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1. Section 1.2.2 Chemical Reduction Study Area, Page 7. Low hexavalent chromium concentration in the groundwater and dewatered alluvial aquifer of the AP flushing treatability study area make the site not a good candidate for conducting field chemical reduction study. Consider that three of six baseline wells have the hexavalent chromium concentration below the level of the reported sample quantitation limit and 3 wells went dry (see Table 26), which leads one to an unreliable conclusion about the results from the field chemical reduction study. NDEP requires an explanation why the field chemical reduction study was executed with known information that the site is not good candidate for the proposed study.	As depicted in the NDEP-approved In-Situ Chromium Treatability Study Work Plan, the location of the chemical reduction field study, within the AP Area Down and Up Flushing Treatability Study area, was selected based on the presence of an existing injection and monitoring well network that could be utilized for evaluating hexavalent chromium reduction in both the alluvial and Upper Muddy Creek formation. The chemical reduction study was also conducted in this area due to the distance from the biological reduction study area to avoid any possible interference or comingling of the two study areas. All the intermediate wells had detectable concentrations of hexavalent chromium (Table 27). The purpose of the chemical reduction study was to verify that calcium polysulfide would reduce hexavalent chromium in-situ; therefore, the presence of detectable hexavalent chromium concentrations in groundwater would have provided adequate evidence. It was anticipated that the down flushing conducted in the vicinity of the monitoring wells would have increased water levels as well as hexavalent chromium concentrations in the shallow wells. The regional decrease in water levels causing several of the shallow wells to go dry was not anticipated.
2. Section 3.3.2.1 Column Setup and Effectiveness Monitoring, Page 15. The packed soil columns from the cuttings produced during drilling were used for the laboratory column study. Because the packed column doesn't have original soil textures, porosities and vertical heterogeneity, the results from the packed column are difficult to be applied to the field study. NDEP suggests that the undisturbed cores should be collected for future laboratory column study when they are obtainable. Cross-sections of Figures 3b, 3c, 4b, 4c and 4d were obviously oversimplified, the geology is more complicated than depicted. Because many borings were drilled in these two small areas, NDEP requires better represented cross-sections that reflects lateral and vertical heterogeneity in both sites, consider using a stratigraphic approach, or facies groupings.	As confirmed by Dr. Batista at UNLV, the use of packed soil columns is commonly used by treatability study laboratories. To obtain undisturbed soil samples, soil samples would be collected using Shelby tubes. Shelby tubes are constructed of metal, and therefore it is not possible to visually inspect the core for any gravel and/or rocks in the sample that may not be representative of the greater lithologic conditions and affect the results of the laboratory column study. In addition, the Shelby tube composition may also affect results or corrode during the laboratory study depending on the substrates being used. Due to these limitations, the standard packed column approach was used and the flow velocity was adjusted to simulate actual field conditions to provide comparable results. The cross-sections in Figures 3b, 3c, 4b, 4c, and 4d have been revised to include additional lithologic details. In general, the Qal consists of sand (poorly and well graded) and silty sand (commonly with gravel) and the UMCf consists predominantly of silt with thin interbedded sandy silt and clayey silt lenses within the chemical and biological reduction study areas. To the depths investigated, the UMCf appears to be less heterogeneous than the Qal.

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3. Figure 5a Groundwater Contours and Flow Direction-Shallow Wells. It is obvious that the substrate injected from the injection wells is likely not moving into monitoring wells of CTMW-03S/D. It is project manager's professional call that at least one additional injection well should be added to upper gradient area ofCTMW-03S/D. This comment is also related to Comment 2 above. If detailed cross-sections were constructed, they will be very useful to locate right injection wells and to explain the observations. NDEP requires that proposed monitoring and injection wells in the approved workplan should be revisited after the site characterization completed in all on-going treatability studies or future treatability studies.	The installation of the injection and monitoring wells were installed in a phased approach over three installation events. The locations of CTMW-03S/D were considered appropriate prior to the start of the treatability study. During the treatability study, the location of CTMW-03S/D were found to be side-gradient to the overall groundwater flow direction, but the data collected from these monitoring wells were very useful in determining the horizontal extent of carbon substrate distribution during the treatability study. This data could not be accurately acquired without a monitoring well along the fringe of the injectate distribution. As shown on Figure 7a, carbon substrate was observed at CTMW-03S following the second injection event as evidenced by the TOC concentration increasing from 2.1 to 250 mg/L. Similarly, the TOC concentration in CTMW-03S increased from 5.4 to 39 mg/L following the third injection event. These results indicate that this well was located on the western edge of the treatment zone. Workplan addendums will be submitted to NDEP for the future treatability studies, including the Unit 4 Bioremediation Treatability Study, Galleria Road Bioremediation Treatability Study, and the Las Vegas wash Pilot Study. These workplan addendums will include revisions to proposed injection and monitoring well locations associated with the studies based on information obtain from site characterization activities.
4. Table 1 Baseline Soil and Depth-Discrete Groundwater Sampling Protocol listed "Purpose" for each parameter, but most purposes were not discussed in the report. NDEP requires that all purposes listed in this table be discussed in the result section.	Section 5.1.1 of the report has been revised to include discussions of the soil sample results related to parameters listed in Table 1. Depth-discrete groundwater samples were obtained at one depth from each of the borings CTIW-01S, CTIW-01D, CTMW-03S, and CTMW-03D. The collection of additional depth-discrete groundwater samples was attempted, but were unsuccessful due to poor groundwater recovery at these locations. However, the vertical extent of hexavalent chromium, chromium, perchlorate, and chlorate in groundwater were assessed later through depth-discrete groundwater sampling performed at boring location CTMW-07D as part of the Remedial Investigation Phase 2 Modification No. 7.

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5. Sections 4.1.5 and 4.2.5 Injections. Please provide a calculation how the volume of injected substrates and calcium polysulfide was determined.	For the biological treatment, the initial volume of carbon substrate injected was determined based on numerous factors including the size of the treatment area and depth, concentrations and mass flux of hexavalent chromium and other COPCs in the treatment zone, the stoichiometric demand, and an appropriate safety factor based on bench-scale results. As several carbon substrates were used, including soluble and slow-release substrates, the chemical oxidant demand (COD) and the absorption capacity for the various carbon substrates were also factored into determining the amount of each substrate injected. The volume of carbon substrate injected and timing for subsequent injections were determined based on the analytical results of downgradient groundwater monitoring wells, including COD, pH, and TOC to maintain adequate bio-available carbon substrate to promote full degradation of the COPCs. The generalized equation for the reduction of hexavalent chromium is as follows: $\text{Carbon Substrate} + 4\,CrO_4^{2-} + 8\,H^+ \rightarrow 3\,CO_2 + 4\,Cr(OH)_3 + H_2$ For the slow-release substrate, EOS, the manufacturer suggested injecting approximately three percent of the pore volume, as indicated by the following equation: Injection Volume of EOS = Treatment Area x Treatment Depth x Porosity x 3% x Safety Factor For the chemical treatment, the injection volume of calcium polysulfide was determined using the size and depth of the treatment area, hexavalent chromium concentrations, the stoichiometric demand, and an appropriate safety factor based on bench-scale testing. The safety factor was used to account for calcium polysulfide reactions with other non-target compounds in the subsurface and other considerations typically associated with in-situ injections. The equations used to determine the stoichiometric demand, mass of hexavalent chromium present, and planned injection volume were as follows: $2\,CrO_4^{2-} + 3\,CaS_5 + 10\,H^+ \rightarrow 2\,Cr(OH)_3 + 15\,S + 3\,Ca^{2+} + 2\,H_2O$ Mass of CrO_4^{2-} = $[CrO_4]$ x Treatment Area x Treatment Depth x Porosity Injection Volume of CPS = Mass of CrO_4^{2-} x Stoichiometric Demand x Safety Factor Section 4.1.5 and 4.2.5 have been revised to include this additional information.

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6. Table 4 Hexavalent Chromium Groundwater Results in Shallow Wells-Biological Reduction Study, Page 33. No reduced hexavalent chromium was observed in CTMW-03S. This may be explained with inappropriate location of the injection wells. However, this observation is in confliction with TOC (Table-6), Dissolved Oxygen (Table 18), Oxidation-Reduction Potential (ORP) (Table 20) and Total Biomass (Table 23) observed. NDEP asks an explanation for this conflicted observation.	A reduction of hexavalent chromium was observed in groundwater at CTMW-3S. Following the second injection event, the hexavalent chromium concentration at CTMW-03S decreased from 14 mg/L to 4.4 mg/L with a corresponding increase in TOC from 2.1 mg/L to 250 mg/L. Similarly, following the third injection event, the hexavalent chromium concentration at CTMW-03S decreased from 14 mg/L to 4.8 mg/L with a corresponding increase in TOC from 5.4 mg/L to 39 mg/L. So a decrease in hexavalent chromium concentrations were observed in shallow groundwater adjacent to well CTMW-03S. Dissolved oxygen concentrations at CTMW-03S reduced from 1.14 mg/L to 0.26 mg/L and ORP reduced from 172 mV to 33 mV following the second injection event. The total biomass at CTMW-03S increased from 7.4 x 10^4 cells/mL to 2.47 x 10^6 cells/mL. This data indicates that an anaerobic environment was created in the subsurface following the second and third injection events that resulted in the temporary reduction of hexavalent chromium concentrations and increase in microbial populations. However, the anaerobic environment was not sustained, likely due to the side-gradient location of CTMW-03S. The purpose of the treatability was to demonstrate that by creating an anaerobic environment in the subsurface, hexavalent chromium concentrations in groundwater could be reduced. The data collected from CTMW-03S was useful as a proof of concept in demonstrating this as well as acquiring direct observations of the cross gradient distribution of organic donor during the treatability study.

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7. Section 5.1.2.8 Metals, Pages 49, 50. "increases in arsenic concentrations in groundwater that have the potential to be outside of natural fluctuation were observed at CTMW-01 S, CTMW- 02S, CTMW-04S, and CTMW-05S when compared to baseline concentrations", "Arsenic concentrations in deep monitoring wells fluctuated in response to geochemical conditions in the aquifer during performance monitoring. At the end of performance monitoring, increases in arsenic concentrations that have the potential to be outside of natural fluctuation were observed in groundwater at CTMW-02D, CTMW-04D, CTMW-05D, and CTMW-06D when compared to baseline concentrations, with the highest concentration of 0.130 mg/L in groundwater at CTMW-05D" and "Arsenic, barium, iron and manganese concentrations in the effluent samples gradually increased" of Appendix A, Page 175. Although the arsenic concentrations tend to return pre-injection of substrate once the reduced condition of groundwater is gone, this will be an issue for a long-term and full-scale in-situ bioremediation. NERT has multiple on-going in-situ bioremediation treatability sites. NDEP suggests that NERT pay more attentions on increase of groundwater arsenic in the in-situ bioremediation.	NERT is currently monitoring and will continue to monitor secondary characteristics in the groundwater following in-situ bioremediation, evaluating both the short-term and long-term effects, in all treatability studies. This includes monitoring for arsenic, barium, iron and manganese. It should be noted that although there is the potential for moderate increases in arsenic concentrations from mineral release under the reducing conditions, field data and observations from the In-Situ Bioremediation Treatability Study performed on City of Henderson parcel in 2015/2016 indicate that in the presence of abundant sulfate in the aquifer, it is likely that precipitated arsenous sulfide forms. As a result, after a slight initial increase, arsenic concentrations decreased to below baseline concentrations in the In-Situ Bioremediation Treatability Study. As NDEP is aware, the Trust elected to complete two additional performance groundwater monitoring events beyond what was reported in the In-situ Chromium Treatability Study Results Report. The results of these performance groundwater monitoring events will be reported as a Technical Memorandum in Fourth Quarter 2018. One groundwater sampling event was completed in March 2018 and an additional sampling event is scheduled to be completed in June 2018. Groundwater results from the March 2018 sampling event indicate that arsenic concentrations in groundwater from one monitoring well, CTMW-04S, have reduced from a maximum concentration of 510 µg/L to baseline pre-injection levels with a March 2018 concentration of 66 µg/L. This result from the additional performance groundwater monitoring event provides additional data that arsenic concentrations should continue to reduce and return to baseline levels as geochemical conditions return to pre-injection levels.

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8. Section 6.3 Cost Considerations For Implantations, Page 70. NDEP wants to clarify two things here. First, One of the objectives in the approved work plan states "Estimate preliminary costs for full-scale implementation, if the field test is effective"; Second, Guide for Conducting Treatability Studies Under CERCLA (EPA, 1989) does include Appendix-Cost Elements Associated with Treatability Studies. NDEP asks the cost for major items for this treatability study. Some examples for the major items may include the price and total cost for substrates and chemicals investigated, the cost for injection of substrate and chemicals, the cost for monitoring wells, injection wells installations, soil borings, aquifer tests, soil, groundwater sampling and chemical analysis, the cost for effectiveness monitoring, and the total cost for labor and professional service required by the treatability study. This information will lay out sound base for the feasibility study. The cost for full-scale implementation of the treatability study is optional for the treatability study report. This comment applies to all on-going and future treatability studies.	This section has been revised to include a discussion of treatability study costs (Section 6.3.1).