

15 March 2006

Mr. Charles S. Berrey
United States Environmental Protection Agency
Region IX
75 Hawthorn Street
San Francisco, CA 94105-3901



Subject: Response to 20 January 2006 Agency Comments on the Final
Perimeter Groundwater Operable Unit Remedial
Investigation/Feasibility Study

Dear Mr. Berrey:

Below are ERM-West, Inc. (ERM) and Aerojet's responses to the most-recently received Agency comments on the Final Perimeter Groundwater Operable Unit Remedial Investigation/Feasibility Study (PGOU RI/FS Report) provided by the United States Environmental Protection Agency (USEPA) in a letter dated 20 January 2006. The text of each comment is repeated verbatim in bold italics, followed by ERM/Aerojet's response.

Agencies' Original General Comment 2.

The Agencies assume Aerojet's response "Comment noted" means Aerojet will comply with the State's requirements for the State to issue a certificate of closure for the Zone 4 waste management units. Also Aerojet will demonstrate to the State that capture of the pollutants with concentrations exceeding the Water Quality Objectives has occurred (such as TCE contained at 0.8 ug/L).

Aerojet understands the Agencies' position.

Agencies Original Specific Comment 8.

In the addendum the Agencies will issue to Operable Unit 5 RI/FS, the Agencies will present their position that beyond Zone 1 TCE contamination at the Libby Pond area there is no evidence for sources of COCs within the OU5 for activities other than Aerojet Operations. The Agencies take exception to Aerojet's general disclaimer presented in Part 1, Vol. 1, Page 12, Section 1.2.3, last paragraph of the RI/FS document that there are other potential sources for TCE, NDMA and perchlorate in OU5.



Aerojet understands the Agencies intend to issue a RI/FS Addendum and that this issue is being discussed between USEPA and Aerojet legal representatives. Accordingly, Aerojet will not respond to this comment in this document.

Agencies Original Specific Comment 138.

Aerojet has suggested that Areas 39 and 41 extent of groundwater contamination not be shown in the OU5 RI/FS because the Remedial Investigation is done for these areas. The Agencies' position is that the OU5 RI/FS needs to show the extent of groundwater contamination in Areas 39 and 41 using the current best available data. Data uncertainty can be shown by using a dashed line where needed.

For clarification in the written record, note that the original Agency Comment stated that the extent of contamination in both Areas 39 and 41 needed to be shown on the site wide composite plume map, which the Agencies have requested in their comments on the PGOU RI/FS report. Aerojet's position was that it was not certain that current, representative groundwater data existed to map the extent of groundwater contamination in both Areas 39 and 41. Regardless, Aerojet has agreed to provide the latest, representative groundwater data that it has and to map the extent of groundwater contamination in Area 39 and 41 on the site wide composite plume maps it has agreed to create for the Agencies.

Agencies' Original Specific Comment 163.

Arsenic

The Agencies agree that "...statistical analysis was just one aspect of the overall evaluation of arsenic"; however, adequate justification is required to exclude any data from subsequent calculations. Also, the information provided by Aerojet is insufficient to evaluate the validity of the responses provided. Additional detail is needed regarding the following numbered statements:

- 1) *"...the sample was identified as an outlier based on an elevated detection limit..."*
Was this sample reported as not-detected at an elevated concentration? If not, the elevated detection limit is not relevant. If so, this data point demonstrates that censored (not-detected) data needs to be treated in a different manner, possibly using substitution methods.

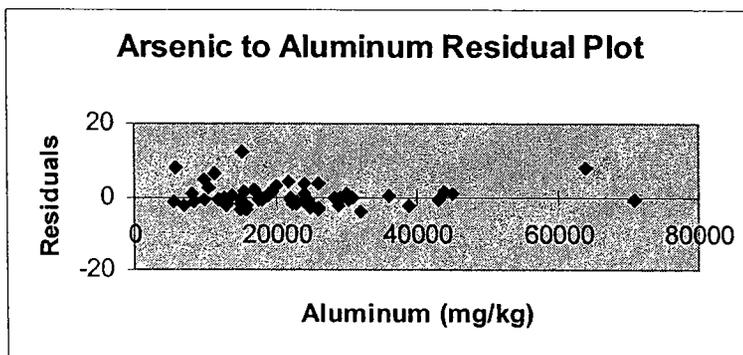
- 2) *"... evaluation of sample data from the same location at shallower depths failed to confirm the presence of elevated arsenic..."*
Why was a different depth interval selected for confirmation? This study does not include vertical profiling (e.g., concentration versus depth), so the comparison of samples from different depths (and potentially, different lithology) may not be useful for the present study.
- 3) *"X Variable 1 Residual Plot and Spearman Rank Correlation"*
The Residual Plot provided in Aerojet's response, as well as the Spearman Rank Correlation (SRC) rationale, is inadequate as presented to support any comment responses. Aerojet needs to provide the following:
- *Labels, units, and related variables for the Residual Plot.*
 - o *Ensure that the scaling of the residuals axis is such that visual evaluation of the data distribution is possible; the Residuals axis scale should be symmetrical around the zero-point (i.e., -20 to +20, etc.).*
 - *Generate a Residual Plot for log-transformed data (if appropriate). Evaluate the distribution of residuals for transformed data.*
 - *Provide the values of the variables determined for any statistical calculations (e.g., SRC), and include other constants (e.g., number of data points, number of non-detects, etc.).*

Samples were collected at 1.5 and 3.5 feet below ground surface (ft bgs) from boring 35D-AH04 on 2 October 1991 and analyzed for metals. The laboratory method was ICP-T (EPA Method 6010) with a practical quantitation limit (PQL) of 10 milligrams per kilogram (mg/kg) for the 1.5-foot sample and a PQL of 50 mg/kg for the 3.5-foot sample. The concentrations reported for arsenic in both samples were less than the PQL, specifically less than 10 mg/kg in the 1.5-foot sample and less than 50 mg/kg in the 3.5-foot sample. It is our understanding that ICP technology used in 1991 often yielded elevated reporting limits. A few other constituents (e.g., thallium, selenium) in the samples collected at that location also had high detection limits, analogous to the arsenic. Therefore, apparently the method in use at the time lacked the sensitivity for these constituents expected based on the methods in use today. Although it is unclear why the PQL (50 mg/kg) for the sample collected at 3.5 ft bgs was higher than the PQL (10 mg/kg) for the sample collected at 1.5 ft bgs, it is possible that some interference was encountered in the deeper soil interval.

Because of the lack of sensitivity in the 1991 arsenic data, Aerojet does not believe that the data should be viewed as reliable for risk assessment purposes. As indicated in Table 5-12, Part 2, Volume 2 of the PGOU RI/FS Report, there is only one detection of arsenic (5.52 mg/kg) in soil samples collected at Site 35D. This concentration is less than the 90% upper confidence limit (UCL) of the mean background value of 6.3 mg/kg. Arsenic in all other soil samples was less than the laboratory reporting limit, which varied by sample between less than 5 to 10 mg/kg (with the exception of the sample collected at 3.5 feet bgs from boring 35D-AH04 with a PQL of 50 mg/kg). Therefore, based on the available data, there is no evidence that arsenic has ever been detected at levels exceeding background at this source site.

As a further point of clarification, the sample at 1.5 ft bgs was not collected to independently verify or confirm the results of the deeper (3.5 ft bgs) sample; rather, the two samples were collected simultaneously at each of the sample locations in Site 35D.

As previously noted, the arsenic to aluminum residual plot is merely illustrative of the deviation of the data from normality, which is also evident from the analysis conducted for the comparison of the PGOU data with the background data set as presented in the RI/FS report. The arsenic to aluminum Spearman Rank Correlation statistic, SRC is 0.49 ($p < 0.001$), $n = 108$. This is a nonparametric correlation statistic and is independent of the data distribution. Other relevant statistics are provided in the RI/FS report and appendices. A revised residual plot is provided, as follows.



Chromium

The comment provided by EPA indicates that "Data are not sufficient to support the assumption that all chromium is present in the trivalent form"; analysis of

all RI samples collected in 2003 for hexavalent chromium, Cr(VI), is acknowledged. However, the Cr(VI) data appear to be of variable quality. Furthermore, it is not clear that the data are of sufficient quantity to use in establishing correlation between Cr(VI) and Cr(III)/Cr(total) concentrations. The recent Aerojet Quality Assurance Program Plan indicates that the analytical method used for Cr(VI) in soil is "extraction, colorimetric". Although analysis of aqueous solutions by EPA SW-846 Method 7196A is acceptable, the preparation method used is not clearly specified. The preferred method is based on alkaline digestion, as described in EPA SW-846 Method 3060A. This preparation method (whose performance also can be variable) is designed to solubilize all forms of Cr(VI) and minimize the reduction of Cr(VI) to the more stable Cr(III) specie; any other extraction method may yield low-biased results. These results would not be useful in comparing Cr(VI) and Cr(total) concentrations. Unless Aerojet is able to generate statistically-valid comparison of measured concentrations of chromium species, using an appropriate sample preparation method, it is recommended that the Preliminary Remediation Goal ratio of 1:6 (hexavalent:trivalent) be used for remedial decision-making.

All analyses were performed using EPA methods and in accordance with the EPA-approved work plan. Specifically, the preparations for Cr(VI) analyses for the RI/FS samples collected in 2003 were done using EPA Method 3060A. Therefore, all of the data evaluated to determine the relationship of Cr(VI) concentrations to total chromium are based on EPA's preferred extraction approach.

USEPA's other assertions regarding the quality and quantity of chromium data are unsupported. The statement that "Cr(VI) data appear to be of variable quality" is not tenable given that the data were validated according to the procedure outlined in the QAPP, none of the chromium data from Area 49 were rejected, and detection limits were within acceptable limits for the methods. USEPA's statement that "it is not clear that the data are of sufficient quantity to use in establishing correlation between Cr(VI) and Cr(III)/Cr(total) concentrations" is not tenable given that 34 analyses were conducted for these parameters in Area 49, and none show a detectable concentration of Cr(VI) greater than 2.1% of the total Cr. Moreover, the single sample with Cr(total) that exceeded the PRG did not have detectable levels of Cr(VI), demonstrating that Cr(VI) risk is not of concern in this sample. There is no basis for USEPA to request any further "statistical" analysis given this clear demonstration of the absence of risk from the analytical data.

Agencies' Original Specific Comment 181 and 191.

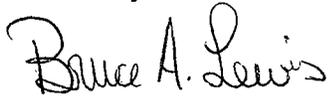
These comments pertain to source sites 10D and 11D identified as ditches. Aerojet asserts that EPA's "Land Use in the Comprehensive Environmental Response, Compensation and Liability Act Remedy Selection Process" Office of Solid Waste and Emergency Response Directive #9355.7-04 dated May 25, 1995 (policy directive) justifies no ecological risk for the ditches or the need to remediate Polychlorinated Biphenyls (PCBs) in the ditch further up the drainage pathway because future development will alleviate any potential concerns. While the policy directive discusses determination of future land use to establish parameters for the RI/FS, the focus of the policy is to ensure that adequate cleanup levels are established in the RI/FS (e.g., unrestricted vs. restricted use) based on the future use of the land and if restricted use is appropriate that adequate institutional controls are evaluated in the RI/FS. The policy does not endorse taking no action today to assess a potential ecological threat or deferring remedial action without adequate institutional controls in place based on potential actions to be taken at an unspecified date in the future.

Prior to the deletion of an area from the National Contingency Plan (NPL) the EPA's Remedial Action Report must state that no further action is required, public health is protected, and in cases of restricted use that adequate institutional controls are in place. The Agencies repeat our position that 1) the RI/FS needs to address if source sites 10D and 11D pose an ecological threat to down-gradient habitat and if so what action is needed to eliminate or mitigate the impact until the ditches are removed; and 2) with PCBs in the sediments in a ditch draining to 11D at 720 mg/kg further up the ditch drainage pathway, the EPA cannot delete source sites 10D and 11D from the NPL without removal of the source or a mechanism in place to prevent PCBs from being washed down the drainage pathway. The EPA will not include source sites 10D and 11D in the OU5 Record of Decision unless these issues are adequately address in the Final OU5 RI/FS revision due May 1, 2006, which will incorporate the vapor intrusion assessment.

Aerojet understands the Agency position and 1) the RI/FS report will address if source sites 10D and 11D pose an ecological threat to the downstream habitat, and 2) will specify the mechanism Aerojet will put in place to prevent any potential PCBs in the ditch upgradient to drain into 11D and 10D.

Thank you for your prompt review of the subject document and your written comments. If you should have any additional questions or comments, please do not hesitate to contact me at (916) 924-9378 or Cindy Caulk at (916) 355-2601.

Sincerely,

A handwritten signature in cursive script that reads "Bruce A. Lewis".

Bruce A. Lewis, P.G.
Program Director

BAL/20648.03