



**ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT FACT SHEET – PROPOSED FINAL**

Permit Number: AKG374000

Norton Sound Large Dredge Placer Miners General Permit

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

Public Comment Period Start Date: **March 22, 2018**

Public Comment Period Expiration Date: **April 24, 2018**

Alaska Online Public Notice System: <http://notes3.state.ak.us/pn>

Technical Contact: Nick Dallman
Alaska Department of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
610 University Avenue
Fairbanks, Alaska 99709
Phone: (907) 451-2142 / Fax: (907) 451- 2187
nicholas.dallman@alaska.gov

Proposed issuance of an Alaska Pollutant Discharge Elimination System (APDES) general permit for:

NORTON SOUND LARGE DREDGE PLACER MINERS

The Alaska Department of Environmental Conservation (hereinafter referred to as the Department or DEC) proposes to issue an APDES general permit for large dredge placer miners who operate within Norton Sound. The permit authorizes and sets conditions on the discharge of pollutants from large dredges to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged and outlines best management practices that must be adhered to.

This fact sheet explains the nature of potential discharges from large dredges operating in Norton Sound and the development of the permit including:

- information on appeal procedures;
- a description of the industry;
- a listing of effluent limitations, monitoring, and other conditions; and
- technical material supporting the conditions in the permit.

Public Comment

The proposed final permit will be made publicly available for a five-day applicant review. After the close of the proposed final permit review period, the Department will make a final decision regarding permit issuance. A final permit will become effective 30 days after the Department's decision, in accordance with the state's appeals process at 18 AAC 15.185.

The Department will transmit the final permit, fact sheet (amended as appropriate), and the Response to Comments to anyone who provided comments during the public comment period or who requested to be notified of the Department's final decision.

The Department has both an informal review process and a formal administrative appeal process for final APDES permit decisions. An informal review request must be delivered within 15 days after receiving the Department's decision to the Director of the Division of Water at the following address:

Director, Division of Water
Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage, AK 99501

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review.

See <http://dec.alaska.gov/commish/review-guidance/informal-reviews> for information regarding informal reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner
Alaska Department of Environmental Conservation at
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800.

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See <http://dec.alaska.gov/commish/review-guidance/adjudicatory-hearing-guidance> for information regarding appeals of Department decisions.

Documents are Available

The permit, fact sheet, and related documents can be obtained by visiting or contacting DEC between 8:00 a.m. and 4:30 p.m. Monday through Friday at the addresses below. The permit, fact sheet, and other information are located on the Department's Wastewater Discharge Authorization Program website: <http://dec.alaska.gov/water/wastewater/>.

Alaska Department of Environmental
Conservation
Division of Water
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501
(907) 269-6285

Alaska Department of Environmental
Conservation
Division of Water
Wastewater Discharge Authorization Program
610 University Avenue
Fairbanks, AK 99709
(907) 451-2136

TABLE OF CONTENTS

1.0 PERMIT COVERAGE	1
1.1 Coverage and Eligibility	1
1.2 Authorized Placer Mining Operations	1
1.3 Limitations on Coverage.....	2
1.4 Operations Requiring an Individual Permit	3
1.5 Notification Requirements	3
1.6 Permit Expiration	3
2.0 REGULATORY HISTORY OF PLACER MINING IN ALASKA.....	3
3.0 INDUSTRY DESCRIPTION.....	5
4.0 RECEIVING WATERBODY.....	6
4.1 Water Quality Standards and Status of Receiving Water	6
4.2 Mixing Zone Analysis.....	7
5.0 EFFLUENT LIMITATIONS.....	9
5.1 Basis for Permit Effluent Limits	9
5.2 Technology-Based Limits	9
5.3 Water Quality-Based Effluent Limits	9
5.4 Best Management Practices (BMPs)	11
5.5 Separation Requirements	13
6.0 OTHER PERMIT CONDITIONS	14
6.1 Monitoring Requirements	14
6.2 Recording and Reporting Requirements	14
6.3 Standard Conditions.....	15
7.0 ANTIBACKSLIDING	16
8.0 ANTIDEGRADATION	16
9.0 OTHER LEGAL REQUIREMENTS	20
9.1 Ocean Discharge Criteria Evaluation.....	20
9.2 Endangered Species Act	21
9.3 Essential Fish Habitat	21
10.0 REFERENCES.....	22

1.0 PERMIT COVERAGE

1.1 Coverage and Eligibility

Section 301(a) of the Clean Water Act (CWA) and Alaska Administrative Code (AAC) at 18 AAC 83.015 provide that the discharge of pollutants is unlawful except in accordance with an Alaska Pollutant Discharge Elimination System (APDES) permit. Although such permits are usually issued to individual dischargers, Alaska Department of Environmental Conservation (hereinafter referred to as DEC or the Department) regulations at 18 AAC 83.205 also authorize the issuance of a general permit to a category of discharges when a number of point sources are:

- Located within the same geographic area and warrant similar pollution control measures;
- Involve the same or substantially similar types of operations;
- Discharge the same types of wastes;
- Require the same effluent limitations or operating conditions;
- Require the same or similar monitoring requirements; and
- In the opinion of the Department, are more appropriately controlled under a general permit than under individual permits.

The Department finds that discharges from large dredges in Norton Sound meet the qualifications above and are appropriately covered under a general permit.

Permit Part 1.0 describes the permit coverage area and summarizes eligibility requirements for new or expanding facilities and existing facilities that plan to move or expand. Authorized discharge requires completion of notification requirements and written notification from DEC that coverage has been granted. Notification requirements are further described in Permit Part 1.5.

The permit coverage area is limited to marine waters of Norton Sound up to three nautical miles offshore between Cape Rodney at 166°24'09" west longitude and Cape Darby at 162°46'54" west longitude. See Permit Appendix D for coverage area maps. The designated coverage area encompasses 23,793 acres of State of Alaska lease tracts offered during an Alaska Department of Natural Resources (DNR) offshore mineral lease sale on September 28, 2011. The 2011 lease sale extended approximately three miles offshore of Nome between the mouth of the Nome River to the east and Rodney Creek to the west. Because additional upland mineral claims extend short distances offshore to the west and east of the 2011 lease sale area and may result in similar offshore operations, the permit also covers marine waters westward to Cape Rodney and eastward to Cape Darby. Operations are further limited as described under Permit Parts 1.2 and 1.3.

1.2 Authorized Placer Mining Operations

Permit Part 1.2 outlines operations that are authorized under the permit. The 2018 permit retains coverage for the same category of large dredges that the 2013 permit covered. Authorized operations include suction dredges with intake diameters greater than ten inches; suction dredge operations with a combination of intake hoses that have a combined intake area greater than that of a ten inch suction dredge; and mechanical dredges, such as excavators or clamshell dredges. Because some large scale operations may wish to incorporate a smaller dredge for prospecting

or other purposes, the permit also covers suction dredges with intake diameters less than or equal to ten inches provided the small dredge is used in conjunction with a larger operation.

Studies indicate that the production rate of a dredge has only a minor effect on the size of the discharge plume when compared to the effects of the silt content of dredged material, current speed, and position in the ore reserve (Garvin, Sweeney, and Rusanowski, 1991). Therefore, the permit does not set a specific limit on production rate or dredge size. Instead, all permittees must comply with best management practices (BMPs) and meet turbidity limits at the mixing zone boundary, as explained in Fact Sheet Section 5.3.

All new or expanding facilities are considered on a case-by-case basis and applicants must be able to reasonably demonstrate that the proposed operation can meet the permit requirements (Permit Part 1.1). To demonstrate an ability to meet permit requirements, an applicant may be required to submit additional information, including output from a mixing zone model or empirical data from a similar operation. A permittee unable to comply with the general permit requirements or who proposes an operation with a scope beyond the normal operations covered under the general permit, may be denied coverage and required to apply for and obtain an individual permit (Permit Part 1.4).

The permit authorizes discharge of only those pollutants resulting from facility processes, waste streams, and operations clearly related to the mining process. Certain pollutants require monitoring beyond the scope of the permit; therefore, addition of chemicals for the enhancement of mineral recovery or discharge of domestic wastewater is not authorized. Discharges that are not authorized must be covered under another applicable general permit or individual permit.

1.3 Limitations on Coverage

Permit Part 1.3 describes discharges that are either not authorized or subject to additional requirements prior to authorization under the permit. Operations that are not authorized must gain coverage under another applicable general permit or apply for and obtain an individual permit. Prohibited discharges are retained from the 2013 permit and included because the discharges potentially contain pollutants that require monitoring beyond the scope of the permit; are from operations that are not appropriately controlled under the permit; are subject to additional water quality standards and regulatory requirements; or occur in protected waters.

To protect areas with higher populations of seabirds, fish, and marine mammals, as described in the Ocean Discharge Criteria Evaluation (ODCE) for the 2013 permit issuance (DEC 2013) and an Environmental Impact Statement for a previous Norton Sound lease sale (MMS 1990), proposed operations within three nautical miles of Sledge Island or east of Cape Nome require additional Department review and approval, and may be subject to site additional effluent limitations, monitoring requirements, and site-specific conditions (Permit Part 1.3.2).

Based on input from the National Marine Fisheries Service (NMFS) during the 2013 permit issuance, the permit further excludes dredging from March 1 to May 31 to ensure protection of red king crab populations that feed and reproduce near shore during spring. To further protect winter king crab fisheries and allow offshore areas an opportunity to recover during winter, the permit also prohibits operation on sea ice.

1.4 Operations Requiring an Individual Permit

As outlined in APDES regulations, “the department may terminate or revoke any discharger’s coverage under a general permit, and may require the discharger to apply for and obtain an individual APDES permit” or “an interested person may petition the department to take action” under certain situations (18 AAC 83.215). For example, an individual permit may be required when 1) the permittee is not in compliance with the conditions of the general permit; 2) a change has occurred in the availability of demonstrated technology or practices for the control of pollutants applicable to the facility; 3) effluent limitations guidelines are promulgated for facilities covered by the general permit; or 4) circumstances have changed so that the permittee is no longer appropriately controlled under the general permit. The permit cites the regulation by reference under Permit Part 1.4.

1.5 Notification Requirements

Applicants with operations eligible for permit coverage must submit a Notice of Intent (NOI). An Application for Permits to Mine in Alaska (APMA) submitted to DNR will be accepted as an NOI if all the required information is included. New or expanding facilities, or facilities with a proposed mixing zone larger than 1,600 feet (discussed in more detail in Fact Sheet Section 4.2), may be required to submit additional information, including output from an approved mixing zone model, for the Department’s use in processing the NOI or authorizing a mixing zone. The notification requirements are detailed in Permit Part 1.5.

1.6 Permit Expiration

APDES regulations allow a permit to be effective for a maximum of five years (18 AAC 83.020). The permit will be issued for the maximum term and expire five years after the effective date.

Under 18 AAC 83.210(a), a permit may be administered according to the individual permit regulations found in 18 AAC 83.115 and 18 AAC 83.120. Therefore, if the permit is not reissued prior to its expiration date, the permit will continue in force and effect until a new permit is issued. A permittee who submits a complete NOI at least 90 days prior to the permit expiration date will be covered by the administratively extended permit, unless the Department has granted the permittee permission to submit an application on a later date. However, the Department cannot grant coverage under an administratively extended permit if an NOI is submitted after the expiration date.

2.0 REGULATORY HISTORY OF PLACER MINING IN ALASKA

The Environmental Protection Agency (EPA) has regulated placer mining under National Pollutant Discharge Elimination System (NPDES) general permits in Alaska since 1994. The following three general permits have covered most active placer operations: the *Mechanical Placer Miners General Permit* (AKG370000), applicable to open-cut placer mines and similar operations; the *Medium Suction Dredge Placer Miners General Permit* (AKG371000), applicable to suction dredges with intake diameters greater than six inches and less than or equal to ten inches; and the *Small Suction Dredge Placer Miners General Permit* (AKG375000), applicable to suction dredges with intake diameters less than or equal to six inches.

Large suction dredge operations (intake diameters greater than ten inches) and mechanical dredge operations in open water were historically been covered under EPA-issued individual permits. EPA first issued individual permits to large dredges in Norton Sound in 1985 for operations by the Western Gold Exploration and Mining Company (WestGold). WestGold operated the BIMA that at the time was the world's largest floating bucket dredge, from 1986 - 1990 (NPDES Permit No. AK-0004319-2). The BIMA dredge incorporated a gravity-based treatment plant that had an average, locally achieved material throughput rate of 460 cubic meters per hour (Garnett and Ellis 1995). As an offshore mining project, the BIMA operation was new to the United States and, therefore, resulted in new protocols in regulations and permit requirements that were formulated to fit the situation. The project was authorized on a tiered basis and regulation was set up in phases, with each phase having well-defined activities. Through an iterative process, BMPs were developed and environmental concerns were addressed and, in many instances, resolved (ENSR 1992). Ongoing evaluation of the BIMA operation against performance criteria helped establish a sound foundation for future permitting of offshore mining operations of similar type and scale.

From 1998 to 2005, EPA issued five individual permits for large suction dredges in Norton Sound as follows:

- Arctic Whitney, Inc., AK-005289-2, issued May 6, 1998, reissued July 14, 2003;
- Aaron Gustafson, AK-005310-4, issued April 29, 1999;
- This Corporation, AK-005318-0, issued July 7, 2000;
- Craig Coggins, AK-005331-7, issued February 12, 2003; and
- Concha Holdings, Ltd., AK-005342-2, issued June 4, 2005.

On October 31, 2008, EPA approved the State's application to administer the NPDES program in the State of Alaska. According to the Memorandum of Agreement between EPA and DEC (DEC 2008), authority to administer the State's program, called the APDES Program, transferred in phases over four years. Under this phased approach, mining permits transferred on October 31, 2010. The transfer of mining permits included the following three individual permits for large suction dredges in Norton Sound: Craig Coggins, AK-005331-7, reissued October 29, 2008; Wesley Devore, AK-005347-3, issued October 29, 2008; and Jim Gribben, AK-005353-8, issued November 18, 2008.

DNR held a competitive sale for offshore mineral leases in Norton Sound on September 28, 2011. The lease sale offered a total acreage of 23,793 acres and brought in \$7.6 million in sales (personal communication, Bill Cole, Geologist, DNR, November 23, 2012). Mineral leases were purchased by a range of bidders, from local residents to global mining companies. As of September 18, 2012, the lease sale, combined with media coverage and record gold prices, resulted in 17 new or proposed permit applications for large gold dredge operations in Norton Sound. Although not all proposed operations reached development, many became operational. To accommodate new operations and streamline the permitting process for operations in Norton Sound, DEC initiated development of the *Norton Sound Large Dredge Placer Miners General Permit*, which was originally issued by the Department on July 16, 2013. As of December 28, 2017, approximately 16 operations had active coverage under the permit.

Table 1 summarizes permit-related dates for the Norton Sound Large Dredge Placer Miners General Permit.

Table 1: AKG374000 Permit Dates						
Agency	Issuance Year	Public Notice		Signed Date	Effective Date	Expiration Date
		Start Date	End Date			
DEC	2013	04/25/2013	05/28/2013	07/16/2013	08/15/2013	08/14/2018
DEC	2018	03/22/2018	04/24/2018	Pending	Pending	Pending

3.0 INDUSTRY DESCRIPTION

Placer mining involves the mining and extraction of gold or other heavy metals and minerals primarily from unconsolidated sediment deposits. These deposits may be in existing stream beds or ancient, often buried, stream deposits, i.e., paleo or fossil placers. Many Alaskan placer deposits consist of unconsolidated clay, sand, gravel, cobble and boulders that contain very small amounts of native gold or other precious metals. Most are stream deposits occur along present stream valleys or on benches or terraces above existing streams. Beach placer deposits have been and continue to be important producers in Alaska. These deposits, most notable near Nome, include both submerged and elevated beach placer deposits.

Placer mining methods to extract gold bearing material (ore) from a deposit include both terrestrial open-cut operations and freshwater or marine dredging operations. The *Norton Sound Large Dredge General Permit* only covers marine dredging operations. Dredging systems consist of a supporting hull with a mining control system, excavating and lifting mechanism, gold recovery circuits (e.g., sluice box), and waste disposal discharge. All dredges are designed to work as a unit to dig, classify, beneficiate ores and dispose of waste. Because dredges work the stream bed or ocean floor, rather than terrestrial areas, the effluent consists entirely of *in situ* water and bed material.

Dredging systems are further classified as hydraulic (e.g., suction dredges) or mechanical (e.g., bucket dredging), depending on the methods of excavation. Suction dredges, the most common hydraulic dredging system, are popular in Alaska with small, medium, and large-scale gold placer miners. A suction dredge, often handled by a diver or remote-controlled equipment, is akin to a vacuum cleaner used underwater and sucks up the bed material. The material passes through a suction hose to a surface-mounted sluice box. Mechanical dredges operate in a manner similar to suction dredges. However, mechanical dredges use a mechanical bucket system (e.g., excavator, clam shell), rather than a suction hose, to elevate material to the wash plant. Mechanical dredges utilize a water pump only to provide water to the beneficiation system. Because suction dredges and mechanical dredges work the ocean floor, or inter-tidal zone, rather than terrestrial areas, the discharge consists entirely of ocean water and bed material.

Elevated material from dredges is processed through various methods utilizing gravity-separation to extract the relatively dense gold from the ore. Many large-scale operations also make use of feed size classification that involves the physical separation of large rocks and boulders from

smaller materials such as gravel and sand. The object of classification is to prevent the processing of large-sized material that is unlikely to contain gold values. The primary tool used for classification is the wash plant. The wash plant is an assemblage of equipment, such as grizzlies, trommels, static or vibrating screens, and jig plants, that separates minerals for further concentration and allows waste material to flow out of the machine. The most common gold recovery method, however, is sluicing. The sluice box is a long, sloped trough into which water is directed to separate gold from the ore. A slurry of water and ore flows down the sluice and the gold, due to its relatively high density, is trapped in riffles along the sluice. The concentrated material from the sluice box is then further separated by panning or use of specialized equipment, such as jigs or shaking tables.

4.0 RECEIVING WATERBODY

The permit authorizes discharges to marine waters of Norton Sound up to three nautical miles offshore between Cape Rodney at 166°24'09" west longitude and Cape Darby at 162°46'54" west longitude with certain restrictions (Fact Sheet Section 1.3).

4.1 Water Quality Standards and Status of Receiving Water

Regulations in 18 AAC 70 require that the conditions in permits ensure compliance with the Alaska Water Quality Standards (WQS). The WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an Antidegradation Policy. The use classification system designates the beneficial uses that each waterbody is expected to achieve. Protected use classifications include water supply for drinking, culinary, food processing, agriculture, aquaculture, and industrial; water recreation, both contact and secondary; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life. The numeric and/or narrative water quality criteria are the criteria that the State deems necessary to support the beneficial use classification of each waterbody. The Antidegradation Policy ensures that the beneficial uses and existing water quality are maintained.

Waterbodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230(e). Some waterbodies in Alaska can also have site-specific water quality criteria per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b). However, Norton Sound has not been reclassified or granted site-specific water quality criteria.

Any part of a waterbody for which the water quality does not or is not expected to meet applicable WQS is defined as a "water quality limited segment" and placed on the State's impaired waterbody list. For an impaired waterbody, CWA Section 303(d) requires states to develop a Total Maximum Daily Load (TMDL) management plan for a waterbody determined to be water quality limited. The TMDL documents the amount of a pollutant a waterbody can assimilate without violating a state's WQS and allocates that load to known point sources and nonpoint sources. Norton Sound is not included on the *Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report*, July 15, 2010 (DEC 2010a), as an impaired waterbody, nor is the waterbody listed as a CWA 303(d) waterbody requiring a TMDL. Accordingly, a TMDL has not been prepared for the subject waterbody.

4.2 Mixing Zone Analysis

State regulations provide that the Department may authorize a mixing zone in a permit (18 AAC 70.240, as amended through June 23, 2003). An authorized mixing zone must ensure that water quality criteria will be met at the boundary of the mixing zone and existing uses outside the mixing zone are maintained and fully protected. The Department's mixing zone analysis follows.

4.2.1 Dimensions and Permit Requirements

Permittees covered under the permit are authorized a 1,600 foot radius mixing zone wherein water quality criteria may be exceeded. Studies and model results from the WestGold BIMA operation indicate that the production rate of the dredge had only a minor effect on the size of the discharge plume when compared to the effects of the silt content of dredged material, current speed, and position in the ore reserve (Garvin, Sweeney, and Rusanowski 1991). Because operational practices affect discharge characteristics more than dredge size or production rate, the permit authorizes a standard mixing zone and controls the discharge through the implementation of BMPs (Fact Sheet Section 5.4).

The mixing zone dimension and permit requirements are retained from the 2013 permit and based on prior EPA-issued NPDES individual permits for large-scale suction and mechanical dredge operations in Norton Sound (AK-004319-2, AK-005331-7, AK-005347-3, and AK-005353-8). EPA-issued individual permits applied the research results from the WestGold BIMA operation in Norton Sound (ENSR 1989, Fact Sheet Section 2.0) and authorized a 500 meter (1,640 feet) radius mixing zone, wherein discharges were allowed to exceed water quality criteria. This permit retains the same mixing zone dimension; however, to remain consistent with similar DEC-issued placer mine general permits, the radius is converted to feet and rounded to the nearest 100 feet. A review of annual reports, aerial photos, and data from site visits of large dredge operations, further indicates that large dredge operations when adhering to BMPs and monitoring requirements are able to comply with a 1,600 foot radius mixing zone and meet water quality criteria at the boundary of the mixing zone.

An applicant may be granted a mixing zone larger than 1,600 feet on a case-by-case basis. The applicant, upon request, must provide all available evidence reasonably necessary to assist in the mixing zone authorization, including output from an approved mixing model or any information the Department deems necessary to assist in the mixing zone calculation. A mixing zone larger than 1,600 feet will be calculated and authorized based on empirical data collected during operation; discharges from similar operations; and/or a mixing zone model, such as CORMIX or other appropriate software. The expanded mixing zone must remain consistent with the CWA and 18 AAC 70.240 – 18 AAC 70.270 (as amended through June 26, 2003). Prior to authorization, an expanded mixing zone would be subject to an initial review by the Alaska Department of Fish and Game (ADF&G), followed by a public notice period, wherein the public would be provided reasonable notice of, and an opportunity to comment on, the proposed mixing zone. If, following either review period, the Department determines the expanded mixing zone poses undue environmental risk, the

mixing zone would not be authorized as public noticed and the permittee would be subject to the standard effluent limitations under Permit Part 2.1.

Due to habit concerns, the 2013 permit did not allow authorization of an expanded mixing zone for an operation proposed within three nautical miles of Sledge Island or east of Cape Nome from 165°10'00" west longitude. Because there may be situations wherein an expanded mixing zone could be authorized within these areas and remain protective of the habitat and existing uses, the 2018 permit removes the exclusion for areas near Sledge Island and east of Cape Nome. An expanded mixing zone in such locations would remain subject to ADF&G review and a public comment period.

The Department may require a permittee with an expanded mixing zone to comply with additional permit requirements, such as numerical effluent limitations and additional water quality monitoring (Fact Sheet Section 5.3). A mixing zone request would be submitted via an approved Department mixing zone application form.

4.2.2 **Rationale**

During the process of offshore mining, trace-metal concentrations in the water column may be increased 1) through the release of metals dissolved in interstitial waters, 2) by washing metals off of dredged tailings, 3) through the resuspension of particulate trace metals, and 4) by exposing previously buried placer deposits with high-metal content to the water column (MMS 1990). The U.S. Geological Survey (USGS) described fourteen metals (i.e., aluminum, antimony, arsenic, calcium, copper, chromium, cadmium, magnesium, mercury, nickel, lead, selenium, silver, and zinc) targeted for monitoring from placer suction dredge operations (USGS 1997). In EPA's Permit Recommendations Resulting from the EPA Metals Study (EPA 1999b), EPA evaluated the relationship of turbidity and metals in freshwater placer mining discharges after the effluent had been treated using settling ponds. Although discharges from terrestrial placer operations and marine dredges may differ somewhat, EPA's (1998, 1999a) study showed that for most metals, turbidity is a reliable indicator parameter for the level of metals in the effluent. Monitoring data collected during the BIMA operation from 1986 -1990 (Fact Sheet Section 2.0) also demonstrated that 1) metal concentrations in the discharge were primarily in particulate form, rather than the more toxic dissolved form; 2) concentrations of total metals in the effluent rarely exceeded the effluent discharge criteria; and 3) metal concentrations met water quality criteria much closer to the discharge point than turbidity samples (Crecelius 1990, Garvin, Sweeney, and Rusanowski 1991). It is therefore expected that turbidity would be a reasonable indicator for effluent metal levels in marine placer mining discharges. Accordingly, an operation in compliance with the water quality criteria for turbidity would also be assumed in compliance with water quality criteria for metals.

Prior studies (ENSR 1989, MMS 1990, Prussian et al. 1999, USGS 1997), the ODCE for the 2013 permit issuance (DEC 2013), and subsequent inspections of dredge operations affirm that suction or mechanical dredging conducted according to permit conditions has only localized impacts from the temporary disturbance of sediments and increased turbidity during mining; however, areas beyond the mixing zone remain unaffected.

In authorizing this mixing zone, the Department considered all aspects required in 18 AAC 70.015 (Antidegradation policy) and 18 AAC 70.240 - 270 (Mixing zones), as

amended June 26, 2003, including, but not limited to, the predicted effluent quality from the discharge and the potential risk to human health and to aquatic resources.

The Department finds that the mixing zone authorized for a discharge following the requirements in the permit is appropriate and provides reasonable assurance that designated and existing uses of the receiving waters at the boundary of the mixing zone will be maintained and fully protected.

5.0 EFFLUENT LIMITATIONS

5.1 Basis for Permit Effluent Limits

The CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBEL) or water quality-based effluent limits (WQBEL). A TBEL is set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit (WQBEL) is designed to ensure that WQS for a waterbody are met. WQBELs may be more stringent than TBELs. The permit limits reflect whichever requirements (technology-based or water quality-based) are more stringent.

5.2 Technology-Based Limits

EPA promulgated effluent limitation guidelines (ELGs) for the gold placer mining point source category in 1988 [40 CFR § 440.143 Subpart M, as adopted by reference at 18 AAC 83.010(g)(3)]. The ELGs specify the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), the best available technology economically achievable (BAT), and New Source Performance Standards (NSPS). The ELGs also established BMPs. However, the gold placer mining ELGs are not applicable “to dredges which process less than 50,000 cu yd of ore per year, or to dredges located in open waters (i.e., open bays, marine waters, or major rivers).” Because the majority of anticipated applicants under the permit process less than 50,000 cu yd of ore per year and the permit coverage area only includes open waters, the permit does not contain TBELs.

5.3 Water Quality-Based Effluent Limits

The CWA required the establishment of limitations in permits necessary to meet WQS by July 1, 1977 [CWA § 301(b)(1)]. DEC regulations require that permits include water quality-based effluent limits that “achieve water quality standards established under CWA § 303, including State narrative criteria for water quality” [18 AAC 83.435(a)(1)]. All discharges to state waters must also comply with state and local coastal management plans, as well as with WQS, including the State’s Antidegradation Policy.

Pursuant to 18 AAC 83.475(3), BMPs must be included in a permit “when numeric effluent limitations are infeasible.” Dredging’s unique method of intake and displacement presents unusual permitting issues. As previously discussed, a dredge is a mechanical device that operates on the water surface and elevates bed material and *in situ* water into a sluice box from which gold or other minerals may be recovered. The discharge from dredges consists entirely of intake water and bed material immediately released back into the receiving water. Because dredges do not contain treatment systems, nor add pollutants other than those already present in the intake water or bed material, numerical limitations are considered infeasible for most

operations; therefore, BMPs have been established in the permit to control the discharges (Permit Part 3.1).

DEC determined that turbidity is a pollutant of concern that must be limited to meet State WQS. The BMPs include requirements to minimize and manage turbidity from the discharge and are applicable to all facilities authorized under the permit. Additionally, turbidity monitoring is required at the mixing zone boundary and ensures that the BMPs are being implemented properly (Permit Part 2.0). The permit requires a daily visual inspection of turbidity within the mixing zone. The inspection must be conducted during normal operation after the plume has reached its full extent. Any visual increase in turbidity beyond the boundary of the 1,600 foot mixing zone is a violation of the permit. If turbidity above background conditions is observed beyond the mixing zone, the permittees must decrease or cease operations to meet the permit limit. In most cases, water quality recovers rapidly when corrective actions are taken.

A permittee authorized a mixing zone larger than 1,600 feet or a permittee unable to comply with the visual monitoring requirement may be required to meet numerical effluent limits and collect water samples in lieu of, or in addition to, visual limitations and monitoring. Alternative effluent limits are implemented on a case-by-case basis dependent on the size, scale, and nature of the operation and include specific minimum requirements. At a minimum, turbidity at the boundary of the authorized mixing zone may not exceed an instantaneous measurement of 25 nephelometric turbidity units (NTU), in accordance with the State's WQS [18 AAC 70.020 (b)(24), as amended through February 5, 2017].

Although WQS establish a turbidity criterion of 25 NTU for marine waters, storm events or other natural conditions can generate high turbidity and cause background levels to exceed 25 NTU. Under such conditions, a mixing zone boundary limit of 25 NTU is infeasible. Data collected during the BIMA operation (Fact Sheet Section 2.0) supports the potential for turbidity exceedances due to natural conditions. Turbidity data were collected from two instrument arrays located on buoys upcurrent and downcurrent of the BIMA operation. Because two turbidity sensors were deployed at each instrument array, it was possible to study the variation in turbidity readings at a single location. Variability of background turbidity reached a maximum of 252 NTU. The average difference in background measurements recorded simultaneously by the two sensors was 10 NTU with a standard deviation of 15 NTU and a 95% confidence interval for the mean difference of +/- 0.44 NTU with a sample size of 1,993. Effluent measurements at the mixing zone boundary had a mean difference of 18 NTU with a standard deviation of 26 NTU and a 95% confidence interval for the mean difference of +/- 1 NTU with a sample size of 2,558 (ENSR 1989). Thus, simultaneous measurements at the same location may vary on average by +/- 11 NTU to 19 NTU.

To account for background conditions and natural variability, the Department may approve a site-specific criterion and permit limit within the permit authorization, provided the criterion is consistent with 18 AAC 70.235, as amended through June 26, 2003. Any site-specific criterion would be based on historical background data, as well as data collected during the active operation. Such a site-specific criterion must undergo review and receive approval from EPA prior to DEC using the criterion in an authorization under the general permit. Additionally, the public would be provided reasonable notice of, and an opportunity to comment on, the modified turbidity limit, and access upon request to all data and other information used to calculate the limit.

Because effluent limitations based on water quality criteria alone are considered infeasible when background turbidity is naturally elevated, the permit also implements BMPs, in accordance with 18 AAC 83.475(3). Permit limits and monitoring, combined with the BMPs, will help ensure that the receiving water is adequately protected for all existing and designated uses.

5.4 Best Management Practices (BMPs)

BMPs are measures that are intended to prevent or minimize the generation and the potential for the release of pollutants from industrial facilities to the waters of the U.S. through normal operations and ancillary activities. APDES permits must include BMPs to control or abate the discharge of pollutants when 1) numeric effluent limitations are infeasible or 2) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA [18 AAC 83.475(3) – (4)]. The required BMPs and rationale follow:

- 5.4.1 The permittee must refrain from dredging that causes undercutting, littoral channeling, or that otherwise results in beach erosion.

This practice ensures that beach erosion does not occur and that the finer sediments that may be found in these areas do not cause turbidity problems in the receiving waters.

- 5.4.2 Reasonable care shall be used when mining through silt and clay materials that would result in a significant increase in turbidity. Reasonable care includes moving the dredge to a new location; limiting the operating speed of the dredge; or implementing additional turbidity control methods, beyond those under Permit Parts 3.1.3 – 3.1.7, to specifically control the extraneous resuspension of silts and clays.

This practice decreases the amount of fine material that will be released into the water and minimizes the length of the turbidity plume.

- 5.4.3 Operational controls to reduce turbidity generated during excavation must be implemented as follows.

- 5.4.3.1 Mechanical dredge operations must avoid bucket over-penetration and overfilling, multiple bucket bites, bucket dragging, and bottom stockpiling. Bucket ascent speed and lateral movement of the submerged bucket must be reduced or controlled to minimize sediment wash.

- 5.4.3.2 Cutterhead dredge operations must use reasonable care to reduce cutterhead rotation and swing speed, in relation to suction velocity, in order to eliminate unnecessary side-casting and resuspension of sediment.

These practices, based on similar operational controls for sediment dredge operations, are intended to ensure that sediment released into the water column during excavation is kept to a minimum and does not generate unnecessary turbidity.

- 5.4.4 Site conditions, such as tides, waves, currents, wind, and substrate type, must be considered and operational methods must be adjusted, as necessary, to ensure discharges comply with permit limits and separation distance requirements, per Permit Part 3.3.

This practice helps ensure that operators monitor the current and other environmental conditions that may affect the turbidity plume length, shape, or location.

- 5.4.5 Operations in water depths greater than 30 feet must install a downspout, or similar equipment, at the primary outfall(s) on the dredge where discharge of fine material occurs. The discharge from the downspout must occur at least five (5) feet below the water surface and as close to the sea floor as practicable. As a standard operating practice, the downspout must be elevated or deflected as necessary to prevent any scouring and minimize resuspension of sediment.

This practice helps ensure solids are returned as close to the excavated area as possible, decreases the dispersion of fine material released into the water column, minimizes the area of the turbidity plume, and confines the seafloor disturbance to the excavated area. Because a downspout in shallow water is more likely to cause bottom-scouring, more likely to be damaged, and less effective overall, the permit only requires use in depths greater than 30 feet.

- 5.4.6 All wastewater discharges, including those from oversized, screened material, must be controlled to minimize aeration and reduce air entrainment that may hinder particle settling. Controls include avoiding discharges into air, directing discharges vertically downward or use of downspouts, deflectors, or similar equipment.

This practice reduces the amount of entrained air within the discharge and enhances particle settling rates. Once entrained, air rises to the water surface and takes fine particles with it. As a consequence, the fines spread over a much larger area which increases turbidity. A properly designed outfall reduces air entrainment, encourages particle settling, and, therefore, reduces turbidity.

- 5.4.7 Mechanical dredges, particularly those that operate in water depths greater than 30 feet, should be fitted with closeable, sealed buckets when economically feasible and practicable.

Similar to operational controls (Fact Sheet Section 5.4.3), this practice is intended to ensure that sediment released into the water column during excavation is kept to a minimum and does not generate unnecessary turbidity. Combined with a properly designed outfall (Fact Sheet Sections 5.4.5 – 5.4.6), this practice will help control and minimize turbidity throughout the entire excavation and discharge process.

- 5.4.8 Releases of petroleum products and other hazard substances must be prevented or mitigated as follows.

- 5.4.8.1 Equipment and systems must be regularly inspected and maintained to avoid situations that result in leaks, spills, and other releases of pollutants. Equipment must be free of excess oils and grease and must not release petroleum products. Biodegradable lubricants and fluids should be used in place of petroleum-based products when economically feasible and practicable.
- 5.4.8.2 Precaution must be taken to ensure that petroleum products are stored at a reasonable distance from the waterbody and cannot spill or otherwise enter the waterbody. Care shall be taken during refueling of the equipment to prevent spills.
- 5.4.8.3 Drip pans or absorbents must be used under or around leaky equipment when practicable. Any spills must be cleaned up using materials such as sorbent pads and booms. All spills must be reported upon discovery per Permit Part 4.4.

The BMPs under Fact Sheet Section 5.4.8 ensure that petroleum contamination from equipment, fuel storage, or refueling is prevented or mitigated. The reporting requirement is included based on DEC regulations that state “a person must notify the [DEC] by telephone immediately in the result of a release or discharge of a hazardous substance” (18 AAC 75.300).

- 5.4.9 Mercury from historical dredge operations or other pollutants may be encountered during dredge operations. The permittee must take measures to ensure mercury or other heavy metal pollutants, such as lead, that are removed from the wastewater streams are retained in storage areas and not released to the waters of the U.S. Information on how to safely handle, store, and dispose of mercury or other pollutants can be obtained by contacting DEC at the address in Permit Appendix A, Part 1.1.1.

Due to historical mining operations, commercial and subsistence fishing, and other factors, dredge operations may occasionally encounter mercury, lead (e.g., buckshot or fishing weights), or other heavy metal pollutants. The intent of this practice is to ensure that any collected pollutants are properly disposed of and not returned to the waterbody.

5.5 Separation Requirements

Permit Part 3.3 outlines separation requirements applicable to turbidity plumes. To 1) minimize cumulative impacts from multiple facilities operating simultaneously in close proximity to each other and 2) prevent monitoring difficulties and turbidity limit violations due to plume overlap, permittees must ensure that discharged turbidity plumes do not overlap with the plumes of other active dredging operation. To verify vessel locations, permittees must maintain daily records that include the arrival time, departure time, and outfall coordinates for each dredge site or dredge track.

Small, medium, and large scale dredges with different plume lengths operate in Norton Sound; therefore, the permit does not implement specific separation distances between dredges. Alternatively, the *Norton Sound Large Dredge Placer Miners General Permit* and similar permits for smaller operations (e.g., AKG371000 and AKG375000) require that permittees monitor plume locations and ensure that plume overlap does not occur regardless of dredge size.

The 2013 permit contained language explicitly requiring permittees “to allow for a zone of passage for fish around the turbidity plume at all times.” Because providing a zone of passage is generally not an issue for most operations in marine waters, and the language as written was undefined, the condition has been removed from the 2018 permit. However, the permit retains stipulations under Permit Parts 3.3.1 and 3.2.2 ensuring there is a zone of passage for fish around the turbidity plume throughout the year. To provide a zone of passage for smolt outmigration, discharge is prohibited within one mile of any anadromous stream or river mouth from June 1 to July 15. To provide a zone of passage for adult salmon migration into streams and rivers, discharge is prohibited within a half mile of any anadromous stream or river mouth from July 16 to September 15. Year round, permittees must ensure that visible turbidity from a discharge plume does not occur within 500 feet from the mouth of any anadromous stream or river. Because currents, discharge volume, mixing zone length, and other factors can potentially affect the plume location relative to a nearby anadromous stream, the 500 feet separation ensures that a stream mouth buffer is provided, regardless of dredge location. Moreover, the separation requirement still provides a permittee the flexibility to operate up to 500 feet from a stream mouth in situations where the ocean currents would carry the plume away from the stream mouth. The Department, at its discretion, may further modify separation requirements within the permit authorization as necessary (Permit Part 3.3).

Anadromous stream and river separation requirements are based on input from NMFS and ADF&G, and similar requirements contained in DNR and U.S. Corps of Engineers permits for operations in Norton Sound. Anadromous waters are identified in the ADF&G Anadromous Waters Catalog (ADF&G 1998) and included in Permit Appendix D.

Designated critical habitat for spectacled eiders, listed as threatened under the Endangered Species Act, occurs south and west of Cape Darby, and is adjacent to, but does not overlap the permit coverage area. To protect spectacled eiders that may occur within the permit coverage area, permittees must maintain a minimum distance of 1,000 feet from any large flock of spectacled eiders within areas known to have high bird populations, i.e., Sledge Island and east of a location near Cape Nome (Permit Part 3.3.4).

Essential Fish Habitat for red king crab occurs in Norton Sound offshore of Nome. To minimize red king crab disturbance, permittees must avoid red king crab mating pairs and clusters and either move to an alternate location or cease operation if mating crabs are observed (Permit Part 3.3.5).

To protect sensitive habitat that may occur within the permit coverage area, discharges are prohibited within coral beds, eelgrass beds, seagrass beds, kelp beds, vegetated shallows, and shellfish beds (Permit Part 3.3.6).

6.0 OTHER PERMIT CONDITIONS

6.1 Monitoring Requirements

APDES regulations require that permits include monitoring to determine compliance with permit requirements (18 AAC 83.455). Monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. Permittees are responsible for conducting visual monitoring on a daily basis and for reporting results to DEC (Permit Part 2.2). A permittee that is authorized a mixing zone larger than 1,600 feet or unable to comply with visual monitoring, may be required to comply with alternative monitoring requirements (e.g., water samples) in lieu of, or in addition to, visual monitoring (Permit Part 2.4). Alternative monitoring requirements are issued on a case-by-case basis and are based on the size, scale, and nature of the operation. The Department will outline specific requirements within the permit authorization.

6.2 Recording and Reporting Requirements

The permit contains recording and reporting requirements that are based on standard regulatory language (Fact Sheet Section 6.3) and additional requirements specific to the permit. Recording and reporting requirements stipulate that the permittee must maintain daily records and submit an annual report to DEC by January 31 for the previous calendar year (Permit Part 4.2). At the Department's discretion, a permittee with a new or expanding operation may be required to submit monthly Discharge Monitoring Reports (DMRs) for a minimum of one season of operation until the permittee reasonably demonstrates an ability to meet permit limits and receives written approval from the Department to discontinue monthly reporting (Permit Part 4.3). Additionally, Permit Appendix A, Part 3.4 (Twenty-four Hour Reporting) requires that reports of any noncompliance event endangering health or the environment be submitted orally

within 24 hours after the permittee becomes aware of the circumstances and in writing within five days after the permittee becomes aware of the circumstances.

The 24-hour reporting requirement is based on state regulations and must be contained in all APDES permits [18 AAC 83.410(f)]. The state regulation is based on the CWA and federal regulations that assume that the facility has access to roads and immediate communication. The regulation does not consider the logistical or communication difficulties present in many remote locations in Alaska. DEC has received requests to modify Permit Appendix A, Part 3.4 to consider logistical and communication difficulties of remote sites. However, DEC is unable to modify standard permit conditions that are based on State regulations. Although DEC is aware of the logistical difficulties of remote operations and recognizes that some permittees may have difficulties meeting the 24-hour noncompliance reporting requirement, permittees are still required to notify DEC of any noncompliance. DEC encourages permittees who report after the deadlines, due to the remoteness of the activities, to also include a separate statement explaining the reason for any late reports.

EPA signed an Electronic Reporting Rule (E-Reporting Rule) on September 24, 2015 and published the rule in the Federal Register on October 22, 2015. The rule applies to municipalities, industries and other facilities and replaces most paper-based NPDES reporting requirements with electronic reporting. Specifically, the rule requires regulated entities to report information electronically, instead of filing written paper reports. These reports include monthly Discharge Monitoring Reports (DMRs), other specified program reports (e.g., Annual Reports), and NOIs to discharge under a general permit. The rule also requires states and other regulatory authorities to share data electronically with EPA. The data that these regulatory authorities will share with EPA includes permit, compliance monitoring (e.g., inspection), violation determination, and enforcement action data. General information about the new E-Reporting rule is available at <http://dec.alaska.gov/water/Compliance/EReportingRule.htm>. Training materials and webinars for NetDMR can be found at <https://netdmr.zendesk.com/home>.

The E-Reporting Rule (40 CFR 127) is implemented in phases. Phase I of the rule requires permittees to be submitting DMR data electronically through NetDMR (<https://cdxnodengn.epa.gov/oeca-netdmr-web/action/login>) on December 21, 2016. Any required DMR data that cannot be reported in a NetDMR field (e.g., mixing zone receiving water data), shall be included as an attachment to the NetDMR submittal. Phase II of the rule will integrate electronic reporting for all other Permit required reports (e.g., Annual Reports and NOIs) and implementation is expected to begin December 2020. Permittees should monitor the E-Reporting Information website (<http://dec.alaska.gov/water/Compliance/EReportingRule.htm>) for Phase II updates and will be notified when they must begin submitting all other reports electronically. Until such time, other reports may be submitted to the address in Permit Appendix A.

6.3 Standard Conditions

Appendix A of the permit contains standard regulatory language that must be included in all APDES permits. These requirements are based on regulations and cannot be challenged in the context of an individual APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

7.0 ANTIBACKSLIDING

18 AAC 83.480 requires that “effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit.”

18 AAC 83.480(c) also states that a permit may not be reissued “to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued.” This reissued permit does not contain effluent limitations that are less stringent than the previous permit, therefore, antibacksliding analysis is unwarranted.

8.0 ANTIDegradation

The Antidegradation Policy of the Alaska WQS states that the existing and designated water uses and the level of water quality necessary to protect existing uses must be maintained and protected (18 AAC 70.015). The following analysis provides rationale for the Department’s decisions with respect to the Antidegradation Policy.

The Department’s approach to implementing the Antidegradation Policy, found in 18 AAC 70.015, is currently based on the Department’s *Interim Antidegradation Implementation Methods (Interim Methods)*, dated July 14, 2010 (DEC 2010b). Note that the Lieutenant Governor signed and filed Antidegradation Implementation Methods regulations on March 7, 2018 with an effective date of April 6, 2018. The regulations were subsequently submitted to EPA on March 9, 2018 for review and approval. The new regulations may not be used for CWA purposes (e.g., APDES permits) until EPA approves the regulations for use in such purposes. As such, until the new regulations are approved by EPA for use in APDES permitting, the existing *Interim Methods* will be used in conjunction with the application of the Antidegradation Policy.

Using these requirements and policies, the Department determines whether a waterbody or portion of a waterbody is classified as Tier 1, Tier 2, or Tier 3. A higher tier indicates a greater level of water quality protection. At this time, the Department has not designated any Tier 3 waters in Alaska. This analysis conservatively assumes that all authorizations completed under the permit will be for discharges to a Tier 2 water (e.g., Norton Sound). Accordingly, the following antidegradation analysis is for Tier 2 waters.

The State of Alaska’s Antidegradation Policy states that existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected; and if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality must be maintained and protected. The Department will authorize a reduction in water quality only after the applicant submits evidence in support of the application and the Department finds that the five specific requirements of the antidegradation policy at 18 AAC 70.015(a)(2)(A)-(E) are satisfied. The Department’s findings follow.

8.1.1 **18 AAC 70.015 (a)(2)(A). Allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located.**

The implementation of BMPs is the most feasible method of controlling the unique type of discharge covered under this permit. Accordingly, the lowering of water quality is necessary as the Department has found that the most effective and reasonable methods of pollution control (i.e., BMPs) are being applied to the discharges (See Fact Sheet 7.1.4).

Placer mining has occurred in Alaska since the late 1800s and has contributed to the economic and social development of the state. A 2014 survey of placer mine operators, open-cut and suction dredge, conducted by McDowell Group (McDowell 2014) indicates that placer mining continues to have a significant economic impact in Alaska. Although the survey did not distinguish between open-cut and dredge operations, the McDowell report found that overall in 2013:

- placer mining-related employment statewide (indirect and induced) totaled 1,700 jobs with a total statewide labor income of \$65 million;
- placer mine production totaled approximately 82,000 ounces of gold, with a total gross production value of approximately \$105 million; and
- placer miners spent approximately \$65 million on goods and services for their operations, with 88% (or \$57.1 million) spent in Alaska.

The placer mining sector also creates revenue for the State of Alaska through a number of mechanisms, including royalty payments, taxes (for example, mining license tax, corporate net income tax, and state fuels tax), annual claim rental, annual labor, and mining permit fees. Payments are also made to various state and local government departments for programs, fees, services, and local sales tax (where levied).

Many placer mines continue to act as small family business. Survey results from the 2014 McDowell report indicate that in 2013, 27% of placer operations were only worked by a single permit holder with no additional employees; 30% of placer operations had two workers, and approximately 44% of placer operations had three or more workers. On average, 4.1 workers worked on active placer operations. Nearly half (47%) of the active placer operators with employees had at least one family member working on their claim. On average, these family-oriented operations have 1.7 family members employed.

Placer gold mining has occurred near Nome for over 100 years and has played an integral role in the economy and community development. From 1898 to 1993, an estimated 4,822,569 ounces gold were produced from stream, hillslope or colluvial, glacial, and marine strandline placer deposits throughout the area, making the Nome district Alaska's second largest producer of placer gold (Bundtzen et al. 1994). Reports estimate 3.3 million to 10 million ounces of gold remain in the permit coverage area (Lasley 2011).

DNR held a competitive sale for offshore mineral leases in Norton Sound on September 28, 2011. The lease sale conveyed a total acreage of 23,793 acres and brought in \$7.6 million in sales (personal communication, Bill Cole, Geologist, DNR, November 23, 2012). Mineral leases were purchased by a range of bidders, from local residents to global mining companies. The lease sale, combined with media coverage, resulted in 17 new permit applications for large gold dredge operations in Norton Sound.

As described in the DNR Final Finding and Decision for the lease sale (DNR 2011), a vibrant offshore mining industry would provide jobs for Alaskans, particularly in the Nome area. A number of offshore dredgers presently live in Nome. Some currently have leases or operate on leases held by other miners. These dredgers benefit from the opportunity to operate on new leases. Mining operations also purchase significant amounts of equipment, parts, fuel, food, freight, and other services; bring business to local merchants and suppliers; and expand and diversify the local economic base. The

development of large mining operations, resulting in a boon to local businesses creates even more jobs supporting the mining industry. During the operation of the BIMA dredge from 1986 -1990, WestGold (Fact Sheet Section 2.0) injected approximately \$8 to10 million per year into the Nome economy (Rusanowski and MacCay 1990, as cited in DNR 2011).

Depending on whether the operator hires local personnel, mining can be an important source of new jobs in the Nome community. DNR does not have the authority to require local hire, but lease sale stipulations encourage it (DNR 2011). From 1986 through 1989, WestGold employment at Nome was 434 person years. Of that employment, 292 person years were Nome residents and 325 person years were Alaska Residents, 67% and 75%, respectively. (Rusanowski and MacCay 1990, as cited in DNR 2011).

After the 2010 opening of the West Nome Beach Public Mining Area in Nome and the 2011 offshore lease sale, the increase in mining activity brought significant economic growth to Nome. The influx of commercial and recreational mining activity has increased city tax revenue and added a new sector to Nome's seasonal tax base. A 2015 study conducted by the Department of Commerce, Community, and Economic Development (DCCED) indicates the City of Nome has seen a significant increase in tax revenue, along with increased revenue from the collection of docking permits and harbor storage fees, since the influx of miners began in 2011 (DCCED 2015). During the 2010 to 2014 timeframe, the city population remained relatively unchanged, increasing by 1.6 percent. Outside of the construction of the Norton Sound Regional Hospital, which was completed in 2012, no other large economic drivers entered the region. From 2010 to 2013, sales tax revenue increased by 21 percent, rising from \$4,443,756 to \$5,373,835. Total property taxes (excluding oil and gas property taxes) increased by 68 percent, rising from \$1,577,427 to \$2,653,922. The local bed tax increased by 25 percent, growing from \$126,575 to \$157,913 (DCCED 2015).

Increased offshore operations also provided revenue to the State of Alaska total from rental payments and production royalties. In 2013, total rent paid to the State on offshore mining leases and submerged land mining claims within the Norton Sound area was approximately \$50,000 and total production royalties were approximately \$8,000 (DCCED 2015). Although resource depletion in Nome may eventually lessen recreational interest in the offshore public mining areas, the economically viable placer gold found in large offshore lease tracts is expected to sustain a long-term commercial mining industry (DCCED 2015).

As a secondary economic benefit, placer gold operations in Alaska have attracted media attention and resulted in the production of multiple cable television series. Expenditures on goods and services during production stimulate the local and statewide economy. Review of Alaska Film Office reports during the issuance of the 2013 permit indicated that \$984,157 in Alaska production expenses was incurred during production in Nome from June 28 to November 5, 2011 and submitted to the State for tax credit approval. Although not all of these expenditures were necessarily spent in Alaska, it is reasonable to assume that a significant amount provided economic benefit to Alaska's economy.

The Department finds that the lowering of water quality is necessary to accommodate important economic and social development in the area where the waterbody is located and that this requirement is met.

8.1.2 **18 AAC 70.015 (a)(2)(B). The reduced water quality will not violate applicable water quality criteria of 18 AAC 70.020 or 18 AAC 70.235 or the whole effluent toxicity limit in 18 AAC 70.030.**

The permit requires adherence to BMPs and authorizes a mixing zone for turbidity. All applicable water quality criteria must be met at the mixing zone boundary. Limits and monitoring in Permit Part 2.0, BMPs in Permit Part 3.1, Separation Requirements in Permit Part 3.3, Site-Specific Requirements in Permit Part 3.4, and mixing zones authorized in accordance with 18 AAC 70.240 (amended through June 26, 2003) will protect water quality under 18 AAC 70.020. Moreover, dredging is a mobile operation, and impacts are localized and transient.

Discharges authorized under this permit will not violate applicable water quality criteria per the site-specific criteria regulations found at 18 AAC 70.235. Under this regulation, the Department may establish site-specific water quality criterion that modifies a water quality criterion set for a waterbody. Currently there are no site-specific criteria established for the receiving waters applicable to this permit. If a site-specific criterion is authorized, a permittee must comply with any additional requirements as described in Permit Part 2.4 and implemented via the permit authorization.

Discharges authorized under this permit will not violate the applicable whole effluent toxicity limit found at 18 AAC 70.030. Discharges do not introduce contaminants that do not already exist in the sediment and water; therefore, whole effluent toxicity is not a concern and further evaluation is not required.

The Department finds that the reduced water quality will not violate applicable water quality criteria or the whole effluent toxicity limit and that the requirement is met.

8.1.3 **18 AAC 70.015(a)(2)(C). The resulting water quality will be adequate to fully protect existing uses of the water.**

EPA-issued NPDES individual permits have authorized discharges from large dredges in Norton Sound since 1985. To date, no negative impacts from permitted large dredge discharges to existing uses of the waterbody have been documented. When compared to requirements in previous individual permits, the permit does not propose any changes that would contribute to the discharge of lower quality wastewater. In addition, all water quality criteria must be met at the boundary of authorized mixing zones ensuring water body uses are maintained.

The Department finds that the resulting water quality will be adequate to fully protect existing uses and that this requirement is met.

8.1.4 **18 AAC 70.015(a)(2)(D). The most effective and reasonable methods of pollution prevention control and treatment will be applied to all wastes and other substances to be discharged.**

The Department finds the most effective methods of prevention, control, and treatment are the practices and requirements set out in this permit and currently in use at these operations. The nature of suction dredge operations allows for limited treatment options (Fact Sheet Section 5.3); therefore, permittees adhere to effluent limitations, monitoring requirements, BMPs, seasonal restrictions, and separation distance requirements to

prevent and control pollution (Fact Sheet Sections 5.0 - 6.0). The Department, on a case-by-case basis, may include additional site-specific requirements for any operation to further ensure that the most effective and reasonable methods of pollution control are implemented.

The Department finds that this requirement to address pollution prevention, control, and treatment is met.

8.1.5 18 AAC 70.015(a)(2)(E). Wastes and other substances discharged will be treated and controlled to achieve the highest statutory and regulatory requirements.

Applicable “highest statutory and regulatory requirements” are defined in 18 AAC 70.990(30) (June 26, 2003). Accordingly, there are three parts to the definition. The first part of the definition includes all federal technology-based ELGs, as found in 40 CFR Part 440 Subpart M, as adopted by reference at 18 AAC 83.010(g)(3). Pursuant to Subpart M (b), the provisions of Subpart M are not applicable to facilities under the *Norton Sound Large Dredge Placer Miners General Permit*. Therefore, as described in Fact Sheet Section 5.2, the permit does not contain technology-based effluent limits.

The second part of the definition appears to be in error as 18 AAC 72.040 considers discharge of sewage to sewers and not minimum treatment. The correct reference appears to be the minimum treatment standards found in 18 AAC 72.050, which refers to domestic wastewater discharges only. Because discharge of domestic wastewater is not authorized under this permit, further evaluation of this part is not required.

The third part includes any more stringent treatment required by state law, including 18 AAC 70 and 18 AAC 72. The correct operation of equipment, visual monitoring, and BMP implementation, as well as other permit requirements, will control the discharge and satisfy all applicable federal and State permit conditions and requirements. See the rationale detailed in Fact Sheet Section 8.1.2.

The Department finds that the treatment required by the permit achieves the highest statutory and regulatory requirements and that this requirement is met.

9.0 OTHER LEGAL REQUIREMENTS

9.1 Ocean Discharge Criteria Evaluation

Section 403(c) of the CWA requires that permits for ocean discharges be issued in compliance with EPA’s Ocean Discharge Criteria for preventing unreasonable degradation of ocean waters. The purpose of the ODCE report is to identify pertinent information and concerns relative to the Ocean Discharge Criteria and wastewater discharges.

EPA’s Ocean Discharge Criteria set forth specific determinations of “unreasonable degradation of the marine environment” that must be made prior to permit issuance [40 CFR Part 125, Subpart M, as adopted by reference at 18 AAC 83.010(c)(8)]. For this permitting action, DEC is relying on 40 CFR 125.122(b) which states “Discharges in compliance with section 301(g), 301(h), or 316(a) variance requirements or State water quality standards shall be presumed not to cause unreasonable degradation of the marine environment, for any specific pollutants or conditions specified in the variance or the standard.” Because the permit implements BMPs, and

monitoring requirements, that ensure applicable water quality standards are being met, pursuant to 40 CFR 125.122(b), DEC determined discharges authorized under the permit not to cause unreasonable degradation of the marine environment.

9.2 Endangered Species Act

NMFS is responsible for administration of the Endangered Species Act (ESA) for listed cetaceans, seals, sea lions, sea turtles, anadromous fish, marine fish, marine plants, and corals. All other species (including polar bears, walrus, and sea otters) are administered by the U.S. Fish and Wildlife Service (USFWS). The ESA requires federal agencies to consult with NMFS and USFWS (collectively referred to as the Services) if their actions could beneficially or adversely affect any threatened or endangered species. As a state agency, DEC is not required to consult with the Services regarding permitting actions. However, the Department values input from the Services and solicited comments from NMFS and USFWS on November 2, 2017 in development of the permit. Any input received from the services will be considered during the permit issuance.

9.3 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) designates Essential Fish Habitat (EFH) in waters used by anadromous salmon and various life stages of marine fish under NMFS jurisdiction. EFH refers to those waters and substrates (sediments, etc.) necessary to fish from commercially-fished species to spawn, breed, feed, or grow to maturity. NMFS describes freshwater EFH for Alaskan stocks of Pacific Salmon as “those waters identified in ADF&G’s Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fish Species ... and wherever there are spawning substrates” (ADF&G 1998, NMFS 2005). Freshwater EFH applies to eggs, larval and juvenile stages, and adult salmon.

The Magnuson-Stevens Act requires federal agencies to consult with NMFS when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. As a state agency, DEC is not required to consult with NMFS regarding permitting actions. However, the Department values NMFS input and solicited comments from them on November 2, 2017 in development of the permit. Any input received from NMFS will be considered during the permit issuance.

10.0 REFERENCES

- ADF&G (Alaska Department of Fish and Game). 1998. Catalog of waters important for spawning, rearing, or migration of anadromous fishes. Alaska Department of Fish and Game, Habitat Division, 6 vols., Anchorage, Alaska. Revised periodically.
- Bundtzen, T. K., R. D. Reger, G. M. Laird, D. S. Pinney, K. H. Clautice, S. A. Liss, and G. R. Cruse. 1994. Progress report on the geology and mineral resources of the Nome mining district. State of Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys, Public-Data File 94-39, Fairbanks, Alaska.
- Crecelius, E. A. 1990. Review of the Westgold Monitoring Program. Prepared by Battelle, Pacific Northwest Laboratories, Richland, Washington. for Westgold Exploration and Mining Company, Nome, Alaska.
- DCCED (Alaska Department of Commerce, Community, and Economic Development). 2015. Nome suction dredge study. State of Alaska, DCCED, Division of Economic Development.
- DEC (Alaska Department of Environmental Conservation). 2008. National Pollutant Discharge Elimination System Memorandum of Agreement between State of Alaska and United States Environmental Protection Agency Region 10, as amended through August 11, 2011. Alaska Department of Environmental Conservation.
- DEC. 2010a. Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report, July 15, 2010. Alaska Department of Environmental Conservation.
- DEC. 2010b. Interim Antidegradation Implementation Methods, Effective July 14, 2010. Alaska Department of Environmental Conservation, Policy and Procedure No. 05.03.103.
- DEC. 2013. Ocean Discharge Criteria Evaluation for the Alaska Pollutant Discharge Elimination System Norton Sound Large Dredge Placer Miners General Permit (AKG374000). Alaska Department of Environmental Conservation.
- DNR (Alaska Department of Natural Resources). 2011. Final finding and decision: Nome offshore lease sale for locatable minerals ADL 231169. Alaska Department of Natural Resources.
- ENSR (ENSR Consulting and Engineering). 1989. ODCE information database for Norton Sound 45 Nome Offshore Placer Project NPDES Permit No. AK-004319-2.
- ENSR. 1992. Regulatory processes associated with metal-mine development in Alaska: a case study of the WestGold BIMA. Prepared by ENSR Consulting and Engineering for the U.S. Bureau of Mines, Alaska Field Operations Center, OFR 88-92, Juneau, Alaska.
- EPA (U.S. Environmental Protection Agency). 1998. Alaska placer mining metals study. U.S. Environmental Protection Agency, Office of Environmental Assessment, Region 10, EPA-910-R-98-003, Seattle, Washington.

- EPA. 1999a. Alaska placer mining metals study - year two. U.S. Environmental Protection Agency, Office of Environmental Assessment, Region 10, EPA910-R-99-004, Seattle, Washington.
- EPA. 1999b. Permit recommendations resulting from the EPA metals study. U.S. Environmental Protection Agency, Office of Environmental Assessment, Office of Water, Region 10, unpublished, Anchorage, Alaska.
- Garnett, R. H. T. and D. V. Ellis. 1995. Tailings disposal at a marine placer mining operation by WestGold, Alaska. *Marine Georesources and Geotechnology* 14:41-57
- Garvin, P. C., C. E. Sweeney, and P. C. Rusanowski. 1991. Evaluation of effluent mixing zone size with permit performance standards for an offshore mining vessel. 23rd Annual Offshore Technology Conference, Houston, Texas, OTC 6552.
- Lasley, S. 2011. Sunken gold draws global miners to Nome. North of 60 Mining [In] *Petroleum News* 16 (44):3-4. <http://www.petroleumnews.com/pntruncate/948275969.shtml> Accessed November 2012.
- McDowell (McDowell Group, Inc.) 2014. The economic impacts of placer mining in Alaska. Prepared by McDowell Group Inc. for the Alaska Miners Association, Inc., Anchorage, Alaska.
- MMS (Minerals Management Service). 1990. OCS Mining Program Norton Sound lease sale: Second draft environmental impact statement. U.S. Department of the Interior, Minerals Management Service, OCS EIS/EA, MMS 90-0032, Anchorage, Alaska.
- Prussian, A. M., T. V. Royer, and G. W. Minshall. 1999. Impact of suction dredging on water quality, benthic habitat, and biota in the Fortymile River, Resurrection Creek, and Chatanika River, Alaska. Prepared by Idaho State University for the Environmental Protection Agency, Region 10, Seattle, Washington.
- Rusanowski, P. C. and C. L. MacCay. 1990. Nome Offshore Placer Project synthesis report 1989. Prepared by ENSR Consulting for Western Gold Exploration and Mining Company (WestGold).
- USGS (United States Geological Survey). 1997. Studies of suction dredge gold-placer mining operation along the Fortymile River, Eastern Alaska. Department of Interior, United States Geological Survey, Fact Sheet 154-97.