			Commenter: Marty Brewer, ADECComments Developed: August 16, 20	<u>12August 13, 2012</u>
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1.		General	Some sections continue for pages without appropriate subsection divides. Text should be divided into more sections for ease of review.	Text will be reviewed and divided, as appropriate.
2.		General	Exposure parameters should be discussed within the appropriate text instead of referring to other sections or tables for the information.	Text will be reviewed and updated, as appropriate.
3.		Background Study	The use of background data is unclear. It is dismissed as inconclusive for the human health risk assessment, but background comparisons are repeatedly made in the ecological risk assessment. Any reference to background data should be approved of by ADEC.	It was agreed to during comment resolution on the Risk Assessment Work Plan (RAWP) that background risks would be considered when interpreting site ecological risks.
4.		Benthic Survey	Please provide the Red Devil Creek Benthic Macroinvertebrate Survey referenced in Section 6.3.3.4 for ADEC review.	If available from BLM, the study report will be provided. If not, E & E will include preliminary tables and figure of the benthic survey data in the revised BERA.
5.		Risk summary	Please include actual risk estimates when summarizing risks instead of describing as above or below criteria.	The document will be reviewed and the requested change made, as appropriate. We will investigate adding a bar chart for hazard quotients greater than 1 as a figure in the HHRA.
6.		Data quality & usability for RA	The risk assessment is lacking a data quality and usability section. Recommend adding this section to the risk assessment.	Data usability it provided in Section 6.1. Additional information on data quality will be included in the RI.
7.		Uncertainty discussions	Risk estimates are presented with accompanying uncertainties discussions which tend to muddle the text. Please refrain from countering each risk estimate with an uncertainty discussion and save this text for the uncertainty section of the risk assessment.	Discussion of uncertainties will be included in Section 6.2.6 and only referenced in Section 6.2.5. The same approach will be used in the baseline ecological risk assessment.
8.	6-3	6.1	Please clarify that the three debris burial areas (monofills) were not permitted nor approved.	That information will be incorporated into Chapter 1 of the RI.
9.	6-3	6.2.1	Include reference to USEPA, June 1997d, <i>EPA Region 10 Supplemental Ecological Risk</i> <i>Assessment Guidance for Superfund</i> , Region 10, Office of Environmental Assessment, Risk Evaluation Unit, EPA 910-R-97-005.	Reference will be added.
10.	6-4, 3 rd paragraph	6.2.2.1	Please present screening levels as adjusted to cancer risk screening level of 10^{-6} and HQ of 0.1.	Screening values included in Tables 6-1 through 6-6 are adjusted to cancer risk level of 10-6 and a HQ of 0.1, as described in Section 6.2.2.1.
11.	6-6, 3 rd paragraph	6.2.2.3	It is unusual not to meet risk screening criteria for PAHs in water samples using SW8270SIM method. This data discrepancy should be considered a potential data gap.	SW8270SIM was used and obtained expected detection limits. Additional discussion will be added to this section.
12.	6-6, 4 th	6.2.2.3	Disagree that the semivolatile compounds detected in groundwater or surface water above	These compounds were not detected above the RBSC. These

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	paragraph		RBSC are not of significance because they were not detected in soils. These COPCs should be carried forward in the risk assessment and inadequacies in detection limits should be considered a potential data gap.	compounds were not detected in any media (groundwater, surface water, soil or sediment). Maximum detection limits were above RBSC. This issue is further discussed in Section 6.2.6.			
13	. 6-9	6.2.3.1	Please present the future onsite adult and child resident exposure duration and frequency. Please also specify what percentage of wild foods will be consumed from the site. Also include ingestion of fish from Red Devil Creek.	This information is provided in Section 6.2.3.4 and in Table 6- 19. It is unclear if the reviewer would also like this information provided in Section 6.2.3.1. Please clarify.			
				It is unclear how a quantitative estimate of consumption of fish from Red Devil Creek could be derived. The ADF&G harvest survey report does not show Red Devil Creek as an area where fish are regularly harvested. The fish ingestion rates are based on fish harvested from the Kuskokwim River. As a health protective approach, concentrations in those fish are estimated based on the fish sampled by BLM in Red Devil Creek.			
14	. 6-10	6.2.3.1	Use of ATVs for recreation and subsistence activities are mentioned in the text, but there is no discussion of any fugitive dust assessment. Please discuss whether or not fugitive dust from ATV riding will be assessed and if so how it will be assessed.	This was assessed, as described in Section 6.2.3.7, page 6-32. Specifically, the airborne dust concentrations during ATV use for the recreational and subsistence users are estimated using equation E-18 of the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (EPA 2002b). This equation is designed to calculate a PEF associated with construction traffic over unpaved roads but was modified to reflect ATV usage of an unpaved road or trail. The equations and input parameters are provided in Appendix D, Table D- 17. The calculated site-specific PEF for ATV use is 3.1 x 109 m3/kg.			
15	. 6-10	6.2.3.1	Please present the recreational visitor exposure duration and frequency. Please also specify what percentage of wild foods will be consumed from the site. Also include ingestion of fish from Red Devil Creek.	Please see response to Comment #13.			
16	. 6-10	6.2.3.1	Please present the industrial/ mine worker exposure duration and frequency and description of work to include excavation activities. Please also specify what percentage of wild foods will be consumed from the site.	Please see response to Comment #13.			

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			Also include ingestion of fish from Red Devil Creek.	
17	. 6-11	6.2.3.1	Present and discuss all COPCs that exceeded risk screening criteria as appropriate.	Additional COPC exceeding EPA or DEC risk or hazard criteria, specifically cobalt, manganese, iron, selenium, and thallium will be discussed.
18	. 6-11	6.2.3.1	DEC is not interested in average concentrations of COPCs. Please discuss concentrations of COPCs in terms of reasonable maximum concentrations (i.e. maximum concentration or 95% UCL).	Ranges, including maximums, are provided in Table 6-7. Discussion of the maximum concentrations and, possibly, the 95% UCL will be added to this section.
19	. 6-11	6.2.3.1	Some discussion is warranted on the similarities of the three geographical areas of the SMA and why it is appropriate to combine them into a single exposure unit.	Discussion will be added.
20	. 6-11	6.2.3.2	Maximum concentrations in groundwater must be used to evaluate risk consistent with ADEC policy and this risk estimate should be used in the cumulative risk calculations. Use of a 95% UCL groundwater concentration as the exposure point concentration is not appropriate and should not be included in the discussion of risk for the site.	Maximum groundwater concentrations will be used in the risk characterization section (Section 6.2.5). A discussion of the range of groundwater concentrations will be included in the uncertainty section (Section 6.2.6).
21	. 6-12	6.2.3.2	Please clarify that maximum groundwater concentrations within each exposure unit were used as EPCs.	Risks and hazards were calculated based on the maximum COPC concentrations in groundwater and presented in Tables D-11 and D-12. To clarify the issue, maximum groundwater concentrations will be used in the risk characterization section (Section 6.2.5). A discussion of the range of groundwater concentrations will be included in the uncertainty section (Section 6.2.6).
22	. 6-14	6.2.3.3	Note that PAHs 1-methylnaphthalene and naphthalene were identified in surface water as COPCs whereas later the text (Section 6.2.4.2) states that no carcinogenic PAHs were identified as COPCs. Both of these PAHs are considered carcinogenic.	The EPA's Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons (EPA 1993b) indicates that carcinogenic polycyclic aromatic hydrocarbons (PAHs include benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzo(a)pyrene; chrysene; dibenzo(a,h,)anthracene; and indeno(1,2,3- cd)pyrene. None of these carcinogenic polycyclic aromatic hydrocarbons were identified as COPCs at the site and no compound was evaluated using the toxicity equivalence factor (TEF) for benzo(a)pyrene.

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23	. 6-15	6.2.3.3	The text discusses the different arsenic bioavailability considered, but does not explicitly state which is used for the risk assessment. Note that it was ADEC's understanding that the default 100% bioavailability would be used consistent with ADEC guidance as well as Region 10 EPA's recommendation of 60%.	The text on this page states, "For soil ingestion and dust inhalation of arsenic, soil intakes are multiplied by an estimate of relative bioavailability to quantify the level of arsenic that reaches systemic circulation. See Section 6.2.3.6 for additional information on arsenic bioavailability."
				Section 6.2.3.6 states, "For soil ingestion and dust inhalation exposures, soil intakes are multiplied by the default relative bioavailability of 60 percent to estimate the level of arsenic that reaches systemic circulation." This is consistent with 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. 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.
24	. 6-16	6.2.3.4	 Inconsistency in shower duration for different exposure routes. inhalation of volatiles - 45 minute shower duration dermal absorption - 15 minutes Please provide rationale and update exposure parameters tables as appropriate 	The discrepancy will be investigated and exposure durations will either be consistent between exposure routes or the discrepancies will be explained.
25	. 6-17	6.2.3.4	 Skin surface areas for children are inconsistent between exposure to sediment and exposure to surface water. Please provide rationale and update exposure parameters tables as appropriate. 	The discrepancy will be investigated and surface areas will either be made consistent or the discrepancies will be explained.
26	. 6-19	6.2.3.5	Please provide the <i>Proposed Approach to Evaluating Consumption of Wild Foods at the Red Devil Mine Site, Alaska, Version 2</i> (E & E 2012) and the agencies comments. The approach should be reiterated in the risk assessment rather than referencing the memo.	Information will be incorporated in an Appendix. Although the memo was referenced, all relevant information was provided in the HHRA.

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27	. 6-21	6.2.3.5	Text states that marine mammals are not included for consideration due to lack of available data in the 2004 Ballew report. However, the text on the previous page (page 6-20) lists seal oil as one of the top 50 foods reportedly consumed in the greatest quantities in the 2004 report. Please rectify the inconsistency.	The text on page 6-21 states, "Marine mammals and marine invertebrates harvest rates are not included in Table 6-20 due to the lack of these categories listed as subsistence foods by Ballew et al. (2004), the large distance to a marine mammal or invertebrate harvest area from the site, and the low harvest levels for marine mammals and invertebrates (IDM 1997)." The Ballew et al. report is not specific to Red Devil but to the much larger Yukon–Kuskokwim Health Corporation Region. The ADF&G report indicates that marine mammals were not harvested by any household in Red Devil. Additional text will be added to Section 6.2.3.5 for clarification.
28	6-21	6.2.3.5	Please specify in the text that the 1997 IDM fish ingestion rates presented in Table 6-21 are 95 th percentiles.	Text will be added to specific the rates shown in Table 6-21.
29	6-27	6.2.3.7	Maximum groundwater concentrations should be used to present the primary risk estimate. Use of a 95% UCL groundwater concentration as the exposure point concentration is not appropriate and should not be included in the discussion of risk for the site.	Maximum groundwater concentrations will be used in the risk characterization section (Section 6.2.5). A discussion of the range of groundwater concentrations will be included in the uncertainty section (Section 6.2.6).
30	6-28	6.2.3.6	DEC commented on the <i>Proposed Approach</i> memo about the adequacy of the sculpin data for comparing total mercury to methylmercury concentrations.	See responses to comments on the Proposed Approach to Evaluating Consumption of Wild Foods at the Red Devil Mine Site, Alaska, Version 2.
31	6-34	6.2.4.1	The assessment of carcinogens does not discuss COPCs with mutagenic mode of action at all, yet chromium is a COPC for the site and considered a mutagen.	Hexavalent chromium is the only form of chromium considered a mutagen. There are no known releases of hexavalent chromium at the site but, per DEC's request, total chromium will be evaluated as hexavalent chromium.
32	6-35	6.2.4.1	Last paragraph states that no carcinogenic PAHs were identified as COPCs for the site. However, on page 6-14 naphthalene and 1-methylnapthalene are discussed as COPCs in surface water.	See response to comment #22.
33	6-36	6.2.4.2	Based upon personal communication with BLM's fish biologist Matt Varner, there has been sampling of inorganic arsenic in fish, but this data has not yet been made available to ADEC This data should be included for consideration in the risk assessment.	This data was not available at the time of the draft risk assessment, and therefore was not included at that time. The data will be incorporated in the Draft Final RI and ADEC and EPA will be provided a copy of the report and/or data when available.
34	6-40	6.2.5.3	Hypothetical future residential exposure areas were generally based upon historic site usage. It was DEC's understanding that the three areas (SMA, MPA, and DA) would be compared	Exposure units were determined based on historical site usage and concentrations levels. Concentration level comparisons

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	5		by concentration levels and a discussion provided in the risk assessment. Please provide this discussion. It was also presumed that risks would be presented by these areas separately and combined.	for the three units are provided in Section 6.2.3.2. Additional information will be provided in this section on to clarify the issue and a reference back to Section 6.2.3.2 will be added. A map of the three areas will be included in the HHRA.	
				Risks and hazards are provided for the areas separately for the residential receptor. For recreational/subsistence users and mine workers, it is assumed that recreational and subsistence activities would be equally spread throughout the site. Therefore, for these receptors, the full site area was treated as a single exposure unit. Additional information will be added regarding why three individual areas (not combined) was evaluated for residential exposure in the HHRA.	
35	•	Figure 6-2	Please present summary risk estimates.	Tables 6-30 and 6-31 present summaries of the risk estimates and hazards at the site. Please provide what additional information the reviewer would like presented in these tables.	
36	. 6-42	6.2.5.3	The FI of 1 was agreed upon for the residential exposure to wild foods pathway.	An FI=1 was used for residential exposure. The adjusted FI discussion will be moved to the Uncertainty Analysis section.	
37	. 6-43	6.2.5.3	Please present non-cancer risk estimate for each media & pathway. Suggest presenting summary risk in table format.	Tables 6-30 and 6-31 present summaries of the risk estimates and hazards at the site by media and pathway. Please provide what additional information the reviewer would like presented in these tables.	
38	. 6-43	6.2.5.3	Adjustments to the FI are made & associated risks presented such that the text becomes confusing. Please reserve uncertainty discussions for the uncertainty section of the risk assessment.	The adjusted FI discussion for the residential scenarios will be moved to the Uncertainty Analysis section.	
39	. 6-43	6.2.5.3	Maximum groundwater concentrations should be used to present the primary risk estimate. Use of a 95% UCL groundwater concentration as the exposure point concentration is not appropriate and should not be included in the discussion of risk for the site.	See response to comment #29.	
40	. 6-43	6.2.5.3	The arsenic results identified as statistical outliers should not be removed from the data set for risk calculations.	These results were not removed from the data set, even though ProUCL identified them as outliers. As discussed in the text, review of total arsenic concentration in groundwater in the MPA shows a number of wells with elevated total arsenic, indicating that these two elevated inorganic arsenic levels may not be true outliers. The goal of this discussion is to show the	

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				influence of these two data points to the overall groundwater risks. The discussion will be reworded for clarify and will be moved to the Uncertainty Analysis section.		
41	•	Figure 6-4	Please present summary risk estimates.	See response to comment #37.		
42.		Figure 6-5	The arsenic results identified as statistical outliers should not be removed from the data set for risk calculations. Moreover, the maximum groundwater concentration should be used as the EPC for risk calculations.	See response to comment #40.		
43	. 6-46	Recreational/ Subsistence User	Please include actual risk estimates when summarizing risks instead of describing as above or below criteria.	Actual risks and hazards are presented on page 6-46. Comparisons to EPA and ADEC criteria are also included. Unclear of requested change.		
44.	. 6-47	Future Mine Worker	Please present summary risk estimates for each media & pathway.	Discussion for risk and hazards for each media and pathway will be added to the Risk Characterization discussion for all receptors.		
45	. 6-47	Risks & Hazards at Maximum GW Levels	Maximum groundwater concentrations should be used to present the primary risk estimate. Use of a 95%UCL groundwater concentration as the exposure point concentration is not appropriate and should not be included in the discussion of risk for the site.	See response to comment #29.		
46	. 6-47	6.2.5.4	The assumption in Section 4.1 that ADEC's recommendation on QC data reduction applies only to the 95% UCL calculations is incorrect. ADEC's recommends using the more conservative (higher value for site characterization & lower value for background determination) of the primary and duplicate sample results for calculating the background threshold level. Primary and duplicate QC samples should not be averaged for calculating the background threshold value.	Background will be recalculated using the lowest concentration for duplicate samples.		
47.	. 6-47	6.2.5.4	Please include a summary discussion of how background risks compare to site risks.	Additional discussion will be added to Section 6.2.5.4.		
48	. 6-48	6.2.5.5	On May 16, 2012 the CDC changed their definition of lead poisoning in children from 10 micrograms per deciliter of blood to 5 micrograms. Please revise this section to reflect a value of 5 micrograms per deciliter of blood as the blood lead level of concern.	Text and model run will be revised. Using the revised criteria, lead does not pose an unacceptable risk at the site.		
49	. 6-49	6.2.6.1	Test states that the background characterization is likely not representative and therefore background risk contributions may be underestimated. Why was this not presented in the background section 6.2.5.4?	Additional discussion on background risk uncertainties will also be added to Section 6.2.5.4.		

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50.	. 6-50	6.2.6.2	Risk to groundwater ingestion should not presume any treatment and risks should be based upon total concentrations.	Risks and hazards were calculated using total concentrations. The uncertainty and potential bias of this assumption are discussed in Section 6.2.6.2.
51	. 6-50	6.2.6.2	Use of 95% UCL groundwater concentrations as EPCs may underestimate risk. ADEC recommends using the maximum groundwater concentration as the EPC to calculate risk.	See response to comment #29.
52.	. 6-51	6.2.6.3	Please provide more detailed information on the arsenic bioavailability study conducted and acknowledge its strengths and weaknesses as well as those for the default bioavailabilities used in the risk assessment.	Additional information on the bioavailability study, including uncertainties in the assumptions, will be provided.
53	. 6-56	6.3.2.4	It should be noted that before remedial investigation activities, Red Devil Creek was not considered an anadromous fish stream. However, it is now being added to the state's list of anadromous fish streams.	Acknowledged. A note to this effect will be added to Section 6.3.2.4.
54	. 6-57	6.3.2.6	Waterfowl were not only noted by ADEC staff, but also BLM staff and local residents. Therefore, it is appropriate to consider waterfowl in the risk assessment.	Acknowledged. The text will be revised to indicate that BLM staff and local residents also have observed waterfowl use of the settling ponds.
55	. 6-59	6.3.4.1	Incomplete sentence. "During a site investigation by the U (Bailey et al 2002)"	The sentence will be completed as follows: <i>During a site investigation by the U.S. Geological Survey (Bailey et al. 2002)</i>
56	. 6-60	6.3.4.2	Although particular attention should be given to metals contaminants on site because of the mining history, all ecological COPCs should be discussed.	Acknowledged.
57.	. 6-60	6.3.4.2	Contrary to the 2 nd bullet, other site related sources exist for PAHs (i.e. historic fuel spills). It is not appropriate to suggest laboratory sample processing as a potential source of PAHs without lab blank contamination confirmation. No mention was made of PAH method blank contamination in the data quality assessment. There are available toxicity data for the PAHs detected in surface water. DEC recommends that any ECOPC exceeding risk screening criteria be carried forward in the BERA.	For PAHs, the first bullet in this section is applicable (i.e., they were detected infrequently at low [part per billion] concentrations in abiotic media at the site) (see SLERA Tables 4-1 to 4-3). We acknowledge that past activities at the site may have resulted in releases of PAHs. PAHs detected in surface water were screened against available surface water screening levels for PAHs (see SLERA Table 4-3). No PAHs in surface water exceeded the available screening levels.

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				All chemicals that exceeded risk screening criteria were carried forward into the BERA.		
58	. 6-65	6.3.6.3	Contrary to the text, there are available soil screening levels protective of invertebrates for arsenic and chromium. There are available soil screening levels protective of microbes for arsenic, chromium, cobalt, silver, and vanadium, Please refer to ORNL's screening benchmarks for earthworms and soil microorganisms (ORNL 1997)	Applicable ORNL soil screening levels will be incorporated into the BERA.		
59	. 6-66	6.3.6.4	Region 5 has a sediment screening criteria of 0.00001mg/kg for methyl mercury.	The Region 5 sediment ecological screening level for methylmercury is for protection fish-eating wildlife. Consequently, it is not applicable to evaluating risk to benthic invertebrates, which is the objective of Section 6.3.6.4 and Table 6-38.		
60	. 6-66	6.3.6.4	Please provide the Red Devil Creek Benthic Macroinvertebrate Survey for ADEC review. Without this report, a discussion of Red Devil Creek benthos is not appropriate.	If available from BLM, the study report will be provided. If not, E & E will include preliminary tables and figure of the benthic survey data in the revised BERA.		
61	. 6-67	6.3.6.5	The spring samples should not be omitted from the surface water data set for Red Devil Creek.	The discussion of the effect of the spring samples on surface water exposure point concentrations for arsenic, iron, and manganese will be moved to the uncertainty section.		
62	. 6-67	6.3.6.5	Please state what the HQ for mercury is in surface water for Red Devil Creek. It is not appropriate to question the validity of the water quality criterion for mercury. The development of this criterion was based upon a much more robust data set than the limited data set for Red Devil Creek. It is not so implausible for the majority of mercury to be methyl mercury. Gray et al. 2000 data showed that 90% of total mercury detected comprised of methlymuercury in fish sample from the Red Devil mining site. Other studies in fish have concurred that the majority of total mercury detected in fish is methyl mercury in some cases 100%.	The HQ value will be stated. The discussion of the mercury surface water standard will be revised based on new information provided by USEPA.		
63	. 6-68	6.3.6.6	Please identify the reference creeks and provide reference data that site surface water results are being compared to. Otherwise, please provide the report that is being referenced for this	The reference creeks will be identified. If available		

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			information. Personal communication with BLM personnel is not a viable refere	ence. from BLM, the study report will be provided to Alaska DEC for review and cited in the revised BERA. If not, E & E will include preliminary tables and figure of relevant data in the revised BERA.
64			end	end