Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Deborah O. Raphael, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

December 17, 2013

Mr. Fredrick Ganster
Exide Technologies
3000 Montrose Avenue
Reading, Pennsylvania 19605

DTSC REVIEW OF STEP-OUT DUST AND SOIL SAMPLING REPORT AND ORDER TO PERFORM EMERGENCY RESPONSE INTERIM MEASURES TO CLEAN UP OFF-SITE CONTAMINATED SOIL, DUST, AND SEDIMENT, EXIDE TECHNOLOGIES, VERNON, CA (CORRECTIVE ACTION CONSENT ORDER, DOCKET NUMBER P3-01 /02-010)

Dear Mr. Ganster:

The Department of Toxic Substances Control (DTSC) has reviewed the *"Step-out Dust and Soil Sampling Report"* (Report), which was prepared by Environ Corporation (Environ) on behalf of Exide Technologies (Exide) and is dated November 2013. The Report summarizes the sampling collection methods used, and the results of laboratory analysis on, dust and soil samples collected on August 29 and 30, 2013, and October 7 through 9, and 15, 2013.

The Report indicates that the stated purpose of the sampling effort was to delineate the lateral extent of metals and other constituents emitted from Exide's Vernon, California facility (Facility) to off-site locations. This objective has not been met. As stated in our November 18, 2013 letter, there is a need for further sampling beyond the 4500-foot perimeter of the Facility.

In addition, DTSC's Geological Services Unit (GSU) and Human Health and Ecological Risk Office (HERO) have reviewed the Report. Comments and recommendations to the Report are presented in the enclosed HERO and GSU and memoranda dated December 9, 2013 and December 11, 2013, respectively. Please respond to our comments and recommendations by January 10, 2014.

The Report identifies several locations sampled for lead and other metals with concentrations in dust and soil at or near hazardous-waste levels within 1,500 feet from the Facility, as well as in sediment samples collected in at least two storm drains along

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Bandini Boulevard. Under the October 4, 2013 Stipulation and Order (P3-12/13-010) Exide is required to perform a Site Specific Human Health Risk Assessment, and based on that, develop risk-based clean-up levels. However, in accordance with Section 5.4 of the 2002 Corrective Action Consent Order (CACO), DTSC considers the elevated concentrations of lead and other contaminants stated in the Report an immediate threat to human health and the environment (i.e., the Los Angeles River) that will require implementing emergency response interim measures.

DTSC is therefore ordering Exide to perform emergency response interim measures to clean up the dust, soil, and sediment found with concentrations of metals at or above hazardous waste levels in the storm water curb boxes and at the sampled locations surrounding the Exide Facility. Because of pending winter rains and the potential impact to the LA River, DTSC believes mitigating the curb boxes should take precedence. Exide shall provide DTSC with a work plan to perform these emergency response interim measures by December 31, 2013, and complete the work by January 31, 2014. A final cleanup report shall be prepared and submitted to DTSC for approval no later than 15 days following completion of the emergency response interim measures.

DTSC's request to cleanup metals in dust, soils, and sediment at or above hazardous waste levels should not be construed as endorsing any final clean up levels for corrective action on- and off-site.

Should you have any questions regarding this letter, please contact me at 916-255-3630 or Peter.Ruttan@dtsc.ca.gov.

Sincerely,

Peter Ruttan, P.G.
Project Manager
Engineering and Special Projects Office

Enclosures (2)

cc: Next page.

cc:(via e-mail)

Mr. Ed Mopas, Exide
Mr. John Hogarth, Exide
Mr. Paul Stratman, Advanced GeoServices
Mr. Russel Kemp, Environ
Ms. Margarita Padilla, DOJ
Mr. Jerrick Torres, City of Vernon
Mr. Ed Pupka, SCAQMD
Mr. Wendy Lui, LA-RWQCB
Dr. Cyrus Rangan; LACPHD
Ms. Nancy Bothwell; DTSC
Mr. Rizgar Ghazi, DTSC
Mr. Edward Nieto, DTSC
Mr. Todd Wallbom, P.G., DTSC
Ms. Shukla Roy-Semmen, DTSC

Department of Toxic Substances Control

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Edmund G. Brown Jr.
Governor

TO: Peter Ruttan
Project Manager
Brownfields and Environmental Restoration Program
Sacramento, California

FROM: Shukla Roy-Semmen, Ph.D.
Staff Toxicologist
Human and Ecological Risk Office
Cypress, California

DATE: December 9, 2013

SUBJECT: Review of an off-site step-out dust and soil sampling report for the Exide Facility at Vernon, California.

PCA: 25040 Site Code: 300214-33

Background

This is a secondary lead recovery facility where lead batteries and other lead bearing materials are recycled. It is located on 15 acres of land, in the City of Vernon, California. It is bounded by East 26th Street to the north, Bandini Boulevard to the south, Indiana Street to the East and Union Pacific Storage Yard to the West. A drainage channel bisects the plant in a north-south direction, and flows into the Los Angeles river, located 500 feet south of the site. A railroad track runs along the northern border of the facility. Other properties surrounding Exide include the Command Packing building, Rehrig Pacific Company, the former Honeywell facility, and Baker rendering plant. The nearest residences are located 0.4 to 0.6 miles north and south of the site.

At the request of DTSC, Exide collected surface dust and soil samples from an area going out 4,500 ft, radially, from the facility, from August through October of 2013. Surface dust samples were collected from 67 distinct locations, while soil samples were collected from 32 locations from depths of 0-1', 1'-3', and 3'-6', bgs. Samples collected from the first 1500 ft were evaluated for the presence of several metals (arsenic, lead, antimony, cadmium, chromium), PCBs, PAHs, dioxins/furans and hexavalent chromium. Samples collected from 1500 ft to 4500 ft were evaluated for all analytes (listed above), except for, antimony, cadmium, chromium, hexavalent chromium, and PCBs. Surface

dust samples were collected by by vacuuming side-walks to gather at least 50 grams of dust. The results of these sampling events are provided in the report.

Document Reviewed

The Human and Ecological Risk Office (HERO) reviewed a report titled "Step-out Dust and Soil Sampling Report, Exide Technologies, Vernon, California". The report was prepared by Environ, for Exide Technologies, Vernon, California, and is dated November, 2013. Comments on the report are provided below.

Scope of Review

HERO reviewed this document with emphasis on those aspects that affect the risk to human health. We assume that regional personnel have evaluated the sampling of environmental media. Any future changes or additions to the document should be clearly identified.

General Comments

1) Page 6: The report states that the soil screening levels (SSLs) for dioxins are 50 ng/kg and 200 ng/kg, for residential and industrial scenarios, respectively. Similarly, the SSL for PAHs is listed as 0.9 mg/kg. This is inconsistent with the screening levels provided in Table 1 of the approved Work Plan for the step-out sampling events (Work Plan for Step-out surface dust sampling and analysis, August 2013), where the USEPA's RSLs were used as screening levels. For dioxins, the screening levels for residential and commercial exposure scenarios were listed as 4.5 ng/kg and 18 ng/kg, respectively. Similarly, the screening levels for various PAHs provided in the approved work plan should be used. Please revise the tables in the report, accordingly. The values listed as "SSLs" in the current report (for dioxins and PAHs) are actually the remediation goals: PAHs (0.9 mg/kg) and dioxins (50 ng/kg and 200 ng/kg, for residential and commercial receptors, respectively. In the case of lead, contaminated properties in southern California have been cleaned up to levels where the 95% UCL of the mean is at or below the appropriate CHHSL for lead (80 mg/kg and 320 mg/kg, for residential and commercial receptors, respectively).

2) Page 7: The report states that "For purposes of this report and upon discussion with DTSC, the dust samples have been presented in units of milligram per kilogram soil and compared to SSLs. As discussed with DTSC, soil-screening levels may not be an appropriate measure in this context". DTSC has concerns with these statements for the following reasons: (1) The exposure assumptions developed by the USEPA for soils, also apply to dust. The USEPA's Exposure Factor Handbook (EFH) specifically states that "For the purposes of this

handbook, soil ingestion includes both soil and outdoor settled dust" (http://www.epa.gov/ncea/efh/pdfs/efh-chapter05.pdf). This does not necessarily apply to areas with loose or bare soils only. In fact, USEPA has used soil exposure assumptions to evaluate contaminants in bulk dust samples (see 2003 World Trade Center report referenced below). (2) The default soil/dust ingestion rates for an outdoor (100 mg of soil/dust a day) and indoor worker (50 mg of soil/dust a day) are small enough that people may be exposed to these levels regardless of whether the areas are paved or unpaved. (3) The difference in the size of the area (from location to location) where dust was collected is not a crucial component for determining exposure, since person(s) coming in contact with the contaminated dust tend to move around over much larger areas. Also, a much larger quantity of dust (50 grams) was collected to allow for the analysis of several contaminants. (4) Regulatory levels have been developed for contaminants in indoor dust (for example, TSCA levels of 40 ug/ft^2 for lead on residential floors) where hand to mouth transfer of contaminated dust is thought to be one of the major pathways of exposure. Risk-based values can be developed for indoor dust using methodologies provided in a May 2003 document titled "World Trade Center Indoor Environmental Assessment: Selecting Contaminants of Potential Concern and setting health-based benchmarks".

3) Page 7, The report states that "several locations exceeded the lead and 2,3,7,8-TCDD SSLs; however, the average lead concentration of 269 mg/kg and the average 2,3,7,8-TCDD TEQ OF 0.000124 mg/kg were below the SSLs for non-residential land use." It may not be appropriate to average out concentrations detected over the entire area (of the two outer rings) since concentrations (of lead, for example) vary significantly (49 to 1100 mg/kg). A more reasonable approach would be to further investigate or remediate areas with elevated concentrations of contaminants. Data can be grouped together if they are from areas with similar land use (residential vs. commercial), and if there are enough samples for a robust statistical evaluation. Statistical analysis and probability plots should be used to evaluate distribution of datasets and outliers.

4) Figures 6 and 8: These figures should be modified to include concentrations of dioxins, since there were several locations with concentrations above the screening levels.

5) Dioxin and PAHs: Please include a section in the report showing details of the dioxin TEQ and PAH B(a)P equivalents calculations.

Recommendations and Conclusions

Overall, the results of the surface dust and soil samples presented in the report indicate that emissions from the Exide facility have affected surrounding off-site areas. These data should be included in a risk assessment evaluation for the site. The sampling and analytical methodologies presented in the report follow guidance provided by USEPA

and California EPA. However, the screening levels provided in the report should be modified to reflect those listed in Table 1 of the approved work plan. Site-wide averaging of data may not be appropriate because of differences in land use and presence of areas which seem to be more heavily impacted by the emissions. Figures should be modified to show dioxin concentrations.

HERO notes that the decisions made in this document are site specific and should not be construed as a policy decision applicable to other sites. If you have additional questions please feel free to contact me at (714) 484-5448 or Sroysemm@dtsc.ca.gov.

Reviewed by:

William Bosan, Ph.D.
Senior Toxicologist
Human and Ecological Risk Office

Matthew Rodriquez
Secretary for
Environmental Protection

Department of Toxic Substances Control

Deborah O. Raphael, Director
9211 Oakdale Avenue
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Edmund G. Brown Jr.
Governor

MEMORANDUM

TO: Peter Ruttan, P.G.
Engineering Geologist
Engineering and Special Projects

FROM: Todd Wallbom, P.G. ____
Engineering Geologist
Chatsworth Geological Services Unit

CONCUR: Craig Christmann, P.G. ____
Senior Engineering Geologist
Chatsworth Geological Services Unit

DATE: December 11, 2013

SUBJECT: Technical Review of Step-Out Dust and Soil Sampling Report
Exide Technologies, Inc. Site
2700 South Indiana Street
Vernon, California 90058
Prepared by Environ Corp. (Environ)

PCA: 22120 Site Code: 300214 Phase: 48 Log No: 20020942

As requested, Geological Services Unit (GSU) staff has performed a technical review of the *Step-Out Dust and Soil Sampling Report* (Report), dated November 2013, for the purposes of Corrective Action (CA) activities. The Report was submitted by Envrion on behalf of the Exide Technologies Corporation (Exide) facility (Site), located at the address listed above.

The Exide facility in Vernon is an actively operating battery recycling facility. Prior to 1922, a portion of the property was occupied by a meat

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rendering plant while other areas were quarried for gravel. Since 1922, lead smelting and metals processing operations have occurred onsite.

Contaminants-of-concern (COCs) at the Site include volatile organic compounds (VOCs); primarily trichloroethene (TCE), and inorganics; primarily antimony, lead, arsenic, cadmium, and zinc. Elevated sulfate, inorganics, VOCs, and low pH (acidic) conditions also continue to occur in groundwater.

GSU staff reviewed Exide's *Work Plan for Step-Out Surface Lead Dust Sampling and Analysis* (Work Plan), received by DTSC on May 17, 2013. The Work Plan was found to be limited in scope and detail. A comment letter was issued by DTSC on May 28, 2013. Exide resubmitted a revised Work Plan (*Work Plan for Step-out Surface Dust Sampling and Analysis*) on August 23, 2013. The revised Work Plan was approved by DTSC on August 26, 2013.

The objective for this effort was to delineate the lateral and vertical extent of metals and other COCs and constituents-of-potential-concern (COPCs) in off-site locations surrounding the facility that may be attributed to air emissions from Exide. Based on our review of the Report, Exide has not achieved this objective. Furthermore, hazardous-waste levels of lead have been detected at several locations around the Exide facility. Expedited action is recommended to mitigate this immediate concern.

We recommend that the Report be revised in accordance with the comments provided in this memorandum and resubmitted as a Technical Memorandum (TM) that lists all the data gaps along with a proposal for additional sampling. Our comments on the Report are as follows:

GENERAL COMMENTS:

1. Exide's Report seems to have been prepared to follow more of a TM format than an actual report. For instance, the Report contains incomplete discussions on the results. The assessment is also incomplete yet the Report fails to note this, or identify any of the data gaps. There are also no conclusions to support why the sampling was halted or figures showing the delineated extent of contamination.

   As noted above, GSU recommends that the Report be formally changed to a TM that includes a listing of all the data gaps along with a proposal on additional sampling. The proposal for additional step-out sampling could be developed as an addendum work plan attachment to the TM. Following the complete assessment of off-site

contamination, a final comprehensive report could then be submitted that includes all of the off-site data collected to date.

2. Despite failing to meet the main project objective, Exide proposes to move towards completing a Human Health and Ecological Risk Assessment (HHERA). Before this occurs, Exide will need to adequately demonstrate that they have met the project DQOs/project objectives (i.e. delineate soil and dust to the SSLs). Only then would it seem appropriate for Exide to complete a HHERA.

3. The results show lead at hazardous-waste levels in soil and dust occurring in several areas at a minimum distance of 1,500 feet from the facility. In addition, hazardous levels of lead occur in sediment in at least two storm drains along Bandini Boulevard. GSU recommends emergency interim measures (IMs) be implemented by Exide to mitigate this immediate threat to human health.

4. The data also show that heavy metal contamination in soil and dust extends beyond the 4,500-foot circle. Moreover, lead above its SSL (residential CHHSL) and arsenic was detected in several locations in residential areas. Step-out soil, sediment, and dust sampling will be required to determine the full extent of contamination.

5. Despite DTSC's request (letter dated May 28, 2013, General Comment No. 3), Exide did not collect surface dust samples within the concrete channel of the LA River south of the facility, or in the open drainage channel. Since the revised Work Plan was approved by DTSC for this phase of sampling, we recommend that sampling the hardscape in these features be listed as a data gap in the TM and included in the work plan addendum.

SPECIFIC COMMENTS:

1. Section 1, Introduction, Page 1: Exide states that "the objective for this effort was to delineate the lateral extent of metals and other constituents in off-site locations proximate to the facility." This objective has still not been completed and should have been reflected in the introduction of the Report.

2. Section 2, Sampling Activities, Page 3: This section does not state how sample locations were determined in the field or what criteria were used to select the three storm water curb boxes for collecting sediment samples. We refer Exide to DTSC Specific Comment No. 2(a)(b), letter dated May 28, 2013, and ask that the TM include this information.

3. Section 2.3, Sampling from Storm Water Boxes, Page 4: The three samples collected from the storm water curb boxes are sediment samples and not, as identified in the Report, soil. Also, interstitial liquid samples were apparently not collected during the sampling. We request that Exide explain why interstitial liquid samples were overlooked during the storm water curb box sampling when this was required under the approved Environmental Monitoring Plan.

4. In the May 28, 2013 comment letter on the Work Plan, DTSC had requested that all Title 22 metals "that could reasonably be expected to occur" be analyzed during the step-out sampling. According to Exide (Table 3, 'Metal Emission Data from Point Sources', 1998, *Fate and Transport of Airborne Metals Emitted from Exide Technologies, Inc. Vernon Facility*, dated September 24, 2007), manganese, nickel, selenium, and zinc (and possibly mercury) are all potentially emitted metals in air emissions from the facility. Instead of eliminating these metals by performing a proper screening (i.e., comparing the results to background data), Exide analyzed for only antimony, arsenic, cadmium, chromium, and lead. Repeat sampling for these missing compounds may be required to collect sufficient data to perform the HHERA.

5. Section 2.4 (and associated Section 3.4), Sampling in the Los Angeles River Channel, Pages 4-5: Despite nearly a 2-year difference between the sampling conducted during the Phase 5 RFI and this sampling, Exide elected to include only their Phase 5 conclusions in this Report. They do not explain why the Report does not include any other historical data collected during previous off-site dust and soil sampling events. GSU reminds Exide that DTSC had requested dust sampling along the hardscape in the river channel and the open drainage channel mainly because the Phase 5 RFI did not include dust sampling. Since the Phase 5 sampling represents a snapshot in time, it is not appropriate to attempt to link it temporally with the August-October, 2013 off-site dust and soil sampling. Therefore, Exide should remove the discussion on the Phase 5 sampling in the TM as it is not pertinent to this assessment.

6. Section 3, Results, Page 6: The Report fails to note that Exide was still unsuccessful in meeting the project data quality objectives (DQOs), as provided in the RFI Work Plan (Addendum No. 1). For instance, DQO Decision Question (DQ) No. 3, 'has nature, degree, and extent of contamination been determined? Are COPCs in soil, sediment, soil gas and groundwater defined to levels below the screening levels?' This is clearly not the case and this DQ should be clearly stated in the TM, followed by a discussion on the additional steps needed to satisfy this DQO.

7. Section 3.2, Surface Dust Sampling, Pages 6-7: Despite DTSC's earlier request [Specific Comment 2(c)] in our review of the first draft of the Work Plan, Exide did not collect and analyze surface dust samples at Bonnie Beach Place where the rail line crosses. We recommend that this location be listed as a data gap in the TM and sampled in the next phase of work.

   Compounding the apparent confusion in identifying the correct sample type for the three sediment samples collected from the storm drains (Exide initially referred to these samples in Section 2.3 as 'soil'), Exide now mentions them in the section that discusses surface dust results. To avoid further confusion, we recommend that Exide create a subsection in the TM titled 'sediment samples', and include a discussion on the sediment results (i.e., description of the sediment, was the sediment dry or wet? what was the percent moisture? etc.).

   Exide should also state the meaning of the sample designation 'ODC' for the sediment samples.

   We note that the laboratory report (Test America analytical report 440-55802-1, dated September 27, 2013) for one of the sediment samples (ODC-02) reports it as having 'insufficient volume for testing". We request that Exide explain the meaning of this note and if this data should be qualified.

8. Section 3.3, Soil Samples, Pages 7-8: Like sample ODC-02, sample 500-NW-SWK-12 was reported by Test America (Job Narrative 440-55802-1) to have insufficient volume for analysis. It is extremely important that sufficient volume be collected for quality control purposes. No qualifiers were included on Table 1 ('Surface Dust Mass Concentrations within 1,500-Foot Radius'), for these two samples. Exide will need to demonstrate that the data is valid or else report it as qualified.

   Exide states that "2,3,7,8-TCDD TEQs were below the SSL in all samples". Despite lead exceeding the lead TTLC in two out of the three sediment samples collected, indicating that dust emissions occurring from Exide have found their way in to the public storm water system, none of the storm water sediment samples were analyzed for dioxins/furans. Therefore, this statement cannot be supported with the data that was provided and should be removed from the discussion on dioxins/furans.

9. Section 4, Quality Assurance and Quality Control, Page 10: The discussion on quality assurance and quality control (QA/QC)

procedures is incomplete. It is not sufficient to state that the "QA/QC procedures are detailed in the Work Plan" without a detailed discussion on how those QA/QC procedures were actually followed. Instead, this section is limited to a discussion on the Relative Percent Difference (RPD) between the original samples and the duplicates. GSU recommends providing a discussion in the TM on the field QA measures that were followed during this phase of sampling (i.e., discussions on collecting duplicate samples for each sample media, equipment or decontamination rinseate blanks),

Also, as part of the data review, Exide should summarize the analytical laboratory QA/QC procedures that were followed (i.e., were holding times met, do any of the samples require qualification as a result of method blank contamination, were laboratory control sample recoveries within acceptable control limits etc.).

10. Tables: Listing 12 mg/kg as 'background' for arsenic is somewhat misleading and may misrepresent the actual arsenic background value for areas not impacted by Exide's emissions. The 12 mg/kg is currently being utilized as a SSL but this does not mean that it necessarily represents background or constitutes a cleanup goal. The 12 mg/kg arsenic value could end up being used as a risk-management screening number by the DTSC toxicologist for evaluating arsenic as a potential COC. However, this does not mean that it should be considered as a representative background value for the area outside of Exide that is not impacted by Exide's arsenic emissions. We recommend revising all tables intended for the TM that list 12 mg/kg as the background value for arsenic to remove any reference that it represents established background.

11. Figures: We recommend modifying the current set of figures, or include new ones in the TM, to clearly show the delineated extent of contaminants to the SSLs. Any areas not delineated will need to be addressed in the next phase of work.

Questions regarding the memorandum should be directed to Todd Wallbom at (818) 717-6622.