Fact Sheet for Revised Draft Permit

NPDES Permit Number: ID-000002-7
Public Notice Start Date: January 6, 2003
Public Hearing Date: February 6, 2003
Public Notice Expiration Date: February 25, 2003
Technical Contact: Kelly Huynh, (206) 553-8414
1-800-424-4372 (within Region 10)
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The U.S. Environmental Protection Agency (EPA) Proposes to Reissue a Wastewater Discharge Permit To:

Coeur Silver Valley Inc.
Coeur and Galena Mines and Mills
P.O. Box 440
Wallace, Idaho 83873

and

the State of Idaho Proposes to Certify the Permit

EPA proposes NPDES permit reissuance.
The EPA proposes to reissue a National Pollutant Discharge Elimination System (NPDES) permit to Coeur Silver Valley Inc. The revised draft permit sets conditions on the discharge of pollutants from the Coeur and Galena mine and mill facilities as well as the Rainbow Mine adit and the Calahan adit to Lake Creek and the South Fork Coeur d'Alene River. 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.

A draft permit, with a supporting Fact Sheet, was previously public noticed (March 28, 2001 through August 3, 2001). The EPA is reopening the public comment period for the draft permit in order to accept comments on newly modified effluent limits (for cadmium, copper, lead, mercury, zinc, and total suspended solids); new toxicity triggers for whole effluent toxicity testing; the inclusion of three year

compliance schedules for various metals; the inclusion of bioassessment monitoring; and the removal of the chromium VI effluent limits for outfall 001. The remainder of the previously public noticed permit has not been changed. Those comments that were submitted during the previous comment period (March 28, 2001 through August 3, 2001) will be addressed through a Response To Comments document. The Response To Comments document will be provided to commenters at the time of permit reissuance and will address any changes to the final permit or lack thereof.

This Fact Sheet for the revised draft permit includes:

- information on public comment, public hearing, and appeal procedures
- a listing of the new revised, previously public noticed, and currently permitted effluent limitations for cadmium, copper, lead, mercury, zinc, and total suspended solids
- background information supporting the proposed cadmium, copper, lead, mercury, zinc, and total suspended solids limitations; and removal of the previously proposed chromium VI effluent limits for outfall 001
- the Idaho Department of Environmental Quality's preliminary 401 certification conditions

The State of Idaho proposes certification.

The Idaho Department of Environmental Quality (IDEQ) proposes to certify the NPDES permit to Coeur Silver Valley Inc. under section 401 of the Clean Water Act. The state submitted preliminary 401 certification comments which were incorporated into the revised draft permit prior to this public notice.

Public comment on the revised draft permit.

Persons wishing to comment on the revised draft permit may do so in writing by the expiration date of the public notice. All comments must be in writing and include the commenter's name, address, and telephone number and either be submitted by mail to Office of Water Director at U.S. EPA, Region 10, 1200 - 6th Avenue, OW-130, Seattle, WA 98101; submitted by facsimile to (206) 553-0165; or submitted via e-mail to mcgrath.patricia@epa.gov. In addition, EPA has scheduled a public hearing on February 6, 2003, beginning at 6:00 p.m. and ending when all persons have been heard, at Silver Hills Middle School Gymnasium at East Mullan Avenue in Osburn, Idaho. A sign-in process will be used for persons wishing to make a statement or submit written comments at the hearing. The public hearing is to receive oral testimony on the revised draft permits to Coeur Silver Valley - Coeur and Galena Mines and Hecla - Lucky Friday Mine.

After the comment period closes, and all significant comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit reissuance.
The EPA will address those significant comments that are received, prior to reissuing the permit. The permit will become effective 35 days after the issuance date, unless an appeal is filed with the Environmental Appeals Board within 30 days.

Public comment on the State preliminary 401 certification

The IDEQ provides the public with the opportunity to review and comment on preliminary 401 certification decisions. Any person may request in writing, that IDEQ provide that person notice of IDEQ's preliminary 401 certification decision, including, where appropriate, the draft certification. Persons wishing to comment on the preliminary 401 certification should submit written comments by the public notice expiration date to the Idaho Department of Environmental Quality, Coeur d'Alene Regional Office, c/o David Stasney at 2110 Ironwood Parkway, Coeur d'Alene, Idaho 83814 or fax number (208)769-1404 or dstasney@deq.id.us.

Documents are available for review.

The revised draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday (see address below).

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-8414 or
1-800-424-4372 (within Alaska, Idaho, Oregon, and Washington; ask to be connected to Kelly Huynh)

The fact sheet and revised draft permit are also available at:

EPA Coeur d'Alene Field Office
1910 NW Boulevard
Coeur d'Alene, Idaho 83814
(208) 664-4588

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, Idaho 83814
(208) 769-1422

Wallace Public Library
415 River Street
Wallace, Idaho
(208) 752-4571

The revised draft permit and fact sheet can also be found by visiting the Region 10 website at www.epa.gov/r10earth/water.htm.

For technical questions regarding the permit or fact sheet, contact Kelly Huynh at the phone numbers or email address at the top of this fact sheet. Those with impaired hearing or speech may contact a TDD operator at 1-800-833-6384 (ask to be connected to Kelly Huynh at the above phone number). Additional services can be made available to persons with disabilities by contacting Kelly Huynh.

TABLE OF CONTENTS

LIST OF ACRONYMS 5

I. APPLICANT 6

II. PURPOSE FOR REOPENING PUBLIC COMMENT PERIOD 6

III. REVISED EFFLUENT LIMITATIONS 7
- A. Cadmium, Lead and Zinc 7
- B. Copper and Mercury 12
- C. Whole Effluent Toxicity Triggers 15
- D. Total Suspended Solids 16

IV. CHROMIUM VI 17

V. OTHER LEGAL REQUIREMENTS 17
- A. Antidegradation 17
- B. Endangered Species Consultation 17
- C. State 401 Certification 18

APPENDIX A - DEVELOPMENT OF EFFLUENT LIMITATIONS A-1

APPENDIX B - EXAMPLE WATER QUALITY-BASED EFFLUENT LIMIT CALCULATIONS B-2

APPENDIX C - MAXIMUM EFFLUENT FLOW CALCULATIONS C-1

APPENDIX D - REFERENCES D-1

LIST OF ACRONYMS

AML	Average Monthly Limit
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BPT	Best Practicable Control Technology
CFR	Code of Federal Regulations
cfs	cubic feet per second
CV	coefficient of variation
CWA	Clean Water Act
EPA	Environmental Protection Agency
IDEQ	Idaho Department of Environmental Quality
LTA	Long Term Average
MDL	maximum daily limit
mgd	million gallons per day
NPDES	National Pollutant Discharge Elimination System
NTR	National Toxics Rule
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
SFCDA	South Fork Coeur d'Alene
s.u.	Standard units
TMDL	Total Maximum Daily Load
TSD	Technical Support Document (EPA 1991)
TSS	Total Suspended Solids
WLA	Wasteload Allocation

I. APPLICANT

Coeur Silver Valley, Inc.
NPDES Permit No.: ID-000002-7

Mailing Address:	P.O. Box 440 Wallace, Idaho 83873
Galena Location:	Lake Gulch, south of Silverton, Idaho (See March 28, 2001 fact sheet for a map denoting the location)
Coeur Location:	Shields Gulch, south of Osburn, Idaho (See March 28, 2001 fact sheet for a map denoting the location)
Facility Contact:	Corey Millard, Environmental Manager

II. PURPOSE FOR REOPENING PUBLIC COMMENT PERIOD

A draft permit, and a supporting fact sheet, was previously public noticed from March 28, 2001 through August 3, 2001. Since that time, additional information has become available to warrant revisions to the 2001 draft permit. A revised draft permit has been prepared to document these revisions. This revised fact sheet explains these revisions. Comments on these revisions are being solicited by EPA. Specifically, EPA is requesting comments regarding:

- revised effluent limits for cadmium, lead zinc, and total suspended solids (TSS);
- revised concentration and mass-based effluent limits (in lbs/day) due to revised effluent flow data;
- revised whole effluent toxicity triggers based on updated effluent data and receiving water information;
- the removal of the previously proposed chromium VI effluent limits for outfall 001; and
- the addition of effluent limits calculated for a new receiving water flow tier as requested by the State

These changes have been highlighted in the revised draft permit. The remainder of the March 2001 draft permit and Fact Sheet has not been modified. Please refer to the previous Fact Sheet for additional supporting information such as a description of the facility location, facility activity, facility background, receiving waters, effluent and ambient monitoring, WET testing, etc. Those comments that were submitted during the previous comment period will be addressed in a Response To Comments document. The Response To Comments document will be provided to the permittee, IDEQ, commenters, and those that have requested it at the time of permit reissuance.

III. REVISED EFFLUENT LIMITATIONS

The effluent limits in the 2001 draft permit and the revised draft permit were developed consistent with the requirements of Sections 101, 301(b), 304, 308, 401, 402, and 405 of the CWA, state and federal regulations, and EPA's 1991 *Technical Support Document for Water Quality-Based Toxics Control* (TSD).

The EPA sets technology-based limits by considering the effluent quality that is achievable using readily available technology. The Agency evaluates the technology-based limits to determine whether they are adequate to ensure that water quality standards are met in the receiving water. If the limits are not adequate, EPA must develop additional water quality-based limits. Water quality-based limits are designed to prevent exceedances of the Idaho water quality standards in the receiving waters. In general, the CWA requires that the effluent limit for a particular pollutant be the more stringent of either the technology-based limit or water quality-based limit. The metals limits that are being proposed in this supplemental fact sheet are all water quality-based. The proposed TSS limits are technology-based and water quality-based.

The following subsections provide a discussion of the effluent limits that were revised since the 2001 draft permit. Appendix A provides a discussion of how the revised effluent limits were developed. Appendix B provides example calculations for cadmium from outfall 001 to demonstrate how the water quality-based effluent limits were developed.

A. Cadmium, Lead and Zinc

1. New Water Quality Criteria.

The previous (March 28, 2001) fact sheet and draft permit contained effluent limitations for cadmium, lead, and zinc based on wasteload allocations (WLAs) from an approved August 18, 2000 Coeur d'Alene River Basin Total Maximum Daily Load (TMDL). The TMDL was developed because the South Fork Coeur d'Alene (SFCDA) River is listed under Section 303(d) of the CWA as not attaining Idaho's water quality standards for heavy metals (specifically, cadmium, lead and zinc). However, on September 6, 2001 (i.e., after the permit was drafted and made available for public notice) the Coeur d'Alene River Basin TMDL (for state waters only) was declared null and void in Idaho 1st District Court. Because the state of Idaho has appealed this decision to the State Supreme Court and there has not yet been a ruling, the status of the TMDL is uncertain as to state waters.

Because of the uncertainty of the TMDL, additional water quality-based effluent limitations are being proposed at this time.

When a TMDL is not available for an impaired waterbody, EPA Region 10 develops effluent limits based on meeting the state's water quality criteria prior to discharge to the water (i.e., end-of-pipe). The IDEQ currently has adopted federally approved water quality criteria for cadmium, lead and zinc consistent with EPA's Quality Criteria for Water 1986 (commonly referred to as the "Gold Book"). These criteria are hereafter referred to as the "Idaho Clean Water Act (CWA) Criteria" because they are currently the criteria for the SFCDA River that are in effect under the CWA. In addition, the IDEQ has recently adopted site specific criteria (SSC) for the SFCDA River and submitted these to EPA for approval August 7, 2002. If approved, these SSC will become effective under the CWA and become applicable criteria for the SFCDA River. Final NPDES permits can not be issued, or reissued, using state adopted water quality standards (including water quality criteria) until they are federally approved. Therefore, two different sets of cadmium, lead and zinc limits are being proposed at this time: 1) end-of-pipe limits based on Idaho CWA criteria; and 2) end-of-pipe limits based on the SFCDA River state adopted SSC. If the SSC are federally approved prior to permit reissuance, then the SSC effluent limits will be retained in the final permit. If the SSC are not federally approved prior to permit reissuance then the effluent limits based on the Idaho CWA criteria will be retained in the final permit.

2. New Effluent Flow

During the development of the March 2001 draft permit, EPA used all available effluent flow data. However, during the comment period the permittee stated that the effluent flow data from April 20, 1999 (3.48 mgd) and May 3, 1999 (2.14 mgd) from outfall 001 should not be used. The permittee stated that the flume and V-notch weir that constitute outfall 001 were not designed to handle a flow of such high magnitude. In addition, the flow data originally used to determine the maximum flow from outfall 002 in the March 2001 draft permit was incorrect. The previous maximum effluent flow values of 3.44 mgd and 1.27 mgd for outfalls 001 and 002 have been replaced by **1.66 mgd** and **0.895 mgd,** respectively. Appendix C describes how these effluent flows were calculated.

The revised maximum effluent flow values were used to calculate the mass-based (i.e., lbs/day) effluent limits for cadmium, lead and zinc in Tables 1 and 2.

3. New Effluent Limits

Tables 1 and 2 contain effluent limits for outfalls 001 and 002 from 1) the current 1989 administratively extended permit; 2) the March 2001 public noticed permit based on the TMDL WLAs; 3) the proposed limits based on the current Idaho CWA criteria; and 4) the proposed limits based on the state adopted SSC.

Preliminary 401 certification from IDEQ suggests that three (3) year compliance schedules may be provided in the final 401 certification for cadmium (outfall 001 only), lead, and zinc (outfall 002 only).

Table 1: Effluent Limits for Outfall 001 (to Lake Creek)									
Parameter	**Current 1989 Limits**		**Previously Proposed Limits (March 28, 2001 Draft Permit)**			**Revised Draft Permit Limits Based on current Idaho CWA Criteria[1]**		**Revised Draft Permit Limits Based on State Site Specific Criteria[2]**	
	Max Daily	**Ave Monthly**	**Flow Tier at SFCDA at Pinehurst**	**Max Daily**	**Ave Monthly**	**Max Daily**	**Ave Monthly**	**Max Daily**	**Ave Monthly**
Cadmium	0.01 mg/L	---	< 97 cfs	100 µg/L	0.00606 lbs/day	1.9 µg/L[3] 0.027 lbs/day[3]	0.87 µg/L[3] 0.012 lbs/day[3]	1.9 µg/L[3] 0.027 lbs/day[3]	0.87 µg/L[3] 0.012 lbs/day[3]
			≥ 97 to < 268 cfs	100 µg/L	0.00806 lbs/day				
			≥ 268 to < 1290 cfs	100 µg/L	0.0172 lbs/day				
			≥ 1290 cfs	100 µg/L	0.0268 lbs/day				
Lead	0.6 mg/L	0.3 mg/L	< 97 cfs	600 µg/L	0.0353 lbs/day	5.2 µg/L[3] 0.072 lbs/day[3]	2.4 µg/L[3] 0.034 lbs/day[3]	58 µg/L[3] 0.81 lbs/day[3]	27 µg/L[3] 0.39 lbs/day[3]
			≥ 97 to < 268 cfs	600 µg/L	0.0464 lbs/day				
			≥ 268 to < 1290 cfs	600 µg/L	0.0871 lbs/day				
			≥ 1290 cfs	600 µg/L	0.0774 lbs/day				
Zinc	1.0 mg/L	0.5 mg/L	< 97 cfs	1500 µg/L	0.634 lbs/day	114 µg/L 1.6 lbs/day	51 µg/L 0.70 lbs/day	195 µg/L 2.7 lbs/day	87µg/L 1.2 lbs/day
			≥ 97 to < 268 cfs	1500 µg/L	0.839 lbs/day				
			≥ 268 to < 1290 cfs	1500 µg/L	1.72 lbs/day				

			≥ 1290 cfs	1500 µg/L	2.32 lbs/day				

Footnotes:

1 These limits are proposed to be included in the final permit unless the SSC adopted by the state are approved and become applicable CWA criteria prior to permit reissuance.

2 These limits are proposed to be included in the final permit if EPA approves the state adopted SSC prior to permit reissuance.

3 A three year compliance schedule may be included in the final permit, consistent with IDEQ's final 401 certification, to allow time to achieve these limitations.

Table 2: Effluent Limits for Outfall 002 (to South Fork Coeur d'Alene River)

Parameter	Current 1989 Limits		Previously Proposed Limits (March 28, 2001 Draft Permit)			Revised Draft Permit Limits Based on current Idaho WQ Criteria[1]		Revised Draft Permit Limits Based on Site Specific Criteria[2]	
	Max Daily	Ave Monthly	Flow Tier at SFCDA at Pinehurst	Max Daily	Ave Monthly	Max Daily	Ave Monthly	Max Daily	Ave Monthly
Cadmium	0.01 mg/L	---	< 97 cfs	100 µg/L	0.00362 lbs/day	2.6 µg/L 0.019 lbs/day	0.91 µg/L 0.007 lbs/day	2.6 µg/L 0.019 lbs/day	0.91 µg/L 0.007 lbs/day
			≥ 97 to < 268 cfs	100 µg/L	0.00481 lbs/day				
			≥ 268 to < 1290 cfs	100 µg/L	0.0102 lbs/day				
			≥ 1290 cfs	100 µg/L	0.0160 lbs/day				
Lead	0.6 mg/L	0.3 mg/L	< 97 cfs	600 µg/L	0.0210 lbs/day	8.2 µg/L[3] 0.061 lbs/day[3]	2.9 µg/L[3] 0.022 lb/day[3]	88 µg/L[3] 0.66 lbs/day[3]	32 µg/L[3] 0.24 lbs/day[3]
			≥ 97 to < 268 cfs	600 µg/L	0.0276 lbs/day				
			≥ 268 to < 1290 cfs	600 µg/L	0.0519 lbs/day				

			≥ 1290 cfs	600 µg/L	0.0462 lbs/day			
Zinc	1.0 mg/L	0.5 mg/L	< 97 cfs	1000 µg/L	0.378 lbs/day	146 µg/L[3] 1.1 lbs/day[3]	53 µg/L[3] 0.39 lbs/day[3]	
			≥ 97 to < 268 cfs	1000 µg/L	0.500 lbs/day			
			≥ 268 to < 1290 cfs	1000 µg/L	1.03 lbs/day			
			≥ 1290 cfs	1000 µg/L	1.38 lbs/day			

Footnotes:

1 These limits are proposed to be included in the final permit unless the SSC adopted by the state are approved and become applicable CW permit reissuance.

2 These limits are proposed to be included in the final permit if EPA approves the state adopted SSC prior to permit reissuance.

3 A three year compliance schedule may be included in the final permit, consistent with IDEQ's final 401 certification, to allow time to ach limitations.

B. Copper and Mercury

The March 2001 fact sheet and draft permit contained effluent limitations for copper and mercury that were calculated based on guidance in EPA's TSD. Effluent limits are calculated based on:

- Idaho's water quality criteria;
- the receiving water flows, available dilution and pollutant concentrations,
- the effluent concentrations, variability, and flow,

Revised effluent limits for copper and mercury have been recalculated for the revised draft permit using the same TSD procedures as for the 2001 draft permit, but incorporating updated data and information, specifically:

- New effluent flow information (See Section III.A.2 above)
- An additional flow tier between the 50th and 90th percentiles as requested in the State's preliminary CWA Section 401 certification (see Part V.C.3, below).

The new reasonable potential calculations and effluent limitations are summarized in Appendix A. Appendix A describes how the data and information was used to develop the revised draft permit effluent limits. Tables 3 and 4 below, contain the new proposed limits for copper and mercury in comparison with the 2001 draft permit limits. Preliminary 401 certification from IDEQ suggests that a three (3) year compliance schedules may be provided in the final 401 certification for mercury.

Because of the large number of flow tiers, the magnitude of some of the limits vary between flow tiers by less than 20%. Limits that vary with receiving water flow can allow for greater discharge flexibility but they also require more operator attention, reporting paperwork, and EPA oversight to ensure that the effluent compliance monitoring is compared to the correct flow tier. EPA would appreciate comment on whether five flow tiers are needed.

Table 3: Copper and Mercury Effluent Limits for Outfall 001

Parameter	Previously Proposed Limits (March 28, 2001 draft permit)					Revised Draft Permit Limits				
	Flow Tier at Lake Creek Upstream of Outfall 001[1]	maximum daily limit		average monthly limit		Flow Tier at Lake Creek upstream of Outfall 001	maximum daily limit		average monthly limit	
		ug/l	lbs/day	ug/l	lbs/day		ug/l	lbs/day	ug/l	lbs/day
Copper	Not dependent on river flow	17	0.49	6.1	0.18	Not dependent on river flow	17	0.24	8.0	0.11
Mercury	< 1.7 cfs	0.021[2]	0.00059[2]	0.010[2]	0.00030[2]	< 1.7 cfs	0.022[2]	0.00030[2]	0.011[2]	0.00015[2]
	≥ 1.7 to < 3.8 cfs	0.021[2]	0.00061[2]	0.011[2]	0.00030[2]	≥ 1.7 to < 3.8 cfs	0.023[2]	0.00032[2]	0.012[2]	0.00017[2]
	≥ 3.8 to < 23 cfs	0.023[2]	0.00067[2]	0.012[2]	0.00033[2]	≥ 3.8 to < 13.4 cfs	0.027[2]	0.00037[2]	0.014[2]	0.00019[2]
						≥ 13.4 to < 23 cfs	0.045[2]	0.00062[2]	0.023[2]	0.00032[2]
	≥ 23 cfs	0.041[2]	0.0012[2]	0.020[2]	0.00059[2]	≥ 23 cfs	0.064[2]	0.00089[2]	0.032[2]	0.00044[2]

Footnotes:

1 The 4 original flow tiers in Lake Creek were developed using a flow relationship between the South Fork Coeur d'Alene at Silverton and Lake Creek above outfall 001. The flow at Lake Creek is estimated as the South Fork at Silverton multiplied by 0.0352. The coefficient of determination is 0.9777.

2 A three year compliance schedule may be included in the final permit, consistent with IDEQ's final 401 certification, to allow time to achieve these limitations.

Table 4: Copper and Mercury Effluent Limits for Outfall 002

Parameter	Previously Proposed Limits (March 28, 2001 draft permit)					Revised Draft Permit Limits				
	Flow Tier at SFCDA River Upstream of Outfall 002[1]	maximum daily limit		average monthly limit		Flow Tier at SFCDA River upstream of Outfall 002	maximum daily limit		average monthly limit	
		ug/l	lbs/day	ug/l	lbs/day		ug/l	lbs/day	ug/l	lbs/day
Copper	< 48 cfs	58	0.61	27	0.29	< 48 cfs	63	0.47	29	0.22
	≥ 48 to < 109 cfs	70	0.74	33	0.35	≥ 48 to < 109 cfs	70	0.52	32	0.24
	≥ 109 to < 649 cfs	98	1.0	45	0.48	≥ 109 to < 379 cfs	107	0.80	50	0.37
						≥ 379 to < 649 cfs	217	1.6	101	0.75
	≥ 649 cfs	430	4.6	200	2.1	≥ 649 cfs	179	1.3	83	0.62
Mercury	< 48 cfs	0.097[2]	0.0016[2]	0.049[2]	0.00080[2]	< 48 cfs	0.13[2]	0.00097[2]	0.065[2]	0.00049[2]
	≥ 48 to < 109 cfs	0.14[2]	0.0023[2]	0.070[2]	0.0012[2]	≥ 48 to < 109 cfs	0.19[2]	0.0014[2]	0.095[2]	0.00071[2]
	≥ 109 to < 649 cfs	0.29[2]	0.0048[2]	0.15[2]	0.0024[2]	≥ 109 to < 379 cfs	0.41[2]	0.0031[2]	0.20[2]	0.0015[2]
						≥ 379 to < 649 cfs	1.4[2]	0.010[2]	0.68[2]	0.0051[2]
	≥ 649 cfs	1.6[2]	0.027[2]	0.82[2]	0.014[2]	≥ 649 cfs	2.3[2]	0.017[2]	1.2[2]	0.0090[2]

Footnotes:

1 The flow tiers in the South Fork Coeur d'Alene River above outfall 002 are representative of the flows just upstream of outfall 002 and have been used to establish the flow tiers for these mixing zone-based limits.

2 A three year compliance schedule may be included in the final permit, consistent with IDEQ's final 401 certification, to allow time to achieve these limitations.

C. Whole Effluent Toxicity Triggers

Section I.B of the March 2001 draft permit included whole effluent toxicity (WET) monitoring and trigger levels for outfalls 001 and 002. If WET monitoring indicates that a trigger level is exceeded then additional WET testing is required and potentially, investigations to determine the cause and to reduce toxicity. The March 2001 triggers were based on the WET criteria, the previous effluent flows of 3.44 mgd (outfall 001) and 1.27 mgd (outfall 002), available dilution, and the previous four flow tiers (based on the 10th, 50th, and 90th percentile receiving water flow). As discussed in Section II.A.2 above, effluent flows have been changed to 1.66 mgd (outfall 001) and 0.895 mgd (outfall 002) and additional flow tiers have been added between the original 3rd and 4th flow tiers to lessen the gap in accordance with IDEQ's 401 precertification (see Section V.C.3 below). Therefore, new WET triggers were recalculated. These new triggers, as well as the previous March 2001 trigger have been provided in Table 5.

Table 5 - Chronic Toxicity Triggers and Receiving Water Concentrations

Outfall	Previously Proposed Triggers (March 28, 2001 draft permit)			Revised Draft Permit Triggers		
	Flow Tier upstream of the outfall	Chronic Toxicity Trigger[1], TU_c	Receiving Water Conc., % effluent	Flow Tier upstream of the outfall	Chronic Toxicity Trigger[1], TU_c	Receiving Water Conc., % effluent
001	< 1.7 cfs	1.1	95	< 1.7 cfs	1.1	90
	≥ 1.7 to < 3.8 cfs	1.1	93	≥ 1.7 to < 3.8 cfs	1.2	86
	≥ 3.8 to < 23 cfs	1.2	85	≥ 3.8 to < 13.4 cfs	1.4	73
				≥ 13.4 to < 23 cfs	2.3	43
	≥ 23 cfs	2.1	48	≥ 23 cfs	3.2	31
002	< 48 cfs	4.9	20	< 48 cfs	6.6	15
	≥ 48 to < 109 cfs	7.1	14	≥ 48 to < 109 cfs	9.6	10
	≥ 109 to < 649 cfs	15.0	6.7	≥ 109 to < 379 cfs	21	5
				≥ 379 to < 649 cfs	69	1.4
	≥ 649 cfs	83.0	1.2	≥ 649 cfs	120	0.9

Footnote:
1 The trigger value shall be determined by using the average monthly flow at the flow tier station (upstream of outfalls 001 and 002). The WET trigger value is expressed in TU_c, where TU_c equals chronic toxic unit.

D. Total Suspended Solids

A draft suspended solids TMDL (IDEQ 2002) has been developed by IDEQ for the SFCDA River and several tributaries and is expected to be submitted to EPA for approval shortly. Therefore, water quality and technology-based effluent limits consistent with the expected TMDL as well as effluent guidelines are being proposed. The previous (March 28, 2001) draft permit only contained effluent limits for TSS based on technology-based requirements found in 40 CFR 440.102. The TMDL was developed because the SFCDA River is listed under Section 303(d) of the CWA as not attaining Idaho's water quality standards for suspended solids. The draft TMDL contains WLAs for TSS for outfalls 001 and 002.

Final NPDES permits can not be issued, or reissued, using state adopted water quality standards, or TMDL WLAs, until they are federally approved and effective under the CWA. Therefore, the limits based on the WLAs will be retained in the reissued permit if EPA receives and approves the TMDL prior to permit reissuance. If the TMDL is not approved prior to permit reissuance, then the previously proposed permit limits will be retained in the final reissued permit.

Table 6 contains effluent limits for outfalls 1 and 2 from the: 1) current 1989 administratively extended permit; 2) previously public noticed permit; and 3) draft Suspended Solids TMDL (IDEQ 2002).

Table 6: Total Suspended Solids Effluent Limits

Parameter	Current 1989 Limits		Previously Proposed Limits (March 28, 2001)		Revised Draft Permit Limits	
	Max Daily	**Ave Monthly**	**Max Daily**	**Ave Monthly**	**Max Daily**	**Ave Monthly**
Outfall 001						
TSS	30 mg/L	20 mg/L	30 mg/L	20 mg/L	30 mg/L 560 lbs/day[1]	20 mg/L 202 lbs/day[1]
Outfall 002						

TSS	30 mg/L	20 mg/L	30 mg/L	20 mg/L	30 mg/L 248 lbs/day[1]	20 mg/L 80 lbs/day[1]

Footnote:

1 The loading (lbs/day) limits are based on the draft SS TMDL (IDEQ 2002). The loading limits will only be included in the final permit if the TMDL is approved by EPA prior to permit reissuance.

IV. CHROMIUM VI

During the development of the March 2001 draft permit, the EPA assumed that the effluent data for chromium provided in Coeur's database was in the hexavalent form (i.e., chromium VI). This assumption was used to determine "reasonable potential" to exceed Idaho's water quality criteria for chromium VI. However, during the comment period, the permittee stated that chromium was in the total form and that effluent monitoring of chromium VI was not available.

The IDEQ's water quality standards only include criteria for chromium III and chromium VI. Therefore, an accurate "reasonable potential' analysis can not be determined in the total form and the chromium VI effluent limit for outfall 001 has been removed. In order to perform a reasonable potential analysis during the next permit cycle, the revised draft permit has retained the requirement for effluent monitoring of chromium VI but has decreased the frequency from weekly to once per quarter.

V. OTHER LEGAL REQUIREMENTS

A. Antidegradation

In setting permit limitations, the EPA must consider the State's antidegradation policy. This policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality just meets the standard. For high quality waters, antidegradation requires that the State find that allowing lower water quality is necessary to accommodate important economic or social development before any degradation is authorized. This means that, if water quality is better than necessary to meet the water quality standards, increased permit limits can be authorized only if they do not cause degradation or if the State makes the determination that it is necessary.

The effluent limits that are being proposed in the revised draft permit are based on applicable water quality criteria for Idaho, the state adopted SSC, and the draft SS TMDL. The discharges as authorized in the revised draft permit will not result in degradation of the receiving water and are more stringent than those in the current permit. Therefore, the conditions in the permit will comply with the State's antidegradation requirements.

B. Endangered Species Consultation

The March 28, 2001 Fact Sheet for the draft permit discussed EPA's responsibility to consult under Section 7 of the Endangered Species Act (ESA) regarding potential

effects a federal action may have on threatened and endangered species. The Fact Sheet contained EPA's determination that the discharges from the Coeur and Galena Mines and Mills as proposed to be authorized in the draft permit will not have an effect on the threatened and endangered species. This determination has not changed for the revised draft permit.

C. State 401 Certification

Section 401 of the CWA requires EPA to seek certification from the State that the permit is adequate to meet State water quality standards before issuing a final permit. The regulations allow for the state to stipulate more stringent conditions in the permit, if the certification cites the CWA or State law references upon which that condition is based. In addition, the regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of State law.

The State provided EPA with a preliminary certification on the revised draft permit (dated December 3, 2002). The permit specific conditions have been provided below:

1. **Mixing zones**. IDEQ requests that the following three statements be included in the draft permit or fact sheet:

   "Mixing zones are defined as a limited area or volume of water where the discharge plume is progressively diluted by the receiving water. Water quality criteria may be exceeded in the mixing zone as long as acutely toxic conditions are prevented from occurring and the applicable existing designated uses of the water body re not impaired as a result of the mixing zone. Mixing zones are allowed at the discretion of the State, based on the State water quality standards regulations."

   "The Idaho water quality standards at IDAPA 58.01.02.060 allow for the use of mixing zones. The Idaho water quality standards recommend that the mixing zone should not be more than 25% of the volume of stream flow, therefore, mixing zone volumes of up to 25% were used to determine reasonable potential and develop effluent limits for copper and mercury. Mixing zones are not allowed where the receiving water is impaired, since there is no assimilative capacity available to allow for dilution (mixing). Since the South Fork Coeur d'Alene River is impaired for cadmium, lead and zinc, mixing zones were not allowed for these parameters."

   "In accordance with state water quality standards, only IDEQ may authorize mixing zones. If IDEQ authorizes a different size mixing zone in its final 401 Certification, EPA will recalculate the reasonable potential

and effluent limits based on the final mixing zones. If the State does not authorize a mixing zone in its 401 certification, EPA will recalculate the limits based on meeting water quality criteria at the point of discharge (i.e., "end-of-pipe" limits)."

The IDEQ has no plans to request changes in the proposed mixing zones for copper and mercury used in the draft permit. However, the IDEQ will provide the permittee an opportunity to conduct mixing zone analyses for use in evaluation and or establishing mixing zone volumes during the public comment period that may be used in final 401 Certification.

2. **Compliance schedule**. The 2001 draft permit included compliance schedules allowing for time to meet effluent limits for metals based upon pre-certification comments on the draft permit submitted by IDEQ in January of 2001. However, a time period was not provided for the draft 2001 permit.

   The 2002 preliminary 401 certification includes authorization of a three (3) year compliance schedule to meet metals limits for cadmium (outfall 001 only), lead, mercury, and zinc (outfall 002 only) that are set forth within the draft permit. The compliance schedule provided is consistent with Water Quality Standard IDAPA 58.01.02.400.03. Written progress status reports are required to be submitted by Coeur Silver Valley Inc. to EPA and IDEQ in accordance with Section I.A.5.b of the permit in conjunction with the compliance schedules. The compliance schedule requirements have been incorporated in Part I.A.5 and Footnote 4 in Tables 1 and 2 of the revised draft permit.

3. **Flow tiers**. The draft permit establishes four (4) flow tiers based on the 10th, 50th, and 90th percentile of stream flow. Effluent limits are calculated from the minimum upstream flow of each tier. Additional flow tiers will allow effluent limits to be increased while maintaining Idaho water quality standards. The largest gap in stream flow occurs between the 50th and 90th percentiles, therefore, the IDEQ is requesting the EPA add one additional flow tier at the 70th percentile for outfalls 001 and 002 in the draft NPDES permit prior to public comment.

   In response to this condition, an additional flow tier was developed based on the flow midway between the 50th and 90th percentiles. While this flow tier does not correspond exactly to the 70th percentile flow tier, it allows for two equal ranges of flow between the 50th and 90th percentiles, and fulfills the intent of the precertification condition.

4. **Bioassessment monitoring**. Coeur Silver Valley Inc. shall conduct annual instream bioassessment monitoring directly downstream of outfalls 001 and

002. Bioassessment monitoring shall be consistent with the most recent IDEQ Beneficial Use Reconnaissance Project workplan for wadeable streams.

In response to this precertification condition, the bioassessment monitoring requirements were included in Part I.D.3. of the revised draft permit.

After the public comment period closes, a proposed final permit will be sent to the State for final 401 certification. If the State authorizes different requirements in its final certification, EPA will incorporate those requirements into the final permit.

APPENDIX A - DEVELOPMENT OF EFFLUENT LIMITATIONS

This section discusses the basis for and the development of cadmium, copper, lead, mercury, zinc, and total suspended solids effluent limits in the revised draft permit including: discussions of the development of technology-based effluent limits (Section I) and water quality-based effluent limits (Section II); and a summary of the effluent limits developed for the revised draft permit (Section III).

I. Technology-based Evaluation

Section 301(b) of the CWA requires technology-based controls on effluents. This section of the CWA requires that, by March 31, 1989, all permits contain effluent limitations which: (1) control toxic pollutants and nonconventional pollutants through the use of "best available technology economically achievable" (BAT), and (2) represent "best conventional pollutant control technology" (BCT) for conventional pollutants by March 31, 1989. In no case may BCT or BAT be less stringent than "best practical control technology currently achievable" (BPT), which is the minimum level of control required by section 301(b)(1)(A) of the CWA.

In many cases, BPT, BCT, and BAT limitations are based on effluent guidelines developed by EPA for specific industries. On December 3, 1982, EPA published effluent guidelines for the mining industry (found in 40 CFR 440). Within these guidelines, Subpart J of Part 440 titled *Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory* applies to the Coeur and Galena mine and mill discharges. The BPT (40 CFR 440.102) and BAT (40 CFR 440.103) effluent limitation guidelines within this subcategory have been considered and the most limiting for cadmium, lead and zinc are provided in Table A-1.

TABLE A-1:Technology-Based Effluent Limitations

Effluent Characteristic	Effluent Limitations for Mine Drainage (outfall 001)		Effluent Limitations for Mill Process Waters (outfall 002)	
	daily maximum	monthly average	daily maximum	monthly average
TSS, mg/L	30	20	30	20
cadmium, µg/L	100	50	100	50
copper, µg/L	300	150	300	150
lead, µg/L	600	300	600	300
mercury, µg/L	2	1	2	1
zinc, µg/L	1,500	750	1,000	500

II. Water Quality-based Evaluation

In addition to the technology-based limits discussed above, EPA evaluated the discharge to determine compliance with Section 301(b)(1)(C) of the CWA. This section requires the establishment of limitations in permits necessary to meet water quality standards by July 1, 1977.

The regulations at 40 CFR 122.44(d) implement section 301(b)(1)(C) of the CWA. These regulations require that permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation (WLA).

A. Cadmium, Copper, Lead, Mercury and Zinc

Water quality-based effluent limits for cadmium, copper, lead, mercury and zinc were developed based upon guidance in EPA's TSD for Water Quality-based Toxics Control. The water quality-based analysis consists of four steps:

1. Determine the appropriate water quality criteria
2. Determine if there is "reasonable potential" for the discharge to exceed the criteria in the receiving water
3. If there is "reasonable potential", develop a WLA
4. Develop effluent limitations based on the WLA

The following sections provide a detailed discussion of each step. Appendix B provides an example calculation to illustrate how these steps are implemented numerically.

1. Water Quality Criteria

The first step in developing water quality-based limits is to determine the applicable water quality criteria. For Idaho, the current State water quality criteria are found at IDAPA 58, Title 1, Chapter 2 (specifically IDAPA 58.01.02210). This section cites the National Toxics Rule (NTR), 40 CFR 131.36(b)(1), and the NTR subparts. The new SSC are found at IDAPA 58.01.02.284 (South Fork Coeur d'Alene Subbasin, Subsection 110.09, HUC 17010302, Aquatic Life Criteria for Cadmium, Lead and Zinc). The applicable criteria are based on the beneficial uses of the receiving water. The beneficial uses for Lake Creek and the South Fork Coeur d'Alene are as follows:

- Lake Creek (outfall 001) - cold water biota, salmonid spawning, and secondary contact recreation (IDAPA 58.01.02110.09(P-9b))

- South Fork Coeur d'Alene River (outfall 002) - secondary contact recreation and cold water biota (IDAPA 58.01.02.110.09(P-1) and federal rule)

For any given pollutant, different uses may have different criteria. To protect all beneficial uses, the permit limits are based on the most stringent of the water quality criteria applicable to those uses. The applicable criteria (both calculations and calculated values) used to determine the reasonable potential to violate water quality criteria for aquatic life and calculate effluent limits are provided in Table A-2. The criteria are expressed as a function of hardness (measured in mg/L of calcium carbonate ($CaCO_3$)). As the hardness of the receiving water increases, the toxicity decreases and the numerical value of the criteria increases. Because a mixing zone is not allowed in an impaired waterbody, the 5th percentile effluent hardness of 97 mg/L (outfall 001) and 130 mg/L (outfall 002) were used to determine the criteria for cadmium, lead and zinc. Because the resulting effluent limits for copper for outfall 001 are less stringent when using an effluent hardness of 97 mg/L (rather than the ambient hardnesses corresponding to the different flow tiers) this was used. The ambient hardnesses corresponding to the 5 different flow tiers for copper from the SFCDA River are: 73mg/L, 54 mg/L, 44 mg/L, 35 mg/L and 27 mg/L.

In addition to hardness, Idaho's criteria for cadmium, copper, lead, mercury (acute only) and zinc include "conversion factors" to convert from total recoverable to dissolved criteria. Conversion factors address the relationship between the total amount of metal in the water column (total recoverable metal) and the fraction of that metal that causes toxicity (bioavailable metal). The conversion factors are shown in italics.

Table A-2: Idaho Water Quality Criteria for Cadmium, Lead and Zinc

Parameter	Cold Water Biota - Aquatic Life Criteria[1]			
	Acute Current ID WQ Criteria	**Chronic Current ID WQ Criteria**	**Acute Site Specific Criteria**	**Chronic Site Specific Criteria**
Dissolved Cadmium , µg/L	*[1.136672-[(ln H)(0.041838)]]*$e^{1.128(\ln H - 3.828}$ or **3.6** (outfall 001) **4.9** (outfall 002)	*[1.101672-[(ln H)(0.041838)]]*$e^{0.7852(\ln H) - 3.49}$ or **1.0** (outfall 001) **1.3** (outfall 002)	*0.973* $e^{[(1.0166 \times \ln H) - 3.924]}$ or **2.0** (outfall 001) **2.7** (outfall 002)	*[1.101672 - (lnH × 0.041838)]*$e^{[(0.7852 \times \ln H) - 3.490]}$ or **1.0** (outfall 001) **1.3** (outfall 002)
Dissolved Copper, µg/L	*0.960* exp [(0.9422)lnH - 1.464] or **17** (outfall 001) **13** (outfall 002, tier 1) **9.5** (outfall 002, tier 2) **7.9** (outfall 002, tier 3) **6.3** (outfall 002, tier 4) **5.0** (outfall 002, tier 5)	*0.960* exp [(0.8545)lnH -1.465] or **11** (outfall 001) **8.7** (outfall 002 tier 1) **6.7** (outfall 002, tier 2) **5.7** (outfall 002, tier 3) **4.6** (outfall 002, tier 4) **3.7** (outfall 002, tier 5)	N/A	N/A
Dissolved Lead, µg/L	*[1.46203-[(ln H)(0.145712)]]*$e^{1.273(\ln H)-1.46}$ or **66** (outfalls 001 and 002)	*[1.46203-[(ln H)(0.145712)]]*$e^{1.273(\ln H)-4.705}$ or **2.6** (outfalls 001 and 002)	$e^{[(0.9402 \times \ln H) + 1.1834]}$ or **240** (outfall 001) **315** (outfall 002)	$e^{[(0.9402 \times \ln H) - 0.9875]}$ or **27.3** (outfall 001) **36** (outfall 002)
Mercury, µg/L	*(0.85)* 2.4 or **2.0** (outfalls 001 and 002)	0.012	N/A	N/A
Dissolved Zinc, µg/L	*(0.978)*$e^{0.8473(\ln H)+0.8604}$ or **38** (outfall 001) **140** (outfall 002)	*(0.986)*$e^{0.8473(\ln H)+0.7614}$ or **34** (outfall 001) **130** (outfall 002)	$e^{[(0.6624 \times \ln H) + 2.2235]}$ or **191** (outfall 001) **232** (outfall 002)	$e^{[(0.6624 \times \ln H) + 2.2235]}$ or **191** (outfall 001) **232** (outfall 002)

Footnotes:
1 Conversion factors are noted in italics
2 Human health criteria is unavailable.

2. Reasonable Potential Evaluation

A reasonable potential analysis was performed to verify the need for limits. This analysis compares the maximum projected effluent concentration (C_e) to the criteria for that pollutant. If the projected effluent concentration exceeds the criteria, there is "reasonable potential", and a limit must be included in the permit. EPA uses the recommendations in Chapter 3 of the TSD to conduct this "reasonable potential" analysis.

The maximum projected effluent concentration (C_e) is defined by the TSD as the 99th percentile of the effluent data. This is calculated by multiplying the maximum reported effluent concentration by a reasonable potential multiplier (RPM). The RPM accounts for uncertainty in the effluent data. The RPM statistically depends upon the amount of effluent data and variability of the data as measured by the coefficient of variation (CV) of the data (See Section 3.3 of the TSD). The RPM decreases as the number of data points increases and the variability (i.e., CV) of the data decreases. Maximum reported effluent concentrations, CVs, and the RPMs used in the reasonable potential calculations were based on data collected by Coeur (Discharge Monitoring Report data and other monitoring) and EPA (compliance inspection data) since December 1994. This data was used because it was determined representative of current and future conditions.

The maximum projected effluent concentration (C_e) is expressed in total recoverable form[1] whereas the aquatic life water quality criteria are expressed as dissolved[2]. To convert between total effluent concentrations and dissolved criteria, "translators" are used in the reasonable potential (and permit limit derivation) equations. Translators can either be specific to the particular receiving waters or the default numbers provided in EPA's guidance; *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (EPA 823-B-96-007, June 1996). In the absence of site-specific translators, this guidance recommends the use of the water quality criteria conversion factors (see Table B-2, the values in italics) as the default translators. Because site-specific translators were not provided by the permittee, the conversion factors were used as default translators in the reasonable potential and permit calculations for the discharges.

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[1] Total metal is the concentration of an analyte in an unfiltered sample.

[2] The dissolved metal is the concentration of an analyte that will pass through a 0.45 micron filter.

If the maximum projected effluent concentration (translated to the dissolved form) is greater than the applicable water quality criterion (in dissolved form) then a water quality-based effluent limit is required.

Tables A-3 and A-4 summarize the data and reasonable potential calculations for outfalls 001 and 002.

TABLE A-3: Reasonable Potential Determination For Outfall 001

Parameter	Effluent Data[1]				Max projected effluent conc.	Current ID Water Quality Criteria	Site Specific Criteria	Reasonable Potential
	Max Effluent Conc[1]	Coefficient of Variation[2]	# of Samples[3]	Reasonable Potential Multiplier[4]				
Total Recoverable Cadmium	100µg/L	0.7	N/A	1.0	94.5 µg/L, acute 91 µg/L, chronic	3.5 µg/L, acute 0.39 µg/L, chronic	2.0 µg/L, acute 1.0 µg/L, chronic	YES
Total Recoverable Copper	300 µg/L	1.37	14	6.05	864 µg/L (acute and chronic	17 µg/L, acute 11 µg/L, chronic	N/A	YES
Total Recoverable Lead	1000 µg/L	0.7	N/A	1.0	477 µg/L, acute and chronic	66 µg/L, acute 2.6 µg/L, chronic	240 µg/L, acute 27 µg/L, chronic	YES
Mercury	2.0 µg/L	0.6	81	1.0	4.4 µg/L (acute) 5.2 (chronic)	2.0 µg/L, acute 0.012 µg/L, chronic	N/A	YES
Total Recoverable Zinc	1500 µg/L	0.8	N/A	1.0	1470 µg/L, acute 1480 µg/L, chronic	38 µg/L, acute 34 µg/L, chronic	190 µg/L, acute and chronic	YES

Footnotes:

1 For parameters with technology-based effluent limitation guidelines, the maximum effluent concentration used to determine RP is the technology-based maximum daily limitation. The technology-based limit is used since water quality-based limits are only required if discharge at the technology-based limits have reasonable potential to exceed water quality standards in the receiving water.

2 The CV is calculated as the standard deviation of the data divided by the mean.

3 The number of samples is used to develop the RPM. For parameters with technology-based effluent limitation guidelines (cadmium, lead and zinc) the RPM is 1, therefore the number of samples is not applicable (N/A).

4 The RPM is based on the CV and the number of samples collected. For parameters with technology-based effluent limitation guidelines the RPM is 1.0.

TABLE A-4: Reasonable Potential Determination For Outfall 002

Parameter	Effluent Data[1]				Maximum projected effluent concentration	Current ID Water Quality Criteria	Site Specific Criteria	Reasonable Potential
	Max Effluent Conc[1]	Coefficient of Variation[2]	# of Samples[3]	Reasonable Potential Multiplier[4]				
Total Recoverable Cadmium	100 µg/L	1.4	N/A	1.0	93.3 µg/L (acute) 89.8 µg/L (chronic)	3.5 µg/L (acute) 1.3 µg/L (chronic)	2.7 µg/L (acute) 1.3 µg/L (chronic)	YES
Total Recoverable Copper	300 µg/L	0.69	14	3	150 µg/L (acute/ chronic, tier 1) 92.1 µg/L (acute/chronic, tier 2) 44.6 µg/L (acute/chronic tier 3) 15.4 µg/L (acute/chronic tier 4) 10.3 µg/L (acute/chronic, tier 5)	13 (acute, tier 1) 9.5 (acute, tier 2) 7.9 (acute, tier 3) 6.3 (acute, tier 4) 5.0 (acute, tier 5) 8.7 (chronic, tier 1) 6.7 (chronic, tier 2) 5.7 (chronic, tier 3) 4.6 (chronic, tier 4) 3.7 (chronic, tier 5)	N/A	YES
Total Recoverable Lead	600 µg/L	1.3	N/A	1.0	452 µg/L (acute and chronic)	66 µg/L (acute) 2.6 µg/L (chronic)	250 µg/L (acute) 28 µg/L (chronic)	YES
Mercury	2.0 µg/L	0.6	41	1	0.752 (acute and chronic, tier 1) 0.457 µg/L (acute, tier 2) 0.214 µg/L (acute, tier 3) 0.064 µg/L(acute, tier 4) 0.037 µg/L (acute, tier 5) 0.538 µg/L (chronic, tier 2) 0.251 µg/L(chronic, tier 3) 0.075 µg/L (chronic, tier 4) 0.044 µg/L (chronic, tier 5)	2.0 µg/L, acute 0.012 µg/L, chronic	N/A	YES

TABLE A-4: Reasonable Potential Determination For Outfall 002								
Total Recoverable Zinc	1000 µg/L	1.3	N/A	1.0	978 µg/L (acute) 986 µg/L (chronic)	140 µg/L (acute) 130 µg/L (chronic)	230 µg/L (acute and chronic)	YES

Footnotes:

1 For parameters with technology-based effluent limitation guidelines, the maximum effluent concentration used to determine RP is the technology-based maximum daily limitation. The technology-based limit is used since water quality-based limits are only required if discharge at the technology-based limits have reasonable potential to exceed water quality standards in the receiving water.

2 The CV is calculated as the standard deviation of the data divided by the mean.

3 The number of samples is used to develop the reasonable potential multiplier. For parameters with technology-based effluent limitation guidelines (cadmium, lead and zinc) the reasonable potential multiplier is 1, therefore the number of samples is not applicable (N/A).

4 The RPM is based on the CV and the number of samples collected. For parameters with technology-based effluent limitation guidelines the RPM is 1.0.

3. Water Quality-Based Permit Limit Derivation

Once EPA has determined that a water quality-based limit is required for a pollutant, the first step in developing the permit limit is development of a WLA for the pollutant. A WLA is the concentration (or loading) of a pollutant that the permittee may discharge without causing or contributing to an exceedence of water quality standards in the receiving water. Wasteload allocations and permit limits are derived based on guidance in the TSD. Wasteload allocations for this permit were established two ways:

- based on meeting water quality criteria at "end-of-pipe" using the current Idaho water quality criteria and
- based on meeting water quality criteria at "end-of-pipe" using the site specific criteria

The acute and chronic WLAs are then converted to long-term average concentrations (LTAs) and compared. The most stringent LTA concentration for each parameter is converted to effluent limits. This section describes each of these steps.

Calculation of WLAs:
Where no mixing zone is allowed, the criterion becomes the WLA. Establishing the criterion as the WLA ensures that the permittee does not contribute to an exceedence of the criteria.

no mixing zone: WLA = criterion

As discussed previously, the aquatic life criteria for cadmium, lead and zinc is expressed as dissolved. However, the NPDES regulations require that metals limits be based on total recoverable metals (40 CFR 122.45(c)). This is because changes in water chemistry as the effluent and receiving water mix could cause some of the particulate metal in the effluent to dissolve. Therefore, a translator is used in the WLA equation to convert the dissolved criteria to total. The translator is the same translator discussed in the reasonable potential evaluation in the previous section (the criteria conversion factors are used as the default translators).

WLA = criterion/translator

Appendix B (see Step 3) provides an example of how the WLAs for cadmium in Outfall 001 were developed.

Calculation of Long-term Average Concentrations: As discussed above, WLAs are calculated for each parameter for each criterion (acute aquatic life, chronic aquatic life,

human health). Because the different criteria apply over different time frames, it is not possible to compare the criteria or the WLAs directly to determine which criterion results in the most stringent limits. For example, the acute criteria are applied as a one-hour average, while the chronic criteria are applied as a four-day average.

To allow for comparison, the acute and chronic aquatic life criteria are statistically converted to LTA concentrations. This conversion is dependent upon the coefficient of variation (CV) of the effluent data and the probability basis used. The probability basis corresponds to the percentile of the estimated concentration. EPA uses a 99th percentile for calculating a LTA, as recommended in the TSD. The following equation from Chapter 5 of the TSD is used to calculate the LTA concentrations (alternately, Table 5-1 of the TSD may be used):

$LTA = WLA \times \exp[0.5\sigma^2 - z\sigma]$

where:

σ^2 = $\ln(CV^2 + 1)$ for acute aquatic life criteria

= $\ln(CV^2/4 + 1)$ for chronic aquatic life criteria

CV = coefficient of variation

z = 2.326 for 99th percentile probability basis, per the TSD

<u>Calculation of Effluent Limits:</u> The LTA concentration is calculated for each criterion and compared. The most stringent LTA concentration is then used to develop the maximum daily (MDL) and monthly average (AML) permit limits. The MDL is based on the CV of the data and the probability basis, while the AML is dependent upon these two variables and the monitoring frequency. As recommended in the TSD, EPA used a probability basis of 95 percent for the AML calculation and 99 percent for the MDL calculation. The MDL and AML are calculated using the following equations from the TSD (alternately, Table 5-2 of the TSD may be used):

$MDL \text{ or } AML = LTA \times \exp[z\sigma - 0.5\sigma^2]$

for the MDL:

$\sigma^2 = \ln(CV^2 + 1)$

z = 2.326 for 99th percentile probability basis, per the TSD

for the AML:

$\sigma^2 = \ln(CV^2/n + 1)$

n = number of sampling events required per month

z = 1.645 for 95th percentile probability basis, per the TSD

For setting water quality-based limits for protection of human health uses, the TSD recommends setting the AML equal to the WLA, and then calculating the MDL (i.e., no calculation of LTAs). The human health MDL is calculated based on the ratio of the AML and MDL as expressed by Equation 10. The MDL, therefore, is based on effluent variability and the number of samples per month. AML/MDL ratios are provided in Table 5-3 of the TSD.

Appendix B shows an example of the permit limit calculation for cadmium in Outfall 001 (see Steps 3 and 4).

B. Total Suspended Solids

Water quality-based loading limits (in lbs/day) for TSS were developed based upon the annual WLAs found in the draft South Fork Coeur d'Alene River Watershed TMDL for outfalls 001 and 002. The federal implementing regulations found at 40 CFR 122.44(d)(1)(vii)(B) state that effluent limits developed to protect a water quality criterion are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA. The TMDL provided 36.9 tons/yr for outfall 001 and 14.6 tons/yr for outfall 002. These WLAs represent 90% of the previous permitted average monthly limit (20 mg/L) converted to tons per year by using Coeur's average discharge flows from 1999 to 2001 (1.36 mgd for outfall 001 and 0.53 mgd for outfall 002). The EPA converted the WLAs from tons/year to pounds/day and applied them as average monthly limits.

<u>Outfall 001:</u>
Average monthly limit = 36.9 tons/year × (1 year /365 days) × (2000 lbs/1 ton)
= 202 lbs/day

<u>Outfall 002:</u>
Average monthly limit = 14.6 tons/year × (1 year /365 days) × (2000 lbs/1 ton)
= 80 lbs/day

The maximum daily limits were determined using Table 5.3 of EPA's TSD. This table considers the frequency of effluent sampling (4 samples/month) as well as the variability of the previous monitoring data (1.33 for outfall 001 and 2.89 for outfall 002).

Maximum daily limit = average monthly limit × value from table 5.3
<u>Outfall 001:</u>
Maximum daily limit = 202 lbs/day × 2.77
= **560 lbs/day**

Outfall 002:
Maximum daily limit = 80 lbs/day × 3.10
= **248 lbs/day**

The suspended solids TMDL has not been submitted to EPA or federally approved yet. Therefore, these limits will be retained in the final permit only if the TMDL is approved by EPA prior to permit reissuance. If the TSS TMDL is not approved prior to permit reissuance, then TSS loading limits will not be included in the final permit.

III. Summary of Revised Draft Permit Effluent Limitations

As discussed in Section III.A of the fact sheet, the revised draft permit contains the more stringent of technology and water quality-based limits. The water quality-based limits are more stringent than the technology-based limits for cadmium, copper, lead, mercury, zinc and loading limits for TSS and have therefore been included in the revised draft permit.

The water quality-based limits for cadmium, copper, lead, mercury, and zinc were originally developed in terms of concentration. The water quality-based limits for TSS were provided from the TMDL in terms of mass. However, with a few exceptions, NPDES regulations (40 CFR 122.45(f)) require that water quality-based effluent limits also be expressed in terms of mass. The following equation was used to convert the concentration-based metals limits into mass-based limits:

mass limit (lbs/day)= concentration limit (mg/L) × effluent flow rate (mgd) × conversion factor

where,

conversion factor =	8.34 (lb/million gallons)/(milligrams per liter)
effluent flow rate =	maximum discharge rate 1.66 mgd outfall 001 and 0.895 mgd for outfall 002

The technology-based concentration limits for TSS were provided by the effluent limitations guidance in 40 CFR 440.102 and 103. Table A-5 summarizes the revised draft effluent limits for cadmium, copper, lead, mercury, zinc, and TSS from outfalls 001 and 002.

Table A-5: Revised Draft Effluent Limitations					
Parameter	**Flow Tier**	**Revised draft Effluent Limitations**			
		Maximum Daily		**Average Monthly**	
		Current Idaho WQ Criteria	**Site Specific Criteria**	**Current Idaho WQ Criteria**	**Site Specific Criteria**
Outfall 001 (to Lake Creek)					
Cadmium, total recoverable	N/A	1.9 µg/L 0.027 lbs/day	1.9 µg/L 0.027 lbs/day	0.87µg/L 0.012 lbs/day	0.87 µg/L 0.012 lbs/day
Copper, total recoverable	N/A	17 µg/L 0.49 lbs/day	N/A	6.1 µg/L 0.18 lbs/day	N/A
Lead, total recoverable	N/A	5.2 µg/L 0.072 lbs/day	58µg/L 0.81 lbs/day	2.4 µg/L 0.034 lbs/day	27 µg/L 0.39 lbs/day
Mercury	<1.7 cfs ≥1.7 to <3.8 cfs ≥3.8 to <13.4 cfs ≥13.4 to <23 cfs ≥23 cfs	0.022 µg/L 0.00030 lbs/day 0.023 µg/L 0.00032 lbs/day 0.027 µg/L 0.00037 lbs/day 0.045 µg/L 0.00062 lbs/day 0.064 µg/L 0.00089 lbs/day	N/A	0.011 µg/L 0.00015 lbs/day 0.012 µg/L 0.00017 lbs/day 0.014 µg/L 0.00019 lbs/day 0.023 µg/L 0.00032 lbs/day 0.032 µg/L 0.00044 lbs/day	N/A
Zinc, total recoverable	N/A	114 µg/L 1.6 lbs/day	195µg/L 2.7 lbs/day	51 µg/L 0.70 lbs/day	87 µg/L 1.2 lbs/day
Total Suspended Solids	N/A	30 mg/L 560 lbs/day		20 mg/L 202 lbs/day	

Table A-5: Revised Draft Effluent Limitations					
Parameter	**Flow Tier**	**Revised draft Effluent Limitations**			
		Maximum Daily		**Average Monthly**	
		Current Idaho WQ Criteria	**Site Specific Criteria**	**Current Idaho WQ Criteria**	**Site Specific Criteria**
Outfall 002 (to the South Fork Coeur d'Alene River)					
Cadmium, total recoverable	N/A	2.6 µg/L 0.019 lbs/day	2.6 µg/L 0.019 lbs/day	0.91 µg/L 0.007 lbs/day	0.91 µg/L 0.007 lbs/day
Copper, total recoverable	<48 cfs ≥48 to <109 cfs ≥109 to <379 cfs ≥379 to <649 cfs ≥649 cfs	63 µg/L 0.47 lbs/day 70 µg/L 0.52 lbs/day 107 µg/L 0.80 lbs/day 217 µg/L 1.6 lbs/day 179 µg/L 1.3 lbs/day	N/A	29 µg/L 0.22 lbs/day 32 µg/L 0.24 lbs/day 50 µg/L 0.37 lbs/day 101 µg/L 0.75 lbs/day 83 µg/L 0.62 lbs/day	N/A
Lead, total recoverable	N/A	8.2 µg/L 0.061 lbs/day	88 µg/L 0.66 lbs/day	2.9 µg/L 0.022 lbs/day	32 µg/L 0.24 lbs/day
Mercury	<48 cfs ≥48 to <109 cfs ≥109 to <379 cfs ≥379 to <649 cfs ≥649 cfs	0.13 µg/L 0.00097 lbs/day 0.19 µg/L 0.0014 lbs/day 0.41 µg/L 0.0031 lbs/day 1.4 µg/L 0.010 lbs/day 2.3 µg/L 0.017 lbs/day	N/A	0.065 µg/L 0.00049 lbs/day 0.095 µg/L 0.00071 lbs/day 0.20 µg/L 0.0015 lbs/day 0.68 µg/L 0.0051 lbs/day 1.2 µg/L 0.0090 lbs/day	N/A
Zinc, total recoverable	N/A	146 µg/L 1.1 lbs/day	237 µg/L 1.8 lbs/day	53 µg/L 0.39 lbs/day	185 µg/L 0.64 lbs/day

Table A-5: Revised Draft Effluent Limitations					
Parameter	**Flow Tier**	**Revised draft Effluent Limitations**			
		Maximum Daily		**Average Monthly**	
		Current Idaho WQ Criteria	**Site Specific Criteria**	**Current Idaho WQ Criteria**	**Site Specific Criteria**
Total Suspended Solids	N/A	30 mg/L 248 lbs/day		20 mg/L 80 lbs/day	

APPENDIX B - EXAMPLE WATER QUALITY-BASED EFFLUENT LIMIT CALCULATION

This appendix demonstrates how the water quality- based analysis (reasonable potential determination and development of effluent limits) was performed using cadmium in Outfall 001 as an example.

Step 1: Determine the applicable water quality criteria.

The current Idaho water quality criteria as well as proposed Site Specific Criteria (SSC) for cadmium, lead and zinc were provided in Table A-2 of Appendix A and have been summarized in Table B-1. Criteria is unavailable for human health.

Table B-1: Cadmium Criteria for Outfall 001

Parameter	Acute criteria	Chronic criteria
Dissolved Cadmium (Current ID Criteria)	3.6 µg/L	1.0 µg/L
Dissolved Cadmium (SSC)	2.0 µg/L	1.0 µg/L

Step 2: Determine if there is reasonable potential for the discharge to exceed the criteria in the receiving water.

To determine reasonable potential, the maximum projected receiving water concentration (C_d) is compared to the applicable water quality criterion. If C_d exceeds the criterion, then reasonable potential exists and a water quality-based effluent limit is established. Since the cadmium criteria is expressed as dissolved:

C_d = translator x C_e
= 94 µg/L (acute)
= 91 µg/L (chronic)

where,
translator = 0.94 (acute)
0.91 (chronic)
C_e = 100 µg/L (maximum projected effluent concentration)
(max. measured effluent concentration is the technology-based effluent limit) x RPM
the RPM is 1.0 for technology-based effluent limitation guidelines

The effluent from outfall 001 has the reasonable potential to exceed the current and proposed cadmium water quality criterion therefore, water quality-based effluent limits are required.

Step 3: Determine the wasteload allocations using current criteria.

Since the applicable criteria are expressed as dissolved, the wasteload allocations (WLAs) for cadmium in Outfall 001 are calculated:

$$WLA = \frac{\text{criterion}}{\text{translator}}$$

3.8 (acute)
1.1 (chronic)

Step 4: Develop long-term average concentrations using current criteria

Effluent limits are developed by converting the aquatic life WLAs to long-term average concentrations (LTAs). The most stringent of the acute or chronic LTA is then used to develop the effluent limits.

$LTA = WLA \times \exp[0.5\sigma^2 - z\sigma]$
$LTA_{acute} = 1.01$
$LTA_{chronic} = 0.52$

where,
z = 2.326 for 99th percentile probability basis (per the TSD)
CV = 0.7 (see Table A-3)
for acute criteria, $\sigma^2 = \ln(CV^2 + 1) = 0.4$
for chronic criteria, $\sigma^2 = \ln(CV^2/4 + 1) = 0.12$

The most stringent LTA concentration (chronic) was used to derive the aquatic life effluent limits for cadmium from outfall 001.

Step 5: Develop effluent limits consistent with current criteria

The chronic LTA concentration is converted to a maximum daily limit (MDL) and an average monthly limit (AML):

$MDL, AML = LTA \times \exp[z\sigma - 0.5\sigma^2]$
MDL = 1.9 µg/L
AML = 0.87 µg/L

where,
for the MDL: z = 2.326 for 99th percentile probability basis (per the TSD)
$\sigma^2 = \ln(CV^2 + 1) = \ln(0.7^2 + 1) = 0.4$

for the AML: $z =$ 1.645 for 95th percentile probability basis (per the TSD)

$\sigma^2 = \ln(CV^2/n + 1) = \ln(0.7^2/4 + 1) = 0.12$

since, n = number of samples per month = 4

Mass-based limits were calculated by multiplying the concentration limit (in mg/L) by a conversion faction (8.34) and the maximum actual effluent flow (1.66 mgd) as previously discussed in Section II of the Fact Sheet.

MDL = 0.027 lbs/day

AML = 0.012 lbs/day

APPENDIX C - MAXIMUM EFFLUENT FLOW CALCULATIONS

The permittee has indicated that the maximum effluent flows that were used in the previous fact sheet to calculate effluent limits are incorrect. The permittee stated that the supplemental flow data (from October 1998 through November 1999) that was submitted separate from the Discharge Monitoring Reports should not be used since the value for April 20, 1999 (3.48 mgd) exceeds the design capacity of the flume and V-notch weir.

When all of the available flow data is graphed for outfall 001 (see Figure A), it appears that the flow data for April 20, 1999 (3.48 mgd) and May 3, 1999 (2.14 mgd) differs significantly from the other data (i.e., are stragglers or outliers).

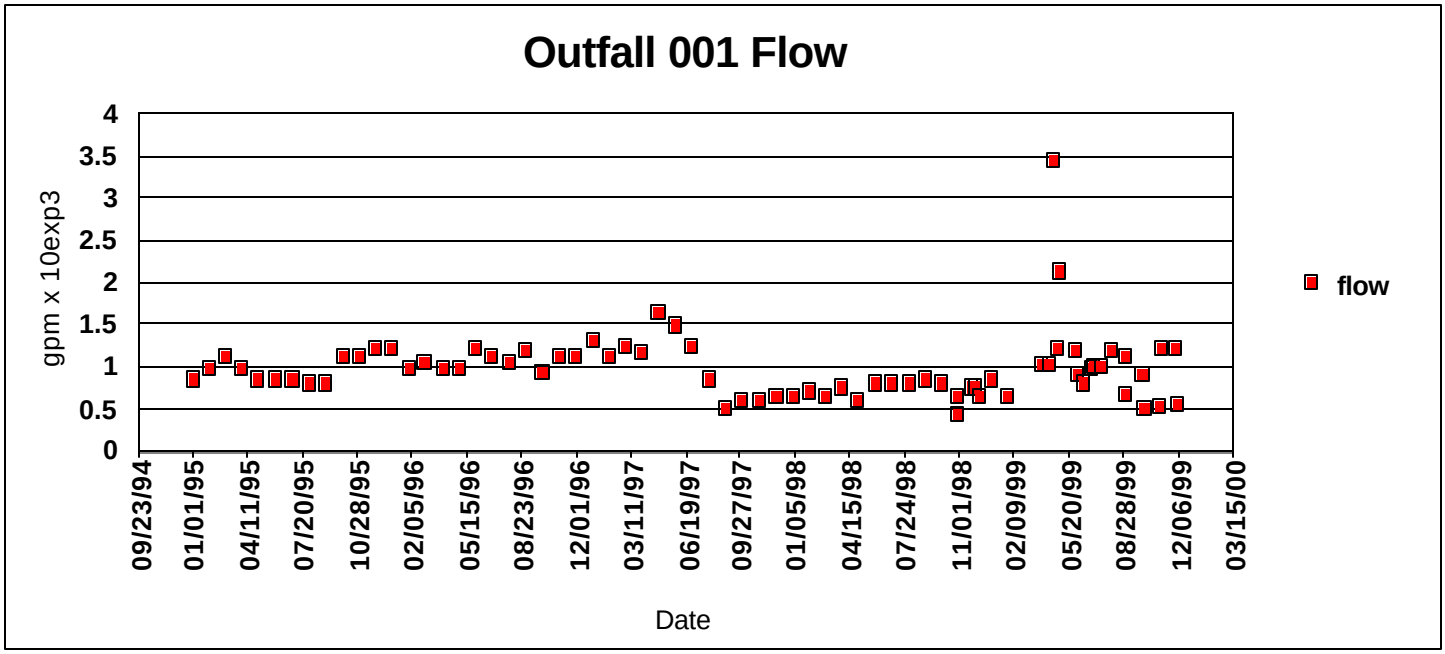

Figure A

In order to mathematically confirm this suspicion, EPA assumed the data set was normally distributed and used the Grubbs Q (outlier) test to assess the suspect data by comparing it with the other data. The test results are as follows:

$$G = 1- \left| \frac{(n - 3) \times s^2_{n-2}}{(n - 1) \times s^2} \right|$$

where,
s = standard deviation of the whole data set
s_{n-2} = standard deviation of data set excluding two suspect values

n = number of data points = 82

$$G = 1 - \left| \frac{79 \times 0.252}{81 \times 0.395} \right| = 0.378$$

Because the test value of 0.378 is greater than the Grubbs critical value of 0.198 (i.e., 0.378 > 0.198), the extreme values (i.e., outliers) are unlikely to have occurred at a 95% confidence level. Therefore the flow data on April 20, 1999 and May 3, 1999 were removed.

The average annual and maximum monthly flow of the remaining data is 0.940 mgd (1.46 cfs) and **1.66 mgd (2.57 cfs)** respectively. In addition, the flow data originally used to determine the maximum flow from outfall 002 in the 2001 draft permit was incorrect. The verified average and maximum flows from outfall 002 are 0.428 mgd (0.663 cfs) and **0.895 mgd (1.39 cfs)** respectively. These maximum flows were used to calculate the following concentration and mass-based limits for copper and mercury for outfalls 001 and 002:

Table C-1: Effluent Limitations and Monitoring Requirements for Outfall 001

Parameter	**Flow Tier**		**Effluent Limitations**			
			Maximum Daily		**Average Monthly**	
	Flow Tier Target Site	**River Flow Value**	**µg/L**	**lbs/day**	**µg/L**	**lbs/day**
Copper[2]	Not dependent upon river flow		17	0.24	8.0	0.11
Mercury	Lake Creek upstream of outfall 001	<1.7 cfs	0.022	0.00030	0.011	0.00015
		≥1.7 to < 3.8 cfs	0.023	0.00032	0.012	0.00017
		≥3.8 to <13.4 cfs	0.027	0.00037	0.014	0.00019
		≥13.4 to <23 cfs	0.045	0.00062	0.023	0.00032
		≥ 23 cfs	0.064	0.00089	0.032	0.00044

Table C-2: Effluent Limitations and Monitoring Requirements for Outfall 002						
Parameter	**Flow Tier**		**Effluent Limitations**			
			Maximum Daily		**Average Monthly**	
	Flow Tier Target Site	**River Flow Value**	**µg/L**	**lbs/day**	**µg/L**	**lbs/day**
Copper	SFCDA River directly upstream of the outfall	< 48 cfs	63	0.47	29	0.22
		≥ 48 to < 109 cfs	70	0.52	32	0.24
		≥ 109 to < 379 cfs	107	0.80	50	0.37
		≥ 379 to < 649 cfs	217	1.6	101	0.75
		≥ 649 cfs	179	1.3	83	0.62
Mercury	SFCDA River directly upstream of the outfall	< 48 cfs	0.13	0.00097	0.065	0.00049
		≥ 48 to < 109 cfs	0.19	0.0014	0.095	0.00071
		≥109 to < 379 cfs	0.41	0.0031	0.20	0.0015
		≥379 to < 649 cfs	1.4	0.010	0.68	0.0051
		≥ 649 cfs	2.3	0.017	1.2	0.0090

APPENDIX D - REFERENCES

EPA 1989. NPDES Permit No. ID-000002-7. Issued on January 9, 1989.

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IDEQ 2001. State of Idaho Department of Environmental Quality (IDEQ). February 14, 2001. Pre-certification comments for NPDES permit No. ID-000002-7. Letter from David Stasney, IDEQ to Kelly Huynh, EPA.

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