

falls within the allowable net precipitation annual discharge volume established in the NPDES permit and required by the ELGs.

EPA issued a Notice of Intent (NOI) to prepare the SEIS for the Red Dog Mine Aqqaluk Project in the Federal Register on August 31, 2007. This initiated the scoping process required under NEPA. EPA held public scoping meetings on October 2 through October 5, 2007 in Anchorage, Kotzebue, Noatak, and Kivalina. The purpose of the scoping meetings was to explain the Aqqaluk Project and the NEPA process and to listen and record the public's comments on the project and respond to the public's requests for background information needed to fully understand the project description and proposed scope of the SEIS. The scoping period ended on October 15, 2007. Comments received during scoping were used to develop the scope of the SEIS and identify significant issues that needed to be evaluated.

The public comment period on the Draft SEIS was held concurrent with the public comment period on the Draft NPDES permit. The 60-day public review period was from December 5, 2008 until February 3, 2009. EPA held public meetings and hearings on the Draft SEIS and Draft NPDES permit on January 12 through 15, 2009 in Kivalina, Noatak, Kotzebue, and Anchorage. Numerous comments were received on the Draft SEIS and on the Draft NPDES permit. The Final SEIS includes an appendix (Appendix H) with responses to comments on the Draft SEIS. The comments on the Draft NPDES permit were responded to in a separate Response to Comments document, which describes changes made to the Final NPDES permit based on the comments received. The Final NPDES permit and NPDES Permit Response to Comments are attached to this ROD (Appendix C). In addition, EPA received four comment letters on the Final EIS. Responses to these comments are included in Appendix B.

#### A. Receiving Waters

The Middle Fork Red Dog Creek is protected in the Alaska Water Quality Standards (WQS) for freshwater Class (1)(A)(iv) for industrial water supply use from the headwaters to the terminus of the Red Dog Mine water management system. Lower Middle Fork Red Dog Creek from the terminus of the Red Dog Mine water management system to the confluence with North Fork Red Dog Creek is protected in the WQS for freshwater Classes (1)(A)(iv) for industrial water supply, (1)(B)(i) for contact recreation, wading only and (1)(B)(ii) for secondary recreation (except fishing). The main stem of Red Dog creek from the confluence of the Middle and North Forks to Ikalukrok Creek is protected in the WQS for freshwater Classes (1)(A)(iv) for industrial water supply, (1)(B)(i) for contact recreation, wading only, (1)(B)(ii) for secondary recreation, and (1)(C) for growth and propagation of fish, shellfish, other aquatic life, and wildlife.

Downstream of Red Dog Creek is Ikalukrok Creek. Ikalukrok Creek from its confluence with Red Dog Creek to the Wulik River is protected in the WQS freshwater Classes (1)(A)(iv) for industrial water supply, (1)(B)(i) for contact recreation, wading only, (1)(B)(ii) for secondary recreation, and (1)(C) for growth and propagation of fish, shellfish, other aquatic life, and wildlife.

The water quality parameters that could be affected by the discharge from the Red Dog mine site include metals, solids, cyanide, and pH. These are common potential water quality parameters of concern in treated mine water discharges.

## B. Description of Discharge

Outfall 001 consists of treated water from the tailings impoundment. The tailings impoundment at the Red Dog Mine receives water from a variety of sources. These sources include: water associated with the tailings from the milling process which includes small amounts of the chemical reagents used in ore processing; domestic wastewater, assay laboratory, filter press discharge, thickener overflows, and heavy equipment washing water carried by the gravity line from the mill/housing area; truck wash water; waste rock dump seepage; overburden pumpback; SAG mill conveyor wet scrubber system, natural gas produced water; filter cloths which are buried with the tailings; soil cement used on the exposed tailings beach; seepage pumpback; blasting agents; secondary containment water; water used as dust suppressant that may contain small amounts of methanol; snow dump; mine sump water; sand filter backwash and sand deposited on the tailings beach; and Port wastewaters hauled to the mine site such as regeneration solution from the ion exchange treatment process at the Port.

Tailings pond water, often called reclaim water, is pumped by floating barge pumps in the tailings pond to two different water treatment plants at the mill facility. Water treatment plant 1 (WTP-1) operates year-round at a nominal rate of 6,000 gallons per minute (gpm) and provides the mill with treated water for processing. Water treatment plant 2 (WTP-2) is seasonally operated and treats reclaim water for discharge at Outfall 001 at a maximum capacity of 14,500 gpm. WTP-2 also has the ability to provide water to the mill when needed.

At WTP-2, reclaim water is first treated in the pipeline with sodium sulfide and mixed in an in-line mixer. The sulfide reacts with the dissolved cadmium in the reclaim water to form insoluble cadmium sulfide, which is stable throughout the remainder of the treatment process. Reclaim water then flows into a rapid mix tank where reacted lime (calcium hydroxide) and recycled sludge are added to adjust the pH to approximately 10.3 standard units (s.u.). From the rapid mix tank the solution gravity flows into a lime reactor.

The significant chemical reaction occurring in the lime reactor is precipitation, altering the form of an ion from a dissolved state to a solid state, of soluble metals as insoluble metal-hydroxides. Teck has proposed using barium hydroxide rather than calcium hydroxide for this treatment step, as needed, to discharge more wastewater to maintain the water balance in the tailings impoundment. The precipitated solids are maintained in suspension and flocculent is added, coalescing the smaller particles into larger solids. The flocculent is allowed to react in the agitated floc mix tank. From the floc mix tank, the wastewater flows into a clarifier where the solids are allowed to settle by gravity and separate from the water. Settled solids (sludge) are removed through the "underflow" and the treated water leaves the clarifier through the "overflow". The majority of the underflow solids are recycled back to the beginning to the treatment process to a lime/sludge mix tank where the solids are mixed with lime. Product in the lime/sludge mix tank is then fed into the rapid mix tank with the raw reclaim water from the

tailings impoundment.

Clarifier overflow water flows to sand filters which remove any residual solids not settled out of solution in the clarifier. From the sand filters, automated pH and turbidity meters take final measurements. If the pH is within permit limits and the range established which ensures effective treatment and the turbidity is within an established range which indicates that effective suspended solids removal has been accomplished, the water is discharged via Outfall 001 to Middle Fork Red Dog Creek. If the pH and turbidity are not within the prescribed range, the filtered water is discharged back into the tailings impoundment.

Water treatment plant 3 (WTP-3) was constructed during the winter/spring of 2004/2005 and began operating in 2006. The plant treats seepage and runoff from the Main Waste Stockpile and Mine Sump before it enters the tailings impoundment. Over time, the operation of WTP-3 is intended to help control TDS and sulfate levels in the tailings impoundment. Like WTPs-1 and 2, WTP-3 uses a lime precipitation process for metals removal.

The volume of effluent discharged varies with precipitation and the amount of mine drainage and seepage entering into the impoundment. Effluent discharge volumes range from 0.2 billion gallons (bgal) per year (1993) to 1.5 bgal per year in 1999 and 2005.

Section 304(e) of the CWA requires EPA to include conditions in the NPDES permit that require the permittee to develop a Best Management Practices (BMP) Plan and/or Stormwater Pollution Prevention Plan (SWPPP) to control potential discharges such as runoff, spillage, and leaks. The NPDES permit requires a Site Management Pollution Prevention Plan (SMPPP) that combines general BMP Plan requirements with SWPPP requirements to control the discharge of toxic or hazardous pollutants by way of plant runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage at the mine site itself. The SMPPP should recognize the hazardous nature of various substances used and produced by the facility and the way such substances may be accidentally dispersed. The intent of the SMPPP is to ensure that the facility and any ancillary activities, such as drilling pads, control storm water discharges.

### C. Endangered Species Act

EPA determined that there were no threatened and endangered species listed under the Endangered Species Act in the vicinity of the discharges from the mine site authorized under the NPDES permit. During an earlier permit issuance (the 2007 NPDES permit, which EPA withdrew), the U.S. Fish and Wildlife Service (USFWS) and the NOAA National Marine Fisheries Service (NOAA) sent letters to EPA stating that there were no threatened or endangered species listed under their jurisdiction in the project area (USFWS letter dated September 21, 2005 and NOAA letter dated September 28, 2005). Since that time, the polar bear has been listed as threatened. Polar bears have been occasionally observed at the port site during the winter, but have not been reported to remain near the port facilities. Since the port does not operate in the winter, EPA determined in the Final SEIS that there would be no impact on the polar bear.

There would be no impact from the NPDES discharge to threatened and endangered species since there are no listed species in the area of discharge. NOAA concurred with this determination in a November 2, 2009 email from Amy Cox, NOAA, to Cindi Godsey, EPA. USFWS concurred with this determination in a November 3, 2009 email from Nora Rojek, USFWS.

#### D. Essential Fish Habitat (EFH)

EPA consulted with NMFS pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and determined that issuance of the permit is not likely to have an adverse effect on EFH in the vicinity of the discharge. Effluent limitations have been incorporated into the permit based on criteria considered to be protective of overall water quality in Red Dog Creek based on the designated uses of the Creek. Teck has constructed a weir as a barrier to fish passage to prevent fish from coming into contact with the discharge.

#### E. National Historic Preservation Act (NHPA)

EPA, in coordination with the Corps, initiated consultation with the Alaska State Historic Preservation Officer (SHPO) regarding two cultural resources sites near the Aqqaluk pit (September 16, 2009 letter to Judith Bittner, SHPO, from Patty McGrath, EPA). EPA determined that there would be no adverse effect to these sites under Section 106 of the NHPA with regard to the agencies' issuance of CWA permits for the proposed Aqqaluk Extension Project. This determination was based on the analysis of impacts to cultural resources in the Final SEIS and also on the measures and operational controls included in Teck's Red Dog Mine Cultural Resources Protection Plan (CRPP) for Alaska Heritage Resource Survey Sites DEL-163 and DEL-337 (July 12, 2009). SHPO responded to EPA's determination by requesting that the site conditions of DEL-163 and DEL-337 be monitored annually and that three specific conditions and clarifications be incorporated into the CRPP as stipulations for these sites. The conditions are related to professional qualifications and SHPO consultation and procedures regarding inadvertent finds. SHPO stated that they concur with EPA's finding so long as these stipulations are included in the CRPP and implemented (October 21, 2009 letter to Patty McGrath, EPA, from Judith Bittner, SHPO). Teck revised its CRPP to include SHPO's stipulations. On November 30, 2009, EPA submitted the revised CRPP to SHPO, which concluded NHPA consultation.

#### F. Tribal Consultation

Pursuant to Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), EPA undertook a concerted effort by contacting the tribal governments (Indian Reorganization Act [IRA] council and traditional councils) of each Native village in the NWAB to determine if the tribal governments were interested in engaging in government-to-government consultation and/or participation as a cooperating agency in developing the SEIS. EPA considered that each of the 11 villages (IRA Council: Buckland, Deering, Kivalina, Kotzebue,

Noatak, Noorvik, Selawik, Shugnak; traditional council: Ambler, Kiana, Kobuk) within the NWAB could potentially be affected by the proposed action. Nine of the tribal village participated as cooperating agencies

The Kivalina IRA Council was the only tribe that originally responded to request government-to-government consultation. EPA, NPS, and the Corps met with the Kivalina IRA Council on October 5, 2007, before the Kivalina public scoping meeting and on January 12, 2009, before the Kivalina public meeting on the draft SEIS and draft NPDES permit. Comments received during the meetings were used to develop the significant issues and alternatives for evaluation in the SEIS.

Following issuance of the draft SEIS, the Point Hope IRA Council requested government-to-government consultation in a comment letter on the draft SEIS and draft NPDES permit submitted on its behalf by Trustees for Alaska. EPA responded by letter and email agreeing to a consultation meeting and requested that the Council contact EPA regarding possible meeting dates. In June 2009, EPA was sent an email by the Point Hope IGAP coordinator requesting EPA's attendance at a meeting in two days. EPA was unable to attend the meeting and requested that EPA and the Point Hope Council work together to set up another date. To date there has been no response to that communication.

## **VI. MITIGATION MEASURES, RECLAMATION, AND MONITORING**

Teck implements mitigation measures and monitoring as part of its ongoing management of the Red Dog Mine. During the analysis in the SEIS, EPA recommended additional mitigation and monitoring measures. See Section 2.5 and Chapter 3 of the Final SEIS.

### **A. Mitigation Measures**

CEQ NEPA implementing regulations require that agencies identify in the ROD whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why not. 40 CFR § 1505.2(c). The regulations further state that a monitoring program shall be adopted and summarized where applicable for any mitigation. Mitigation measures are the practical means to avoid, minimize, and reduce impacts, and compensate for unavoidable impacts by replacing or providing substitute resources or environments.

Teck has built into its project many mitigation measures that have been taken into account in assessing the environmental consequences of the alternatives. Additional mitigation measures were identified in the SEIS analysis. These measures and a summary of whether/how they can be implemented is provided in Table 3 (Appendix A). EPA recommends that other agencies require, or Teck voluntarily, implement mitigation measures that cannot be required by the NPDES permit.

## B. Reclamation

The overall goal of Red Dog Mine closure and reclamation is to return disturbed land to the post-mining land use designated by the land owner, primarily NANA. Under all alternatives, including the preferred alternative, long-term treatment and discharge of wastewater will be required. The reclamation and closure plan was described above under Alternative B and is described in more detail in the Final SEIS and in Teck's Red Dog Mine Closure and Reclamation Plan (the Closure Plan). The Closure Plan was approved by the State of Alaska on December 2, 2009. The Closure Plan, including the level of financial assurance will be reviewed and subject to modification every five years or at any time that the State determines that the financial assurance amount is not adequate. Currently the State has required \$305.15 million in financial assurance to cover reclamation and closure, including long-term water treatment.

## C. Monitoring

Teck has an ongoing environmental monitoring program to gather data and determine compliance with federal and state authorizations and approvals. Additional monitoring measures were identified in the SEIS analysis. These monitoring measures and a summary of whether/how they can be implemented is provided in Table 4 (Appendix A). EPA recommends that other agencies require, or Teck voluntarily, implement monitoring measures that cannot be required by the NPDES permit.

The following testing and monitoring will be required specifically in the NPDES permit. The attached permit (Appendix C) provides specific parameters and details of the monitoring program.

### Outfall 001

The NPDES permit requires monitoring of metals, TSS, cyanide, fecal coliform, ammonia, and pH on a weekly or monthly basis (depending upon the parameter) in order to determine compliance with the effluent limits in the permit. Additional monitoring for other parameters is required to assess the characteristics of the effluent and to determine whether permit limits may be needed in the future. The permit also requires that effluent flow be monitored to determine compliance with TDS limits and cumulative volume of discharge be monitored to determine compliance with the volume limit, which is based on the ELGs.

### Whole Effluent Toxicity (WET) Requirements

Chronic WET testing is included in the permit on a monthly basis. The testing will occur at Outfall 001 so that the full effects of the discharge into Red Dog Creek can be determined. If WET testing indicates that WET limits are exceeded, then Teck is required to conduct a Toxicity Reduction Evaluation to reduce the toxicity and potentially a Toxicity Identification Evaluation to identify the cause of toxicity.

### Surface Water Ambient Monitoring

The permit requires monitoring of flow and conductivity in Red Dog Creek and

Ikalukrok Creek in order to determine compliance with instream TDS limits. The permit requires monitoring for metals, cyanide, pH, ammonia, temperature, TDS, and turbidity at two locations in Ikalukrok Creek (downstream edges of the TDS mixing zone and further downstream), in Red Dog Creek (downstream edge of the TDS, ammonia, and cyanide mixing zone), in North Fork Red Dog Creek, and in the Middle Fork Red Dog Creek upstream of Outfall 001. The permit also requires ongoing bioassessment monitoring in the North Fork Red Dog Creek, Main Stem Red Dog Creek, and Ikalukrok Creek.

#### TDS Management Plan

The permit requires Teck to prepare and implement a TDS Management Plan to include information on actions that will be taken to provide enhanced treatment for TDS and/or source control. The purpose of preparing and implementing the TDS Management Plan is to ensure that the permittee will be able to discharge through Outfall 001 a sufficient volume of wastewater in compliance with the TDS effluent limits to maintain a safe water level behind the tailings impoundment dam.

#### Site Management Pollution Prevention Plan

The NPDES permit requires the permittee to develop and implement a Site Management Pollution Prevention Plan (SMPPP). The SMPPP will be used to prevent and minimize the potential for the release of pollutants from the site into waters of the U.S. The SMPPP must establish specific Best Management Practices (BMPs) to control the discharge of toxics or hazardous pollutants by way of spillage or leaks, sludge or waste disposal, and drainage from raw material storage. The SMPPP must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants.

## VII. CONCLUSION

Based on the findings of the Final SEIS, EPA has selected Alternative B as the Preferred Alternative and has developed a final NPDES permit for treated wastewater discharge from tailings impoundment (Outfall 001) to Middle Fork Red Dog Creek and for storm water to the tundra. The final NPDES permit is attached as Appendix C.

Further information regarding this Record of Decision may be obtained by contacting:

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**Signed,**

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**Michael A. Bussell**

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