

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING AND COMPLIANCE
APPLICATION PROCESSING AND CALCULATIONS

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P/C

COMPANY NAME AND ADDRESS

Quemetco, Inc. ID 8547
720 South Seventh Avenue
City of Industry, CA 91746 mailing and equipment address

EQUIPMENT DESCRIPTION

APPLICATION NO. 511852

ALTERATION TO THE BATTERY WRECKING AND CONVEYING SYSTEM OF A/N 262165 (P/O D49307) BY THE:

DELETION OF:

CRUSHER, 50-H.P., ROTARY IMPACT, LEAD ACID BATTERIES (DEVICE D1)

ADDITION OF:

HAMMERMILL, WILLIAMS-PATENT CRUSHER INC., MODEL NO. 370 RS STAINLESS STEEL, SERIAL NUMBER 21174, 7'-0"W. X 17'-6"L. X 4'-6"H., 500-H.P.

APPLICATION NO. 511853

RECLAIM/TV FACILITY PERMIT REVISION

HISTORY

Application Nos. 511852-3 were received on 6/17/2010 to modify the battery crushing system as indicated above. The subject crushing equipment was previously operating under A/N 262165, P/O D49307 issued on 3/2/1992. This equipment was subsequently incorporated into the RECLAIM/TV Facility Permit. The TV permit was issued a renewal on 5/3/2006. Numerous changes and updates were performed to the TV permit in this renewal. Refer to the AQMD letter dated 4/28/2006 for a list of changes.

During the renewal process, the AQMD updated the description for the battery crushing system by incorporating all equipment devices in this permit unit. It was decided to perform administrative updates to equipment devices for this system during the renewal in order to ensure an accurate description in the renewal permit. A list of changes is described in detail under the PROCESS DESCRIPTION section of this report.

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PROCESS DESCRIPTION

Quemetco, Inc. recycles spent lead acid batteries to recover lead metal. Metallic lead is the desired product in this operation. A waste material, lead depleted slag, is shipped offsite for proper disposal. The waste slag by-product consists mainly of metal oxides and sulfates, and silica sand which may occur in this material as metal silicates. The metals present in the waste slag are expected to be mostly unrecoverable lead, calcium, iron, sodium, and trace heavy metals. The waste slag may also contain various alkaline earth metals.

In this operation, lead acid batteries are broken into fragments and the liquid sulfuric acid is washed and/or partially neutralized. The solid fragments include process material consisting of lead, rubber, and plastic. The bulk of the plastic is separated and washed, and sold to an external buyer. The remainder of feed material are mixed along with other additives consisting mainly of calcined carbon coke, lime, iron, borax, and/or silica sand. The shredded and treated raw feed material is stored in piles to drain as much liquid out of the feed piles as possible, and then a skip loader is used to charge buckets of this material to a rotary kiln hopper. Most of the moisture is removed in the rotary kiln and the dehydrated feed mix is charged to a reverberatory furnace. The raw mixture is smelted in this furnace and two streams of molten material are produced. The first stream, lead metal, is tapped from the reverberatory furnace and poured into large molds. The second stream, molten slag, is continuously charged to an adjacent electric resistance heated slag reduction furnace.

The reverberatory furnace operates at high temperatures of about 2400 degrees F. Molten slag floats on top of the denser liquid lead metal. The slag layer insulates the molten lead from further oxidation. The reducing agents chemically react with the slag material and reduce the lead content to metallic lead, which sinks to the bottom of the slag layers. Due to the high temperature, long residence time, and oxidizing atmosphere in the reverberatory furnace chamber, most of the organic gases produced in the reverberatory furnace are destroyed. However, both the reverberatory furnace and rotary dryer emit ROG and CO with the majority of these contaminants coming from the rotary dryer. The rotary dryer is direct fired and is not designed to heat the feed to high temperatures. A regenerative thermal oxidizer, in line between the rotary dryer baghouse and the WESP system is used to control ROG, CO, and toxic organic compounds emitted by the rotary dryer furnace.

Raw lead metal from the reverberatory and slag reduction furnaces, previously cast into lead blocks, is subsequently charged to refining pot furnaces. The lead is re-melted and mixed with various reagents to remove impurities and to adjust alloy composition. Reagents include sodium nitrate, elemental sulfur, sodium hydroxide, antimony, arsenic, calcium metal, sodium metal, red phosphorus, and petroleum coke. The chemical fumes and gases produced in the refining process are vented to an air pollution control baghouse, which filters the emissions existing as particulates. The exhaust outlet of this baghouse is vented to the WESP.

The pot furnaces are indirectly fired with natural gas. The burner compartments from the pot furnaces vent directly to atmosphere. Previously, each burner compartment had its own

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dedicated stack. Subsequent to the WESP installation, the individual burner stacks were manifolded into one common stack served by a NOx CEMS, for Rule 2012 compliance.

PROPOSED PROCESS CHANGES

The proposed changes to this equipment consist of replacing the 50-H.P. rotary impact crusher with a new 500-H.P. hammer mill type crusher. Since the process weight limit for this facility is enforced with the feed limit on the rotary dryer/reverberatory furnace, no emissions increase is expected.

The battery crusher is vented to a venturi scrubber and cyclone separator for the control of liquid particulate mist emissions containing lead and arsenic. The exhaust of the venturi scrubber system is connected to the facility total enclosure building which is kept under negative pressure and is vented to nine room ventilation baghouses equipped with second stage HEPA filters.

The room ventilation baghouses have been previously tested and shown to have a minimum control efficiency on lead of at least 98 percent. The control efficiency of the venturi scrubber is estimated to be approximately 90 percent. Therefore, overall control efficiency of mist from the battery crusher is expected to be about 99.8 percent. Any emission changes from this alteration is expected to be de minimus.

PREVIOUS BATTERY CRUSHER EQUIPMENT DESCRIPTIONS

The following descriptions summarize changes which have occurred between the period of time that the previous P/O was issued and the time that the previous TV renewal permit was issued.

APPLICATION NO. 262165

ORIGINAL EQUIPMENT DESCRIPTION

BATTERY WRECKING AND CONVEYING SYSTEM CONSISTING OF:

1. CRUSHER, 50-H.P. WITH A 3-H.P. CHARGING BELT CONVEYOR.
2. BATTERY PUNCHER WITH FOUR DRIVERS, EACH 5-H.P. MAXIMUM.
3. SINK/FLOAT STATION WITH A 3-H.P. SCREW CONVEYOR AND A LEAD RECEIVING BIN.
4. CRUSHER DISCHARGE SCREW CONVEYOR, 5-H.P.
5. SCRAP PLASTIC HAMMER MILL, 50-H.P., WITH A 5-H.P. FEED SCREW CONVEYOR.
6. SCRAP PLASTIC SINK/FLOAT STATION WITH A 3-H.P. PADDLE, A 3-H.P. DISCHARGE SCREW CONVEYOR, A 3-H.P. CASE MATERIAL DISCHARGE SCREW CONVEYOR, AND A CASE MATERIAL RECEIVING BIN.
7. SCRAP PLASTIC WASHING SYSTEM WITH A 2-H.P. PADDLE, A 1-H.P. SCRAP PLASTIC DISCHARGE SCREW CONVEYOR, A 3-H.P. CLEAR PLASTIC DISCHARGE SCREW CONVEYOR, A 3-H.P. VIBRATOR, A 5-H.P. SCREW CONVEYOR, AND A 15-H.P. TRANSPORT BLOWER.
8. RUBBER CASE MATERIAL SCREW CONVEYOR, 3-H.P.
9. FOUR LEAD SCRAP SCREW CONVEYORS, ONE 3-H.P., TWO 5-H.P., AND ONE 7.5-H.P.

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BATTERY CRUSHING SYSTEM CONFIGURATION AS OF 2/25/2005

- 1 VIBRATORY FEEDING TABLE.
- 2 BELT CONVEYOR FOR TRANSPORTING & SORTING.
- 3 INCLINED BATTERY TRANSPORT BELT CONVEYOR.
- 4 ROTARY IMPACT BATTERY CRUSHER, 50-HP, WITH A DISCHARGE SCREW CONVEYOR.
- 5 CRUSHED BATTERY SINK/FLOAT STATION WITH DRAG CONVEYOR FOR LEAD, SURFACE TRANSPORT PADDLES FOR CASE MATERIAL AND A SCREW TRANSPORT DISCHARGE CONVEYOR FOR CASE MATERIAL.
6. VIBRATORY PASTE WASHING TABLE, WITH A PASTE NEUTRALIZING (DESULPHURIZATION) TANK, A HOLDING TANK, A SURGE TANK, AND A PASTE FILTER PRESS.
- 7 TRANSPORT SCREW CONVEYOR FOR BATTERY CRUSHER MATERIAL.
- 8 CASE MATERIAL HAMMER MILL, 100-HP.
- 9 CASE MATERIAL SINK/FLOAT STATION WITH AGITATING/TRANSPORT PADDLES, HEAVY MATERIAL DISCHARGE SCREW CONVEYOR, AND A PLASTIC MATERIAL DISCHARGE SCREW CONVEYOR.
- 10 HEAVY MATERIAL TRANSPORT SCREW CONVEYOR SYSTEM CONSISTING OF 4 SCREW CONVEYORS.
- 11 PLASTIC MATERIAL SINK/FLOAT & WASHING STATION WITH AGITATING/TRANSPORT PADDLES, HEAVY MATERIAL DISCHARGE SCREW AND PLASTIC DISCHARGE SCREW CONVEYOR.
- 12 PLASTIC MATERIAL VIBRATORY TABLE FOR DE-WATERING AND TRANSPORT WITH TWO 10 HP VIBRATORS.
- 13 TWO PLASTIC MATERIAL TRANSPORT BLOWERS, 15-HP EACH.

CURRENT FACILITY PERMIT DESCRIPTION

DEVICE	DESCRIPTION AND SUB-DEVICES
D111	table, vibratory, feed, lead acid batteries
D112	conveyor, belt, transport and sorting.
D113	conveyor, belt, incline, battery transport
D1	crusher, 50-hp, rotary impact, lead-acid batteries D115 conveyor, screw, discharge
D116	tank, sink/float, crushed batteries D117 conveyor, drag, lead, with surface transport paddles for case material D118 conveyor, screw, transport discharge, case material
D119	table, vibratory, paste washing D120 tank, paste desulphurization D121 tank, holding D122 tank, surge D123 filter press, paste
D124	conveyor, screw, battery crusher material transport
D125	hammer mill, 100-hp, case material
D126	tank, case material sink/float, with agitating/transport paddles, D127 conveyor, screw, heavy material discharge D128 conveyor, screw, plastic material discharge
D129	conveyor, screw, heavy material transport
D130	conveyor, screw, heavy material transport
D131	conveyor, screw, heavy material transport

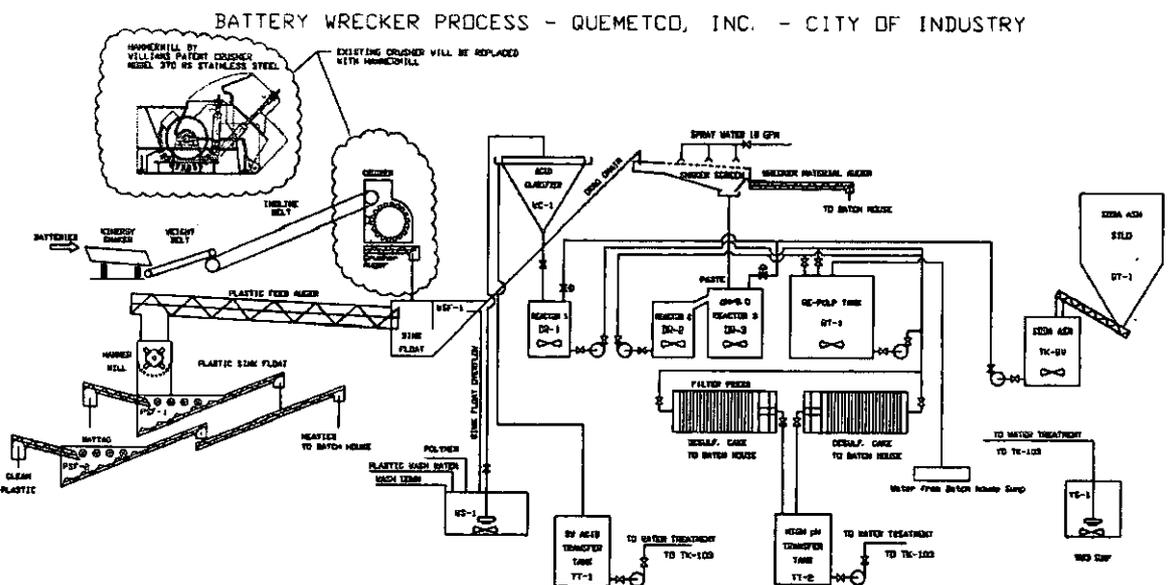
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DEVICE	DESCRIPTION AND SUB-DEVICES
D132	conveyor, screw, heavy material transport
D133	tank, plastic material sink/float and rinse, with agitating/transport paddles, D134 conveyor, screw, heavy material discharge D135 conveyor, screw, plastic discharge
D136	table, vibratory, plastic material de-watering and transport, with 2 10-hp vibrators
D137	conveyor, pneumatic, plastic material transport, with 2 15-hp blowers

The applicant provided the following process flow diagram for the battery breaking system:



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The subject equipment is operated 24 hours/day, 7 days/week, and 52 weeks/year, maximum

CALCULATIONS

Previous emissions reported under A/N 262165

Ave emissions, lbs/hr:

	R1	R2
PM10:	3.4	0.34
Pb:	0.02	0.002
As:	0.00008	0.000008

Ave emissions, lbs/day:

	R1	R2
PM10:	81.6	8.16
Pb:	0.48	0.048
As:	0.00192	0.000192

Current emissions subsequent to additional control by room ventilation baghouses

Ave emissions, lbs/hr:

	R1	R2
PM10:	3.4	0.0068
Pb:	0.02	0.00004
As:	0.00008	0.00000016

Ave emissions, lbs/day:

	R1	R2
PM10:	81.6	0.1632
Pb:	0.48	0.00096
As:	0.00192	0.00000384

EVALUATION

CEQA

There are no emission increases. Therefore a CEQA evaluation is not required.

RULE 212

There are no emission increases. Therefore, public notice under this rule is not required.

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RULES 401, 402, 404, 405, 1420, 40CFR 63, Subpart X

Previous evaluations have demonstrated that this equipment can be operated in compliance with all applicable rules and regulations.

REGULATION XIII

PM10, Baseline = 8 lbs/day

PM10, final = 0 lbs/day

Net change = -8 lbs/day

There is an overall decrease of 8 lbs/day of PM10 that was previously not accounted since the ventilation of this equipment to the total enclosure building occurred subsequent to the issuance of the previous permit. The record will now be updated to reflect this decrease.

RULE 1401

There will be no significant change in emissions of toxic air contaminants as a result of this modification. Therefore, there will be no increase in health risk and a Rule 1401 evaluation is not required in this case.

DISCUSSION

The subject equipment has been previously determined to operate in compliance with all applicable Rules and Regulations. The proposed changes will have a negligible effect on the emissions potential for this equipment.

RECOMMENDATION

APPLICATION NO. 509242

APPROVE RECLAIM/TV PERMIT REVISION

APPLICATION NO. 511853

Cancel RECLAIM/TV permit revision with full refund. This application is superfluous since this modification is being performed concurrently with other minor changes included under A/N 509242.

APPLICATION NO. 511852

Approve revisions to the Facility Permit as indicated below:

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Changes to section H

Add device D1:

HAMMERMILL, WILLIAMS-PATENT CRUSHER INC., MODEL NO. 370 RS STAINLESS STEEL, SERIAL NUMBER 21174, 7 FT.-0 IN. W. X 17 FT.-6 IN. L. X 4 FT.-6 IN. H., 500-H.P.

Add connections:

D1 to C2
D1 to C168
D1 to C169

Add existing conditions:

B163.4, D323.1, K67.13

Add existing emission limits:

LEAD: (10) [40CFR 63 Subpart X, #02, 6-23-2003]
PM: (9) [RULE 405, 2-7-1986]