

**REVIEW COMMENTS**

**PROJECT:** BLM Red Devil Mine

**DOCUMENT:** Draft RI Report

**DATE:** 5/25/12

**REVIEWER:** Anne Marie Palmieri

**PHONE:** (907) 766-3184

Item No.	Location (page, par., sen.)	COMMENTS	BLM Response
1.	Section 1.4.2.4, last sentence	1) Clarify that the petroleum contamination at the pipeline mentioned here was cleaned up in the 2006 and 2010 efforts, unless you are referring to some other contamination. 2) Add text stating that petroleum from the ASTs and pipeline will not be addressed as part of the RI.	1) The text will be modified to make this clarification. However, it should be noted that samples collected for the RI in this area (MP17) contained petroleum hydrocarbons. 2) The text will be added as requested.
2.	Section 1.4.3.6	Update the demographics section with current information from the 2010 census.	The text will be updated using 2010 census data.
3.	Section 1.4.5.1 & 1.4.5.2	For all areas where it is stated “this soil was addressed in 2002”, how that soil or other material was specifically addressed needs to be clarified.	The additional detail will be added to the text as requested.
4.	Section 2.3	It would be helpful to list the 5 wells that were not sampled here and also identify them on Figure 2-7, perhaps by designation with a different color?	The wells that could not be sampled in 2012 will be identified in the text and in Figure 2-7.
5.	Section 2.5.4	1) Who collected the samples in the Holitna? 2) Were these results used in the background determination for sediment in the Kuskokwim? 3) This was not part of the approved work plan for the off-shore sampling was it? 4) Not all of the planned locations were sampled; this should be discussed including why they weren’t sampled.	The samples collected from the Kuskokwim River near the mouth of the Holitna River will be removed from the background sediment data set.  1)
6.	Figure 2-12	It would be helpful to designate which samples represent background conditions and which are to be used for the contaminated area.	The samples used to represent background conditions will be identified on the figure as requested.
7.	Section 3.3.1; Figure 1-7	The position of the Red Devil Creek channel in 1963 is not clear on Figure 1-7.	The figure will be revised to more clearly indicate the location of the historic channel.
8.	Page 3-18, para 3	Last sentence: sentence fragment....	The fragment will be corrected.
9.	Page 3-19, para 2	Last sentence: sentence fragment....	The fragment will be corrected.
10.	Table 3-4	Where is the grain size data for the Holitna samples? KR48-51, 53	The grain size data for these samples will be added to the table.

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11.	Figures 3-3 to 3-8	There are no figures which show subsurface sample locations and results. It would be beneficial to have this information on figures to see how the concentrations change across the site in the various waste types.	Chapter 3 provides descriptions of the physical characteristics of the site; figures in this chapter are not intended to identify sample locations/depths or present results of chemical sampling. BLM considered creating figures showing specific subsurface sample locations for Chapter 4, however, it was determined that such figures would not effectively illustrate sample locations and results due to the large number of borings and samples per boring. BLM did recognize the importance of communicating subsurface results in a “vertical” format; this presentation of data is contained in Appendix C. In addition, several cross-sections showing selected sample results will be added to Chapter 4.
12.	Figure 3-9	It is unclear how the text in Section 2.3 states that 5 wells were dry and couldn't be sampled and Figure 3-9 shows only one well (MW11) as dry and water in the rest of the wells. Were the wells dry or did not provide sufficient recharge for sampling?	The text will be revised to more clearly indicate which wells were dry and which wells recharged too slowly for sample collection. This information is presently available in Table 2-5.
13.	Figure 3-11	It would be helpful to show the sample locations and results on this figure – are there trends that can be observed?	Such results are presented in Figures 4-29 and 4-30. The bathymetric contours will be added to these Chapter 4 figures.
14.	Section 4	Whereas it is possible for the reviewer to correlate the results from the tables with the sample locations on the figures, it is time-consuming and does not allow for the visualization of possible contamination trends that the inclusion of data on a figure would give.	Initial versions on the Chapter 4 figures contained data tables for each location and the result was very crowded and difficult to interpret. The color coding is a reasonable compromise that allows correlation of broad concentration trends, reducing the scale of more detailed spatial analysis using the tables.
15.	Section 4.1	The ProUCL data inputs need to be provided so that DEC can evaluate the appropriateness of the data used.	The data inputs will be provided as an appendix in the next draft.
16.	Section 4.1	Duplicate and primary sample results were averaged. DEC guidance states that the most conservative value (lowest for determining background) should be used. This guidance is not specific to only 95UCLs, but to all data. Revise.	Background values will be recalculated using the lowest concentration for duplicate samples.

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17.	Sections 4.2, 4.3, & throughout	Presentation of the information in this manner does not give the reviewer an understanding of the nature and extent of contamination. There are beneficial descriptions of the extent of soil types at each area, but does not effectively describe how elevated the contaminants are or show subsurface samples on a figure so that trends can be discerned or areas can be compared with one another. This information is needed in order to evaluate alternatives in the FS. The text focuses on soil types whereas the figure don't show that and focus on sample location and concentrations; there is a disconnect here. There also needs to be discussion about what was found during the field work (unsuspected petroleum, elemental mercury, TCLP criteria, etc).	BLM attempted to convey contaminant trend information primarily through tables and figures to reduce the amount of text in the RI report. The sample results maps will be modified to show the soil types in relation to contaminant concentrations detected during the RI. Additional discussion will be provided in Chapter 4 addressing the locations and nature of unsuspected petroleum and elemental mercury. Additional text will be provided to address the petroleum contamination found near the "box" in the petroleum treatment area.
18.	Section 4.2.1.2, & throughout	It is not acceptable to screen organic compounds such as SVOCs, DRO, RRO, and PCBs against a "background" concentration, as these are not naturally-occurring constituents. Biogenics can be accounted for in other ways, if this is an issue. Use the DEC default cleanup levels of 18 AAC 75 to screen for these organics.	All references to "background values" of organic contaminants will be removed from this Chapter.
19.	Sections 4.2.1 & 4.2.2	There needs to be discussion about the samples that were collected for TCLP and where they were and those results. It would be helpful to have these samples shown on a figure with the area of potential hazardous waste delineated.	Discussion of TCLP results and a map showing the TCLP results will be added to the Chapter.
20.	Section 4.3.2.2	It was relayed on a conference call last summer that unanticipated petroleum contamination was found in the subsurface near the settling ponds. Include narrative information about the extent of what was found this section.	Discussion of petroleum hydrocarbon detections will be added to the Chapter.
21.	Section 4.8	There needs to be discussion regarding concentrations of inorganics in the soil and how that compares to concentrations in the vegetation.	Vegetation results will be compared with nearby soil sample results in this section.
22.	Table 4-17 & throughout	It would be helpful to include Federal criteria for TCLP and State criteria for SVOCs, PCB, DRO, and RRO.	Table 4-17 will be revised
23.	Figure 4-2 & throughout	Key, last line: I suspect that you mean the <u>blue</u> sample symbols are below background rather than the <u>green</u> sample symbols.	This correction will be made to all applicable figures.

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24.	Figure 4-2 & throughout	Is there any basis associated with risk or any technical issue for the division of color-coding?	The color coding will be revised to clearly indicate sample results below background values. Prototypes of the revised color coding system will be distributed to ADEC and EPA prior to production of the draft final RI report.
25.	Figures 4-5, 4-6, & 4-7	It would be helpful to at least have the sample IDs on this figure; inclusion of sample results would be ideal, however but may not be possible due to space availability. Some sample IDs and results were included on 4-7.	The sample codes will be added to these figures.
26.	Figure 4-8	It would be helpful to show the SVOC, DRO, RRO, and PCB concentrations which exceeded state standards on this figure.	A figure will be added to Chapter 7 that shows exceedences of state standards for these compounds.
27.	Figures 4-31 – 4-34	It would be beneficial to the reviewer to denote the background samples in a different color. Also helpful would be the inclusion of the corresponding soil sample locations and results.	The figures will be revised to show the background samples and nearby soil sample results for arsenic, antimony, and mercury.
28.	New Figures	The creation of the following figures is requested: SPLP locations and results; TCLP locations and results; soil/waste types (surface); mercury SSE locations and results; and arsenic speciation locations and results.	New figures will be added to facilitate review of this section. At present, it's not clear if all the information listed in the comment will added to figures due to complexity of the task.
29.	Sections 5.1.2.1 & 5.1.2.2	It would be clearer to show the SPLP and TCLP results and the total results in a small table in each subsection as well as the graph.	New tables will be prepared and presented in Chapter 5 to supplement the tables presented in Chapter 4 Appendix C.
30.	Section 5.1.2.2, Arsenic	1) Line one: Correct "SPLP" to "TCLP". 2) Add narrative discussing sample results in comparison to RCRA regulatory values.	1) The text will be corrected as indicated. 2) The text will be revised to include narrative comparing TCLP results to RCRA regulatory values.
31.	Section 5.2.2.1	1) Were there any differences in the SSE results in the various soil/waste types? 2) Were there any distinguishable patterns based on location or source area?	1) Yes, differences in SSE results were noted for different soil types. Paragraph 2 of this section, which provides some information regarding these differences, will be expanded to further describe such differences. 2) Yes, differences in SSE results were noted based on differences in location and source area, which are associated with source type or soil type. This section will be expanded to further describe such differences.

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32.	Section 5.2.2.2	How did the Red Devil Creek samples compare to the various types of tailings?	The text will be expanded to provide a comparison of SSE results for Red Devil Creek sediment and tailings and tailings/waste rock.
33.	Section 5.3 and throughout	As previously discussed during the development of the work plan, all data and conclusions associated with the results of arsenic bioavailability are rejected due to the fact that the method used to obtain this data is not an EPA-approved method.	Noted. It is BLM's opinion that the arsenic bioavailability data are important to consider in the risk assessment uncertainty analysis (Section 6.2.6.3) as part of risk management decision-making for the site.
34.	Section 6	It does not appear that DEC comments on the Wild Foods January Tech Memo were incorporated in the risk assessment. These comments need to be discussed and incorporated.	Comments on the technical memorandum, <i>Proposed Approach to Evaluating Consumption of Wild Foods at the Red Devil Mine Site, Alaska, Version 2</i> , were received after incorporation into the draft risk assessment was possible. Comments on the tech memo are included in this set of response to comments and will be incorporated into the next draft of the risk assessment.
35.	Section 6	The BLM fish tissue report needs to be reviewed and approved prior to using the data in the risk assessment.	Red Devil Creek sculpin tissue concentrations were used for the HHRA. Therefore copies of the Fish Tissue Study work plan and quality assurance reports will be made available to ADEC to verify that sculpin tissue data quality is appropriate for a CERCLA Baseline Risk Assessment.  BLM will forward a copy of the latest draft of the Fish Tissue Study Report to ADEC once it is ready for distribution. The Fish Tissue Study Report is not part of the CERCLA action. Therefore BLM is not seeking ADEC approval of the report.

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36.	Section 6.2.3.6	DEC guidance states that arsenic bioavailability should be calculated at 100%. Include discussion to that extent and calculate bioavailability at both 60% and 100% as previously discussed.	Per EPA's direction and consistent with Region 10 policy (Lon Kissinger e-mail August 12, 2011) and response to comments on DEC's Anne Marie Palmieri's July 21, 2011 comments, arsenic was evaluated as being 60% bioavailable. BLM worked closely with EPA on this issue, including DEC in those correspondences, and EPA requested we evaluate at 60%. DEC did not bring up also evaluating arsenic at 100% during the discussions of the work plan. Evaluating arsenic as both 60% and 100% bioavailable would be more appropriate for a screening assessment versus a baseline risk assessment. BLM also believes that evaluating both 60% and 100% would confuse the results. Arsenic bioavailability of 60% will be used in the HHRA and the impacts of using 100% bioavailability will be presented in the uncertainty section.
37.	Page 6-29, para 2-3	Preliminary telemetry data has shown that the pike and burbot migrate significantly along the Kuskokwim River. A comparison of modeled concentrations from Red Devil Creek and fish from the Kuskokwim is not appropriate.	Telemetric studies on burbot and northern pike show that movements can be highly variable and difficult to predict for a given river system. Impacts of contamination from Red Devil Mine to fish harvested for subsistence use in the Kuskokwim River is unknown. As directed by DEC, BLM to use data from Red Devil Creek to estimate concentrations of COPCs in fish to evaluate impacts to people consuming these fish. Based on the ADF&G report, households in Red Devil Village currently harvest fish primarily from the Kuskokwim River. As shown in Table 6-24 of the risk assessment, the modeled fish COPC concentrations based on data from Red Devil Creek greatly exceed the actual concentrations of antimony, arsenic and mercury in Northern Pike, a primary harvested food, from the Kuskokwim. The comparison of modeled fish concentrations from Red Devil Creek and actual Kuskokwim River fish concentrations is important to show the health-protective approach taken in the risk assessment. The last paragraph of page 6-53 will be reworded to clarify issue.

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38.	Section 7.1.2, Soil	Why does this section compare sample results to State and Federal default screening levels whereas Section 2 compares the results to background concentrations? It would be preferable to list both background and default screening levels in the Section 2 tables.	<p>Chapter 2 does not compare results to any criteria; BLM assumes the commenter is referring to Chapter 4. Chapter 4 uses only background values to determine when analyte concentrations represent “contamination”. Inclusion of the state and federal criteria (and/or risk-based criteria) in Chapter 4 would provide multiple concentrations that could represent “contamination”, and would be confusing. BLM’s approach is as follows:</p> <ol style="list-style-type: none"> <li>1) Determine what constitutes “contamination” using background value comparisons (Chapter 4).</li> <li>2) Determine the media and contaminants posing risk to human health or ecological receptors (Chapter 6).</li> <li>3) For the media that is “contaminated” and posing risk, compare to relevant standards and criteria for cleanup decision making (Chapter 7).</li> </ol>
39.	Section 7.1.2, para 3	If organics in surface soil have not been fully delineated, this data gap could possibly be addressed during the 2012 field season.	The RI data for soil are sufficiently detailed to develop the Feasibility Study for petroleum contaminated media. The last sentence on page 7-2 will be expanded to reflect that additional characterization of organic compounds in soil may be implemented at a later date.
40.	Table 7-1	<ol style="list-style-type: none"> <li>1) Beryllium should not be shaded.</li> <li>2) What is the difference between Diesel Range Hydrocarbons and C10-C25 DRO and Motor Oil and C25-C36 RRO?</li> <li>3) Screening level for C25-C36 RRO should be 10,000.</li> </ol>	<ol style="list-style-type: none"> <li>1) The shading of beryllium will be removed.</li> <li>2) The petroleum hydrocarbon results were generated by separate labs in 2010 (ARI which reported hydrocarbons using the C-ranges) and in 2011 (CAS, which reported hydrocarbons as DRO and RRO). The results from the two field seasons are from the same analysis but are simply reported differently by the labs.</li> <li>3) The screening level will be corrected.</li> </ol>
41.	Table 7-2	<ol style="list-style-type: none"> <li>1) Zinc should not be bolded.</li> <li>2) C10-C25 DRO screening level should be 250.</li> </ol>	<ol style="list-style-type: none"> <li>1) The shading of zinc will be removed.</li> <li>2) The screening level will be corrected and shaded.</li> </ol>

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42.	Table 7-3	Groundwater screening criteria should also include 18 AAC 75.345, Table C. Nickel = 100; Silver = 100; Vanadium = 260; Zinc = 5000; methylmercury = 3700; DRO = 1500; RRO = 1100	The noted criteria will be added to the table.
43.	Table 7-4	It is unclear if screening levels for the following metals have been adjusted for hardness as required by Alaska Water Quality Standards: Cadmium, Chromium, Copper, Lead, Nickel, Silver, and Zinc. If so, please state that this was performed in the narrative.	The metals criteria will be adjusted for hardness and this will be noted in the text.
44.	Table 7-4	Methylmercury: It appears to me that in the Suter and Tsao (1996) report the concentration of 0.0028 is ug/L, not ng/L – please check this and correct if needed.	The methylmercury criterion will be corrected and the shading will be removed.
45.	Tables 7-5 & 7-6	ADEC Guidance states that the TEL and PEL should be used as screening values for sediment. Revise.	The TEL and PEL sediment benchmarks from NOAA will be used in place of the TEC and PEC benchmarks from MacDonald et al. (2000).
46.	Section 7.2, #2	The answer to this question is not readily apparent in one section of the report, rather the reviewer must pull together the information from various tables, figure, and text. If this is an important distinction that will drive how different areas are treated in the FS, additional information needs to be provided in the RI.	At this time, BLM does not anticipate that these various types of processed ore wastes will be evaluated differently in the Feasibility Study.



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47.	Data Gaps	<p>The following issues are seen as remaining data gaps, additional data gaps may be identified as the RI is revised and site information is more readily evaluated.</p> <ol style="list-style-type: none"><li>1) Extent of soil leaching arsenic at concentrations that exceed TCLP criteria.</li><li>2) Seasonal groundwater flow information with respect to Red Devil Creek.</li><li>3) If elemental mercury is migrating from Monofill 2.</li><li>4) Extent of organics contamination in the surface soil.</li></ol>	<p>Response:</p> <ol style="list-style-type: none"><li>1) BLM plans to proceed with the FS under the assumption that all tailings/waste rock at the site exceed TCLP criteria.</li><li>2) Seasonal groundwater and Red Devil Creek flow data were collected in May and June of 2012. These data will be incorporated into the draft final RI report.</li><li>3) The RI data collected do not indicate that elemental mercury is migrating from Monofill 2.</li><li>4) BLM plans to proceed with the FS using existing organic contaminant data. The current RI results are sufficient to support the FS.</li></ol>
48.		--end--	