The U.S. Army Corps of Engineers, Regulatory Division (USACE) has received and is reviewing a Department of the Army permit application from Mr. Beau Epstein, IPOP LLC to conduct exploratory coring under Nationwide Permit 6, and a test dredge operation, under Nationwide Permits 18 and 19 (USACE File# POA-2018-00123).

The USACE designated Mr. Michael Travis of Travis/Peterson Environmental Consulting, Inc. (TPECI) as the Non-Federal representative to conduct informal consultation under section 7(a)(2) of the Endangered Species Act (ESA) for the proposed project (letter enclosed). We have determined that the proposed activity may affect, but is not likely to adversely affect the bearded seal (*Erignathus barbatus*), spotted seal (*Phoca largha*), and ringed seal (*Phoca hispida*). Our supporting analysis is provided below. We request your written concurrence if you agree with our determinations.

Project Description

The proposed exploratory project consists of two distinct activities. The first involves using a GeoProbe® coring rig to advance exploratory borings for soil sample collection and analysis. Coring will be conducted exclusively in the winter season. The second portion of the exploratory project involves using a small dual-engine, 6-inch diameter suction dredge to evaluate water quality impacts. Dredging will be conducted in the ice-free season. See enclosed equipment photo log for photos of the coring rig and dredge. Both parts of the exploratory project are described below.

Exploratory Coring

A 540MT GeoProbe® will be mounted on a sled pulled behind an all-terrain vehicle. The GeoProbe® uses a percussion hammer to advance probe cylinders into the ground. Core samples will be collected with a 2.25" diameter by 4-foot long sample tube and bagged for onsite logging and possible panning. Samples will then be selected for geochemical analysis and will include metallic screening, multi-element analysis, and free-gold assaying. IPOP intends to advance 13 borings throughout the project area to a maximum depth at 31 feet or refusal.

IPOP anticipates completing two to four borings per day and be finished within 14 days. However, inclement weather conditions could extend this period. The coring program will occur in the winter months.

Exploratory Dredging
A Keene® dual-engine, mini 6-inch dredge (Model #6211M263) will be used to perform the exploratory dredging. IPOP intends to use the mini dredge to dredge five locations within the project area. No more than five cubic yards of material will be removed from any single location. Therefore, total disturbed yardage is not to exceed 25 cubic yards.

Dredging will occur in two phases. The first phase focused on upper sedimentary layers (colloidal silt, clay) and the second phase focused on lower sedimentary layers (sand, gravel). During the dredging process, a powered skiff will trail the dredge within the tailing discharge zone to document surface water turbidity and transparency. Water turbidity and transparency documentation will occur in 100-foot intervals in a semi-circular grid centered on the discharge point. Water column transparency will be documented using a Secchi disc. Water turbidity will be determined at various depths using a Van Dorn-type sampler and handheld optical turbidity meter (Hach® 2100Q, Hanna Instruments® 93703 or similar). IPOP is anticipating a larger turbidity plume from the first phase and a smaller plume from the second and will adjust the grid accordingly.

IPOP anticipates completing exploratory dredging at all five locations within one month. However, inclement weather conditions could extend this period. The dredging program can only occur in open water. The project site is located at Sections 24 and 25, T11S, R30W Kateel River Meridian; 64.513275°N, 164.592773°W near Nome, Alaska.

Description of the Action Area
The action area is defined in the ESA regulations (50 CFR 402.02) as the area within which all direct and indirect effects of the project will occur. The action area is distinct from and larger than the project footprint because some elements of the project may affect listed species some distance from the project footprint. The action area, therefore, extends out to a point where no measurable effects from the project are expected to occur.

For the proposed project, the action area includes the project site located in the Bonanza Channel where the proposed exploratory coring and dredging activities will occur out to a determined in-water radial distance. For this project, the two exploratory activities will occur in opposing seasons and thus have action areas specific to each task. For example, the action area for coring is primarily influenced by the sound generated by the GeoProbe® percussion hammer. The action area also includes waters, which would be impacted by a turbidity plume generated by the dredge. The following paragraphs describe this determination.

Determination of Action Area for Coring
The action area during coring activities is defined as the area where marine mammals could be exposed to underwater noise at 120 decibels (dB) or louder according to the National Oceanic and Atmospheric Administration (NOAA) in-water acoustic threshold guidance (NOAA, 2016). According to GeoProbe®, the operating decibels of the 540MT through air at a frequency of 60 hertz is approximately 120 decibels (dB) at 1m and 80dB at 100m. Decibels cited for air are not equivalent to underwater decibels due to many

variables (i.e., temperature, salinity, density) but primarily because of a difference in reference pressures. However, studies of underwater noise conducted by NOAA's R/V Okeanos Explorer (Nieukirk, 2002) provide a rough conversion between the two decibel scales by adding 26dB when converting decibel levels from air to water. Using this basic conversion, IPOP estimates the GeoProbe® 540MT has an approximate underwater operating decibel level of 146dB at 1 meter and 106dB at 100m. Therefore, the action area radius for coring activities will be conservatively set at 100m. See enclosed Figure 1 for a map of the action area for coring activities.

IPOP also considered the dampening effects of coring within the lagoon. All thirteen soil borings will be advanced within the Bonanza Channel, which is insulated from the waters of Norton Sound by a barrier island. This is significant because underwater sound generated by the coring rig will be mostly confined to the lagoon as the proposed soil boring locations are 3-5 miles from Norton Sound via waters of Safety Sound and the mouth of the Solomon River. Despite this dampening effect, IPOP will maintain a 100m action area.

Coring will occur in the winter season when ice is present. The presence of ice in this area will limit the access of marine mammals into the lagoon since open water necessary for breathing will be either scarce or non-existent. However, ice seal research conducted between 2014-2017 by Alaska Department of Fish and Game (ADF&G) indicated a population of bearded and ringed seals was present in Norton Sound around Nome, Alaska during the winter months. Therefore, bearded and ringed seals are the most anticipated marine mammals to inhabit the project area during coring activities.

Determination of Action Area for Dredging
The Keene® suction dredge does not produce significant sound underwater. Thus, the action area for dredging is not determined by sound but rather by the estimated extent of the generated turbidity plume.

The first phase of the dredging process will involve fine sedimentary layers, while the second phase involves coarser sands and gravels. Therefore, the turbidity plume is expected to reach its maximum extant during the first phase of the dredging process. The purpose of the exploratory dredging process is to determine the extent of the turbidity plume; thus, the action area radius cannot be objectively determined. However, given the small size of the dredge (6-inch intake) and type of sedimentary material being dredged, IPOP does not believe the turbidity plume will exceed 150m (approx. 500ft). Therefore, the action area radius for dredging activities will be set at 150m. See enclosed Figure 2 for a map of the action area for dredging activities.

Dredging will occur in the summer season during a time of year where marine mammals may frequent the Bonanza Channel. The lagoon was surveyed in 2018 and had an average depth of 4-6 feet. Thus, due to their size, whales and porpoises are not anticipated. However, bearded, spotted, and ringed seals have the physiology to access these waters and are therefore the most anticipated marine mammals to inhabit these waters during dredging.

NMFS Listed Species and Critical Habitat in the Action Area

The bearded seal (*Erignathus barbatus*), spotted seal (*Phoca largha*), and ringed seal (*Phoca hispida*) were the only Marine Mammal Protection Act (MMPA)-protected species expected to occur within the action area. The following paragraphs discuss this determination and are organized by species and by the seasons that exploratory activities will occur.

Winter Season - Coring

Exploratory coring will only occur in the winter season when the ice allows rig access to the 13 proposed boring locations. Outside of the bearded seal and ringed seal, no other MMPA-protected species are expected to occur within the 100m winter action area.

Bearded Seal

On December 28, 2012, NMFS listed the bearded seal Beringia distinct population segment (DPS) as threatened under the ESA (77 FR 76740) and depleted under the MMPA. This DPS is the only bearded seal common to Alaska and is thus considered Alaska stock. The ESA listing is a point of contention and has been contested by the Alaska Oil & Gas Association (14-35806,14-35811), but ultimately upheld by the U.S. Court of Appeals for the Ninth Circuit and the U.S. Supreme Court (17-133, 17-118). As such, the bearded seal Beringia DPS remains a threatened species under the ESA. Critical habitat has not been proposed for the bearded seal Beringia DPS.

Given their widespread habitat range, the bearded seal has the potential to be present at the project site. In the winter, bearded seals tend to concentrate around their preferred ice habitat at the ice edge, which allows for hauling out between foraging trips (https://www.fisheries.noaa.gov/species/bearded-seal). The 2014-2017 ADF&G ice seal research confirmed bearded seal presence in the area during winter. However, the probability of encountering a bearded seal within the project area during the estimated 14-day coring timeline is low due to lack of open water within the lagoon during winter. Mitigation measures are discussed in the following section.

Ringed Seal

Like the bearded seal, on December 28, 2012, NMFS listed the Arctic subspecies (the Alaska stock) of the ringed seal as threatened under the ESA (77 FR 76706) and depleted under the MMPA. The listing is also a point of contention for the same reasons as the bearded seal and has likewise been contested in similar cases. However, the ringed seal Arctic subspecies remains a threatened species under the ESA. Critical habitat for the Arctic subspecies of the ringed seal has been proposed and is currently being evaluated. The proposed critical habitat for the Arctic subspecies of ringed seal encompasses much of the Beaufort Sea, Chukchi Sea, and northern Bering Sea, including all of Norton Sound.

Unlike the bearded seal, the ringed seal can occupy areas with 100% ice cover due to their ability to create and maintain their own breathing holes. They also make snow caves (lairs) in snowdrifts that form around the breathing holes. The pups are typically birthed, reared, and weaned in the lairs before the ice melts in the spring (https://www.fisheries.noaa.gov/species/ringed-seal). The 2014-2017 ADF&G ice seal research confirmed ringed seal presence in the area during winter. The probability of encountering a ringed seal within the project area during the 14-day coring timeline is moderate. Mitigation measures are discussed in the following section.

Open Water Season – Dredging

Exploratory dredging will only occur in the open water season when no ice is present at the 5 proposed dredging locations. Outside of the bearded seal and spotted seal, no other MMPA-protected species are expected to occur within the 150m summer action area.

Bearded Seal

Most adult bearded seals migrate north during the summer months to utilize the fragmented ice edge for pup rearing and foraging. The 2014-2017 ADF&G ice seal research showed that migration occurred alongside the sea ice retreat in late-May/early-June months. However, juvenile bearded seals are known to remain near the coast, often in bays, estuaries, and river mouths (https://www.fisheries.noaa.gov/species/bearded-seal). As such, the probability of encountering juvenile bearded seals within the project area during the estimated one-month dredging timeline is high. Mitigation measures are discussed in the following section.

Spotted Seal

Unlike the bearded seal and ringed seal, spotted seals are not ESA-listed and are not listed as depleted under the MMPA. Critical habitat is not considered necessary for the spotted seal.

The spotted seal Bering DPS is the only spotted seal common to Alaska is thus considered Alaska stock. Seals overwinter in the Bering Sea near the sea ice edge and resort to hauling-out in coastal areas throughout the summer. During this time they are primarily foraging (https://www.fisheries.noaa.gov/species/spotted-seal). The probability of encountering spotted seals within the project area during the estimated one-month dredging timeline is high. Mitigation measures are discussed in the following section.

Mitigation Measures

IPOP proposes that the following mitigation measures are implemented to minimize risk to marine mammals within the calculated action area. These basic measures would apply to the proposed coring and dredging activities:

1. Coring and dredging activities will not be initiated until the action area is thoroughly inspected for marine mammal activity by the project manager.

2. A shut-down zone of 100m radius centered around coring activities and 150m radius for dredging activities will be established. All activities will halt if a marine mammal enters the shut-down zone. Activities will resume once the animal has exited the shut-down zone on its own accord.

3. The project manager will continuously monitor the action area throughout coring and dredging activities. This will include scanning the area with binoculars and a range finder.

4. The project manager will maintain an in-depth log book noting the time and date of exploratory activities, environmental conditions (e.g., sea state, weather, visibility (km/mi), lighting conditions and percent ice cover), beginning and end times for all shut-down events, marine mammal species observed, number of marine mammals observed, and marine mammal behaviors (e.g. foraging, hauling-out), and any other miscellaneous observations. Copies of the log book will be provided to the NMFS Protected Resources Division after the exploratory program is completed.

Effects of the Action

There are two potential marine mammal stressors that may result from the exploratory coring and dredging activities. No critical habitat will be affected by the action.

The first stressor involves acoustical disturbance from coring. The coring process is expected to produce underwater noise at 120 dB out to 100m from the coring rig. As mentioned in the previous section, all activities will halt if a marine mammal enters the established 100m shut-down zone. Therefore, IPOP does not anticipate that this project will expose bearded seals or ringed seals to noise levels above 120 dB. However, acoustical noise generated by the coring process will extend beyond this zone and may alter the behavior of marine mammals (e.g., attraction/aGeovoidance of the area). The short duration of coring activities (est. 2-4 borings per day) combined with restricted access to the boring locations due to the presence of thick ice in a shallow channel make it unlikely that any individual seals will encounter acoustic noise generated by the project. IPOP therefore considers any acoustic disturbance from coring to be insignificant or extremely unlikely to occur.

The second stressor involves temporary habitat alteration from the turbidity plume generated during exploratory dredging. The generation of the turbidity plume may temporarily alter movement of fish species that the bearded seal and spotted seal forage. However, the turbidity plume generated during the exploratory dredging process will eventually settle out with little to no significant repercussions to fish habitat. Additionally, moments of high turbidity in the waters of Bonanza Channel is a natural occurrence during storm events. Therefore, IPOP considers any temporary habitat alteration generated from the turbidity plume during dredging activities to be insignificant and discountable.

Conclusions

Based on the analysis that all effects of the proposed project will be insignificant, extremely unlikely, or discountable, IPOP has determined that the proposed project is not likely to adversely affect any listed species or critical habitat under NMFS's jurisdiction. We have used sound logic and the best scientific and commercial data available to complete this analysis. We request your concurrence with this determination.

Please contact me via email at mtravis@tpeci.com, by mail at the address above, or by phone at (907) 522-4337 if you have any questions or concerns.

Sincerely,

Michael Travis, P.E.
Principal

Enclosures: Non-Federal Representative Authorization Letter
Equipment Photo Log
Figure 1 – Coring Action Area Map
Figure 2 – Dredging Action Area Map

CC: Beau Epstein, IPOP LLC
Leslie Tose, United States Army Corps of Engineers: Alaska District

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Exhibit 2

Eelgrass Study

EXHIBIT 2: Eelgrass Survey

IPOP and reviewed and applied the Corps document "Components of a Complete Eelgrass Report Guidelines" (May 27, 2016) provided by the Corps to the extent of conducting a Tier 1 survey, because IPOP has at all relevant times proposed to avoid any work in eelgrass (*Zostera marina*). All survey activities were done at the end of the summer, at the time of maximal growth.

Inasmuch as the Corps guidance reports that survey results are only valid for a period of one year, the critical question for summer 2020 operations is whether or not eelgrass is present in the areas IPOP proposes to mine during that summer as set forth in the Plan of Operations. Fortunately, the drone footage leaves no doubt that these areas have minimal to no vegetation, being extremely shallow. The detailed drone footage of the actual areas to be worked, given the extreme shallows, should give the Corps the confidence of a Tier 2 survey.

Survey Activities

All survey work was conducted by three individuals trained in the identification of *Zostera marina*, a surveyor, Eric Tweet, and two helpers, Ben Arata and Tyler Green. Survey activities initially focused on documenting the presence of eelgrass, *Z. marina*, with a survey conducted on September 25, 2018 with Eric Tweet and Ben Arata. The only *Z. marina* found was floating samples which IPOP believes drifted in from Safety Sound. The Corps has received and reviewed the survey and rejected as inadequate, so IPOP determined to conduct a renewed survey in 2019 using both individuals in boats and comprehensive drone-based footage.

IPOP engaged the firm of Oregon Aerial Solutions, and extensive experiments were conducted with known eelgrass beds in Safety Sound, and a special spectral camera used on drones to assess land-based agricultural activities. This work was conducted from August 14-17, 2018, and from August 28 through September 2, 2019, but the underwater nature of the eelgrass interfered with effective efforts to use a spectral signature to identify the presence of eelgrass.

However, an extensive boat and drone-based survey of *Z. marina* in the eastern portion of Safety Sound did succeed in identifying the nearest patch to the mouth of the Bonanza Channel, which is reflected in this drone photo with the GPS coordinates (64.49794, -164.69353):

IPOP notes that this point is 1.5 miles from the opening of the channel and about three miles from DSKN 30-32. IPOP also utilized an underwater video camera to capture and review the specific appearance of beds of *Z. marina*:

IPOP notes that dense eelgrass beds of appreciable significance to local fish populations in Safety Sound are easily visible even from high level aerial photographs of Safety sound:

IPOP's surveyors found the highest density of eelgrass in the darkened area visible in photo. No such areas appear anywhere within IPOP's thirty-two claims.

As noted in the guidance, aerial photography may be used to determine eelgrass locations for very large sites. With the failure of the drone-based spectral identification method, IPOP commissioned extensive drone-based 4K resolution surveys of all thirty-two claims. Photographs comprising the

western side of the claim block were collected from September 16-21, 2019. During this process, a boat crew followed along near the drone areas, conducting a physical survey.

IPOP's surveyors report that the only vegetation with the appearance of seagrass identified on the claims, and particularly in DSKN 30-32, is a species with much narrower and rounder leaves or stems than *Zostera marina*, believed to be *Phyllospadix scouleri*, though this species is more common in the Alaska panhandle.

The species is present throughout DKSN 30-32 (and elsewhere on the IPOP claims), and is the principal species present, with the second most numerous vegetation being the green moss that is attached to this species, believed to be *Rosenvingiella polyrhiza*. *Ruppia maritima* may also be present. IPOP's surveyors obtained underwater video footage of the two species in multiple locations. This still is taken from a video taken in the shallow channel NNE of the island at the west end of DKSN 30:

The white color is to some extent an artifact of the camera, and the unknown species, and other algae colonizing it, are in fact green. The water is approximately three feet deep in this area.

The DroneDeploy firm was engaged to utilize AI-powered drone data processing to stitch together the tens of thousands individual photographs taken into a single view that may be accessed and viewed much like Google earth.

Here is the 4K drone footage of the portion of the channel where the above underwater photograph was taken, and one can see it is easy to distinguish the beds of the unknown species from the shallower portions where less vegetation is present:

The *P. scouleri* is growing in very thick clumps in the deeper portions of Bonanza Channel. In the latter part of October, IPOP's surveyors removed and photographed one dead clump to show the density:

IPOP speculates that this species may form a significant obstacle to returning adult salmon and other fish in the channel portions of the Bonanza Channel.[1]

Given the total absence of *Z. marina*, and the general absence of high quality habitat, IPOP believes that while further survey work is being completed, the appropriate regulatory response is to use the available drone footage of DSKN 30-32 to concur that mining operations for the summer of 2020 will not cause any adverse effect on essential fish habitat.

The shallow areas appear lighter and are nearly devoid of underwater vegetation, as seen in this closeup of the NE end of the shoal:

[1] IPOP notes that a recent article in the *Anchorage Daily News* shows dead pink salmon in the Shaktoolik River entangled in vegetation strikingly similar to that present in the Bonanza Channel. *See* https://www.adn.com/alaska-news/rural-alaska/2019/07/12/warmer-waters-investigated-as-cause-of-pink-salmon-die-off-in-norton-sound-region/. It is conceivable that the vegetation is in fact an invasive species.

In addition to being nearly devoid of vegetation, the area is extremely shallow and provides no cover for aquatic animals from bird predation.

The drone footage also permits IPOP to assess the path from the camp site to the area identified for summer 2020 operations.

These still pictures do not do justice to the full scale of detail that is visible from the drone footage. The following hyperlink will permit agency access to the stitched-together drone photos, from which closer views can be obtained throughout DSKN 30-32 and the path to the base camp:

https://www.dronedeploy.com/app2/data/5d88f96ae2922d5d6a4afc1e;jwt_token=eyJhbGciOiJIUzUxMiIsInR5cCI6IkpXVCJ9.eyJvdmVybGF5X2ZvbGRlcl9pZCI6IjVkODQ1ODM5Mzg4NWNlMzAzODgyOGE5ZCIsInNjb3BlIjpbIjY2YWZiNmQ0ODBfQkE1NjNBODg3eN09QRU5QSVBFTElORSJdLCJ0eXBlIjoiUmVhZE9ubHlQbGFuIiwiaWQiOiI1ZDg4Zjk2YWUyOTIyZDVkNmE0YWZjMWUiLCJleHAiOjI1MzQwMjMwMDc5OX0.1KSItmwzzTP2rTQiXVRhMbrBYpz3XOPm5TQVhHSjRg_sTPOkskk46V7fllDx2Z5MZDuaZVspqk-yqsVZZGkhLw

IPOP requests that the agencies not use any features to make changes in the database, and requests that the confidentiality of this hyperlink be maintained, as the data within it was assembled at considerable cost and could be damaged by users of the hyperlink.

IPOP believes that its investment in this high-quality footage will permit the agency to confirm minimal adverse impact from proposed operations, and IPOP proposes to conduct further biological examination of the deeper areas of with more vegetative cover during the summer of 2020.

Exhibit 3

Essential Fish Habitat Draft Assessment

DRAFT ESSENTIAL FISH HABITAT ASSESSMENT FOR TEN IPOP, LLC. PLACER MINING CLAIMS NEAR SOLOMON, ALASKA

Prepared for:

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1.0 INTRODUCTION

This report is a draft assessment of the Essential Fish Habitat (EFH) that overlaps ten IPOP, LLC. (IPOP) placer mining claims near Solomon, Alaska (Figure 1, Appendix A). IPOP intends to suction dredge sediments for gold within these claims. The claims are located within coastal lagoons. IPOP contracted Travis/Peterson Environmental Consulting, Inc. (TPECI) to conduct an EFH draft assessment to identify and determine whether suction dredge mining will adversely impact designated EFH.

Enacted in 1976, the Magnuson-Stevens Fishery and Conservation and Management Act (Magnuson-Stevens Act) governs the United States fisheries management. In 1996, Congress amended the Magnuson-Stevens Act to include sustainable fisheries management procedures and defined EFH as *"those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity"* and is only applicable to species managed under a federal Fishery Management Plan. EFH are reviewed and updated every five years with the 2015-17 EFH being the most recent review. Section 305(b) of the Magnuson-Stevens Act states that federal agencies must consult with the National Marine Fisheries Service (NMFS) if an EFH assessment determines that proposed activities may have an adverse effect on EFH. An adverse effect is essentially any impact that decreases the quality of EFH, specifically "*direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions*", as stated in the Magnuson-Stevens Act.

TPECI did not find that the proposed mining activities for the ten IPOP mining claims would adversely affect EFH. Therefore, TPECI does not believe consultation with the NMFS is required. This assessment discusses the reasoning behind this conclusion in the following format: (1) a project description, (2) a summary of EFH in the project area, and (3) an analysis of the effects on EFH.

1.1 PROJECT LOCATION

IPOP currently holds thirty-two State of Alaska mining claims in Alaska State Waters near Solomon, Alaska on the Seward Peninsula. The current mining operation will attempt to recover gold within ten of the thirty-two mining claims. Below are the ten mining claims, totaling 880 acres, where proposed mining activities are proposed to occur. Consult Figure 2 in Appendix A for a map showing each mining claim location.

1. DKSN 15 – 160 acres
2. DKSN 16 – 160 acres
3. DKSN 17 – 40 acres
4. DKSN 18 – 40 acres
5. DKSN 21 – 40 acres
6. DKSN 22 – 40 acres
7. DKSN 23 – 40 acres
8. DKSN 26 – 40 acres
9. DKSN 31 – 160 acres
10. DKSN 32 – 160 acres

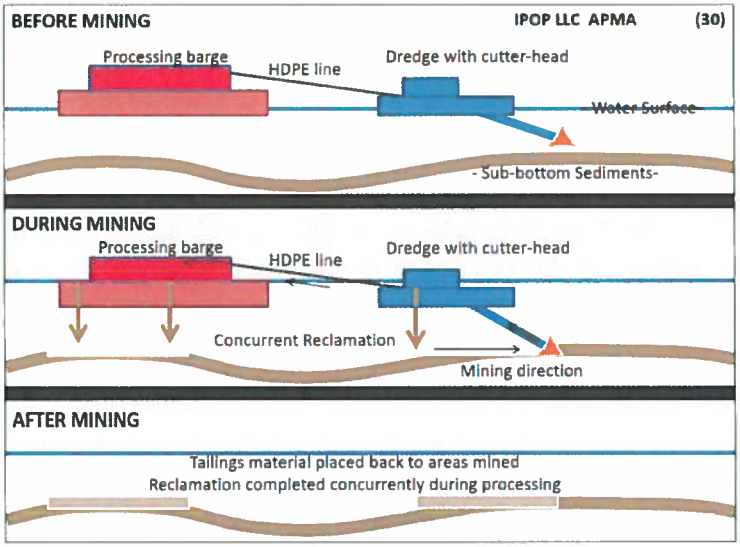
Claims DKSN 15-26 are located in a shallow coastal lagoon approximately 1.5 miles east-northeast of the Solomon River mouth. Claims DKSN 31 and DKSN 32 are located in Bonanza Channel approximately 2.75 miles southwest of the Bonanza River intersection with the Bonanza Channel.

Surrounding landscape is comprised of relatively flat coastal wetlands, grassland, and tidal mudflats. Freshwater hydrology is primarily influenced by the Solomon River and Bonanza River. Smaller freshwater inputs include Pine Creek and Secret Creek. Other nearby freshwater rivers include the Eldorado and Flambeau River systems, which contribute to the waters of Safety Sound. Marine hydrology is solely comprised of the waters from Norton Sound.

1.2 PROJECT DESCRIPTION

The IPOP placer mining operation is comprised of a single-engine, 10-inch diameter intake, suction dredge (20-feet x 73-feet) and processing barge (40-feet x 70-feet). The suction dredge will excavate sediment to a maximum depth of 31 feet below water level. Excavated material will run through a box and screen shaker before the finer material is processed by centrifuges. The excavated area created by the suction dredge will be filled by the trailing processing barge and will be concurrent with the mining process. This will be accomplished using depth sonar and GPS location mapping to distinguish disturbed benthic soils from non-disturbed areas, which will leave the bottom as close to where it was originally dredged. IPOP intends to mine claims at a rate of 100-acres (approximately 484,000 cubic yards) per year.

IPOP has completed the *Application for Permits to Mine in Alaska* (APMA) with the Alaska Department of Natural Resources. The APMA contained detailed descriptions of the proposed mining operation. See the drawing below for a graphic representation of the proposed mining process.



Drawing 1 *The suction dredge pulls material from the bottom of the lagoon and pushes it to the processing barge. The processing barge separates the material using box and screen shakers and centrifuges to access gold. Tailings are deposited from the processing barge into the original dredged area during the mining process. Drawing was created by Alaska Earth Sciences and was included in the APMA as a cross-section sketch.*

To operate, the dredge also requires a discharge permit from the Alaska Department of Environmental Conservation (ADEC). The 2015 *Medium-Size Suction Dredge General Permit (AKG371000)* outlines best management practices for medium-size suction dredge operations and authorizes discharges to fresh waters of the United States (18 AAC 83.990(77)). The permit also allows exceedance of Alaska Water Quality Standards for turbidity within mixing zones up to 500-feet from the discharge point.

2.0 ESSENTIAL FISH HABITAT

TPECI used the NMFS EFH Interactive Mapping Tool to identify EFH in and around the ten IPOP mining claim locations. Five species of salmon (Oncorhynchus family: Chum – *Oncorhynchus keta*, Pink – *Oncorhynchus gorbuscha*, Coho – *Oncorhynchus kisutch*, Sockeye – *Oncorhynchus nerka*, and Chinook –

Oncorhynchus tshawytscha) have EFH at this location. Saffron cod (*Eleginus gracilis*) are also present at this location, but do not have designated EFH in the area. The Red King Crab (*Paralithodes camtschaticus*) EFH is located several miles off the Seward Peninsula coastline, but red king crab are not present in the lagoons where the mining claims are located. No designated Habitat Areas of Particular Concern were identified in this area. TPECI has shared these findings with NMFS Supervisory Fisheries Biologist, Mr. Matthew Eagleton.

The following subsections discuss the EFHs of concern listed above.

2.1 PACIFIC SALMON EFH

The EFHs for five-species of Pacific salmon overlap with all ten IPOP mining claims. See Appendix B for a map showing the EFH for each species of salmon. Of these, Chum and Coho salmon are fished commercially using set gillnets. The Division of Commercial Fisheries of Alaska Department of Fish & Game (ADF&G) manages commercial and subsistence fisheries. According to ADF&G Norton Sound Commercial Fisheries Management Biologist, Jim Menard, there were six permit holders in the Nome Subdistrict 1 (333-10) in 2017.

Historically, commercial fishing has mostly focused on Chum salmon; however there has been recent market interest in Pink salmon. The Nome Subdistrict 1 commercial salmon fishery has a rocky past. In 1984, salmon management shifted focus from commercial to subsistence. This shift resulted in a significant reduction in sport fishing bag limits and a reduction in commercial harvest areas as well as commercial fishing time. Throughout the 1980s-early 2000s, the commercial salmon fishery was nearly eliminated due to low productivity. In 2003, the Alaska Board of Fisheries (board) designated the Chum salmon stock in this subdistrict as a management concern. An Action Plan was created in December 2003 (Menard-Bergstrom, 2003), which outlined steps to reduce chum salmon fishing mortality to meet spawning escapement goals to allow for subsistence harvest. In 2015, the board discontinued the Nome Subdistrict chum salmon stock as a management concern because the majority of escapement goals had been met (Menard-Bergstrom, 2015). The Chum salmon runs of 2013-2015 were some of the highest on record with the largest runs occurring in the Eldorado River.

2.1.1 Pacific Salmon Impact Analysis

TPECI and IPOP recognize agency and local concerns with the proposed suction dredge mining of these claims. Suction dredging by nature causes a localized increase in turbidity within the water column and disturbs benthic soils. Such activities can disturb salmon migration patterns and impede access to anadromous rivers. However, TPECI believes the ten mining claims under consideration can be successfully mined without significant adverse effects to Pacific salmon EFHs.

The IPOP dredge is classified by the ADEC as a "medium-size" suction dredge due to its 10-inch diameter intake. As previously mentioned, the ADEC general permit for medium-size suction dredge operation in marine waters restricts the turbidity mixing zone to a maximum of 500-feet from the dredge. All mining operations must halt if the turbidity exceeds State thresholds. Mining operations may resume when the plume settles. These restrictions are important because at no single location within any of the ten IPOP mining claims could a 500-foot turbidity mixing zone impede pacific salmon from reaching the Bonanza or Solomon River. See Figures 3 and 4 in Appendix A for maps showing permitted mixing zones for each mining claim.

Mr. Menard informed TPECI that most salmon access the Bonanza River from the direction of the Bonanza Bridge and to a lesser extent from Safety Sound. Mining claim DKSN 31 and 32 are in the Bonanza Channel between Safety Sound and the Bonanza River. Therefore, turbidity plums generated by mining activities in this area will not block salmon passage to the Bonanza River and not cause adverse effects to Pacific salmon EFHs.

The remaining eight claims (DKSN 15-26) are in a lagoon fed by Pine Creek and Secret Creek. TPECI used the ADF&G Anadromous Waters Catalog Interactive Mapper to determine that neither creek is classified as anadromous. Therefore, mining activities in this area will not impeded salmon passage or cause adverse effects to Pacific salmon EFHs.

3.1 SAFFRON COD EFH

Saffron cod is not commercially fished in this area; however, it is a popular subsistence fish harvested from the Bonanza Bridge and Bonanza Channel in the fall (September/October) and through the ice. The species is managed under the Arctic Management Area, which encompasses waters of the Chukchi Sea and Beaufort Sea, but does not extend south of the Bering Strait (NPFMC, 2009). The EFH for Saffron cod does not include Norton Sound (Appendix B).

3.1.1 Saffron Cod Impact Analysis

The Saffron cod EFH does not overlap with any IPOP mining claims; therefore, mining activities in this area would not have an adverse impact on EFH. However, TPECI and IPOP recognize there is local concern with the proposed suction dredge mining of these claims, specifically the claims located in the Bonanza Channel (DKSN 31 and DKSN32). However, TPECI believes mining activities at DKSN 31 and DKSN 32 will not affect Saffron cod because the claims are located several miles from the primary subsistence fishing areas in the vicinity of the Bonanza Bridge and mouth of the Bonanza River.

4.1 RED KING CRAB EFH

The Red King Crab EFH does not overlap with any IPOP mining claims. Therefore, mining activities in this area would not have an adverse impact on EFH. The EFH for red king crab is in Norton Sound (Appendix B). TPECI and IPOP recognize there is significant regional concern with the red king crab stock.

4.1.1 Red King Crab Impact Analysis

TPECI and IPOP understand the proximity of the Red King Crab EFH to the mining claims. However, TPECI does not believe mining activity at any of the IPOP claims could have an adverse effect on the Red King Crab EFH because of its significant distance from the area.

5.0 CONCLUSIONS

TPECI has reviewed EFH literature in this area and does not believe suction dredging the ten IPOP mining claims will adversely affect EFH in this area. Mitigation is therefore not applicable.

Five species of salmon have EFH that overlap with the mining claims. However, the ADEC turbidity mixing zone restrictions prevent turbidity plumes generated by placer mining to exceed 500-feet. At no single point

within any of the ten IPOP mining claims could a 500-foot turbidity plume obstruct salmon passage to the Bonanza and Solomon Rivers. Saffron cod does not have EFH in the area. However, it is a popular fish that is locally fished from the Bonanza Channel and Bonanza Bridge in the fall. Mining activities in the Bonanza Channel will be several miles from the subsistence area. The Red King Crab EFH is located several miles offshore in the Norton Sound, but does not overlap with any of the IPOP mining claims.

6.0 REFERENCES

ADEC, Alaska Department of Environmental Conservation, *Authorization to Discharge Under the Alaska Pollutant Discharge Elimination System for Medium-Size Suction Dredge Placer Miners: General Permit Number AKG371000*, Effective: February 1, 2016, Expires: January 31, 2021.

ADF&G, Alaska Department of Fish & Game, Anadromous Waters Interactive Mapper, http://extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=awc, accessed April 5-10, 2018.

Menard, J., D. J. Bergstrom. *2003 Norton Sound Nome Subdistrict Chum Salmon Stock Status and Action Plan: a report to the Alaska Board of Fisheries*. Alaska Department of Fish and Game, Regional Information Report No. 3A03-35, Anchorage.

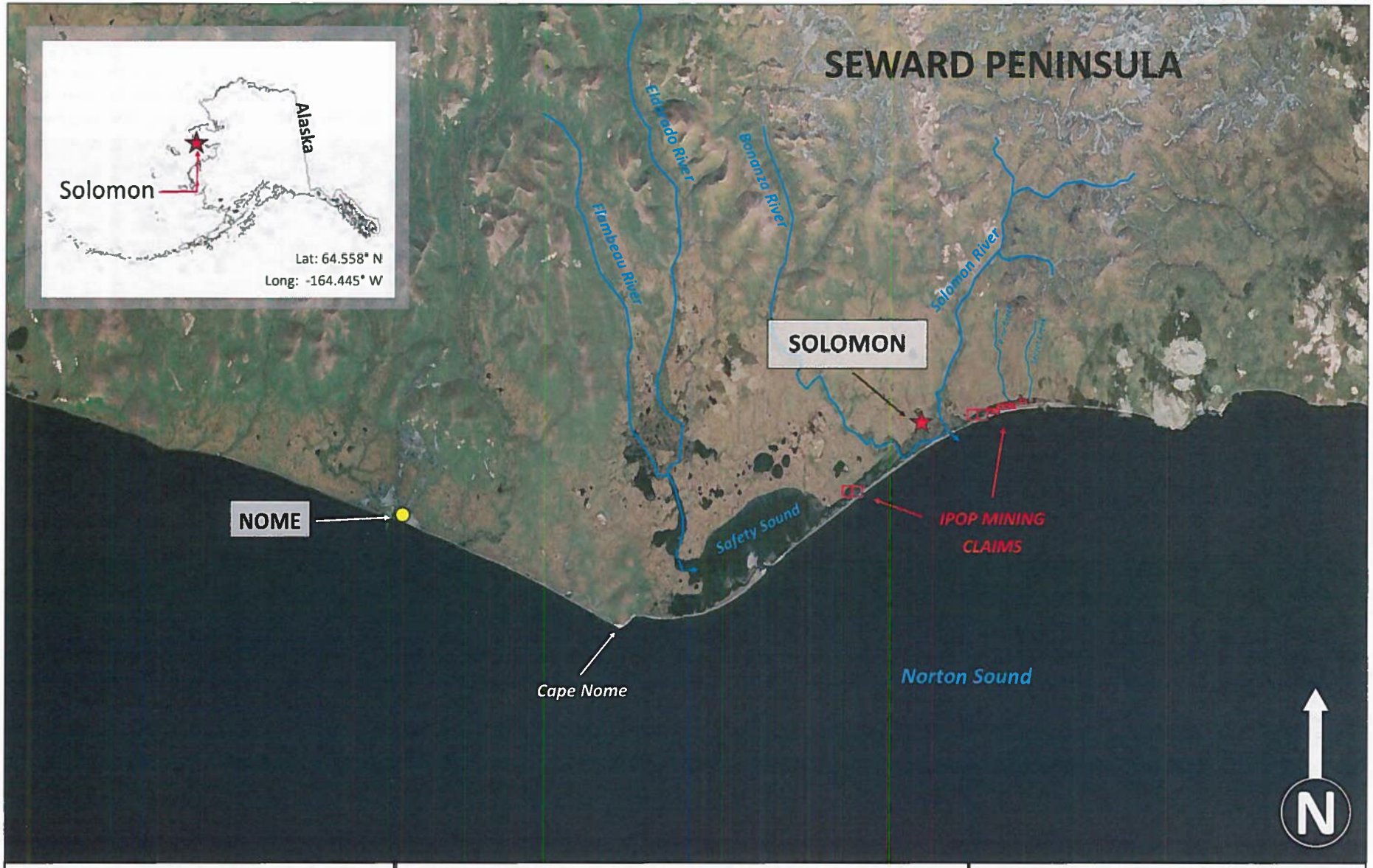
Menard, J., D. J. Bergstrom. *2015. Norton Sound Subdistricts 1-3 chum salmon stock status and action plan, 2016; a report to the Alaska Board of Fisheries.* Alaska Department of Fish and Game, Special Publication No. 15-18, Anchorage.

NMFS, National Marine Fisheries Service, Essential Fish Habitat Interactive Mapping Tool, https://www.habitat.noaa.gov/protection/efh/efhmapper/index.html, accessed April 5-10, 2018.

NPFMC, North Pacific Fishery Management Council, *2009 Fishery Management Plan for Fish Resources of the Arctic Management Area*, August 2009.

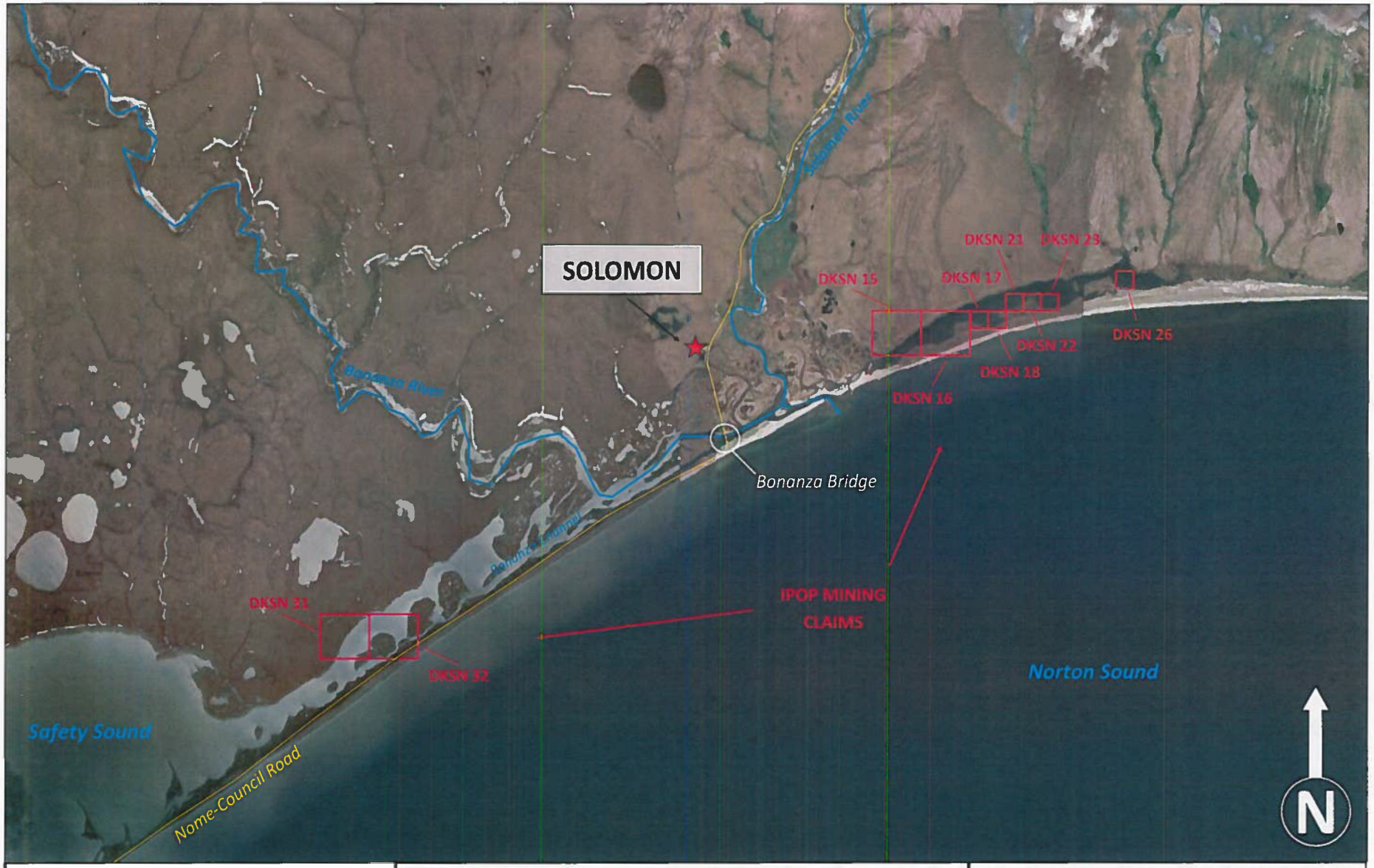
APPENDIX A

Figures



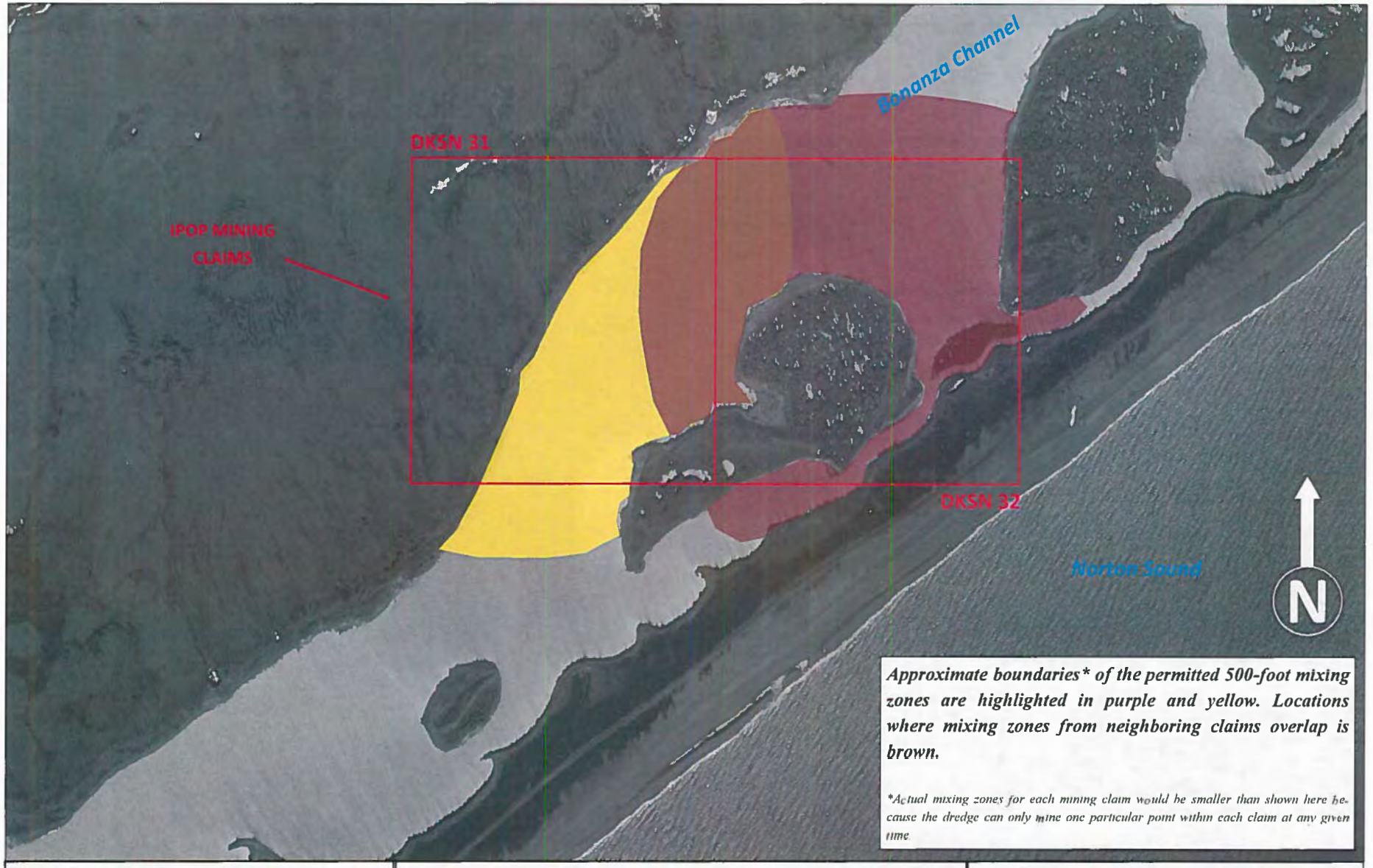
Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	Solomon, Alaska	Figure 1 - Vicinity Map	
Project No: 1610-01	File: Projects/1610/01-Permitting/FIgures	Date: 4/09/18	Scale: 1 inch = 7.25 miles

DNR-A-005389



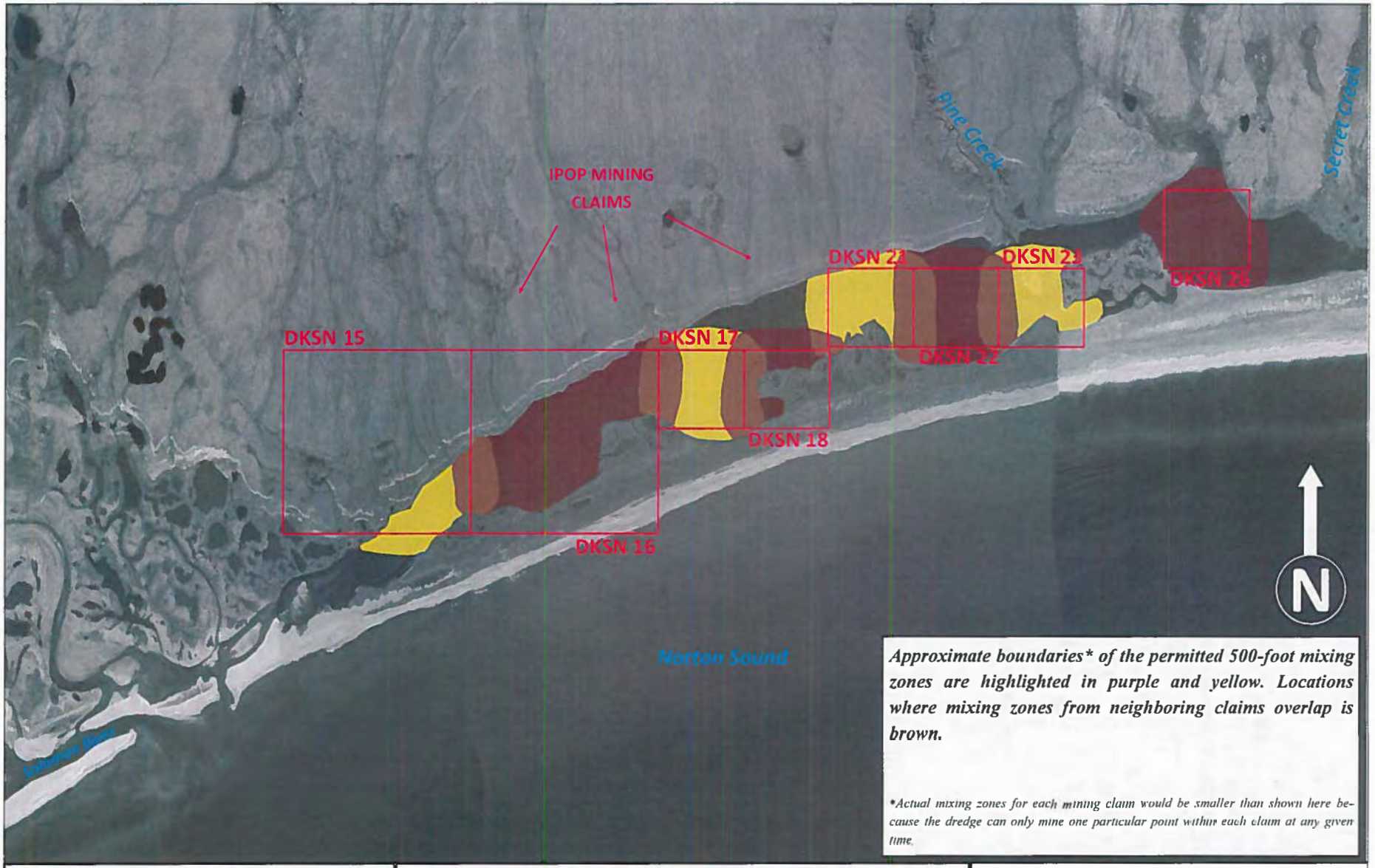
Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	Solomon, Alaska	Figure 2 - IPOP Mining Claims Map	
Project No: 1610-01	File: Projects/1610/01-Permitting/Figures	Date: 4/09/18	Scale: 1 inch = 1.25 miles

DNR-A-005390



Travis/Peterson Environmental Consulting, Inc. 3305 Arctic Boulevard, Suite 102 Anchorage, AK 99503 907-522-4337	Solomon, Alaska	Figure 3 - Mixing Zone Map for DKSN 31-32
Project No: 1610-01	File: Projects/1610/01-Permitting/Figures	Date: 4/11/18 — Scale: 1 inch = 1,000-feet

DNR-A-005391



Approximate boundaries* of the permitted 500-foot mixing zones are highlighted in purple and yellow. Locations where mixing zones from neighboring claims overlap is brown.

**Actual mixing zones for each mining claim would be smaller than shown here because the dredge can only mine one particular point within each claim at any given time.*

Travis/Peterson Environmental Consulting, Inc.
3305 Arctic Boulevard, Suite 102
Anchorage, AK 99503
907-522-4337

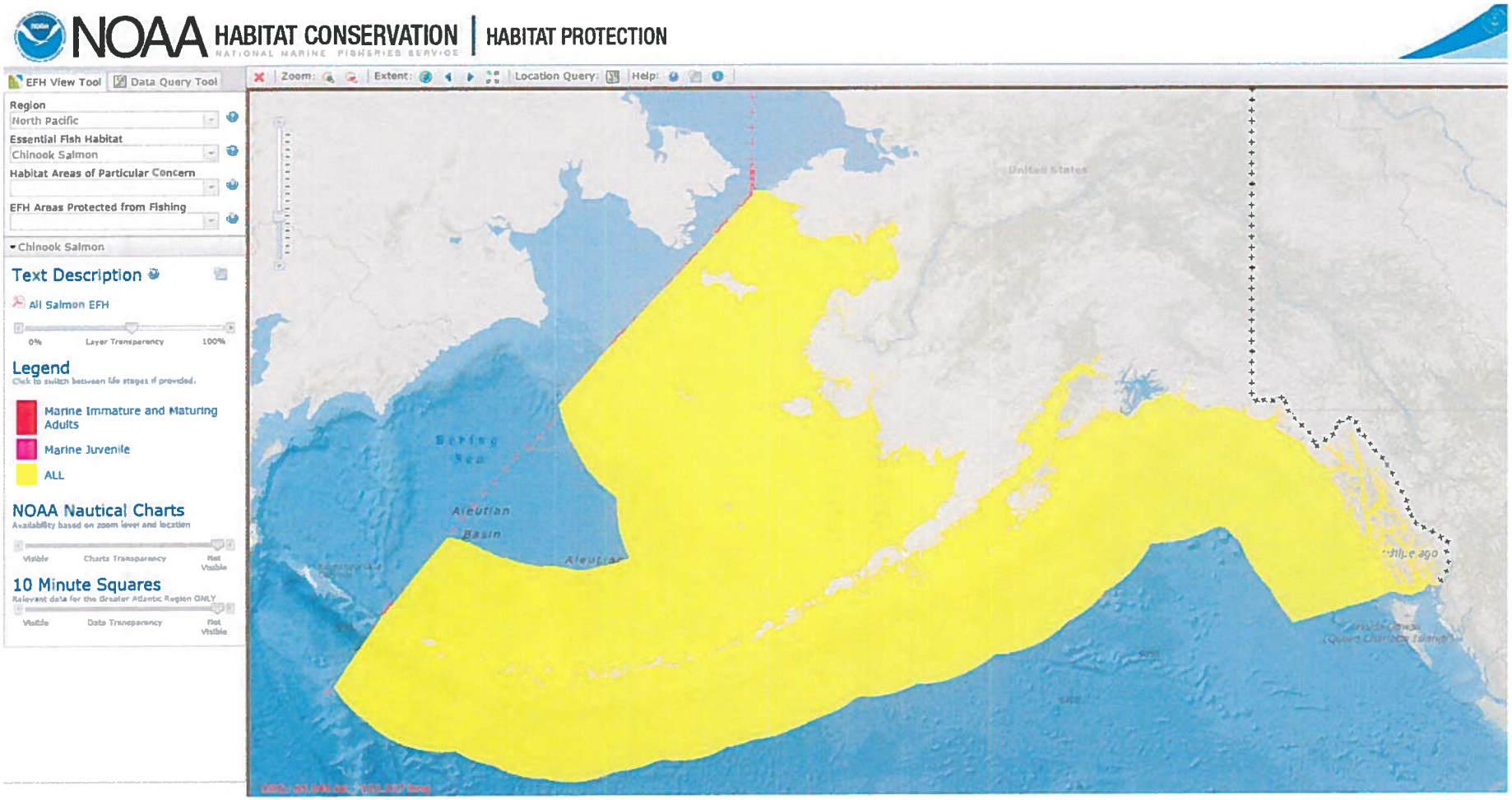
Solomon, Alaska

Figure 4 - Mixing Zone Map for DKSN 15-26

Project No: 1610-01	File: Projects/1610/01-Permitting/Figures	Date: 4/11/18	Scale: 1-inch = 2,500-feet

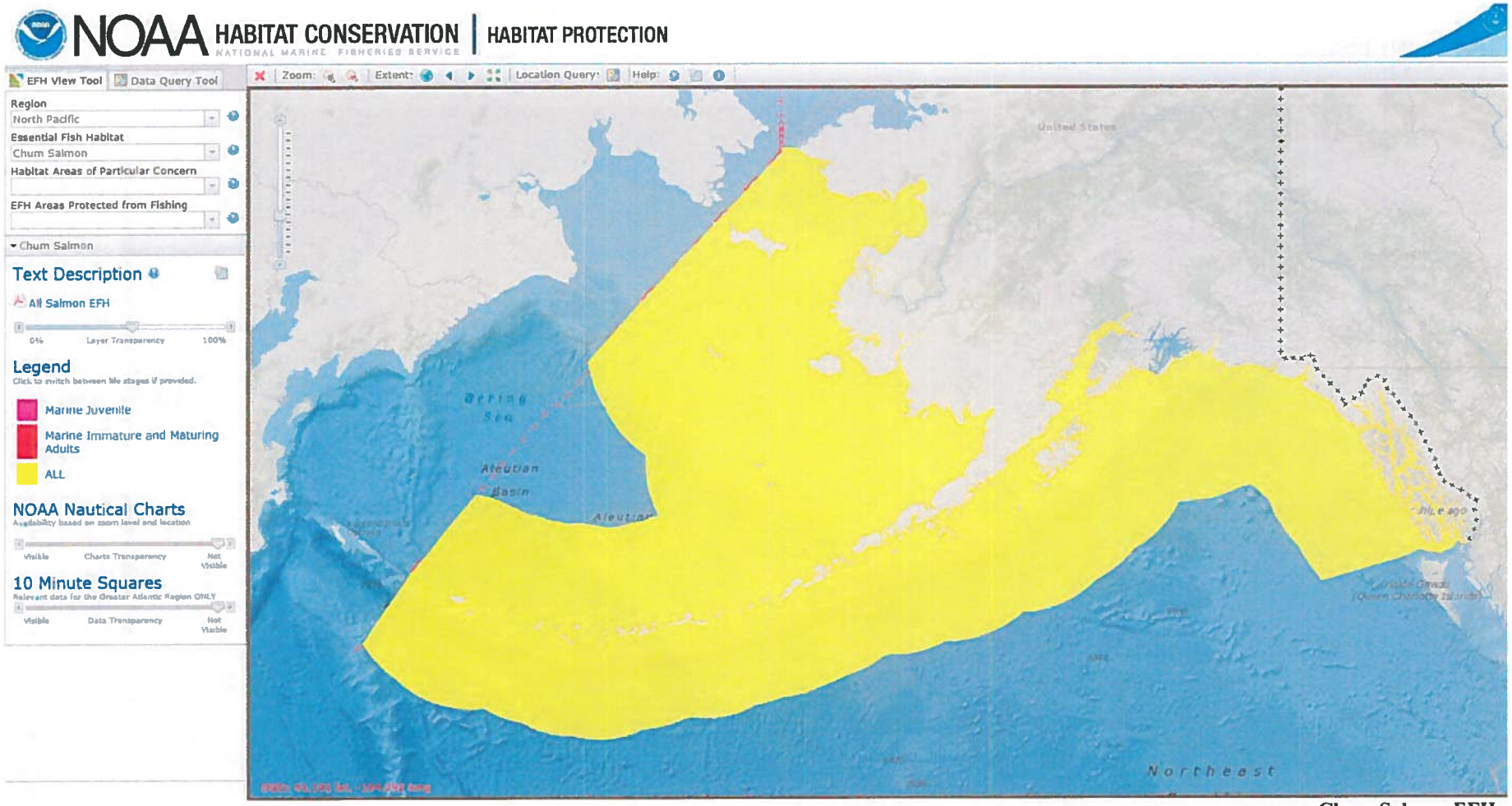
APPENDIX B

NMFS EFH Maps



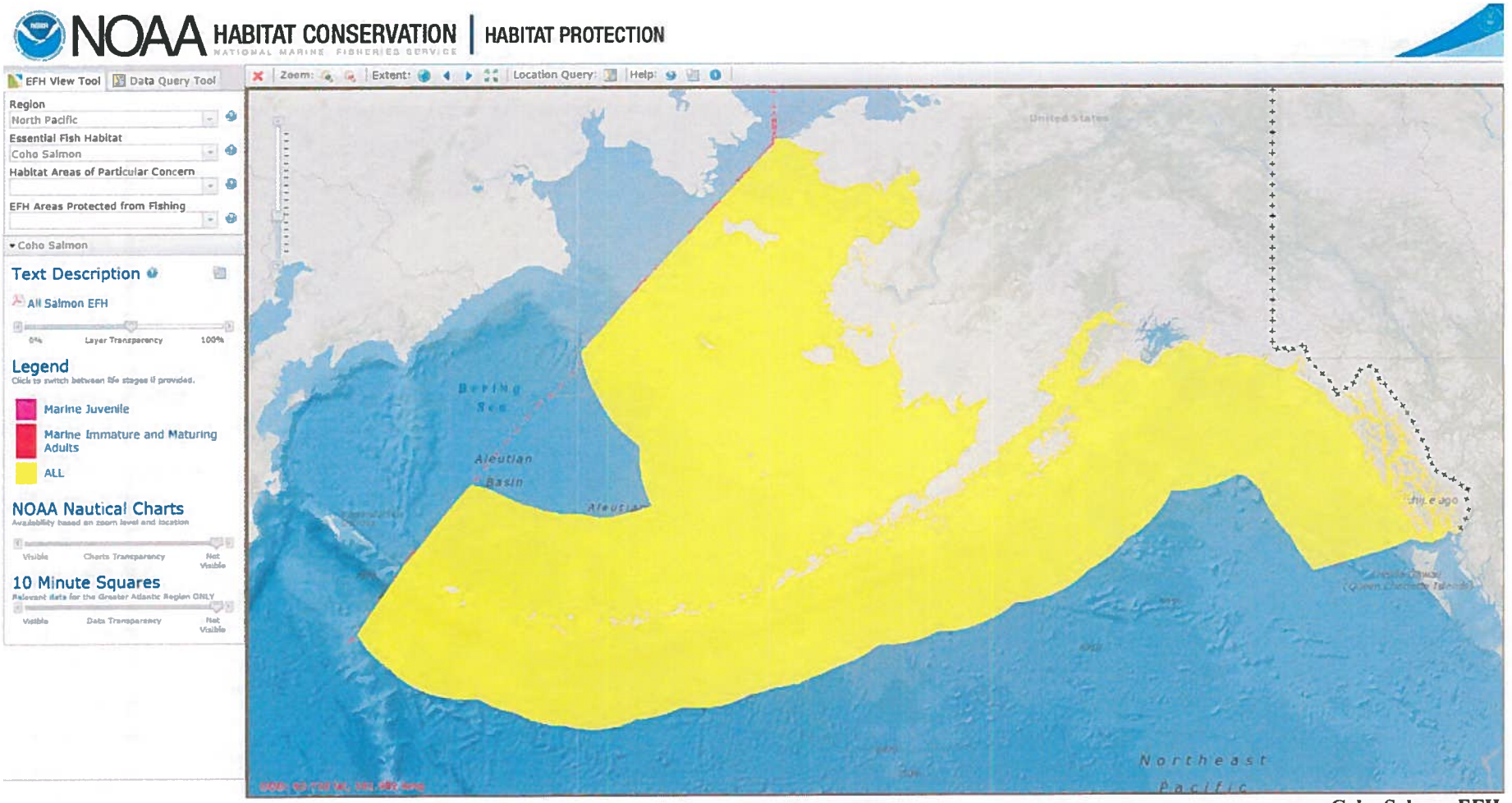
Chinook Salmon EFH

Accessed April 10, 2018



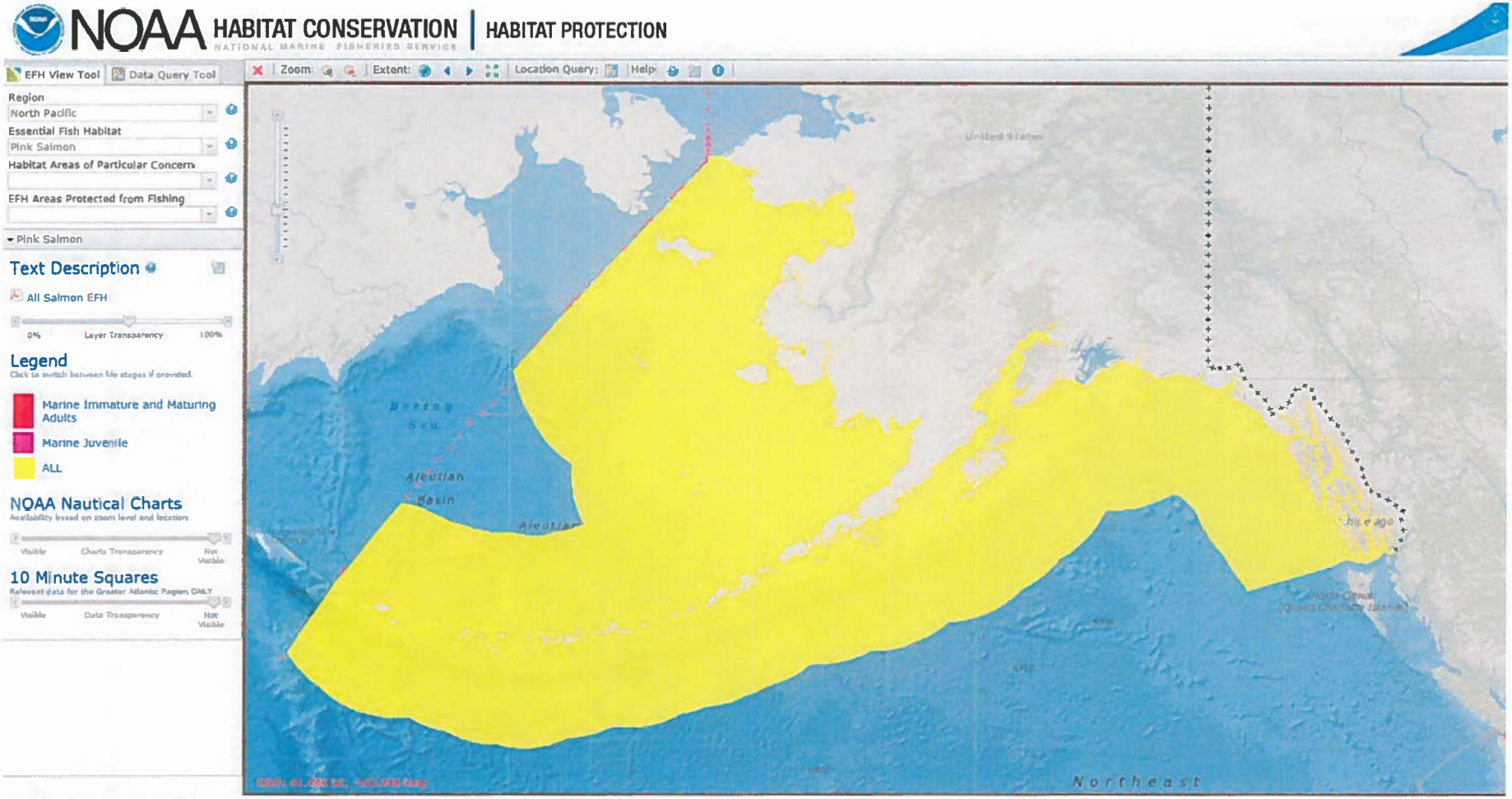
Chum Salmon EFH

Accessed April 10, 2018



Coho Salmon EFH

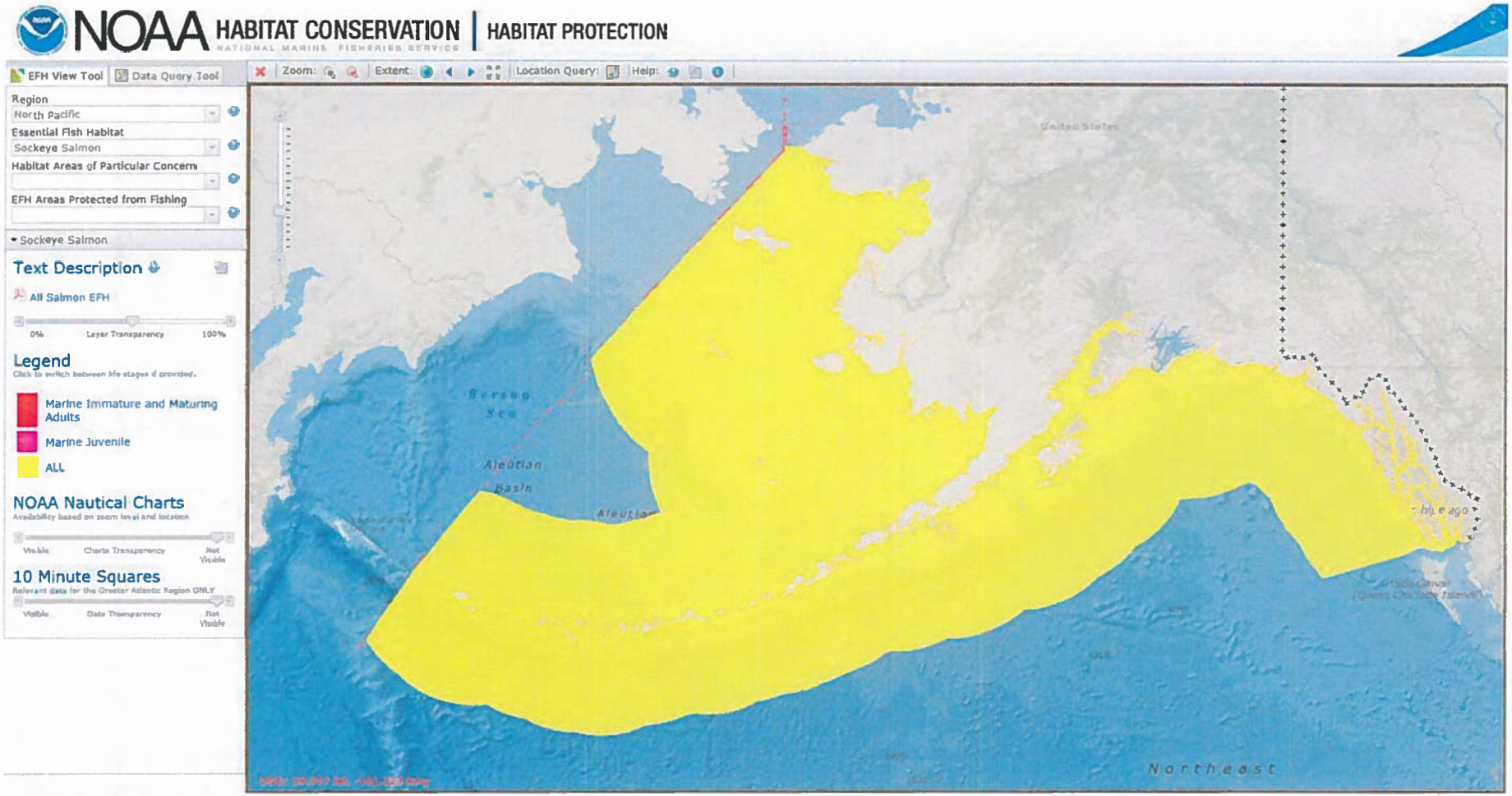
Accessed April 10, 2018



Pink Salmon EFH

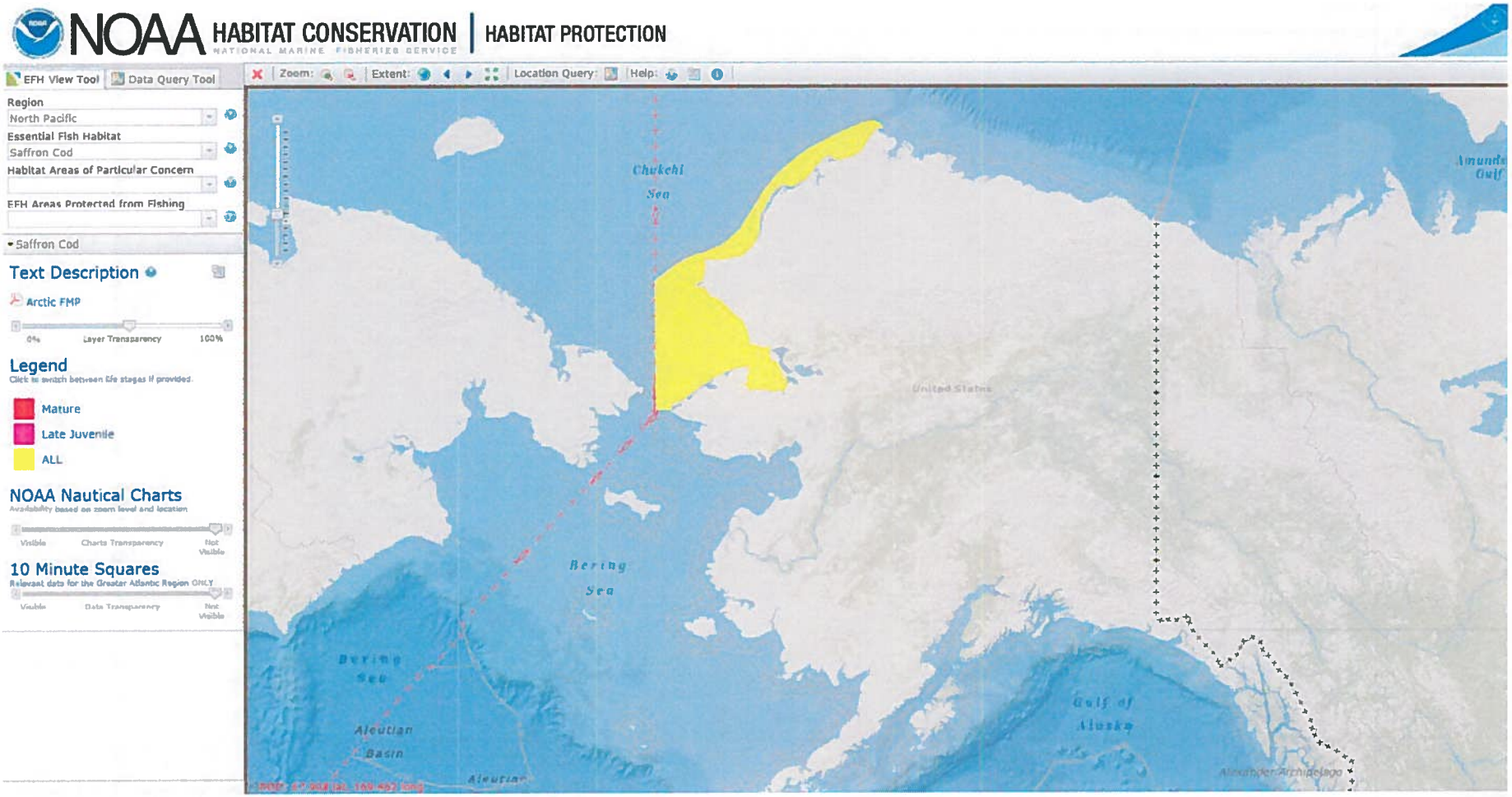
Accessed April 10, 2018

DNR-A-005397



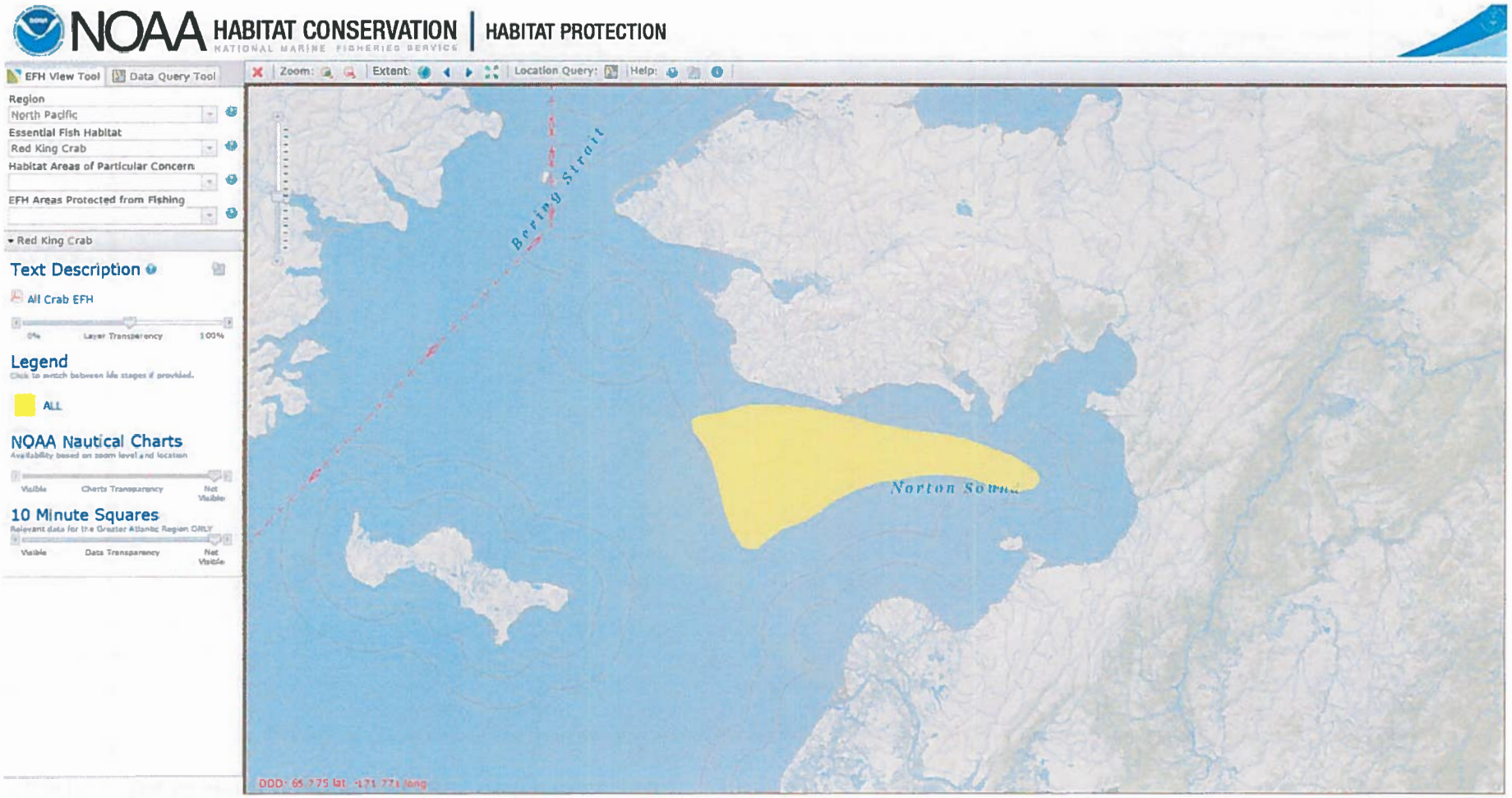
Sockeye Salmon EFH

Accessed April 10, 2018



Saffron Cod EFH

Accessed April 10, 2018



Red King Crab EFH

Accessed April 10, 2018

DNR-A-005400

Exhibit 4

Alternatives Analysis

Project Location and Layout Options

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Location- Bonanza Channel	LOC-001	**Origination-** Applicant Proposed Project **Description**- The proposed project involves the development of a placer gold deposit on state ground, in water, in the Nome region of the Seward Peninsula, Alaska. The Applicant's stated project purpose is: *To economically produce gold from the inland water portion of IPOP's mining claims on the Bonanza Channel and Tidal Lagoon using proven technologies that are specifically designed for shallow water estuary dredging and ultra-fine gold recovery.* **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Location- Nome Offshore	LOC-002	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option involves an alternative project located on an offshore mining lease. Such lease areas exist in the Nome region of the Seward Peninsula, Alaska, but these areas have been mined before and depleted the gold resources available to mine and these areas and are not within a shallow, calm water body. **Screening**- 1. Purpose and Need Test: Does not meet the project purpose and may not meet the project need. The area may or may not contain economic concentrations of gold. Additionally working in ocean waters vastly decreases the reach of a ladder-type dredge, significantly affecting the economic potential of mining offshore. 2. Reasonable and Practicable Test: This option is not reasonable nor practicable. There is no guarantee that the mining lease has not been mined before, therefore a given parcel may or may not be economic- this is a great unknown. The Applicant's machinery is designed for shallow, calm water, the freeboard is 18 inches, meaning ocean waves would swamp and sink the dredge. Additionally, the Applicant is experienced working in shallow estuarine locations, therefore this location is not reasonable to assume a successful operation to achieve the project purpose. 3. Environmental Impacts Test: No reason to believe that mining in the offshore would cause fewer environmental impacts than mining in shallow, non-productive estuaries. Additionally , there is no potential environmental benefit to mining offshore. ***Why Eliminated:*** This alternative does not meet the Applicant's stated project purpose. These areas are outside of the experience skillset of the company and the equipment designed by the company will not work in the offshore environment, thus it is not reasonable to assume a successful operation that would achieve the Project Need. Additionally mining offshore does not provide an environmental benefit (compared to the potential benefits of mining on the Bonanza Channel of creating essential fish habitat and/or creating shorebird, seabird habitat with dredged material).	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Location- Nome, Solomon or Surrounding Area, Uplands	LOC-003	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option explores seeking placer deposits on land, in the Nome and the Council-Solomon Mining Districts. No open State of Alaska lands were available to stake claims and although some claims and land exists to purchase or lease in the Nome region of the Seward Peninsula, Alaska, the land is overpriced, and leases are too expensive. Additionally, the upland area of Nome has been mined extensively and gold resources are diminished. Furthermore, a mine in this area would be a surface mine that would have a negative affect on air quality, and visual impacts. **Screening**- 1. Purpose and Need Test: Does not meet the Applicant's stated project purpose as the project purpose is water and location dependent. This option would meet the project need only if the area contains economic concentrations of gold. 2. Reasonable and Practicable Test: This option is not reasonable. No State of Alaska land was available for staking that had not been mined previously, and any land for sale was overpriced. Additionally because the area had been mined in the past the mining has significantly reduced the amount of mineable placer gold resources and it is unknown if an exploration or mining program would identify any resources remaining in this area. The upland areas are not practicable for this operation either, as IPOP's operation is using a shallow water dredge, and these projects would be on land using heavy equipment. ***Why Eliminated:*** Does not meet the project purpose (stated as location and water dependent). This alternative area is an unreasonable place to find a placer project area because there was no ground available to stake mineral claims, and what was available was uneconomical. Additionally exploration records were inconsistent and could not be relied upon and the area had already been well picked over and mined historically. Also this option required a surface mining operation with the associated negative environmental impacts such as noise, disturbance, carbon footprint and negative visual impacts. The Applicant's equipment is designed for use in a shallow water sitting.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Location- Nome, Solomon or Surrounding Area, Productive Placer Rivers or Streams	LOC-004	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option is to seek placer properties in water (streams and rivers) within either the Nome or the Council-Solomon mining district. There are no open State of Alaska lands available to stake claims. Although some claims and land exists to purchase or lease in the Nome region of the Seward Peninsula, Alaska, the land is overpriced, and leases are too expensive. Additionally, all productive streams and rivers of Nome and Solomon and surrounding areas have been mined extensively for 120 years and have significantly reduced the amount of mineable placer gold resources. **Screening**- 1. Purpose and Need Test: Does not meet the Applicant's stated Project Purpose. Meets the project need. 2. Reasonable and Practicable Test: This option is not reasonable as no State of Alaska land was available for staking that had not been mined previously, and any land for sale was overpriced and previous mining had depleted any remaining, mineable gold resources in these areas. Additionally because the area had been mined in the past, it is unknown if an exploration or mining program would identify any resources remaining in these areas. This option is not practicable as the Applicant's equipment is designed for mining sands, not gravels down to bedrock as would be required in the stream setting. ***Why Eliminated:*** This alternative area does not meet the Applicant's stated project purpose. Also, this area is not a good place for the Applicant to find a placer gold project area because there was no ground available to stake mineral claims, and what was available was uneconomical. Additionally exploration records were inconsistent and could not be relied upon, and the area had already been mined for a very long time. Also this option requires a dredge or a surface mining set up that can remove and screen large rocks and gravels down to bedrock. The Applicant's equipment is not designed for this stream-dredging or mining application.	Eliminated from Further Analysis
Location- Other Areas of Alaska	LOC-005	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option requires finding and staking or acquisition of a placer gold project elsewhere in Alaska **Screening**- 1. Purpose and Need Test: Does not meet IPOPs stated project purpose nor does it meet the project need to provide socio-economic benefits to the rural and remote community of Nome and surrounding communities. 2. Reasonable and Practicable Test: No State of Alaska land was available for staking that had known large placer gold resources and had not been mined previously. Land for sale in high producing placer camps has been worked over and no reliable resource estimates are available. Exploration and discovery of new placer deposits is expensive and time consuming and would not be economic. The cost per ounce of gold purchased is more expensive in areas previously mined with depleted resources. ***Why Eliminated:*** 1) this location did not meet the purpose and need test because it would not result in producing gold from the water of the Applicants Claims or providing socio-economic benefits to Nome and surrounding communities. 2) Considering placer gold ground in other areas of Alaska would not work for this project because there was no ground available to stake mineral claims, and what was available would involve a surface mining operation that would likely be uneconomical. Additionally exploration records for placer deposits are often unreliable and inconsistent so the process of location, evaluation, and feasibility would be very time consuming and expensive.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Location- Other areas outside of Alaska	LOC-006	**Origination**- Evaluating alternative mining location options for placer gold during project development **Description**- This option requires finding and staking or acquisition of a placer gold project outside of Alaska **Screening**- 1. Purpose and Need Test: Does not meet IPOPs project purpose and need to a) produce gold from the water body on IPOP's claims, b) provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, c) provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments, and d) develop and operate a gold mining project in Alaska in order to meet current and future demand for the metal ***Why Eliminated:*** Does not meet the Purpose and Need Test. The Applicants stated project need is to produce gold commodity from Alaska to provide an economic revenue generator for the State of Alaska and to develop an Alaskan Mine to meet current and future demand constrains the location alternatives; therefore this option does not meet the overall purpose of the project.	Eliminated from Further Analysis
Layout- Proposed Layout: One Continuous Mining Areas (Mining Channel)	LAY-001	**Origination-** Applicant Proposed Project **Description**- This layout is based on locating the mining area in a single continuous "mining channel" located by capturing areas where the applicant had conducted exploratory drilling that indicated the presence of economic gold concentrations. The mining channel is continuous to combine all dredge material disposal sites into a single area, and to mine systematically through the gold-enriched sands to a prescribed depth, resulting in a predictable plan, with predictable results, thereby minimizing the environmental impact of the mining operation as compared to other alternatives considered. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Layout- No Defined Mining Areas	LAY-002	**Origination**- This mine layout option was the first option envisioned by the Applicant. **Description**- This option involves "indicative" mining, whereby the location of gold by mining directs the mining rather than mining being directed by drilling results. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This layout was originally part of the Applicant's proposed project, and on that basis, is assumed by the applicant to be reasonable and practicable. 3. Environmental Impacts Test: This option could conceivably result in a larger seasonal footprint (or acreage of estuarine disturbance), if the gold distribution is erratic and varies with respect to depth. Does not meet minimization requirements and does not pass this test. ***Why Eliminated:*** This option would not provide an environmental benefit and would not meet minimization criteria for the operation.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Layout- Five Individual Separate Annual Mining Areas	LAY-003	**Origination**- This mine layout option was proposed in November, 2019 draft application. **Description**- This layout is based on locating mining areas to avoid vegitated shallows in and around an area that had been sparsely drilled. The reason for the mining area layout was considered to minimize the distruption of vegitated shallows, even though the vegitation was not the eelgrass beds of concern. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This layout was originally part of the Applicant's proposed project, and on that basis, is assumed by the Applicant to be reasonable and practicable at the time. 3. Environmental Impacts Test: The random placement of the seasonal mining areas results in random dredge material disposal site locations, potentially increasing the seasonal disturbance footprint not only annually, but overall. ***Why Eliminated:*** This method and layout results in scattered dredge material disposal sites and islands of un-mined material between the seasonal mining areas that may or do have economic gold concentration and could eventually be mined at some point in the future. Because the mining sequence is not systematic, and because this layout would potentially increase environmental disturbance, this layout does not meet minimization criteria for the operation.	Eliminated from Further Analysis
Layout- Restricted Mining Size	LAY-004	**Origination**- This mine layout is a hypothetical layout in the event of strict regulation restricting the areas the Applicant can mine. **Description**- A small restricted size of the mining area, restricting it to a claim, portion of a claim, or limiting the claims that can be mined. **Screening**- 1. Purpose and Need Test: Does not pass this test. A small restricted layout would conflict with the project need to a) provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments, by significantly reducing the life of mine, and potentially shutting down an operation by reducing or eliminating its internal rate of return. ***Why Eliminated:*** Restricting the area open to mining would have a detrimental economoic effect to the operation.	Eliminated from Further Analysis
Layout- Restricted Mining Depth	LAY-005	**Origination**- This mine layout is hypothetical layout in the event of strict regulation. **Description**- Restricting the operation with respect to depth of dredging. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This layout passes this test. 3. Environmental Impacts Test: There is no environmental benefit to shallow dredging as compared to deep trench dredging. Deep dredging results in less overal acres of disturbance and a smaller annual operational footprint. ***Why Eliminated:*** This method and layout results in larger estuarine disturbance over deep dredging and as a result was eliminated.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Layout- Larger Mine/Dredge Area to Develop More of the Placer Gold Deposit Annually.	LAY-006	**Origination**- This option considers the evaluation to maximize the potential economic benefits of developing the deposit by mining the larger extent of the gold resource over time, resulting in a longer life-of-mine, as the Applicant anticipates after having claimed such a large area. **Description**- This option would increase the mine site and dredging extents over time, extending the duration of the operation to develop more of the known and inferred mineral potential in the estuary. **Screening**- 1. Purpose and Need Test: Meets the purpose and increases the liklihood that the project would meet the Applicant's stated project need 2. Reasonable and Practicable Test: This layout was originally part of the Applicant's proposed project, and on that basis, is assumed by the Applicant to be reasonable and practicable at the time. Shareholders of the company have been told that expanded development is an option. 3. Environmental Impacts Test: This option would slightly increase the environmental impacts, however temporarily by increasing the overall mining footprint. Though because of the well thought out reclamation and dredge material disposal plan, reclamation and natural re-vegitation would conceal this disturbance year to year, with a net environmental effect similar to a one or two year operation. Deepening of the Bonanza Channel to create fish passage over the entire lenght of the Bonanza Channel would be a tremendous environmental benefit to the dying estuary. ***Discussion:*** This option is not eliminated, but considered as a reasonable foreseeable future action because it provides potential environmental benefits, it was not found to be reasonable or practicable at the current time.	Is considered to be a Reasonable Foreseeable Future Action with potential unknown cumulative environmental effects, but also a significant environmental benefit
Dredge Material Disposal Sites- Proposed Layout: Dredge material disposal sites underwater adjacent to the dredge mining channel	DDS-001	**Origination-** Applicant Proposed Project **Description**- This dredge material disposal site layout is based on depositing/locating the dredge material adjacent to the access channel and mining channel at a level right at or below the MLLW (Mean Lower Low Water) level. The mining channel is continuous to combine all dredge material disposal sites into a single area between the mining channel and the N shore of Bonanza Channel thereby minimizing the environmental impact of the mining operation as compared to other alternatives considered. Dredge material disposal sites are locations for temporary storage of material/soils from access trenches, and excess dredged soils (bulk, or swell) that may occur during normal mining operations. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Dredge Material Disposal Sites- Dredge material disposal sites above water adjacent to the dredge mining channel	DDS-002	**Origination**- This DDS option is considered in the event that more swelling/bulking of soil occurs beyond what is expected. **Description**- This dredge material disposal site layout is based on depositing/locating the dredge material adjacent to the access channel and mining channel above the MLLW (Mean Lower Low Water) level in the event that extra storage space is needed should bulking of material exceed what is calculated and expected for this project. The mining channel is continuous to combine all dredge material disposal sites into a single area, and to mine systematically resulting in a predictable plan, with predictable results, thereby minimizing the environmental impact of the mining operation as compared to other alternatives considered. Dredge material disposal sites are locations for temporary storage of material/soils from access trenches, and excess dredged soils (bulk, or swell) that may occur during normal mining operations. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This layout is part of the Applicant's proposed project contingency and mitigation plan, and on that basis, is assumed by the applicant to be reasonable and practicable. 3. Environmental Impacts Test: This option could be a benefit to the environment by creating shallows and mudlfats that may provide habitiat and feeding areas for seabirds, shorebirds and waterbirds.	Included in Action Alternative 2

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Dredge Material Disposal Sites-Uplands	DDS-003	**Origination**- This option considers the evaluation of depositing excess dredge spoil on uplands. **Description**- This option would increase the project footprint, but would allow deepening of the Bonanza Channel for fish habitat. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing, and though the equipment can be added, the potential benefit does not outweigh the costs to the Applicant. 3. Environmental Impacts Test: This option would slightly increase the environmental impacts in the short-term by temporarily by increasing the overall mining footprint. The benefit to the environment may be that natural re-vegitation would conceal this disturbance year to year with grass growth, providing critical upland nesting habitiat for various species of birds and waterfowl. Deposition of dredged material outside of the Bonanza Channel would allow deepening of the Bonanza Channel to create fish passage over the entire lenght of the Bonanza Channel and would be a tremendous environmental benefit to the dying estuary. ***Discussion:*** This option exceeds the scope of the proposed 5 year project. Because expansion is a possible future action, it is not considered an alternative option to the proposed project.	Is considered to be a Reasonable Foreseeable Future Action with potential significant environmental benefits
Dredge Material Disposal Sites-Ocean Beach, Supratidal Deposition	DDS-004	**Origination-** This option considers the evaluation of depositing a percentage of dredge spoil along the shore of Norton Sound in the supratidal zone **Description**- This alternative considers pumping a percentage of the dredge spoil/soil across the Nome-Council Highway to the beach and deposit in the supratidal zone for beach renourishment. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing and heavy equipment would be needed on the barrier island to distribute the sand along the beach. Though the equipment can be added, the potential benefit does not outweigh the costs to the Applicant at this time. 3. Environmental Impacts Test: This option would provide a net benefit to the environment providing beach nourshment for the barrier island that is constantly washing away due to longshore currents. The deposition of sediment in the supritidal zone would potentially create a food source for various species of shorebirds, seabirds and waterbirds. Deposition of dredged material outside of the Bonanza Channel would allow deepening of the Bonanza Channel to create fish passage over the entire lenght of the Bonanza Channel and would be a tremendous environmental benefit to the dying estuary. ***Why Eliminated:*** This option is not practicable for cost reasons, and may not be a reasonable alternative as it would alter the shorelines of adjacent private property.	Eliminated from Further Analysis

Project Location and Layout Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Dredge Material Disposal Sites-Ocean Beach, Intratidal Deposition	DDS-005	**Origination-** This option considers the evaluation of depositing a percentage of dredge spoil along the shore of Norton Sound in the intratidal zone **Description**- This alternative considers pumping a percentage of the dredge spoil/soil across the Nome-Council Highway to the beach and deposit in the intratidal zone for beach renourishment. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing, but because the material would be deposited in the intratidal zone wave action and longshore currents would re-distribute the sand along the beach naturally. Though this pumping capacity can be added to the project, the potential benefit does not outweigh the costs to the Applicant at this time. 3. Environmental Impacts Test: This option would provide a net benefit to the environment providing beach nourshment for the barrier island that is constantly washing away due to longshore currents. Deposition of dredged material outside of the Bonanza Channel would allow deepening of the Bonanza Channel to create fish passage over the entire lenght of the Bonanza Channel and would be a tremendous environmental benefit to the dying estuary. ***Why Eliminated:*** This option is not practicable for cost reasons at this time.	Is considered to be a Reasonable Foreseeable Future Action with potential significant environmental benefits

Mining Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Mining Type-Cutterhead Dredge Mining	MIN-001	**Origination-** Applicant Proposed Project **Description**- This option is central to the ideas, planning and economics of the proposed project which consists of using a cutterhead dredge to mine the gold-rich sands in the shallow estuary. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Mining Type-Bucket Line Dredge Mining	MIN-002	**Origination**- Historically much of the Seward Peninsula was mined using bucket-line dredges. **Description**- This option involves mining using a series of buckets on a chain that are constantly digging, requiring no pumps to move material up to the processing plant. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This method is out of date, old technology, and is too slow and maintenance-intensive to be considered a practicable means for mining in this location, more suited to rocky stream and river beds, or large stretches of historical beach area like around the Nome Uplands. ***Why Eliminated:*** This alternative is slow compared to MIN-001, this coupled with the high maintenance costs make this method un-economic.	Eliminated from Further Analysis
Mining Type-Tailing Suction Dredge Mining	MIN-003	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves using a larger self-propelled vessel that moves along the waterbody whilst dragging one or two trailing suction heads with hard-faced teeth. A combination of water sprays and the dragging and suction remove channels of material, essentially vacuuming sediment as it travels. Of all dredging methods this method is said to be one of the most effective at collecting a majority of the heavy mineral component of the material being dredged. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This alternative does not pass this test because this method requires a large vessel, generally designed for deepening ship passages, it would be unable to float in the shallow 2-4ft waters of Bonanza Channel. ***Why Eliminated:*** This alternative will not work in shallow waters.	Eliminated from Further Analysis
Mining Type-Standard Suction Dredge Mining	MIN-004	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves using a single or a series of smaller 8-10 inch floating suction dredges operated by divers. **Screening**- 1. Purpose and Need Test: Because this method has a reduced throughput compared to the Applicant's proposes MIN-001 this mining method would result in reduced gold production compared to MIN-01, thus would not pass this test for project need with regards to a) would not provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) woudl not provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments. ***Why Eliminated:*** This alternative does not meet the project purpose and need requirement.	Eliminated from Further Analysis

Mining Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Mining Type- Backhoe or Dipper Dredge	MIN-005	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves using a dredge outfitted with an excavotor, or a clamshell style dipper that is lowered into the water either on a hydraulic arm (backhoe) or a cable (dipper). The dipper or bucket picks up material and is retrieved to the surface and dumped in a hopper. **Screening**- 1. Purpose and Need Test: Because this method has a reduced throughput compared to the Applicant's proposes MIN-001 this mining method would result in reduced gold production compared to MIN-01, thus would not pass this test for project need with regards to a) would not provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) woudl not provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments. ***Why Eliminated:*** This alternative does not meet the project purpose and need requirement.	Eliminated from Further Analysis
Mining Type- Dragline Dredge	MIN-006	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves using a dredge outfitted with a dragline bucket that is winched between a fixed location ahead of the dredge and the dredge itself. The bucket scoops up material and is retrieved to the surface of the water and dumped in a hopper. **Screening**- 1. Purpose and Need Test: Because this method has a reduced throughput compared to the Applicant's proposes MIN-001 this mining method would result in reduced gold production compared to MIN-01, thus would not pass this test for meeting the project need with regards to a) would not provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) woudl not provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments ***Why Eliminated:*** This alternative does not meet the project purpose and need requirement.	Eliminated from Further Analysis
Mining Type- Wash Plant, Sluces and Fine Gold Jigs	MIN-007	**Origination**- An alternative to cutterhead dredging. **Description**- This option involves moving sediment with excavators or loaders, hauling with a truck to a washplant where the material is screened and processed through a series of sluce boxes and gravity circuit equipment to recover various size fractions of gold. **Screening**- 1. Purpose and Need Test: Because this method has a reduced throughput compared to the Applicant's proposes MIN-001 this mining method would result in reduced gold production compared to MIN-01, thus would not pass this test for project need with regards to a) would not provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) would not provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments 2. Reasonable and Practicable Test: This alternative does not pass this test because this method is not reasonable for mining fine sand from under water in an estuary. ***Why Eliminated:*** This alternative does not meet the project purpose and need requirement.	Eliminated from Further Analysis

Processing Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Facility Location & Process Type- On-site Gold Concentrate Production	PRO-001	**Origination-** Applicant Proposed Project **Description**- This alternative is part of the proposed project in which the material dredged from the operation will be processed on-site on a processing barge that follows the dredge. Material is transported to the processing barge with a long flexible pipe. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Facility Location & Process Type- Alternate-site Ore Processing	PRO-002	**Origination**- The Applicant evaluated the option of "off-site" or "alternate-site" processing when designing the project. In this case off-site meant processing material "outside of the estuary". **Description**- This option involves dredging ore, or sediment, and piping it to an alternate location for processing. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This method does not pass this test as pumping costs would make this option less reasonable than the alternative PRO-001. Additionally, this option is less practicable than PRO-001 as it requires either access across lands to the coastal processing location, or a very long pipe that would need to be semi-permanent and would need to be constantly lengthened. 3. Environmental Impacts Test: Increased environmental impacts will result on land. ***Why Eliminated:*** This alternative is not Reasonable or Practicable compared to PRO-001.	Eliminated from Further Analysis

Mining Rate Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Mining Rate- 267 Yd/Hr	YPH-001	**Origination-** Applicant Proposed Project **Description**- This alternative is part of the proposed project in which the material is dredged at a design rate of 267 cubic yards per hour. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Mining Rate- Reduced Mining Rate	YPH-002	**Origination**- The Applicant evaluated the option of smaller dredge throughputs. **Description**- This option involves dredging ore at a throughput less than YPH-001 **Screening**- 1. Purpose and Need Test: Because project economics for fine grained low grade placer gold are sensitive to gold price, recovery and throughput (production) this option does not pass this test becuase it has the potential to not a) provide socio-economic benefits to the rural and remote community of Nome and other surrounding communities, b) provide a significant economic revenue generator for the State of Alaska in terms of rental and royalty payments ***Why Eliminated:*** This alternative does not pass the Purpose and Needs Test.	Eliminated from Further Analysis
Mining Rate- Expanded Mining Rate	YPH-003	**Origination**- This option considers the evaluation to maximize the potential economic benefits of developing the deposit by mining at a much faster rate resulting in a shorter life-of-mine, but a more profitable operation. **Description**- This option would increase the dredge throughput (production) consequently increasing the daily, monthly and annual gold production. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This layout was originally part of the Applicant's proposed project, and on that basis, is assumed by the Applicant to be reasonable and practicable at the time. Shareholders of the company have been told that increased dredge throughput is an option. 3. Environmental Impacts Test: This option would slightly increase the environmental impacts by increased turbidity and larger overall seasonal mining footprint. Though because of the well thought out reclamation and dredge material disposal plan, reclamation and natural re-vegitation would conceal this disturbance year to year, with a net environmental effect similar to a one or two year operation. ***Dsicussion:*** This option exceeds the scope of the proposed 5 year project. Because throughput modifications are a possible future action, it is not considered an alternative option to the proposed project.	Is considered to be a Reasonable Foreseeable Future Action for meeting the stated project need

Gold Recovery Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Gold Recovery-Gravity	AUR-001	**Origination**- Applicant proposed project. This option considers the evaluation to maximize the potential economic benefits of the project by processing the sands using strictly gravity separation. **Description**- This option would use nugget boxes followed a centrifuge technology coupled with spirals specifially designed to recover very fine gold out of the sands, clays and silts to recover the maximum percentage of gold. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Gold Recovery-Cyanide	AUR-002	**Origination**- This option considers the evaluation to maximize the potential economic benefits of the project by processing the concentrates using a small cyanide CIL processing unit. **Description**- This option would use cyanide to dissolve gold out of the concentrate and tailings to recover any gold too fine for the gravity circuit. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This method does not pass this test as the costs associated with this method would make this option less reasonable than the alternative PRO-001. Additionally, this option is less practicable than PRO-001 as it requires the use of a chemical solvent and creates a potential environmental liability. 3. Environmental Impacts Test: Cyanide is toxic to aquatic organisms, wildlife and humans. This option does not pass this test as it would increase the risk to the environment and not provide an environmental benefit. ***Why Eliminated:*** This option is not reasonable nor practicable and increases the potential risk to adverse environmental impacts form the transportation, storage and use of cyanide.	Eliminated from Further Analysis
Gold Recovery-Mercury	AUR-003	**Origination**- This option considers the evaluation to maximize the potential economic benefits of the project by processing the concentrates using mercury. **Description**- This option would use mercury to recover gold from the concentrate too fine for the gravity circuit. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This method does not pass this test as the costs associated with this method would make this option less reasonable than the alternative PRO-001. Additionally, this option is less practicable than PRO-001 as it requires the use of a toxic element creates a potential environmental liability. 3. Environmental Impacts Test: Mercury is toxic to aquatic organisms, wildlife and humans. This option does not pass this test as it would increase the risk to the environment and not provide an environmental benefit. ***Why Eliminated:*** This option is not reasonable nor practicable and increases the potential risk to adverse environmental impacts form the transportation, storage and use of mercury.	Eliminated from Further Analysis

Access Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Project Access-DOT ROW Nome-Council Hwy	PAC-001	**Origination-** Applicant Proposed Project **Description**- This option considers accessing the project via the Nome-Council Highway, State of Alaska public Right-of-Way (ROW). **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Project Access-Other Alternatives	PAC-002	**Origination-** This option considers other options to accessing the mining claims. **Description**- This option considers accessing the project via alternative routes, other than the Nome-Council Highway. **Screening**- The only other access options are by ocean or by air, both are neither practicable or reasonable for an area accessed by a public ROW.	Eliminated from Further Analysis
Mining Access-State of Alaska Land	MAC-001	**Origination-** Applicant Proposed Project **Description**- This option considers accessing the mining area through State of Alaska land on State of Alaska Mineral Claims held by the Applicant. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Mining Access-Private Land	MAC-002	**Origination**- This option considers accessing the mining area from private land. **Description**- This option considers accessing the mining area through private land along the Nome-Council Highway. This access route would require the Applicant to either 1) Lease land from a private landowner whose land borders the Appliant's State of Alaska Mineral Claims, or 2) Purchase land bordering the State of Alaska Mineral Claims from a private landowner to use as access to the mining area. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This access is both Reasonable and Practicable for accessing some of the mining claims. 3. Environmental Impacts Test: This access does not pose any environmental risks or benefits.	Included as Action Alternative 2
Mining Access-Federal Land	MAC-003	**Origination**- This option considers accessing the mining area from Federal Land. **Description**- This option considers accessing the mining area through Federal land on the southwest side of the claim block. **Screening**- 1. Purpose and Need Test: Meets the purpose and need 2. Reasonable and Practicable Test: This method does not pass this test as the applicant does not have Federal Mineral Claims. ***Why Eliminated:*** This option is not reasonable nor practicable.	Eliminated from Further Analysis
Dredge Access-Access Channel - State of Alaska Mining Claims	DAC-001	**Origination-** Applicant Proposed Project **Description**- This option considers constructing and maintaining an access channel to the proposed seasonal dredging areas on State of Alaska Mining Claims. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1

Access Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Dredge Access-Access Channel - Solomon Bridge Boat Ramp	DAC-002	**Origination**- Evaluation of accessing the dredging area from the boat ramp, near Solomon bridge, that is with the State of Alaska, DOT, public easement and ROW. **Description**- This dredge access route option was evaluated by the Applicant when developing the project plans to use this location for accessing claims near and to the East of the Solomon Bridge. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This access is both Reasonable and Practicable for accessing some of the mining claims. 3. Environmental Impacts Test: This access does not pose any environmental risks or benefits.	Included as Action Alternative 2
Dredge Access-Access Channel - Safety Sound	DAC-003	**Origination**- Evaluation of accessing the dredging area from Safety Sound **Description**- This dredge access route option was evaluated by the Applicant when developing the project plans to use this location for accessing the western-most claims nearest Safety Sound. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This access is not reasonable, as it would require a longer access channel to be dredged and maintained to the mining area. 3. Environmental Impacts Test: This access could have an environmental benefit of deepening the channel for the passage of fish. ***Why Eliminated:*** This option is not reasonable as it would require a longer access channel that would need to be dredged/deepend, and maintained. This longer access channel also stands a greater chance of affecting wildlife as it would create more hours of boat traffic in Bonanza Channel.	Eliminated from Further Analysis

Camp and Power Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Camp Location-DOT ROW Nome-Council Hwy, State Mineral Claim DKSN 35	CMP-001	**Origination-** Applicant Proposed Project **Description**- This option considers a camp location on mineral claims held by the Applicant adjacent to the Nome Council Highway **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Camp Location-Private Land	CMP-002	**Origination**- Evaluation of locating camp on private land near the mining area **Description**- This camp option considers leasing or purchasing private land from nearby landowners for a camp location. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is Practicable for placing a camp near the mining claims, but not reasonable considering private ground is held by various people, who may or may not rent or sell, and who may or may not be close to the mining area, and who may or may not charge a reasonable rate for using their land. 3. Environmental Impacts Test: This camp option may mean a longer access channel to the dredging area, suseqently larger dredge material disposal sites, and more phyiscal disturbance of the estuary.	Included as Action Alternative 2
Camp Location-No Camp	CMP-003	**Origination**- Evaluation of no camp near mining area **Description**- This camp option considers no camp for the operations, and workers commuting daily from Nome to the work site **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option does not pass the Reasonable and Practicable test. It is not reasonable to operate the project without a camp as it is >28 miles from Nome on a rough, washboard gravel road because of the wear and tear on vehicles, and workers working 12 hour shifts, driving nearly an hour before and after work. This option is not practicable either, as the costs of housing a crew in Nome and the annual cost of fuel, tires and vehicle maintenance and liability far outweigh the costs of supplying a man-camp for the operation. 3. Environmental Impacts Test: This camp option is not a benefit to the environment, as it would substantially increase the daily traffic on the Nome-Council gravel highway, creating dust and noise that could affect the birds along the Bonanza Channel. Additionally a camp with a satellite internet system is preferable for uploading real-time environmental monitoring data. ***Why Eliminated:*** This option is not reasonable or practicable because of costs and liability. The option of not having a camp increases road traffic, which in turn creates more dust, more disruption to the birds in the area, and increases the project's carbon footprint.	Eliminated from Further Analysis
Project Power-On Site Power Generation-Diesel Generator	POW-001	**Origination-** Applicant Proposed Project **Description**- This option considers a dual diesel powered 55kWe stationary power source (generators) located on mineral claims held by the Applicant adjacent to the Nome Council Highway. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1

Camp and Power Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Project Power-On Site Power Generation-Natura Gas Generator	POW-002	**Origination**- Evaluation of a cleaner burning natural gas generator for a power source **Description**- This camp option considers using natural gas-fired generators as opposed to diesel. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is Practicable because there is no natural gas supply source in this area. ***Why Eliminated:*** This option is not practicable as natural gas is not readily avaiable in the area of the project.	Eliminated from Further Analysis

Environmental BMP and Reclamation Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Turbidity Control- Silt Curtain - 100% Operation Containment	TUR-001	**Origination-** Applicant Proposed Project **Description**- This option considers a bottom-mounted silt curtain surrounding the entire dredging operation, 10-12 acres at a time, to create a 100% turbidity containment and fish barrier. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1
Turbidity Control- Silt curtain surrounding processing barge only	TUR-002	**Origination**- Evaluation of surrounding only the processing barge with a silt curtain, original proposed plan **Description**- This option considers surrounding only the processing barge with a silt curtain that hangs above the bottom of the mining channel. This option was envisioned to control turbitity by allowing fines to flocculate naturally within the curtain and stay out of the waterway. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option was believed to be practicable, but the applicant determined it was not reasonable to assume that this method would allow them to meet the 100ft mixing zone from an outfall as required by the ADEC. 3. Environmental Impacts Test: This alternative posed a risk of non-compliance to ADEC turbidity limits outside of the 100ft mixing zone. Additionally, this method did not create a fish barrier to keep fish out of the mining/dredging area. ***Why Eliminated:*** This option poses a risk of non-compliance to ADEC turbidity limits outside of the 100ft mixing zone. Additionally, this method did not create a fish barrier to keep fish out of the mining/dredging area.	Eliminated from Further Analysis
Turbidity Control- No Turbidity Control	TUR-003	**Origination**- Evaluation of using no turbidity control for the dredging operation in conjunction with DDS-005. **Description**- This option was considered with DDS-005 (pumping dredge spoils/soil) to the intratidal zone of Norton Sound if 100% of the dredge material was disposed in the ocean. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing, and is not reasonable to assume that there would be zero turbidity from the mining operation and be able to meet the 100ft mixing zone requirements imposed by ADEC. ***Why Eliminated:*** This option poses a risk of non-compliance to ADEC turbidity limits outside of the 100ft mixing zone. Additionally, this method did not create a fish barrier to keep fish out of the mining/dredging area.	Eliminated from Further Analysis
Turbidity Monitoring- Real Time Buoys or Tripods	MON-001	**Origination-** Applicant Proposed Project **Description**- This option considers either a floating or a bottom-mounted tripod monitoring station both up- and down-current of the mining operation that would capture, record and upload real-time turbidity, conductivity, water temperature, weather, flow velocity data and send turbidity exceedance alarms to the dredge operator for quick response in the case of a failed turbidity BMP. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review	Included in Action Alternative 1

Environmental BMP and Reclamation Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Turbidity Monitoring-Physical	MON-002	**Origination**- Evaluation of monitoring turbidity physically with the use of a Secchi disk and a hand-held portable turbidity multi-probe that measures pH, ORP, conductivity, turbidity and temperature. **Description**- This option considers periodic physical measurements of mixing zone conditions by a environmental technician. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option was believed to be practicable and reasonable using the hand-held multiprobe instead of the Secchi disk in low light conditions. 3. Environmental Impacts Test: This alternative benefits the environment by measuring and comparing background, up-current conditions with down-current mixing zone conditions. Because this system is human-dependent, it relies upon diligence and training of the technician and requires constant record-keeping. Because this system is not real-time, response/correction to a turbidity release will be slower than MON-001. Thus this option represents trade-offs and is carried forth for detailed consideration.	Included in Action Alternative 2
Turbidity Monitoring-None	MON-003	**Origination**- The option of no continuous turbidity modeling was briefly contemplated by the applicant **Description**- This option considers no monitoring of turbidity. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This alternative is not reasonable given the stakeholder and agency concern over turbidity levels from this operation. 3. Environmental Impacts Test: This alternative does not create any environmental benefit and provides no method of understanding or documenting either ever-changing background or mining/dredging turbidity levels. ***Why Eliminated:*** This option was not reasonable from the perspective of the ADEC who would require monitoring as a stipulation of the permit.	Eliminated from Further Analysis
Reclamation-Concurrent Partial Re-establishment of Natural Bottom Profile	REC-001	**Origination-** Applicant Proposed Project **Description**- This option considers reclamation concurrent with mining. The process involves: 1) Measuring and modeling pre-mining depth with sonar and GPS, 2) Dredging and processing soils, 2) Depositing soils bulk/swell (if present) into the shallows of the dredge material disposal sites creating shallows for critical water/shore/sea bird habitat, 3) Deposition of remaining soil in a sweeping pattern over the dredged out bottom until the prior mining depth is attained in the mining trench, or until MLLW elevation is reached (as indicated by sonar and GPS on the processing platform) while leaving the access channel at a newly established depth of 10' BMHW. The benefit to leaving the access channel to the new depth of 10' BMHW is to improve navigability and/or depth required for fish passage and possible establishment of eel grass beds. **Screening**- Because this option is included in the proposed project, it meets the three screening criteria for purposes of detailed environmental review, specifically the benefit to the environment to restoring the channel to its pre-mining condition.	Included in Action Alternative 1

Environmental BMP and Reclamation Alternatives			
Option	**Option #**	**Option Details and Screening** **Option Details:** Origination and Description **Screening Criteria:** 1. Purpose and Need Test; 2. Reasonable and Practicable Test; 3. Environmental Impact Test **Reason Eliminated from Further Analysis** (if applicable)	**Outcome**
Reclamation-Concurrent 100% Re-establishment of Natural Bottom Profile	REC-002	**Origination**- Evaluation of reclaiming the bottom of the entire Bonanza Channel to pre-mining depth profiles as proposed in previous preliminary project descriptions. **Description**- This option considers concurrent mining/reclamation. The process involves: 1) Dredging and processing soils, 2) Depositing soils in a sweeping pattern over the dredged out bottom unilt the prior mining depth is reached. This method assumes a bulking factor of 0, meaning the material will not swell or expand after it is dredged up and processed. **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is a practicable alternative because the dredge and processing equipment has Trimble GPS location mapping coupled with sonar and sophisitcated software that develops a point-cloud bottom profile before mining, and lets the operators know when reclamation/re-deposition of dredged material is restored to the pre-mining depth. However, it is not reasonable to assume a bulking factor of 0, and the Applicant expects some material bulking through this mining process. ***Why Eliminated:*** This option is not reasonable because the probability of the dredged material not bulking (swelling or expanding) is very low.	Eliminated from Further Analysis
Reclamation-Dredging and Deepening/ Improvement of Bonanza Channel - No Reclamation	REC-003	**Origination**- Evaluation of the option of improving fish habitat by deepening the Bonanza Channel. **Description**- This option was considered with DDS-005 (pumping dredge spoils/soil) to the intratidal zone of Norton Sound whereby 100% of the dredge material was disposed in the ocean. In this scenario, the bottom depth of the channel would be left at 30-31 feet below MHW (Mean High Water). **Screening**- 1. Purpose and Need Test: Meets the project purpose and need 2. Reasonable and Practicable Test: This option is not practicable with the equipment as it is not designed to pump solids after processing. 3. Environmental Impacts Test: This option provides the best environmental benefit to the future of Bonanza Channel because: 1) Increasing the water depth would allow natural establishment of eel grass beds (that need deep water to exist), 2) The new eelgrass habitiat would be beneficial to the Salmon population, 3) The deep channel would provide safe salmon rearing and possibly improve the productivity of the Bonanza and Solomon River fisheries. ***Why Eliminated:*** This option is not practicable because of the designed equipment configuration, and adding this capability would be expensive. Additionally, there is a lack of stakeholder commitment to the improvement of the estuary.	Is considered to be a Reasonably Foreseeable Future Action with potential significant environmental benefits. (*See DDS-005)*

Exhibit 5

Fuel Tank Specifications

SPECIFICATION DATA SHEET I MODEL : 30TCG

TRANS CUBE

Extend the run times of your diesel powered equipment with the **TRANS**CUBE™ 30TCG. *Increased Efficiency + Decreased Expenses = Maximized Revenue*.

- **Transportable.** Full load lifting eyes, forklift pockets and internal baffles designed to allow handling of the tank full of fuel.
- **Stackable.** Easily stackable (2)-high full of fuel and (3)-high empty to reduce storage space requirements.
- **Accessible.** Access manway for maintenance and inspection of inner tank. Removable inner tank for servicing and cleaning.
- **Efficient.** Lockable equipment cabinet locks and secures equipment and fuel ports to run up to 3 pieces of diesel-powered equipment.
- **Environmentally Safe.** Double-walled, 110% containment eliminates the need for spill pans, UL 142 approved.

SPECIFICATIONS*	
STANDARD FITTINGS: High accuracy contents gauge; 3"Fill Point; 2" fusible link fill port; 1" pump feed with flexible dip pipe, strainer & non-return valve; (1) engine feed and return port set; pressure/vacuum vent; breather vent. OPTIONAL FITTINGS: Complete transfer pump kits; water & particulate filter kits; fuel up to (2) feed & return blocks; fuel hose & quick couplers.	
Capacity (Brim-Fill) Litres: 3000	**Dimension Height (mm/in):** 1315 mm/51.77"
Capacity (Brim-Fill) Imperial Gallons: 660	**Weight Empty (lbs/kg):** 2234 lbs (1013kg)
Capacity (Brim-Fill) US Gallons: 793	**Weight Full (lbs/kg):** 8855 lbs (4016kg)
Dimension Length (mm/in): 2298 mm/90.45"	**Approvals:** UL142, ULC S-601-07, SUN IBC Type 31A,
Dimension Width (mm/in): 1548 mm/60.94"	UN DOT, NFPA, Transport Canada, Vlarem, Kiwa

*Model specifications may slightly differ based on stock availability in your area. Please contact your local representative to confirm tank specifications.

SPECIFICATION DATA SHEET I MODEL : 40TCG

TRANS CUBE

The **TRANS**CUBE™ 40TCG is a versatile fuel deployment solution for larger diesel-powered equipment. With 1,000 gallons of back-up fuel, your need for fuel truck visits is decreased, which in turn helps you to lower your carbon footprint and your expenses!

- **Transportable.** Full load lifting eyes, forklift pockets and internal baffles designed to allow handling of the tank full of fuel.
- **Stackable.** Easily stackable (2)-high full of fuel and (3)-high empty to reduce storage space requirements.
- **Accessible.** Access manway for maintenance and inspection of inner tank. Removable inner tank for servicing and cleaning.
- **Efficient.** Lockable equipment cabinet locks and secures equipment and fuel ports to run up to 3 pieces of diesel-powered equipment.
- **Environmentally Safe.** Double-walled, 110% containment eliminates the need for spill pans, UL 142 approved.

SPECIFICATIONS	
STANDARD FITTINGS: High accuracy contents gauge; 3"Fill Point; 2" fusible link fill port; 1" pump feed with flexible dip pipe, strainer & non-return valve; (1) engine feed and return port set; pressure/vacuum vent; breather vent. OPTIONAL FITTINGS: Complete transfer pump kits; water & particulate filter kits; fuel up to (2) feed & return blocks; fuel hose & quick couplers.	
Capacity (Brim-Fill) Litres: 3785	**Bund Material Thickness (in):** 1/8"
Capacity (Brim-Fill) Imperial Gallons: 833	**Inner Tank Material Thickness (in):** 1/8"
Capacity (Brim-Fill) US Gallons: 1000	**Weight Empty (lbs/kg):** 2724 lbs (1235kg)
Dimension Length (mm/in): 2312 mm/91"	**Weight Full (lbs/kg):** 9370 lbs (4251kg)
Dimension Width (mm/in): 2200 mm/87"	**Approvals:** UL142, ULC S-601-07, NFPA,
Dimension Height (mm/in): 1220 mm/48"	Transport Canada, Vlarem, Kiwa
Dimension Cabinet Opening (mm/in): 850.9 mm x 355.6 mm/ 33.5" x 14"	

P12

- 3,124 US GAL
  11,834 LITRES
  2,603 IMP GAL
- 118 x 96 x 114 IN
  2,997 x 2,438 x 2,896 MM
- 8,816 LBS
  3,999 KG