



October 4, 2013

Mr. Weiquan Dong, PE
Bureau of Corrective Actions, Special Projects Branch
Nevada Division of Environmental Protection
2030 E. Flamingo Rd., Suite 230
Las Vegas, Nevada 89119

Re: NERT Response to NDEP June 27, 2013 Comments on the Remedial Investigation and Feasibility Study Work Plan; Nevada Environmental Response Trust Site, Henderson, Nevada; dated December 17, 2012 (NDEP Facility ID #H-000539)

Dear Mr. Dong:

On behalf of the Nevada Environmental Response Trust ("NERT" or the "Trust"), ENVIRON International Corporation (ENVIRON) has prepared an annotated response to the Nevada Division of Environmental Protection's (NDEP's) comments on the Remedial Investigation and Feasibility Study Work Plan (RI/FS Work Plan) for the NERT site. The comments were included as Attachment A in NDEP's letter to the Trust dated June 27, 2013. Our annotated response to comments is provided in Attachment A to this letter. Additional tables and a figure, pertaining to our responses to comments are provided in Attachments B through D.

ENVIRON requests feedback on this submittal from NDEP by October 31, 2013 to ensure a timely delivery of the final RI/FS Work Plan on or before December 27, 2013. Please contact John Pekala at (602) 734-7710 if you have any comments or questions concerning this response to comments.

Sincerely,

John M. Pekala, CEM #2347
Senior Manager

Allan J. DeLorme, PE
Principal

Attachment

cc: BMI Compliance Coordinator, NDEP, BCA, Las Vegas
Brian Rakvica, McGinley and Associates, Las Vegas
NDEP c/o McGinley and Associates, Reno

ec: JD Dotchin, NDEP
Greg Lovato, NDEP
Stephen Tyahla, USEPA
Nevada Environmental Response Trust
Tanya O'Neill, Foley & Lardner LLP
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Lee Farris, Landwell
Ranjit Sahu, BMI
Joe Kelly, Montrose
Paul Sundberg, Montrose

Curt Richards, Olin
Jay Gear, Olin
Davis Share, Olin
Chuck Elmendorf, Stauffer
Nick Pogoncheff, Stauffer
George Crouse, Syngenta
David Hadzinsky, TIMET
Steve Sarandis, GEI Consultants
Kirk Stowers, Broadbent & Associates
Victoria Tyson, Tyson Contracting
Enoe Marcum, WAPA

Attachment A

**Response to NDEP Comments on
Remedial Investigation and Feasibility Study Work Plan
Nevada Environmental Response Trust Site, Henderson, Nevada
Dated December 17, 2012**

NDEP Comment	Response
1. General Comment, the NDEP recommends that NERT update all cited references to the date that this Deliverable is finalized.	The cited references in the revised Remedial Investigation/Feasibility Study (RI/FS) Work Plan will be updated to reference the most recent documents, as applicable.
2. General Comment, the NDEP recommends that Executive Summary be added to the Deliverable. The executive summary should clearly states the long-term and short-term remediation goals of the NERT site.	An Executive Summary, which clearly provides the long-term and short-term remediation goals for the NERT site, will be included in the revised RI/FS Work Plan.
3. General comment, the NDEP requests that NERT revise the Deliverable to include specific methods for calculating values for the following four performance criteria:	As part of the Groundwater Extraction and Treatment System (GWETS) Optimization Study, a memo describing proposed performance metrics will be developed and submitted to NDEP for review on November 15, 2013. This memo will include all of the requested metrics and a description of the methodology to be used in the calculation of each metric. The memo can be included as an appendix to the revised RI/FS Work Plan. Note also that an evaluation of the SWF was not included in the initial scope of the GWETS Optimization Study. However, a revised scope will be submitted to NDEP that includes an evaluation of the SWF in the current GWETS Optimization Study.
a. The concentrations at which NERT is achieving 90% and 99% capture of perchlorate and chromium;	
b. Pounds per day mass removal from environment;	
c. Mass discharge at the Athens Road Well Field and the Seep Well Field;	
d. Mass loading at Northshore Road. The mass loading at Northshore Road is sum of the mass discharge from BMI Complex and Common Areas, bank and stream bed storage and upper Las Vegas Wash.	
4. General comment, the RI/FS study tasks are outlined in Section 6 (Remedial Investigation/Feasibility Study Tasks) of the Deliverable. Information related to data quality objectives (DQO's), methods for sample collection and analysis, methods for data evaluation and quality assurance, risk assessment methodology, and other critical components to supporting documents, such as a sampling and analysis plan (SAP), should be included in this Deliverable. It is suggested that these items could be included as appendices to allow for ease of future modification.	As discussed with NDEP, a detailed Sampling and Analysis Plan (SAP) and a separate Baseline Health Risk Assessment (BHRA) Work Plan will be developed and submitted to NDEP as separate deliverables, following submittal of the revised RI/FS Work Plan. The SAP will include field sampling plans, a Quality Assurance Project Plan (QAPP) and a site-specific Health and Safety Plan (HASP). Information related to data quality objectives (DQOs), methods for sample collection and analysis, methods for data evaluation and quality assurance, risk assessment methodology, and other components, will be included in these deliverables. The SAP will be submitted to NDEP on or before January 24, 2014 and the BHRA Work Plan will be submitted to NDEP on or before February 21, 2014.

NDEP Comment	Response
<p>5. General Comment, use of the March 9, 2010 health risk assessment (HRA) Work Plan that has been developed and approved for this site is not included in this Deliverable. Since this HRA Work Plan was approved by the NDEP on March 16, 2010, the Trust should consider including it and add the information not covered in it to this RI/FS Work Plan.</p>	<p>ENVIRON has reviewed the NDEP-approved Health Risk Assessment (HRA) Work Plan prepared by Northgate Environmental Management (Northgate) and dated March 9, 2010. ENVIRON will adopt the general risk assessment methodology, including exposure equations, toxicity values, and risk equations, outlined in the HRA Work Plan. However, other elements of the 2010 work plan lacked sufficient detail for ENVIRON to implement or do not account for the completed soil removal action. For example, the conceptual site model (CSM) does not include all exposure pathways that NDEP and/or ENVIRON have more recently identified for evaluation. In addition, exposure units are not identified in the 2010 work plan and the post-removal-action data sets that will be used for the risk assessment are not included. <i>(ENVIRON notes that these data sets were not available at the time the 2010 work plan was prepared.)</i></p> <p>ENVIRON will prepare the BHRA Work Plan to update background information on the site, update the CSM, and describe the approach for dividing the site into exposure units. In addition, the BHRA Work Plan will include preliminary summary statistics for the post-removal data set for the Facility Area as a whole and by exposure unit. Applicable elements from the 2010 HRA Work Plan will be incorporated by reference, and, for completeness, the 2010 HRA will be included as an attachment to the ENVIRON BHRA Work Plan. The contents of the BHRA Work Plan and reliance on some elements of the 2010 HRA Work Plan (as described in this response) will be added to Section 5.0 (Initial Site Evaluation) and/or Section 6.6 (Task 6: Risk Assessment) of the RI/FS Work Plan, as appropriate.</p>
<p>6. General comment, since at least one site Chemical of Potential Concern (COPC) has been identified within the Las Vegas Wash; the Deliverable should include ecological risk. Due to the multiple sources of the downgradient water from the site discharge points, it is noted that this issue may be best addressed after aquifer restoration.</p>	<p>The text of the RI/FS Work Plan will be revised to note that an ecological risk assessment will be prepared for ecological receptors in the Las Vegas Wash (but not for on-site ecological receptors), consistent with our discussions with NDEP. The CSM will be expanded to include off-site ecological receptors. The Trust concurs with NDEP's comment that the off-site ecological risk assessment is best addressed following aquifer restoration; this timeframe will be noted in the revised RI/FS Work Plan.</p>

NDEP Comment	Response
7. General comment, no discussion of radionuclide exposure and risk quantification was included in this Deliverable. The Trust should note that these risks should be addressed in any risk assessment performed for the site.	The text of the RI/FS Work Plan will be revised to include radionuclides as chemicals of potential concern (COPCs) and additionally, to identify exposure pathways unique to radionuclides. The CSM will be revised accordingly.
8. General comment, the RI/FS Work Plan as written does not provide any discussion as to the human health or ecological impacts for Category 1 or 2 Excavation Control Areas (ECAs), the Deliverable should clearly state that potential risks for these ECAs are managed through the Site Management Plan (SMP).	Additional discussion will be added to the RI/FS Work Plan to note that potential human health impacts associated with the Category 1 soils (Excavation Control Areas [ECAs]) will be managed through the Site Management Plan (SMP), as amended. Also, the text will be expanded to discuss the potential human health impacts associated with the Category 2 soils (i.e., soils with COPC concentrations less than soil remediation goals (SRGs) that are not in ECAs). As noted in Comment #6, an ecological risk assessment will not be conducted for on-site ecological receptors. However, potential off-site transport of contaminants from the site to the Las Vegas Wash and the associated ecological impacts will be evaluated.
9. General comment, the validation status of all data utilized in this Deliverable should be clearly stated.	The validation status of data utilized for data analysis and decision making will be provided in the revised RI/FS Work Plan. As agreed upon during discussions with NDEP, the validation status will not be provided for data cited in more qualitative general and/or overview discussions in the RI/FS Work Plan.
10. General comment, all COPCs in groundwater should be addressed in this Deliverable, not just perchlorate and hexavalent chromium.	A complete list of the groundwater COPCs identified based on a review of the available data is presented in Section 5.1.4.2 of the RI/FS Work Plan, and all COPCs in groundwater will be addressed in the SAP. Perchlorate, chromium, and chloroform are the primary site-related chemicals detected in groundwater downgradient of the site. Therefore, the distribution of these three chemicals is presented on Work Plan figures to illustrate the extent of groundwater impact. Since perchlorate is the most widely distributed COPC, the perchlorate distribution is used in the RI/FS Work Plan for the planned RI groundwater investigation locations. The presence and distribution of all COPCs in groundwater will be evaluated in the RI based on both historical data and the investigations that will be conducted as part of the RI.

NDEP Comment	Response
<p>11. Section 2.1 Operational History, page 4, second paragraph, the Deliverables states that the 373 acres are leased to Tronox LLC. Please check the number of acreage for the NERT property, parcels proposed to sell and the leased area and make sure that they are accurate and consistent in all Deliverables.</p>	<p>The acreage of the Tronox-leased area has been checked and determined to be approximately 114 acres. The Trust property, including the Tronox-leased area and sale parcels, is 410 acres. The sale parcels A-H (except E) consist of approximately 145 acres, with approximately 64.2 acres located north of Warm Springs Road (Parcels A & B), 45.2 acres south of Warm Springs Road and north of the GW-11 and WC ponds (Parcels C & D), and 35.4 acres south of Avenue F (Parcels F, G, and H). The acreage of the Tronox-leased area will be corrected in the revised RI/FS Work Plan, and the property sizes noted here will be consistently provided in all future deliverables. In addition, the attached figure showing the acreage of the Trust property, including the Tronox-leased area and sale parcels, will be included in the revised RI/FS Work Plan (Attachment B).</p>
<p>12. Section 2.5.3 Local Hydrogeology, page 9, the Deliverable states that there is no water supply wells within four miles of the site. Please verify this through Nevada Division of Water Resources database and other related information available.</p>	<p>A review of publicly available information regarding the possible presence of water supply wells within four miles of the site will be conducted. A summary of any wells identified will be included in the revised RI/FS Work Plan. If none are identified, the Work Plan will be modified to read "Based on a review of publicly available records, there are no known or reported water supply wells within four miles of the site that extract water from the Shallow, Middle, or Deep Zones." The details of the records and/or databases reviewed will be included in an appendix of the revised RI/FS Work Plan.</p>
<p>13. Section 3.1 Overview of Regulatory Actions and Environmental Investigations: 1970 to 2005, page 10. "Between 1971 and 1976" paragraph: Please specifically identify the surface impoundments constructed and refer to an existing figure, if applicable. "In July 1981" paragraph, first sentence: Please specify the "existing on-site impoundments" and refer to an existing figure, if applicable.</p>	<p>Ponds P-1 and Old P-2 were constructed in May through September 1972 for management of potassium bearing process fluids. Pond S-1 was completed in October 1974 for management of chlorate process liquids. Ponds AP-1, AP-2, and AP-3 were completed by May 8, 1974 for management of ammonium perchlorate liquids. Pond C-1 was completed by December 1974 for management of nonhazardous wastes including cooling tower liquids (Kleinfelder 1993). The "existing on-site impoundments" cited in the "July 1981" paragraph refer to ponds S-1 and P-1.</p> <p>The surface impoundments constructed by the Kerr-McGee Chemical Corporation (KMCC) between 1971 and 1976 and the on-site impoundments existing in 1981 will be specifically identified in the text. These ponds are shown on the "Historical and Active Pond Locations" figure (currently Figure 5-2) in the RI/FS Work Plan.</p>

NDEP Comment	Response
<p>14. Section 3.2.1.2 Investigations of Parcel Soils, page 15, the Deliverable references the “Olin” groundwater treatment system. NDEP understands that the referenced groundwater treatment system is owned and operated by a group of companies and is generally referred to as the Olin Stauffer Syngenta Montrose (OSSM) groundwater treatment system. Please revise as necessary.</p>	<p>The text of the RI/FS Work Plan will be revised to indicate the groundwater treatment system on Parcel E is owned by a group of companies and referred to as the Olin Stauffer Syngenta Montrose (OSSM) groundwater treatment system.</p>
<p>15. Section 3.2.2 Soil Gas, page 17, please discuss why some soil borings were collected at 20’ bgs. NDEP’s understanding is that the total depth of these borings was tied to the depth of the adjacent structures.</p>	<p>Soil gas samples were collected at 5 feet below ground surface (ft bgs), with the exception of four samples collected at 20 ft bgs in the vicinity of Units 3, 5, and 6. In a July 18, 2007 conference call (NDEP 2007), NDEP and Tronox agreed that deeper soil gas samples would be collected from areas with higher chemical concentrations in groundwater, as well as from less impacted areas. Further, as specified in NDEP’s March 26, 2008 approval (NDEP 2008) of ENSR’s Phase B Source Area Investigation – Soil Gas Survey Work Plan (ENSR 2008b), NDEP stated that samples in the vicinity of Unit 3 should be collected below the depth of the Unit 3 basement, which was occupied with engineering staff (Northgate 2010). Based on these discussions, 20 ft bgs samples were collected as follows: SG-41, near Unit 3; SG-36, near an area of higher chloroform concentrations in groundwater (ENSR 2008a); and SG-37 and SG-38, near areas with relatively lower chloroform concentrations in groundwater (ENSR 2008a). The text of Section 3.2.2 will be revised to include the rationale for collecting some soil gas samples at 20 ft bgs.</p>

NDEP Comment	Response
16. Section 3.2.3 Indoor Air, page 18, 2 nd paragraph, NDEP provides the following comments:	Please see the following responses to the individual comments:
a. The Deliverable references “occupational exposure levels”, please clarify if these are OSHA PELs or a site-specific derived number.	<p>The text will be revised to indicate that the “occupational exposure levels” are the American Conference of Governmental Industrial Hygienists (ACGIH) 8-hour Threshold Limit Values (TLVs). Further, to avoid possible confusion as to the intent of the statement in this paragraph regarding a 1×10^{-5} risk level, a statement regarding NDEP’s point of departure will be added. The revised text is provided below:</p> <p style="padding-left: 40px;">Northgate (2011a) reported that the maximum and mean indoor air concentrations of the target analytes were significantly below their respective occupational exposure levels (specifically, Threshold Limit Values [TLVs]), and that mean indoor air concentrations were below risk-based commercial air concentrations corresponding to a 1×10^{-5} risk level. (It is noted that the NDEP point of departure for exposures to chemicals in indoor air resulting from site-related releases is 1×10^{-6}.)</p>
b. The Deliverable references 10^{-5} as a point of departure for risk due to soil gas. Please revise the Deliverable to indicate that 10^{-6} is the point of departure for risk due to soil gas.	The RI/FS Work Plan states “Northgate (2011a) reported that the measured chloroform concentrations were below occupational levels and below the 1×10^{-5} risk level.” Although the Work Plan does not state that 10^{-5} is the point of departure, ENVIRON will add the following sentence to avoid possible confusion as to the intent of the statement: “(The NDEP point of departure for risk due to soil gas is 1×10^{-6} .)”

NDEP Comment	Response
<p>17. Section 4.1 Interim Soil Removal Actions and Health Risk Assessments at the Facility Area, page 25, 2nd paragraph, please revise this paragraph to note that the Revised Interim Soil Removal Action Completion Report was approved by NDEP on December 6, 2012. Sections 4.3 Site-wide Health Risk Assessment for Soil Gas, 5.1.3 Summary of the Soil Conceptual Site Model (CSM), and 5.1.5.2 Exposure Media and Pathways, pages 26, 44, and 49, respectively, the risk assessment should address exposure to soil gas for all ECAs and all on-site receptors. Further, should the risks or HIs exceed 10^{-6} or 1, respectively, for any on-site populations, then off-site exposures should be quantified as well.</p>	<p>The referenced paragraph will be revised to note that the Revised Interim Soil Removal Action Completion Report was approved by NDEP on December 6, 2012.</p> <p>Sections 4.3, 5.1.3, and 5.1.5.2 (pages 26, 44, and 49, respectively) will be revised to note that exposures to potential current and future indoor receptors will be evaluated for all soil categories (i.e., Categories 1, 2, 3, and 4) where data indicate that groundwater and/or soil gas is contaminated with volatile organic compounds (VOCs). If risks or HIs exceed 10^{-6} or 1, respectively, for the on-site indoor commercial/industrial worker, then potential risks to on-site outdoor commercial/industrial workers will also be quantified. If risks or HIs exceed 10^{-6} or 1, respectively, for the on-site outdoor commercial/industrial worker, then potential risks to off-site populations will also be quantified.</p>
<p>18. Section 4.4.1.2 Perchlorate Removal and the Athens Road and Seep Well Fields, NDEP provides the following comments:</p>	<p>Please see the following responses to the individual comments:</p>
<p>a. Page 28 – 30, chromium removal should also be discussed at the Athens Road Well Field (AWF) and the Seep Well Field (SWF). Please revise as necessary.</p>	<p>Chromium is removed at the Athens Road Well Field (AWF) and the Seep Well Field (SWF), but at substantially lower concentrations than from the Interceptor Well Field (IWF). Because the concentrations of total chromium within extraction wells at the SWF are well below the GWETS effluent discharge limitation of 0.1 mg/L (7-day average), groundwater extracted from the SWF is not treated specifically to remove chromium. However, some incidental chromium removal is achieved in the fluidized bed reactors (FBR).</p> <p>Total chromium concentrations in extraction wells at the AWF range from <0.0020 to 1.4 mg/L (May 2013 data). As noted at the bottom of page 32 (in Footnote 16), a small ferrous sulfate drip system is located at the AWF lift station (Lift Station 3) to treat the chromium in groundwater captured at the AWF.</p> <p>Chromium removal is discussed within Sections 4.4.2.1 and 4.4.2.2 (pages 31-34) of the RI/FS Work Plan. The text of Section 4.4.1.2 (pages 28-30) will be revised to also discuss chromium at the AWF and SWF.</p>

NDEP Comment	Response
<p>b. Page 30, 4th paragraph, the total perchlorate removed from AP-5 is 1,176 tons that is less than the number of 1,295 tons reported in Page 4 of TRX-NDEP_RTC_AP5 Pond Info Req 12-10-10 (ENVIRON, 2012), please show how the value was calculated identifying what data was used. Additionally, please revise text as necessary for consistency.</p>	<p>The estimate of 1,176 tons was calculated in ENVIRON's March 30, 2012 memo (ENVIRON 2012) regarding discontinuation of treatment of AP-5 pond water at the site. The estimate of perchlorate removed from AP-5 was calculated from monthly GW-11 flow and perchlorate data provided by Veolia, for the period from September 2006 to June 2011. Data from GW-11 was used since it has received the water pumped from AP-5. Based on the monthly flow and concentration data, the mass of perchlorate was calculated for each month, which were summed to obtain the estimate of 1,176 tons. These numbers are consistent with those presented on Figure 3 of the March 30, 2012 memo that illustrates the trend for contribution of AP-5 perchlorate, through the GW-11 Pond. The basis of the 1,295 ton estimate prepared by Northgate on behalf of Tronox in December 2010 has been requested from Northgate; however, as the date of this response, the information has not yet been received. These estimates will be further reviewed and additional information on the basis of each estimate will be included in the revised RI/FS Work Plan.</p>
<p>19. Section 4.4.2.1 Description of the Current Groundwater Extraction and Treatment System (GWETS), page 32. The Trust should describe the GWETS in more details. Basic information should be included is:</p>	<p>Additional details of the GWETS will be included in the revised RI/FS Work Plan. As of July 24, 2013, the GWETS Operator is Envirogen Technologies, Inc. (Envirogen). ENVIRON will work with Envirogen to address NDEP's specific requests listed in this comment.</p>
<p>a. The diameter, length and capacity of the pipe lines from the lift station 1 to lift station 2, from the lift station 3 to lift station 2, from left station 2 to the GWETS, the fluidized biological reactor (FBR) to the effluent discharge point at the Las Vegas Wash;</p>	<p>Pipeline diameter and lengths are generally available in design drawings, but capacities are not available. Capacity of the various sections of the pipeline would need to be determined by hydraulic analysis. The pipeline lengths and diameters are presented in Attachment C. Where specific diameters were not indicated in the design drawings, the diameters were assumed based on available information on either end of pipe. This information will be updated as necessary in the revised RI/FS Work Plan.</p>
<p>b. The capacity of all pumps in the GWETS;</p>	<p>The capacities of the pumps in the GWETS are provided in Attachment D. This information will be included in the revised RI/FS Work Plan.</p>
<p>c. The hydraulic and mass loading capacity of the Groundwater Treatment Plant or GWTP for the chromium treatment;</p>	<p>According to Envirogen, the current configuration of the Groundwater Treatment Plant (GWTP) has a design maximum capacity of 75 gallons per minute (gpm) at a maximum hexavalent chromium concentration of 15 milligrams per liter (mg/l).</p>

NDEP Comment	Response
<p>d. The hydraulic and mass loading capacity of the FBR;</p>	<p>The FBR design hydraulic flow is 1,000 gpm (at a contaminant loading of 1,800 equivalent pounds per day). Although the FBRs could handle an increased flow at a decreased contaminant load, the hydraulic capacity of the effluent discharge pipeline is approximately 1,000 gpm. The maximum contaminant (nitrate, chlorate, and perchlorate) loading to the FBR is 1,800 equivalent pounds per day as calculated with the following formula:</p> <p>Equivalent Pounds $= ((0.9 \cdot \text{NO}_3) + (0.17 \cdot \text{ClO}_3) + (0.18 \cdot \text{ClO}_4)) \cdot ((\text{gpm} \cdot 1440) / 1000) \cdot 8.34.$</p>
<p>e. The capacity of GW-11 pond, the perchlorate concentration, water level elevation and volume of present GW-11 and the roles of GW-11 in the GWETS.</p>	<p>The maximum operating capacity of the GW-11 pond is approximately 62.4 million gallons (Mgal) with an allowed three feet of freeboard, which corresponds to a maximum operating water elevation of 1,747 feet above mean sea level (amsl). As an emergency contingency, the GW-11 pond may be operated at two feet of freeboard with prior notice to NDEP and the Nevada Division of Water Resources (NDWR). The capacity with two feet of freeboard is approximately 67.1 Mgal, corresponding to a water elevation of 1,748 feet amsl.</p> <p>The current water level elevation (as of October 3, 2013) is 1743.85 feet amsl, which corresponds to a water volume of approximately 48.2 Mgal. The most recent concentration of perchlorate in the GW-11 pond (sampled September 3, 2013) was reported as 56 mg/L.</p> <p>This information regarding the capacity of the GW-11 pond, the current perchlorate concentration, water level elevation and pond volume for GW-11, and the role of GW-11 in the GWETS will be included in the revised RI/FS Work Plan.</p>

NDEP Comment	Response
<p>20. Section 4.4.2.1 Description of the Current Groundwater Extraction and Treatment System, page 32, the Deliverable states “From the equalization tanks, the blended water flows through activated carbon beds to remove organic compounds before being filtered”, NDEP provides the following comments:</p>	<p>Please see the following responses to the individual comments:</p>
<p>a. The Trust should consider or discuss some means of filtration prior to the activated carbon beds to extend their useful life. It is understood that this evaluation is being deferred to a future Deliverable. Please track this matter as a data gap and address this matter in that Deliverable.</p>	<p>While it is true that there is no means of filtration prior to the carbon beds, this does not necessarily reduce their useful life. When the pressure drop across the carbon beds increases—thus indicating clogging of the beds—the beds are backwashed using stabilized Lake Mead water to remove the particulates. During backwash events, the carbon remains in the vessels and is reused until the adsorptive capacity of the carbon is ultimately spent, while the particulates are discharged to the GW-11 pond.</p> <p>The discharge of particulates to the GW-11 pond is a matter that will be evaluated as part of the ongoing performance evaluations of the GWETS. Over time solids have accumulated in the GW-11 pond. Currently, the Trust is in the process of estimating the amount of solids in the GW-11 pond and evaluating possible removal methods.</p> <p>A detailed evaluation of the existing treatment system is considered beyond the scope of the RI/FS Work Plan but will be included as part of the analysis of Remedial Action Alternatives in the FS. Envirogen will evaluate the GWETS operations and recommend improvements that can be made to the GWETS to enhance performance and cost efficiency. If, based on Envirogen’s analysis, changes to the GWETS are warranted to increase performance/efficiency in the short term, such changes will be proposed to NDEP.</p>
<p>b. NDEP is not aware of any data that has been presented to date to demonstrate what sort of efficacy the activated carbon beds have and what compounds are being addressed. This issue is of increasing importance due to the high levels of organic compounds that may be approaching the system from the west. It is understood that this evaluation is being deferred to a future Deliverable. Please track this matter as a data gap and address this matter in that Deliverable.</p>	<p>Trespassing organic compounds from west of the site are a data gap that will be addressed as part of the RI/FS. It is anticipated that the efficacy of carbon beds will be evaluated and as noted in the response to Comment #20a, if changes to the GWETS are warranted to increase performance/efficiency in the short term, such changes will be proposed to NDEP.</p>

NDEP Comment	Response
<p>c. Last paragraph, last sentence: Is the “seep surface-flow capture sump” the same as the “weir-sump” referred to in Section 4.4.1.2 that was constructed in 1999?</p>	<p>Yes, the “seep surface-flow capture sump” and “weir sump” refer to the same feature. The text of the RI/FS Work Plan will be revised to be consistent when referring to this feature.</p>
<p>21. Section 4.4.2.1 Description of the Current Groundwater Extraction and Treatment System, page 32. When referencing laboratory quantification limits, e.g., “chromium concentrations in the SWF pumping wells are below laboratory quantification limits,” the Trust should identify what reporting limit is currently being used.</p>	<p>In the revised RI/FS Work Plan, where discussed, the specific laboratory quantitation limits will be identified.</p>
<p>22. Section 4.4.2.2 Performance of the Current Groundwater Extraction and Treatment System, page 33, the Trust should estimate on how much perchlorate mass remains in the subsurface and this estimate (or range) may be developed for use in assessing remedial durations of various alternatives.</p>	<p>The RI/FS Work Plan will be revised to include estimates of remaining perchlorate mass, which were presented in Attachment 1 of the <i>Annual Remedial Performance Report for Chromium and Perchlorate July 2012-June 2013</i> submitted to NDEP on August 30, 2013. Three methodologies were presented using 2012 data. The range of remaining perchlorate within the plume boundary was estimated to be between 2,674 and 3,728 metric tons. Estimates of perchlorate remaining were also prepared using 2006 and 2002 data. In 2006, the remaining perchlorate mass was estimated in the range of 3,724 to 3,843 metric tons. In 2002, the mass was estimated in the range of 5,514 to 6,743 metric tons. The previously referenced report includes a detailed discussion of the methods and assumptions used to prepare the mass estimates.</p>
<p>23. Section 4.4.2.2 Performance of the Current Groundwater Extraction and Treatment System, page 34, there is no description of chromium removal for AWF and SWF, please discuss how the chromium of AWF and SWF is removed and identify the maximum capacity of chromium removal for these two well fields.</p>	<p>Please see response to Comment #18a.</p>
<p>24. Section 4.4.2.2 Performance of the Current Groundwater Extraction and Treatment System, last paragraph, page 34. The installation of new extraction wells to capture the current withdrawal gaps at the ends of the IWF and downgradient of the AWF. The Deliverable suggests upgrading the existing system and adding additional wells at IWF and AWF to capture bypass flows in those areas. It would seem that additional wells and augmented treatment between the Wash and the AWF could potentially be installed along the center line of the perchlorate plume.</p>	<p>Preliminary Remedial Action Alternatives (RAAs) (Section 5.3.4) were identified in the Work Plan based on the proposed Remedial Action Objectives (RAOs) identified and preliminary screening of remedial technologies and process options. Based on this analysis, enhanced groundwater containment and recovery has been identified as a required component of future remedial action at the site and was included as a component of each Preliminary RAA identified in the Work Plan. The installation of additional wells and augmented treatment to target the center of the plume between the AWF and the Wash will be evaluated as part of the RI/FS, as will other potential configurations.</p>

NDEP Comment	Response
<p>25. Section 4.5 Groundwater Monitoring Program, page 35, last paragraph, the Deliverable states that samples are analyzed for perchlorate and total dissolved solids (TDS). Please clarify whether chromium is analyzed and if not; please discuss why chromium is not included. Please clarify if all of the sampling and analyses described are related directly or indirectly to NPDES permit compliance.</p>	<p>This particular paragraph discusses only the monthly sampling of groundwater wells, which is intended to evaluate performance of the perchlorate removal measures specifically. Chromium sampling and analysis is performed during the quarterly and annual events. The majority of groundwater sampling and analysis is not related to NPDES permit compliance. In fact, only one groundwater well is sampled quarterly as part of the NPDES monitoring. The remaining groundwater samples are for monitoring the status of the groundwater plumes and for evaluating performance of the GWETS. The text of the RI/FS Work Plan will be revised to clarify this information.</p>
<p>26. Section 4.6 Proposed Additional Interim Removal Actions, page 36, Remove “Interim” from title of this section for consistency with the National Contingency Plan (NCP).</p>	<p>The requested change will be incorporated into the revised RI/FS Work Plan.</p>
<p>27. Section 4.6 Proposed Additional Interim Removal Actions, page 36. As described at the February 2013 NERT Annual Stakeholder Meeting, an ion-exchange system is currently being considered by the new GWETS operator for treatment of the seep area wells. This proposed remedial alternative is not described in the RI/FS Work Plan. It would appear this effort should be considered as a treatability pilot study, similar to the intent of the permeable reactive barrier (PRB) proposal. This effort to consider ion-exchange for downstream plume remediation should be included as part of the RI/FS with the proposed approach fully described in the RI/FS Work Plan.</p>	<p>Ion exchange was evaluated as part of the screening process and retained as a process option (see Table 5-3 page 6 of 23) for further evaluation in the RI/FS. At this time, we do not believe that a treatability study is warranted because ion exchange is a well-developed technology with significant operational information readily available to allow evaluation in the RI/FS.</p>
<p>28. Section 4.6.2 AP-5 Pond Solids Characterization and Disposal, page 37, the Deliverable states that “step two has been completed to the extent possible utilizing the existing AP-5 pond pumping system.” Please clarify whether additional dewatering will be needed prior to implementation of Task 3 (solids removal and disposal) or if implementation of Task 3 can commence without additional dewatering.</p>	<p>Since submittal of the RI/FS Work Plan, the AP-5 pond dewatering (step 2) has been completed and characterization of residual solids in the AP-5 pond for off-site disposal (step 3) is in progress. In addition, the AP-5 pond solids characterization work plan, submitted to NDEP on September 28, 2012, was approved by NDEP on February 4, 2013. Section 4.6.2 of the RI/FS Work Plan will be updated to provide the current status of work for the AP-5 pond solids characterization, removal, and disposal.</p>
<p>29. Section 5.1.1 Potential Contaminant Sources and Release Mechanisms, page 40, 5th bullet the discussion should include the remainder of the ditch system and conveyance systems. Please revise as necessary.</p>	<p>The text of the 5th bullet in Section 5.1.1 of the Work Plan will be revised to include the remainder of the ditch system and conveyance systems.</p>

NDEP Comment	Response
<p>30. Section 5.1.1.1 Source Area, page 41, this section does not address the numerous tenants that have occupied the site. Any effects that these operations have on work to be performed during development of the RI/FS should be described. Also, if current or anticipated tenant operations have the potential to impact the recommendations that may result from the RI/FS process, that should also be fully described in the Work Plan. Please discuss how this issue will be addressed in the RI/FS process.</p>	<p>The RI/FS Work Plan will be revised to acknowledge the existence of data gaps in areas with no or limited sampling because of access constraints that precluded soil characterization (e.g., soils beneath Unit Buildings or active ponds). As part of the RI/FS process, the available sampling data for all areas of the site, including areas with no or limited data and deeper soils (>10 ft bgs) will be reviewed to identify data gaps and strategies for sampling, containment, and/or remediation.</p> <p>The RI/FS Work Plan will be revised to integrate the following points:</p> <ul style="list-style-type: none"> • With respect to former tenants at the site, it is ENVIRON's understanding that the need to investigate areas potentially impacted as a result of former tenant operations would have been addressed through NDEP's identification of LOUs and the Phase A and B investigations conducted at the LOUs. • While the primary current tenant, Tronox, is discussed in the work plan, additional information (location and operations) will be provided for other current tenants. • The revised RI/FS Work Plan will acknowledge that RI/FS planning must take into consideration the presence of current tenants and that soil investigations conducted to date have been impeded by current building footprints and associated infrastructure, leaving data gaps in the investigation. • The revised Work Plan will acknowledge that the presence of tenant buildings and associated infrastructure will be considered in evaluating possible remedial alternatives. • In conducting any remedial action, potential exposures/risks associated with the inhalation pathway (and any other relevant pathways) for tenants (and off-site receptors) will be considered.
<p>31. Section 5.1.1.2 Neighboring Properties, NDEP provides the following comments:</p> <p>a. Page 42, 1st paragraph of section, NDEP would like to clarify that the unlined Beta Ditch transported the contaminants from the west through the Trust site.</p> <p>b. Page 43, 2nd paragraph, please include the LOU number for the Hazardous Waste Landfill for consistency.</p>	<p>The information requested in points (a) through (c) will be added to the text of the revised RI/FS Work Plan.</p>

NDEP Comment	Response
<p>c. Page 43, the historic BMI Dump is not listed as an off-site source. This facility was upwind of the Trust site and reportedly received asbestos containing materials (ACM) amongst other wastes streams. Please include the BMI Dump in all off-site source lists.</p>	
<p>32. Section 5.1.2 Release Mechanisms and Potential Migration Pathways, page 44, it appears that vapor intrusion and rewetting of the soil column via rising water levels and subsequent smear zones is not addressed in this Section. Please revise to address this comment.</p>	<p>Section 5.1.2 will be revised to include vapor intrusion and rewetting of the soil column and subsequent smear zones as a transport pathway.</p>
<p>33. Section 5.1.3 Summary of the Soil CSM, page 44, there is the appearance of an inconsistency with respect to the emphasis on leaching to groundwater as a basis for data gaps and the site history described in earlier sections of this Deliverable. A well-documented rationale for focusing on groundwater leaching must be provided or the Deliverable must be amended to address sampling to characterize surface and near-surface exposures. Soil COPCs related to possible surface exposure pathways must include all site-related COPCs, not only those identified in groundwater. The basis for this request follows:</p> <p>As described in the last paragraph of Section 5.1.3 of this Deliverable, the interim soil removal focused on the 0 to 10 ft below ground surface (bgs) horizon with the primary concern for deeper soils being leaching to groundwater. Following the interim removal, footnote 21 states that there was backfilling and grading, such that the new ground surface may consist (presumably) of clean fill of some (presumably variable) thickness. This Deliverable, therefore, addresses soils within the ECAs where grading and backfill may only partially address potential future soil exposures (that is, grading and backfill resulting in fill depth of <10 ft). The work plan also addresses soils outside of ECAs where contamination may (presumably) exist at or near the ground surface. COPCs, DQOs and sampling designs to address surface exposure pathways and groundwater-leaching pathways may substantially differ.</p>	<p>The text of the RI/FS Work Plan will be revised to provide a more balanced discussion of (1) leaching to groundwater as a basis for data gaps and (2) soils with post-removal contamination in the 0-10 ft depth interval as a basis for data gaps. The current emphasis on leaching to groundwater is supported by (1) the relatively small area of the site where soil remediation goals (SRGs) are exceeded within the post-removal 0-10 ft depth interval and the area is not identified as an ECA (see Category 3 areas shown on Figure 5-3 of the RI/FS Work Plan), and (2) a substantial number of post-removal subsurface samples in Category 3 areas that can be used to support the BHRA. Text will be added to the Work Plan to state that there are post-removal soil samples in Category 3 areas and that these samples will be used for the risk assessment. In addition, the text will note that an ongoing review of the available analytical results for these samples is being conducted as part of the BHRA Work Plan and data gaps evaluation for the SAP. Soil samples for collection will be identified in the SAP to address any data gaps identified based on this review. <i>(We note that Category 1 and 2 soils do not require a soils data gap evaluation. Specifically, Category 1 soils are ECAs and risks will be managed through the SMP. For Category 2 soils, COPC concentrations are less than SRGs within the current 0-10 ft depth interval. Category 4 soils [soils not previously investigated] are identified for investigation in the Work Plan.)</i></p>

NDEP Comment	Response
<p>34. Section 5.1.3 Summary of the Soil CSM, page 45, last paragraph, please clarify if the soil horizons referenced are the pre-excavation 0 to 10 ft bgs horizon or the post-excavation 0-10 ft bgs horizon. Please note that this issue occurs several times in this Deliverable but will not be repeated. Please revise the Deliverable as necessary to address this comment.</p>	<p>The text throughout the Work Plan will be revised to identify if the discussion is in reference to pre- or post-excavation 0-10 ft soil horizons.</p>
<p>35. Section 5.1.3 Summary of the Soil CSM and Section 5.4.1 Soil (Data Gaps), pages 44 and 65. The soil CSM focuses on accessible soils with COPCs that exceeded soil remediation goals (SRGs) in the upper 10 feet of the soil column. Based on the soils evaluation, the surface and near surface soils were placed into four categories, and ECAs were identified where soils with COPCs that exceeded the SRGs were removed. The ECAs included accessible areas and depths to 10 feet. Unfortunately, the soil removal actions did not address inaccessible areas or those areas where high perchlorate and other COPCs exist at depths greater than 10 feet below the ground surface. The RI/FS Work Plan should also provide greater information with regards to the “access and other constraints” that did not allow characterization of some soils. A significant data gap needs to be acknowledged for the areas where soluble compounds, perchlorate specifically, exist in inaccessible areas such as beneath existing and former processing buildings or at depths greater than 10 feet. These areas should be identified in the Work Plan as requiring investigation for remediation planning.</p>	<p>For clarification, ENVIRON notes that ECAs were established where soils with COPCs exceeding SRGs were left in-place due to access constraints. On-site human health risks associated with ECAs are managed through the approved SMP. The RI/FS Work Plan will be revised to acknowledge the existence of data gaps in areas with no or limited sampling because of access constraints that precluded soil characterization (e.g., soils beneath Unit Buildings or active ponds). As part of the RI/FS process, the available sampling data for all areas of the site, including areas with no or limited data and deeper soils (>10 ft bgs) will be reviewed to identify data gaps and strategies for sampling, containment, and/or remediation.</p>
<p>36. Section 5.1.4 Summary of the Groundwater CSM, NDEP provides the following comments:</p>	<p>Please see the following responses to the individual comments:</p>
<p>a. Page 45, the Deliverable states that the data has not been fully evaluated for the Category 3 and 4 areas. The data has been collected and available for evaluation. Please discuss and establish a schedule to address this comment.</p>	<p>It appears that this comment refers to Section 5.1.3 (Summary of the Soil CSM) rather than Section 5.1.4. The text on p. 45 states “Based on the review conducted to date...” and footnote 22 states “Additional Category 3 and 4 areas may be identified during completion of the data review.” This section will be revised to state that during the detailed data review that will be completed during preparation of the BHRA Work Plan, it is possible that additional areas would be classified as Category 3 or 4.</p>

NDEP Comment	Response
<p>b. Page 46, the Deliverable states that the Leaching-Based Site-Specific Level (LSSL) Deliverables have not been approved by NDEP. Please clarify the approval status of these LSSL documents. Please note that NDEP disagrees with the use of DAF 20 for any evaluation at the site without supporting documentation and approval, which affects a number of sections of the Deliverable. Please revise the Deliverable as necessary to address this comment.</p>	<p>As stated in the RI/FS Work Plan, the Leaching-Based Site-Specific Level (LSSL) document by Northgate dated February 14, 2011, has not been approved by NDEP. The RI/FS Work Plan will be revised to clarify that the Northgate LSSL document will not be revised and resubmitted, and that it will not be used in future evaluations. The initial screening of soil COPCs based on the Northgate document presented in the current draft of the RI/FS Work Plan will be replaced in the revised Work Plan by an updated screening against NDEP's leaching-based basic comparison levels (LBCLs). This revised screening will be based on a dilution attenuation factor (DAF) of 1. If warranted, ENVIRON may develop LSSLs for specific chemicals and/or locations, and will include appropriate justification for their use.</p>
<p>c. Page 46, the Deliverable states "ENVIRON is currently updating the screening of vadose zone soil concentrations against the leaching-based basic comparison levels (LBCLs) using a soil dataset that has been revised to incorporate changes resulting from the interim soil removal action." If LSSLs are not going to be derived, then please remove or modify the discussion of the LSSL Deliverable to clearly state that the LSSLs Deliverable will not be used in the future and the Trust will default to the LBCLs.</p>	<p>See response to Comment #36b.</p>
<p>d. Page 46, the Trust proposes to use a 5% frequency of detection (FOD) as a screen for site-related chemicals (SRCs). NDEP disagrees with this approach as on a general site-wide basis without localized hot spots analysis. Please provide how hot spot analysis will be performed to address this concern.</p>	<p>The RI/FS Work Plan will be revised to clarify how hot spot analysis will be performed as part of the screening process for COPCs. Before a chemical is screened out as a COPC for having a detection frequency of less than 5%, the spatial distribution of detections will be evaluated to determine whether they occur in a limited "hot spot" area or are spread more or less randomly throughout the site.</p>
<p>37. Section 5.1.4.1 Leaching-Based Soil COPCs, page 47, 1st paragraph. Please provide the reference for the NDEP guidance that is being cited in this paragraph.</p>	<p>The RI/FS Work Plan will be revised to include the referenced NDEP memo in the reference list.</p>
<p>38. Section 5.1.4.2 Groundwater COPCs, NDEP provides the following comments:</p>	<p>Please see the following responses to the individual comments:</p>
<p>a. Page 47, USEPA MCLs should have primacy over NDEP basic comparison levels (BCLs). Please revise.</p>	<p>The hierarchy will be revised to list USEPA maximum contaminant levels (MCLs) first and NDEP basic comparison levels (BCLs) second. The remainder of the hierarchy will not change.</p>

NDEP Comment	Response
b. Page 47, per the NDEP comment above, NDEP does not agree with the 5% FOD without inclusion of a hot spot analysis procedure.	The RI/FS Work Plan will be revised to include a description of the hot spot analysis procedure that will be followed as part of the groundwater COPC screening process.
c. Page 47, NDEP believes that TDS should be included in the future evaluations of background and upgradient conditions.	The RI/FS Work Plan will be revised to indicate that the future background evaluation will include total dissolved solids (TDS) and other constituents that may be present in background groundwater above screening criteria.
d. Page 48, screening metals should include mercury and selenium.	Selenium and mercury were not included in the preliminary list of groundwater COPCs because the maximum detected concentrations were below MCLs. When revising the RI/FS Work Plan, we will confirm that the list of COPCs is complete.
e. Page 48, TDS is listed as having no comparison criteria; however, there is a secondary USEPA MCL. Please revise.	The RI/FS Work Plan will be revised to clarify that TDS has a secondary MCL. ENVIRON notes that the secondary MCL is not a health-based criterion.
39. Section 5.1.4.2 Groundwater COPCs, page 47, perchlorate and chromium are the primary site-related chemicals detected in groundwater downgradient of the site but chloroform is present in groundwater downgradient of the site and appears to have potential on-site sources. Please revise to include chloroform in this discussion.	Section 5.1.4.2 of the RI/FS Work Plan will be revised to include chloroform in the discussion.
40. Section 5.1.4.2, groundwater COPCs at the Trust site include radionuclides, which have been identified by previous soil investigations as site-related contaminants. However, external radiation is not identified as a potentially complete exposure pathway in Section 5.1.5.2. This Deliverable pertains to soils within and outside of ECAs that have not been adequately characterized. Unless there is well-documented rationale for limiting the scope of the analyses in un-sampled areas, exposure models must address all potentially complete pathways not only those related to contaminants that exceeded SRGs in existing samples.	Section 5.1.5.2 of the Work Plan will be revised to include external radiation as an exposure pathway.

NDEP Comment	Response
41. Section 5.1.5.2 Exposure Media and Pathways, NDEP provides the following comments:	Please see the following responses to the individual comments:
<p>a. Page 50, regarding off-site receptors, BMI has historically collected ambient air data, which indicates elevated levels of a number of compounds possibly sourcing from the Trust site. Please contact NDEP regarding incorporation of this data into the revised Deliverable.</p>	<p>Our review of the ambient air data collected by BMI indicates that the data are not representative of potential exposures of off-site receptors to site releases of airborne soil particulates. The first consideration leading to this conclusion is that the BMI ambient air data were collected from 2008 through 2010, <u>before</u> the extensive soil removal activities that occurred on the NERT site (i.e., between August 2010 and November 2011). Because site surface soil concentrations decreased as a result of the removal action, BMI's ambient air data would no longer be representative of current site releases. Our review also indicates that the purpose of many of the BMI air monitoring studies was to collect samples to evaluate off-site emissions during remediation and material hauling operations on the BMI Complex, as well as emergency collections in response to chemical odors detected on the BMI Complex. Again, this data would not be representative of current conditions at the site.</p> <p>In the absence of monitoring data, ENVIRON anticipates modeling potential airborne concentrations of COPCs resulting from site releases. The specific approach to be used will be provided in the BHRA Work Plan.</p>
<p>b. Page 50, regarding surface water, the Trust should also consider the impacts to stormwater channels and retention basins adjacent the unit buildings 4, 5, and 6.</p>	<p>The RI/FS Work Plan will be revised to include an expanded discussion of retention basins, storm water channels, and conveyance lines around the unit buildings and other areas of the site. The discussion will include consideration of contaminant transport and associated potential for exposures of on-site and off-site receptors.</p>
<p>c. Page 51, Groundwater paragraph, please contact NDEP regarding revising the text to account for uncertainty (e.g. unknown or historic domestic wells in the area, small potential for groundwater to be used as drinking water in the future, etc.)</p>	<p>Groundwater at the site is not currently used as a source of drinking water and is not planned to be used as a source of drinking water in the future. As described in the response to Comment #12, a review of publicly available information regarding the possible presence of water supply wells within four miles of the site will be conducted. If any such wells are identified in the downgradient area, we will attempt to identify their current status and use. However, given the high TDS concentrations in groundwater in this area, it is highly unlikely that groundwater is currently being used for drinking water from unknown wells or that it would be used for drinking water in the future.</p>

NDEP Comment	Response
<p>d. Pages 50 and 51, for off-site receptors paragraph, the Deliverable states that, "The nine wells operating at the SWF were installed to mitigate this exposure pathway. This system has been extremely effective, reducing the amount of perchlorate entering Las Vegas Wash by approximately 90 percent (Las Vegas Water District 2012)." Please clarify whether this means that the SWF alone has reduced the perchlorate load entering Las Vegas Wash by 90% or the combined IWF/AWF/SWF.</p>	<p>Section 5.1.5.2 of the RI/FS Work Plan will be revised to clarify that the combined effect of the IWF, AWF, and SWF has reduced the perchlorate mass loading to Las Vegas Wash by approximately 90%.</p>
<p>e. Page 51, bulleted list of exposure pathways, this listing should include all pathways of exposure for each population. For example, the "Long term outdoor industrial/commercial workers" should have "inhalation of vapors" included even though this pathway will only be quantified should indoor risk and/or hazards be greater than 10^{-6} and/or a HI of 1, respectively. Figure 5-1 should be updated accordingly.</p>	<p>A comprehensive table detailing all exposure pathways will be prepared to replace the bulleted list of pathways on page 51 and Figure 5-1 will be updated for consistency with the table.</p>
<p>f. The RI/FS Work Plan should also acknowledge that Lake Mead and the downstream Colorado River provides municipal and agricultural water sources for California, Arizona, and Mexico and that these downstream users are also affected by the noted exposure pathways, which, again, have been demonstrated as complete (as opposed to "potentially complete"). Language should be added to identify these additional off-site receptors.</p>	<p>The text of the RI/FS Work Plan will be revised to note that Lake Mead and the downstream Colorado River are the sources of municipal and agricultural water for areas of California, Arizona, and New Mexico, and to identify the additional off-site receptors noted in NDEP's comment.</p>
<p>42. Section 5.2.1.1 Potential Chemical-Specific ARARs and TBC Criteria, page 53, NDEP provides the following comments:</p>	<p>Please see the following responses to the individual comments:</p>
<p>a. None of the solid waste or RCRA regulations appear to be listed.</p>	<p>The solid waste and Resource Conservation and Recovery Act (RCRA) regulations will be added as applicable.</p>
<p>b. The National Historic Preservation Act of 1966 (NHPA) should be included as a potential ARAR. (e.g., historic places, archeological sites).</p>	<p>The National Historic Preservation Act of 1966 (NHPA) will be included as a potential Applicable or Relevant and Appropriate Requirement (ARAR).</p>
<p>c. There are additional sections of NAC 445A which have not been cited such as 445A.121, .122, and .1236. Please re-review NAC445A and include a comprehensive listing of citations.</p>	<p>Following review of NAC445A, the NAC 445A sections 445A.121, 445A.122, and 445A.1236 will be included as relevant.</p>

NDEP Comment	Response
d. Please discuss if the spill control and countermeasures (SPCC) regulation under 40 CFR Part 112 apply to any of the facilities at the site.	The spill control and countermeasures (SPCC) regulation under 40 CFR Part 112 applicability will be considered in the revised RI/FS Work Plan.
e. There are other OSHA citations, such as PELs which appear to be applicable. Please clarify.	Clarification will be provided in the revised Work Plan, as appropriate.
f. Please provide a specific citation for “Clark County Air Quality Regulations”, also please clarify if this address issues specific to the county specific to asbestos.	There are numerous Clark County Air Quality Regulations that are potentially applicable to the various remedial alternatives being evaluated. Although the potentially applicable air regulations are too numerous to list here, the specific and relevant Clark County Air Quality Regulations will be cited in the revised RI/FS Work Plan.
43. Section 5.2.2 Potential Remedial Action Objectives (RAOs) for the Site, page 55. Under “Perchlorate:” Should add EPA’s December 2008 Interim Drinking Water Health Advisory for Perchlorate (of 15 µg/L) as a TBC and PRG (Advisory: Office of Water, EPA 822-R-08-25 of December 2008; and PRG guidance: OSWER Memo of January 8, 2009).	The requested RAOs will be added to the revised RI/FS Work Plan as applicable.
44. Section 5.2.2.1 Short-Term Remedial Objectives, page 55, the Deliverable states that, “This RAO is currently being achieved and (in the short-term) will be met via continued operation of the SWF, the AWF, and the IWF and Barrier Wall System.” The foregoing should be restated to indicate that this RAO is “partially” being achieved, as the perchlorate load in Las Vegas Wash is currently estimated at about 60 to 80 pounds per day.	This RAO was intended to address the primary CERCLA objective of protection of human health and the environment. Implementation and continued operation of the GWETS has reduced perchlorate concentrations in Lake Mead to below current health-based regulatory criteria and is thus determined to be protective and consistent with this short-term RAO. The RI/FS Work Plan will be revised to clarify this statement.
45. Section 5.2.2.1 Short-Term Remedial Objectives, page 55, please provide perchlorate concentrations with references for Las Vegas Wash, Lake Mead, and “downgradient surface water.”	Current perchlorate concentrations for Las Vegas Wash, Lake Mead, and downgradient surface water will be included in the revised RI/FS Work Plan.
46. Section 5.2.2.2 Long-term Remedial Action Objectives, page 56. “Vadose Zone Source Control” bullet: This does not mention prevention of direct contact with constituents in soil that would cause unacceptable risks, such as the “Shallow Soil” for the short-term RAO.	This bullet in Section 5.2.2.2 of the Work Plan will be updated as applicable to include prevention of direct contact with constituents in soil that would cause unacceptable risks.
47. Section 5.3 Development General Response Objectives and Screening Technologies and Process Options, page 56. Please change “Objectives” to “Actions” in title.	The requested change will be made in the revised RI/FS Work Plan.

NDEP Comment	Response
<p>48. Section 5.3.3.1 Process Option Screening Criteria, page 60. Cost is identified as a secondary screening criterion, with a qualitative comparison of capital and O&M costs listed in Table 5-3. Have life cycle costs for the listed technologies been considering this evaluation? If a lower cost treatment will require several more years of operation, this will need to be part of the cost evaluation considered during the RI/FS process, and the approach to conduct this analysis should be clearly defined in the RI/FS Work Plan.</p>	<p>Life cycle costs have been considered, though not explicitly, in the relative cost comparisons in the initial screening process. The initial screening process is intended, consistent with USEPA guidance, to evaluate technologies and process options to determine their overall applicability to the site considering technical feasibility, practical implementability, and cost. Detailed cost estimates are generally not conducted at the screening stage as such estimates require sufficient site-specific information to develop at least a conceptual design. However, this type of detailed analysis, including evaluation of life cycle costs, will be conducted as part of the comparative analysis of RAAs in the feasibility study. The comparative analysis of RAAs will include development of both direct and indirect capital costs, as well as annual/periodic operations and maintenance (O&M) costs. The comparative analysis of alternatives will include a present-value analysis of capital and O&M costs consistent with USEPA guidance (<i>Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA; EPA/540/G-89/004; USEPA 1988</i>)</p>
<p>49. Section 5.3.3.2 Preliminary Selection of Feasible Technology, NDEP provides the following comments:</p>	<p>The requested changes will be made in the revised RI/FS Work Plan.</p>
<p>a. Page 61, Source Control Options, please include soil excavation, hydraulic containment and bioremediation options.</p>	
<p>b. Page 62, Downgradient Plume Options, please also include slurry walls or other containment options.</p>	
<p>c. Page 62, In-Situ Process Enhancement Options, please also include soil flooding and bioremediation options.</p>	
<p>d. Page 63, Discharge Options, please also include the Pittman Bypass Pipeline and enhanced Zero Discharge (i.e. utilize enhanced evaporation mechanisms) as options.</p>	

NDEP Comment	Response
50. Section 5.3.4 Preliminary Remedial Action Alternatives, NDEP provides the following comments:	Please see the following responses to the individual comments:
a. Page 63, it appears that this Section only address groundwater RAOs, please clarify how soil and soil vapor RAOs will be addressed.	This section presented several conceptual RAAs that would be considered likely alternatives given what is known at present. As there are remaining data gaps (particularly for VOCs), this section was not intended to include all potentially applicable alternatives. As discussed at the bottom of page 63 and the top of page 64, it is anticipated that numerous variations on each conceptual RAA identified below will be included for analysis in the FS. As information is obtained in the RI to address data gaps, additional RAAs may be identified and included in future analyses.
b. Page 64, RAA-2, please clarify how this RAA addresses the other COPCs, which are referenced.	As discussed at the bottom of page 63, these conceptual RAAs were developed to address the <i>primary</i> COPCs at the site (perchlorate and hexavalent chromium). It is anticipated that refinement of the RAAs presented in the Work Plan will occur throughout the RI/FS process as additional information is obtained. Specifically, consistent with USEPA guidance, the COPC list will be investigated and refined during the RI, and development of refined RAAs to address all identified COPCs would be incorporated into the FS.
51. Section 5.3.4 Preliminary Remedial Action Alternatives, page 64. Criteria should be established that will be used to evaluate the various technologies/strategies that could be implemented to meet the short-term and long-term RAOs. The NERT should answer if remedial measures that satisfy short-term RAOs and are compatible with long-term RAOs are rated higher than those that satisfy only short-term or only long-term RAOs.	Section 6.10 of the Work Plan identifies the nine criteria, as required by the National Contingency Plan (NCP) [40 CFR 300 (e)(9)(iii)], against which all Remedial Action Alternatives will be evaluated in the FS. As noted in Section 6.10, Compliance with ARARs and Overall Protection of Human Health and Environment (both of which are consistent with the RAOs proposed in the Work Plan) are the primary criteria which all RAAs must meet to be consistent with the objectives of CERCLA. Short-Term Effectiveness, and Long-Term Effectiveness and Permanence are balancing criteria with which to evaluate RAAs, on a comparative basis. The revised Work Plan will present more site-specific criteria for evaluating RAAs with respect to short-term and long-term RAOs.
52. Section 5.4.1 Soil, page 65. The evaluation of soils within all ECAs should be done based on the existing soil boring data.	Analytical results for existing soil borings in ECAs (Category 1 soils) and in all other areas of the site (Categories 2, 3, and 4 soils) will be used to evaluate the potential for leaching to groundwater. The data gap evaluation (presented in the BHRA Work Plan and/or SAP) will consider the existing data and whether additional sample collection and analyses are needed to evaluate leaching of soil contaminants to groundwater.

NDEP Comment	Response
<p>53. Section 5.4.1 Soil, page 65. The areas below Site unit processing buildings have been identified as a significant contaminated source area with presumably the highest levels of perchlorate and possibly other COPCs within the footprint of the contaminated plume. As indicated within earlier comments, greater investigation and characterization of the contamination within the areas below and adjacent to the unit processing buildings must be included within the RI/FS development, with the focus of identifying the potential for these areas to be sources of COPCs that may migrate to groundwater.</p>	<p>The RI/FS Work Plan will be revised to acknowledge the existence of data gaps in areas with no or limited sampling because of access constraints that precluded soil characterization (e.g., soils beneath Unit Buildings or active ponds). As part of the RI/FS process, the available sampling data for all areas of the site, including areas with no or limited data and deeper soils (>10 ft bgs) will be reviewed to identify data gaps and strategies for sampling, containment, and/or remediation.</p> <p>The RI/FS Work Plan will be revised to include an evaluation of the feasibility for assessment of the areas below the site unit processing buildings as potential sources of COPCs that may migrate to groundwater. This evaluation will include a description of the unit buildings, historic operations, and their current status; a summary of existing data collected from previous borings near the unit buildings; identification of data gaps; evaluation of potential investigation methods (including directional drilling) that would include implementability in light of the significant access constraints in this area, and a proposed investigation approach.</p>
<p>54. Section 5.4.2 Groundwater, NDEP provides the following comments:</p>	<p>Please see the following responses to the individual comments:</p>
<p>a. Page 66, the last sentence of the first paragraph should be changed to state that chromium and perchlorate impacts are “partially” mitigated.</p>	<p>The requested change will be made to the text of the revised RI/FS Work Plan.</p>
<p>b. Page 68, Trespassing Chemicals, please note and discuss that there are a number of compounds besides VOCs in the plume approaching from the west.</p>	<p>As noted on page 68, the DNAPL in the trespassing chemicals plume has been analyzed by Montrose and found to contain several VOCs, pesticides, and herbicides. A more detailed review of the Montrose investigation reports will be conducted as part of the RI. ENVIRON believes that this effort is more appropriately part of the RI rather than the RI/FS Work Plan. It will be important for NDEP to keep the Trust informed on the plans by other parties to address the chemicals originating from their sites. It is our understanding that the Trust should assume in conducting the RI/FS, that NDEP will require Responsible Parties at sites upgradient of the NERT site, to contain chemicals at the downgradient property boundary of the site which contains the source.</p>

NDEP Comment	Response
c. Pages 68 and 69, Downgradient Plume – Lateral Extent, NDEP provides the following comments:	<p>Subsequent to these comments, there has been additional discussion with NDEP regarding the delineation of the downgradient plume to be addressed by the Trust in its RI/FS. We understand that the Nevada provisional action level of 18 µg/L for perchlorate will be used as the basis to delineate the boundaries of the area-wide BMI complex commingled groundwater plume. However, within the area of commingled groundwater, where concentrations are several orders of magnitude higher, a different approach is needed to define the Trust's Study Area. Based on the existing data, a 1 mg/L perchlorate concentration appears to provide a basis for separation between the Trust plume and the AMPAC plume to the west. However, on the east side, commingling between the Trust plume and BMI Common Areas plume is more extensive. A geographic boundary (such as Pabco Road) appears to be more practical.</p> <p>Regarding Comment #54c i, the core area of the downgradient plume within the mapped paleochannels will be a primary focus of the FS remedial alternatives evaluations. The suggested wells are positioned to confirm the extrapolated separation between the Trust plume and the AMPAC plume in areas where little data are available.</p> <p>Regarding Comment #54c iv, the figure reference will be corrected.</p>
i. NDEP would like to know how the suggested wells will help the Trust in its remediation, well field optimization, and mitigation efforts at the IWF, AWF, and SWF.	
ii. Page 68, last paragraph, no basis has been provided for the 1 mg/L cut off for delineation of perchlorate versus the health-based screening level of 18 µg/l. Please include justification and discussion addressing this comment.	
iii. Page 69, 1 st partial paragraph, per comments above, NDEP is not aware of any NDEP-approved Deliverable that has been submitted to date that demonstrates a separation of the Trust and AMPAC plumes with an approved screening value, please revise.	
iv. Page 69, 1 st partial paragraph, reference to Figure 5-10 should be revised to Figure 5-11.	
v. Page 69, 1 st full paragraph, NDEP disagrees with the Trust's statements regarding a separate BMI Common Areas plume due to the comparison using a 5 mg/L or 10 mg/L metric that has not been approved by NDEP.	
55. Section 5.4.2.1, Groundwater Analytic Program, page 69, extensive testing of the chromium versus hexavalent chromium speciation has been completed historically. Please review historical data to confirm if this is truly a data gap and revise the Deliverable as necessary.	<p>The text of the RI/FS Work Plan will be revised to clarify that the data gap is related to redox potential which will control the solubility of chromium in groundwater. It is clear from existing data that all dissolved-phase chromium detected in groundwater is hexavalent chromium.</p>
56. Section 6.2 Task 2: Community Relations, page 71. Refer to the NCP to identify the essentials of a community relations plan. Establishing and maintaining an administrative record and public involvement / opportunity to comment at the proposed plan stage are especially important.	<p>Section 6.2 of the RI/FS Work Plan will be revised to reference the NCP and confirm the components of the Community Involvement Plan (CIP) meet the requirements of the NCP, including maintaining an administrative record and providing appropriate opportunities for public involvement, review, and comment. The text will be revised to indicate NDEP has been and will continue to be responsible for maintaining the administrative record.</p>

NDEP Comment	Response
57. Section 6.3 Task 3: Field Investigation, page 72, NDEP provides the following comments:	Please see the following responses to the individual comments:
a. Please clearly describe how the Parcels will addressed or will not be addressed as a part of this and associated future Deliverables.	As discussed with NDEP, the Parcels (i.e., Parcels A, B, C, D, E, F, G, and H) have generally been evaluated in separate investigations and on a timeline separate from investigations of the Facility Area. As agreed with NDEP, the status of the Parcels will be discussed briefly in Sections 1 and/or 2 of the revised Work Plan and all other reference to the Parcels will be deleted from the Work Plan. More specifically, Sections 3.2.1.2 (Investigations of Parcel Soils, p15) and 4.2 (Soil Removal Actions and Health Risk Assessments at the Parcel Areas, p25) will be deleted from the Work Plan. In addition, all text within a section that focuses solely on the Parcels will be deleted.
b. The investigations or evaluation relating to soil gas or ambient air do not appear to be addressed in this Section. Please contact NDEP to discuss how these topics may be handled.	The SAP and/or BHRA Work Plan will describe how soil gas and ambient air will be addressed.
58. Section 6.3 Task 3: Field Investigation, page 72, a Field Sampling Plan should be referenced here or the relevant methodological information should be cited and provided for the activities identified in the bullets.	See response to Comment #4. The detailed SAP will include field sampling plans.
59. Section 6.4 Task 4: Sample Analysis and Data Verification and Validation, page 73, while some relevant references have been cited, this section lacks the details needed to provide a thorough explanation of how sample analysis and data validation will be conducted for this particular investigation. Additional information that needs to be included or identified as to be included in the SAP is:	See response to Comment #4. The detailed SAP will include a QAPP with the requested information.
a. COPCs, media, and associated analytical methods	
b. Laboratories that will be analyzing the data; required detection limits	
c. Identity of who will be performing data validation	
d. Procedure for establishing data quality criteria.	
e. Additionally, please identify that electronic data deliverables will be uploaded to the NDEP Site-Wide Database and will comply with promulgated NDEP guidance on this matter.	

NDEP Comment	Response
<p>60. Sections 6.4 Task 4: Sample Analysis and Data Verification and Validation and 6.5 Task 5: Data Evaluation, pages 73 – 74, the Trust should consider addressing the section of the process in a sub-area fashion.</p>	<p>It is anticipated that the Facility Area will be divided into subareas (exposure units) for risk assessment purposes. Accordingly, Tasks 4 (Sample Analysis and Data Verification and Validation) and 5 (Data Evaluation) would be conducted for the corresponding exposure units. The text of the RI/FS Work Plan for Tasks 4 and 5 will be revised to reflect this approach. Detailed information on the proposed exposure units will be provided in the BHRA Work Plan.</p>
<p>61. Section 6.6 Task 6: Risk Assessment, page 74, NDEP provides the following comments:</p>	<p>Please see the following responses to the individual comments:</p>
<p>a. Superfund guidance for human health risk assessment (OSWER 9200.4-18, August 1997; OSWER 9200.4-31P, December 1999) recommends that cancer risks related to radionuclide and chemical COPCs should be summed. This consideration should inform supporting documents including the SAP and the Baseline Health Risk Assessment Work Plan.</p>	<p>The Trust will use the cited guidance document to inform supporting documents such as the SAP and the BHRA Work Plan.</p>
<p>b. This section is generic and does not provide any specific information or references to indicate how the risk assessment will be conducted. The methods and assumptions for the risk assessment can have a substantial impact on the identification of data gaps and identifying appropriate sampling designs. The work plan should include a discussion of risk assessment methods and assumptions related to these and other relevant subjects to inform the SAP. The references (Section 8) include Environ 2012g, which is listed as a Baseline Health Risk Assessment Work Plan (<i>in preparation</i>) but this reference does not appear in the text and was not available during review.</p>	<p>Please see responses to Comments #4 and 5. The requested information (i.e., the specific details of how the risk assessment will be conducted) will be presented in the BHRA Work Plan and the BHRA approach will inform the SAP.</p>
<p>62. Section 6.7 Task 7: Treatability Studies, page 75. It was indicated at the February 2013 NERT Annual Stakeholder Meeting that pilot testing of an ex-situ ion exchange system will be pursued for the SWF. Is this considered another treatability study with a work plan to be developed?</p>	<p>See response to Comment #27.</p>

NDEP Comment	Response
<p>63. Section 6.10 Task 10 Detailed Analysis of Alternatives, page 76. In evaluating the cost of the alternatives, suggest including alternatives' cost per mass of perchlorate removed/destroyed. In evaluating the "Short-term effectiveness," the Trust should assess the anticipated times to achieve cleanup goals will be particularly important. The RI/FS Work Plan should discuss the means and methods that will be used to identify those cost-effective alternatives that will likely provide the greatest benefit towards achieving the RAOs considering the limited funds available.</p>	<p>The revised RI/FS Work Plan will provide more detail on the approach for performing the detailed analysis of alternatives including discussion of how treatment times will be considered in the analysis. Also see response to Comments #48 and #51.</p>
<p>64. Section 7.1 Project Organization and Responsibilities, page 78. "Ms. Shannon Harbour, PE, previously project manager for the site," should be replaced with "Mr. Weiquan Dong, PE, project manager for the site".</p>	<p>The requested change will be made in the revised RI/FS Work Plan.</p>
<p>65. Section 7.1 Project Organization and Responsibilities, page 78. Suggest updating to reflect transition to Envirogen, giving key milestone dates.</p>	<p>The requested change will be made in the revised RI/FS Work Plan.</p>
<p>66. Section 7.2 Project Schedule, page 79, Add dates on schedule</p>	<p>Calendar dates for anticipated timeframes and completion dates of project tasks will be added to the text of Section 7.2 and to the anticipated project schedule in Figure 7-1 of the revised RI/FS Work Plan.</p>
<p>67. Table 2-1 Summary of Neighboring Properties, NDEP provides the following comments that should be addressed in the revised Deliverable:</p>	<p>Please see the following responses to the individual comments:</p>
<p>a. AMPAC, as discussed above, NDEP has not approved the theory that the AMPAC and the Trust plumes do not commingle as it appears that this theory is based on the concentration metric selected when making this determination. Please contact NDEP to discuss this issue as necessary.</p>	<p>See response to Comment #54c.</p>
<p>b. BMI Common Areas, as discussed above, the BMI Dump, the complete ditch system and other conveyances should be included in this table.</p>	<p>The information requested will be added to Table 2-1 of the revised RI/FS Work Plan, or this information will be provided in a separate table.</p>
<p>c. Tenants should be included in this Table.</p>	<p>Information about site tenants will be added to Table 2-1 of the revised RI/FS Work Plan, or this information will be provided in a separate table.</p>

NDEP Comment	Response
68. Table 4-1 Summary of the Groundwater Monitoring Program. Please include units for well depth and screen interval and clarify if screen interval is referring to depths “below ground surface.”	This requested change will be made in the revised RI/FS Work Plan.
69. Table 5-2 Initial Screening of Remedial Technologies, this table appears to only include groundwater, per NDEP’s comments above, please include how soils, ambient air or vapor intrusion will be addressed. This is an inconsistency that affects numerous sections of the Deliverable, which should be addressed throughout the Deliverable.	This table presents a number of process options and technologies for addressing soils and vapor intrusion in addition to those for groundwater. For ease of presentation, the screening table was generally divided by whether the treatment technology or process option addressed groundwater or “source areas”. Soil and soil vapor are included in the latter category. Because soils are most typically the source of airborne particulates, addressing soil contamination would typically address the ambient air pathway. Therefore, the process options addressing soil, ambient air, and soil vapor are included under the <i>Ex-Situ Source Area Treatments</i> General Response Action (GRA) on pages 7-9 and under the <i>In-Situ Groundwater and Source Area Treatment</i> GRA on pages 9-14.
70. Table 5-3 Secondary Screening of Remedial Technologies, based on issues identified in above-comments, there appear to be a number of incorrect conclusions in this table. NDEP has not provided specific comments for all instances. Please review this table in regards to other comments included in this response letter. However, NDEP provides the following specific comments for this table:	The table will be reviewed with respect to the conclusions on individual process options and technologies. Changes will be made in the revised RI/FS Work Plan where appropriate.
a. Steam/Hot Water Injection, Page 16 of 23, this technology is eliminated because it requires a pilot test, yet two pilot tests are proposed in this Deliverable. This seems like an incorrect and inconsistent screening. Please provide additional rationale for elimination.	<p>This process option was not rejected from further evaluation because it requires a pilot test. Rather, it was rejected because the target contaminants are generally fuels and Semi-Volatile Organic Compounds (SVOCs), not VOCs. On page 16 of 23 under the column “Screening Comments” the text reads as follows:</p> <p><i>REJECTED. The primary target contaminant groups for steam or hot water flushing/stripping are SVOCs and fuels. VOCs also can be treated by this technology, but there are more cost-effective processes for VOCs.</i></p> <p>However, as with all other process options and technologies, as the COPC list is refined during the RI/FS, process options and technologies will be re-screened and re-evaluated as necessary to develop the RAAs as part of the RI/FS.</p>

NDEP Comment	Response
<p>b. In-Situ Chemical Oxidation, page 18 of 23, please note that this technology is not compatible with the chromium groundwater plume and should be eliminated in areas with chromium groundwater contamination.</p>	<p>Table 5-3 (page 18 of 23) currently indicates that In-Situ Chemical Oxidation (ISCO) is not applicable in the treatment of perchlorate and chromium and was retained as a potential alternative for remediation of localized VOCs/DNAPLs in groundwater. It is possible that ISCO can mobilize soil-bound chromium and this will be considered during the evaluation of this technology.</p>
<p>c. Deep Re-Injection Trenches, page 22 of 23, this process option was problematic at the AMPAC in-situ remediation area. Please determine and discuss what studies should be implemented and how conditions at the Trust site are expected to be different than those for AMPAC.</p>	<p>Biofouling was a significant problem with the Deep Re-Injection Trench (DRIT) operated by AMPAC. There may be other configurations of this technology that could reduce biofouling. This process option will be further evaluated in preparation of the revised RI/FS Work Plan.</p>
<p>d. Secondary Screening of Remedial Technologies. Soil excavation for offsite or onsite treatment and disposal should be retained for areas where soils with high perchlorate or other COPC concentrations are present and limited removals would have a significant benefit by eliminating a large perchlorate and/or other COPC mass from the overall source.</p>	<p>Excavation-related process options will be retained through the secondary screening per this request. The revised RI/FS Work Plan will be changed accordingly.</p>
<p>e. Phytoremediation may be a viable technology that could be implemented in the seep area where perchlorate concentrations are relatively low and groundwater is close to the ground surface. This technology should be retained for further evaluation</p>	<p>Phytoremediation will be retained through the secondary screening process and the revised RI/FS Work Plan will be changed accordingly.</p>
<p>71. Figure 2-1 Surrounding Facilities, please depict the BMI Dump per NDEP comments above.</p>	<p>The location of the BMI Dump will be added to Figure 2-1 of the revised RI/FS Work Plan.</p>
<p>72. Figure 4-1 Groundwater Extraction and Treatment System Flow Diagram, NDEP provides the following comments: The ferrous sulfate is added to the Lift Station 3 of AWF. Please clarify where the precipitates are removed for this influent stream and capacity of chromium removal with this method. The comment is also applied to the SWF.</p>	<p>The precipitates are retained in the activated carbon beds and are subsequently backwashed into the GW-11 pond using stabilized Lake Mead water. This practice has contributed to the solids loading of the GW-11 pond, which is discussed in response to Comment #20a. The overall efficacy of the carbon beds is also discussed in response to Comment #20b. The efficacy of the carbon beds, including the effect of the precipitates and the ultimate solids loading to the GW-11 pond, will be evaluated as part of the analysis of Remedial Action Alternatives to be included in the FS.</p>

NDEP Comment	Response
73. Figure 4-5 Well Field Extraction Rates and chromium and Perchlorate Mass Removals, the total Chromium removed from the AWF has slightly increased consistently with time; however, perchlorate has not. Please discuss in the text of the revised Deliverable.	A discussion of the chromium and perchlorate mass removed from the AWF over time will be added to the text of the revised RI/FS Work Plan.
74. Figure 5-1 Preliminary Conceptual Site Model Diagram: Site and Downgradient Plume, the figure does not include ecological receptors; please refer to Figure 5-4, which indicates both terrestrial and aquatic receptors.	See response to Comment #6.
75. Figure 5-2 Historical and Active Pond Locations, the depiction of the Northwest Ditch is inconsistent with what NDEP has seen previously. Please provide a citation for this depiction and discuss with NDEP or revise as necessary.	<p>The depiction of the Northwest Ditch on Figure 5-2 of the RI/FS Work Plan was based on Figure 4-1 of the <i>Phase A Source Area Investigation Results</i> (ENSR 2008a) and Figure 5-2 of the <i>Phase B Source Area Investigation Results, Soil Gas Survey Work Plan</i> (ENSR 2008b).</p> <p>In response to NDEP's comment, ENVIRON reviewed historical reports prepared for the site and other BMI properties. Reports prepared for the TIMET site (Tetra Tech 2005, TIMET 2013) provided additional information on the current locations of the Beta Ditch and Northwest Ditch on the TIMET property as well as the ditch configurations from pre-1955 through 1979. A revised Figure 5-2, incorporating this information, will be provided in the revised RI/FS Work Plan.</p> <p>We note that the locations of the Northwest and Beta Ditches <i>within</i> the site boundary that were shown on Figure 5-2 of the Work Plan are consistent with the ditch locations shown on figures from earlier reports. Thus, ditch locations within the site to be depicted on the revised Figure 5-2 will not change.</p>
76. Figure 5-4 Preliminary Conceptual Site Model Illustration, please explain the relative impact scale, (e.g., minimal relative to which water quality standard, etc.).	Figure 5-4 will be revised to incorporate the requested change.
77. Figure 5-7 Perchlorate in Shallow Groundwater, May-June 2012, please review and address the above-comments regarding justification of using 1 mg/L perchlorate as the basis for the outer concentration contours.	See response to Comment #54c.

NDEP Comment	Response
78. Figure 5-7 Perchlorate in Shallow Groundwater, May-June 2012. Greater resolution based on available monitoring data should be provided on the minimum isoconcentration contours to fully reflect the potential for interactions between the perchlorate plumes originating from the NERT and AMPAC sites.	Please see response to Comment #77. Greater resolution will be provided on the Plate 3 IWF, AWF, and SWF insets where the well density and the available data are sufficient to allow a more detailed interpretation at the scale of the insets.
79. Figure 5-8 Total Chromium in Shallow Groundwater, May-June 2012. Greater resolution based on available monitoring data should be provided on the minimum isoconcentration contours.	Greater resolution will be provided on the Plate 4 IWF, AWF, and SWF insets where the well density and the available data are sufficient to allow a more detailed interpretation at the scale of the insets.
80. Figure 7-1 Remedial Investigation and Feasibility Study Schedule, this figure presents a timeline for a baseline HRA work plan. Please clarify whether the Trust plans on submitting a new HRA work plan or revise the existing one (Northgate 2010).	See response to Comment #5.
81. Plate 2 Potentiometric scaling: Gradients are flatter below the COH Bird Viewing Ponds, possibly due to higher hydraulic conductivity. This needs to be examined in more detail to optimize perchlorate capture while reducing pumping in the SWF area. It is assumed that the SWF wells are partially capturing Las Vegas Wash water, but possibly they are capturing City of Henderson (COH) waste water effluent in the downgradient SWF wells also. Examination of major or trace ion data might be an approach to this issue.	The question of how much surface water is being captured by the SWF will be examined in more detail as part of the GWETS Optimization Study. Results of this analysis will be incorporated into the RI/FS as they are developed.
82. Plate 4 shows WMW5.7N as containing "< 3 mg/L", which is correct; but actual values are probably much lower. For example, WMW5.8SI is something over 200 µg/L. These need to be depicted in more detail to help understand the conditions near the Pabco Weir. TDS is similarly too grossly scaled, showing nothing < 5000 mg/L.	The maps were developed using data available at the time. As part of preparing the revised RI/FS Work Plan, additional data will be sought from the Southern Nevada Water Authority (SNWA) and others as appropriate in order to refine the interpretations in this area.
83. Plate 4 Groundwater Total Chromium Map, Shallow Water-Bearing Zone. The Call-out maps shows the perchlorate concentrations instead of the total chromium concentrations.	This will be corrected in the revised RI/FS Work Plan.
84. Appendix A Letter of Understanding (LOU) Roadmap, Table A-1 Road Map of Site Soil and Soil Gas investigation, NDEP provides the following comments:	As discussed with NDEP, the title of Appendix A, Table A-1 is misleading. Table A-1 identifies investigations <i>completed</i> as of December 2012; that is, Table A-1 was intended to show the current status of investigatory activities at the site and in particular, provide a summary that links the LOUs with historical investigations. Table A-1 is
a. Per NDEP comments above please clarify why ambient air discharges are not being evaluated as part of an HRA.	

NDEP Comment	Response
<p>b. Please clarify whether vast areas of the site will never be redeveloped to justify that soil gas investigations are listed as N/A.</p>	<p>not a roadmap of future investigations planned for the site. The title of the table will be revised and the table will be reviewed and further annotated as needed for clarification.</p> <p>In response to NDEP's specific comment, ambient air discharges and soil gas investigations are being considered in the BHRA, as discussed in the RI/FS Work Plan.</p>
<p>85. Appendix C, Table C-2 McCullough Range Background Radionuclide Concentrations, the McCullough background data appear to be inappropriately divided into depth intervals of 0-6' below ground surface (bgs), 6-10' bgs, and 0-10' bgs when the text (Section C.2.1) states that two depth intervals (0-0.5' bgs and > 0.5' bgs) exist for this dataset. It is unclear what the rationale is for sub-setting the background data into these intervals in Table C-2. Please provide clarification.</p>	<p>Table C-2 (Appendix C), which identifies background concentrations for radionuclides from the McCullough Range dataset, was taken from the soil HRA for Parcels C, D, F, G, and H (Northgate 2012), which was based on the dataset presented in the Background Shallow Soil Summary Report for the BMI Complex and Common Areas Vicinity (Basic Remediation Company [BRC]/TIMET 2007). ENVIRON had understood that the depth intervals presented in the Northgate report (i.e., 0-10 and 0-6 ft bgs) had been discussed with and approved by NDEP. More recently, in Appendix E of the soil HRA for Parcels C, D, F, G, and H (Northgate 2013), the background evaluation for radionuclides was based on 0-10 ft (and not 0-6 ft) samples from the McCullough Range dataset. During discussions with NDEP, ENVIRON understood that NDEP approved of this dataset – and the depth interval used -- for the background evaluation. Table C-2 of the RI/FS Work Plan will be revised to present the dataset for radionuclides that ENVIRON used for the Parcels C, D, F, G, and H evaluation.</p>
<p>86. Appendix D PRB Treatability and Bench Scale Test Study Work Plan, Section 2.2.2 Field-Scale Pilot Objectives, page D-2, as previously stated, the Trust should consider the work completed by AMPAC in their in-situ remediation area, which could be very helpful towards addressing a number of the data gaps in this Appendix.</p>	<p>The work completed by AMPAC involving installation and operation of the active in-situ permeable reactive wall has been reviewed, and considerations as they may relate to the proposed in-situ Permeable Reactive Barrier (PRB) Study at the NERT site will be discussed in the revised Treatability Study Work Plan. In general, ENVIRON believes that the observed biofouling experienced by the AMPAC system was primarily related to the specific design of the system (i.e., mixing extracted groundwater with nutrients and electron donor ex-situ prior to reinjection).</p>

NDEP Comment	Response
<p>87. Appendix D, Section 3.2 Hydrology, page D-5, the Deliverable states that the Shallow Water-Bearing Zone will only be targeted for this study. Please include discussion as to why the Middle Zone and Deep Zone are not considered.</p>	<p>Current information suggests that the primary flux of contaminants is through the more permeable alluvial deposits. Due to the low permeability of the Upper Muddy Creek formation (UMCf), we believe that this zone represents only a small percentage of the contaminant flux and installation of the PRB through this formation was not considered as part of the pilot study. ENVIRON notes that the treatment effectiveness of a PRB in such a tight formation would be limited and extending the PRB into the UMCf could present certain technical challenges and potential impracticalities (particularly for a “trenched”-type PRB) for installation to these depths. The revised Treatability Study Work Plan will include an explanation of this rationale.</p>
<p>88. Appendix D, Section 4 Technology Overview and Rationale, page D-6, as stated above, the Trust should review AMPAC’s experience immediately to the west in the downgradient area or the previous bench scale studies by Shaw and Northgate and include information from the former AMPAC In-Situ System into this work plan.</p>	<p>As indicated in response to Comment #86, the work completed by AMPAC involving installation and operation of the active in-situ permeable reactive wall has been reviewed, and considerations as they may relate to the proposed in-situ PRB Study at the NERT site will be discussed in the revised Treatability Study Work Plan.</p> <p>The results of previous bench scale studies performed by Shaw and Northgate were considered in the development of the Work Plan submitted and were the reason why bench-scale testing has been proposed. Additional discussion supporting this rationale will be provided in the revised Treatability Study Work Plan.</p>
<p>89. Appendix D, Section 5.3.1, Microcosm (Serum Bottle) Testing, page D-11, the Deliverable states the selected electron donors was “based on their ability to be applied to a variety of potential PRB morphologies (e.g., via direct injection, passive diffusion wells or within a trenched wall), their demonstrated success in similar environments based on review of case studies and published research.” The stated success in similar environments appears to disregard AMPAC’s experience less than one mile away. Please incorporate information from the former AMPAC In-Situ System into this work plan.</p>	<p>Additional discussion of AMPAC’s experience in the installation and operation of the active in-situ permeable reactive wall will be added to the revised Treatability Study Work Plan.</p>
<p>90. Appendix D, Section 5.3.1 Microcosm (Serum Bottle) Testing, page D-12, please consider including chlorate analysis.</p>	<p>Chlorate analysis of serum bottles will be added to the revised Treatability Study Work Plan.</p>

NDEP Comment	Response
<p>91. Appendix D PRB Treatability and Bench Scale Test Study Work Plan. The NERT should note applicability of the bench-test results to the field scale test. The NERT may study the FBR to get some information about biomass accumulation in the PRB.</p>	<p>Similar to consideration of the experience of AMPAC in the installation and operation of the active in-situ permeable reactive wall (i.e., that experienced plugging due to the formation of biomass in-situ), operational considerations relative to the formation of biomass accumulation in the FBR will be discussed in the revised Treatability Study Work Plan.</p>
<p>92. Appendix E In-Situ Soil Flushing Treatability Study Work Plan, Section 1.2 Purpose and Objectives, pages 2 – 3, the volume of water infiltrating from the flushing water should be evaluated before the pilot study. The evaluation should include the impact to the groundwater table elevation, the change of capture zones due to rising groundwater table elevation, and the capacity of GWETS and GWTP.</p>	<p>Preliminary Green-Ampt modeling, using various flushing water application rates, was performed to estimate potential mounding under different flushing conditions and these results are currently included in the Treatability Study Work Plan.</p> <p>It is noted, however, that the available information to accurately predict the effect of flushing is limited, and is the purpose of the planned initial field investigation activities (i.e., soil boring, lithologic logging, permeameter testing and soils sampling as described in Section 5 and 6 of the Treatability Study Work Plan) that is proposed.</p> <p>Additional discussion and a figure will be included in the revised Treatability Study Work Plan that includes a projection of potential mounding effects of flushing water (i.e., as can be reasonably predicted from the limited information available and output of the Green-Ampt model) and the effect on the current capture zones and the capacity of the GWETS and GWTP.</p>
<p>93. Appendix E, Section 1.2 Purpose and Objectives, page 2, 2nd bullet, the Deliverable states “Evaluate the potential for other constituents of concern to be mobilized during flushing operations”. Prior to the commencement of any pilot study for soil flushing, please evaluate the mobilization of other COPCs using physical chemical properties and identify any COPCs that may be expected to mobilize due to soil flushing.</p>	<p>The potential for other COPCs to be mobilized during soil flushing was evaluated in bench-scale column tests performed by PRIMA Environmental in 2009. Water was flushed through three columns of soil cores taken from the NERT site. One of the soil cores was collected from RSAM-5 which is located within in the proposed soil flushing pilot area presented in the Treatability Study Work Plan of Appendix E. Based on the results presented by PRIMA, the following COPCs were detected in at least one leachate sample from the RSAM-5 column test and may be mobilized during the soil flushing pilot: chloride, fluoride, nitrate, sulfate, ammonia, chlorate, TDS, total organic carbon (TOC), total suspended solids (TSS), arsenic, boron, calcium, chromium, cobalt, iron, magnesium, manganese, potassium, sodium, uranium, beta BHC. A discussion of these results and the potential for mobilization will be included in the revised Treatability Study Work Plan.</p>

NDEP Comment	Response
<p>94. Appendix E, Section 5.2 Flushing Fluids Characterization, page 8, please clarify whether the cost benefit of not using stabilized Lake Mead water outweighs the complications of using GWETS effluent and the potential negative consequences of using this effluent. Additionally, the Trust should commence discussions with NDEP Bureau of Water Pollution Control prior to planning or implementing any pilot studies. If the GWETS effluent is used, new column leaching tests with the effluent should be completed prior to the commencement of the pilot study. Besides studying the perchlorate recovery from the leaching experiment, other COPCs should be evaluated. The TDS of the effluent from the column leaching experiment should also be determined.</p>	<p>Based on a preliminary analysis of costs, there could be significant cost-savings in using treated effluent versus Lake Mead water for flushing (approximately \$23,000 per acre). This cost analysis will be presented in greater detail in the revised Treatability Study Work Plan.</p> <p>Prior to finalizing the plans for the field-scale pilot test, to evaluate the use of GWETS effluent as a source of flushing water and to assess the potential for leaching of COPCs from the site soils (i.e., due to the higher ionic strength of the GWETS effluent water), bench-scale column testing of site soils using GWETS effluent as a flushing liquid will be performed. This additional bench-scale testing will be incorporated into the revised Treatability Study Work Plan.</p>
<p>95. Appendix E, Section 6 Preliminary Pilot System Design & Operation, page 9, please clarify what sort of air emissions monitoring is expected as part of this work plan.</p>	<p>A discussion of the following air monitoring and control measures will be incorporated into the revised Treatability Study Work Plan. Similar to the air monitoring performed during the earlier soil removal activities at the site, air monitoring will be performed for workers during construction of soil flushing pilot cell using personal DataRAM devices programmed to measure the sixty-second average of real-time dust concentrations. Readings of upwind and downwind concentrations will be measured hourly and recorded in a daily logbook. Dust control measures consisting of wetting the ground surface in the construction area will be implemented. Water for dust control will be obtained from onsite fire hydrants.</p>
<p>96. Appendix E, Section 7.3 Groundwater Monitoring, page 14, please specify the anticipated screened intervals of the wells: specifically which lithologies will be screened and if any wells will be cross-screened.</p>	<p>A table of anticipated screen intervals for wells and piezometers and the associated lithologies screened will be provided in the revised Treatability Study Work Plan. Screened intervals have been summarized in Table 3.</p>
<p>97. Appendix E, Figure 5 Interceptor Trench Projected Capture Zone, please specify the concentrations that were used to develop the inferred capture zone.</p>	<p>An updated Figure with the most recent capture zone projection indicating the associated groundwater concentrations used to develop the inferred capture zone will be provided in the revised Treatability Study Work Plan.</p>
<p>98. Appendix E Treatability Study Work Plan In-Situ Soil Flushing. The NERT should note that</p>	<p>The Trust is aware of the potential challenges associated with groundwater mounding and in-situ lithologic conditions that may affect the treatment of perchlorate. The purpose of the treatability study is to assess such limitations, and to explore means to reduce or manage their effects on a potential full-scale application.</p>
<p>a. Column tests are unlikely to be representative of field conditions, due to the presence of soil structure and lithologic layering and anisotropic hydraulic properties.</p>	

NDEP Comment	Response
<p>b. In practice, maintaining full saturation in soils on a large scale would appear to be difficult, due to development of preferred pathways within the vadose zone (for example, see publications by Dr. Robert Glass, of Los Alamos National Laboratory). There is a substantial body of literature on the spatial variability of vadose zone hydraulic properties.</p>	<p>As discussed in the response to Comment #92, preliminary Green-Ampt modeling was performed to estimate potential mounding under different flushing conditions and these results are currently included in the Treatability Study Work Plan. However, the available information to accurately predict the affect of flushing is limited. During the initial field investigation activities (i.e., soil boring, lithologic logging, permeameter testing and soils sampling as described in Section 5 and 6 of the Treatability Study Work Plan) planned, the conditions encountered in the area of the planned pilot cell will be assessed and incorporated into the final design of the pilot-scale system prior to construction.</p> <p>A discussion of relevant research (e.g., publications by Dr. Glass) will be included in the revised Treatability Study Work Plan.</p>
<p>c. The hydraulic conductivity and ability to transport perchlorate would be substantially lower in vadose zone areas adjoining the preferred pathways. This would act to prolong perchlorate residence time within the soils being treated.</p>	
<p>d. Even if perchlorate-bearing soils are fully saturated (downward unit gradient conditions) the effects of hydrodynamic dispersion and anisotropy due to stratification are likely to prolong the time required for flushing of soils.</p>	
<p>e. Removal of solute from dead-end and tight pore spaces is a diffusion-limited process, again suggesting a relatively long timeframe to clean the soils, which means that the flushing system must operate for an extended period.</p>	
<p>f. Flushing with water from sources outside the GWETS (for example, City of Henderson wastewater treatment plant effluent) for an extended period of time would add to the mass of contaminated water within the plume and increase the likelihood that perchlorate would escape the capture zones (see 10b above).</p>	
<p>99. Appendix F Groundwater Extraction and Treatment System Optimization Study: Preliminary Analysis of Groundwater Capture and Extraction Rates at the Interceptor and Athens Road Well Fields, please note that the NDEP response letter of January 17, 2013 regarding the <i>Annual Remedial Performance Report for Chromium and Perchlorate</i> should also applied to the Appendix F.</p>	
<p>100. Appendix F Groundwater Extraction and Treatment System Optimization Study. The NDEP recommends that capture zone analysis of the SWF should be conducted in the current study. The SWF should be included in the current evaluation and not be delayed for future studies.</p>	<p>An evaluation of the SWF was not included in the initial scope of the GWETS Optimization Study. However, a revised scope will be submitted to NDEP that includes an evaluation of the SWF in the current GWETS Optimization Study.</p>

NDEP Comment	Response
<p>101. Appendix F, Section 1 Introduction, page F-1, the Trust should consider using a RAO for capture of perchlorate, chromium, and any other COPCs above an applicable concentration metric (i.e. an ARAR). Please note that NDEP would require justification for and approval of the establishment of such a benchmark.</p>	<p>ENVIRON notes that optimization of the GWETS is intended primarily to increase the effectiveness and efficiency of the existing system which would be consistent with the short-term RAOs proposed in the Work Plan. Additional RAOs/metrics that are specific to evaluation of the GWETS optimization including incremental mass removal, capture, etc. will be considered and addressed in the GWETS Optimization Study.</p>
<p>102. Appendix F, Section 2.2, “constraints” listed in bullet format: Hydraulic loading limitations are identified, but potential increases in mass loadings to the perchlorate and chromium treatment systems are not mentioned. Were mass loadings found to be insignificant or manageable through equalization/blending?</p>	<p>With the initiation of the GWETS Optimization Study, Appendix F will be removed from the RI/FS Work Plan. This comment will be evaluated as part of the GWETS Optimization Study.</p>
<p>103. Appendix F, Section 3 Estimated Capture Zones and Potential Gaps in Capture, page F-5, with regards to the IWF, the Deliverable states, “To address this gap, ENVIRON proposes to begin pumping the several new wells, which is described in more detail in the following sections.” Additionally, with regards to the AWF, the Deliverable states, “To address this gap, ENVIRON proposes to begin pumping some of the new wells, which is described in more detail in the following sections.” Given that pumping and treatment system is at/or near capacity, please explain how the foregoing will be accomplished and what is expected to be accomplished.</p>	<p>With the initiation of the GWETS Optimization Study, Appendix F will be removed from the RI/FS Work Plan. This comment will be evaluated as part of the GWETS Optimization Study.</p>
<p>104. Appendix F, Section 3 Estimated Capture Zones and Potential Gaps in Capture, page F-5, this Deliverable has not discussed potential underflow beneath or through the slurry wall. NDEP is aware that Northgate collected samples for permeability testing of the slurry wall and reported the results on September 29, 2010; however, no report discussing the potential underflow beneath or flow through the slurry was submitted. Please discuss how this data gap will be addressed.</p>	<p>An evaluation of the effectiveness of the barrier wall based on current data will be included in the GWETS Optimization Study. Based on the results of this evaluation, additional data collection may be proposed to address any remaining data gap.</p>

NDEP Comment	Response
<p>105. Appendix F Groundwater Extraction and Treatment System Optimization Study, Section 5.4, page F-10. The RI/FS Work Plan should clearly identify how the model will be used and potentially upgraded to characterize capture zones, plume migration, fate and transport of COPCs, and effects of operational changes. A specific section within the RI/FS Work Plan should be dedicated to this discussion.</p>	<p>A description of proposed model updates and model analyses will be provided in the revised RI/FS Work Plan.</p>
<p>106. The NERT should test alternative capture well placement and pumping scenarios using the model and use these to guide installation of additional wells in the SWF and AWF.</p>	<p>The GWETS Optimization Study will evaluate the capture zones of the SWF and AWF, and will evaluate the potential effectiveness of additional wells if needed to prevent plume migration past the existing systems. As described in the response to Comment #24, installation of additional wells and their configuration (including those that target the center of the plume) will be evaluated as part of the RI/FS.</p>

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- Nevada Division of Environmental Protection (NDEP), 2007. Meeting Minutes, Phase A Report and Phase B Work Plan. July 18.
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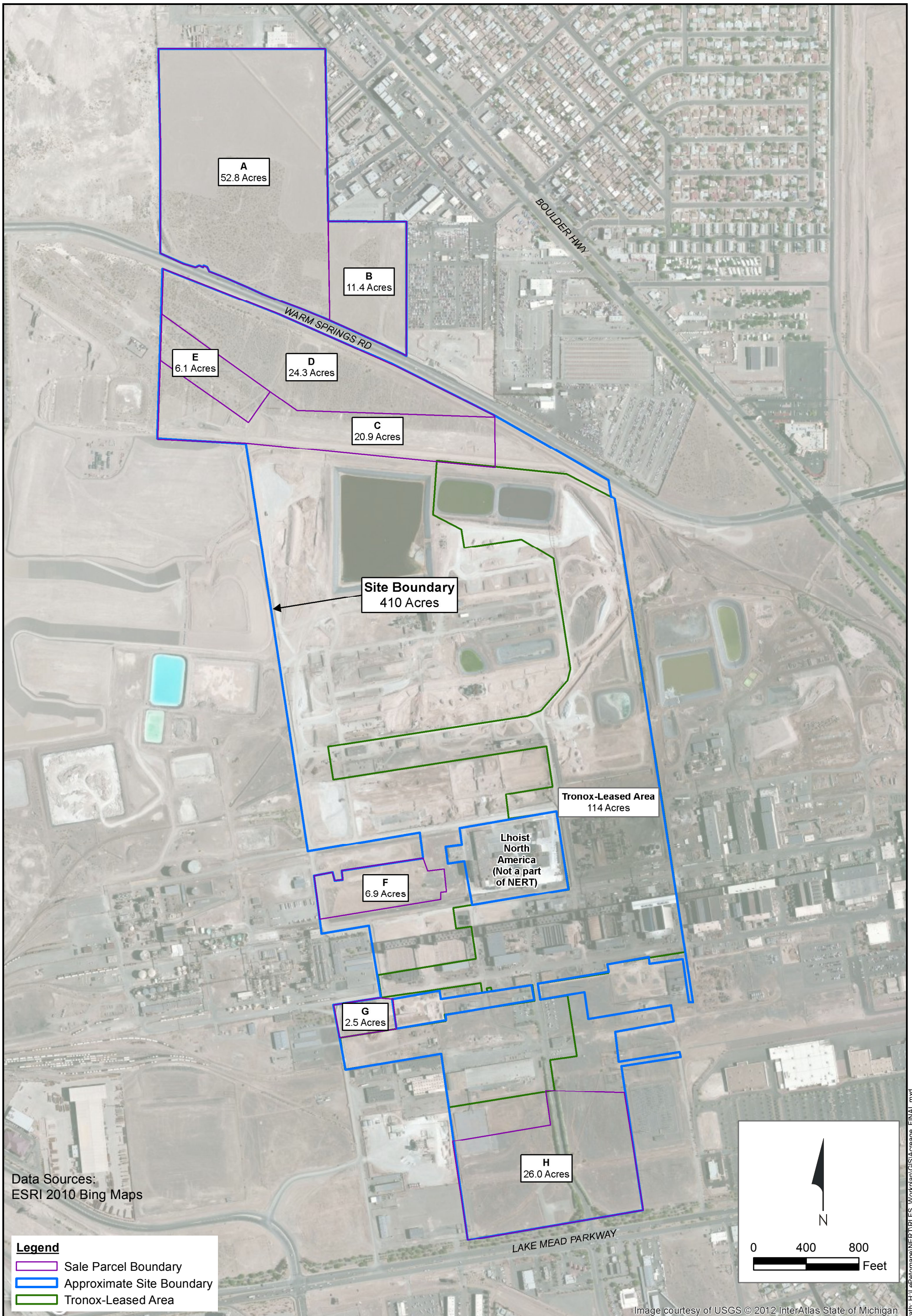
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Attachment B

**Figure: Site Boundary, Sale Parcels, and Tronox-Leased Area Acreage
*Nevada Environmental Response Trust Site, Henderson, Nevada***



Data Sources:
ESRI 2010 Bing Maps

Legend

- Sale Parcel Boundary
- Approximate Site Boundary
- Tronox-Leased Area

Image courtesy of USGS © 2012 InterAtlas State of Michigan



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Site Boundary, Sale Parcels, and Tronox-Leased Area Acreage
Nevada Environmental Response Trust Site, Henderson, Nevada

Figure
1

Drafter: RS Date: 9/30/2013 Contract Number: 21-32100I (I01) Approved by: Revised:

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Attachment C

**Table: Pipeline Diameter and Lengths for the GWETS
*Nevada Environmental Response Trust Site, Henderson, Nevada***

**TABLE 1. PIPELINE DIAMETER AND LENGTHS FOR THE GWETS
Nevada Environmental Response Trust Site; Henderson, Nevada**

FLOW	LOCATION	PIPELINE SECTION	DIAMETER (in)	LENGTH (ft)
Influent	Lift Station 1 to Lift Station 2	Single pipe	10	8200
	Lift Station 3 to Lift Station 2	LS3 to Pabco Rd	10	630
		Pabco Rd to LS2	8	1730
	Lift Station 2 to GWETS	LS2 to south end of Pabco Rd	12	6780
		South end of Pabco Rd to GW-11 pond	12	3680
Effluent	FBR to Effluent Discharge Point at Las Vegas Wash	FBR to GW-11 pond	12 (assumed)	2160
		GW-11 Pond to South End of Pabco Road	12	3680
		South End of Pabco Road to LS2	10	6780
		LS2 to LS1	10	8200
		LS1 to Discharge Point	10 (assumed)	710

Abbreviations:

ft = foot or feet

in = inch or inches

FBR = fluidized-bed reactor

GWETS = Groundwater Extraction and Treatment System

NDEP = Nevada Division of Environmental Protection

Attachment D

**Table: Capacities of Pumps in the GWETS
*Nevada Environmental Response Trust Site, Henderson, Nevada***

TABLE 2. CAPACITIES OF PUMPS IN THE GWETS
Nevada Environmental Response Trust Site; Henderson, Nevada

PUMP LOCATION		NUMBER OF PUMPS	POWER (hp)	FLOW RATE
Lift station #1 vertical turbine pumps		2	50	625 gpm
Lift station #2	Vertical turbine	1	100	approx. 925 gpm
	Submersible pump	1	100	900 gpm
Lift station #3 submersible pumps		2	10	350 gpm
Raw Water feed pump P-102a/b		1	100	1000 gpm
Pond transfer pump P-104		2	5	75 gpm
Chrome plant effluent to FBR feed pumps P-103a/b		1	2	100 gpm
FBR fluidization pumps		14	30	2000 gpm
FBR media return pumps		5	1	30 gpm
DAF pressurization pumps		2	25	206 gpm
DAF float pumps		2	2	20 gpm
Effluent pumps p-601/602		1	30	1000 gpm
Sand filter reject pumps		2	5	150 gpm
Effluent booster pumps		2	100	1000 gpm
Sludge transfer pump		1	10	213 gpm
Sludge filter press pumps, air operated		2	--	150 gpm
Sludge filtrate pump		1	1.5	20 gpm
Chrome plant Feed pumps		2	5	100 gpm
Chrome plant pumps to and from the BT tanks (not in use anymore)		--	6	50 gpm
Chemical pump lift station #3 ferrous injection		1	0.05	--
Chemical pump ethanol, front stage		5	--	20 gph
Chemical pump ethanol, back stage		4	--	8 gph
Chemical pump caustic		9	0.1	0.12-7.6 gph
Chemical pump urea		5	--	1.67 gph
Chemical pump Phosphoric Acid		9	--	0.08-0.54 gph
Chemical pump micronutrient blend, output varies with tube size		2	--	75 ml/min
Chemical pump Hydrogen peroxide, output varies with tube size		2	--	20 ml/min
Chemical pump Ferric chloride, output varies with tube size		2	--	10 ml/min
Chemical pump ferric chloride pump for the conditioning tank		1	--	40 gpm

Abbreviations:

gpm = gallons per minute

gph = gallons per hour

ml/min = milliliters per minute

hp = horsepower

DAF = dilution attenuation factor

BT = Balance Tanks

FBR = fluidized-bed reactor

GWETS = Groundwater Extraction and Treatment System

NDEP = Nevada Division of Environmental Protection