

# STATE OF ALASKA

**DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF WATER  
WASTEWATER DISCHARGE AUTHORIZATION PROGRAMS**

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**Response to Comment Document  
Alaska Section 401 Certification  
NPDES Permit AK-003865-2**

This document addresses comments received on the department's Clean Water Act Section 401 draft Certification (certification) of EPA's draft NPDES Permit AK-033865-2 for discharges from Red Dog Mine. The public comment period ran from December 5, 2008 to March 12, 2009 with public hearings in Kivalina on January 12, 2009, Noatak on January 13, 2009, Kotzebue on January 14, 2009, and Anchorage on January 15, 2009. The public hearings in Kivalina, Noatak, Kotzebue, and Anchorage combined concerns involving the certification, as well as, the draft NPDES Permit and draft Supplemental Environmental Impact Statement. At the public hearings, no testimony was provided relating to the certification. The department received written comments specific to the certification from seven parties: (1) Center for Science in Public Participation, (2) Center on Race, Poverty, & the Environment, (3) Northern Alaska Environmental Center, (4) Trustees for Alaska on behalf of the Native Village of Point Hope IRA Council, (5) Mr. Robert E. Moran of Michael Moran Assoc., LLC, (6) Trustees for Alaska on behalf of the Native Village of Kivalina IRA council and Ms., Becky Norton, and (7) Teck Alaska Incorporated.

A summary of comments received on the certification and the department's responses follow.

♦Documents 1, 2, 3, 4, and 6

Comment No. 1- Mixing zones for total dissolved solids (TDS), ammonia, pH, and weak acid dissociable (WAD) cyanide may not be protective and could impede fish passage into the North Fork of Red Dog Creek. The mixing zone lengths and dilution factors are not justified.

Response - *Red Dog and Ikalukrok Creeks have been documented to have naturally occurring water quality conditions that precluded some designated uses, which have been removed (see 18 AAC 70.230(e)(8) and (18-20)). The designated use for the protection of aquatic life begins at the confluence of the Middle and North Forks of Red Dog Creek (Main Stem of Red Dog Creek). The mixing zones have been granted to ensure that the water quality criteria for all designated and existing uses, including the protection of aquatic life, are met at the edge of the mixing zone. Since the effluent*

*discharge has not demonstrated any reasonable potential to exceed the applicable water quality criteria prior to the start of the Main Stem, a regulatory mixing zone has not been granted for the Middle Fork (except for pH, see the response below). As a result, the mixing zones for TDS, cyanide, and ammonia are accurately described in the certification as beginning in the Main Stem.*

*18 AAC 70.240(l) provides for determination of the flow available for dilution by either collecting actual flow data concurrent with the discharge or calculating the low flow of the receiving water. In this case, the permittee applied for the mixing zones for ammonia and cyanide based on actual data comparing the ratio of the average daily concentrations at Station 10 in the Main Stem and the outfall from the tailings impoundment. The dilution factor of 2.5 incorporates an extremely conservative assumption. Using the ratios for the period May 2003 through September 2005, the dilution factor of 2.5 represents the value where dilution will exceed that amount 95% of the time. As documented in the certification, the department has determined that the mixing zones will be protective of the aquatic life in the Main Stem as well as ensuring fish passage to the North Fork. In large part, this is based on the finding that the mixing zones will not change the composition of the discharge and no adverse effects have been observed from pre-mining conditions in the Main Stem or the North Fork. The effluent limits for ammonia based on the 2.5 dilution factor apply under all flow conditions.*

*The department concurs with EPA's conservative approach in using the 95<sup>th</sup> percentile, pH, and temperature data for the receiving water to determine the applicable criteria for ammonia. Note that the chronic criterion of 7 mg/L is not the same as the average monthly effluent limit of 5.7 mg/L, but it provides a basis for that limit.*

*The mixing zone for pH will not affect either the existing recreational/contact uses of the segment. The actual contact uses generally only include sampling by mine and agency personnel that will not be impacted by the elevated pH in the immediate vicinity of the discharge. In the Main Stem beyond the pH mixing zone, the effluent moderates the pH of naturally acidic waters that may otherwise harm aquatic life.*

*Aquatic monitoring has shown fish populations in Red Dog Creek increase and decrease with time. There are no discernible differences between populations in areas affected by discharges from mine operations and the North Fork, which is not affected by mining operations. There also have been no effects on fish populations in the North Fork compared to pre-mining conditions indicating that there have not been adverse impacts on fish passage through the watershed. Last, there have been no observable negative impacts on existing uses, within the mixing zones or outside of them, since mining began. About 20 years of reproducible biological and water quality monitoring data indicate that discharges have not impaired existing uses, either within or outside the mixing zones, and there will be no impairment to the overall biological integrity of the waterbody.*

## ♦Documents 2 and 5

Comment No. 2 – The pH effluent limit from 6.5 to 10.5 pH units is not protective of the environment, and the map does not show the mixing zone for pH which begins at Outfall 001.

Response - *In preparing the final permit, the department recognized that a pH mixing zone is necessary because the pH criterion of 6.5-8.5 for primary contact recreation applies to the Lower Middle Fork. The mixing zone is protective of the actual recreational/contact uses (e.g. sampling by mine and agency personnel) in the Lower Middle Fork. In addition, as documented in the rationale for the mixing zones in the certification (condition 1), the upper pH limit of 10.5 allows for necessary metals removal and ensures a neutral pH in the Main Stem where the aquatic life designated use applies. Reasonable potential analyses for and, where applicable, calculation of water quality based effluent limits for metals are addressed separately from pH to ensure protection of aquatic life and other designated uses.*

*There has been no change in the amount or composition of the effluent pH and none is anticipated. Therefore, no adverse impacts are indicated.*

*Attachments A (map) and B (diagram) to the certification show the pH mixing zone.*

## ♦Document 2

Comment No. 3 – The deletion of the requirement for consultation with state and federal agencies on Arctic grayling spawning before discharge commences does not protect the grayling.

Response - *Since the requirements of the final permit no longer depend on the timing of grayling spawning, the consultation described by the commenter is unnecessary.*

## ♦Documents 2 and 5

Comment No. 4 – Raising the TDS concentration allowed downstream of the discharge is not protective on the environment.

Response - *The State adopted the site-specific criterion (SSC) allowing TDS concentrations up to 1500 mg/L in the Main Stem without the timing restrictions that had been in place previously. The comment period for that action passed. Then in a letter dated April 21, 2006, EPA approved the SSC. Therefore, Teck Alaska Inc. simply needs to demonstrate that they will meet the applicable water quality standards rather than demonstrate that the standards will have no effect on aquatic life.*

*Before adopting the current TDS SSC, the department determined that the change is protective of beneficial uses, including aquatic life, including the viability of spawning habitat, based on the body of research available. For example, Stekoll et al. (2003) found reduced fertilizations, increased mortality after fertilization, and decreased*

*fertilization with increasing TDS concentrations in coho salmon with fertilization being identified as the most sensitive stage. In assessing fertilization success, the lowest no observed effect concentration (NOEC) was identified at 750 mg/L TDS and the lowest observed effects concentration (LOEC) at 1250 mg/L TDS. No significant differences were observed among the various salmon species tested. Discharges in compliance with the permit would be below the LOEC value downstream of the mixing zone in Ikalukrok Creek (about 3,420' downstream from the confluence of Red Dog and Ikalukrok Creeks). Water quality standards therefore would ensure the viability of spawning habitat in Ikalukrok Creek.*

◆Documents 2, 4, and 6

Comment No. 5 – The certification violates antidegradation requirements.

Response - *Please see Appendix A to the final certification for the discussion of compliance with the State's antidegradation requirements at 18 AAC 70.015(a). Alaska's antidegradation policy/procedures are codified in the regulations at 18 AAC 70.015(a), which is consistent with the federal regulations at 40 CFR Part 131.12. Note that as discussed in Appendix A, the antidegradation analysis for this final permit only considers changes from the 1998 permit, which was subject to previous antidegradation review.*

◆Document 2

Comment No. 6 – The renewed permit drops condition I.G. which is even more necessary since there has been precipitate noticed along Red Dog Creek downstream of the Outfall 001 in recent years.

Response - *Previous analyses confirmed the following understanding of the situation. When basic effluent mixes with acidic receiving water carrying dissolved metals, the stream pH rises, metals solubility decreases, and some of the background dissolved metals may precipitate. Receiving water chemistry, discharge water chemistry, precipitates, and aquatic life have all been closely monitored since 1998 or before. No adverse impacts associated with precipitates have been observed. The situation is well understood, and close monitoring of the receiving water chemistry, discharge water chemistry, and aquatic life will continue. Given that, it was determined that further of the precipitates monitoring will not provide meaningful information beyond what is currently understood and monitored.*

◆Documents 2, 3, and 5

Comment No. 7 – The monitoring and limits for nickel, silver, zinc, cadmium, TDS, total cyanide, selenium, lead, hardness, whole effluent toxicity (WET), and ambient monitoring and biomonitoring/bioassessment are not protective of the environment.

Nickel Response - Appendix A, the antidegradation analysis, explains that nickel limits are more stringent than the previous permit and protects against degradation of water quality.

Silver Response - Silver was monitored during the previous permit cycle, showed no reasonable potential to violate water quality criteria established that it is not a constituent of concern, and as a result, was removed from the permit.

Zinc Response - The applicable water quality standard for zinc in the Main Stem of Red Dog Creek is determined as required in 18 AAC 70.020(b) and the Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances. See Appendix A to the certification and Appendix C to the permit's fact sheet.

Cadmium Response - The cadmium natural condition-based site specific criterion of 2.0 µg/L in Main Stem Red Dog Creek and Ikalukrok Creek in Appendix A to the certification was approved by EPA on February 27, 2007 and remains in effect for the purposes of this certification.

TDS Response - The current water quality standards at 18 AAC 70.236(b)(5) specify that the TDS with calcium greater than 50% by weight of the total cations, may not exceed 1,500 mg/L in Red Dog Creek from the confluence of the Middle Fork and North Fork to the confluence of Red Dog and Ikalukrok Creeks. The certification implements those regulations.

Total Cyanide Response - In Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances, as amended through December 12, 2008, endnote 40 on page 41 specifies that the aquatic life criteria for free cyanide shall be measured as WAD cyanide or equivalent approved EPA methods. There is no requirement to measure as free cyanide as total cyanide, only WAD.

Selenium Response - Appendix A to the certification and the certification explain why selenium limits are fully protective of existing uses. Additionally, no adverse effects have been observed from pre-mining conditions, there has been no change in the amount or composition of the effluent selenium, none is anticipated, and therefore, no adverse impacts are indicated.

Lead Response - Appendix A to the certification and the certification explain why lead limits are fully protective of existing uses. Additionally, no adverse effects have been observed from pre-mining conditions, there has been no change in the amount or composition of the effluent lead, none is anticipated, and therefore, no adverse impacts are indicated.

Hardness Response - As explained in the certification, increased hardness lessens the toxicity of some metals in water. No adverse effects have been observed from pre-

*mining conditions, there has been no change in the amount or composition of the effluent hardness, none is anticipated, and therefore, no adverse impacts are indicated.*

WET Response – *Condition 2 of the certification explains that the limit is unchanged from the previous permit. No adverse effects have been observed from pre-mining conditions, there has been no change in the amount or composition of the effluent in regards to WET, none is anticipated, and therefore, no adverse impacts are indicated.*

Ambient Monitoring and Biomonitoring/Bioassessment Response – *EPA determined that the requirements for ambient monitoring and biomonitoring/bioassessment will remain in the NPDES Permit. The State's Waste Management Permit and its monitoring plan, which is adopted by reference, include all the ambient monitoring and biomonitoring/bioassessment in the NPDES permit, as well as, additional locations.*

♦Document 7

Comment No. 8 – The certification could be clearer in several instances if greater detail were added.

Response - *The department appreciates these comments, and in some areas, the certification was expanded and detail added.*

Referenced documents:

1. **Center for Science in Public Participation** comments addressed to Patty McGrath, from David M. Chambers, 7 pages, February 3, 2009
2. **Center on Race, Poverty & the Environment** comments addressed to Office of Watersheds Director and Tim Pilon, from Luke Cole, 41 pages, February 3, 2009
3. **Northern Alaska Environmental Center** comments addressed to Patty McGrath, from Zachary Richter, 16 pages, February 3, 2008
4. **Trustees for Alaska** on behalf of the Native Village of Point Hope IRA Council comments addressed to Patty McGrath, Cindi Godsey and Tim Pilon, from Nancy S. Wainwright, 11 pages, February 3, 2009
5. **Robert E. Moran, Ph. D.** comments addressed to Office of Watersheds Director and Luke Boles, from Robert E. Moran, 7 pages, no date
6. **Trustees for Alaska** on behalf of the Native Village of Kivalina IRA Council and Ms. Becky Norton comments addressed to Patty McGrath, Cindi Godsey and Tim Pilon, from Nancy S. Wainwright, 11 pages, February 3, 2009
7. **Teck Alaska Incorporated** comments addressed to Tim Pilon, from Jim Kulas, 8 pages, February 3, 2009