

Atlantic Richfield Company

Roy I. Thun
Environmental Business Manager

4 Centerpointe Drive
LaPalma, CA. 90623-1066
Office: (661) 287-3855
Fax: (661) 222-7349
E-mail: roy.thun@bp.com

June 10, 2009

Ms. Nadia Hollan Burke
Remedial Project Manager
U.S. Environmental Protection Agency - Region 9
75 Hawthorne Street, SFD-8-2
San Francisco, California 94105

Subject: Request for Technical Meeting and Responses to April 13, 2009 Comments on the August 30, 2007 Draft Process Areas (OU-3) Remedial Investigation Work Plan, Yerington Mine Site; Administrative Order for Remedial Investigation and Feasibility Study, EPA Docket No. 9-2007-0005

Dear Ms. Hollan Burke:

Atlantic Richfield Company (ARC) has reviewed the comments on the August 30, 2007 Draft Process Areas (OU-3) Remedial Investigation Work Plan (RI Work Plan) for the Yerington Mine Site provided by the U.S. Environmental Protection Agency - Region 9 (EPA) and the Yerington Paiute Tribe (YPT) and, per EPA request, has prepared the attached responses. As indicated in the comments, ARC agrees that a technical meeting on the schedule and phased approach to the remedial investigation will be necessary before the draft RI Work Plan can be finalized. In addition, ARC proposes that the technical meeting be used to discuss a modified version of the first phase of the investigation, as described below.

Based on recent vadose zone characterization results from the inactive Anaconda evaporation ponds, ARC proposes to revise the Process Areas RI Work Plan to emphasize the vadose zone characterization and monitoring activities in the first phase of work as the only characterization activity to be performed below a depth of 10 feet below ground surface. The rationale for this is that: 1) human health and ecological risk investigations will be limited to the surface and the upper 10 feet of Process Areas soils; and 2) the proposed vadose zone characterization will address the existing and future potential for the sourcing of chemicals of concern to groundwater beneath the Process Areas. ARC proposes to work with EPA to identify 'worst-case' locations in the Process Areas for characterization (the vadose zone investigation locations presented in the RI Work Plan and the additional locations suggested in the comments likely achieve this objective). In addition, ARC believes that a discussion at the technical meeting of the radiological materials characterization work plan and associated removal actions (per the 2009 Administrative Order on Consent and associated Scope of Work), in the context of the Process Areas RI Work Plan would be beneficial.



Ms. Nadia Hollan Burke
U.S. Environmental Protection Agency
June 10, 2009
Page 2 of 2

If you have any questions about the agenda for the technical meeting or the attached responses to CSM comments, please contact me at 661-287-3855 or via e-mail (roy.thun@bp.com).

Sincerely,



Roy Thun
Environmental Business Manager

cc:

Dave Seter (EPA)
Tom Olsen (BLM) - hard copy
Paul Meyer (BLM) - via CD
John Krause (BIA) - via CD
Joe Sawyer (NDEP) - hard copy
Lyon County Library System - hard copy
TetraTech/EPA Anaconda Document Library
Justin Whitesides (YPT)
Edmund Reymus (Walker River Tribe)
John Batchelder (BP)
Jim Chatham (BP)
James Lucari (BP)
Chuck Zimmerman (BC)
Guy Graening (BC)
Linda Henry (BC)
Matt Arno (Foxfire)
Les Williams (Integral)
Rich Curley (Curley and Associates, LLC)
Victor Early (TetraTech)
Ken Greene (CH2MHill)

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
EPA General Comments			
1			<p>Overall, the Draft OU3 Remedial Investigation (RI) Work Plan contains the required items as listed in EPA’s Administrative Order. However, there are a number of comments below that address deficiencies in the amount of detail needed for the Work Plan and investigation approach. It would be beneficial for EPA and ARC to discuss the proposed RI schedule and phasing approach before submission of a revised Work Plan.</p> <p>Response: ARC agrees that a technical meeting on the schedule and phased approach to the remedial investigation would be beneficial. While it is possible to provide details for the scope of the early phases of the investigation, ARC does not believe it is possible or prudent to attempt to provide detailed work scopes for subsequent phases because it is not possible to anticipate all field conditions and analytical results that might be encountered during previous investigation phases (similar to the Groundwater OU). ARC proposes to work closely with EPA to make the Process Areas remedial investigation as efficient and comprehensive to move into the feasibility study phase. Based on recent vadose zone characterization results from the Anaconda evaporation ponds, as part of the AOC/SOW removal action, ARC proposes to revise the Process Areas RI Work Plan to emphasize the vadose zone characterization and monitoring activities in the first phase of work as the only characterization activity to be performed below a depth of 10 feet below ground surface. The rationale for this is that: 1) human health and ecological risk investigations will be limited to the surface and the upper 10 feet of Process Areas soils; and 2) the proposed vadose zone characterization will address the existing and future potential for the sourcing of chemicals of concern to groundwater beneath the Process Areas. ARC proposes to discuss this approach with EPA in the technical meeting mentioned above and will work with EPA to identify ‘worst-case’ locations where vadose zone investigations will be conducted, either as part of the Process Areas RI Work Plan or a preliminary investigative step analogous to the HFA for the Groundwater OU. In addition, ARC proposes to discuss the MARSSIM characterization work plan and associated removal actions required under the 2009 AOC SOW in the context of the Process Areas RI Work Plan.</p>
2			<p>The potential mixing of older (Anaconda) and newer (Arimetco) contaminants in the subsurface and groundwater will need to be addressed by ARC at some point of the site-wide RI/FS process. On page 57, in the first paragraph of Section 2.2.4, the text states that EPA is currently addressing the possibility that Arimetco/Copper Tek operations may have resulted in a flux of mine-related chemicals to groundwater. To date, EPA’s Arimetco RI work has primarily focused on the above-ground features of the Arimetco OU. In the Process Areas, this issue is complicated by the presence of former Anaconda facilities, primarily the sulfuric acid plant and associated features that were subsequently buried beneath Arimetco Heap Leach Pads. The aerial photos included in Appendix B show liquids being discharged from the sulfuric acid plant. ARC should propose a strategy for inclusion of Arimetco-related contaminants and sources into the RI that may be co-mingled with Anaconda contaminants and sources.</p> <p>Response: Regarding surface and near surface soil impacts, Arimetco facilities are in discrete portions of the Site that are generally geographically separate from Anaconda facilities – the one primary exception in the Process Areas being the former Acid Plant. Therefore, the surface and near surface soil samples proposed in the Process Areas RI Work Plan are appropriate to characterize Anaconda-related impacts from past mining activity. The Calcine Ditch used to convey solid waste from the Acid Plant to the evaporation ponds has been included in the investigation.</p> <p>With respect to differentiating Anaconda-related groundwater impacts from Arimetco-related groundwater impacts, an evaluation will be conducted using groundwater quality data from monitor wells proposed by ARC in the Site-Wide Groundwater RI Work Plan, the revised Process Areas RI Work Plan, and the additional wells that ARC will install in response to EPA Specific Comment 157. In particular, the well recommended by the EPA on the Mega Pond embankment will be situated to monitor groundwater quality near (and presumably hydraulically downgradient of) the former Acid Plant that was subsequently buried beneath Arimetco Heap Leach Pads. ARC considers the laboratory analytical parameter list proposed in Table 6-6 of the Process Areas RI Work Plan to be sufficiently broad to support this evaluation. If other parameters useful to such an evaluation are identified during preparation of the revised Process Areas RI Work Plan, these will be incorporated.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
3			<p>Additional site-specific process information and historical analytical data regarding the chemistry of process solutions relative to their locations within the process areas should be included in this work plan to facilitate interpretation of the data. Examples of what site-specific information might be needed include: 1) Metals or radiochemicals that might be present in each of the ores (oxide ores, sulfide ores, and sulfur ores used in the sulfuric acid plant). Historic assay reports, if available, should contain this information; 2) How each of these metals or radiochemicals behaves during the various steps of the ore beneficiation (i.e., does it remain in the solid phase or is it solubilized); 3) Metals or radiochemicals sorption behavior under differing pH conditions and in the presence of other metals or compounds (e.g., oxide coatings on mineral grains); and 4) Interactions between inorganic and organic contaminants. While the focus may be on the contaminants that were determined to be present above the preliminary screening levels, it is important to also consider all the other chemicals present, as there may be interactions with, and impacts on, the contaminants of greater concern.</p> <p>Response: Historic information pertaining to ore composition consists almost exclusively of copper concentrations and mineralogy because this type of information was directly relevant to the ore beneficiation processes. Little or no information was found in the historical documents pertaining to other metals (other than copper) and radiochemicals. In an August 31, 1976 letter from Kilborn NUS, Inc. that addressed a technological and economic feasibility for uranium removal, clarified copper leach solution reportedly contained approximately 0.019 grams per liter of U3O8. Historical documents also indicate that the precipitate from the Cottrells in the former Acid Plant were treated to recover selenium. This information, and any other information that may become available, will be incorporated into the revised Process Areas RI Work Plan, where appropriate</p> <p>ARC also suggests that EPA consider the chemical composition of the oxide and sulfide tailings, waste rock piles and the precipitates found in evaporation pond sediments, which would represent the bulk whole rock chemical composition of the processed ores less the copper values. EPA could also consider the remaining materials in the open pit, which would also represent the chemistry of the ore materials, with less copper than was determined to be economic at the time of mining. A more comprehensive picture of the ore that was processed could be developed by integrating the chemical analyses from these materials from other Site OUs. ARC does not agree that items (2), (3) and (4) listed above will provide any benefit to the RI/FS process (e.g., how will they support a future remedial action decision?). ARC proposes to discuss their importance in the technical meeting.</p>
4			<p>The Work Plan often lacks detailed discussions of the proposed studies and other aspects necessary for a comprehensive review. For example, portions of the plan allude to the collection and use of geochemical information: (a) the sixth bullet in Section 1.0 Introduction mentions a number of soil chemistry parameters; (b) the seventh bullet in Section 1.0 Introduction alludes to understanding the soil and contaminant interactions based on their geochemistry; (c) Step 3 of Data Quality Objective (DQO) #4 in Table 5-1 states that geochemical data will be collected; and (d) the last bullet in Section 10.0 mentions geochemical evaluations for contaminant fate and transport. However, there is little to no discussion of these geochemical aspects of the RI within the Work Plan. Other examples include the proposed vadose zone modeling in Section 6.4. It is recognized that the details of some of these investigations will be driven by the results of previous study phases. However, it is recommended that, to the extent practicable, the details of these studies should be included to minimize future requests for additional data collection that may be needed to fulfill the study objectives.</p> <p>Response: EPA directed ARC to collect and test samples of aquifer solids to evaluate potential geochemical processes that affect contaminant mobility in the saturated zone as part of the Second-Step Hydrologic Framework Assessment and included in the Draft Site-Wide Groundwater RI Work Plan. Pending a technical meeting with EPA, ARC will finalize the aquifer solids testing procedure (to date, ARC and EPA technical staff have not yet met to develop the details of these geochemical evaluations). With respect to unsaturated zone chemical processes, ARC proposes to conduct meteoric water mobility procedure leach testing of soil samples associated with the vadose zone hydraulic investigation (see response to EPA General Comment 1).</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
5			<p>Groundwater quality is discussed with respect to upgradient water quality data obtained from wells B/W-13, 14, and 15. As noted in review of previous work plans, any conclusions regarding “background” water quality are premature. A better definition of the groundwater flow field is needed to support this effort.</p> <p>Response: The discussion of groundwater quality in the Process Areas relative to upgradient water quality data from wells B/W-13, 14, and 15 was necessitated by the available data and Site understanding in 2007 when the draft Process Areas RI Work Plan was prepared. Subsequently, a substantial amount of additional information has been collected to update the latest Site-wide CSM. This information will be incorporated into the revised Process Areas RI Work Plan.</p>
6			<p>Provide available data that may indicate groundwater elevations or the depth to groundwater during historical mining operations to improve understanding of the past hydrologic setting.</p> <p>Response: Historical documents have been reviewed to assess whether this type of information is available, and little if any usable information has been located. The limited available water level information pertains to production wells located at or near the rim of the pit and, consequently provide no quantitative information regarding the groundwater elevation or flow direction beneath the Process Areas.</p>
7			<p>The Work Plan needs to be reviewed and updated as necessary to be consistent with the latest versions of the Site-wide QAPP and the Site-wide CSM. In particular, the screening levels need to be updated, the analytical procedures and reporting limits need to be updated, and the exposure pathways discussed in risk assessment Work Plans (Appendixes A and C) need to be consistent with the CSM.</p> <p>Response: The Process Areas RI Work Plan will be updated as necessary to be consistent with the latest Site-wide QAPP and CSM. Special emphasis will be made to ensure Appendixes A and C are consistent with the most up-to-date CSM. In addition, ARC proposes that the work plan be consistent with the results of the MARSSIM characterization work plan and associated removal actions, required under the 2009 AOC SOW.</p>
8			<p>The screening values to be used for comparing RI results need to be updated to reflect those values presented in the latest version of the Site-wide QAPP along with the background concentrations presented in the latest version of the Background Soils Data Summary Report. These updates will impact both the number and locations of exceedences of screening criteria that have been used to develop the proposed RI field program.</p> <p>Response: The screening values will be updated to reflect those values presented in the latest version of the Site-wide QAPP along with the background concentrations presented in the latest version of the Background Soils Data Summary Report. This causes cascading edits to the document including: Sections 3 and 4 where results above screening levels are discussed; and Section 6 where step out borings are proposed. ARC would like to discuss the radiological screening levels included in the latest Site-wide QAPP.</p>
EPA Specific Comments			
1	1	1.0	<p>Three objectives are provided for this investigation; however the primary overall objective of an RI is to characterize the nature and extent of contamination. This objective should be explicitly stated.</p> <p>Response: The first sentence of the third paragraph in Section 1.0 Introduction (page 1) will be revised as follows: “This Process Areas RI Work Plan is focused on the continued characterization of soils, groundwater and physical structures with the integrated objectives of: 1) characterizing the nature and extent of contamination to determine the potential for adverse effects to human health and ecological receptors , and existing and potential future impacts to groundwater; 2) developing remedial action alternatives ...”.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
2	8	2.1.1	<p>The text states that Anaconda developed the ore deposit “with assistance from the Federal government.” Please clarify this statement and the role of the government, as the statement is misleading as written; the government did not develop ore at the mine and Anaconda did not use government money to develop the mine. From an excerpt from the Explosives Engineer – November-December issue (1955) A Certificate of Necessity was granted Anaconda by the Government, which permitted the company to amortize, for tax purposes, 75% of the eligible part of the cash outlay for development, this amortizing to come within five years. The Government agreed to buy up to 256,000,000 pounds of copper for at least 25.5 cents a pound in the first six years of Anaconda operation, provided that it could not be sold to industry at the minimum price. – Up to the latter part of 1955, the price of copper had not dropped to the minimum price industry was taking all the copper. To the best of our knowledge and historical records, the government did not purchase copper from the Anaconda-Yerington Mine Site.</p> <p>Response: The third sentence of the first paragraph in Section 2.1.1 Operational History (page 8) will be revised as follows: “At that time, Second World War placed heavy demands on metals production and Anaconda developed the ore deposit partly to meet the demands. The Government granted a Certificate of Necessity to Anaconda which permitted the company to amortize, for tax purposes, 75 percent of the eligible part of the cash outlay for development, this amortizing to come within five years. The Government agreed to buy up to 256,000,000 pounds of copper for at least 25.5 cents a pound in the first six years of Anaconda operation, provided that it could not be sold to industry at the minimum price.” The historical document Explosives Engineer – November-December issue (1955) will be added to the reference section of the report.</p>
3	9	2.1.1	<p>Please clarify the type of ore (oxide or sulfide) that are relevant to the processes described in the timeline (e.g., 1953 and 1965). Please also specify the location (for example, W-3) when describing dump leaching. The information associated with Don Tibbals needs to be verified; there are some discrepancies in the files associated with the dates for when he purchased the mine and when he leased it to CopperTek.</p> <p>Response: The text will be revised to indicate that oxide ores were processed in 1953 and that both oxide and sulfide ores were processed in 1965. In addition, when describing dump leaching, the location will be specified (e.g., W-3). Information pertaining to Don Tibbals will be researched to resolve any time frame discrepancies.</p>
4	10	2.1.2	<p>4th bullet – The area listed as S-32 also appears to be labeled as S-23 on some old maps. Please verify if these two are equivalent.</p> <p>Response: All references to this feature will be edited to the correct label “S-23”.</p>
5	12	Item 1	<p>Text states that PLS with a concentration of approximately 15-25 g/L copper and 4-5 g/L sulfuric acid was pumped through 4” plastic pipes sunk into the concrete bottoms of the launder tanks. Please confirm the pipe material. According to Mark Nesbitt, 1954, new solution was conveyed from storage to cementation in 8”-lead pipelines. Historical plans confirm that all pipe shall be of 6% antimonial lead (1952 Historical Drawing YD-49 – Strong Solution Supply Line General Arrangement and Details).</p> <p>Response: The reference to “plastic” pipe will be replaced with “lead” pipe in the first sentence of Item 1 Primary Bank (page 12).</p>
6	13	Item 4, last sen.	<p>Is any more information available to clarify the statement “...non-digestible residual material was removed from system and discarded.” At what frequency and where was it discarded?</p> <p>Response: The frequency and location that the residual material was discarded could not be determined from recent file reviews.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
7	13	Item 5, 4 th sen.	<p>Please confirm the statement that “Spent solutions were stored in the Dump Leach Surge Pond (KK) and were available for reuse in the plant”. The Dump Leach Surge Pond was also used for storage of PLS from W-3 Dump Leach Operations.</p> <p>Response: The statement will be removed from Item 5 Dump Leach Primary and Secondary (page 13).</p>
8	14	1 st par.	<p>Please confirm the statement “Actual chemicals used in the Yerington concentrator have not been determined.” Our understanding is that the Anaconda files do contain information to confirm the actual chemicals used.</p> <p>Response: The statement will be removed. The text describing the Concentrator (page 14) indicates that xanthate and pile oil were used.</p>
9	14	3 rd par.	<p>Please provide the general locations of the production wells mentioned.</p> <p>Response: The document will be revised to incorporate available historical information regarding the locations of the production wells. Specifically, paragraph 3 will be revised to indicate that: “Excess pulp after the floatation separation was disposed in the sulfide tailings as a slurry mixture of solids and water. Operation of the concentrator required approximately 3,000 gpm of water, which was obtained from seven groundwater production wells located around the rim of the pit (see figure) and recycled water from decanting the sulfide tailings and other plant operations (Skillings Mining Review, 1972; Anaconda Drawing YG-3, 1952).”</p>
10	16	1 st par.	<p>Some photos also indicate equipment parking in general area of current SX/EW plant.</p> <p>Response: The following sentence will be added to the second paragraph of Section 2.1.3 Description of Ancillary Support Facilities (page 16): “Historical photos indicate that the area south of Burch Road opposite the Administration Building was used periodically for vehicle parking and equipment storage.”</p>
11	16	2 nd par.	<p>The text notes the uncertainty in the location of a drain line. All areas where uncertainty remains about the locations of drain lines should be incorporated into the underground utility survey work component of the UST investigation in Section 6.2.2.</p> <p>Response: Section 6.6.7 Pipeline and Conveyance Feature Sample Locations and Rationale states: “Because some uncertainty remains as to the accuracy of the locations of the conveyance features, ARC proposes to use a backhoe to locate the target pipeline and determine the depth at the planned sample location. When piping is encountered, the backhoe will trench along the length of the pipe until a joint or seam is encountered, and a sample will be collected 6 to 12 inches below the pipe. In the case of surface piping and surface ditches, samples will be collected from surface soils (0 to 2 feet bgs) and subsurface soils (4 to 5 feet bgs).” This approach includes drain lines such as the Grease Pit Drain (UT-L) line mentioned in this comment. Note that additional sampling is proposed in Section 6.6.7 along this drain line.</p>
12	16	3 rd par.	<p>What is the basis for the statement that the Wash Rack is the likely source of hydrocarbon contamination found in the Upper Truck Sludge Pond?</p> <p>Response: The fourth paragraph of Section 2.1.3 Description of Ancillary Support Facilities (page 16) provides the explanation: “The Wash Rack is an open concrete area with a sloping floor that collects in a drain sump on the north side and appears to drain to the Upper Truck Sludge Pond. The Wash Rack was likely used for hosing off and steam cleaning a variety of mine vehicles and equipment and may have included the use of degreaser soaps or solvents. Drainage from the Wash Rack is the likely source of hydrocarbon contamination found in the Upper Truck Sludge Pond.”</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
13	17		<p><u>Descriptions of Sub-Areas and Features.</u> Throughout this section, there are descriptions of facilities and associated, potential contaminants. As appropriate, there should also be mention of the possibility for many of the buildings/facilities to contain asbestos and lead-based paint. This likelihood is described in Section 6.5 which discusses assessment of these features.</p> <p>Response: The following text will be added after Table 2-2 Process Areas Components and Sub-Area Designations at the end of Section 2.2 Descriptions of Sub-Areas and Associated Features (page 19): “Where possible, a discussion of potential chemical use, storage, or disposal is provided for each sub-area and feature. It is possible that asbestos-containing building materials or lead-based paint are present in buildings or facilities. Some process piping contained 6 percent antimonial lead. In addition, it is possible that residual fluids (e.g., petroleum products) are present in features such as tanks, pipelines, sumps, and machinery.”</p>
14	17		<p><u>Descriptions of Sub-Areas and Features.</u> Throughout this section, there are descriptions of features such as tanks, pipelines, sumps, machinery, etc. that historically contained solutions or petroleum products. The Work Plan does not discuss field confirmation of the potential presence of residual fluids. It should be confirmed that no liquids remain in any of the aforementioned features based on previous field investigations. If this can not be confirmed, the RI Work Plan should describe this activity and how any fluids encountered will be managed.</p> <p>Response: In the subsection Surface UST Investigation and Removal within Section 6.2.2 UST Investigation (page 156), the text describes destructive sampling (pumping, inerting, removal, cleaning, and disposal) of the UST and associated piping will be performed. A new Section 6.5.3 Management of Residual Fluids will be added that describes how any residual fluids in non-UST features encountered during the field effort will be managed.</p>
15	21	1 st full par.	<p>This section should provide more information regarding what types of analytical processes were performed, at what rate, and provide an indication of the types and volume of chemicals that may have been present.</p> <p>Response: ARC will conduct additional research on the site historical files in an attempt to determine more information about the Assay Laboratory (i.e., what types of analytical processes were performed, at what rate, and provide an indication of the types and volume of chemicals that may have been present). This information was not identified during a recent file review in April 2009.</p>
16	22	1 st full par.	<p><u>Small Warehouse Annex (H).</u> The text notes that 91 transformers and oil-filled switches are present, with most of the transformers containing PCBs. These figures are not up-to-date as EPA’s April 2006 removal action should have addressed these. If PCB-containing transformers remain, ARC should present a plan for investigation and removal.</p> <p>Response: The following text will be revised in the section describing the Small Warehouse Annex (page 22): “The building formerly contained used transformers and oil-filled switches, and some of the transformers were identified as containing PCBs (Ecology and Environment, 2006).” In addition, the April 2006 document regarding the removal action will be added as a reference.</p>
17	23	1 st full par.	<p><u>Plumber’s Shop (T).</u> The text should provide the specific types of organic compounds that may have been associated with this building.</p> <p>Response: ARC will conduct additional research on the site historical files in an attempt to determine more information about chemical storage, use, and disposal at the Plumber’s Shop. If no additional information is found, the text will be modified to indicate typical chemicals that were used in the industry during the era of site operations such as lead coatings and solvents.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
18	23	2 nd full par.	<p><u>Filling Station #1 (U)</u>. The text should list the parties currently using this filling station for petroleum fueling and describe who is in charge of maintenance.</p> <p>Response: The first sentence describing Filling Station #1 (page 23) will be revised to indicate that the station was formerly used.</p>
19	24	3 rd par.	<p><u>Filling Station #4 (Z)</u>. Are the above-ground fuel tanks mentioned here also associated with any of the other filling stations described herein?</p> <p>Response: A historical map indicates that the above-ground fuel tanks serviced Filling Station #2, Filling Station #3, and Filling Station #4. The text describing these features (page 24) will be modified to reflect the associations. In addition, the text describing the Fuel Distribution Pipeline (UT-J) will be revised as well (page 46).</p>
20	25	1 st par. 4 th sen.	<p><u>Equipment Wash Building (C)</u> The text states that the purpose of the sump is unknown. Are there any drains, etc. in the concrete sump? Is it possible to propose the purpose of the sump based on its proximity to other operations.</p> <p>Response: The response to this comment is tied in with the response to EPA Specific Comment 22 below. The sump collected the wash water from the truck wash pad. There is an 8-inch diameter drain pipe in the sump that leads directly to the Upper Truck Sludge Pond. The seventh sentence describing the Equipment Wash Building (page 25) will be revised as follows: “A concrete sump is located outside of the northeast wall of the building that drains the wash pad associated with the Truck Wash and Paint Shop.”</p>
21	25	1 st full par.	<p><u>Fire Engine Storage/Tire Shop (I)</u>. The information on the used transformers should be updated to account for EPA’s removal action.</p> <p>Response: The following text will be revised in the section describing the Fire Engine Storage/Tire Shop (page 25): “The building formerly contained used transformers, and some were identified as containing PCBs (Ecology and Environment, 2006).” In addition, the April 2006 document regarding the removal action will be added as a reference.</p>
22	27	2 nd par.	<p><u>Truck Wash and Paint Shop (M)</u>. How large is the unlined pit? Is the pit completely dirt lined?</p> <p>Response: The pit is unlined and is actually the Upper Truck Sludge Pond. The second paragraph describing the Truck Wash and Paint Shop (page 27) will be revised as follows: “Outside the building on the northwest side, a large concrete wash pad drains to a nearby sump and discharges through an 8-inch pipe to the Upper Truck Sludge Pond.” Text describing the Upper Truck Sludge Pond (page 37) will be revised to indicate it was unlined.</p>
23	27	3 rd par.	<p><u>Carpenter Shop</u>. If the building was solely used for carpentry, why is a sump present? The text states that there were not likely chemicals present; however, the location of a sump should be explained. Also, is it possible that wood preservatives could have been used here?</p> <p>Response: A recent field visit in April 2009 revealed that the feature was actually a vault with a valve for water supply to the Carpenter Shop rather than a sump. The text describing the Carpenter Shop (page 27) will be revised accordingly.</p>
24	28	1 st Par., 2 nd sen.	<p><u>Emergency Shed</u>. Could the emergency supplies have included fire suppression chemicals?</p> <p>Response: In the subsection Emergency Shed within Section 2.2.2 Area 2 – Truck Shop, Crusher and Miscellaneous Features (page 28), the first sentence will be revised as follows: “The nature of the past activities conducted inside the Emergency Shed is unknown, although the name suggests that “emergency” supplies were stored inside (e.g., gasoline or diesel for generators, fire suppression equipment/chemicals).</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
25	28	2 nd Par., 3 rd sen.	<p><u>Sheet Metal Shop</u>. Could the past source also have been associated with pickling compounds for sheet metal work?</p> <p>Response: The following text will be added to the section describing the Sheet Metal Shop (page 28): “Potential past sources of chemicals associated with the Sheet Metal Shop include diesel fuel and acidic solution/pickling compounds.”</p>
26	29	1 st Par., 4 th sen.	<p><u>Primary Crusher</u>. Please clarify whether the below grade conveyor beltway is still in place in this location as is noted for the Secondary Crusher.</p> <p>Response: The underground conveyor was not present during a recent site visit in April 2009. The text will be revised accordingly.</p>
27	30	3 rd par., 4 th sen.	<p><u>Leach Vats</u>. The sluices were lined with lead sheets, which represent another potential source of contamination. There is also the pump house located at northwest end of the vats that represents a potential source.</p> <p>Response: The following text will be added to the section describing the Leach Vats (page 30): “A Solution Advance Pump House on the northwest end of the last leach vat #8 contained two 2,000-gpm variable pumps that moved fluids through the vats. Piping, joints, flanges, valves and other components associated with the leach vats typically contained lead or were lined with lead for corrosion resistance.”</p>
28	30	4 th par., 3 rd sen.	<p><u>Leach Vats</u>. The mastic lining was compromised in early mining operations resulting in potential releases adjacent to and beneath the vats.</p> <p>Response: The following text will be added to the section describing the Leach Vats (page 30): “The mastic lining was compromised in early mining operations resulting in potential releases adjacent to and beneath the vats.”</p>
29	31	3 rd Par.,	<p><u>Solution Tanks. (DD)</u>. The overflow spill sump and fluid distribution system should also be mentioned as potential sources of contamination in this area.</p> <p>Response: The following text will be added to the section describing the Solution Tanks (pg 31): “There is a spill trough and overflow spill sump between the Solution Tanks Electrical Building and Pumphouse and the point where the solution enters the center Solution Tank. The potential past sources of chemicals associated with the Solution Tanks, spill trough, and overflow spill sump are acid, metals, radiochemicals, and the material stored in the 55-gallon drums.”</p>
30	31	5th Par.	<p><u>Solution Tanks Electrical Building and Pumphouse (FF)</u>. More detail is needed on the pumps and fluid transfer operations.</p> <p>Response: The following text will be added to the section describing the Solution Tanks Electrical Building and Pumphouse (pg 31): “Two 750-gpm variable drive pumps moved pregnant leach solution through the strong solution tank and two 2,000-gpm variable drive pumps moved wash solution through the wash water tanks.”</p>
31	32	3 rd Par., 4 th sen.	<p><u>Area 5 Precipitation Plant (EE)</u>. The text should note that the pregnant copper solution from dump leaching was stored in the W-3 surge pond (KK) until entering the plant mid-way through the process.</p> <p>Response: The following text will be added to the section describing the Precipitation Plant (pg 32): “Pregnant leach solution from the W-3 Dump Leach Surge Pond was also sent to the Precipitation Plant, but was introduced mid-way through the process and kept separate from the vat leach solution.”</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
32	32	4 th Par., 1 st sen.	<p><u>Area 5 Precipitation Plant (EE)</u>. More detail should be provided about the pumps, sumps, and piping associated with the Precipitation Plant.</p> <p>Response: The following text will be added to the section describing the Precipitation Plant (pg 32): “The Iron Launder Pump House was located northwest of the last launder No. 15 and contained four 500-gpm variable drive pumps that recirculated solution through the launders and two 750-gpm variable drive pumps moved spent solution out of the launders to the evaporation ponds. A drywell is located at the junction of the pipe trench leading from the Solution Tanks to the Precipitation Plant. The drywell measures 4 feet wide by 5 feet long and 5 feet deep and is filled with rock.”</p>
33	33	5 th Par., 3 rd sen.	<p><u>Sulfide Plant (HH)</u>. Were there also sumps and drains associated with the Sulfide Plant?</p> <p>Response: Although historical engineering drawings are available for many of the original Anaconda facilities (e.g., leach vats and cementation plant), ARC has not been able to locate engineering drawings for the Sulfide Plant, which was constructed after the original facilities to beneficiate sulfide ores. Various sumps and drains were identified during a site visit in April 2009. Groundwater characterization will be performed in the area of the Sulfide Plant. If a vadose zone source is indicated near or under the Sulfide Plant, additional investigation may be conducted.</p>
34	34	4 th Par.,	<p><u>Calcine Ditch</u>. The text should describe the composition of the historic calcines in more detail, including potential contaminants. Based on historical photos, the text should note that the calcine ditch was unlined and carried solutions to the unlined finger ponds.</p> <p>Response: Historic information on the composition of the calcine solution related primarily to characteristics of importance to ore beneficiation. No information was found directly relevant to potential contaminants. Although the composition of the calcine solutions likely varied somewhat over time, the solutions were acidic (pH = 2.35 to 2.9) and iron rich (approximately 10 to 20 g/L iron). Engineering drawing YG-20 Water Supply & Distribution Daily Water Balance Diagram (Anaconda, 1954) indicates that the Calcine Ditch conveyed 750 gpm of plant discard solution to the unlined evaporation ponds. The Calcine Ditch was also unlined. The document will be revised to include this information.</p>
35	35	3 rd Par., last sen.	<p><u>East Solution Ditch</u>. It is also likely that this ditch historically contained spent acid solutions.</p> <p>Response: The following text will be added to the section describing the East Solution Ditch (page 35): “It is also possible that spent solution was discharged to the East Solution Ditch.”</p>
36	36	1 st sen.	<p><u>Area 10--North Low Area</u>. For consistency here and in later sections, references to the Surge Pond and Dump Leach Surge Pond should include “W-3” at the beginning.</p> <p>Response: The text will be revised to indicate “W-3 Dump Leach Surge Pond”.</p>
37	36	4 th Par., 2 nd sen.	<p><u>Dump Leach Surge Pond</u>. What is the basis for the statement that the Surge Pond may have been clay-lined? Also, based on visual observation in the field, the maximum depth appears to be greater than 5 feet.</p> <p>Response: The text will be deleted in Section 2.2.10 Area 10 – North Low Area where it mentions the pond may have been clay-lined. The text indicating the pond depth will be revised to indicate a depth of 6 feet.</p>
38	37	4 th Par., 2 nd sen.	<p><u>Lower Truck Sludge Pond</u>. Is the synthetic liner referenced in the text visible at the surface?</p> <p>Response: The text describing the Lower Truck Sludge Pond (page 37) will be revised to indicate it was unlined.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
39	38	1 st Par., 2 nd sen.	<p><u>Truck Sludge Pond Ditch</u>. Couldn't this ditch also be a potential source of spent solvents?</p> <p>Response: The text describing the Truck Sludge Pond Ditch (page 38) will be revised to indicate that the feature is a potential source of solvents.</p>
40	38	2 nd Par.,	<p><u>Drain Outlet</u>. Potential past sources of chemicals could also include metals.</p> <p>Response: The response to this comment is related to the response to EPA Specific Comment 51. We recommend eliminating the Drain Outlet (MM) as a feature since it is simply a broken section of the Secondary Crusher Dust Slurry Line (UT-O). This drain line is a potential source of metals.</p>
41	38	4 th Par.	<p><u>Core Building</u>. Was there any other prior use of this building besides core storage?</p> <p>Response: No other use of this building has been determined to date.</p>
42	38-41	Sec. 2.2.12	<p><u>Area 12- Peripheral Process Components</u>. Figure 2-2 is not detailed enough to show some of these peripheral areas well and some areas are on either Figure 2-1 or 2-2 but not referenced. Either modifications to existing figures or additional figures are needed to show some of these areas in more detail.</p> <p>Response: Additional figures will be added to show these peripheral process components in more detail.</p>
43	40	1 st Par.	<p><u>Acid Plant</u>. Additional detail should be provided on the acid plant, including the production process and the other potential contaminants associated with this source, including selenium, other metals, sulfate, etc.</p> <p>Response: The discussion of the former Acid Plant will be revised and expanded, as follows: "The Acid Plant was located where the Arimetco Phase III/South Heap Leach Pad is currently situated. Historical records (Smith, 1958; Skillings Mining Review, 1972; Explosives Engineer, 1955; Nesbit, 1954) indicate that the Acid Plant produced sulfuric acid solution as early as 1954, and continued production of approximately 200 to 450 tons of sulfuric acid per day until at least 1975. Pyritic ore from the Leviathan Mine in California was originally used to make the sulfuric acid until approximately 1971 when the Leviathan ore was depleted. Subsequently, sulfur was purchased from an unknown source(s) (Skillings Mining Review, 1972). After crushing, the sulfidic ore was delivered to the Acid Plant for processing. Crushed sulfur ore was burned (i.e., oxidized) in reactor units to liberate sulfur dioxide gas, which was subsequently passed through three banks of Buell cyclones, a Peabody scrubber, Cottrell mist precipitators, and delivered to the contact acid plant to make the sulfuric acid. The dust removed from the gas by the coolers, cyclones, and the scrubbers were sluiced to the evaporation ponds area along with the calcines from the reactor units by using the spent solution from the cementation launders. The dust presumably contained various metals, although no specific information is available in the historic documents. The precipitate from the Cottrells was treated to recover selenium. The potential past source of chemicals in this area is primarily sulfuric acid."</p>
44	40	2 nd Par., 4 th sen.	<p><u>Motor Cargo Building</u>. Other trucks beyond those mentioned were potentially repaired at this facility, including trucks from Leviathan Mine and other trucks used in on-site activities.</p> <p>Response: The fourth sentence of the section describing the Motor Cargo Building (page 40) will be revised as follows: "Previously, the building was used for parking and possibly repair of trucks used in mine operations."</p>
45	42	2.2.1.3	<p><u>Descriptions of Process and Utility Pipelines, Drains, and Ditches</u>. This section should also address drywells and sumps.</p> <p>Response: The text in this section will be edited to address drywells and sumps.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
46	43	2 nd Par.	<p><u>Leach Vat Pregnant Solution.</u> Historical documents indicate that in the early 1950s, open sluice boxes were used to transfer pregnant leach solutions. These sluices would have had a higher probability of release from leaks or spills.</p> <p>Response: Historical engineering drawings YC-11 Leaching Vats and Cementation Launderers, Piping and Launderers Flow Sheet and YC-101 Leaching Vats Wash Drain & Iron Launderers Solution indicate launders (i.e., open sluice boxes) that conveyed wash solution from the Leach Vats to the wash water sumps associated with the Solution Tanks. The launders had inner dimensions of approximately 1.5 feet by 1.5 feet, and were constructed of wood with lead lining. These open sluice boxes conveyed wash solutions (not pregnant leach solutions), which likely contained residual acids, metals, and radiochemicals, and may have leaked. Pregnant leach solutions were typically conveyed in transite pipe or lead pipe (steel with 6 percent antimonial lead).</p>
47	45	5 th Par., 1 st sen.	<p><u>Acid.</u> Weren't wooden pipes also used for distributing sulfuric acid?</p> <p>Response: Historical engineering drawing YD-51 Cementation Spent Solution Line to Fluosolids Plant, General Arrangement indicates the 1,400-foot line was constructed of 8-inch ID wood stave pipe (Douglas Fir). In addition, ARC located a 1959 historical map that indicated an "8-inch wooden stave pipe" for spent solution leading to the Acid Plant. It did not appear this pipe was used for distributing sulfuric acid. The text in the section describing the Precipitation Plant Spent Solution to Acid Plant (UT-E) line will be modified to reflect the correct construction details.</p>
48	46	2 nd Par., 4 th sen,	<p><u>Sulfuric Acid to Dump Leach.</u> Have the historical records been reviewed to try and confirm the acid strength used in the W-3 Dump Leach operations?</p> <p>Response: ARC has not located historical files that specify the acid strength used in the W-3 Dump Leach operation. However, historical documents indicate that the Acid Plant produced sulfuric acid at a strength of 93 percent for use in the leach vats. Therefore, ARC assumes that the strength of the sulfuric acid used in the W-3 Dump Leach could be up to 93 percent.</p>
49	47	1 st Par., 3 rd sen.	<p><u>Drains.</u> The relative magnitude of both flows (drain lines and process solutions) should be provided.</p> <p>Response: The text in Section 2.2.7 will be updated to state that approximately 750 gallons per minute of fluids were discharged to the Calcine Ditch according to historical engineering drawing YG-20 Water Supply and Distribution Daily Water Balance. ARC has not located historical files that specify the relative magnitude of flows for other conveyances and drains.</p>
50	47	4 th Par., 3 rd sen.	<p><u>Fuel Tank Sump Drain.</u> Have the historical drawings been reviewed to determine if this drain line went to a drywell?</p> <p>Response: One unidentified historical drawing shows a drain line exiting the fuel tank storage area and draining to the northeast (somewhere off the map). The terminus of the drain line is unknown and it is possible that it drained to a dry well or unlined pond.</p>
51	48	1 st Par., 4 th sen.	<p><u>Secondary Crusher Dust Slurry Drain.</u> The location of MM on Figure 2-1 is in a different place than the exit point shown on Figure 2-3.</p> <p>Response: During a site visit in April 2009, close inspection revealed that feature MM is not a drain, but rather a broken section of the Secondary Crusher Dust Slurry Line (UT-O). The pipe continues on to the Sulfide Tailings as is indicated on historic maps. ARC recommends eliminating MM as a feature.</p>
52	48	2 nd Par., 3 rd sen.	<p><u>Vat Leach Pumphouse Drain.</u> Figure 2-3 appears to show this near feature YY from Figure 2-1. If YY is the same as the "northwest end of Vat No. 8" this should be specified in the text for consistency.</p> <p>Response: Figure 2-3 will be revised to show the Vat Leach Pumphouse Drain (UT-P) from the Solution Advance Pump House (adjacent to Vat No. 8) to a dry well, and the revised text will describe this feature.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
53	48	4 th Par., last sen.	<p><u>Overflow Solution Ditch</u>. The text states that the source and composition of the solutions is not known, however the pregnant solution text mentions spillage went to the overflow sump. Also, this ditch likely carried pregnant leach solutions the leaked from the sluices.</p> <p>Response: The following text will added to the section describing the Overflow Solution Ditch (page 48): “Although the precise use of this ditch is uncertain, it may have carried waste solutions or runoff from the Solution Tanks to the sulfide tailings ponds because of its location. The potential past sources of chemicals include acidic solutions containing metals and radiochemicals.”</p>
54	49	1 st Par., 2 nd sen.	<p><u>East Solution Ditch</u>. Spent solutions also likely went into this ditch.</p> <p>Response: The following text will be added to the section describing the East Solution Ditch: “It is also possible that spent solutions were discharged to the East Solution Ditch.”</p>
55	49	2 nd Par.	<p><u>Sewer Lines</u>. The text states that the historic sewage ponds were at an “unknown location”. Maps indicate that these ponds were to the south of EPA’s new evaporation pond. Also, a map from late 1959 shows a 10-inch concrete sewer line in contrast to the 8-inch steel pipe referenced in this text.</p> <p>Response: ARC was not able to locate this map during a review of site files in April 2009 and requests that EPA provide a copy of the reference. The text in the section describing the Sewer Lines (page 49) will be modified to reflect the correct location of the historical sewage ponds and construction details of the sewer line if and when that information becomes available.</p>
56	50	2.2.14	<p>All site features discussed in the report should be included on a figure, including these substations.</p> <p>Response: A new figure will be added that identifies the locations of electrical sub-stations and transformers (PA-TR1 through PA-TR5).</p>
57	51	2.2.14	<p>Information about EPA's transformer removal efforts should be summarized in this section somewhere.</p> <p>Response: Text will be added to this section to summarize EPA’s 2006 transformer removal effort.</p>
58	53	2 nd Par.	<p>The Shacklette and Boerngen study had very few samples collected over tremendous distances and can not be considered representative of conditions in the Yerington area as the text implies. Perhaps this discussion would be better suited by referring in general to the findings of the site-specific background soils sampling.</p> <p>Response: The revised Process Areas RI Work Plan will discuss the site-specific background soil sampling results, and where relevant, the Shacklette and Boerngen study.</p>
59	53	2.3.2	<p>This section that summarizes Hydrogeology should be updated with text from the most recent 2nd Step Hydrologic Framework Assessment Data Summary Report or from the text according to the EPA comments on the Draft.</p> <p>Response: Relevant sections of the revised Process Areas RI Work Plan will incorporate hydrogeologic information obtained during numerous investigations conducted since 2007. These include the Second-Step Hydrologic Framework Assessment Data Summary Report, Shallow Alluvial Aquifer Characterization investigation, and routine groundwater monitoring.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
60	54	2 nd Par.	<p>This text minimizes the potential extent of downward migration. However, deep water quality data at B/W-11 confirm that significant amounts of mine-impacted water have migrated deep into the subsurface.</p> <p>Response: The text will be revised to indicate that deep water quality data from B/W-11 indicates that mine-impacted water has migrated to depth. The text will be revised as follows: “Although some degree of resistance to vertical flow exists within the alluvial aquifer, created by the depositional layering of sedimentary deposits and the occurrence of low-permeability layers, downward migration of mine-related groundwater has occurred at well B/W-11 and may have occurred at other locations as a result of historical operations at the Site and the influence of agricultural irrigation practices immediately north of the Site. Additional characterization of the deep alluvial aquifer has been proposed by ARC in the Draft Site-Wide Groundwater Remedial Investigation Work Plan (OU1 Work Plan) dated November 16, 2007. ARC anticipates receiving EPA comments on this document in a few months and will revise the OU1 Work Plan to address the scope of work proposed to address the deep alluvial aquifer and underlying bedrock.”</p>
61	54	2.4	<p><u>Conceptual Site Model</u>. This section and associated figures should be updated to be consistent with the latest version of CSM document.</p> <p>Response: This section and associated figures will be updated to be consistent with the latest Site-wide CSM.</p>
62	56	2.4.3,	<p><u>Surface Soil</u>. The text notes that building walls inhibit transport of dust particles. However, it should also be noted that the building walls and other surfaces in the Process Areas have potentially been contaminated by the dust, including accumulation of alpha and beta contamination. Finally, radon transport is different than VOCs from fuel-related compounds and should have a separate discussion.</p> <p>Response: ARC agrees with EPA that building walls and other surfaces in the Process Areas downwind of sources may potentially be impacted by windblown dust, including the accumulation of alpha and beta contamination. The field sampling and analysis plan described in Section 6.1 includes the evaluation of building interiors.</p>
63	57	1 st Par.	<p>Although the text lumps them together, radon transport in the subsurface occurs by different processes than the volatile compounds associated with releases of fuel-related contamination.</p> <p>Response: EPA is correct and the last sentence will be modified as follows “... and of each individual chemical and radon ...”</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
64	57	2.4.4	<p><u>Vadose Zone Infiltration.</u> [Part 1] EPA does not agree with the statement that transport of contaminants to groundwater ceased when Anaconda ownership ended in 1978. Conditions conducive to infiltration of Anaconda generated fluids and waste have likely continued to occur periodically, including ponding, and increased precipitation infiltration during wet periods.</p> <p>[Part 2] The last sentence states that EPA is addressing potential transport of mine-related chemicals to groundwater from the heap leach pads and associated ponds. Although EPA is assessing potential releases from Arimetco facilities, ARC needs to be evaluating potential migration of Anaconda-related contaminants to groundwater in areas where historic contaminants from Anaconda operations likely remain in the vadose zone.</p> <p>Response [Part 1]: The text will be revised to indicate as follows: “Infiltration of process solutions into the vadose zone, with the potential to source chemicals to groundwater, is a potential release mechanism that substantially decreased when operations associated with Anaconda/ARC ownership ended in 1978.” Aspects of this will be discussed in the technical meeting, which will review the results of vadose zone modeling of the evaporation ponds (see ARC’s response to EPA General Comment 1). For clarity, Bullets 1 and 2 on page B-6 will be combined to collectively address both the large- and small-scale aspects of infiltration, deep percolation, and potential chemical loading to groundwater as follows: “On a large, Site-wide scale, long-term chemical loading to groundwater from inactive OUs (i.e., Oxide Tailings, Sulfide Tailings, Evaporation Ponds, Waste Rock Areas, and Process Areas) is expected to be absent or minimal based on Site-specific climate conditions (i.e., low average precipitation and high evaporation rates on the valley floor) and soil hydraulic properties, which will limit infiltration and prevent significant fluid and chemical fluxes to underlying groundwater. Deep percolation and chemical loading to groundwater may occur locally (e.g., in topographic depressions), temporarily (e.g., during larger precipitation events), or where the thickness of the vadose zone limited (e.g., beneath the lined Evaporation Ponds). Such conditions will be characterized in OU-specific RIs, as appropriate (e.g., vadose zone characterization described in the Process Areas RI Work Plan). Given that ongoing fluid management operations are associated with the Arimetco Facilities, sourcing of chemicals to the vadose zone, and potentially to groundwater, may continue to occur from these operations.”</p> <p>Response [Part 2]: ARC is unclear as to the meaning of this comment. ARC understands that the EPA is assessing potential releases from Arimetco facilities, while ARC is evaluating potential migration of Anaconda-related contaminants to groundwater in areas where historic contaminants from Anaconda operations likely remain in the vadose zone. This comment should be discussed in the technical meeting.</p>
65	57	3 rd Par.	<p>EPA cannot concur at this time with the conclusion that the potential for percolation of precipitation through the vadose zone is extremely limited or non-existent. Additional data collection and evaluation is required to support this statement.</p> <p>Response: See ARC’s response to EPA Specific Comment 64. Additional data collection and evaluation will be performed to support this statement.</p>
66	58	1 st Par.	<p>The text states that grain size distribution data suggest that the vadose zone is relatively homogeneous beneath the entire extent of the Process Areas. This conclusion for a very broad area is not consistent with typical alluvial fan geology. Please provide data and sources (lithologic logs, logging of cores) that support this conclusion.</p> <p>Response: The text will be revised to incorporate the existing information, and an approach will be proposed in the revised Process Areas RI Work Plan to collect additional samples for grain size distribution testing to further evaluate the heterogeneity of the subsurface materials in the Process Areas.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
67	61	1 st Par.	<p>The statement that “The vadose zone conceptual model suggests very limited or no potential for present-day or future migration of mine-related chemicals from the alluvial fan materials underlying the Process Areas to the groundwater pathway” appears to be premature. Additional data collection, evaluation and vadose zone modeling is required to support this conclusion, particularly for very wet periods when water accumulates in ponds and other low areas and standing water may be present for an extended period.</p> <p>Response: See ARC’s response to EPA Specific Comment 64. Additional data collection and evaluation will be performed to support this statement.</p>
68	62	1 st Par.	<p><u>Radiation.</u> Exposure to radiation may not be limited to the upper 6 inches of soil thickness, it depends on the magnitude of the source. Radon should also be mentioned in this paragraph.</p> <p>Response: External radiation contributed by materials at increasing depths below 6 inches below the ground surface is attenuated by the increasing thickness of shielding material such that no significant increase radiation exposure above the ground surface occurs. Therefore, sampling of the top 6 inches is believed to be sufficient to characterize external radiation exposure above the ground surface. Discussion of exposure to radon will be added to this paragraph. Subsurface soil sampling for radiological constituents will be conducted as part of the step-out sampling program described in Section 6.6 of the Process Areas RI Work Plan for radiological constituents that exceed the screening levels.</p>
69	64	1 st Par., 3 rd Line	<p>Add “Selected” before samples at the beginning of this sentence.</p> <p>Response: The text will be added as requested.</p>
70	65	2 nd Par., 1 st sen.	<p>The text should be updated to reflect use of the screening levels included in the latest Site-wide QAPP, including current background levels, EPA RSLs and ecological screening levels.</p> <p>Response: The entire second paragraph on page 65 will be revised now that background soils results are available. In addition, this paragraph will incorporate the new screening levels included in the latest Site-wide QAPP, including EPA RSLs and ecological screening levels. There are significant cascading edits associated with revising the screening levels, including Table 3-2, Table 3-3, etc.</p>
71	68	3.1.2	<p>The text and Table 3-2 should be updated to reference the screening levels presented in the latest Site-wide QAPP as noted in Comment 70.</p> <p>Response: As noted in the response to EPA Specific Comment 70, there are significant cascading edits associated with revising the screening levels, including Table 3-2, Table 3-3, etc. that will be made for the revised work plan.</p>
72	69	3.1.3	<p>The conclusions in the text and Table 3-3 regarding the need for further investigation are only applicable to the need for step-out sampling from the samples collected during the initial phase of investigation. Any sampling conducted in potential source areas that were not thoroughly investigated previously will require analysis of the full-suite of metals. In addition, any metals that have been detected at elevated concentrations in Process Area groundwater should be kept as part of all RI soil sampling. Further, the risk assessment to be completed for this OU will include all metals to estimate cumulative risks, regardless of whether or not the metals individually are above screening levels. Any metal that may contribute in a substantive way to the cumulative risks needs to be retained for analysis.</p> <p>This comment needs to also be applied throughout Section 3.1.4 and bullets summarizing the results for each metal.</p> <p>Response: The text in Section 3.1.3, Table 3-3, and Section 3.1.4 will be updated with screening levels from the latest Site-wide QAPP. In addition, the text will reflect analysis of samples for the original list of 25 metals.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
73	70-75	3.1.4	<p>In general, the text discussions accurately represent what the box plots show. However, there are a few instances in which the text discussion does not correlate with what the box plots show. Also, the box plots show the Stained Soils (EX), Electrical Transformers (TR), and Utility Pipeline (U) samples separately. These samples are from within Areas 1 to 12, but the text does not consistently or fully discuss or describe these other categories of samples, in stating where the highest concentrations are found.</p> <p>For total chromium, the text indicates that Area 7 had the highest concentrations, however, the box plots and examination of the data indicates that Area TR had the highest concentrations, followed by Area 9, and then Area 3. Several other Areas also had higher concentrations than Area 7. For copper, the text indicates that the highest concentrations were in Area 5. While the highest maximum concentrations were indeed in Area 5, the highest median concentrations were in Area 7 (looking just at Areas 1 to 12). In future discussions of metals distributions and “highest” concentrations, the discussions could be made slightly more straightforward by including two categories of “highest”: (1) what Areas had the highest median concentration, and (2) what Areas had the highest individual concentrations (i.e., outliers and extremes).</p> <p>It is also recommended that tables be provided that include the actual concentration values used for the median, 75th percentile, 25th percentile, interquartile range, and step (whisker height), for each analyte (and by each Area and by each sample depth interval). Table 3-1 includes other summary statistics, but for all Process Areas, together. The Statistical Summary Tables provided in Appendix E2 includes just the mean, minimum, maximum, and standard deviation (of all analytes), for each Area. This recommendation would allow easy determination and verification of the actual concentration values used for the box plots and discussed in the text.</p> <p>Response: The text will be corrected to accurately reflect what the box plots show. Results from the Stained Soils, Electrical Transformers, and Utilities Pipeline areas will be incorporated into the discussion of where the highest concentrations are found. The text will be clarified to describe areas with the highest median concentration, and areas with the highest individual concentrations (i.e., outliers and extremes). The Statistical Summary Tables provided in Appendix E2 will be revised to include the following statistics for each analyte: 25th percentile, median, 75th percentile, interquartile range, and step (whisker height).</p>
74	75	3.2, 1 st Par.	<p>It isn't clear how this detailed discussion of the radiochemical decay chains impacts the Work Plan or proposed RI field investigation. The text should be clarified.</p> <p>Response: The purpose of this text is to provide the rationale for why sampling for uranium-238, thorium-232, radium-226, and radium-228 provides sufficient information to fully characterize these two radioactive decay chains. The detailed discussion is in support of the statement made in the third sentence in this paragraph.</p>
75	76	Tab. 3-5	<p>The screening levels should be updated to be consistent with the latest Site-wide QAPP.</p> <p>Response: The screening levels in Table 3-5 will be updated to be consistent with the latest Site-wide QAPP. These changes also cascade edits to Table 3-6 as well. As mentioned in ARC's response to EPA General Comment 8, ARC would like to discuss the radiological screening levels in the latest Site-wide QAPP.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
76	76-77	3.2.4	<p>The text for each radiochemical states that the distribution is fairly consistent throughout the shallower depths. Examination of the box plots appears to show a slight trend toward the uppermost sample depth interval having the greatest number of higher concentrations. In addition, the text states that the box plots indicate that radium-228 is prevalent throughout the Process Areas except for Area 8. However, the box plots and data show that the median concentration of radium-228 in Area 8 is just as high, if not higher, than in the other Areas (the three samples collected and reported for Area 8 each had similar concentrations). Please modify or clarify the text.</p> <p>Response: The indicated text "...except for Area 8" will be deleted from the sentence. The text will be modified to indicate box plots of the radiochemicals appear to show a slight trend toward the uppermost sample depth interval having the greatest number of higher concentrations. In addition, the text will be modified to indicate that radium-228 is prevalent throughout the Process Areas, including Area 8, when the median concentrations of radium-228 are considered.</p>
77	79-80	3.3.4 bullets	<p>Many of the Stained Soils samples (EX) also had high concentrations of TPH diesel range (TPH-d). It is not clear if the discussion of the areas having the highest concentrations incorporates these Stained Soils samples. It is recommended that the text be clarified.</p> <p>Response: The following sentence will be added to Section 3.3.1 Summary Statistics: "These statistics include results from the Stained Soil Areas and Excavations (PA-EX samples)." In addition, the text in Section 3.3.4 Petroleum Hydrocarbon Distribution will be modified to include the Stained Soil Areas. Note that the maximum detections of TPH did not occur at the Stained Soil Areas.</p>
78	81	Tab. 3-10	<p>A mean concentration of zero (0.000) is listed for several constituents, please correct the table.</p> <p>Response: Additional significant digits will be displayed to correct the mean values in the table.</p>
79	81	3.4.2	<p>Correct the typo in the text that references VOCs rather than SVOCs.</p> <p>Response: The typo will be corrected.</p>
80	82	3.4.3	<p>The text should be modified to state that statistics were calculated only for pesticides detected in more than one sample.</p> <p>Response: The text will be modified as requested.</p>
81	83	3.4.3	<p>EPA does not concur with removal of pesticides from the analytical group for the RI field program. Pesticides should be analyzed in any samples collected in the vicinity of the prior exceedances noted in the text and in any other area where pesticide were stored or used on a routine basis.</p> <p>Response: In the instances where pesticides were detected above screening levels in soil samples from the 2004-2005 investigation, pesticides will be analyzed in associated step-out samples. ARC has not discovered any historical information that indicates where pesticides may have been stored or used on a routine basis at the Site.</p>
82	83	3.4.4	<p>Correct the typo in the text that references pesticides rather than herbicides.</p> <p>Response: The typo will be corrected.</p>
83	84	Tab. 3-14	<p>The title should be corrected to refer to PCBs rather than pesticides.</p> <p>Response: The typo will be corrected.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
84	84	3.4.5	<p>The table indicates there were only 19 detections of PCBs in 1,100 samples. However, many or most of the samples were collected from at least 0.5 ft bgs or deeper (and possibly composited over a discrete soil interval), with possibly only a few from the very topmost surface soil. PCBs commonly have very limited vertical migration and it may be that some PCB contamination at the surface was not detected in the prior investigation. Accordingly, the RI field program should incorporate surface sampling and PCB analysis in any areas near electrical substations or current/former transformer locations where stained soil is present or there are other indication of potential historic releases.</p> <p>Response: The text will be revised to include surface sampling and PCB analysis in areas near electrical substations or current/former transformer locations where stained soil is present or there are indications of potential historic releases.</p>
85	84-86	3.4.6	<p>This section provides the Acid-Base Potential (ABP) results. While the text states that “most” soils had positive ABP results (i.e., not expected to produce acid), some areas did have soil samples with negative ABP values. However, there did not appear to be any further discussion in the Work Plan of how these ABP results (especially the negative values) would be used in the evaluation of contaminant fate and transport. It is recommended that the geochemical evaluation include discussion of the ABP results and their implications. Additional ABP analyses should be conducted in key locations during the RI field program.</p> <p>Response: The text will be revised to address how the ABP results will be used to evaluate contaminant fate and transport, and what additional ABP testing may be warranted in key locations during the RI investigation.</p>
86	86-103	3.5	<p>The text and tables in Section 3.5 should be modified using updated screening criteria consistent with the latest Sitewide QAPP.</p> <p>Response: Text and tables in Section 3.5 (pages 86 to 103) will be modified using updated screening criteria consistent with the latest Site-wide QAPP.</p>
87	89	3.5.3	<p>The presence of elevated copper concentrations at depths of 12 to 18 feet likely indicates vertical migration of process solutions. This should be characterized further in the RI field program.</p> <p>Response: Additional borings PA-YY3, -YY4, and -YY5 were proposed in the area northwest of the Leach Vats to delineate impacts.</p>
88	101	3.5.14, 2 nd sen.	<p>What is the current status of the soil stockpiles described in the text?</p> <p>Response: The second sentence of the first paragraph in Section 3.5.14 Results for Stained Soil Areas and Excavations (page 101) will be edited as follows: “Two areas (PA-EX01 and PA-EX04) met the excavation criteria defined in the Process Areas RI Work Plan, and visibly contaminated soil was excavated and stockpiled on plastic sheeting just southeast of the Carpenter Shop (N). During a recent site visit in April 2009, the stockpiles were inspected and re-covered with plastic sheeting.”</p>
89	107	3.7.2	<p>Additional drywells found on the historic maps for the Process Areas should be included on the list of additional areas of investigation.</p> <p>Response: Several edits will be made to Section 3.7.2 Areas/Features Identified Since Last Investigation that result in proposing additional text and/or borings in Section 6.6.6 Area Specific Sample Locations. Note that four borings are proposed to address the terminus of the Assay Laboratory Drain (UT-N) line and dry well (see ARC’s response to EPA Specific Comment 196). Text will be added to acknowledge a historic map indicates a small dry well associated with the Large Warehouse Annex. The dry well was in the same area as soil staining and borings PA-G1 and PA-G2 were previously drilled to address this area. Since no analytes were detected above screening levels, no additional investigation is proposed for the dry well.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
90	108	Tab. 3-35	<p>There may not be need for further characterization on the listed features at this time, depending on the outcome of other RI activities, however these areas/features are not necessarily eliminated from NFA based on early results. This could change in the future.</p> <p>Response: If new information becomes available that indicates the potential for chemical storage, use, or disposal associated with these features, ARC will consider investigative activities.</p>
91	110	4.0	<p>The Section 4 text should be updated to be consistent with the latest versions of the Conceptual Site Model and the 2nd Step Hydrogeologic Framework Data Summary Report.</p> <p>Response: Section 4 text will be updated to be consistent with the latest Site-wide CSM and the 2nd Step Hydrogeologic Framework Data Summary Report.</p>
92	110	4.1	<p>Additional caveats should be added to conclusions regarding local groundwater flow conditions beneath the Process Areas. The statement that bedrock outcrops between the Process Areas and the Walker River likely impedes recharge from the river to the alluvium beneath the Process Areas has not yet been confirmed through the ongoing groundwater investigation. Also, the influence of the pit on shallow groundwater conditions in the vicinity of the Process Areas has not yet been evaluated. The available data set to evaluate groundwater flow conditions beneath the Process Areas remains limited.</p> <p>Response: This section of the Process Areas RI Work Plan will be revised to indicate that: 1) the understanding of local groundwater flow beneath the Process Areas is based on regional groundwater flow conditions and limited monitor well data within the Process Areas; and 2) groundwater conditions in the Process Areas will be further investigated pursuant to the revised Process Areas RI Work Plan and Site-Wide Groundwater RI Work Plan. The text will also be revised to indicate that the concept that the Singatse Spur (which is mineralized bedrock) impedes alluvial groundwater flow is a preliminary, working concept that is based on the large difference in water levels on either side of the bedrock spur. Furthermore, the text will indicate that this working concept will be subject to further investigation pursuant to the revised Process Areas RI Work Plan and the Site-Wide Groundwater RI Work Plan.</p>
93	111	4.2, last sen.	<p>It isn't clear what data have been used to conclude that the prior borehole grab samples and monitor well locations potentially provided locations that may have represented background water quality conditions for the Process Areas. This conclusion appears to be premature and needs further support in the text.</p> <p>Response: This sentence will be removed from the text.</p>
94	112	4.2.1	<p>It would be more accurate to state that aluminum, beryllium, and silver were detected the least often. Detection frequencies approaching 40% cannot be categorized as "infrequent".</p> <p>Response: The third sentence, second paragraph of Section 4.2.1 Metals Results will be revised as follows: "Aluminum, beryllium, and silver had between 22 and 30 percent detections.</p>
95	113-114	4.2.2, Tab. 4-2	<p>The text and Table 4-2 should be updated to be consistent with the screening criteria included in the latest Sitewide QAPP. For constituents without an MCL the EPA RSLs should be used for screening comparisons. Exceedence of the additional screening criteria should be incorporated into the chemical-specific bullets in Section 4.2.3.</p> <p>Response: The text in Section 4.2.2 Comparison of Metals Results to Screening Criteria and Table 4-2 Groundwater Screening Levels for Metals will be updated to be consistent with the screening criteria included in the latest Site-wide QAPP. These changes cascade updates to the discussion in Section 4.2.3 Metals Distribution.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
96	114	Tab. 4-2	<p>The MCL that should be used for lead is 15 ug/L, not 150 ug/L. Also, nickel does not currently have a federal MCL but there is a federal tap water screening level (730 ug/L) that should be used. These changes will impact both the MCL and exceedence columns.</p> <p>Response: The values for lead and nickel in this table will be updated with the screening levels included in the latest Site-wide QAPP.</p>
97	115	Tab. 4-3	<p>More recent monitoring data should be added to the table and median and mean concentrations provided for each analyte.</p> <p>Response: More recent monitoring data and mean/median concentrations will be added to Table 4-3 Summary Statistics from Background Wells.</p>
98	116	bullets	<p>In the antimony and beryllium bullets, consistent units should be used throughout- currently both ug/L and mg/L are used. Also, the boron bullet references an MCL of 3.7 mg/L. Although boron does not have an MCL, this compound does have a federal tap water screening level (7,300 ug/L) that should be referenced.</p> <p>Response: The units for antimony and beryllium will be edited for consistency. The values for boron in this section will be updated with the screening levels included in the latest Site-wide QAPP</p>
99	119	1 st Par.	<p>Appendix I should include plots of field parameters that may also be indicators mine-related impacts to groundwater, such as pH, conductivity, redox, and dissolved oxygen.</p> <p>Response: Appendix I already includes a contoured plot of pH. The revised version of Appendix I will include a contoured plot of conductivity because this parameters is relatively stable and unaffected by sample collection methodologies. In contrast, redox and dissolved oxygen are relatively unstable field parameter measurements that may be substantially affected by sample collection methodology, especially those that result in atmospheric contact, such as the grab sample method used to collect groundwater samples in the Process Areas. Consequently, ARC does not believe that redox and dissolved oxygen measurements for the groundwater grab samples are truly representative of groundwater conditions and contoured plots of these data should not be included in the revised version of Appendix I.</p>
100	119	4.3, 1 st Par.	<p>The boreholes/monitoring wells with mine-related groundwater may not be limited to just those listed. Several other locations, including PA-GW-7 and -8, contain elevated metals concentrations that may be mine-related. In addition, the presence of petroleum hydrocarbon contamination is also mine-related contamination, but this discussion is only focused on metals. Please revise the text.</p> <p>Response: The text will be revised to include these specific locations, which are adjacent to the locations already cited in the text.</p>
101	120	2 nd and 3 rd Par.	<p>Why were the top 20 highest concentrations selected for tabulation and comparison, as opposed to some other number? The significance of the 20 concentrations isn't clear. Also, why are uranium concentrations presented as mg/kg and zinc as ug/kg? It would be clearer if the same units were used for both.</p> <p>Response: As a preliminary approach to identifying hot spot locations within Area 5 (the Precipitation Plant), all soil data were ranked from high to low values and the twenty highest concentrations of chemicals were selected for tabulation and comparison. The number of samples selected for this analysis (i.e., twenty) is arbitrary; however, selection of a somewhat smaller or larger set of data does not substantially affect the identification of hot spots or other spatial interpretations. The units for concentration will be revised to be consistent.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
102	120	2 nd – 4 th Par.	<p>Evaluations of where elevated soil concentrations are present should be based on comparison to background concentrations, not just a comparison to a localized average concentration.</p> <p>Response: With the completion of the background soil sampling program, the evaluation of where elevated soil concentrations are present will be revised to include consideration of background concentrations.</p>
103	120	4 th Par.	<p>Evaluation of contaminant sources should also include concentration contour maps instead of just relying on this statistical evaluation.</p> <p>Response: The revised Process Areas RI Work Plan will include contour maps of soil contamination.</p>
104	121	2 nd Par.	<p>Given that sulfate is an indicator of potential mine-related impacts to groundwater, it should have been included in the earlier discussions regarding constituent distribution and exceedances of screening criteria.</p> <p>Response: The Process Areas RI Work Plan will be revised to incorporate a discussion of the distribution of sulfate and exceedances of screening levels.</p>
105	122-124	4.3	<p>[Part 1] The discussion for the Southern Area discounts the Assay Laboratory and soil in Areas 1 and 2 from being a source of the groundwater impacts, based on the box plots showing lower soil contaminant concentrations in these Areas than for other Areas. However, if a small area of soil had received a relatively high volume of waste solutions having concentrated metals, such a source area might currently be undetected. The purported Assay Laboratory dry well might be such a source location. This possible dry well is mentioned in the text (p. 47). However, although samples were collected from around the Warehouse/Assay Laboratory (Appendix E-1, p. 1), samples were not collected from the point of drain line discharge into this dry well (Appendix E-1, p. 12). The Work Plan proposes one sample to be collected at the point of discharge; however, additional samples may be necessary, especially if the actual point of discharge cannot be identified. It is recommended that the type and volume of waste generated by the Assay Laboratory be researched, and a further effort be made to identify and sample the dry well if significant wastes were generated by the Assay Laboratory.</p> <p>[Part 2] The work plan hypothesizes (p. 124; also p. 159 in section 6.3) that the elevated groundwater concentrations in the Southern Area may be due to impacts from the mining activities upgradient (i.e., south) of the Process Areas. While this may be a possibility, and should be considered, it is recommended that all available data for areas south of the Process Areas be considered and interpreted prior to submitting a revised work plan.</p> <p>Response [Part 1]: ARC has reviewed the available soil and groundwater data in conjunction with historical documents describing activities and chemical usage at the Assay Laboratory. Based on this review, additional borings will be proposed to characterize soil and groundwater conditions in the vicinity of the assay lab, especially around the dry well. The response to EPA Specific Comment 196 proposes four borings to address the terminus of the Assay Laboratory Drain (UT-N) line and dry well. ARC reviewed the site historical files in April 2009 and could not locate information on the type and volume of waste generated by the Assay Laboratory.</p> <p>Response [Part 2]: Relevant data presented in the EPA's Public Review Draft Remedial Investigation Report Arimetco Facilities Operable Unit 8 Anaconda Copper Yerington Mine (July 2008) will be considered and included in the revised Process Areas RI Work Plan as appropriate.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
106	124	Last sen.	<p>There is also the possibility that historic groundwater flow directions beneath the Process Areas were to the south towards the dewatered pit which may place the sulfuric acid plant hydraulically upgradient of this area. Have historic data been reviewed to assess local groundwater flow directions during active mining operations?</p> <p>Response: Historical documents have been reviewed to assess whether this type of information is available. Little if any usable information has been located. The limited available water level information pertains to wells located at or near the rim of the pit and, consequently provides no quantitative information regarding the groundwater elevation or flow direction beneath the Process Areas. Nonetheless, ARC agrees that it is possible that historic groundwater flow directions beneath the Process Areas were to the south towards the dewatered pit which may place the sulfuric acid plant hydraulically upgradient of this area.</p>
107	125	Tab. 4-6	<p>The screening levels presented in this table should be updated to be consistent with the latest Sitewide QAPP, including replacing PRGs with RSLs. Also, for clarity the same units should be used for all constituents.</p> <p>Response: Table 4-6 Comparison of Select Metals in Soil Borings Near Groundwater Grab Sample PA-GW4 will be updated to be consistent with the latest Site-wide QAPP, including replacing PRGs with screening levels. In addition, the units used in the table will be consistent.</p>
108	127	4.4	<p>This section should include a discussion of the correlation of radionuclides concentrations in groundwater with those in soils and how the distribution of radionuclides in groundwater relates to potential source areas. The possibility that the radiochemicals may be in disequilibrium should be addressed, which is also an issue regarding conclusions, provided in the soils portion of the plan.</p> <p>Response: This section of the Process Areas RI Work Plan will be revised to discuss the correlation of radionuclide concentrations in groundwater with those in soils and how the distribution may be related to potential source areas. In addition, the document will discuss the potential disequilibrium of the radiochemicals.</p>
109	127	1 st two bullets	<p>The text should be clarified regarding the Radium 226 and 228 MCL. The MCL is actually 5 pCi/L for Radium 226 plus Radium 228. In evaluating exceedances, the combined concentration needs to be used. It is not appropriate to compare the individual sample concentrations to 5 pCi/L.</p> <p>Response: The text will be clarified to reflect that the MCL is for Ra-226 and Ra-228 combined.</p>
110	128	1 st bullet	<p>The last sentence describes three sample concentrations as being “slightly elevated” (text actually says “evaluated”). It is not appropriate to describe these concentrations, all of which are well above the MCL as slightly elevated. Also, the listed PA-GW-13 concentration appears to be a typo.</p> <p>Response: The text, “... but also slightly evaluated...” will be removed and the concentration for PA-GW-13 will be corrected.</p>
111	128	Tab. 4-9	<p>See comment number 109 regarding comparisons to the radium MCL.</p> <p>Response: The text will be clarified to reflect that the MCL is for Ra-226 and Ra-228 combined.</p>
112	128	4.5	<p>This section should include a discussion of the correlation of TPH concentrations in groundwater with those in soils and how the distribution of TPH in groundwater relates to potential source areas.</p> <p>Response: The data will be reviewed and the text in Section 4.5 Petroleum Hydrocarbon Results will be revised to discuss the correlation between TPH concentrations in soil and groundwater and their relationship to potential sources.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
113	130	Last Par.	<p>The text should discuss all VOCs that exceeded MCLs (e.g., 1,2-DCA and EDB) and where those exceedances occurred.</p> <p>Response: The text in Section 4.6.1 VOCs will be revised to discuss all VOCs that exceeded MCLs and where those exceedances occurred.</p>
114	131	4.6.2	<p>The text should discuss whether any of the locations with elevated SVOCs correlate with locations that had elevated TPH results.</p> <p>Response: The text in Section 4.6.2 SVOCs will be revised to discuss the correlation, if any, between locations with elevated SVOCs and locations that had elevated TPH results.</p>
115	135	1 st sen.	<p>Text should be clarified to confirm that the northwest portion of the Process Areas OU includes the Calcine Ditch, so the boundary should be just beyond the ditch.</p> <p>Response: The first sentence (page 135) will be modified as follows: “The geographical study boundary for the Process Areas OU is limited to the main Process Areas, bounded on the northeast by the Sulfide Tailings, on the northwest by the Oxide Tailings, on the southwest by the Arimetco Phase IV Heap Leach Pad and Mega Pond, and on the southeast by Burch Drive (Figures 2-1 and 2-2).”</p>
116	135	2 nd Par.	<p>The work plan states “The boundary for vertical delineation of chemicals in soil is limited to 25 ft bgs.” While it is recognized that some limitation in the depth and number of samples is necessary, there is no basis for arbitrarily selecting 25 ft bgs. The vertical boundary will be defined by the extent of contamination. If elevated contaminant concentrations are present at 25 feet, deeper samples will be required to complete the characterization and assess threats to groundwater.</p> <p>Response: See ARC’s response to EPA General Comment 1. ARC proposes to discuss the depth of sampling with EPA at a technical meeting to be scheduled prior to revision of the Process Areas RI Work Plan. ARC proposes to conduct detailed vadose zone investigations in focused ‘worst-case’ locations (e.g., dry wells, solution tanks, calcine ditch) in the Process Areas to characterize soil hydraulic and geochemical properties to assess soil impacts and potential current or future sourcing of chemicals to groundwater. Based on the results of vadose zone characterization, EPA and ARC will determine the need, if any, for a subsequent phase of soil investigations below 10 feet (the maximum depth of soils for ecological or human health risk assessments). ARC believes that this approach, in combination with extensive lateral step-out sampling to a depth of 10 feet bgs, will provide the required information to conduct a Feasibility Study of remedial alternatives for Process Areas soils (there are limited remediation options available for a processing/beneficiation area, which will likely be applied over the entire Process Areas, rather than specific features).</p>
117	136	DQO # 1 and 2	<p>The distinction between DQO #1 and DQO #2 is unclear. It appears they could be combined as the 2nd half of DQO applies to both soil and groundwater.</p> <p>Response: DQO #1 is meant to apply to radiochemicals and the DQO #2 to all non-radiological constituents. The wording of DQO #1 will be revised to remove reference to non-radiochemicals.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
118	136	2 nd Par.	<p>[Part 1] Sampling around any of the buildings, structures and process components in the OU is not an issue. As necessary, sampling can be done beneath any of the listed facilities by either coring through floor to directly access underlying soil or drilling angled borings beneath the structure. [Part 2] This paragraph should also be modified to account for background soils data now being available.</p> <p>Response [Part 1]: During the 2004-2005 investigation, attempts to drill through foundations were often unsuccessful due to the presence of: 1) steel rebar/reinforcement; 2) subsurface debris; or 3) additional foundations/structure at deeper depths. In Section 6.0 Field Sampling and Analysis Plan, ARC has proposed Phase 4-3 Characterization of Soils Beneath Removed Buildings that involves demolition and removal of facilities followed by soils investigations under facility footprints and, potentially, further delineation sampling.</p> <p>Response [Part 2]: The last full paragraph of Section 5.3 Study Goals/Data Quality Objectives will be revised now that the background soils investigation has been completed.</p>
119	137	DQO 1,	<p>Step 2 should clearly state that the primary goal is to delineate the nature and extent of contamination.</p> <p>Response: The text “occurrence and distribution” in Step 2 of DQO #1 will be revised to “nature and extent”.</p>
120	137	DQO 1	<p>Steps 3 to 5 need to also address non-radiological constituents such as metals, VOCs, SVOCs, TPH, pesticides, and PCBs.</p> <p>Response: See ARC’s response to EPA Specific Comment 117. Non-radiological constituents are addressed by DQO #2.</p>
121	137-138	DQO 1&2	<p>Step 7 indicates that previously untested areas will be analyzed for all analytical suites (metals, radiochemicals, TPH, VOC, SVOC, pesticide, herbicide, and PCB). Although this contradicts earlier work plan text, this is the correct approach.</p> <p>Response: See ARC’s response to EPA Specific Comment 117 which states that DQO #1 was meant to apply to radiochemicals only. No change to the text in DQO #2 Step 7 is proposed based on the comment. Text in other sections of the draft Process Areas RI Work Plan will be revised to eliminate contradictions.</p>
122	137-138	DQO 1&2	<p>Step 7- 1st paragraph- the text should be updated to reflect the screening levels from the latest Sitewide QAPP; 2nd paragraph- the text appears to be contradictory relative to the maximum depth of samples, but sample collection will not be limited to the upper 10 feet in areas where contamination extends deeper; 4th paragraph- untested areas where potential releases of process solutions or other liquids have occurred should be sampled down to 25 feet initially.</p> <p>Response: See ARC’s response to EPA Specific Comment 117 which states that DQO #1 was meant to apply to radiochemicals only. The first paragraph of DQO #2 Step 7 will be updated to reflect the screening levels from the latest site-wide QAPP. The text in the second paragraph will be revised as follows: “Delineation samples will be collected from a borehole at depth intervals of 5 feet. Samples will typically be collected to a maximum depth equivalent to the deepest sample that exceeded the screening level. Sampling may be conducted at greater depths in limited locations if there is indication that impacts are deeper.”</p>
123	138-141	Step 1	<p>For several of the DQOs, Step 1 indicates that the problem statement from DQO #1 also applies to that specific DQO. However, it doesn’t appear that the problem statement from DQO#1 fully applies to all of these additional DQOs.</p> <p>Response: For DQOs #2, #3, #4 and #7, the text in Step 1 Problem Statement will be re-written to be specific to that DQO.</p>
124	138	DQO 2, Step 4	<p>Note that the subsurface study boundary will be defined by the maximum depth of contamination- not 25 feet.</p> <p>Response: DQO #2 Step 4 will be revised to address the vadose zone characterization approach described in ARC’s response to EPA General Comment 1 and EPA Specific Comment 116.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
125	138	DQO 3	<p>The study goals indicate that mine-related contamination will only be characterized in the alluvial aquifer beneath the Process Areas. The vertical extent of mine-related contamination should be characterized, which may include bedrock. The table needs to be revised to indicate that bedrock characterization may be needed to fulfill the objective of characterizing groundwater flow and contaminant migration pathways. In addition, Step 7 indicates that the maximum depth of investigation will be 200 ft. This arbitrary depth limitation should be removed.</p> <p>Response: ARC proposes to discuss this comment with EPA in a technical meeting. Section 5.0 Data Quality Objectives will be revised to indicate that the nature and extent of contamination in the alluvial aquifer and bedrock, as necessary, will be characterized. Step 2 of the DQO #3 will be revised to indicate that the study goal is to: “Identify the nature and extent of mine-related groundwater in the alluvium and bedrock, as necessary, underlying the Process Areas and, if possible, determine if the occurrence is associated With Process Areas facilities or facilities located up-gradient of the Process Areas.” The depth criterion of 200 ft bgs in Step 7 of DQO #3 will be eliminated.</p>
126	139	DQO 4	<p>The study goals of Step 2 include obtaining estimates of current recharge fluxes under existing surface conditions within the Process Areas. While understanding the current conditions is the focus and critical part of determining the current and future impacts of mine-related chemicals in the Process Areas, it will also be important to use the available data to understand how and where contamination may have migrated under the conditions that existed during mine operations (i.e., infiltration of likely greater volumes of water and solutions). If that is not done, the causes of the groundwater contamination underlying the Process Areas and the current distribution of contamination may be misunderstood. Step 5 also references only current and future migration.</p> <p>Response: ARC proposes to discuss this comment with EPA in a technical meeting. ARC believes that: 1) insufficient information exists to accurately characterize historic recharge conditions that may have existed during past mine operations; 2) historic recharge conditions can not be meaningfully quantified or modeled; 3) the inability to quantify recharge during mine operations will not adversely affect the understanding of past groundwater impacts; and 4) the inability to quantify past recharge during mine operations will not adversely affect feasibility studies to be conducted at a future date. Pursuant to the results of the technical meeting, Step 2 (Study Goal) of DQO #4 will be modified to reflect the vadose zone characterization approach, which will qualitatively address residual effects of historic recharge conditions.</p>
127	139	DQO 4	<p>Step 3 indicates that one information input is geochemical data to understand the soil chemistry (solubility, ion speciation, adsorptive coefficient, leachability). However, the plan for obtaining data (Step 7) and the later section on the vadose zone investigation (Section 6.4) describe only geotechnical analysis, not any geochemical analysis. It is recommended that the work plan include an explanation of geochemical analyses that will be conducted (i.e., how the geochemical data will be obtained).</p> <p>Response: See ARC’s response to EPA General Comment 4.</p>
128	139	DQO 5	<p>Step 4 makes reference to roofing materials. However, DQO 1 indicates that building will only be characterized up to 6 feet above the floor.</p> <p>Response: DQO 1 is addressing the building interiors as indicated in the last sentence of Step 4 of that DQO. DQO 5, in referencing roofing materials, is addressing the building exterior.</p>
129	140	DQO 6	<p>Additional information inputs listed in Step 3 of DQO #6 should include the geophysical surveys used to delineate the presence of USTs and pipelines.</p> <p>Response: The following will be added to DQO #6, Step 3 Identify Information Inputs: “Results of geophysical surveys to locate USTs and fuel pipelines.”</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
130	141	DQO 7	<p>The information inputs in Step 3 need to be updated with the screening levels presented in the latest Sitewide QAPP.</p> <p>Response: The information in DQO #7, Step 3 Identify Information Inputs will be updated to reference the screening levels presented in the latest Site-wide QAPP.</p>
131	142-143	6.0	<p>Now that all of the data sources referenced in the 1st paragraph are available, the proposed RI field program and phasing should be updated. As noted in General Comment 1, the proposed phasing approach should be discussed with EPA prior to submittal of a revised Work Plan.</p> <p>Response: See ARC's response to EPA General Comment 1.</p>
132	143	Phase 2 bullets	<p>Note that any removal activities will require submittal of a separate Work Plan for EPA approval. Also, the initial soils investigation should occur in Phase 1.</p> <p>Response: ARC will submit separate work plans for removal activities as required by the EPA. The soils investigation for delineation of impacts was proposed as a Phase 2 activity to allow higher priority activities to be conducted first. For example, it is crucial to conduct the radiometric survey (Phase 1-1) and associated removal of any radioactive materials (Phase 2-1) early in the fieldwork schedule to allow unrestricted access to the Process Areas. Also, filling data gaps such as the vadose zone investigations (Phase 1-4) and preliminary building assessment (Phase 1-5), will be more beneficial to the immediate understanding of chemical impacts to soil, groundwater, and buildings in the Process Areas than conducting a second round of soil sampling for delineation.</p>
133	143	1 st Par.	<p>Building/structure ownership should not impact implementation of the RI. EPA can facilitate discussions between ARC and the owner in order to ensure that necessary accommodations are made to complete the characterization beneath the buildings.</p> <p>Response: Please note that schedule estimates in the draft Process Areas RI Work Plan are over 1.5 years old and require updating. As stated in the third full paragraph of Section 6.0 Field Sampling and Analysis Plan (page 143), ARC does not anticipate the timing of Phase 4 activities will be affected by preceding investigations, unless renewed mining and ore processing activities occur at the Site.</p>
134	144	1 st two Par.	<p>A detailed schedule should be provided for ARC's proposed phasing approach. What is meant by the phrase "once EPA and ARC agree on the approach for this Process Areas RI Work Plan"? The Work Plan is supposed to present ARC's proposed approach for EPA approval. It is difficult to evaluate the proposed approach without an associated schedule.</p> <p>Response: See ARC's response to EPA General Comment 1 regarding the iterative nature of investigating complex sites/OUs and the associated infeasibility of developing detailed scopes of work for work phases that come later in the investigation. In addition, ARC notes that experience with phased work at other OUs indicates that the findings of the initial phase of work strongly affect the scope and schedule for subsequent phases of work. Consequently, ARC believes that a detailed schedule developed at this time for the entire investigation would be unrealistic. ARC believes that it would be more productive to work with EPA as the work progresses to refine the scope and schedule.</p>
135	145	Tab. 6-1	<p>Area 7 Calcine Ditch is not listed in the preliminary MARSSIM Class Designations. Consider a Class 1 designation.</p> <p>Response: Portions of the Calcine Ditch will be considered MARSSIM Class I based on the surveys performed by the EPA START team. Further detail is provided in the MARSSIM Characterization Work Plan for the Process Areas, required as a removal action under the AOC SOW.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
136	145	2 nd Par., 3 rd sen.	<p>Scanning should also be performed at a height of 3 inches above ground as well.</p> <p>Response: Scanning was specified at a height of 1 meter since this was required by the EPA-issued UAO. Additional scanning will be performed at a height of 6 inches as detailed in the MARSSIM Characterization Work Plan for the Process Areas. Since this additional scanning is addressed in a separate work plan which is anticipated to precede this work plan with regard to implementation, no changes have been made to this work plan. If the EPA concurs with the removal of the requirement to perform a scan at a height of 1 meter since scanning will be performed at a height of 6 inches as detailed in the MARSSIM Characterization Work Plan for the Process Areas, then the 1 meter scanning will be removed from this work plan.</p>
137	146	1 st par., 1 st sen.	<p>The preceding paragraph references a scanning speed of 1 m/s, but this text mentions 0.5 m/s- please clarify.</p> <p>Response: The reference to 0.5 m/s in this paragraph is part of the citation to the Nielson reference. The subsequent text in this paragraph explains why the difference in scanning speed between what is proposed by ARC and that analyzed by Nielson is inconsequential.</p>
138	146	2 nd Par., 4 th sen.	<p>See comment # 136 regarding also surveying at 3” above ground.</p> <p>Response: See ARC’s response to EPA Specific Comment 136.</p>
139	147		<p>Radionuclides can become concentrated in the scale that tends to form within process pipelines. The Work Plan should include selective sampling of the interior of process pipelines in the vicinity of facilities where elevated concentrations of radionuclides are known or suspected.</p> <p>Response: The Process Areas RI Work Plan will be modified to collect samples of pipe scale where present from open ends of process piping. In addition, gamma surveys of the piping system interiors will be performed in conjunction with the video camera inspections of the piping systems.</p>
140	147	1 st Par.	<p>For the compositing, was consideration given to also collecting a sample beneath the anomaly (within the upper 6 inches)?</p> <p>Response: The compositing specified in this section has no bearing on the location of any anomalies. With the addition of surveying at a height of 6 inches and soil sampling as detailed in the MARSSIM Characterization Work Plan for the Process Areas, compositing is no longer necessary and will be removed from the Process Areas RI Work Plan. The MARSSIM Characterization Work Plan for the Process Areas will collect soil samples for the purposes of radiological characterization of surface soils.</p>
141	148	1 st sen.	<p>The investigation also needs to provide sufficient data to support completion of human health and ecological risk assessments, not just a final status survey analysis.</p> <p>Response: The purpose of MARSSIM is to provide documentation that as-left conditions are in compliance with remediation goals established by regulation, via risk-based calculations, or other methods. Risk calculations are based on broad-area constituent concentrations, which are the very quantity verified in a final status survey. Therefore, data collection sufficient for a final status survey simultaneously provides the information needed for a risk assessment for surface soils since the two are the same. For the risk assessments, these data will be supplemented by subsurface soil sampling for radiological constituents conducted as part of the step-out sampling program described in Section 6.6 of the Process Areas RI Work Plan for radiological constituents that exceed the screening levels.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
142	149	1 st Par., 3 rd sen.	<p>It is not clear why the number of samples does not need to be sufficient to satisfy statistical tests for uranium and thorium. Please clarify.</p> <p>Response: The point is that the number of samples that will be needed is driven by the statistical testing requirements for Ra-226 and Ra-228. Sufficient samples to meet those requirements will more than satisfy the statistical testing requirements for uranium and thorium.</p>
143	149	2 nd Par., 4 th sen.	<p>Why aren't soil samples also proposed for 0-2 feet and 2-10 feet? Samples from these depths are needed for the risk assessments. Does sampling described elsewhere cover these requirements for radiological constituents?</p> <p>Response: Subsurface soil sampling for radiological constituents will be conducted as part of the step-out sampling program described in Section 6.6 of the Process Areas RI Work Plan for radiological constituents that exceed the screening levels.</p>
144	149	6.1.1	<p>As noted in the last sentence, a separate Work Plan will be submitted to EPA for the removal activities. As such, the remaining text in Section 6.1.1 only needs to provide a general overview of the steps involved in conducting the removal. Currently, this section provides some, but not all, of the specific technical details of the potential removal work. EPA does not intend to approve those technical details at this time.</p> <p>Response: As noted in the EPA comment, a separate work plan will be prepared for the removal activities and is more appropriately addressed in such a separate work plan. The general overview text from this section (i.e., all text except the first paragraph of the section) will be deleted.</p>
145	153	6.2.1, bullets	<p>Were there any impacts from associated metals or radiological constituents in these areas?</p> <p>Response: This section is a discussion of the proposed field activities for areas with petroleum hydrocarbons contamination. The summary of impacts is presented in Section 3.5.11 and Table 3-28 which tabulates which samples exceeded screening levels, including for metals or radiological constituents.</p>
146	154	Num. list	<p><u>Item #2-</u> Please provide some specifics on what is meant by "low soil gas levels". Consider use of field test kits. <u>Item #4-</u> Soil samples from the final excavation may also need to be analyzed for the other COCs.</p> <p>Response: The text will be revised to indicate: "less than or equal to 100 ppmv". ARC will consider the use of field test kits to determine the excavation extent. Soil samples were limited to petroleum hydrocarbon analysis to focus the removal action on addressing "hot spots" of petroleum contamination. Remediation alternatives for other chemicals will be addressed in the feasibility study.</p>
147	154	6.2.2. 1 st bullet	<p>The conclusion that the tank was removed in 1998 should be confirmed through review of NDEP files or documentation obtained from the company that removed the pumps.</p> <p>Response: Additional research will be conducted on NDEP files and site historical files in an attempt to confirm the tank removal.</p>
148	156	2 nd bullet	<p>The text should state how the excavated soil will be stockpiled pending disposal- on a liner and covered?</p> <p>Response: The text will be modified to indicate that contaminated soils will be stockpiled on plastic or in bins and covered.</p>
149	156	Last sen	<p>The specific "local requirements" referred to in the text should be provided.</p> <p>Response: The phrase "In accordance with local requirements" will be deleted.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
150	157	1 st bull	Selected samples will also need to be analyzed for metals and radiological constituents. Response: The following sentence will be added to the first bullet (page 157): “Additional analyses may be performed as required by the disposal facility.”
151	157	3 rd bull	The specific “local requirements” referred to in the text should be provided. Response: The following sentence will be deleted: “These standards meet local requirements.”
152	157	6.3, last sen.	Two additional monitoring well locations should be added- one near the historic sulfuric acid plant (e.g., on one of the berms around the Mega Pond) and one near the CCC/DDD areas on the northeast side of the Process Areas. Response: The two additional monitoring well locations recommended by the EPA will be added to the revised Process Areas RI Work Plan. One monitor well will be located near the former Acid Plant (e.g., on one of the berms around the Mega Pond) and the second will be located near the CCC/DDD areas on the northeast side of the Process Areas.
153	158	Tab 6-4	The proposed well designs include use of screens 20 ft in length. The rationale for use of screens of this length should be provided for review. In general, shorter screen lengths may be more appropriate for shallow wells installed near potential source areas to limit the effects of dilution within the well bore. Response: Well screen lengths of 20 feet were selected during the First-Step Hydrologic Framework Assessment, with input from the EPA and retained in the Second-Step Hydrologic Framework Assessment. Screen intervals of 20-foot were selected because most of the existing Site monitor wells had screen lengths that were 20 feet long and the goal was to maximize the comparability of data from old, existing wells with data from new Site monitor wells. This same goal is the basis for proposing 20 foot long screens for new monitor wells in the Process Areas.
154	158	Tab 6-4	The proposed zonal sampling needs to extend into the bedrock at several of these locations to indicate whether mine-related impacts extend into bedrock. Response: Consistent with EPA Specific Comment 126, the vertical extent of mine-related contamination will be characterized, which may include bedrock. The results of zonal groundwater samples will be used to assess the need for drilling into bedrock.
155	158	Tab 6-4	<u>Notes.</u> Note 1 indicates that the new wells are referred to as deep wells, but they are expected to be screened at levels equivalent to intermediate wells in other portions of the site. Why not just call these new wells intermediate wells? Note 4 does not appear to be referenced in the table. Response: The revised Process Areas RI Work Plan will refer to these wells as intermediate zone wells and the table will be corrected to include Note 4.
156	159	1 st sen.	Same as Comment No. 155 regarding labeling deep wells vs. intermediate wells. Response: The revised Process Areas RI Work Plan will refer to these wells as intermediate zone wells.
157	160	2 nd Par., 1 st sen.	PA-MW-6 and PA-MW-7 are both located within a couple hundred feet of PA-MW-5, however, the text states that these two locations have increased saturated thickness and depth to bedrock compared to PA-MW-5. Please verify that this statement is accurate. Response: The Process Areas RI Work Plan inadvertently referred to well PA-MW-5 when it should have referred to well PA-MW-4. Proposed well PA-MW-4 would be located in the southern portion of the Process Areas, where the depth to bedrock is limited relative to the northern portion of the Process Areas. The sentence will be revised as follows: “The proposed locations of PA-MW-5 through PW-MW-8 are in areas where the saturated thickness and depth to bedrock are anticipated to increase relative to PA-MW-4.”

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
158	160	2 nd Par., 2 nd sen.	<p>The plan indicates that these investigations will be terminated at a maximum depth corresponding to an elevation of approximately 4220 ft amsl. The plan should be revised to continue investigation deeper, if necessary, to define the maximum vertical extent of contamination. Also, how close is the bedrock expected to be to the proposed maximum depth of 4,220 feet amsl? At least 1 of the borings in this area should extend into bedrock to verify the expected depth and to conduct zonal sampling for evaluation of potential bedrock impacts.</p> <p>Response: See ARC's response to EPA Specific Comment 125. ARC proposes to discuss this comment with EPA in a technical meeting. Consistent with past groundwater investigations at the Site, the nature and extent of groundwater impacts have been determined by collection of depth-discrete (zonal) samples during borehole drilling followed by monitor well installation for long-term monitoring purposes. ARC understands that zonal data may indicate the need to investigate bedrock impacts. However, because the results of zonal samples in the alluvial aquifer may show that groundwater impacts do not extend into the bedrock, ARC believes that it is premature to commit to EPA's request that at least one of the borings in this area extend into bedrock. Unless data indicate that the bedrock is impacted, ARC does not understand how information regarding the depth to bedrock is relevant to decisions regarding the evaluation and selection of remedial alternatives for the Site.</p>
159	160	Last sen.	<p>It isn't clear why the criteria for collection of zonal samples in the Process Areas should be different than other areas. Please expand on the potential presence/absence of clay horizons and their impact on zonal sampling.</p> <p>Response: During the Second-Step Hydrologic Framework Assessment, which focused on offsite areas north of the mine site, zonal groundwater sample intervals were selected during drilling based on a variety of criteria including the presence of the shallow and deep clay horizons. For example, the following sentence was stated on page 30 of the Second-Step Hydrologic Framework Assessment Work Plan (Brown and Caldwell, 2007): "At the first transmissive zone immediately below the first shallow clay horizon ...". The shallow clay is considered to be a lakebed deposit associated with historic Lake Lahonton. Mapping by Reheis (USGS, 1999) suggests that the lakebed deposits do not extend beneath the Process Areas. Consequently, if the shallow and/or deep clays are not present in the Process Areas, then the criteria linked to the clay horizons would not apply to the decision making process for depth-specific sample collection in the Process Areas.</p>
160	161	6.3.1, 1 st sen.	<p>As noted in the preceding comments, selected borings in the Process Areas should extend into bedrock.</p> <p>Response: See ARC's responses to EPA Specific Comments 125 and 158.</p>
161	162	5 th bull	<p>For the Process Areas, please provide a listing of the domestic wells that were used for the proposed depth-specific groundwater sample intervals. It is requested that the rationale for determining sample collection intervals be more clearly specified.</p> <p>Response: There are no domestic wells in or near the Process Areas. The domestic wells are located to the west and north of the mine site. Domestic well screen positions were one of several decision criterion used during the First- and Second-Step Hydrologic Framework Investigations (HFA I and II) for selecting zonal groundwater sample intervals and designing new monitor wells. These two investigations were conducted in 2005 and 2007, respectively, and the decision criteria were incorporated into the 2007 version of the Process Areas RI Work Plan. HFA I and II data have advanced the SCM for groundwater and resulted in conceptualization of the alluvial aquifer as comprised of three hydrostratigraphic zone. Many of the domestic wells with known construction information are screened in the intermediate zone, and many new offsite monitor wells have been installed in the intermediate zone. The Process Areas RI Work Plan will be revised to eliminate reference to domestic well screen positions while still including decision criteria relevant to collecting zonal samples in the intermediate zone.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
162	164	1 st Par., 3 rd sen.	<p>The volumetric requirement of two times the casing/screen volume should be met regardless of the purge time. The one-hour cutoff should only apply if the volumetric requirements have been met, but the parameters have not stabilized.</p> <p>Response: The third sentence of the first paragraph on page 164 will be revised as follows: “Purging will be conducted until a minimum of two times the volume of water in the wells screen and casing below the bottom of the packer is removed and when field parameter stabilization criterion (specified below) are met, or after a maximum of approximately one hour of purging.” This revised sentence clarifies the purging procedure and eliminates the need for the 4th sentence in the paragraph. A logic flow diagram will also be included to clarify the purging and sampling criterion.</p>
163	165	6.3.5	<p><u>1st sentence.</u> Same as Comment No. 162.</p> <p>Response: This sentence will be revised to state: “Once the volumetric purging criterion (i.e., two screen/casing volumes) have been met and field parameters have either stabilized or purging has been conducted for at least one hour, the flow through cell will be disconnected from the riser/discharge tubing.”</p>
164	167	Last Par	<p>Will all monitoring wells be constructed of 2-inch diameter, Schedule 40 PVC regardless of depth? This may be problematic for deep wells.</p> <p>Response: Pursuant to other OU investigations, numerous deep monitor wells have been installed at the Site. These wells have been constructed of 2-inch diameter, Schedule 80 PVC. If required to delineate the extent of contamination, deep monitor wells in the Process Areas would also be constructed of constructed of 2-inch diameter, Schedule 80 PVC.</p>
165	169	1 st Par.	<p>At the completion of well development, slug tests should be conducted at selected monitoring wells to provide additional information on aquifer properties in the Process Areas.</p> <p>Response: In response to EPA's comments on the Second-Step Hydrologic Framework Assessment Work Plan (Brown and Caldwell, 2007) ARC has agreed to, and performed, slug tests in all new monitor wells that are installed at the Site since 2007. Consistent with other work plans, hydraulic (slug) testing will be performed in all new monitor wells. A new subsection of the revised Process Areas RI Work Plan will discuss the hydraulic (slug) testing, and slug test procedures will be similar to those used during other Site investigations.</p>
166	169	2 nd bul., last sen.	<p>The bullet states that purging will continue until a minimum of one screen volume of water is removed. The last bullet on the same page contradicts the previous bullet stating that at least two screen volumes should be removed prior to sampling. It is recommended that the second bullet be revised to indicate a minimum of two screen volumes will be purged prior to sampling.</p> <p>Response: The second bullet will be revised to indicate a minimum of two screen volumes will be purged prior to sampling.</p>
167	171- 172	Tab. 6-6	<p>The reporting limits need to be updated to match the latest Site-wide QAPP. Also, Thorium -232 should be added to the analyte list.</p> <p>Response: The reporting limits in Table 6-6 will be revised to match the latest Site-wide QAPP. Thorium-232 will be added to the list.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
168	174	1 st Par, last sen.	<p>The text indicates that potential current and future migration of mine-related chemicals to the water table is likely low. However, the vadose zone investigation should also evaluate potential historic migration of mine-related constituents to groundwater during operations.</p> <p>Response: The ability to meaningfully model historic fluid and chemical fluxes through the vadose zone will be highly constrained by the availability of historical information regarding fluid management (volumes, timing, duration and locations where fluids were stored) and chemical composition. Consequently, ARC anticipates that there will be little confidence that model results would accurately reflect historical conditions (see responses to previous general and specific comments). In addition, this activity is not expected to meaningfully support the identification and/or selection of remedial alternatives.</p>
169	174	2 nd Par., last sen.	<p>It does not seem that likely that the results from a Process Areas vadose zone investigation will be directly applicable to site-wide conditions given the size of the site, variability in soil types present in this alluvial fan environment, and variable vadose zone thicknesses; however, results from this investigation may be used to provide support to the site-wide investigations.</p> <p>Response: As stated in Section 6.4 Vadose Zone Investigations: “ARC understands the importance of conducting a comprehensive vadose zone investigation in the Process Areas, given that results may be applicable to Site-wide conditions and other OUs overlying similar alluvial fan materials with analogous unsaturated zone characteristics.” Thus, ARC understands that the results of the vadose zone investigation in the Process Areas will best support the Site-wide investigations where subsurface materials and conditions are reasonably similar to the Process Areas. This concept is also supported by the results of preliminary vadose zone characterization activities for the Anaconda evaporation ponds.</p>
170	174	Last sen	<p>Two additional locations for vadose zone borings should be added, including one that is the same as the additional monitoring well requested near the Sulfuric Acid Plant/Mega Pond (Comment 152) and one southeast of PA-VZ-4 near the lined trench between DD and EE.</p> <p>Response: The two additional vadose zone monitoring locations recommended by the EPA will be incorporated into the revised Process Areas RI Work Plan to support the ‘worst-case’ scenario envisioned for vadose zone characterization. Vadose zone monitoring point PA-VZ-10 will be located southeast of PA-VZ-4 and positioned near the lined trench between DD and EE. Vadose zone monitoring point PA-VZ-10 will be located near the Sulfuric Acid Plant/Mega Pond near the location of the former pipeline conveying acid to the vat leach tanks.</p>
171	174- 177	6.4	<p>The proposed approach to vadose zone investigations focuses on numerical modeling without a proposed validation of the results. This type of approach often results in significant uncertainty. At a minimum, it is recommended that the results be validated using techniques such as those mentioned in Section 6.4.2 and, possibly, including others such as characterization of temporal variations in soil temperature profiles in areas that may be subject to recharge and examination of fluctuations in ground-water elevations in comparison with recorded precipitation. If a modeling approach is ultimately used, it is recommended that a detailed work plan describing this aspect be provided for review.</p> <p>Response: ARC anticipates that many fundamental aspects of conducting vadose zone modeling at the Site will be addressed by EPA's review and comments on the vadose modeling approach presented in the Evaporation Ponds Removal Action Data Summary Report, which will be submitted to EPA in June 2009. Based on EPA comments, the proposed technical meeting to discuss the vadose zone modeling approach in the Process Areas will be incorporated into the revised Process Areas RI Work Plan. The results of vadose zone modeling in the Process Areas will be presented to EPA for review and as a basis for discussing the need for and types of field validation techniques. Based on the meeting, ARC will revise the Process Areas RI Work Plan to include validation techniques (i.e., vadose zone monitoring).</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
172	176	Tab. 6-8	<p>Building foundations and sumps also represent candidate areas where precipitation and surface water runoff can pool and infiltrate, where the presence of a structure can inhibit evaporation. The vadose zone investigation should include an inspection to identify whether such areas exist and warrant further investigation.</p> <p>Response: Vadose zone investigations should include ‘worst-case’ locations in the Process Areas (see ARC’s response to EPA General Comment 1). ARC will work with EPA to identify such locations where vadose zone investigations will be conducted, either as part of the Process Areas RI Work Plan or a preliminary investigative step analogous to the HFA for the Groundwater OU.</p>
173	177	1 st Par.	<p>See comment #169 regarding potential use of the Process Areas to represent other OUs.</p> <p>Response: See the response to EPA Specific Comment 169.</p>
174	178	1 st sen.	<p>This text should be revised to list all buildings that warrant subsurface soil characterization. The Work Plan needs to include appropriate optional procedures to be used for collection of samples from beneath buildings.</p> <p>Response: See the response to EPA Specific Comment 118 [Part 1]. In Section 6.0 Field Sampling and Analysis Plan, ARC has proposed Phase 4-3 Characterization of Soils Beneath Removed Buildings that involves demolition and removal of facilities followed by soils investigations under facility footprints and, potentially, further delineation sampling.</p>
175	178	6.5, 1 st par.	<p>The text states that the schedule will be extended due to potential demolition and removal of facilities. However, this should not be the case. The soil beneath all buildings that represent a significant source of contamination should be characterized during the same time frame as the rest of the soils investigation. If the building is still present, either slant or horizontal drilling or drilling through the building floor should be implemented to characterize the underlying soils.</p> <p>Response: See the response to EPA Specific Comment 118.</p>
176	178	6.5.1	<p>This section only references a survey of buildings. What about transite piping on the surface?</p> <p>Response: The EPA has recently issued a SOW that requires the removal of transite piping on the surface. The text will be modified to indicate that a separate work plan will be developed for the removal of transite piping.</p>
177	184	1 st Par., 4 th sen.	<p>Regardless of the potential depth of a buried feature, the goal of the investigation is to delineate the nature and extent of contamination, including the vertical extent of subsurface contamination. Samples will not be limited to a depth of 25 feet if there are indications of potential impacts extending deeper.</p> <p>Response: See ARC’s response to EPA General Comment 1.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
178	184	Last Par	<p>The analyte list is not sufficient. The list of metals that exceeded background levels or ecological screening levels is much longer than the 5 metals listed in the Work Plan. In addition, a broad range of metals was detected in Process Areas groundwater samples. Accordingly, all samples should be analyzed for the full suite of metals except calcium, magnesium, potassium and sodium. If there are other metals that ARC would like to eliminate from analyses, the Work Plan should have a detailed analysis of each metal compared to the prior groundwater and soil results and the latest screening levels. For areas that were not sampled previously, the full suite of analyses is required, including VOCs, SVOCs, pesticides and PCBs in selected areas.</p> <p>Response: The text will be revised to indicate analysis for the original list of 25 metals. For areas that were not sampled previously, samples will be analyzed for metals, radiochemicals, TPH, VOCs, SVOCs, and pesticides. As noted in ARC response to EPA Specific Comment 84, PCBs will be sampled in areas near electrical substations or current/former transformer locations where stained soil is present or there are indications of potential historic releases.</p>
179	185	Tab. 6-10	<p>This table should be expanded per the prior comment. The reporting limits need to be updated to be consistent with the latest Sitewide QAPP.</p> <p>Response: The table will be revised to indicate analysis for the original list of 25 metals. The reporting limits will be updated to be consistent with the latest Site-wide QAPP.</p>
180	188	3 rd Par.	<p>Borings should be added by the dry well associated with the lab.</p> <p>Response: Four borings are proposed to address the terminus of the Assay Laboratory Drain (UT-N) line and dry well (see ARC's response to EPA Specific Comment 196).</p>
181	190	3 rd Par.	<p>Isn't there a buried conveyor way associated with the Primary Crusher that has not yet been evaluated?</p> <p>Response: The No. 1 conveyor was an aboveground conveyor that exited from the bottom of the Primary Crusher and led to the top of the Coarse Ore Storage Bin. The No. 1 conveyor has been removed. No borings are proposed for this former conveyor feature since it carried coarsely crushed ore.</p>
182	190	2 nd Par.	<p>An additional boring should be included along the alignment of the overflow ditch in the western portion of Area 4.</p> <p>Response: Borings PA-FFF-23, -24, -25, and -26 located along the alignment of the Overflow Ditch (FFF) in the western portion of Area 4 were previously drilled and sampled. With the incorporation of new screening levels, there will likely be step-out borings required.</p>
183	192	3 rd Par.	<p>In addition to PA-FF5 and the new boring along the overflow ditch alignment, three additional locations, spread geographically across Area 4, should also be drilled to 20 feet rather than 10 feet.</p> <p>Response: Proposed borings PA-DD16, PA-DD20, and PA-DD27 will be drilled to a total depth of 20 feet.</p>
184	194	1 st Par.	<p>Holes should be cored through the concrete apron as close as is feasible to the Launderers to allow installation of six borings spaced along the apron from the northern end, extending down around the southeast end of the facility. The borings at three of these locations should extend to 20 feet rather than 10 feet.</p> <p>Response: The text (page 194) and Figure 6-11 will be revised to propose six additional borings PA-EE41 through PA-EE46 to a total depth of 10 feet located adjacent to the trench along the northeast length of the Launderers. The concrete must be cored and there is a possibility of encountering subsurface structures that inhibit achieving the target depth.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
185	195	1 st Par.	Based on the presence of additional metal and concrete structures 8 ft. bgs, it appears that some additional subsurface characterization is warranted. Three additional borings should be installed down to 15 feet. These should be located between PA-HH5 and PA-HH14 (1 boring) and PA-HH4 and PA-HH5 (2 borings). Response: See ARC's response to EPA General Comment 1.
186	196	1 st Par.	Five angle borings should be installed along the stretch of Calcine Ditch being investigated. These borings should extend to the northwest side of the ditch and provide sampling at approximately 25 feet below the bottom of the ditch. Response: Drilling in the previous locations in the Calcine Ditch required a limited access drill rig. Angle borings would require a full-sized drill rig that would need to enter the narrow ditch, then back up perpendicular to the central axis of the ditch. A recent site visit in April 2009 indicated that there is not enough room to position a rig in this manner. ARC acknowledged in the text: "Because of the proximity of the VLT pile on its northwest side, there is limited to no access to collect delineation samples in that direction. Additional delineation sampling may be affected by proposed vadose zone characterization activities in the area of the Calcine Ditch.
187	197	1 st Par.	Based on the depiction of the ditch in Figure 6-13, it appears that there is space for one more sample location both to the north of PA-WW1 and to the south of PA-WW10. Please add additional boring locations. Response: All but one sample from the initial borings exceeded the preliminary screening levels. ARC assumes that additional samples to the north of PA-WW1 and to the south of PA-WW10 will yield results with similar characteristic concentrations. The step-out borings proposed in addition to the previous borings provide sufficient information regarding impacts associated with the Calcine Ditch and sufficient information to evaluate remedial alternatives. Therefore, ARC feels that no additional borings are warranted in the locations proposed.
188	197	Tab. 6-18	The depths of the new PA-FFF19 and 20 borings need to be extended to at least 30 feet based on the presence of contamination at 25 feet in the original borings. Response: See ARC's response to EPA General Comment 1.
189	199	2 nd Par.	<u>last sentence.</u> The additional location PA-HHH-73 could not be located on Figure 6-16. Is this supposed to be HHH-43? Response: The typo will be corrected (page 199) to indicate PA-HHH43.
190	200		<u>Lower Truck Sludge Pond.</u> Two additional delineation samples should be added, one to the east and one to the southwest of the pond area. Response: The additional delineation samples will be added as requested.
191	201	1 st Par.	<u>last sentence.</u> The additional location PA-HHH72 could not be located on Figure 6-17. Is this supposed to be HHH52? Response: The typo will be corrected (page 201) to indicate PA-HHH52.
192	201	Tab. 6-21	The proposed depth of the PA-CCC5 and 6 and PA-HHH69 to 71 borings needs to be extended to at least 30 feet based on the presence of nearby contamination down to 25 feet. Response: See ARC's response to EPA General Comment 1.

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
193	202	4 th Par.	<p>Tailings Pumphouse (VV) – One additional boring should be added on the north side of the Pumphouse, near the Wabuska Drain.</p> <p>Response: See ARC’s response to EPA General Comment 1.</p>
194	204	Last Par	<p>Add one additional boring location near the dry well sump east of the northern end of this structure.</p> <p>Response: Proposed borings PA-EE-35, -36, -37, and -38 associated with the southwest side of the Precipitation Plant are in the area where the dry well is; therefore, these borings will provide the required information regarding impacts associated with the dry well.</p>
195	205	1 st Par., last sen.	<p>The sample depths along this pipeline should extend to 10 feet bgs, not 4-5 feet bgs as is currently planned.</p> <p>Response: See ARC’s response to EPA General Comment 1.</p>
196	208	1 st Par.	<p>It is recommended that the interpretation of the data from the area surrounding the Assay Laboratory, and the potential contaminant distribution and past contaminant transport in this area, be revisited. This area may have had more of a contribution to the unsaturated zone and groundwater contamination than was stated in the Work Plan. Additional data may need to be collected beyond the one proposed sample. Specifically, the Assay Laboratory dry well should be clearly identified and sampled with at least one boring.</p> <p>Response: The following text will replace the first paragraph (page 208): “ARC proposes to use a backhoe to locate the Assay Laboratory Drain as it exits the building and leads 100 feet to a dry well indicated at 4 ft bgs on a historical map. This investigative effort will determine if the drain is connected to the dry well and if the dry well is present as indicated. If a joint or seam is encountered, a sample will be collected 6 to 12 inches below the pipe. Four boring locations are proposed at the terminus of the drain line to evaluate potential impacts associated with the dry well.”</p>
197	208	3 rd Par.	<p>Just because the location of the dry well is unknown does not mean the area should not be characterized. Additional effort should be made in the field to locate the drain line. Four borings should be drilled in the most likely direction of the drain line and dry well.</p> <p>Response: Four borings are proposed to address the terminus of the Assay Laboratory Drain (UT-N) line and dry well (see ARC’s response to EPA Specific Comment 196).</p>
198	209	3 rd Par.	<p>It appears that additional attempts to locate the main sewer line are warranted, followed by installation of additional borings. Please propose additional approaches to locating the pipeline and add 3 to 4 borings along the pipe.</p> <p>Response: During the 2004-2005 investigation, ARC attempted to locate a large section of the Main Sewer Line (UT-U) along the Precipitation Plant by excavation. Other approaches will be considered including subsurface geophysical surveying.</p>
199	214	2 nd Par.	<p><u>2nd sentence.</u> The required frequency for collection of field duplicates is 10% or 1 in 10. The text incorrectly lists 1 in 20.</p> <p>Response: The text will be revised to indicate the frequency for collection of field duplicates is 1 per every 10 investigation samples.</p>
200	216	Sec. 7.5	<p>The data verification requirements should match the latest Sitewide QAPP.</p> <p>Response: Section 7.5 QA/QC Review will be updated so that it matches the latest Site-wide QAPP.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
201	218	2 nd sen.	<p>The reference to Section 4.0 should be changed to 6.0.</p> <p>Response: The typo will be corrected as indicated.</p>
202	226	2 nd par.	<p>The schedule for the phased RI Report needs to be described (e.g., 180 days after last sample is collected for that phase).</p> <p>Response: As stated in Section 10.0 Reporting: “Due to the phased approach for completing the extensive activities described in this Work Plan, the draft RI Report will be prepared in phases (e.g., draft Phase 1 RI Report).” The following sentence will be added: “Each draft RI Report that documents the results of a phase, will be delivered to the EPA 180 days after the last sample was collected for that phase” (actual dates for future documents will be negotiated between ARC and EPA).</p>
	226-227	10.0	<p>The last bullet on page 227 states “Data associated with the testing of aquifer solids will be used to evaluate potential geochemical processes that affect the release and/or attenuation of chemicals from/to aquifer solids (in particular, contaminant partitioning to various operationally-defined mineral fractions), and the mobility and transport of chemicals in groundwater.” This statement is vague and does not explain how such evaluations will be conducted. Further clarification is recommended.</p> <p>Response: See ARC’s response to EPA General Comment 4.</p>
203	Fig.	1-2	<p>Please revise the figure to be consistent with the newer EPA OU Boundaries figure. For example, some of the changes that need to be made include changing the label for Yerington from “Town” to “City” and including the portion of Oxide Tailings labeled “Weed Heights Landfill” as part of the OU-6 boundary.</p> <p>Response: Figure 1-2 will be revised to be consistent with the newer EPA OU Boundaries figure.</p>
204	Fig.	1.2 1.5	<p>The identified features need to be depicted in the figures provided. Section 1.2 identifies features including Sunset Hills, Locust Drive, and Luzier Lane on Figure 1-2, that do not appear to be on Figure 1-2. Section 1.5, has a verbal description of the study area geographic boundary but no supporting figure with the identified features is provided. Figure(s) need to be provided that depict the identified features and areas.</p> <p>Response: Figure 1-2 will be revised to identify the features described in Section 1.2. The document did not contain a Section 1.5.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
205	Fig.	1.4	<p>Additional EPA human health risk assessment guidance documents need to be included and followed in the development of the OU-3 HHRA. EPA guidance documents that need to be added and followed during the HHRA development include:</p> <ul style="list-style-type: none"> • U.S. Environmental Protection Agency (EPA). 2001. Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, Part D – Standardized Planning, Reporting, and Review of Superfund Risk Assessments. Office of Solid Waste and Emergency Response. 9285.7-47. December. <u>Note: This guidance document includes the format, approach, and methodology for use of the RAGS Part D Tables, which need to be used in this HHRA. RAGS Part D Tables provide an ideal EPA approved and recommended format for this HHRA for documenting:</u> <ul style="list-style-type: none"> – Exposure Pathways – Occurrence, Distribution, and Selection of Chemicals of Concern – Exposure Point Concentrations – Equations and Values Used for Daily Intake Calculations for Each Receptor Evaluated – Noncancer Toxicity Data – Cancer Toxicity Data – Calculation of Chemical Cancer Risk – Calculation of Chemical Noncancer Hazards – Summary of Risk and Hazards – Risk Summary • U.S. Environmental Protection Agency (EPA). 2004. User's Guide and Background Technical Document for Preliminary Remediation Goals (PRG), and Region 9 PRG Table. EPA Region 9. October. <u>Note: This Region 9 document supports the Region 9 PRG Table (now called the Regional Screening Level (RSL) Table, which has incorporated new inhalation exposure equations, presents both industrial and residential air screening values, includes additional safety factor for cancer-causing substances. Maintains residential and industrial soil, ambient air, and tap water, PRGs/Screening Levels, which should be used in this HHRA.</u> <p>U.S. Environmental Protection Agency (EPA). 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim, EPA/540/R/99/005. July. <u>Note: This guidance document includes the approach and methodology for evaluating dermal exposures, which should be used in this HHRA.</u></p> <p>Response: The three references will be included.</p>
206	Fig.	2-5	<p>This figure should be updated based on the latest version of the sitewide conceptual site model.</p> <p>Response: Figures 2-4 and 2-5 will be updated with the latest Site-wide CSM.</p>
207	Fig.	6-2 and 6-3	<p>The use of field test kits should be incorporated into the decision tree (in addition to field instruments).</p> <p>Response: ARC will consider using field test kits to delineate the excavation areas.</p>
208	Fig.	6-6	<p>The 1st box on the left side should be updated to reference the latest screening levels. Also, the 3rd box on the right side should be updated regarding the 10-foot sample depth. The depth of initial sampling depends on the type of new source area that has been identified.</p> <p>Response: This figure will be revised to reference the screening levels provided in the latest Site-wide QAPP. The first box on the right associated with the 3x median will be removed.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
Appendix A			
209	3-1	3.1	<p><u>Potential Sources and Release Mechanisms.</u> Potential chemical sources need to be identified in the HHRA Work Plan, not just referred to in Section 2 of the RI Work Plan. The complete list of potential chemicals of concern from the RI Work Plan should be reproduced in the HHRA work plan. The chemical compositions/components of “solutions” and “materials”, vital to the understanding of the HHRA work plan need to be defined including:</p> <ul style="list-style-type: none"> • Sulfuric acid precipitation solution. • Spent solutions, calcine. • Fuels (gasoline, diesel?). • Laboratory materials • Stored materials/lubricants/solvents. <p><u>Locations of potential releases need to be presented in figures.</u> Locations of potential releases should be presented in figures that are part of the HHRA work plan:</p> <ul style="list-style-type: none"> • Precipitation Plant Area • Acid Plant • Dump leach surge pond • Evaporation pond • Ditch • Truck Shop • Truck Sludge Ponds • Stormwater ditch • Fuel Storage tanks • Onsite laboratory • Locations of stored materials. <p>Response: Currently Section 3.0 of the HHRA Workplan in Appendix A contains a summary of key potential sources and release mechanisms. This comment requests that a substantial amount of the text and figures from the main sections of the Process Areas RI Work Plan be repeated in Appendix A. ARC does not see the value in doing this. The locations of potential sources (including those specifically listed above) are identified in the text and shown on numerous figures in the Process Areas RI Work Plan. The Process Areas RI Work Plan also lists the potential chemicals of concern, and where historic information is available, discusses the composition of the sulfuric acid, spent solutions, fuels, laboratory materials, and stored materials. As necessary, HHRA text will be revised to refer more explicitly to the existing text and figures in the Process Areas RI Work Plan.</p>
210	3-3	3.2.4	<p><u>Radiation</u> –Exposure to external radiation may not be limited to materials within the upper 15 cm of soil thickness. It is dependent on the magnitude of the source.</p> <p>Response: Both Section 3.4 and the reference to limiting radiation exposure to the upper 15 cm of soil will be deleted.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
211	4-1	4.1	<p><u>Potential Human Receptors and Exposure Routes.</u> Residential land use and residential receptors need to be included in the Work Plan. A baseline HHRA evaluates potential future baseline human health risks. “Baseline risks are risks that might exist if no remediation or institution controls were applied to the site” (EPA RAGS Part A, 1989). Future land use zoning that would prohibit residential land use for the Anaconda Mine Process Area (OU-3) would be an institutional control. Future potential residential land use and residential adult and child receptors must be included in the HHRA Work Plan.</p> <p>Additionally, as stated in Section 6.5 of the Draft Process Areas RI Work Plan, Atlantic Richfield Company no longer owns the Process Areas property. Therefore ARC can not exercise any control over potential future land use onsite. Potential future land use is the sole right and responsibility of the current and future land owners, in coordination with Lyon County and its zoning regulations at the time of future redevelopment. It is stated, “Future workers within the Process Area OU may include indoor and outdoor industrial workers and commercial or office workers”. (Potential land use was described earlier in Section 1 as “light industrial’ and “commercial-office use”.)</p> <p>The master plan for Yerington, Nevada (2005) has a section titled: “Zoning is not permanent.” This section clearly states: “In any jurisdiction, zoning can be changed by the current governing body; it is not bound by prior zoning actions.” Therefore, it is possible that Lyon County could at some future date decide, by a zoning change, to permit residential land use in the former process area, OU-3. The same can be said for light industrial or commercially zoned areas.</p> <p>Residential land use and residential (adult and child) receptors need to be added to Section 4.1 as potential future receptors that will be quantitatively evaluated in the HHRA. Additionally, residential (adult and child) receptors need to be added to Figures 3.2, 3.3 and 3.4 as receptors that will be evaluated in the HHRA.</p> <p>Response: As presented in the latest Site-wide CSM (Revision 3 dated January 30, 2009) and as requested by EPA in CSM comments dated January 5, 2009, exposure pathways for future residential receptors are considered “low probability and potentially incomplete.” The exposure pathways will be included in the discussion in the revisions to Appendix A and in the CSM figure for Human Health Receptors (Figures 3-2 and 3-3) and noted as “low probability and potentially incomplete.” Residential receptors will not be included in the quantitative calculation of risk.</p>
212	4-4	4.1.2, 1 st Par.	<p>The second sentence should also mention potential work in vaults as part of the future trench worker activities.</p> <p>Response: Note that, consistent with the latest Site-wide CSM (2009), the future trench worker receptor has been included in the larger category of a Future Construction Worker because this receptor includes a broader range of exposure than a Trench Worker. Reference to working in trenches and vaults will be added to this description when it is incorporated into the revised Process Areas HHRA WP in Appendix A</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
213	4-5	4.1.3	<p><u>Future Outdoor Worker: Section 4.1.4, Future Indoor Worker: Figure 3-4.</u> These sections and associated figure need to be more inclusive of potential primary exposure routes for an outdoor worker and an indoor worker. The text and figure which support this section need to be revised to identify dermal contact, ingestion, and external radiation exposure as potential primary routes of exposure with surface soil, 0 to 2 ft bgs. The Anaconda Mine site is in an arid climate and receives only ~5 inches of rain per year. Upon redevelopment, unless landscaping is planted and constantly irrigated, the typical alternative in an arid climate is desert tolerant landscaping with a large percent of bare soil. Since ARC does not own the site property, landscape design and irrigation will be the responsibility of future developers. Similar revisions are required for Figure 3-2, Conceptual Site Model, as well.</p> <p>The site is unvegetated so future outdoor workers will have potential opportunities for dermal contact with bare soil unless surface soil is landscaped, irrigated, and sufficient soil amendments added to support landscaping. Indoor workers will also have potential dermal contact, ingestion, and external radiation exposures with onsite surface soil and outdoor and indoor dust.</p> <p>Response: Appendix A will be revised to be consistent with the latest Site-wide CSM (2009). The dermal contact, ingestion and external radiation to surface (0 to 2 ft bgs) soil as well as subsurface (2 to 10 ft bgs) soil are included in those revisions as primary exposure pathways. Section 4.1 in Appendix A will be replaced with the text from Section 3.0 of the with the latest Site-wide CSM (2009) for the Future Construction Worker, Current and Future Outdoor Worker, Future Indoor Worker, Onsite Resident and Trespasser</p>
214	4-8	4.2	<p><u>Exposure Units.</u> The Process Areas are identified as including 230 acres in the RI Work Plan, but are described as only 106 acres in Section 4.2. The correct area should be verified and reported consistently in both locations.</p> <p>Response: The correct area will be verified and reported in the text as indicated.</p>
215	4-9	4.3.3	<p><u>Selection of Screening Values.</u> This section (and Table 4-1) needs to be updated to present screening levels consistent with the latest Sitewide QAPP. These primarily include background levels, RSLs, and PRGs (if RSLs aren't available).</p> <p>Response: Per EPA Specific Comment 72, screening levels will not be considered in the selection of chemicals of potential concern. Section 4.3.3 and Table 4-1 will be deleted.</p>
216	4-10	4.4 4.4.5	<p><u>Calculation of Intake; Exposure Factors; 4.4.5 Relative Bioavailability Adjustment.</u> The proposed Exposure Factor values, for onsite receptors (including residential receptor) need to be updated and identified from EPA guidance documents and submitted to EPA for input and approval from the EPA project toxicologist. RAGS Part D Tables offer an excellent format for providing this information for each evaluated receptor. Relative Bioavailability Adjustment (RBA) factors are included in the proposed intake equations for chemicals and radiation. Site specific RBAs derived from appropriate laboratory studies would be the first choice for RBAs for any EPA Superfund site including the Anaconda Mine site. Lacking site-specific RBAs approved by the EPA Region 9 project toxicologist, all RBAs proposed for use in the HHRA work plan and the subsequent HHRA would need to be pre-approved by EPA.</p> <p>Response: ARC will submit any proposed Relative Bioavailability Adjustment (RBA) factors to EPA for review and approval in a timely manner. At this time, site-specific development of RBAs is not considered warranted. It is not possible to determine the need for development of site-specific RBAs until the data collection is completed and any chemicals of potential concern are identified. At that time, a determination of the value of a site-specific RBA can be made.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
217	4-13	1 st full par.	<p>The text states that surface soil concentrations will be used to estimate fugitive dust concentrations. Use of air monitors should be considered to supplement surface soil results. This will provide insight to current conditions, and provide air monitoring during anticipated R/I construction and activities that may disrupt the soil.</p> <p>Response: Currently Appendix A proposes to use the particulate emission factor (PEF) from the Region 9 PRGs (RSLs) to evaluate fugitive dust, the standard approach for HHRAs. This approach would eliminate the need to install onsite air monitors in the Process Areas at this time. ARC has collected an extensive air monitoring data set at the Site perimeter and these data will be used to prepare an Inhalation Risk Assessment for offsite receptors and also provide data for baseline conditions for any future remediation. Air monitors would be used for any construction-related activities at the Site, where fugitive dust may be generated, including the Process Areas.</p>
218		5	<p><u>Toxicity Assessment.</u> California EPA, Office of Environmental Health Hazard Assessment toxicity values are also part of the Toxicity Value Hierarchy identified in the EPA OSWER Directive 9285.7-53 and should be listed as a potential source of toxicity values. The set of cancer and noncancer toxicity values proposed for use in the HHRA should be compiled using RAGS Part D format tables for review and input by the EPA project toxicologist prior to use in the HHRA.</p> <p>Response: RAGS Part D formatted tables will be used throughout the risk assessment. In addition, the third paragraph in the introduction to Section 5, Toxicity Assessment will be revised to read as follows: “Toxicity values for carcinogenic and noncarcinogenic health effects have been developed for many chemicals by government agencies, including EPA, the U.S. Agency for Toxic Substances and Disease Registry (ATSDR), and the World Health Organization. As recommended by EPA in Human Health Toxicity Values in Superfund Risk Assessments (U.S. EPA 2003), the primary sources that will be consulted for selection of toxicity values are, in order of priority, EPA’s Integrated Risk Information System (IRIS), EPA’s Regional Screening Levels (U.S. EPA 2008) and the data base maintained by the California Office of Environmental Health Hazard Assessment. Chemicals without toxicity values will be assigned a surrogate toxicity value based on chemical similarity. A table of toxicity values will be submitted to EPA for review prior to preparation of the risk assessment.”</p>
219		5.1	<p><u>Noncancer effects.</u> The text needs to be revised to state that chronic RfDs and RfCs will be used for the noncancer hazards analysis of children for the 0-6 years that residential receptors are exposed before experiencing the next 24 years as an adult; for a total chronic exposure period of 30 years.</p> <p>Response: Section 5.1 Noncancer Effects will be revised to read as follows: “The potential for noncancer health effects from chronic exposures is evaluated using a reference dose (RfD) for oral exposure routes or reference concentration (RfC) for inhalation exposure routes. The toxicity values are combined with the RfD and RfC to estimate the potential for noncancer health effects. The toxicity values represent average daily exposure levels at which no adverse effects are expected to occur with chronic exposures. Daily intake for the oral routes of exposure using the RfD are based on children (ages 0 to 6 years) as the more sensitive receptor when compared to adults. Therefore, the potential for noncancer health effects based on a young child are considered protective of adults. The RfC is not dependent on the age of the receptor and is equally protective for adults and children.”</p>
220			<p><u>General Comment:</u> The values proposed as screening levels for soil and groundwater are quite high. Please provide example calculations showing the inputs and supporting the values chosen. In addition, the background soil values for the site should be used rather than those from the State of Washington.</p> <p>Response: Per EPA Specific Comment 72, screening levels will not be considered in the selection of chemicals of potential concern. Section 4.3.3 and Table 4-1 will be deleted.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
Appendix C			
221		C-1	<p><u>Appendix C-1 General Comment.</u> Although characterization of habitat attributes of the Process Area OU will undoubtedly aid in the assessment of risks presented by contaminant releases, collection of these data needs to be focused such that they are linked to the ecological risk assessment work plan (Appendix C-2) and the site CSM. It is unclear what key questions collection of these data is intended to address. Presentation of data quality objectives for the ecological investigations would greatly enhance the utility of these data. In addition, the process for analysis and interpretation of the data that will be obtained is poorly described. What conclusions are to be drawn from these data?</p> <p>Response: ARC will amend the text where appropriate and reverse the order of appendices C-1 and C-2 to make it clear that the ecological investigations are meant to play a supporting role to the SLERA. The end of the introductory paragraph of the Ecological Investigations Appendix will be modified as follows: “Our objective is to characterize the quantity, quality, and location of potential plant and wildlife habitat in the Process Areas in a reproducible, quantitative manner in order to supplement the conceptual site model for the Screening Level Ecological Risk Assessment. This objective will be accomplished through the use of vegetation surveys and wildlife habitat assessments for chosen receptors and feeding guilds in the Process Areas.” In addition, ARC will add a brief final section to the Ecological Investigations Appendix titled “Applications of Results” containing the following text: “The purpose of the habitat surveys is to provide a measure of how suitable or unsuitable the Process Areas is for receptors and feeding guilds chosen in the SLERA. Vegetation and wildlife habitat surveys provide quantifiable, repeatable measures of important habitat attributes, and will inform discussions of the results of the SLERA. Specifically, the results of the ecological investigations will be used to supplement the uncertainty assessment and summary and risk management recommendations sections of the SLERA.”</p>
222	2	2.1	<p><u>line 8.</u> How many off-site reference areas will be evaluated? How will reference locations be selected?</p> <p>Response: None. ARC will amend the text so it no longer alludes to reference areas. The proposed vegetation and habitat surveys should provide useful supplementary information for the SLERA without being compared to reference areas.</p>
223	3	2.4	<p>Much more detail on statistical analyses should be provided. Which statistical tests of proportions will be employed? What are the null hypotheses that are to be tested? Will analyses be limited to univariate statistics or will multivariate tests be conducted?</p> <p>Response: All statistical analyses will be solely descriptive; no comparative statistics or hypothesis testing will be used. The goal of the ecological investigations is to provide numerical measures of habitat quality: these measures can be qualitatively compared to habitats in the literature as needed, or used on their own. For this purpose, sample sizes need to be large enough to provide confidence in the survey results, and ARC will add text to this end. References to comparative statistics will be removed.</p>
224	4	3.1	<p><u>lines 8-9.</u> The statement that “Areas without vegetation will be considered unsuitable as wildlife habitat” is too broad. What may appear barren from the air in a photo may not be representative of existing habitable vegetation. Low growing vegetation, even if sparse can support wildlife, and areas that lack habitat can serve as contaminant sources to adjacent habitat. Ground truthing will be necessary before any area is dismissed as potential habitat. In addition, these areas could revert back to habitat thus providing a potential exposure pathway in the future.</p> <p>Response: The statement will be deleted from the text. The orthoquad analysis will be used to develop stratified sampling areas of “relatively vegetated” and “relatively barren” areas as stated; the habitat within these general areas will then be assessed (i.e., ground truthed) via transects. Any transects bereft of vegetation may rate poorly as habitat, but will still be included in the characterization of the Process Areas for the reasons stated above.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
225	4	3.2	<p>The pigeon and raven do not seem to be important here for the eco risk evaluation. Please describe why these are of interest.</p> <p>Response: We will remove references to pigeons and ravens. We will also clarify that the meadowlark is being used as a surrogate for other insectivorous birds (such as the killdeer) for direct application to the SLERA.</p>
226	5	3.3	<p>The statement that “barren and human-made portions of the site will be considered unsuitable for wildlife habitat <i>a priori</i>” should be deleted. No piece of land is ever completely without life of some kind and buildings, etc. can make very good wildlife habitat.</p> <p>Response: The statement will be replaced with the following text: “Representative transects of relatively barren and human-made portions of the site will be performed as well.”</p>
227	5	3.4	<p>Utility of the HIS evaluation would be greatly increased if species selected corresponded with the assessment endpoints and receptors selected for the SLERA as identified in Appendix C-2. Western meadowlarks, pigeons, and ravens do not match with selected SLERA receptors. Habitat suitability for pocket gophers, shrews, <i>Myotis</i> bats, and killdeer should be included.</p> <p>Response: No HSI models exist for pocket gophers, shrews, bats, or killdeer; HSIs exist for few species at all. Mule deer, the meadowlark, and the chukar were chosen because they are in the CSM or may serve as surrogate species. As stated, ARC will evaluate the habitat suitability for several other species through more qualitative means, such as evaluation matrices.</p>
Appendix C-2			
228	1-1	1.1	<p>This section should definitively state whether the Process Areas OU is strictly an upland site or if aquatic habitat may also be present. Reference to Walker River raises questions.</p> <p>Response: The Walker River is mentioned in a paragraph that is discussing the overall location of the Yerington Mine Site. A sentence will be added to Section 1.1 Environmental Setting to clarify that the Process Areas is an upland site and that the only surface water expected would be ephemeral on a time scale of hours to days in association with infrequent, intense rain events.</p>
229	1-2	1.1	<p><u>lines 3-5.</u> If this is to be a stand-alone document, suggest including brief summary of the plant and animal species and potential habitats in the Process Areas OU. Current text is too streamlined. Line 6 references ‘Section 5.5 of the Work Plan’. There is no Section 5.5 in this work plan. Which plan is referenced?</p> <p>Response: A sentence describing the general vegetative community in the vicinity of the Site will be added. Because no qualitative or quantitative habitat or vegetative surveys have been conducted for the Process Areas OU, it is not appropriate to conjecture what plant and animal species are present in this operable unit. Line 6 should have referred to appendix C1, and this will be corrected.</p>
230	1.2		<p><u>1st paragraph.</u> Should clarify that a SLERA does not evaluate risks <i>per se</i>. Rather it differentiates between analytes, areas, and receptors for which available data clearly indicate the absence of risks, and those for which insufficient data are available to support a conclusion of no risk. Failing a SLERA does not in itself indicate that risks are present. It simply indicates that risks are possible and that additional evaluation is needed to determine if they are present.</p> <p>Response: Language discussing the calculation of risks will be removed and language discussing the use of the SLERA to identify analytes, receptors and pathways not evidencing ecological risk will be added.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
231	1-2	1.3	<p>Should state how big the site is. Additional detail on the land cover and other attributes of the Process Area OU should be provided. Although referencing another report is acceptable for extensive details, readers should not have to search for basic descriptive information. Current text is confusing.</p> <p>Response: Text will be added that describes the size of the Process Areas OU and its processing and support facilities.</p>
232	1-2	1.4	<p>Text should summarize which previous and ongoing investigations will be included. Description should include area evaluated, date of data collection, along with analytes, media, and locations evaluated. Although referencing another report is acceptable for extensive details, readers should not have to search for basic descriptive information. Current text is confusing.</p> <p>Response: The text will be revised to describe the major types of data that are planned to be collected pursuant to this Process Areas RI Work Plan that will be used to support the SLERA.</p>
233	2-1	2.1	<p><u>lines 1-3.</u> Quality criteria outlined in the QAPP should be briefly summarized here.</p> <p>Response: Text will be added that describe categories of quality criteria outlined in the latest Site-wide QAPP.</p>
234	2-2	2.2.1	<p><u>paragraph 2, line 3.</u> Text should indicate that ‘estimated’ values were greater than the MDL, but less than the contract reporting limit (CRL).</p> <p>Response: Text will be added that indicates J-qualified values are greater than the MDL but less than the CRL.</p>
235	2-2	2.2.1	<p><u>paragraph 2, line 5.</u> What concentrations are estimated results assigned? Suggest inserting ‘...at the estimated concentration...’ after ‘... risk assessment...’ if this represents what will be done.</p> <p>Response: Text will be added indicating that J-flagged results will be used at the reported concentration.</p>
236	2-2	2.2.1	<p><u>paragraph 4, line 3.</u> Section 2.1 does not really identify what are useable data, it simply lists general criteria that are to be considered.</p> <p>Response: See ARC’s response to EPA Specific Comment 233. This section describes the guidelines and QAPP criteria that will be used to determine whether data is usable. Data acquisition pursuant to field investigations proposed in this Process Areas RI Work Plan has not been undertaken and, therefore, the data are not available for evaluation at this time. Consequently, ARC can only cite the procedures by which data usability will be judged following the field investigation, laboratory analyses, and validation.</p>
237	2-3	2.2.2	<p><u>lines 2-4.</u> This is inappropriate. Before an analyte that is ND in all samples can be dropped, you must determine if the detection limit was adequately low. If the $MDL \geq TRV$ (or screening level?), the analyte must be retained as an uncertainty.</p> <p>Response: Text will be added that specifies analytes for which MDLs higher than SLVs will be retained and discussed in the uncertainty analysis.</p>
238	2.2.1	2.2.2	<p>How will sample results with qualifiers other than U, J, or R be handled? Will these three qualifiers be all that will show up in the results?</p> <p>Response: Section 2.2.2 Non-Detected Data pertains only to the treatment of non-detected values as described. Other data qualifiers will affect data usability as discussed in Sections 2.1 Data Evaluation and Selection Criteria, 2.2.1 Detected Analytical Results, and the response to EPA Specific Comment 236.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
239		2.2.3	How will negative results be evaluated? These data should be assigned a value of 0, as negative radiation emissions are not realistic. Response: As the EPA has stated, negative radiation emissions are not realistic. However, the retention of negative values for individual sample results is appropriate for the purposes of performing statistical tests and analyses. Any negative results from the statistical analyses, if any occur, would be set to a minimum value of zero before being used for the risk assessment.
240		2.2.4	The general practice is to retain the higher of either the investigative or field duplicate results for risk assessment purposes. Response: The text will be changed to show that the higher of either the investigative or field duplicate results will be used.
241		2.3	Collection of these habitat data is acceptable, but it needs to be recognized that they are not used as part of the SLERA. They can serve as part of the refinement of the screening evaluation results conducted in the BERA problem formulation. Response: Text will be added to clarify how the results of the habitat data collection will be used to support the SLERA. The habitat surveys will provide a measure of how suitable or unsuitable the Process Areas is for receptors and feeding guilds chosen in the SLERA. Vegetation and wildlife habitat surveys provide quantifiable, repeatable measures of important habitat attributes, and will support discussions of the results of the SLERA. Specifically, the results of the ecological investigations will be used to supplement the uncertainty assessment and summary and risk management recommendations sections of the SLERA and will help guide revisions to the CSM and the problem formulation for the BERA if needed.
242	3-1	3	<u>paragraph 1, last line.</u> Should Section 3.6 actually refer to Section 3.4? Response: The text will be corrected as indicated.
243	3-1	3.1	<u>line 3.</u> Suggest text to read ‘...Process Areas <i>RI</i> Work Plan’. Response: The text will be corrected as indicated.
244	3-1	3.1	<u>1st bullet.</u> Suggest text to read ‘... <i>metal-containing acid solutions</i> ...’; Also please define ‘filling’ of what? Response: The text regarding the acid will be edited as indicated. The text will be edited to indicate filling the iron launders used for precipitating copper from leach solutions.
245	3-1	3.1	<u>2nd bullet, last line.</u> Suggest changing ‘of’ to ‘through’ and ‘penetrations’ to ‘other openings’. Response: The text will be edited as indicated.
246	3-2	3.1	<u>3rd bullet.</u> Please state whether calcine ditch is lined or not Response: The text will be changed to indicate that the Calcine Ditch is unlined.
247	3-2	3.1	<u>4th bullet, line 4.</u> Insert ‘into’ before ‘soils’. Response: The text will be edited as indicated.

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
248	3-2	3.1	<p><u>6th bullet.</u> Please include a reference for historical maps and define what constitutes ‘laboratory materials’. Also, as noted previously there are additional dry wells in the Process Areas beyond the one listed.</p> <p>Response: The drain line leading from the Assay Laboratory to a dry well is indicated on a portion of a historical map that is missing the title and date. See ARC’s response to EPA Specific Comment 15 which states that the nature of the laboratory materials has not yet been identified. The text will be revised to indicate additional dry wells in the Process Areas. See ARC’s response to EPA Specific Comment 89 for more details on other dry wells.</p>
249	3-2	3.1	<p>Additional bullet should be added to address the potential leaks from dry wells on site and/or leaks from the sulfide tails.</p> <p>Response: Text will be added as requested.</p>
250	3-2	3.2	<p>Additional bullet, Biota is an additional exposure medium that should be included.</p> <p>Response: Biota will be added as an additional bullet to the list of exposure media.</p>
251	3-3	5 th Par.	<p>Exposure to radiation may not be limited to the upper 6 inches of soil thickness, it depends on the magnitude of the source.</p> <p>Response: ARC maintains that radiation will be limited to exposure to materials within the upper 6 inches of soil and that materials below this will be shielded by the intervening medium. However, organisms such as plants with roots penetrating the subsurface or burrowing animals may be exposed to deeper radiation materials. The text will be revised as follows: “As stated previously, exposure of organisms living above the soil surface to radiation is limited to materials within the upper 6 inches of soil thickness; radiochemicals found below this level are shielded by the top layer of soil (Cember 1996). Exposure of organisms below the soil surface (e.g., plant roots, burrowing animals) to radiochemicals depends both on the depth to which the organism is rooted or is living below the surface as well as on the magnitude of the radiological materials.”</p>
252	3-3	3.2	<p><u>Last paragraph, line 2.</u> Suggest changing ‘accumulate’ to ‘be present’. Note that reference Cember (1996) is not in the literature cited section.</p> <p>Response: The text will be edited as indicated. The reference will be added to reference list.</p>
253	3-4		<p><u>3rd bullet.</u> Need to include internal dosage. Exposure to radiation is due to the combined internal and external dosage. Focusing only on external dose under-represents radiation exposure.</p> <p>Response: Text will be edited to discuss both internal and external radiation exposure.</p>
254	3-4	3.2.1.2	<p><u>2nd sentence.</u> However, particulate accumulation can result in significant exposure to radionuclides and also serves as a pathway to herbivorous wildlife.</p> <p>Response: Direct deposition of airborne particulates onto plants is not expected to be a primary pathway (the majority of chemical uptake by a plant is through its root system). This section describes dermal contact (pathways to herbivorous wildlife is related to the trophic exposure route and is addressed elsewhere).</p>
255	3-5	3.2.1.2	<p><u>3rd from last paragraph, last sentence.</u> However, TPH and other petroleum products that are expected at the site do have a high affinity for dermal uptake. This pathway should be acknowledged for these analytes.</p> <p>Response: Text in this section states that some pesticides and organic compounds have a higher potential for dermal uptake or dermal toxicity, but that these materials are not expected to be present at elevated levels at the Site.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
256	3-5	3.2.1.2	<p><u>2nd from last paragraph.</u> Suggest that dermal exposure to airborne particulates is potentially complete, but not significant.</p> <p>Response: The text will be revised to state that dermal exposure to airborne particulates is potentially complete, but not significant and will be consistent with the revised Site-wide CSM (i.e., the terms “primary” and “minor” will be used throughout the SLERA to refer to the relative importance of exposure pathways).</p>
257	3-6	3.2.1.4	<p><u>2nd paragraph.</u> This text is only true for herbivores. This pathway is incomplete for all other trophic groups. Airborne particles settle on soil and thus are addressed as part of the soil pathway.</p> <p>Response: This section provides a pathway-specific discussion for herbivores versus other consumers: “Exposure to airborne particulates via trophic transfer for all receptors is considered a potentially complete but insignificant pathway for all receptors, because direct contact of airborne particulates with vegetation and inhalation exposure routes from airborne particulates to potential prey...”</p>
258	3-6	3.2.1.5	<p>Need to include internal radiation exposure too. External exposure is generally less than half of the picture.</p> <p>Response: The text will be changed to address both internal and external radiation exposure.</p>
259	3-6	3.2.2	<p>Please add another receptor (e.g., the Great Basin spadefoot toad) that may be present and using the ephemeral ponds to breed.</p> <p>Response: Ponded waters that temporarily form as a result of intense precipitation events or snowmelt in low-lying areas are expected to be ephemeral and do not provide meaningful aquatic habitat: “... pooled waters may serve as a temporary drinking water source for some terrestrial receptors, but these waters are expected to be too ephemeral to provide aquatic habitat”. Such waters are not expected to persist for a sufficient duration to provide viable breeding habitat for aquatic or semi-aquatic organisms and is not a complete pathway. Text will be added, consistent with the latest site-wide CSM, to explain that toxicity information for reptiles and amphibians is generally lacking in the literature and these types of receptors will be represented by surrogate bird and mammal receptors.</p>
260	3-8	3.2.3	<p><u>last bullet.</u> Add ‘and internal’ after ‘external’ so that both portions of radiation exposure are addressed. THIS IS A GLOBAL COMMENT that should also be applied in all subsequent sections where radiation exposure is described.</p> <p>Response: Radiation exposure will be defined in Section 3.2.1.5 as both internal and external (see ARC’s response to EPA Specific Comment 258), and subsequent references to radiation exposure throughout the document will be changed to refer to both internal and external exposure.</p>
261	3-8	3.2.4	<p><u>Figure 3-1.</u> Recommend pooling epifaunal and infaunal invertebrates in to one single group – terrestrial invertebrates. Although the epifaunal/infaunal distinction is common for aquatic invertebrates, it is less clear for terrestrial invertebrates, especially in a desert environment where most invertebrates exploit both surface and subsurface habitats.</p> <p>Response: Epifaunal and infaunal invertebrates will be grouped and exposure pathways limited to invertebrates that use the subsurface environment will be noted.</p>
262	3-8	3.2.4	<p><u>Figure 3-1.</u> Dermal contact with airborne particles (as a complete, but insignificant pathway) should be added along with inhalation.</p> <p>Response: Dermal contact with airborne particulates will be added as a complete, minor pathway.</p>
263	3-10	3.2.5	<p><u>9 (References).</u> CDTS 1998 should be DTSC 1998 (Department of Toxic Substances Control).</p> <p>Response: The reference will be corrected as indicated.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
264	3-13	3.3	<p><u>1st bullet.</u> Birds and mammals are generally evaluated at the population level, not the community level. Survival, growth, and reproduction are population or individual-level metrics. Community-level metrics would include abundance, diversity, and species richness.</p> <p>Response: The text will be changed to rephrase the assessment endpoints to survival, growth and reproduction of receptor groups (appropriate to the SLERA).</p>
265	3-13	3.3	<p><u>general.</u> Are any special-status species (i.e., state or federal threatened or endangered) present at the site? If they are, they need to be included as assessment endpoints. Regardless, explicit discussion of special status species should be included.</p> <p>Response: Special status species are identified in the latest Site-wide CSM; we are not aware of state or federal threatened or endangered species that would be expected to be present in the Process Areas, nor are we aware of EPA guidance that obligates the use of listed species as assessment endpoints in a SLERA. The proposed approach is consistent with SLERA guidance to use conservative assumptions and no-effect screening values to evaluate risk to species with a high likelihood of exposure, and so we would expect the approach at this level to be protective of all potential Site receptors.</p>
266	3-13	3.3	<p><u>4th bullet.</u> Text should indicate that ‘screening-level’ values will consist of NOECs, NOAELs, or equivalent values.</p> <p>Response: A footnote will be added to indicate that SLVs are based on concentrations associated with no observed adverse effects (e.g., NOECs, NOAELs).</p>
267	3-13	3.4	<p><u>Figure 3-1.</u></p> <ul style="list-style-type: none"> – dermal contact to airborne particles should be complete but insignificant for invertebrates and all birds and mammals; <p>Response: The figure will be edited as indicated.</p> <ul style="list-style-type: none"> – trophic transfer from airborne particles should be incomplete for invertebrates and all birds and mammals; a note should be added to invertebrates that air-trophic transfer pathway is captured by surface soil pathway. <p>Response: Trophic transfer will be removed as a potential exposure route for airborne particulates and a footnote will be added to indicate air-trophic pathway captured by surface soil.</p> <ul style="list-style-type: none"> – dermal contact to, and ingestion of ephemeral pooled water should be complete but insignificant for all birds and mammals, except bats which are incomplete; <p>Response: The figure will be edited as indicated.</p> <ul style="list-style-type: none"> – trophic transfer from ephemeral pooled water should be incomplete for all birds and mammals; <p>Response: The figure will be edited as indicated.</p> <ul style="list-style-type: none"> – external radiation from ephemeral pooled water should be complete for all birds and mammals, except bats which should be incomplete; <p>Response: The figure will be edited as indicated.</p> <ul style="list-style-type: none"> – dermal contact to surface soil should be complete for invertebrates and complete but insignificant for mule deer; other birds and mammals ok as listed; <p>Response: Dermal contact is already complete for invertebrates. The figure will be edited for mule deer.</p> <ul style="list-style-type: none"> – ingestion of surface soil by killdeer should be a complete pathway;

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
			<p>Response: ARC assumes this comment refers to making surface soil ingestion by killdeer a complete and primary exposure route, and the figure will be changed accordingly.</p> <p>– external radiation from surface soil should be complete for plants, invertebrates, and all birds and mammals, except bats which should be incomplete; Response: The figure will be edited as indicated.</p> <p>– dermal contact with subsurface soil should be complete for invertebrates, and complete but insignificant for jackrabbits; Response: See the comment below regarding the jackrabbit.</p> <p>– ingestion of subsurface soil should be complete but insignificant for jackrabbits, kit fox, and coyote; Response: The figure will be edited as indicated for the coyote. See the comments below for the kit fox and jackrabbit.</p> <p>– trophic transfer from subsurface soil should be complete for chukar and killdeer; – Response: The trophic transfer from subsurface soil to the chukar and killdeer is already listed as potentially complete.</p> <p>– External radiation from subsurface soil should be complete for plants, invertebrates, jackrabbits, pocket gophers, shrew, kit fox, and coyote. Inhalation of vapors should be complete for kit fox. Response: The external radiation transfer is already complete for plants, invertebrates, pocket gophers, shrew, and coyote. See the comment below for the kit fox and jackrabbit.</p> <p>General Response: See specific response to comments above; most edits will be made as indicated, with the following exceptions: 1) consistent with the latest Site-wide CSM, ARC will remove the kit fox as a receptor and add the American kestrel; therefore, comments addressed to kit fox are no longer relevant; and 2) as indicated in the text, the jackrabbit forages as a browser (scrapes the first few inches of soil), which supports no complete exposure pathway for subsurface soil.</p>
268	4-1	4.1	<p><u>1st paragraph.</u> The acronym ‘SLV’ is not defined. Response: SLV = screening level values. Text will be changed to include this definition.</p>
269	4-2	4.2	<p>Please use the feeding rates in the following publication to estimate intake rather than the EPA 1993 values: Nagy, K.A. 2001. “Food requirements of wild animals: Predictive equations for free-living mammals, reptiles, and birds.”, Nutrition Abstracts and Reviews, Series B: Livestock Feeds and Feeding. Vol. 71, No. 10. Response: More recent data and citations will be provided consistent with the methods used by EPA to develop Eco-SSLs.</p>
270	4-2	4.3.2.1	<p><u>3rd sentence.</u> It is inappropriate not to include ingestion of biota as part of the screening-level exposure model. Many models are available to estimate uptake into wildlife foods, both for inorganic and organic contaminants. In the absence of a model, a BAF of 1 could be used – this would conservatively assume that the concentration in biota is equal to that in soil. Excluding food ingestion in a screen will result in a non-conservative screen. Response: The SLERA does include ingestion of biota, and the text will be corrected to identify this.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
271	4-3	4.3.2.1	<p><u>top of page.</u> At a screening level it does not matter that availability of plants/inverts, plus consumption by biota have not been quantified. The purpose is to be conservative such that if there is a potential for risk it is captured.</p> <p>Response: See ARC's response to EPA Specific Comment 270.</p>
272	4-4		<p><u>parameter Ps.</u> Soil ingestion data presented in USEPA (1993) is the same as that from Beyer et al. (1994). Also, with exception of Canada goose (which should be dropped) none of the bird or mammal receptors selected for the site have soil ingestion data presented in Beyer et al. (1994). How will soil ingestion be estimated? This is critical as this pathway dominates wildlife exposure for metals.</p> <p>Response: The Canada goose will be removed as a receptor for the Process Areas. Table 4-5 lists the soil ingestion parameter data that will be used for the SLERA.</p>
273	4-4		<p><u>1st full paragraph.</u> Please identify the San Francisco Regional Toxicity Reference Values – the reference, DeVries (2007) is not in the reference section. Please add. Are these the Navy-BTAG values? If this is so, the correct reference is: <i>EFA West (Engineering Field Activity, West). 1998. Development of toxicity reference values for conducting ecological risk assessments at Naval facilities in California, Interim Final. EFA West, Naval Facilities Engineering Command. United States Navy. San Bruno, California.</i></p> <p>Response: DeVries 2007 will be added to the reference section. DeVries, S. 2007. Personal Communication (paper copy of San Francisco Bay Regional Toxicity, Reference Values provided to Dr. Les Williams, Integral consulting, Inc.), U.S. Environmental Protection Agency, San Francisco, CA.</p>
274	4-4		<p><u>bottom, Bij discussion.</u> Although this text focuses only on plants, the same modeling approaches can be applied to soil invertebrates and small mammals.</p> <p>Response: ARC agrees that the same modeling approach that is used for plant uptake of chemicals from soils can be used for soil invertebrates and for small mammals. See ARC's response to EPA Specific Comment 276 that indicates agreement to estimate screening level values based on multiple trophic guilds.</p>
275	4-5	4.3.2.1	<p><u>Table 4-3.</u> The manner in which these equations and the SLVs are presented is confusing – exposure models and calculated SLVs are presented but parameters to calculate exposure in the SLVs are not discussed until Section 4.3.2.2 and Table 4-5. The presentation should represent a logical progression to allow the reader to track the development and calculation of the screening values. Also note that Table 4-3 contains inhalation SLVs, but description of models used to calculate these values are not presented until Section 4.3.3.</p> <p>Response: ARC acknowledges these comments on the organization of the presentation of screening level value calculations and will consider these concerns in revising the text to present the screening level calculation discussion in a logical and clear manner.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
276	4-5	4.3.2.2	<p><u>1st paragraph.</u> All receptors should be modeled and screened unless a clear reason not to can be presented (current justification is insufficient). Second sentence states that herbivore feeding guilds were modeled because they have higher exposure. This is incorrect. The greatest exposure is generally experienced by insectivores (shrews) and ground-feeding birds. Also, this section calculates bioaccumulation from soil to plants and integrates this into the SLV. This directly contradicts Page 4-2, Section 4.3.2.1, 3rd sentence.</p> <p>Response: See ARC's response to EPA Specific Comment 270; the third sentence in Section 4.3.2.1 will be corrected. The approach outlined in the SLERA uses Eco-SSLs as the primary source for screening level values and follows Eco-SSL guidance in the development of SLVs. Eco-SSLs are based on exposure parameters for a surrogate species that is expected to be at the high end of the exposure distribution for the group, and a TRV that is expected to be at the low end of the toxicity distribution of the group. Therefore, the Eco-SSL is expected to provide a high degree of protection to those members of the group which it represents. Based on this approach, the screening level value is conservative; modeling every receptor would be a redundant exercise yielding less conservative screening level values. Where Eco-SSLs were not available, conservative toxicity values were used as the basis for back-calculating a threshold level protective of an appropriate site-specific representative receptor. ARC agrees with the comment that herbivores may not necessarily represent the highest exposure risk for all chemicals. Screening level values will be expanded to include values based on multiple trophic guilds, consistent with Eco-SSL guidance.</p>
277	4-5		<p><u>Avian Receptors.</u> Killdeer also forage on the ground and would be expected to consume large volumes of soil.</p> <p>Response: ARC agrees that killdeer also forage on the ground and may be expected to incidentally ingest soil. Chukar are discussed as a surrogate species for an herbivorous bird with potential high exposure to soil. See ARC's response to EPA Specific Comment 276; additional trophic guilds will be included as the basis for screening level values and discussed in the text as appropriate.</p>
278	4-5		<p><u>last sentence.</u> This text should be in Section 4.3.3</p> <p>Response: The text will be moved to Section 4.3.3.</p>
279	4-6	4.3.3	<p><u>2nd line.</u> Delete second 'therefore'.</p> <p>Response: The requested word will be deleted.</p>
280	4-7		<p><u>VF parameter.</u> Please clarify whether the value for 1,1,1-TCA was used for all VOCs or if this is just an example.</p> <p>Response: The value for 1,1,1-TCA was used for all VOCs, consistent with the presentation of the inhalation dose estimation in USEPA 2003. This clarification will be made by adding a footnote to indicate that this value was used for all VOCs.</p>
281	4-7		<p><u>PEF parameter.</u> Please clarify source of value – USEPA 1996?</p> <p>Response: USEPA 1996 is the source of this value, and a reference will be added to indicate this.</p>
282	4-7		<p><u>TRV.</u> Are these the same TRVs as used for the dietary exposure? If this is the case, these values are incorrect. Due to the dramatic differences in absorption via the GI tract and lungs, inhalation exposure and effects must be evaluated using inhalation toxicity data.</p> <p>Response: The TRVs presented are dietary TRVs. ARC recognizes and agrees with the comment that inhalation TRVs may provide different estimates of toxicity, and if acceptable inhalation TRVs are available, such as those presented in Eco-SSL guidance, they will be used in revision of the document.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
283	4-8	4.3.4	Text should state that values were taken from Sample et al. (1996) and used as is. Need to note that toxicity data used for these may not correspond to that used for the food ingestion-based SLVs. Also the water values have had allometric adjustments applied to account for differences in bodyweight. Response: The appropriate citation and additional details explaining the source of these data, including Sample et al.'s use of body weights to adjust water intake rates, will be added to the text.
284	4-8	4.3.5	Note that the DOE BCGs evaluate the sum of both the internal and external radiation exposure. Terrestrial animal values apply to invertebrates, birds, and mammals. Terrestrial plant values should be added. Also, why are BCGs listed in Table 4-7 only for ²²⁶ Ra and ²²⁸ Ra? Thorium and uranium radionuclides are identified a potential contaminants of interest in the draft revised CSM for the site. Response: Text will be added to specify that BCGs evaluate the sum of internal and external radiation exposure. Thorium and uranium BCGs will be added to Table 4-7. Terrestrial plant values will be added to Table 4-7.
285	5-1	5.1	<u>3rd bullet.</u> Bioaccumulation should be included and considered from the outset. Many models exist and should be used as part of the wildlife exposure modeling. Response: Bioaccumulation is already considered as part of Eco-SSLs and back-calculations described in the SLERA that include bioaccumulation factors for biota that uptake chemicals from soils and are consumed by receptors. The text will be corrected to reflect this consideration.
286	6-1	6.2	<u>1st paragraph., 4th line.</u> Suggest changing 'endpoint' to read 'mode of action'. Response: Text will be added to clarify what is meant by "toxicological endpoint" and clarify the process used for initially adding up hazard quotients across all chemicals. If HSI's indicate risk potential, then this process may be followed by grouping chemicals by common mechanisms of action to further evaluate whether it is reasonable to treat hazard quotients in an additive manner.
287	6-1	6.3	<u>point 2.</u> Background evaluation is not part of the SLERA. It can be discussed as part of the refinements conducted in the BERA problem formulation. Response: Comparisons to background are proposed to provide context to the preceding comparisons that are based entirely on comparisons to SLVs.
288	6-1	6.3	<u>point 3b.</u> Please define the term "significantly" with regard to concentrations different from background. Response: The text will be corrected to indicate that statistically significant difference between site and background concentrations is meant here.
289	6-2	6.3	Analytes with non-detects that exceed screening values also need to be evaluated and retained as uncertainties to be addressed in the BERA. Response: The following text will be added: "If a chemical concentration is not detected in any sample in the medium, but the detection limit exceeds the screening value, the chemical will be carried forward and discussed in the uncertainty analysis for the SLERA. This and other information will then be used to facilitate risk management decisions to conduct a BERA and if so, to determine whether non-detected analytes should be included in the BERA."
290		4-1	<u>Table 4-1.</u> The WWW site referenced as the source of the EcoSSL values (USEPA 2007) does not actually present these values. Rather the analyte-specific EcoSSL documents present the values. The analyte-specific EcoSSL documents should be referenced. Response: The analyte-specific Eco-SSL documents will be referenced.

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
291		4-2	<p><u>Table 4-2.</u> Additional detail should be provided for the NOAELs for each analyte – what was the primary reference, what was the test species, study duration, dose route, effect endpoint, and whether any uncertainty factors or other calculations were incorporated that may add uncertainty to the overall value. Also, DeVries (2007) is not in lit cited – the reference likely should be EFA West (1998) (see Comment No. 112).</p> <p>Response: See ARC’s response to EPA Specific Comment 273 for the DeVries reference. ARC is not aware of source information for DeVries values. Eco-SSL and ORNL values are very well documented as to the original reference, test species, dose route, and other test parameters. ARC provides references for these TRVs so that this level of detail can be obtained from the source citation, and does not believe that repeating this detail in the body of the SLERA is necessary.</p>
292		4-2	<p><u>Table 4-2.</u> Please explain the difference in how the values for “mammals” and “fossorial mammals” were derived. Also, please review the values cadmium, lead and nickel. They seem to be different from those in the cited reference.</p> <p>Response: ARC has re-checked the TRVs for cadmium, lead and nickel in this table against source references (Eco-SSLs and BTAG values) and did not find errors. Differences in NOAELs for mammals and fossorial mammals result from ORNL values which are based on white-tailed deer TRVs to represent mammals and meadow vole TRVs to represent fossorial mammals. A footnote will be added to the table to clarify these differences.</p>
293		4-3	<p><u>Table 4-3.</u> Washington State DOE soil background values are not a valid comparison to Nevada. Please use the background values from the site in the next draft. Also, why is inhalation SLV based on meadow vole? This species is not an assessment endpoint and is not at the site. Suggest using pocket gopher instead.</p> <p>Response: ARC will use background information published in the Eco-SSL guidance as well as available site-specific background information. ARC chose meadow vole as the fossorial receptor because, consistent with the assumptions outlined in Eco-SSL guidance, which evaluates the inhalation exposure route for meadow vole, exposure assumptions are readily available for meadow vole; the meadow vole is an herbivore and its simplified diet decreases the number of dietary pathways and allows for a more conservative evaluation of percent contribution of the inhalation pathway. The meadow vole has a small body weight which tends to maximize dose. However, to make the screening approach as site-specific as possible, and assuming appropriate exposure parameters are available for substitution, ARC can modify the receptor to pocket gopher as requested.</p>
294		4-4 4-5	<p><u>Tables 4-4, 4-5.</u> Why evaluate meadow vole? This species is not an assessment endpoint and is not at the site. Suggest using pocket gopher instead. Also in Table 4-5, exposure parameters for all other wildlife species should be presented.</p> <p>Response: See ARC’s response to EPA Specific Comment 293. ARC will modify the approach to use pocket gopher as a representative site-specific receptor. Table 4-5 already lists relevant exposure parameters used to support development of screening values for the SLERA.</p>
295		4-4	<p><u>Table 4-4.</u> These values are very high and require explanation. Explain and show an example of how these two different values were derived. This is particularly the case for arsenic, chromium, cobalt, copper and lead.</p> <p>Response: Values differ because they are based on the calculations presented in Sections 4.3.2.1 and 4.3.3 for herbivorous (deer) and fossorial (meadow vole) receptors, respectively, and using exposure parameters outlined in Table 4-5. These two sections of text explicitly state that the calculations presented are used as the basis for the values presented in Table 4-4.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
296		4-6	<p><u>Table 4-6.</u> Units are not consistent for SLVs for all analytes. This may increase potential mistakes in later calculations. Suggest presentation in common units. Also, These values are very high and require explanation. Please provide example calculations including the inputs for how these numbers were derived.</p> <p>Response: Table 4-6 will be corrected to present SLVs in consistent units. As defined in Table 4-6, these values are estimated wildlife NOAELs and LOAELs for surface water obtained directly from Sample et al. 1996, and the methods used to calculate these values are described therein.</p>
297	8-1	Last sen.	<p>Delete “and ARC.” EPA will make the determination if a site-wide ecological risk assessment is required.</p> <p>Response: The text will be deleted as requested.</p>
Yerington Paiute Tribe Comments			
1	1	1	<p>This report is dependent on the completion of the Conceptual site model as stated on page 1. The Conceptual Site Model is still under review and as such, limits comments that can be made on this work plan.</p> <p>Response: The information presented in the latest Site-wide CSM will be incorporated into the final version of this document.</p>
2	6	1.3	<p>Discussion should be added regarding NDEP assessment and response that included this area prior to EPA lead at the site.</p> <p>Response: Additional text will be added to Section 1.3 Previous Investigations that summarizes NDEP assessment and response.</p>
3	7	1.4	<p>Agency contacts require updating.</p> <p>Response: The agency contacts will be updated.</p>
4			<p>General Comment: This section should include detailed description of any connection to potential below ground utilities for every feature as well as the probability for other below grade features/utilities. This site managed TENORM which is known to concentrate in pipe scale and could be released during fluid transfers. This should be considered a priority for this investigation.</p> <p>Response: TENORM issues will be addressed by the MARSSIM Characterization Work Plan, to be implemented as a 2009 removal action activity with results included in the revised Process Areas RI Work Plan.</p>
5	55	2.4	<p>The term ‘mine related groundwater’ should include the description “groundwater that appears to have elevated concentrations of iron, sulfate, heavy metals and other chemicals”. The current provided descriptions may be interpreted to downplay the hazards presented by this material.</p> <p>Response: The term “mine-related groundwater” will be defined as “groundwater that appears to have elevated concentrations of iron, sulfate, heavy metals and other chemicals”.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
6	61-62	2.4.7	<p>It is useful to indicate that a few inches of soil can be effective shielding for radiation sources but this must be tempered in the discussion since assessment and remediation efforts will include excavating and exposing potentially radioactive materials.</p> <p>Response: Planned assessment activities do not include disturbance of the ground surface that could expose buried potentially radioactive materials. Wastes generating during characterization activities (i.e., Investigation Derived Waste [IDW]), will be treated as such and disposed of properly. The determination that areas are acceptable for release for radiological concerns is being conducted in accordance with MARSSIM and that document's requirements for Final Status Surveys (FSSs). Any areas that are excavated and not backfilled such that previous buried radioactive materials could become exposed will be the subject of a post-excavation FSS to determine if the area is suitable for release or if additional remediation is required.</p>
7	106	3.7	<p>Comments regarding data gaps for the previous Process Area assessment were provided to EPA and ARC in September of 2006 by the YPT. These comments included: [see a through f below]. These questions still remain and should be addressed more specifically/included in this section.</p>
7a			<p>There is a potential for contaminated building components within the Process Area. Sampling of these potentially dangerous materials can be important as reuse or disposal options are considered.</p> <p>Response: ARC proposed initial assessment of buildings, structures, and process components in Section 6.0 Field Sampling and Analysis Plan. The radiometric survey described in Section 6.1 includes the assessment of buildings and other features in the Process Areas, and would be conducted prior to any further assessment. Asbestos and lead-based paint surveys are proposed in Section 6.5.</p>
7b			<p>The previous report did not utilize remote cameras or similar available technology to confirm and map utilities. These types of methods could greatly enhance this study since BP has already stated that maps were unreliable and some important utility components were non-conductive. Although some utility sampling has been conducted, it is important to confirm that the sampling was complete and identify utilities that may connect the study area to other mine features.</p> <p>Response: Section 6.6.7 Pipeline and Conveyance Feature Sample Location and Rationale explains: "Because some uncertainty remains as to the [current condition and] accuracy of the locations of the conveyance features, ARC proposes to use a backhoe to locate the target pipeline and determine the depth at the planned sample location. When piping is encountered, the backhoe will trench along the length of the pipe until a joint or seam is encountered, and a sample will be collected 6 to 12 inches below the pipe." The method of excavating pipelines at key locations and visually examining them is more likely to produce useful information than video surveillance, given that the current condition of pipelines may prevent equipment from passing through (e.g., crushed sections). Surveying a section of buried pipeline that has been exposed by excavation is as accurate as determining the location of video surveillance equipment in a pipeline.</p>
7c			<p>The use of industrial PRGs was useful in the discussion but could be enhanced by including residential PRGs since the actual remediation goals for the site have not been determined.</p> <p>Response: The soil screening levels will be updated to reflect those values presented in the latest Site-wide QAPP along with the background concentrations presented in the Background Soils Data Summary Report (Revision 1).</p>
7d			<p>Previous discussions for this data have included questions regarding the parameter list including radionuclide parameters. This question will need to be addressed prior to the next phase.</p> <p>Response: The parameter list for assessing data gaps will be the parameter list provided in Table 6-10.</p>

RESPONSE TO COMMENTS
DRAFT PROCESS AREAS (OU-3) REMEDIAL INVESTIGATION WORK PLAN (dated August 30, 2007)
YERINGTON MINE SITE

No.	Page	Sec.	Comment/Recommendation
7e			<p>Previous discussion indicated serious issues with the current monitoring well locations. Additional monitoring wells will be required and may be a useful preliminary step to acquire data for planning subsequent phases.</p> <p>Response: The three monitor wells are positioned in a line, as noted by the reviewers. However, as shown on Figure 6-4, these three wells would be supplemented by two other wells (OU1-ONMW-3 and OU1-ONMW-5) that have been proposed pursuant to the Site-Wide Groundwater RI Work Plan (Brown and Caldwell, 2007). Two additional wells recommended by EPA (Specific Comment 152) will be installed to adequately characterize groundwater conditions.</p>
7f			<p>The lack of surface soil samples (less than 6 inches from ground surface) was identified as an issue with this data. This is important since some parameters have very limited solubility and may be deposited at or near the surface including ditches in the area.</p> <p>Response: ARC proposes to discuss this comment in the technical meeting associated with revising the Process Areas RI Work Plan.</p>
8	108	3.8	<p>This section should include a discussion quantifying how often the lack of visible material concurred with negative sampling results. Without that correlation and subsequent discussion, areas not sampled due to lack of visible staining will require sampling, i.e., lack of visible staining may not be a valid decision making tool. There are useful and simple field methods for screening petroleum hydrocarbons that should be considered.</p> <p>Response: ARC does not feel sampling is warranted for areas/features where no chemical use or storage has been indicated in reviews of historical files and where no soil staining/discoloration of soil is observed during site visits.</p>
9	110	4.0	<p>A significant limitation in the groundwater monitoring, as indicated above, is the limited groundwater data. This data is handicapped by the decision to place all three monitoring wells in a line as opposed to a more correct triangle configuration. This limitation needs to be addressed in the discussion and the remedy clearly indicated. A solution for this problem should not be delayed for another, later, work plan due to the need to improve interpretation of the existing data.</p> <p>Response: See ARC's response to Yerington Paiute Tribe Comment 7e.</p>
10	135	5.2	<p>The vertical boundary definitions should include a brief discussion on how natural ground surface is used in defining study boundaries. Since the use of fill in the area to cover areas associated with mine waste would be common practice for the industry and era, i.e., covering petroleum product spills or burying a facility, managing these areas is important and can affect the special boundaries of the study.</p> <p>Response: See ARC's response to EPA General Comment 1.</p>
11	139	5.1	<p>Video survey of utilities is not only common practice but would be very useful for meeting DQO #5.</p> <p>Response: ARC will consider using video surveillance techniques to achieve DQO #5. See ARC's response to Yerington Paiute Tribe Comment 7b.</p>
12		6.0	<p>The phased approach is not well presented and should be reviewed with the stakeholders. Issues regarding removal actions may not all be appropriate for this work plan without complete review of the screening methods and actions levels.</p> <p>Response: See ARC's response to EPA General Comment 1.</p>