CATEGORY: **MISCELLANEOUS**

BACT Size: Small Emitter BACT (PTE < 10 lb/day) **CONCRETE RECYCLER**

BACT Determination Number: 146	**BACT Determination Date:**

Equipment Information

Permit Number: 24381
Equipment Description: CONCRETE RECYCLER
Unit Size/Rating/Capacity:
Equipment Location: RIVER CITY WASTE RECYCLERS, LLC
10286 WATERMAN RD
ELK GROVE, CA

BACT Determination Information

ROCs	**Standard:**	
	Technology Description:	
	Basis:	
NOx	**Standard:**	
	Technology Description:	
	Basis:	
SOx	**Standard:**	
	Technology Description:	
	Basis:	
PM10	**Standard:**	
	Technology Description:	Baghouse serving crusher(s), water sprays at other material transfer points, use of water spray equipment on stockpiles and compliance with the latest opacity requirements of 40 CFR Subpart OOO.
	Basis:	Achieved in Practice
PM2.5	**Standard:**	
	Technology Description:	Baghouse serving crusher(s), water sprays at other material transfer points, use of water spray equipment on stockpiles and compliance with the latest opacity requirements of 40 CFR Subpart OOO.
	Basis:	Achieved in Practice
CO	**Standard:**	
	Technology Description:	
	Basis:	
LEAD	**Standard:**	
	Technology Description:	
	Basis:	

Comments: This BACT is for a stationary concrete recycling operation.

District Contact: Felix Trujillo Phone No.: (916) 874 - 7357 email: ftrujillo@airquality.org

777 12th Street, Third Floor

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Sacramento, CA 95814

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

DETERMINATION NO.: 146

DATE: January 11, 2018

ENGINEER: Felix Trujillo, Jr.

Category/General Equip Description: Miscellaneous

Equipment Specific Description: Stationary Concrete Recycling

Equipment Size/Rating: Small Emitter BACT (< 10 lb/day)

Previous BACT Det. No.: None

This BACT determination will be made for a stationary concrete recycling operation including crushing, screening, stacking, conveying equipment and stockpiles with PM10 and PM2.5 less than 10 lb/day.

This BACT was determined under the project for A/C's 24381 and 24382 (River City Waste Recyclers, LLC).

BACT ANALYSIS

A: ACHIEVED IN PRACTICE (Rule 202, §205.1a)

The following control technologies are currently employed as BACT for stationary concrete recycling operations:

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>US EPA</td><td>BACT
Source: EPA RACT/BACT/LAER Clearinghouse
<table>
<tr><th colspan="2">Stationary Concrete Recycling Operation</th></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>US EPA</td><td><u>RULE REQUIREMENTS</u>:
40 CFR 60 Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants

This regulation applies to fixed or portable nonmetallic mineral processing plants that include crushing or grinding equipment with capacities of 25 tons/hr or 150 tons/hr, respectively.

This regulation includes two separate opacity limitations based on the construction, modification or reconstruction date of the equipment. Pursuant to 40 CFR Subpart A Section 60.2 (Definitions), installation is included under the definition of construction. For equipment that was installed after April 22, 2008, are subject to an opacity limit of 7% for screening and conveyor transfer points and 12% for crushers. Equipment installed after April 22, 2008, are also required to do monthly inspections on their water spray equipment. A Method 9 (Visible Emissions) source test is required for verification of compliance with the opacity limitations of the NSPS.

For equipment that is served by a baghouse, the regulation sets a PM standard of 0.014 gr/dscf (Section 60.672(a)). The regulation requires an initial source test to verify compliance with this limit (Section 60.675(b)(1)). Section 60.674(c) requires quarterly 30-minute visible emissions inspections using EPA Method 22 or the use of a bag leak detection system (Section 60.674(d)).</td></tr>
<tr><td>ARB</td><td><u>BACT</u>
Source: ARB BACT Clearinghouse
<table><tr><th colspan="2">ARB BACT Clearinghouse</th></tr><tr><td>VOC</td><td>No standard</td></tr><tr><td>NOx</td><td>No standard</td></tr><tr><td>SOx</td><td>No standard</td></tr><tr><td>PM10</td><td>No standard</td></tr><tr><td>PM2.5</td><td>No standard</td></tr><tr><td>CO</td><td>No standard</td></tr></table>
<u>RULE REQUIREMENTS</u>:
None</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>SMAQMD</td><td>

BACT
Source: SMAQMD BACT Clearinghouse (http://www.airquality.org/businesses/permits-registration-programs/best-available-control-technology-(bact))

<table>
<tr><th colspan="2">Stationary Concrete Recycling Operation</th></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>

The SMAQMD BACT Clearinghouse does not have an existing BACT for stationary concrete recycling operations. BACT No. 41 applies to aggregate processing plants, which are similar type of operations. But the BACT was determined for minor sources. Prior to the 10/28/10 version of District Rule 202 (New Source Review Rule), the District had a BACT threshold of 10 lb/day. Therefore, no small emitter BACTs were determined as none were required. It was only after the implementation of the 0 lb/day BACT threshold, that the District started to develp small emitter BACTs for the smaller sources. Therefore, the more restrictive BACT No. 41 will not be referenced for this BACT determination.

RULE REQUIREMENTS:
None

</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>South Coast AQMD</td><td>
<u>BACT</u>
Source: SCAQMD BACT Guidelines for Non-Major Polluting Facilities, page 13.
<table>
<tr><td colspan="2">Stationary Concrete Recycling Operation</td></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>
The SCAQMD BACT trigger level is 1 lb/day. Therefore, the SCAQMD BACT Clearinghouse was reviewed as part of this BACT determination. There is no specific BACT guideline for concrete recycling. The SCAQMD does include a BACT for Rock-Aggregate processing with an all rating (SCAQMD BACT Guidelines for Non-Major Polluting Facilities 10/20/00), page 104) that lists a baghouse venting a crusher and water sprays at other material transfer points. Although this BACT is not for a concrete recycling operation, it is similar and will therefore be referenced.

<u>RULE REQUIREMENTS</u>:
None
</td></tr>
<tr><td>San Diego County APCD</td><td>
<u>BACT</u>
Source: NSR Requirements for BACT, page 3-22.
<table>
<tr><td colspan="2">Stationary Concrete Recycling Operation</td></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>
The SDCAPCD has a BACT trigger level of 10 lb/day. Therefore, the SDAPCD BACT clearinghouse will not be referenced for this BACT.

<u>RULE REQUIREMENTS</u>:
None
</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>Bay Area AQMD</td><td>

BACT
Source: BAAQMD BACT Guideline

<table>
<tr><th colspan="2">Stationary Concrete Recycling Operation</th></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>

The BAAQMD has a BACT trigger level of 10 lb/day. Therefore, the BAAQMD BACT clearinghouse will not be referenced for this BACT.

RULE REQUIREMENTS:
None

</td></tr>
<tr><td>San Joaquin Valley APCD</td><td>

BACT
Source: SJVUAPCD BACT Guideline (Rescinded)

<table>
<tr><th colspan="2">Stationary Concrete Recycling Operation</th></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>No standard</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>

The SJVAPCD BACT trigger level is 2 lb/day. Therefore, the SJVAPCD BACT Clearinghouse was reviewed as part of this BACT determination. BACT Guideline 6.1.4 addressed asphalt and concrete recycling (≥ 450 tons processed/hr), but listed the use of a baghouse serving a crusher and the use of water sprays at other transfer points as being technologically feasible. The District contacted the SJVAPCD via email (5/26/16 to Jag Kahlon – SJVAPCD Northern Region Air Quality Engineer) and asked if the A/C permit (S-1926-1-0, Project #930258) had been converted to a permit. The response was that no permit was ever issued for that operation.

BACT Guideline 6.1.1 applies to aggregate crushing, screening & storage for operations with process rates ≥ 5,850 tons/day. .

</td></tr>
</table>

The following control technologies have been identified as the most stringent, achieved in practice control technologies:

BEST CONTROL TECHNOLOGIES ACHIEVED		
Pollutant	**Standard**	**Source**
VOC	No Standard	
NOx	No Standard	
SOx	No Standard	
PM10	Baghouse serving crusher(s), water sprays at other material transfer points, use of water spray equipment on stockpiles and compliance with the latest opacity requirements of 40 CFR Supart OOO.	SCAQMD, EPA
PM2.5	No standard	
CO	No Standard	

B. TECHNOLOGICALLY FEASIBLE AND COST EFFECTIVE (Rule 202, §205.1.b.):

Technologically Feasible Alternatives:
Any alternative basic equipment, fuel, process, emission control device or technique, singly or in combination, determined to be technologically feasible by the Air Pollution Control Officer.

The table below shows the technologically feasible alternatives identified as capable of reducing emissions beyond the levels determined to be "Achieved in Practice" as per Rule 202, §205.1.a.

Pollutant	Technologically Feasible Alternatives
VOC	Not applicable
NOx	Not applicable
SOx	Not applicable
PM10	Enclosure of crushers, screens, conveyors and transfer points and vented to a baghouse (A)(B)
PM2.5	No other technologically feasible option identified (A)(B)
CO	Not applicable

(A) This is listed as a technologically feasible BACT in the BAAQMD BACT Document #144.1 for rock and aggregate processing.
(B) Although the use of enclosed conveyors, screensand transfer points can be listed in this section, a review of portable concrete recycling operation's Method 9 test results show water sprays to be as effective in controlling particulate emissions from conveyors, screens and conveyor transfer points (see Attachment B). Therefore, enclosure of these equipment is not necessary for small emitters.

Cost Effectiveness Analysis Summary

The cost analysis was processed in accordance with the EPA OAQPS Air Pollution Control Cost Manual (Sixth Edition). The sales tax rate was based on the District's standard rate of 8.5% as approved on 10/17/16. The electricity (11.24 cents/kWh) rate were based on an industrial application as approved by the District on 10/17/16. The life of the equipment was based on the EPA cost manual recommendation. The interest rate was based on the previous 6-month average interest rate on United States Treasury Securities (based on the life of the equipment) and addition of two percentage points and rounding up the next higher integer rate. The labor (Occupation Code 51-9021: Crushing, grinding, and polishing machine setters, operators and tenders) and maintenance (Occupation Code 49-9099: Installation, maintenance, and repair workers, all others) rates were based on data from the Bureau of Labor Statistics.

Background:

BAAQMD BACT Document 144.1 – Rock and Aggregate Processing, includes the enclosure of crushers, screens, conveyors and transfer points served by a baghouse. A cost effectiveness determination will be performed in order to determine if it is cost effective to enclose the screen, conveyors and transfer points and have them served by a baghouse. Only the addition of a baghouse will be used to determine if the additional control is cost effective. The EPA cost manual will be used to determine the cost of the baghouse. The enclosure of the equipment and ducting would only add to the cost of the system.

Enclosure of Screen, conveyors and transfers points served by a baghouse:

Equipment Life = 20 years

Total Capital Investment = $61,108.85

Annualized Total Capital Investment = $4,903.53 per year

Direct Annual Cost = $11,771.73 per year

Indirect Annual Cost = $6,460.62 per year

Total Annual Cost = $23,135.87 per year

PM10 Removed = 1.825 tons per year

Cost of PM10 Removal = $12,677.19 per ton reduced

A detailed calculation of the cost effectiveness for PM10 removal with a baghouse is shown in Appendix C. As shown above, the cost of enclosing the equipment and venting the emissions to a baghouse is not cost effective.

Using the PM10 BACT standard for PM2.5:
Since both, PM10 and PM2.5 trigger BACT at > 0 lb/day and PM2.5 is a subset of PM10, BACT for PM2.5 will be triggered whenever BACT is triggered for PM10. Therefore, BACT for PM2.5 will be set to be the same as for PM10.

C. SELECTION OF BACT:
Small emitter BACT (< 10 lb/day) for a stationary concrete recycling operation is the following:

BACT FOR STATIONARY CONCRETE RECYCLING (< 10 LB PM10, PM2.5/DAY)		
Pollutant	**Standard**	**Source**
VOC	NA	NA
NOx	NA	NA
SOx	NA	NA
PM10	Baghouse serving crusher(s), water sprays at other material transfer points, use of water spray equipment on stockpiles and compliance with the latest opacity requirements of 40 CFR Subpart OOO	SCAQMD, EPA
PM2.5	Baghouse serving crusher(s), water sprays at other material transfer points, use of water spray equipment on stockpiles and compliance with the latest opacity requirements of 40 CFR Subpart OOO	SCAQMD, EPA
CO	NA	NA

REVIEWED BY: _____ **DATE:** _____

APPROVED BY: _____ **DATE:** _____

Attachment A
Review of BACT Determination

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities*

10-20-2000 Rev. 0

Equipment or Process: Rock – Aggregate Processing

	Criteria Pollutants					
Rating/Size	**VOC**	**NOx**	**SOx**	**CO**	**PM_{10}**	**Inorganic**
All					Baghouse Venting Jaw Crushers, Cone Crushers, and Material Transfer Points Adjacent to and after these Items; and Water Sprays at Other Material Transfer Points (1990)	

* Means those facilities that are not major polluting facilities as defined by Rule 1302 - Definitions

Attachment B

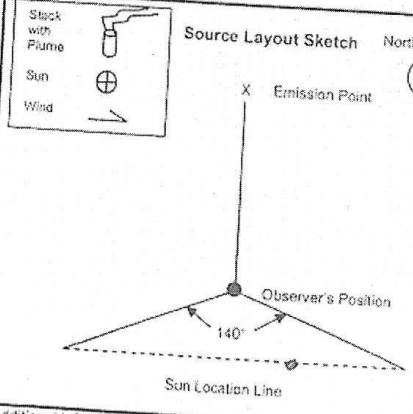
EPA Method 9 Test Results for Concrete Recycling Operations

California Environmental Protection Agency
Air Resources Board

VISIBLE EMISSION OBSERVATION FORM

Company Name: Granite Construction Co	
Street Address: 12300 White Rock Rd	
City: Rancho Cordova	State: CA; Zip: 95742
Phone: 916 417 5309	Source ID Number: 90,13689R
Process Equipment: Powerscreen Warrior	Operating Mode:
Control Equipment:	Operating Mode:
Describe Emission Point: Final Side Conveyor	
Height Above Ground Level: 8'	Height Relative to Observer: Start: 2' End: 2'
Distance from Observer: Start: 85' End: 85'	Direction from Observer: Start: N End: N
Describe Emissions: Start: None End: None	
Emission Color: Start: None End: None	If Water Droplet Plume: Attached ☐ Detached ☐
Point in plume at which opacity was determined: Start: End:	
Describe Plume Background: Start: Sky ⇒ End: Equipment / Blue	
Background Color: Start: Blue End: Blue	Sky Conditions: Start: Clear End: Clear
Wind Speed: Start: 5 End: 5	Wind Direction: Start: NW End: NW
Ambient Temp: Start: 40°F End: 40°F	Wet Bulb Temp: ; RH Percent:

Source Layout Sketch — North Arrow ①



Additional Information:

Observation Date: 1-24-13 | Start Time: 10:00AM | End Time: 10:30AM

Sec / Min	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observers Name (Print): Charles Hawkins

Observers Signature: [signature] Date: 1-24-13

Organization: GCCO

Certified By: Date:

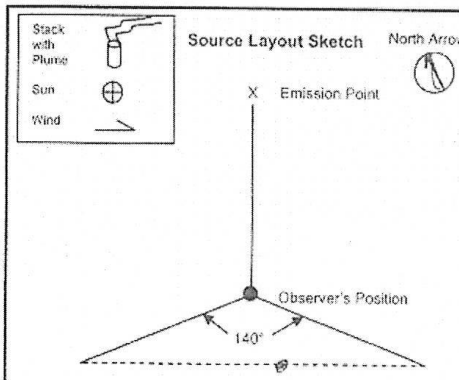
Continued on VEO form Number:

ED/TCAB-082 (New 3/06)

California Environmental Protection Agency
Air Resources Board

VISIBLE EMISSION OBSERVATION FORM

Company Name: Granite Construction Co.	
Street Address: 12300 White Rock Rd.	
City: Rancho Cordova	State: CA Zip: 95742
Phone: 916 417 5309	Source ID Number: 90.13669R
Process Equipment: Powerscreen Warrior	Operating Mode:
Control Equipment:	Operating Mode:
Describe Emission Point: Middle Deck Side Conveyor.	
Height Above Ground Level: 8'	Height Relative to Observer: Start: 2' End: 2'
Distance from Observer: Start: 50' End: 50'	Direction from Observer: Start: NE End: NE
Describe Emissions: Start: None End: None	
Emission Color: Start: None End: None	If Water Droplet Plume: Attached ☐ Detached ☐
Point in plume at which opacity was determined: Start: End:	
Describe Plume Background: Start: Earth Material End: Same	
Background Color: Start: Brownish End: Same	Sky Conditions: Start: Clear End: Clear
Wind Speed: Start: 5mph End: 5mph	Wind Direction: Start: NW End: NW
Ambient Temp: Start: 50 End: 50	Wet Bulb Temp: RH, Percent:



Additional Information:

Observation Date: 1-24-17	Start Time: 2:10 PM	End Time: 2:40 PM

Sec / Min	0	15	30	45	Comments
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	
5	0	0	0	0	
6	0	0	0	0	
7	0	0	0	0	
8	0	0	0	0	
9	0	0	0	0	
10	0	0	0	0	
11	0	0	0	0	
12	0	0	0	0	
13	0	0	0	0	
14	0	0	0	0	
15	0	0	0	0	
16	0	0	0	0	
17	0	0	0	0	
18	0	0	0	0	
19	0	0	0	0	
20	0	0	0	0	
21	0	0	0	0	
22	0	0	0	0	
23	0	0	0	0	
24	0	0	0	0	
25	0	0	0	0	
26	0	0	0	0	
27	0	0	0	0	
28	0	0	0	0	
29	0	0	0	0	
30	0	0	0	0	

Observers Name (Print): Charles Hawkins	
Observers Signature:	Date: 1-24-17
Organization: CCC	
Certified By:	Date:
Continued on VEO form Number:	

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

SOURCE TEST REPORT

NAME OF APPLICANT: A & A Concrete **SOURCE TEST DATE(S):** August 7, 2008

MAILING ADDRESS: 8272 Berry Avenue, Sacramento, CA 95828 **PERMIT NO.:** 21283

EQUIPMENT LOCATION (ADDRESS): 8272 Berry Avenue, Sacramento, CA 95828

SOURCE TESTER: John Finnell

DATE CONSTRUCTION AUTHORIZED: July 29, 2008

TYPE OF TEST:	INITIAL	ROUTINE	FOLLOW-UP	WEATHER	WIND DIRECTION & VELOCITY
	X			Clear skies	0-1 mph

USUAL OPERATING SCHEDULE FOR THIS EQUIPMENT: 14 hours/day, 575 hours/quarter, and 575 hours/year

NAMES AND TITLES OF PERSONS CONTACTED: Dan Barber, D.K. Barber P.E. & Associates

REMARKS: A source test was performed on the portable rock crushing plant located at 8272 Berry Avenue, Sacramento. The crusher was tested at an hourly process rate of 90 to 95 tons/hour. The equipment was verified and the following deviations from the A/C were observed: a) the two deck screen was 5' x 11' rather than 4' x 10'; b) the crusher engine was different than permitted; and c) the smaller, stacker engine was 85 hp rather than 73 hp. The changes were noted in the inspection reports and the evaluation was amended to account for the changes.

The following test was performed.

1. EPA Method 9 – Visible Emissions – Opacity

The visual emissions (VE) reader was certified by the Air Resources Board. His VE certificate was current and had an expiration date of December 19, 2008. The equipment complies with the opacity limitations as indicated in the summary below.

Location No.	Emission Point	Opacity Limit (%)	Maximum 15 second Reading	Pass
1	Receiving Pan & Vibrating Grizzly	10	10	Yes
2	Conveyor Under Crusher	10	0	Yes
3	2 Deck Screen	10	0	Yes
4	Conveyor Under Screen	10	10	Yes
5	Crusher Impact 4242	15	10	Yes
6	Conveyor Return to Crusher	10	0	Yes
7	Conveyor (cross) from Lower Screen Deck	10	0	Yes
8	Conveyor Product Stacker	10	0	Yes

REVIEWING ENGR: A.C. Olfa 7-6-10 **PERMIT ENGR:** Jeff Weiss

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

FIELD INSPECTION REPORT

_X__ I have read and am familiar with the safety equipment necessary to inspect this source as listed in the ACode of Safe Practices-Field Staff≅ in the Safety Manual.	_X__ I asked the source if there were any hazards to be aware of on site prior to the inspection.

SOURCE Golden State Crushing P/O NO. 24232 DATE 4/27/15

ADDRESS 5980 Outfall Circle,Sacramento PHONE (916-826-8067)

CONTACT PERSON Scott Silva TITLE Managing Member

INSPECTOR Felix Trujillo, Jr. TIME 9:30 [X] AM [ ] PM

WEATHER Clear WIND DIRECTION & SPEED S @ 0-3 mph

EQUIPMENT OBSERVED Electric concrete recycling equipment consisting of screens, a crusher and conveyors.

OPERATING SCHEDULE: _____ HOURS/DAY _____ DAYS/WEEK

TYPE: [ ] Annual [ ]Breakdown [ ]Complaint [ ]Follow-up [ ]Surveillance [X]other Initial

REMARKS: I performed an inspection of the electric equipment. No issues were observed. I observed water sprays on the equipment and stockpiles. There were no particulate emissions emitted from the equipment. The operation was subject to Method 9 testing to comply with Subpart OOO. Mathew Peterson (Amador County APCD Air Quality Specialist, ARB ID:33053) performed the VE testing. The equipment is in compliance with the permit conditions. I recommend that a P/O be issued for this equipment.

Signature:_____ Supervisor: 5-31-16

[X] Continued on back

Method 9 Summary		
Observed Points	Compliance Standard	Measured VE
Jaw Crusher	12	0
Jaw Crusher Conveyor	7	0
Cone Crusher	12	0
Screen	7	0
Belt Conveyor #1	7	0
Belt Conveyor #2	7	0
Belt Conveyor #3	7	0
Belt Conveyor #4	7	0
Belt Conveyor #5	7	0
Belt Convryor #6	7	0
Under Screen Conveyor	7	0
Screen Cross Conveyor	7	0
Transfer Conveyor #1	7	0
Transfer Conveyor #2	7	0

AS
5-31-16

[X] Continued on back

Attachment
Cost-Effectiveness Analysis

COST EFFECTIVENESS ANALYSIS FOR BAGHOUSE

This cost effectiveness analysis was performed using EPA's OAQPS Control Cost Manual
EPA publication No. 452/B-02-001, Chapter 1, Baghouses and Filters (12/98)

FACILITY NAME:	River City Waste Recyclers
LOCATION:	10286 Waterman Road, Elk Grove, CA 95624
PERMIT NO.:	24381 & 24382
EQUIPMENT DESCRIPTION:	Concrete Recycling Operation

PM10 Baghouse Cost Effective Requirements

PM Cost effective Number	11400	$/ton
PM emission from concrete reycling operation	1.825	tons/yer
CRF (5% interest and 20 year life)	0.080242587	

Particulate Matter Control (Bag House) Cost Analysis

Gas to cloth ratio for shaker or reverse air bag house	2	Table 1.1
A	10	Table 1.4
B	1	Table 1.4
L	0.1	
D	10	
V	7.478512079	equation 1.11
acfm of system	12000	acfm
Bag Size	1604.597261	ft^2
Cost of Bag house common housing design	$ 13,800.73	
Cost of insulation	$ 4,619.25	
Cost of bag (Pulse jet, BBR - fiberglass, Table 1.8), bottom bag removal	$ 2,711.77	
Bag house cages	119.57	
cage cost	12.23	$/cage
Total cage costs	$ 1,462.25	
Equipment Costs (A)	$ 22,594.00	
Instrumentation	$ 2,259.40	0.10*A
California Sales taxes	$ 1,920.49	0.085*A
Freight	$ 1,129.70	0.05*A
Purchase Equipment Cost **(PEC)**	$ 27,903.59	

Direct Installation Costs

Foundation & Supports	$ 1,116.14	0.04*PEC
Handling & erection	$ 13,951.79	0.50*PEC
Electrical	$ 2,232.29	0.08*PEC
Piping	$ 279.04	0.01*PEC
Insulation for ductwork	$ 1,953.25	0.07*PEC
Painting	$ 1,116.14	0.04*PEC
Total direct installation costs	$ 20,648.65	

Indirect Costs (installation)

Engineering	$ 2,790.36	0.10*PEC
Construction and field expense	$ 5,580.72	0.20*PEC
Contractor fees	$ 2,790.36	0.10*PEC
Starup-up	$ 279.04	0.01*PEC
Performance test	$ 279.04	0.01*PEC
Contingencies	$ 837.11	0.03*PEC
Total indirect installation costs	$ 12,556.61	

Total Capital Investment (TCI) (PEC+DC+IC) $61,108.85

Direct Annual Costs

Operating Labor	$1,803.10	(.5 hr/shift) (1 shift/8 hrs)(2080 hrs/yr)*$11.24
Supervisor	$270.47	15% of operating Labor
Maintenance Labor	$2,310.10	(.5 hr/shift) (1 shift/8 hrs)(2080 hrs/yr)*$17.77
Material	$2,310.10	100% of maintenance labor
Electricity	$5,077.96	(0.000181)(12000 acfm)(10 in H2O)(2080 hr/yr)($0.1124 kW/h)
Total Annual DC	$ 11,771.73	

Indirect Annual Costs

Overhead	$4,016.26	60% of total labor and material
Admin charges	$1,222.18	2% of TCI
Property Tax	$611.09	1% of TCI
Insurance	$611.09	1% of TCI
Capital Recovery	$4,903.53	
Total Annual IC	$11,364.15	

Total Annal Costs (DAC + DIC) $23,135.87

TAC/tons controlled **$12,677.19**