KETTLE INVENTORY REMOVAL SUMMARY
7/28/15 CLOSURE PLAN

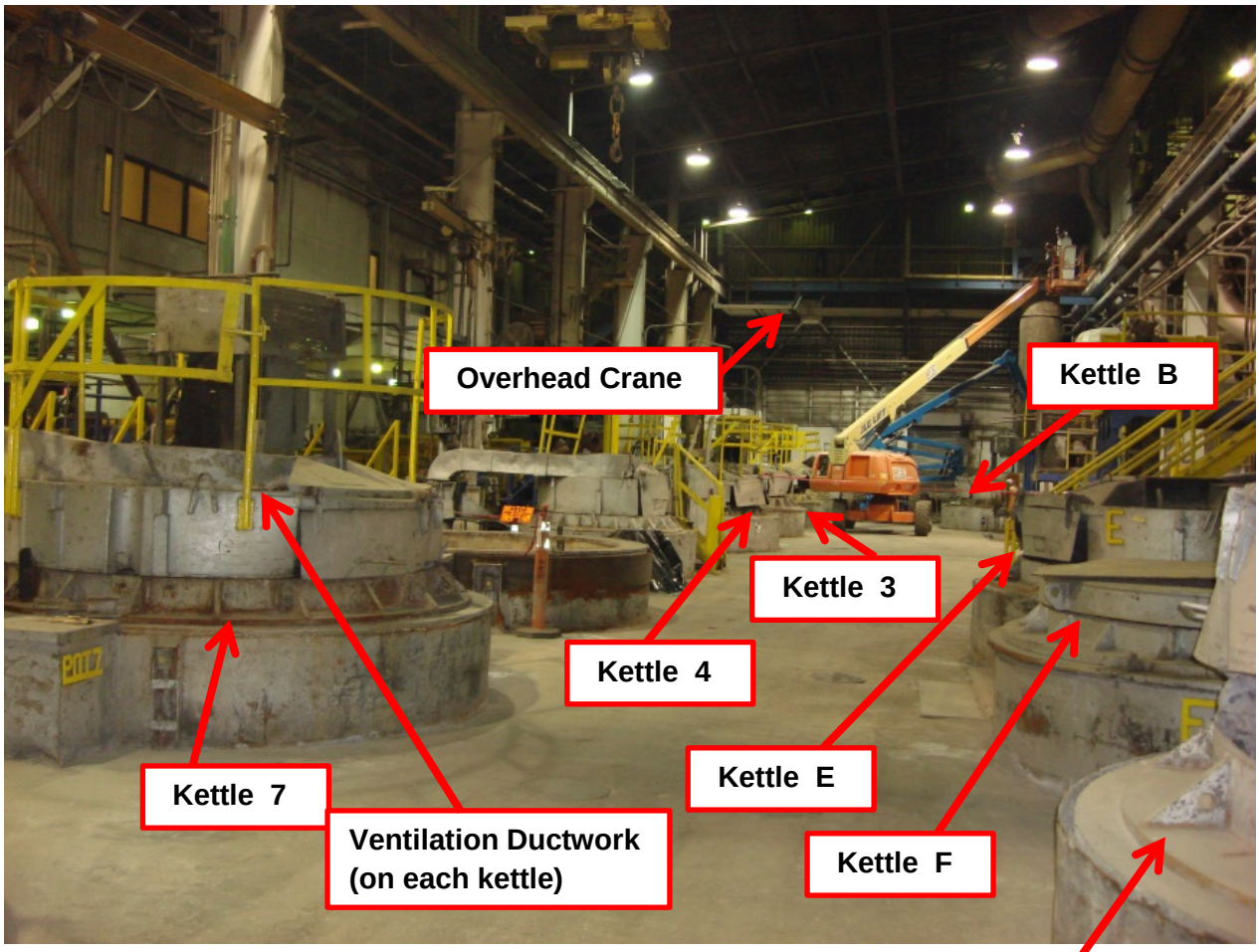
One of the first steps in closing the facility is to move material out of the facility, including lead. Exide has 13 kettles in its Smelter Building, each containing some amount of lead. The lead has hardened over time because Exide permanently ceased production. Exide intends to remove the kettles and the lead inside those kettles from the Smelter Building early in the closure process.

Exide has overhead cranes capable of lifting up to 15 tons. Exide estimates that 6 of the 13 kettles have less than 12 tons of lead. Because the lead tonnage in each kettle is an estimate (*i.e.*, kettles estimated to have less than 12 tons may actually have a bit more than 12 tons), as a margin of safety Exide has determined that it will use 15-ton capacity cranes to lift out the 6 kettles estimated to have less than 12 tons of lead.

As discussed in the Vernon Closure Plan in Section 2.8.3.5 Lead Product, Exide estimates that 7 of the 13 kettles in the Smelter Building have 12 tons or more of lead. The tonnage of lead in these 7 kettles ranges from about 12 tons all the way up to about 100 tons. These kettles are too heavy for the existing overhead cranes to remove. The floor of the Smelter Building cannot support a larger crane; therefore only the existing overhead cranes with a limit of 15 tons can be used. The best option from a safety and environmental protection standpoint is to re-melt the hardened lead before removing it from the facility. As demonstrated by the chart attached as Exhibit 1, re-melting is substantially preferable to any other alternative for removing this lead. Re-melting will be a relatively quick process performed purely to remove lead from the facility as part of the closure process – re-melting lead does not require any smelting, refining, or production. Exide will not be "re-starting" the plant. Following are some additional informational details to help understand the situation.

KETTLE INVENTORY REMOVAL SUMMARY
7/28/15 CLOSURE PLAN

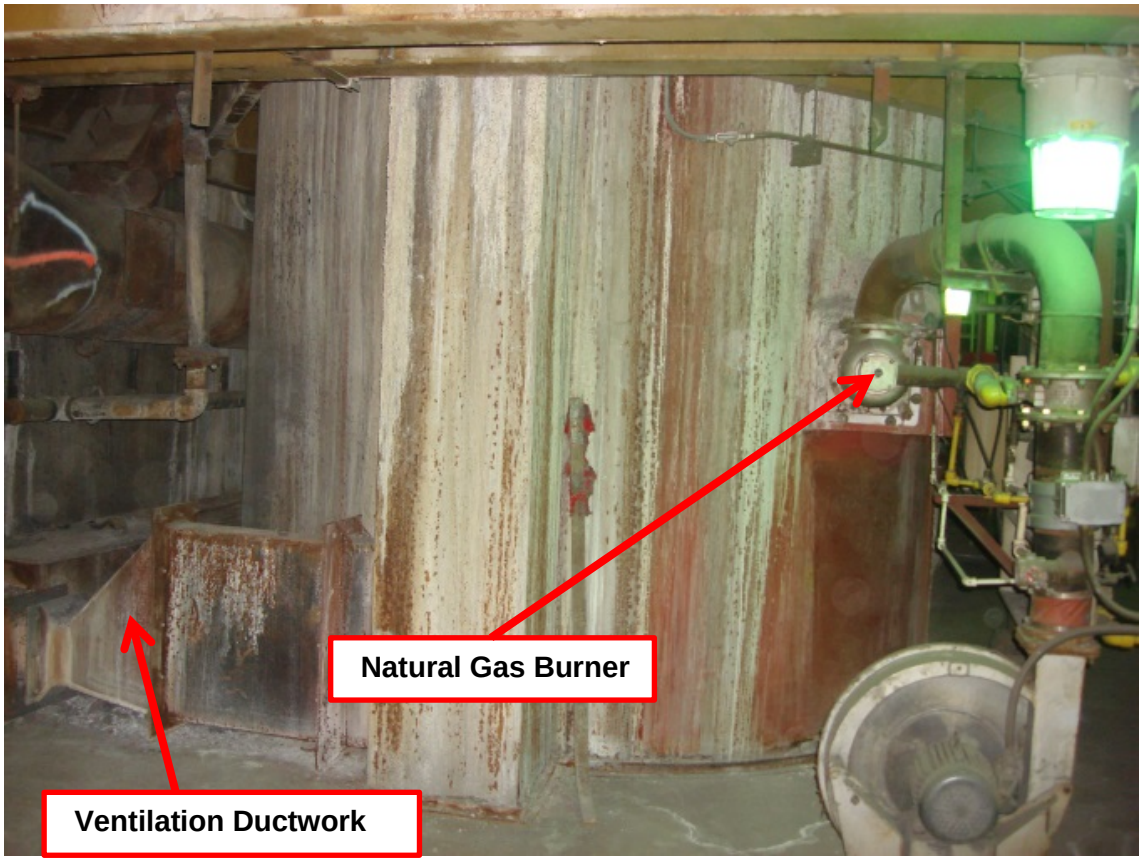
Below is a picture of the Kettle area showing the kettles in two rows on both sides of the Smelter Building. There are two cranes in the overhead structure of the room that are used to move equipment around the kettle area. The kettles that are too heavy to lift with the cranes are labeled in the picture.



Kettle Area (looking south)

KETTLE INVENTORY REMOVAL SUMMARY
7/28/15 CLOSURE PLAN

Below is a picture of the typical kettle setting that is in the Smelter Building Lower Level. Every kettle has a similar brick-lined setting (housing) that the kettle actually sits in. There is a drawing of the kettle itself on the last page of this summary. The kettle is 8.75 feet in diameter and 7.3 feet tall.



Kettle Lower Level (typical setting holding kettle)

KETTLE INVENTORY REMOVAL SUMMARY
7/28/15 CLOSURE PLAN

STATUS OF LEAD REMAINING IN BOTTOM OF KETTLES

- Remaining solidified lead will be evaluated to determine if they can be removed by lifting with a crane or similar equipment.

  - The following kettles are estimated to have less than 12 tons of lead. The kettle and lead will be removed from the setting with the overhead crane which has a lifting capacity of 15 tons.

    - Unit 89 (Receiving Kettle A)
    - Unit 94 (Refining Kettle 1)
    - Unit 95 (Refining Kettle 2)
    - Unit 98 (Refining Kettle 5)
    - Unit 101 (Refining Kettle B)
    - Unit 102 (Refining Kettle 9)

  - The following kettles are estimated to have greater than 12 tons of lead. The lead will be re-melted and the lead cast into molds for off-site recycling. No processing of the lead will be performed.

    - Unit 90 (Receiving Kettle B) … 50 tons
    - Unit 91 (Receiving Kettle E) … 65 tons
    - Unit 92 (Receiving Kettle F) … 100 tons
    - Unit 93 (Receiving Kettle G) … 12 tons
    - Unit 96 (Refining Kettle 3) … 15 tons
    - Unit 97 (Refining Kettle 4) … 30 tons
    - Unit 100 (Refining Kettle 7) … 15 tons

PROCESS OF REMELTING THE LEAD

- Re-melting

  - Uses natural gas to heat the lead until molten, and the lead is pumped out of the kettle into molds.
  - Temporary natural gas line will be installed to service the kettles.
  - Existing natural gas burner on the kettle setting would be started to heat the lead to about 900 degrees F in about 24 hours.
  - Molten lead will be pumped out of the kettle via a submerged lead pump to 1-ton molds and allowed to solidify into block molds.
  - Blocks of lead are taken out of the molds and shipped off-site.
  - All of the lead within the kettle will be pumped out, except for about 5 tons remaining at the bottom of the kettle below the bottom of the lead pump.

KETTLE INVENTORY REMOVAL SUMMARY
7/28/15 CLOSURE PLAN

- Pump will be removed from the kettle and a steel beam will be lowered into the remaining molten lead. The lead will be allowed to solidify around the steel beam.
- Remaining solidified lead and steel beam will be lifted out of the kettle using the overhead crane.
- Removal is estimated to occur in a two week period.

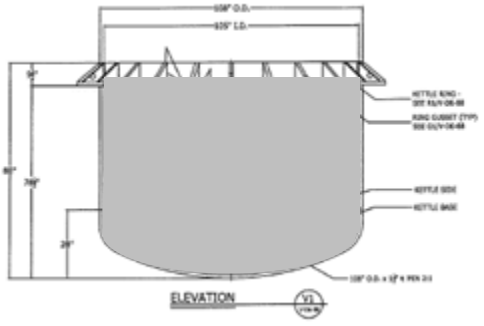
- AQMD-approved air emission control equipment will be used

  - Combustion products from the burner are vented from the kettle setting by the existing MAC baghouses and associated HEPA secondary filtration.
  - Blast Furnace kettles are vented by the Hard Lead baghouse and associated HEPA secondary filtration.
  - Reverb Furnace kettles are vented by the Soft Lead baghouse and associated HEPA secondary filtration.
  - The Refinery building is vented by the North and South Torit baghouses and associated HEPA secondary filtration.
  - These five ventilation baghouses apply over 450,000 cubic feet of air cleaning per minute.

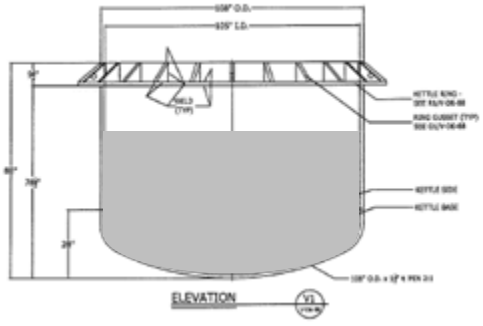
<u>DIAGRAMS OF EACH KETTLE TO BE REMELTED SHOWING THE SOLIDIFIED LEAD LEVEL INSIDE THE KETTLE</u>

- **Kettle inner dimensions … 8.75 feet diameter / 7.3 feet tall**

Unit 92 (Kettle F)
~ 100 tons

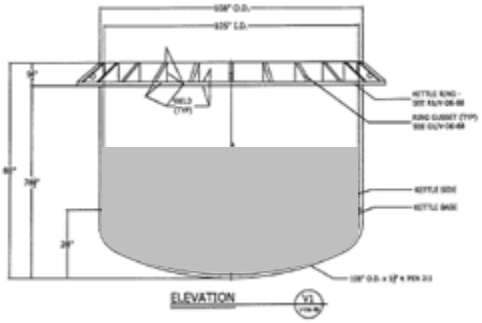


Unit 91 (Kettle E)
~ 65 tons

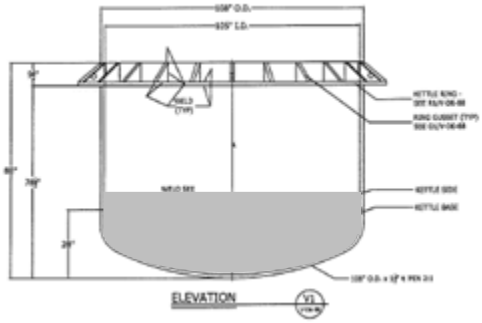


KETTLE INVENTORY REMOVAL SUMMARY
7/28/15 CLOSURE PLAN

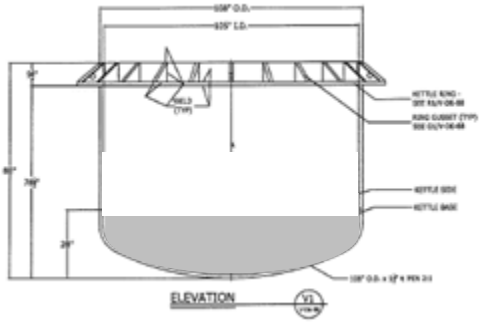
Unit 90 (Kettle B)
~ 50 tons



Unit 97 (Kettle 4)
~ 30 tons



Unit 93 (Kettle G)
~ 12 tons



Unit 100 (Kettle 7) & Unit 96 (Kettle 3)
~ 15 tons each

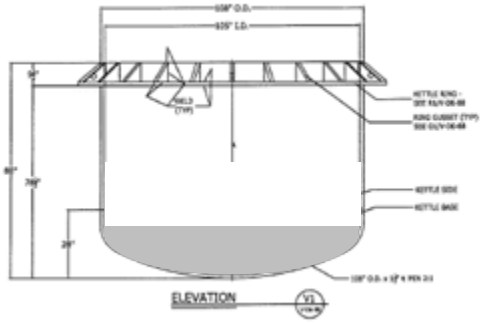


EXHIBIT 1

ADVANCED GeoServices
Engineering for the Environment. Planning for People.™
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West Chester, PA 19380-4293
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September 17, 2015

2013-2993-21

Mr. Wayne Lorentzen
California Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826-3200

RE: Kettle Inventory Removal Comparison
Closure Plan
Exide Technologies
Vernon, California

Dear Mr. Lorentzen:

As requested by DTSC, Advanced GeoServices, on behalf of Exide Technologies, has prepared the attached table to supplement the July 28, 2015 Closure Plan for the Exide facility in Vernon, California. It is anticipated that the table will be incorporated into future Closure Plan revisions.

The table compares methods for removal of lead heels from kettles by evaluating eleven factors: equipment, removal rate, time to remove the lead heels, confined space entry risk to employees, injury risk to employees, blood lead risk to employees, kettle stability, water management, air emissions, temperature and experience with the method. Each factor was given a score with 5 being the best case, and 1 being the worst case. The total possible score was 55. Re-melting of the lead and casting into molds scored significantly higher in the evaluation and was the selected method. Re-melting the lead heels is the method that is the most environmentally sound and protective of the health of the public and workers.

Manual demolition and water cutting methods were not selected as they had a high risk to employees, slow removal rate, long time to remove the lead heels, high risk of kettle instability, and no experience with the method.

Please contact Jen DiJoseph at (610) 840-9189 or Paul Stratman at (610) 840-9122 with any questions.

Sincerely,

ADVANCED GEOSERVICES

for
Jennifer W. DiJoseph
Project Consultant

Paul G. Stratman, P.E.
Consultant

JWD:PGS:vm

Enclosure

cc: N. Serieys
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L. Grossberg, City of Vernon
M. Nazemi, AQMD
R. Kemp, Environ
O. Theard, Sheppard Mullin
C. Graessle, Exide

KETTLE INVENTORY REMOVAL METHOD COMPARISON
EXIDE TECHNOLOGIES, VERNON, CALIFORNIA

EVALUATION TOPIC	MANUAL DEMOLITION		WATER CUTTING		REMELTING	
Description	Uses high pressure air to cut small pieces of lead from larger mass.	NA	Uses high pressure water to cut small pieces of lead from larger mass	NA	Uses existing natural gas burners to heat lead until molten. Lead is pumped into molds. Final 5 tons is removed with an overhead crane.	NA
Equipment Used	Mobilize air demolition equipment or backhoe with spade shaped tool.	3	Design, build and mobilize water cutting equipment. Specialty equipment would need to be designed and built over several months. 150 gpm of water at 20,000 to 40,000 psi	1	Use existing natural gas burners, pumps and molds. Install temporary natural gas line to service kettles.	5
Rate of Lead Heel Removal	800 hours to cut 100 tons lead	1	400 hours to cut 100 tons lead	3	50 hours per 100 ton kettle	5
Time to Remove 300 tons Lead Heels	300 8-hr shifts, or 63 5-day weeks	1	Several months to build equipment, plus 150 8-hr shifts, or 32 5-day weeks	3	Approximately two 5-day weeks	5
Employee Risk	Personnel enter kettle (confined space entry)	1	Personnel enter kettle (confined space entry)	1	Personnel do not enter kettle	5
	Very high potential for injury while moving lead pieces.	1	Very high potential for injury while moving lead pieces.	1	Minimal risk to employees as using existing equipment and historically successful safety procedures	5
	Very high potential for elevated lead in workers blood.	1	Very high potential for elevated lead in workers blood.	1	Minimal risk to employees as using existing equipment and historically successful safety procedures	5
Kettle Stability	Kettle may not remain structurally sound during cutting and could suddenly collapse into housing	1	Kettle may not remain structurally sound during cutting and could suddenly collapse into housing	1	Kettle is expected to remain structurally sound as using procedures similar to historic operations	5
Water Management	Collect and treat water used for dust control	3	Collect and treat 9,000 gallons per hour (72,000 gallons per day) of water containing lead grit particules resulting from cutting. Water collection and treatment system would need to be designed and mobilized.	1	Collect and treat water used for dust control, if any.	4
Air Emissions	Low risk to public as managed by existing Baghouses and associated HEPA secondary filtration per existing AQMD Permit	5	Low risk to public as managed by existing Baghouses and associated HEPA secondary filtration per existing AQMD Permit	5	Low risk to public as managed by existing Baghouses and associated HEPA secondary filtration per existing AQMD Permit	5
Temperature	Ambient	5	Ambient	5	900 degrees F achieved in 24 hours. This is a lower temperature than used during typical smelting operation.	3
Experience with Method	None. Trial & Error. Never Done on this Scale.	1	None. Trial & Error; Never done before	1	Exide employees are experienced with this method and have implemented these procedures successfully during historic operations.	5
Evaluation Results	Not Selected - high employee risk, slow removal rate, new method, high risk of kettle instability	23	Not Selected - high employee risk, equipment not available, high water production, slow removal rate, new method, high risk of kettle instability	23	**Selected - low employee risk, reasonable removal rate, existing equipment**	**52**

NOTES:
1. Score is based on a best case score of 5, worst case score of 1.
2. Highest total score is the selected case.
3. Total possible score is 55.