PERMIT TO CONSTRUCT APPLICATION
for a
CRUSHING & SCREENING PLANT

submitted by

BARDON, INC. (dba AGGREGATE INDUSTIRES – MAR)

Located at
5850 SHERIFF RD, CAPITOL HEIGHTS, PRINCE GEORGES COUNTY

OCTOBER 2014

The application was prepared by Kathryn O'C. Gunkel, P.E., WILDWOOD Environmental Engineering Consultants, Inc.

Please direct all questions about the application to Ms Gunkel, (410) 780-9663, wildwoodenvironmental@comcast.net. Please be sure to copy Timothy Bevard, tim.bevard@aggregate-US.com on all email correspondence.

Robert F. Petty, Vice President

Date 10/23/14

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OCT 27 2014

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard ■ Baltimore, Maryland 21230
(410) 537-3230 ■ 1-800-633-6101 ■ www.mde.state.md.us
Air and Radiation Management Administration ■ Air Quality Permits Program

APPLICATION FOR PROCESSING/MANUFACTURING EQUIPMENT

Permit to Construct ☒ Registration Update ☐ Initial Registration ☐

1A. Owner of Equipment/Company Name

BARDON, INC. (dba AGGREGATE INDUSTRIES - MAR)

Mailing Address

6401 GOLDEN TRIANGLE DRIVE, SUITE 400

Street Address

GREENBELT | MARYLAND | 20770

City | State | Zip

Telephone Number

301.982.1400

Signature

ROBERT F. PETTY, VICE PRESIDENT

Print Name and Title

10/23/14

Date

DO NOT WRITE IN THIS BLOCK

2. REGISTRATION NUMBER

County No. (1-2) | Premises No. (3-6)

Registration Class (7) | Equipment No. (8-11)

Data Year (12-13) | Application Date

1B. Equipment Location and Telephone Number (if different from above)

5850 SHERIFF RD.

Street Number and Street Name

CAPITOL HEIGHTS | MARYLAND | 20743 | 301.982.1485

City/Town | State | Zip | Telephone Number

Premises Name (if different from above)

3. Status (A= New, B= Modification to Existing Equipment, C= Existing Equipment)

Status (15)	New Construction Begun (MM/YY) (16-19)	New Construction Completed (MM/YY) (20-23)	Existing Initial Operation (MM/YY) (20-23)
A	1214	1214	

4. Describe this Equipment: Make, Model, Features, Manufacturer (Include Maximum Hourly Input Rate, etc.)

ONE (1) 300 TPH KOBELCO 1315 IMPACT CRUSHER, ONE (1) 300 TPH THUNDERBIRD 6 x 16 SCREEN, ONE (1) 350 TPH ASTEC 6 x 18 MOBILE SCREEN, 13 BELT CONVEYORS, 2 RADIAL STACKER CONVEYORS.

5. Workmen's Compensation Coverage WC026034879 (Binder/Policy Number) 1-Apr-2015 (Expiration Date)

Company: NEW HAMPSHIRE INSURANCE CO.

NOTE: Before a Permit to Construct may be issued by the Department, the applicant must provide the Department with proof of worker's compensation coverage as required under Section 1-202 of the Worker's Compensation Act.

6A. Number of Pieces of Identical Equipment Units to be Registered/Permitted at this Time 1 CRUSH'G & SCREEN'G PLANT

6B. Number of Stack/Emission Points Associated with this Equipment 29 FUGITIVE EMISSION POINTS

7. Person Installing this Equipment (if different from Number 1 on Page 1)

Name _____ Title _____

Company _____

Mailing Address/Street _____

City/Town _____ State _____ Telephone (_____) _____

8. Major Activity, Product or Service of Company at this Location

PROCESS ASPHALT PAVEMENT WASTE MATERIALS INTO SMALLER SIZES FOR RE-USE IN ASPHALT PAVING MIXTURES PRODUCED AT EXTERNAL ASPHALT PAVING MATERIALS MIXING PLANTS.

9. Control Devices Associated with this Equipment

NONE [ ] 24-0

Simple/Multiple Cyclone	Spray/Adsorb Tower	Venturi Scrubber	Carbon Adsorber	Electrostatic Precipitator	Baghouse	Thermal/Catalytic Afterburner	Dry Scrubber
[ ] 24-1	[ ] 24-2	[ ] 24-3	[ ] 24-4	[ ] 24-5	[ ] 24-6	[ ] 24-7	[ ] 24-8

Other [X] 24-9 Describe ***WATER SPRAY***

10. Annual Fuel Consumption for this Equipment

OIL - 1000 GALLONS	SULFUR %	GRADE	NATURAL GAS - 1000 FT³	LP GAS - 100 GALLONS	GRADE
26-31	32-33	34	35-41	42-45	

COAL - TONS	SULFUR %	ASH %	WOOD - TONS	MOISTURE %
46-52	53-55	56-58	59-63	64-65

OTHER FUELS (Specify Type) [ ] 66-1 ANNUAL AMOUNT CONSUMED (Specify Units)

OTHER FUELS (Specify Type) [ ] 66-2 ANNUAL AMOUNT CONSUMED (Specify Units)

1 = Coke 2 = COG 3 = BFG 4 = Other

11. OPERATING SCHEDULE (for this equipment)

Continuous Operation	Batch Process	Hours per Batch	Batch per Week	Hours per Day	Days Per Week	Days per year
X 67-1	[ ] 67-2	12 68-69	[ ]	12 70-71	6 72	312 73-75

Seasonal Variation in Operation:

No Variation	Winter Percent	Spring Percent	Summer Percent	Fall Percent	(Total Seasons= 100%)
[ ] 76	10 77-78	30 79-80	30 81-82	30 83-84	

12. Equivalent Stack Information- is Exhaust through Doors, Window, etc. Only? (Y/N) [Y] 85

If not, then

Height Above Ground (FT)	Inside Diameter at Top	Exit Temperature (^{o}F)	Exit Velocity (FT/SEC)
86-88	89-91	92-95	96-98

NOTE:
Attach a block diagram of process/process line, indicating new equipment as reported on this form and all existing equipment, including control devices and emission points.

13. Input Materials (for this equipment only)
Is any of this data to be considered confidential? [ ] (Y or N)

NAME	CAS NO. (IF APPLICABLE)	INPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. *ASPHALT PAVEMENT WASTE*		*300*	*TONS*	*600,000*	*TONS*
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

14. Output Materials (for this equipment)
Process/Product Stream

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1. *RECLAIMED ASPHALT PAVEMENT*		*300*	*TONS*	*600,000*	*TONS*
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

15. Waste Streams - Solid and Liquid

NAME	CAS NO. (IF APPLICABLE)	OUTPUT RATE PER HOUR	UNITS	PER YEAR	UNITS
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
TOTAL					

16. Total Stack Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
99-104	105-110	111-116
Carbon Monoxide	**Volatile Organic Compunds**	**PM-10**
117-122	123-128	129-134

17. Total Fugitive Emissions (for this equipment only) in Pounds Per Operating Day

Particulate Matter	Oxides of Sulfur	Oxides of Nitrogen
135-139	140-144	145-149
Carbon Monoxide	**Volatile Organic Compunds**	**PM-10**
150-154	155-159	160-164

PM-2.5
4

Method Used to Determine Emissions **(1= Estimate 2= Emission Factor 3= Stack Test 4= Other)**

TSP	SOX	NOX	CO	VOC	PM10	PM2.5
2					2	2
165	166	167	168	169	170	

AIR AND RADIATION MANAGEMENT ADMINISTRATION USE ONLY

18. Date Rec'd. Local **Date Rec'd. State** **Return to Local Jurisdiction**

Date _____ By _____

Reviewed by Local Jurisdiction **Reviewed by State**

Date _____ By _____ Date _____ By _____

19. Inventory Date **Month/Year** (171-174) **Equipment Code** (175-177) **SCC Code** (178-185)

20. **Annual Operating Rate** (188-192) **Maximum Design Hourly Rate** (193-199) **Permit to Operate Month** (200-201) **Transaction Date (MM/DD/YR)** (202-207)

Staff Code (208-210) **VOC Code** (211 212) **SIP Code** (213 214) **Regulation Code** (215-218) **Confidentiality** (219)

Point Description (220-238)

Action (239) A: Add C: Change

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Summary of Demonstrations for Meeting the Ambient Impact Requirement (26.11.15.05) and the T-Bact Requirement (26.11.15.06)

DO NOT WRITE IN THIS SPACE

Company Name ***BARDON, INC. (dba AGGREGATE INDUSTRIES - MAR)***

1. Summary of T-BACT Demonstration: List all emission reduction options considered in determining T-BACT starting with the option that reduces the emissions the most. Supporting documentation must be attached.

Emission Reduction Option	% Emission Reduction	COSTS	
		Capital	Annual Operating
1. ***WATER SPRAY***	***90.0%***		
2.			
3.			
4.			
5.			

2. Identify the emission reduction option selected as T-BACT and briefly explain why this is the best selection. Supporting documentation must be attached.

3. List screening levels and highest estimated off-site concentrations (ug/m3) resulting from **premises-wid allowable emissions** (1) of each Toxic Air Pollutant that is covered by the regulations and discharged from the installation or source applying for the permit. See the General Instructions for more detail. Supporting documentation **must** be attached.

STACK CONCENTRATION

	Toxic Air Pollutant	CAS Number	SCREENING LEVEL(S) 1-HR	8-HR	Annual	OFF-SITE CONCENTRATIONS 1-HR	8-HR	Annual
1	CRYSTALLINE SILICA	14808-60-7	EMISSION RATE OF CRYSTALLINE SILICA MEETS THE THRESHOLD OF 0.003 LB/HR, NO MODELING NECESSARY					
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

If unable to use a Screening Analysis, check the box, and attac the Second Tier Analysis or Special Permit request to this form. ☐

(1) **Premises** is defined as: "all the installations or other sources that are located on contiguous or adjacen properties and that are under the control of one person or under common control of a group of persons" (COMAR 26.11.15.01B (12)).

Allowable Emissions are defined as: "the maximum emissions a source or installation is capable of discharging after consideration of any physical or operational limitations required by this subtitle or by the enforceable conditions included in an applicable air quality permit to construct, permit to operate, secretarial order, plan for compliance, consent agreement, or court order" (COMAR 26.11.15.01B (2)).

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Emissions Data

Fill out one Form 5B for each stack or other emission point subject to the regulations (see the General Instructions for more detail).

Company Name ***BARDON, INC. (dba AGGREGATE INDUSTRIES - MAR)***

1. Number Identifying this Emission Point on Required Plot Plan
   (If applicable, list company's internal I.D.)

2. Brief description of Emission Point, Associated Equipment and Control Devices
   FUGITIVE EMISSIONS FROM CRUSHING & SCREENING & CONVEYING OPERATIONS

3. Emission Schedule (for this stack or emission point)

Continuous	Intermittent	Minutes/Hour	Hours/Day	Days/Week	Weeks/Year
X		60	12	6	52

Seasonal Variation: None ____ Winter % 10% Spring % 30% Summer% 30% Fall% 30%

4. Stack Information
   Height above ground (ft) ____ Inside Diameter at top of round stack (ft) ____ Exit Temperature (oF) ____
   Height above structures (ft) ____ Dimensions at top of rectangular stack (ft) ____ Exit Velocity (ft/min) ____
   Distance to Nearest Property Line (ft) ____ Gas Volume (acfm) ____
   Dimensions of Building Stack is on (ft): Height ____ Length ____ Width ____

5. Control Devices Associated with this Stack or Emission Point

Control Device	Number	Control Device	Number
0. None		7. Elec. Precipitator	
1. Simple Cyclone		8. Baghouse	
2. Multiple Cyclone		9. Thermal Afterburner	
3. Spray Tower		10. Catalytic Afterburner	
4. Absorption Tower		11. Other (specify) ***WATER SPRAY***	X
5. Venturi Scrubber			
6. Carbon Adsorber			

6. Criteria Pollutant Emissions (attach supporting documentation)

Criteria Pollutants	ESTIMATED EMISSIONS Design Capacity (lb/hr)	Projected (lb/hr)	Operations (1) (ton/year)
Particulate Matter PM 2.5	11.23 0.295	11.23 0.295	12.6 0.34
PM10		2.70	3.1
Oxides of Sulfur			
Oxides of Nitrogen			
Carbon Monoxide			
VOC (total)			
Lead			

7. Toxic Air Pollutant Emissions (attach supporting documentation)

Toxic Air Pollutant (list all)	CAS Number	ESTIMATED EMISSIONS Design Capacity (lb/hr)	Projected Operations (1) (lb/hour)	Projected Operations (1) (ton/year)	Used for Form 5A, Part 3 (2) (lb/hour)	Used for Form 5A, Part 3 (2) (ton/year)
1. CRYSTALLINE SILICA	14808-60-7	2.95 E-03	2.95 E-03	2.95 E-03	2.95 E-03	2.95 E-03
2.						
3.						
4.						
5.						
5.						
6.						
7.						
6.						
7.						
6.						
9.						

(1) Based on the emission schedule reported in Block three of this form.

(2) This column must be filled in with the emission estimates used to demonstrate compliance with the

PERMIT TO CONSTRUCT APPLICATION
for a
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submitted by
BARDON, INC. (dba AGGREGATE INDUSTIRES – MAR)
Located at
5850 SHERIFF RD, CAPITOL HEIGHTS, PRINCE GEORGES COUNTY

OCTOBER 2014

DISCUSSION

Bardon, Inc. (dba Aggregate Industries – MAR) [AGG] is proposing to install a FRAP Crushing & Screening (FRAPCS) plant at 5850 Sheriff Road, Capitol Heights, MD, Prince Georges County. The FRAPCS is used to reduce the size of the stone embedded in reclaimed asphalt pavement materials to allow for higher percentages of RAP use in the manufacture of asphalt paving materials.

The FRAPCS includes one primary crusher, two screens, various belt conveyors, and two radial stackers. One screen is a high frequency screen, the "FRAP" screen, and the other is a screen as typically found in RAP screening operations. As a permanent installation at this site, the processing equipment will be hard-wired to the power grid and WILL NOT use fossil fuel-fired engines to power the processing equipment.

The materials processed in this equipment will be asphalt pavement materials only.

The application includes an equipment flow diagram and layout for the FRAPCS. Each emission point for which an emission rate was calculated is shown on the diagram. A material balance is provided in the application which shows the amount of materials expected to be re-circulated at steady state operations and distribution to the two stockpiles.

ESTIMATES OF EMISSION RATES FOR THE CRUSHING & SCREENING PLANT:

The emission rates for the various emission points are based on the emission factors provided in EPA's AP-42, Section 11.19 and WEBFire.

The emission factors for the FRAPCS are based on tons of material throughput. The emission rates were estimated by multiplying the estimated hourly throughput for the specific emission point by its emission factor. The daily emission rate was determined by multiplying the hourly emission rate by the maximum daily hours. The annual emission rate was

determined by multiplying the ratio of the material throughput for the emission point and the total hourly crusher process rate with the total annual throughput and the emission factor, then dividing by 2000 lbs/ton.

HOURLY EMISSION RATE:

$$ER_{hr}\left(\frac{lb}{hour}\right) = EF\left(\frac{lb}{ton}\right) \times EPTR\left(\frac{tons}{hour}\right)$$

Where ER = Emission Rate, EF = Emission Factor, and EPTR = Emission Point Throughput Rate.

DAILY EMISSION RATE:

$$ER_{d}\left(\frac{lb}{day}\right) = ER_{hr}\left(\frac{lb}{hour}\right) \times 12\left(\frac{hours}{day}\right)$$

ANNUAL EMISSION RATE:

$$ER_{yr}\left(\frac{tons}{year}\right) = EF\left(\frac{lb}{ton}\right) \times \frac{EPTR\left(\frac{tons}{hour}\right)}{MCPR\left(\frac{tons}{hour}\right)} \times TR_{yr}\,\frac{tons}{year} \div C\left(\frac{2000\ lbs}{ton}\right)$$

Where MCPR = Maximum Crusher Process Rate, TR = Throughput Rate, and C = a constant.

ESTIMATES OF EMISSION FACTORS FOR ON-SITE VEHICLE TRAFFIC.

The estimate for on-site vehicle traffic emission factors based on tons of throughput was developed using AP-42 Section 13.2.2 Unpaved Roads. The AP-42 Section provides a size-specific emission factor based on vehicle miles traveled (lb/VMT). The emission table uses emission factors based on material throughput, therefore the VMT emission factor must be converted to a representative emission factor based on throughput.

An aerial photo of the site was obtained from maps.google.com which includes a scale. Traffic patterns were estimated based on the proposed location of the equipment and the site's ingress/egress location. There are four basic vehicle uses:

1) A front-end loader transfers "raw" materials from the raw material stockpile to the feed hopper of the FRAPCS.
2) A front-end loader (FEL) transfers processed materials (product) from the product stockpiles into transport vehicles, generally known as "tandems".
3) Tandems arrive on-site loaded with "raw" materials, the asphalt pavement waste, and deliver it to the specified location.
4) Tandems leave the site loaded with product (processed materials).

In many cases, the tandems which haul the asphalt pavement waste to the site will leave with a load of product. However, to add an element of conservatism, it was assumed that

all the tandems entering the site are used strictly for Uses 3 or 4, but not for both, which doubles the number of vehicles expected on-site. It will often be the case that the FEL loading the feed hopper will also load the tandems, but when it is busy, a second FEL will be put into service. For the purpose estimating emissions under the worst case situation, it was assumed that two FELs are operated.

With the aid of the aerial photo and an estimated traffic pattern on-site for the four vehicle uses, the total distance traveled by a vehicle per trip on-site was estimated, then converted to a per ton basis based on the "payload" of the vehicles involved.

For use 1, the FEL's bucket has a payload of about 8 tons/bucket and it is estimated that it will travel 200 feet from the hopper to the stockpile and back to the hopper. The miles traveled (feet converted to miles) was divided by the payload of the vehicle to obtain a VMT/ton of material value.

For use 2, the Tandem's payload of 20 tons was used because the FEL loading the tandems will have to make several trips between the stockpile and the vehicle. Based on the payload of the FEL, it will have to make three trips. The haul vehicle usually drives up close to the stockpile from which it will be loaded, so it was assumed that the FEL roundtrip between stockpile and haul vehicle is 35 feet. A little extra was added to the distance to account for the FEL's travel from one stockpile to the other when a vehicle has to be loaded from the other stockpile.

For uses 3 & 4, it was assumed that every tandem that arrives on-site will travel from the entrance to the scale, then to the appropriate location for its use: to the product stockpiles or to the raw materials stockpile.

In the case of tandems picking up product (Use 4), it was assumed that there are three locations to which a tandem could to go to be loaded. The VMT/ton value for Use 4 is an average of the three locations: Sum of the distances for each path divided by the sum of the payloads. It was assumed that the locations would be used equally.

The EPA emission factor formula depends on the mean weight of the vehicle, therefore two emission factors were calculated, one for the FELs and one for the Tandems. The VMT/ton for the FELs were added together and the VMT/ton for the tandems were added together. Each VMT/ton was multiplied by the size specific VMT-based emission factor calculated from the EPA formula.

AP-42 also provides a formula to account for precipitation. At a site of this nature, they do not rely on precipitation, but keep the site watered on a regular basis to prevent fugitive dust occurring from the roadways. The applicant anticipates that operations will occur on a maximum of 312 days in 365 days. It is expected that the amount of water applied to the

roadways will exceed 0.01 inch. But, there can be equipment breakdowns, so it was assumed that watering occurred on 296 of the 312 days of operations, a 95% application rate.

DISPERSION MODELING

The FRAPCS plant is a fugitive dust source, it has no stacks, therefore it was modeled as an area source. The FRAPCS plant was broken down into 14 smaller area sources. They were physically measured by AGG staff. SCREEN3 version 13043 was used to predict the maximum ambient air concentration (AAC) for each area source (this diagram is part of the application package). The emission rate that was "modeled" is a time-weighted average (TWA) emission rate: the total estimated daily emission rate divided by 24 hours/day. The PM2.5 NAAQS includes a 24-hour limit (35 $\mu g/m^3$) and an annual limit (15 $\mu g/m^3$) and the PM10 NAAQS includes only a 24-hour limit (150 $\mu g/m^3$). Compliance was demonstrated for the *annual* NAAQS using the 24-hour TWA emission rate, which was larger than the annual TWA emission rate by a factor of 1.68. Therefore, modeling was not conducted using the annual TWA emission rates.

The SCREEN3 output is for a 1-hour averaging period. EPA has established scaling factors to adjust the 1-hour averaging period result to reflect other averaging periods. To scale the 1-hour result to a 24-hour averaging period, the factor is 0.4. To scale the 1-hour result to an annual averaging period, the factor is 0.06. The modeling assumption is that the emission rate occurs continuously over the averaging period, therefore, EPA allows for averaging of the emission rate for periodic emissions.

For the purposes of this compliance demonstration, it was assumed that the predicted AAC for each area source occurs at the same receptor at or beyond the property line. This assumption is most likely to overestimate the predicted AAC for the source overall since it is physically impossible for the maximum predicted AAC for each source to occur at the same point at or beyond the property line.

TIME-WEIGHTED (TWA) EMISSION RATE:

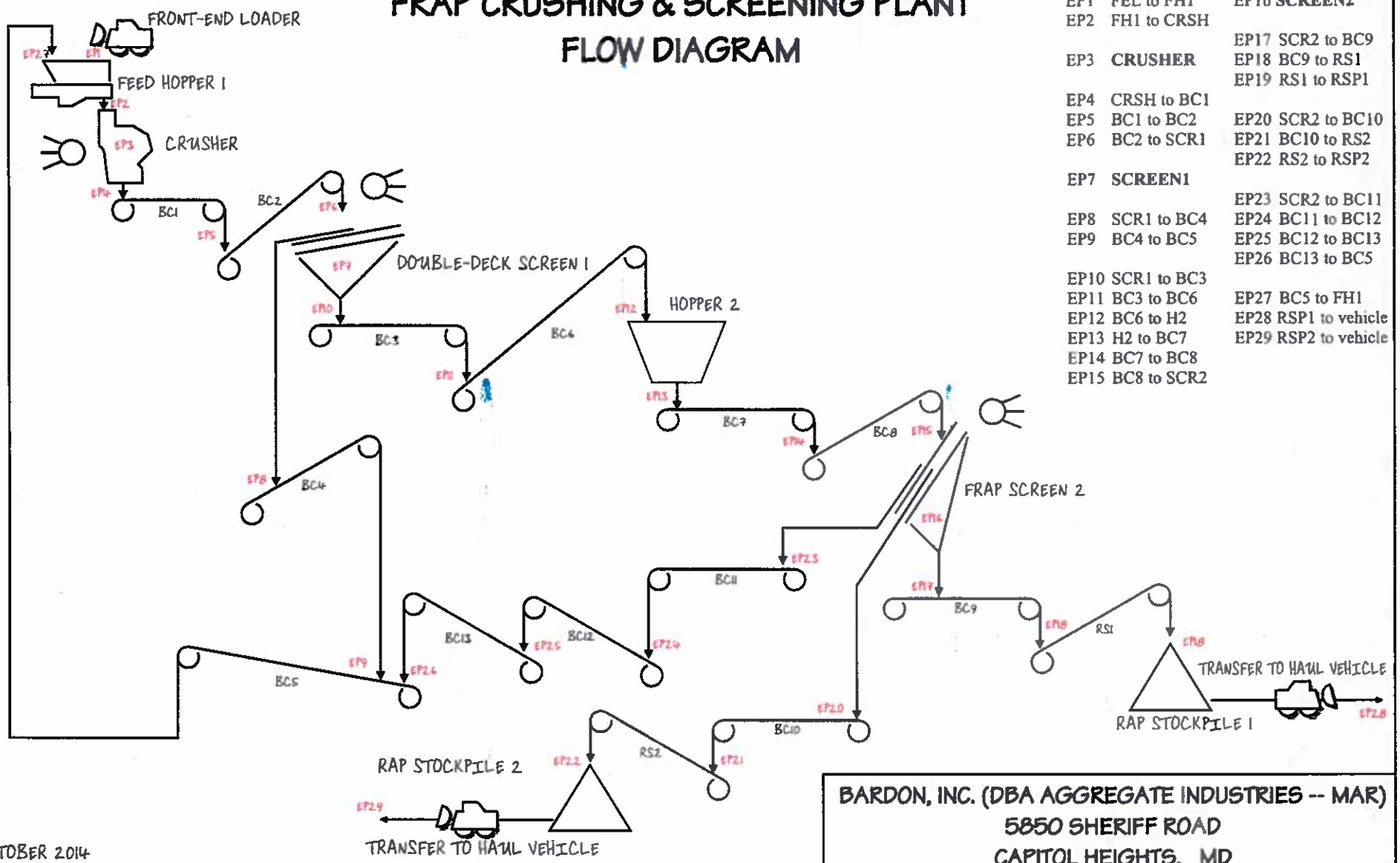
$$\text{TWAER}\ \left(\frac{\text{lb}}{\text{hour}}\right) = \text{ER}_d\ \left(\frac{\text{lb}}{\text{day}}\right) \div \frac{24\ \text{hours}}{\text{day}} \times \frac{0.125\ \text{gram/sec}}{\text{lb/hour}}$$

The results of the SCREEN3 analysis are:

$PM_{2.5}$	24-hour NAAQS –	16 $\mu g/m^3$
	Annual NAAQS –	2 $\mu g/m^3$
PM_{10}	24-hour NAAQS –	95 $\mu g/m^3$

Compliance was demonstrated for all applicable NAAQS.

FRAP CRUSHING & SCREENING PLANT
FLOW DIAGRAM

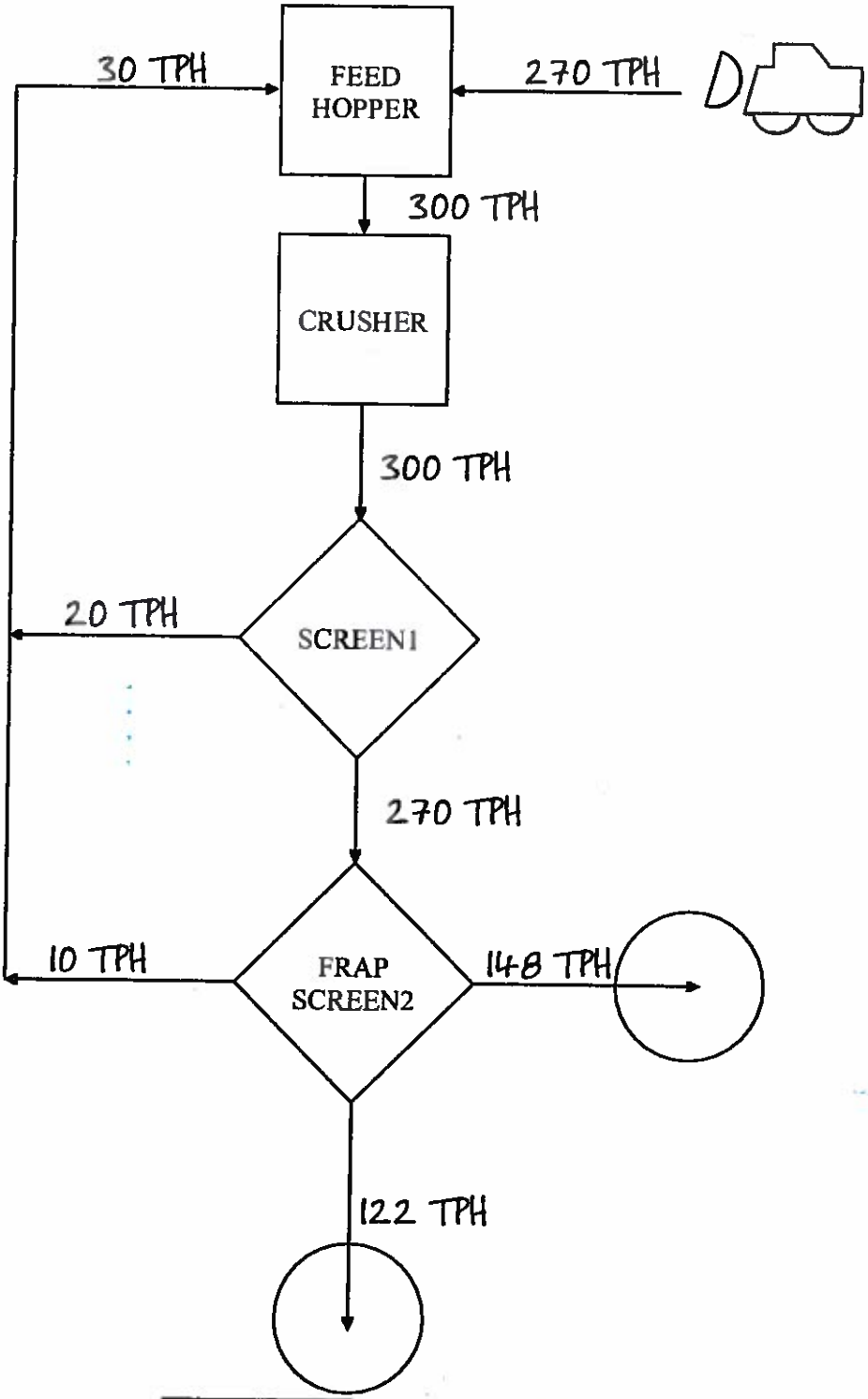


EP1	FEL to FH1	EP16	**SCREEN2**
EP2	FH1 to CRSH		
		EP17	SCR2 to BC9
EP3	**CRUSHER**	EP18	BC9 to RS1
		EP19	RS1 to RSP1
EP4	CRSH to BC1		
EP5	BC1 to BC2	EP20	SCR2 to BC10
EP6	BC2 to SCR1	EP21	BC10 to RS2
		EP22	RS2 to RSP2
EP7	**SCREEN1**		
		EP23	SCR2 to BC11
EP8	SCR1 to BC4	EP24	BC11 to BC12
EP9	BC4 to BC5	EP25	BC12 to BC13
		EP26	BC13 to BC5
EP10	SCR1 to BC3		
EP11	BC3 to BC6	EP27	BC5 to FH1
EP12	BC6 to H2	EP28	RSP1 to vehicle
EP13	H2 to BC7	EP29	RSP2 to vehicle
EP14	BC7 to BC8		
EP15	BC8 to SCR2		

OCTOBER 2014

BARDON, INC. (DBA AGGREGATE INDUSTRIES -- MAR)
5850 SHERIFF ROAD
CAPITOL HEIGHTS, MD

FRAP CRUSHING & SCREENING PLANT
MATERIAL BALANCE DIAGRAM



BARDON, INC. (DBA AGGREGATE INDUSTRIES -- MAR)
5850 SHERIFF ROAD
CAPITOL HEIGHTS, MD

OCTOBER 2014

EMISSION CALCULATIONS FOR: ***BARDON, INC. (dba AGGREGATE INDUSTRIES - MAR)***
CAPITOL HEIGHTS, MARYLAND 20743
Facility Identification #: 033-00934

Maximum Expected Annual FEED rate:	***600,000***	***tons Reclaimed Asphalt Pavement (RAP) materials***
Maximum Expected Operating Hours:	***3,744***	***hours of production time***
Maximum Expected Operating Days:	***312***	***days of production***
Maximum Hourly CRUSHER PROCESSING rate:	***300***	***tons RAP materials***
Oversize Recirculation rate:	***30***	***tons RAP materials***

EMISSION ESTIMATE FOR PARTICULATE MATTER: $PM_{2.5}$

Emission Rate Calculation: lbs/hr = Emission Factor * tons/hour, tons/yr = lbs/hr * AnnualHours / 2000, lbs/day = tons/yr / days/yr * 2000

	Emission Description	SCC	Process Equipment Description	Emission Description	Max. Tons per Hour	Emission Factor	Emission Rate (lb/hr)	Emission Rate (lb/day)	Emission Rate (tons/yr)
	MATERIAL FEED TO STOCKPILE								
EP1	FEL to HOPPER1	3-05-020-06	Initial Feed Hopper & Grizzly	Material Drop	300.0	1.30E-06	3.90E-04	4.68E-03	3.90E-04
EP2	Grizzly to Conveyor		Grizzly pass through	Material Drop		1.30E-06	3.90E-04	4.68E-03	3.90E-04
EP3	CRUSHER	3-05-020-01	PRIMARY CRUSHER		300.0	5.00E-05	1.50E-02	1.80E-01	1.50E-02
EP4	Crusher to BC1	3-05-020-06	Crusher discharge	Material Drop	300.0	1.30E-06	3.90E-04	4.68E-03	3.90E-04
EP5	BC1 to BC2		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.30E-05	3.90E-03	4.68E-02	3.90E-03
EP6	BC2 to SCREEN1		Belt Conveyor to Screen	Material Drop		1.30E-06	3.90E-04	4.68E-03	3.90E-04
EP7	SCREEN1	3-05-020-02	PRIMARY SCREEN		300.0	5.00E-05	1.50E-02	1.80E-01	1.50E-02
EP10	SCREEN1 to BC3	3-05-020-06	Screen Discharge	Material Drop	270.0	1.30E-06	3.51E-04	4.21E-03	3.51E-04
EP11	BC3 to BC6		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.30E-05	3.51E-03	4.21E-02	3.51E-03
EP12	BC6 to HOPPER2		Belt Conveyor to Hopper	Material Drop		1.30E-06	3.51E-04	4.21E-03	3.51E-04
EP13	HOPPER2 to BC7		Hopper Discharge	Material Drop		1.30E-06	3.51E-04	4.21E-03	3.51E-04
EP14	BC7 to BC8		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.30E-05	3.51E-03	4.21E-02	3.51E-03
EP15	BC8 to SCREEN2		Belt Conveyor to Screen	Material Drop		1.30E-06	3.51E-04	4.21E-03	3.51E-04
EP16	SCREEN2	3-05-020-02	SECONDARY SCREEN		270.0	5.00E-05	1.35E-02	1.62E-01	1.35E-02
EP17	SCREEN2 to BC9	3-05-020-06	Screen Discharge	Material Drop	148.0	1.30E-06	1.92E-04	2.31E-03	1.92E-04
EP18	BC9 to BC10		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.30E-05	1.92E-03	2.31E-02	1.92E-03
EP19	BC10 to RSP1		Radial Stacker to Stockpile	Material Drop		1.30E-06	1.92E-04	2.31E-03	1.92E-04
EP28	RSP1 to Truck		Loader to Truck transfer	Material Drop		1.30E-06	1.92E-04	2.31E-03	1.92E-04
EP20	SCREEN2 to BC11	3-05-020-06	Screen Discharge	Material Drop	122.0	1.30E-06	1.59E-04	1.90E-03	1.59E-04
EP21	BC11 to BC12		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.30E-05	1.59E-03	1.90E-02	1.59E-03
EP22	BC12 to RSP2		Radial Stacker to Stockpile	Material Drop		1.30E-06	1.59E-04	1.90E-03	1.59E-04
EP29	RSP2 to Truck		Loader to Truck transfer	Material Drop		1.30E-06	1.59E-04	1.90E-03	1.59E-04
	OVERSIZE RECIRCULATION								
EP8	SCREEN1 to BC4	3-05-020-06	Screen Discharge	Material Drop	20.0	1.30E-06	2.60E-05	3.12E-04	2.60E-05
EP9	BC4 to BC5		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.30E-05	2.60E-04	3.12E-03	2.60E-04
EP23	SCREEN2 to BC13	3-05-020-06	Screen Discharge	Material Drop	10.0	1.30E-06	1.30E-05	1.56E-04	1.30E-05
EP24	BC13 to BC14		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.30E-05	1.30E-04	1.56E-03	1.30E-04
EP25	BC14 to BC15		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.30E-05	1.30E-04	1.56E-03	1.30E-04
EP26	BC15 to BC5		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.30E-05	1.30E-04	1.56E-03	1.30E-04
EP27	BC5 to HOPPER1	3-05-020-06	Belt Conveyor to Hopper	Material Drop	30.0	1.30E-06	3.90E-05	4.68E-04	3.90E-05
	TOTAL PROCESS FUGITIVE EMISSIONS						**6.27E-02**	**7.52E-01**	**6.27E-02**
	VEHICULAR TRAFFIC FUGITIVE EMISSIONS								
EP30, EP31	FRONT-END LOADERS				270.0	3.42E-04	9.23E-02	1.11E+00	1.03E-01
EP32, EP33	TRANSPORT VEHICLES				270.0	5.20E-04	1.40E-01	1.68E+00	1.56E-01
EP34, EP35							2.95E-01	0.32 tons/year	
							3.54 lbs/day		

CRYSTALLINE SILICA EMISSIONS ESTIMATE

0.2954 lb/hr, $PM_{2.5}$ emissions

1% Crystalline Silica fraction of Respirable Dust

0.00295383 lb/hr, Crystalline Silica Emission Rate

Less than the COMAR 26.11.15.06 threshold of 0.003 lb/hour, so the plant is in compliance and mathematical modeling is not necessary

EMISSION CALCULATIONS FOR: ***BARDON, INC. (dba AGGREGATE INDUSTRIES - MAR)***
CAPITOL HEIGHTS, MARYLAND 20743
Facility Identification #: ***033-00934***

Maximum Expected Annual FEED rate:	***600,000***	***tons Reclaimed Asphalt Pavement (RAP) materials***
Maximum Expected Operating Hours:	***3,744***	***hours of production time***
Maximum Expected Operating Days:	***312***	***days of production***
Maximum Hourly CRUSHER PROCESSING rate:	***300***	***tons RAP materials***
Oversize Recirculation rate:	***50***	***tons RAP materials***

EMISSION ESTIMATE FOR PARTICULATE MATTER: PM_{10}

Emission Rate Calculation: lbs/hr = Emission Factor * tons/hour, tons/yr = lbs/hr * AnnualHours / 2000, lbs/day = tons/yr / days/yr * 2000

	Emission Description	SCC	Process Equipment Description	Emission Description	Max. Tons per Hour	Emission Factor	Emission Rate (lb/hr)	Emission Rate (lb/day)	Emission Rate (tons/yr)
	MATERIAL FEED TO STOCKPILE								
EP1	FEL to HOPPER1	3-05-020-06	Initial Feed Hopper & Grizzly	Material Drop	300.0	4.60E-05	1.38E-02	1.66E-01	1.38E-02
EP2	Grizzly to Conveyor		Grizzly pass through	Material Drop		4.60E-05	1.38E-02	1.66E-01	1.38E-02
EP3	CRUSHER	3-05-020-01	PRIMARY CRUSHER		300.0	5.40E-04	1.62E-01	1.94E+00	1.62E-01
EP4	Crusher to BC1	3-05-020-06	Crusher discharge	Material Drop	300.0	4.60E-05	1.38E-02	1.66E-01	1.38E-02
EP5	BC1 to BC2		Belt Conveyor to Belt Conveyor	Conveyor Transfer		4.60E-05	1.38E-02	1.66E-01	1.38E-02
EP6	BC2 to SCREEN1		Belt Conveyor to Screen	Material Drop		4.60E-05	1.38E-02	1.66E-01	1.38E-02
EP7	SCREEN1	3-05-020-02	PRIMARY SCREEN		300.0	4.60E-05	1.38E-02	1.66E-01	1.38E-02
EP10	SCREEN1 to BC3	3-05-020-06	Screen Discharge	Material Drop	270.0	4.60E-05	1.24E-02	1.49E-01	1.24E-02
EP11	BC3 to BC6		Belt Conveyor to Belt Conveyor	Conveyor Transfer		4.60E-05	1.24E-02	1.49E-01	1.24E-02
EP12	BC6 to HOPPER2		Belt Conveyor to Hopper	Material Drop		4.60E-05	1.24E-02	1.49E-01	1.24E-02
EP13	HOPPER2 to BC7		Hopper Discharge	Material Drop		4.60E-05	1.24E-02	1.49E-01	1.24E-02
EP14	BC7 to BC8		Belt Conveyor to Belt Conveyor	Conveyor Transfer		4.60E-05	1.24E-02	1.49E-01	1.24E-02
EP15	BC8 to SCREEN2		Belt Conveyor to Screen	Material Drop		4.60E-05	1.24E-02	1.49E-01	1.24E-02
EP16	SCREEN2	3-05-020-02	SECONDARY SCREEN		270.0	4.60E-05	1.24E-02	1.49E-01	1.24E-02
EP17	SCREEN2 to BC9	3-05-020-06	Screen Discharge	Material Drop	148.0	4.60E-05	6.81E-03	8.17E-02	6.81E-03
EP18	BC9 to RS1		Belt Conveyor to Belt Conveyor	Conveyor Transfer		4.60E-05	6.81E-03	8.17E-02	6.81E-03
EP19	RS1 to RSP1		Radial Stacker to Stockpile	Material Drop		4.60E-05	6.81E-03	8.17E-02	6.81E-03
EP28	RSP1 to Truck		Loader to Truck transfer	Material Drop		1.30E-06	1.92E-04	2.31E-03	1.92E-04
EP20	SCREEN2 to BC10	3-05-020-06	Screen Discharge	Material Drop	122.0	4.60E-05	5.61E-03	6.73E-02	5.61E-03
EP21	BC10 to RS2		Belt Conveyor to Belt Conveyor	Conveyor Transfer		4.60E-05	5.61E-03	6.73E-02	5.61E-03
EP22	RS2 to RSP2		Radial Stacker to Stockpile	Material Drop		4.60E-05	5.61E-03	6.73E-02	5.61E-03
EP29	RSP2 to Truck		Loader to Truck transfer	Material Drop		1.30E-06	1.59E-04	1.90E-03	1.59E-04
	OVERSIZE RECIRCULATION								
EP8	SCREEN1 to BC4	3-05-020-06	Screen Discharge	Material Drop	20.0	4.60E-05	9.20E-04	1.10E-02	9.20E-04
EP9	BC4 to BC5		Belt Conveyor to Belt Conveyor	Conveyor Transfer		4.60E-05	9.20E-04	1.10E-02	9.20E-04
EP23	SCREEN2 to BC11	3-05-020-06	Screen Discharge	Material Drop	10.0	4.60E-05	4.60E-04	5.52E-03	4.60E-04
EP24	BC11 to BC12		Belt Conveyor to Belt Conveyor	Conveyor Transfer		4.60E-05	4.60E-04	5.52E-03	4.60E-04
EP25	BC12 to BC13		Belt Conveyor to Belt Conveyor	Conveyor Transfer		4.60E-05	4.60E-04	5.52E-03	4.60E-04
EP26	BC13 to BC5		Belt Conveyor to Belt Conveyor	Conveyor Transfer		4.60E-05	4.60E-04	5.52E-03	4.60E-04
EP27	BC5 to HOPPER1	3-05-020-06	Belt Conveyor to Hopper	Material Drop	10.0	4.60E-05	4.60E-04	5.52E-03	4.60E-04
	TOTAL PROCESS FUGITIVE EMISSIONS						**3.73E-01**	**4.48E+00**	**3.73E-01**
	VEHICULAR TRAFFIC FUGITIVE EMISSIONS								
EP30, EP31	FRONT-END LOADERS				270.0	3.42E-03	9.23E-01	1.11E+01	1.03E+00
EP32, EP33	TRANSPORT VEHICLES				270.0	5.20E-03	1.40E+00	1.68E+01	1.56E+00
EP34, EP35							**2.70E+00**	**2.96 tons/year**	
							32.41 lbs/day		

EMISSION CALCULATIONS FOR: ***BARDON, INC. (dba AGGREGATE INDUSTRIES - MAR)***
CAPITOL HEIGHTS, MARYLAND 20743
Facility Identification #: 033-00934

Maximum Expected Annual FEED rate:	***600,000***	***tons Reclaimed Asphalt Pavement (RAP) materials***
Maximum Expected Operating Hours:	***3,744***	***hours of production time***
Maximum Expected Operating Days:	***312***	***days of production***
Maximum Hourly CRUSHER PROCESSING rate:	***300***	***tons RAP materials***
Oversize Recirculation rate:	***50***	***tons RAP materials***

EMISSION ESTIMATE FOR PARTICULATE MATTER: TSP

Emission Rate Calculation: lbs/hr = Emission Factor * tons/hour, tons/yr = lbs/hr * AnnualHours / 2000, lbs/day = tons/yr / days/yr * 2000

	Emission Description	SCC	Process Equipment Description	Emission Description	Max. Tons per Hour	Emission Factor	Emission Rate (lb/hr)	Emission Rate (lb/day)	Emission Rate (tons/yr)
	MATERIAL FEED TO STOCKPILE								
EP1	FEL to HOPPER1	3-05-020-06	Initial Feed Hopper & Grizzly	Material Drop	300.0	1.40E-04	4.20E-02	5.04E-01	4.20E-02
EP2	Grizzly to Conveyor		Grizzly pass through	Material Drop		1.40E-04	4.20E-02	5.04E-01	4.20E-02
EP3	CRUSHER	3-05-020-01	PRIMARY CRUSHER		300.0	1.20E-03	3.60E-01	4.32E+00	3.60E-01
EP4	Crusher to BC1	3-05-020-06	Crusher discharge	Material Drop	300.0	1.40E-04	4.20E-02	5.04E-01	4.20E-02
EP5	BC1 to BC2		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.40E-04	4.20E-02	5.04E-01	4.20E-02
EP6	BC2 to SCREEN1		Belt Conveyor to Screen	Material Drop		1.40E-04	4.20E-02	5.04E-01	4.20E-02
EP7	SCREEN1	3-05-020-02	PRIMARY SCREEN		300.0	2.20E-03	6.60E-01	7.92E+00	6.60E-01
EP10	SCREEN1 to BC3	3-05-020-06	Screen Discharge	Material Drop	270.0	1.40E-04	3.78E-02	4.54E-01	3.78E-02
EP11	BC3 to BC6		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.40E-04	3.78E-02	4.54E-01	3.78E-02
EP12	BC6 to HOPPER2		Belt Conveyor to Hopper	Material Drop		1.40E-04	3.78E-02	4.54E-01	3.78E-02
EP13	HOPPER2 to BC7		Hopper Discharge	Material Drop		1.40E-04	3.78E-02	4.54E-01	3.78E-02
EP14	BC7 to BC8		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.40E-04	3.78E-02	4.54E-01	3.78E-02
EP5	BC8 to SCREEN2		Belt Conveyor to Screen	Material Drop		1.40E-04	3.78E-02	4.54E-01	3.78E-02
EP16	SCREEN2	3-05-020-02	SECONDARY SCREEN		270.0	2.20E-03	5.94E-01	7.13E+00	5.94E-01
EP17	SCREEN2 to BC9	3-05-020-06	Screen Discharge	Material Drop	152.0	1.40E-04	2.13E-02	2.55E-01	2.13E-02
EP18	BC9 to BC10		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.40E-04	2.13E-02	2.55E-01	2.13E-02
EP19	BC10 to RSP1		Radial Stacker to Stockpile	Material Drop		1.40E-04	2.13E-02	2.55E-01	2.13E-02
EP28	RSP1 to Truck		Loader to Truck transfer	Material Drop		1.30E-06	1.98E-04	2.37E-03	1.98E-04
EP20	SCREEN2 to BC11	3-05-020-06	Screen Discharge	Material Drop	108.0	1.40E-04	1.51E-02	1.81E-01	1.51E-02
EP21	BC11 to BC12		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.40E-04	1.51E-02	1.81E-01	1.51E-02
EP22	BC12 to RSP2		Radial Stacker to Stockpile	Material Drop		1.40E-04	1.51E-02	1.81E-01	1.51E-02
EP29	RSP2 to Truck		Loader to Truck transfer	Material Drop		1.30E-06	1.40E-04	1.68E-03	1.40E-04
	OVERSIZE RECIRCULATION								
EP8	SCREEN1 to BC4	3-05-020-06	Screen Discharge	Material Drop	20.0	1.40E-04	2.80E-03	3.36E-02	2.80E-03
EP9	BC4 to BC5		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.40E-04	2.80E-03	3.36E-02	2.80E-03
EP23	SCREEN2 to BC13	3-05-020-06	Screen Discharge	Material Drop	10.0	1.40E-04	1.40E-03	1.68E-02	1.40E-03
EP24	BC13 to BC14		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.40E-04	1.40E-03	1.68E-02	1.40E-03
EP25	BC14 to BC15		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.40E-04	1.40E-03	1.68E-02	1.40E-03
EP26	BC15 to BC5		Belt Conveyor to Belt Conveyor	Conveyor Transfer		1.40E-04	1.40E-03	1.68E-02	1.40E-03
EP27	BC5 to HOPPER1	3-05-020-06	Belt Conveyor to Hopper	Material Drop	10.0	1.40E-04	1.40E-03	1.68E-02	1.40E-03
	TOTAL PROCESS FUGITIVE EMISSIONS						**2.17E+00**	**2.61E+01**	**2.17E+00**
	VEHICULAR TRAFFIC FUGITIVE EMISSIONS								
EP30, EP31	FRONT-END LOADERS				270.0	1.33E-02	3.59E+00	4.31E+01	3.99E+00
EP32, EP33	TRANSPORT VEHICLES				270.0	2.02E-02	5.46E+00	6.56E+01	6.07E+00
EP34, EP35							**1.12E+01**	**12.24 tons/year**	
							134.75 lbs/day		

EMISSION FACTORS USED FOR BARDON, INC. EMISSION CALCULATIONS

EPA's AP-42, Compilation of Emission Factors, Section 11.19.2, 'Crushed Stone Processing and Pulverized Mineral Processing' was used to estimate emissions for BARDON, INC. (dba AGGREGATE INDUSTRIES - MAR). Where an emission factor was provided for one particle size, but not another, the Particle Multipliers found in AP-42 Section 13.2.4, 'Aggregate Handling And Storage Piles', page 13.2.4-4 was used to estimate an emission factor by using a ratio of the two particle size multipliers.

Table 11.19.2-2 (English Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS (lb/Ton)[a]

(NOTE: The table below was COPIED from AP-42 Section 11.19.2 and then rearranged to put the SCC on the same line as the other data.)

Source [b]	SCC	Total Particulate Matter [r,s]	EMISSION FACTOR RATING	Total PM-10	EMISSION FACTOR RATING	Total PM-2.5	EMISSION FACTOR RATING
Primary Crushing	3-05-020-01	ND [n]		ND [n]		ND [n]	
Primary Crushing (controlled)	3-05-020-01	ND [n]		ND [n]		ND [n]	
Secondary Crushing	3-05-020-02	ND [n]		ND [n]		ND [n]	
Secondary Crushing (controlled)	3-05-020-02	ND [n]		ND [n]		ND [n]	
Tertiary Crushing	3-05-020-03	0.0054 [d]	E	0.0024 [o]	C	ND [n]	
Tertiary Crushing (controlled)	3-05-020-03	0.0012 [d]	E	0.00054 [p]	C	0.0001 [q]	E
Fines Crushing	3-05-020-05	0.039 [e]	E	0.015 [e]	E	ND	
Fines Crushing (controlled)	3-05-020-05	0.003 [f]	E	0.0012 [f]	E	0.00007 [q]	E
Screening	3-05-020-02	0.025 [e]	E	0.0087 [l]	C	ND	
Screening (controlled)	3-05-020-02	0.0022 [d]	E	0.00074 [m]	C	0.00005 [q]	E
Fines Screening	3-05-020-21	0.3 [g]	E	0.072 [g]	E	ND	
Fines Screening (controlled)	3-05-020-21	0.0036 [g]	E	0.0022 [g]	E	ND	
Conveyor Transfer Point	3-05-020-06	0.003 [h]	E	0.0011 [h]	D	ND	
Conveyor Transfer Point (controlled)	3-05-020-06	0.00014 [i]	E	4.6 E-5 [i]	D	1.3 E-5 [q]	E
Wet Drilling - Unfragmented Stone	3-05-020-10	ND	E	8.0 E-5 [j]	E	ND	
Truck Unloading -Fragmented Stone	3-05-020-31	ND		1.6 E-5 [j]	E	ND	
Truck Loading - Conveyor, crushed stone	3-05-020-32	ND		1.0 E-4 [k]	E	ND	

a. Emission factors represent uncontrolled emissions unless noted. Emission factors in lb/Ton of material

of throughput. SCC = Source Classification Code. ND = No data.

b. Controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. The moisture content of the study group without wet suppression systems operating (uncontrolled) ranged from 0.21 to 1.3 percent, and the same facilities operating wet suppression systems (controlled) ranged from 0.55 to 2.88 percent. Due to carry over of the small amount of moisture required, it has been shown that each source, with the exception of crushers, does not need to employ direct water sprays. Although the moisture content was the only variable measured, other process features may have as much influence on emissions from a given source. Visual observations from each source under normal operating conditions are probably the best indicator of which emission factor is most appropriate. Plants that employ substandard control measures as indicated by visual observations should use the uncontrolled factor with an appropriate control efficiency that best reflects the effectiveness of the controls employed.

c. References 1, 3, 7, and 8

d. References 3, 7, and 8

e. Reference 4

f. References 4 and 15

g. Reference 4

h. References 5 and 6

i. References 5, 6, and 15

j. Reference 11

k. Reference 12

l. References 1, 3, 7, and 8

m. References 1, 3, 7, 8, and 15

n. No data available, but emission factors for PM -10 for tertiary crushers can be used as an upper limit for primary or secondary crushing

o. References 2, 3, 7, 8

p. References 2, 3, 7, 8, and 15

q. Reference 15

r. PM emission factors are presented based on PM -100 data in the Background Support Document for Section 11.19.2

s. Emission factors for PM-30 and PM-50 are available in Figures 11.19.2-3 through 11.19.2 -6.

FROM WEBFIRE AS OF MARCH 16, 2014

Emission Point	SCC	Emission Factor	Type
Secondary Crushing/Screening	3-05-020-02	2.20E-03	PM, primary -- Wet Suppression
		7.40E-04	PM10, primary -- Wet Suppression
		5.00E-05	PM2.5, primary -- Wet Suppression
Miscellaneous Operations:	3-05-020-06	1.40E-04	PM, primary -- Wet Suppression
Screen/Convey/Handling		4.60E-05	PM10, primary -- Wet Suppression
		1.30E-05	*PM2.5, primary -- Uncontrolled*
*Assumes 90% control for wet suppression		1.30E-06	PM2.5, primary -- Wet Suppression*

VEHICULAR TRAFFIC FUGITIVE EMISSIONS

8 tons carried by Front-end loader (FEL) bucket which loads the hopper
8 tons carried by the Front-end loader bucket which loads the transport vehicles
20 tons carried by the Tandems hauling materials on-site and hauling product off-site

100 ft is the estimated average travel distance for the FEL between material pick-up and the feed hopper, based on using an aerial photo with a distance scale
134 ft is the estimated average travel distance per vehicle load for the FEL loading haul vehicles, based on using an aerial photo with a distance scale
294 ft is the estimated average travel distance for a delivery vehicle after leaving the scale

It is assumed there are three paths haul vehicles could take to get to the product stockpiles after leaving the scale, and that they are used equally over the course of an hour, day and year.

230 ft, via Path 1
173 ft, via Path 2
237 ft, via Path 3

190 ft is the estimated travel distance from the plant entrance to the scale, based the same aerial photo used for the above distances

FEL traveling between Hopper and Feed Stockpile:

100 ft traveled from hopper to pile
200 ft traveled roundtrip
8 tons per load discharged to the hopper
25 ft/ton material discharged to the hopper
0.00473 VMT/ton material discharged to the hopper

FEL loading haul vehicles:

134 ft per haul vehicle load
20 tons is maximum load per Tandem
6.7 ft/ton product hauled off-site
0.00127 VMT/ton Product transferred to Haul Vehicle

Haul Vehicles (Tandems) bringing materials to the site:

484 ft from entrance to scale and scale to discharge location
968 feet round trip to bring a load of material on-site
20 tons is maximum load per Tandem
48.4 ft/ton material brought on-site
0.00917 VMT/ton matieral brought on-site

Haul Vehicles (Tandems) hauling Product from the site:

Path 1	Path 2	Path3	
420	363	427	ft from entrance to scale and scale to loading location
840	726	854	feet round trip to haul a load of Product off-site
20	20	20	tons is maximum load per Tandem
		2420	feet traveled each time all three paths have been used
		60	tons loaded each time all three paths have been used
		40.3	ft/ton Product hauled off-site, on average
		0.007633	VMT/ton Product hauled off-site

From AP-42, Section 13.2.2, UNPAVED ROADS

The following formula for vehicles traveling on unpaved surfaces at industrial sites is used, EQUATION 1A:

$$E = k\,(s/12)^a\,(W/3)^b$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)

from Table 13.2.2-2. CONSTANTS FOR EQUATION 1a

Industrial Roads (Equation 1a)

Constant	PM-2.5	PM-10	*PM-30
k (lb/VMT)	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45
Quality Rating	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)

From Table 13.2.2-3, RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1A

Emission Factor	Surface Silt Content (%)	Mean Vehicle Wt. (tons)	Mean Vehicle Speed (mph)	Surface Moiture Content (%)
Industrial Roads	1.8 to 25.2	2 to 290	5 to 43	0.03 to 13

Accounting for Preciptation (i.e., watering the roads)

Equation 2

$E_{est} = E\,[(365-P)/365]$

where:

E_{est} = annual size-specific emission factor extrapolated for natural mitigation, lb/VMT
E = emission factor from Equation 1A
P = # of days in a year with at least 0.01 in. of precipitation

Vehicle Weights

Tandems:

Unloaded weight	11
Loaded weight	31
Arrives on the site or leaves the site empty	
Arrives on the site with a load or leaves the site with a load	
Mean vehicle weight	21

FELs:

Unloaded weight	77.5
Loaded weight	85.5

Half of the roundtrip the bucket is empty, Half of the roundtrip the bucket is loaded

Mean vehicle weight	81.5

Values for Equation 1a Variables

s - Surface material silt content, estimated:	5 %
W (FELs)	81.5 tons
W (Tandems)	21 tons

On-Site Watering (effective Precipitation)

A watering truck will be on-site and will dispense enough water each day such that a minimum of 0.01 inch of equivalent precipitation will occur.

It is expected that there will be a maximum of 312 days of operations on the site.

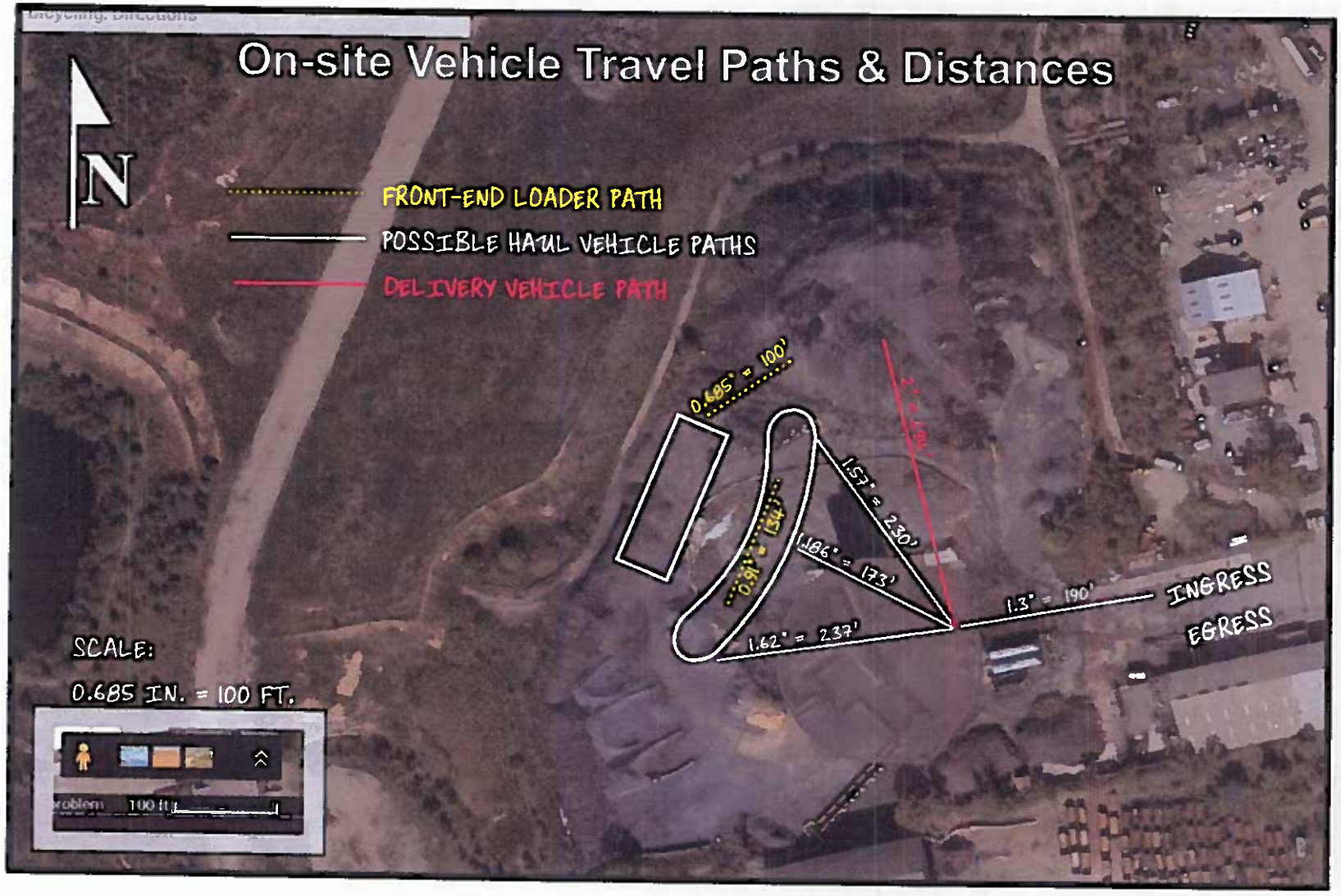
It is expected that the watering truck will properly water the roadways on-site every day. However, to add a conservative element to this estimate, it is estimated that watering will occur 95% of the days the plant is operated.

% days watering occurs	95%
p =	296
(365 - p) / 365 =	18.9%

CALCULATED EMISSION FACTORS

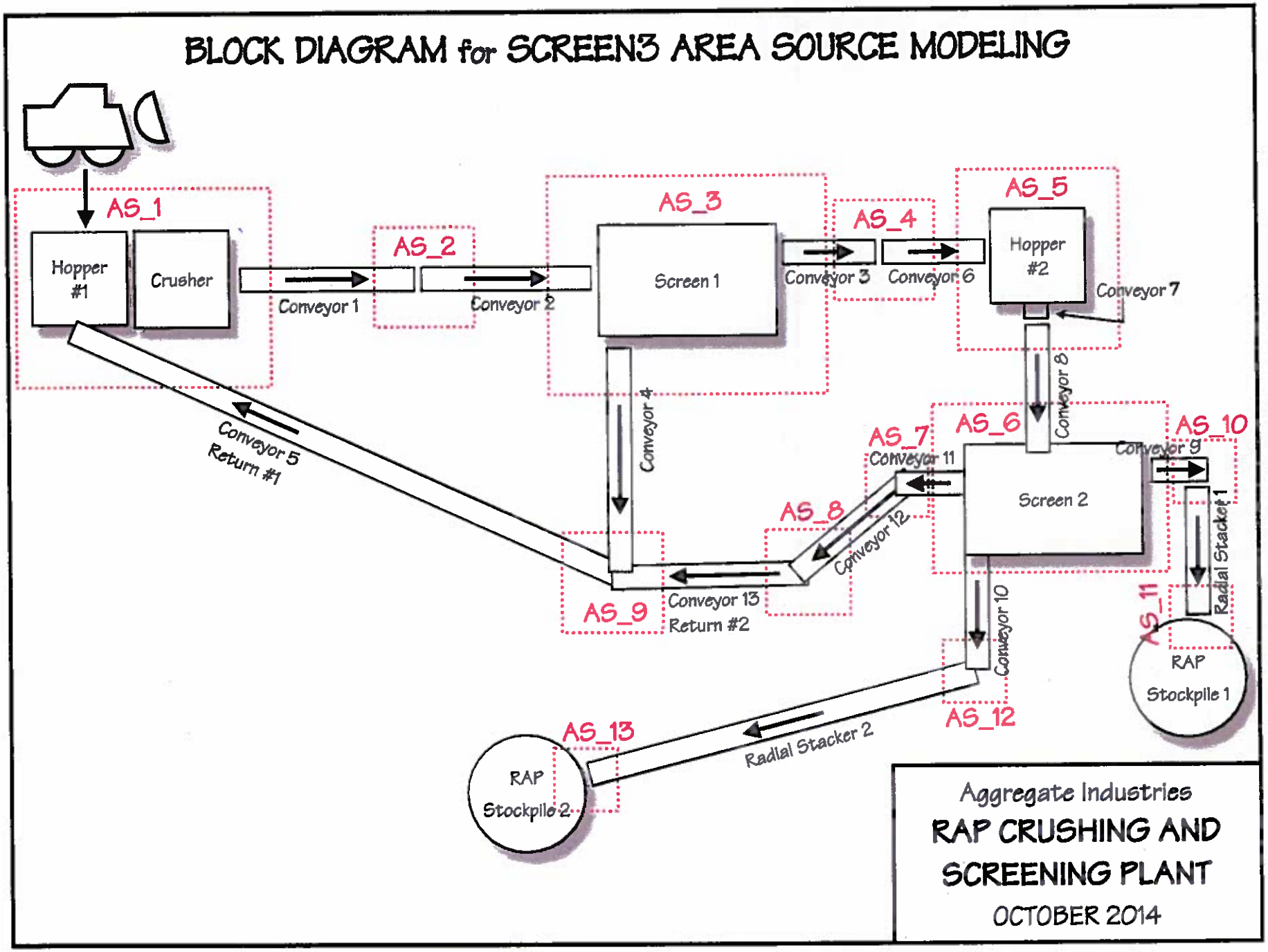
	E_{est} lb/VMT		ton-based EF lb/ton	
	FEL	Tandem	FEL	Tandem
VMT/ton	0.0060	0.0168		
PM2.5	0.0570	0.0309	0.0003	0.0005
PM10	0.5697	0.3095	0.0034	0.0052
TSP	2.2173	1.2045	0.0133	0.0202

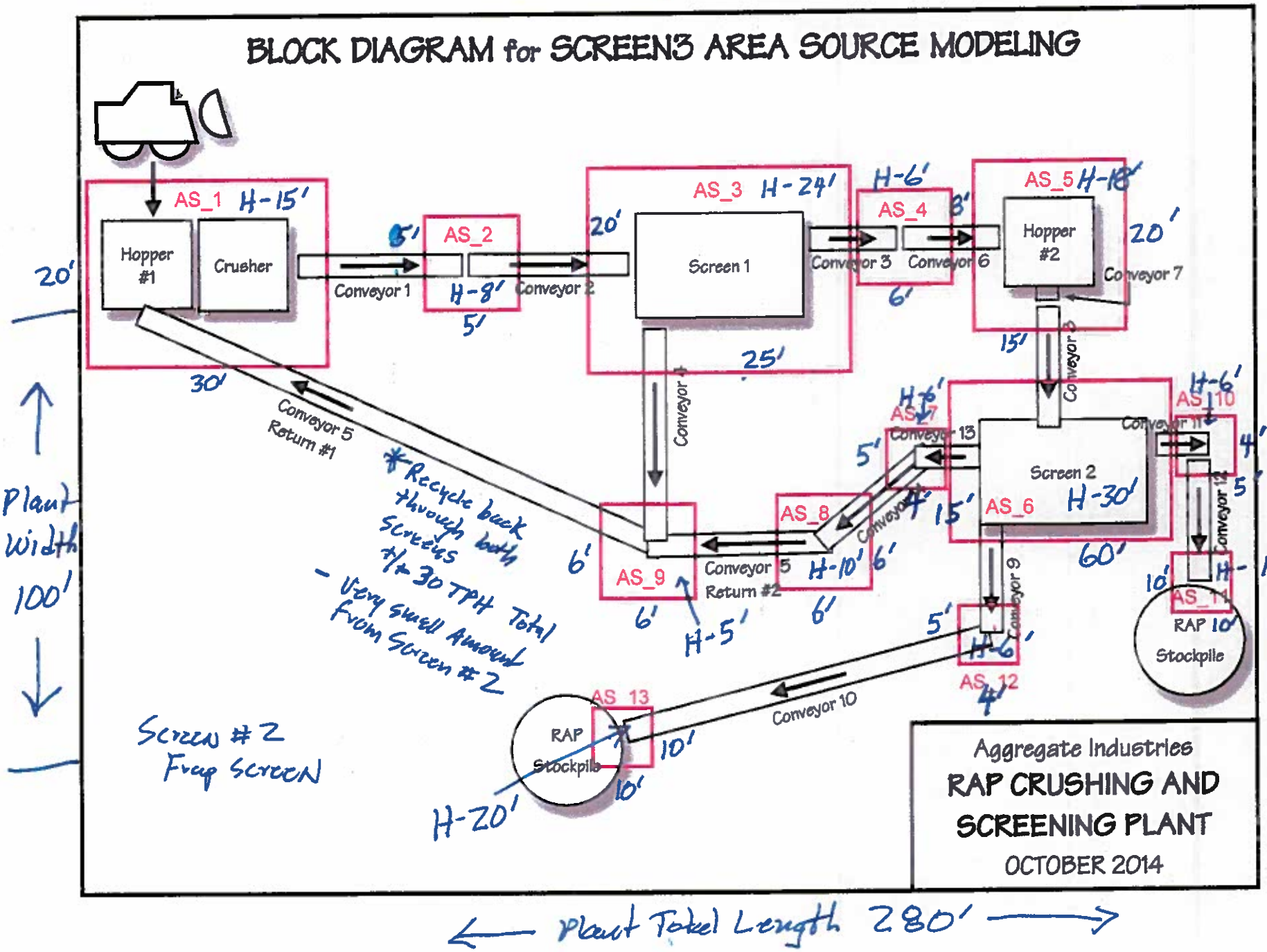
Bardon, Inc. (dba Aggregate Industries -- MAR)



5850 SHERIFF RD., CAPITOL HEIGHTS, MD

BLOCK DIAGRAM for SCREEN3 AREA SOURCE MODELING




BLOCK DIAGRAM for SCREEN3 AREA SOURCE MODELING
AS_1 H-15'
Hopper #1
Crusher
Conveyor 1
AS_2
H-8'
5'
Conveyor 2
AS_3 H-24'
20'
Screen 1
25'
Conveyor 3
H-6'
AS_4
8'
Conveyor 6
6'
AS_5 H-18'
Hopper #2
20'
Conveyor 7
15'
Conveyor 8
30'
Conveyor 5 Return #1
* Recycle back through both screens +/- 30 TPH Total - Very small Amount From Screen #2
Conveyor 4
6'
AS_9
Conveyor 5 Return #2
H-5'
6'
AS_8
H-10'
6'
Conveyor 9
H-6'
AS_7
Conveyor 13
5'
4'
15'
AS_6
Screen 2
H-30'
60'
AS_10
H-6'
Conveyor 11
4'
5'
Conveyor 12
10'
AS_11
H-15'
RAP 10' Stockpile
5'
H-6'
AS_12
4'
Conveyor 10
AS_13
RAP Stockpile
10'
10'
H-20'
Plant Width 100'
Screen #2 Prop Screen
Aggregate Industries
RAP CRUSHING AND SCREENING PLANT
OCTOBER 2014
Plant Total Length 280'

Area Source ID	Equipment Description	Emission Points	$PM_{2.5}$ Emission Rate			Side 1	Side 2	Area	Height	TWA EmisRate per Sq M	1-Hour SCREEN3 Result	Distance	24-Hour Predicted AAC	Annual Predicted AAC
			lb/hr	lb/day	TWA g/sec	meters	meters	M^2	meters	g/sec-M^2	ug/M^3	meters	ug/M^3	ug/M^3
AS_1	Crusher, Feed Hopper, Return Conveyor	EP27,EP1,EP2,EP3,EP4	1.62 E-2	1.95 E-1	1.02 E-3	9.1	6.1	55.74	4.6	1.83 E-5	8.69 E+0	25	3.48	0.52
AS_2	BC1 to BC2 Conveyor Transfer pt	EP5	3.90 E-3	4.68 E-2	2.46 E-4	1.5	1.5	2.32	2.4	1.06 E-4	6.61 E+0	25	2.64	0.40
AS_3	Primary Screen, Conveyor Discharge, Conveyor loading (2)	EP6,EP7,EP8,EP10	1.58 E-2	1.89 E-1	9.93 E-4	7.6	6.1	46.45	7.3	2.14 E-5	3.71 E+0	25	1.48	0.22
AS_4	BC3 to BC6 Conveyor Transfer pt	EP11	3.51 E-3	4.21 E-2	2.21 E-4	1.8	1.8	3.34	2.4	6.61 E-5	5.90 E+0	25	2.36	0.35
AS_5	Transfer Hopper, Conveyor Discharge, Converyor loading (BC7), BC7 to BC8 Conveyor Transfer pt	EP12,EP13,EP14	4.21 E-3	5.05 E-2	2.65 E-4	6.1	4.6	27.87	5.5	9.52 E-6	1.73 E+0	28	0.69	0.10
AS_6	Secondary Screen, Conveyor discharge, Conveyor loading (BC9, BC11)	EP15,EP16,EP17, EP20,EP23	1.42 E-2	1.71 E-1	8.96 E-4	18.3	4.6	83.61	9.1	1.07 E-5	1.99 E+0	48	0.80	0.12
AS_7	BC11 to BC12 Conveyor Transfer pt	EP24	1.30 E-4	1.56 E-3	8.19 E-6	1.5	1.2	1.86	1.8	4.41 E-6	3.06 E-1	25	0.12	0.02
AS_8	BC12 to BC13 Conveyor Transfer pt	EP25	1.30 E-4	1.56 E-3	8.19 E-6	1.8	1.8	3.34	3.0	2.45 E-6	1.46 E-1	28	0.06	0.01
AS_9	BC4 & BC 13 to BC5 Conveyor Transfer pt	EP9,EP26	3.90 E-4	4.68 E-3	2.46 E-5	1.8	1.8	3.34	1.5	7.35 E-6	1.04 E+0	25	0.41	0.06
AS_10	BC9 to RS1 Conveyor Transfer pt	EP18	1.92 E-3	2.31 E-2	1.21 E-4	1.5	1.2	1.86	1.8	6.52 E-5	4.66 E+0	25	1.86	0.28
AS_11	Conveyor transfer to Stockpile 1	EP19	1.92 E-4	2.31 E-3	1.21 E-5	3.0	3.0	9.29	4.6	1.30 E-6	1.13 E-1	25	0.05	0.01
AS_12	BC10 to RS2 Conveyor Transfer pt	EP21	1.59 E-3	1.90 E-2	9.99 E-5	1.5	1.2	1.86	1.8	5.38 E-5	3.31 E+0	25	1.32	0.20
AS_13	Conveyor transfer to Stockpile 2	EP22	1.59 E-4	1.90 E-3	9.99 E-6	3.0	3.0	9.29	6.1	1.08 E-6	4.68 E-1	25	0.19	0.03
AS_14	Truck loading (2 identical sources)	EP28, EP29	1.92 E-4	2.31 E-3	1.21 E-5	3.0	2.4	7.20	3.0	1.68 E-6	2.27 E-1	28	0.18	0.03
Assuming the emissions from each Area Source land at the same receptor the predicted 1-Hour Ambient Air Concentration (AAC) for the Crushing & Screening Plant is:													16	2

Area Source ID	Equipment Description	Emission Points	PM_{10} Emission Rate			Side 1	Side 2	Area	Height	EmisRate per Sq M	1-Hour SCREEN3 Result	Distance	24-Hour Predicted AAC
			lb/hr	lb/day	TWA g/sec	meters	meters	M^2	meters	g/sec-M^2	ug/M^3	meters	ug/M^3
AS_1	Crusher, Feed Hopper, Return Conveyor	EP27,EP1,EP2,EP3,EP4	2.04 E-1	2.45 E+0	1.28 E-2	9.1	6.1	55.74	4.6	2.30 E-4	1.09 E+2	25	44
AS_2	BC1 to BC2 Conveyor Transfer pt	EP5	1.38 E-2	1.66 E-1	8.69 E-4	1.5	1.5	2.32	2.4	3.74 E-4	2.34 E+1	25	9
AS_3	Primary Screen, Conveyor Discharge, Conveyor loading (2)	EP6,EP7,EP8,EP10	4.09 E-2	4.91 E-1	2.58 E-3	7.6	6.1	46.45	7.3	5.55 E-5	9.63 E+0	25	4
AS_4	BC3 to BC6 Conveyor Transfer pt	EP11	1.24 E-2	1.49 E-1	7.82 E-4	1.8	1.8	3.34	2.4	2.34 E-4	2.09 E+1	25	8
AS_5	Transfer Hopper, Conveyor Discharge, Converyor loading (BC7), BC7 to BC8 Conveyor Transfer pt	EP12,EP13,EP14	3.73 E-2	4.47 E-1	2.35 E-3	6.1	4.6	27.87	5.5	8.42 E-5	1.53 E+1	28	6
AS_6	Secondary Screen, Conveyor discharge, Conveyor loading (BC9, BC11)	EP15,EP16,EP17, EP20,EP23	3.77 E-2	4.53 E-1	2.38 E-3	18.3	4.6	83.61	9.1	2.84 E-5	5.29 E+0	48	2
AS_7	BC11 to BC12 Conveyor Transfer pt	EP24	4.60 E-4	5.52 E-3	2.90 E-5	1.5	1.2	1.86	1.8	1.56 E-5	1.08 E+0	25	0
AS_8	BC12 to BC13 Conveyor Transfer pt	EP25	4.60 E-4	5.52 E-3	2.90 E-5	1.8	1.8	3.34	3.0	8.66 E-6	5.17 E-1	28	0
AS_9	BC4 & BC 13 to BC5 Conveyor Transfer pt	EP9,EP26	1.38 E-3	1.66 E-2	8.69 E-5	1.8	1.8	3.34	1.5	2.60 E-5	3.66 E+0	25	1
AS_10	BC9 to RS1 Conveyor Transfer pt	EP18	6.81 E-3	8.17 E-2	4.29 E-4	1.5	1.2	1.86	1.8	2.31 E-4	1.65 E+1	25	7
AS_11	Conveyor transfer to Stockpile 1	EP19	6.81 E-3	8.17 E-2	4.29 E-4	3.0	3.0	9.29	4.6	4.62 E-5	3.99 E+0	25	2
AS_12	BC10 to RS2 Conveyor Transfer pt	EP21	5.61 E-3	6.73 E-2	3.54 E-4	1.5	1.2	1.86	1.8	1.90 E-4	1.17 E+1	25	5
AS_13	Conveyor transfer to Stockpile 2	EP22	5.61 E-3	6.73 E-2	3.54 E-4	3.0	3.0	9.29	6.1	3.81 E-5	1.65 E+1	25	7
AS_14	Truck loading (2 identical sources)	EP28, EP29	1.92 E-4	2.31 E-3	1.21 E-5	3.0	2.4	7.20	3.0	1.66 E-6	2.27 E-1	28	0.18
Assuming the emissions from each Area Source land at the same receptor the predicted 1-Hour Ambient Air Concentration (AAC) for the Crushing & Screening Plant is:													95

OUTPUT FROM SCREEN3 V. 13043
FOR ALL 14 AREA SOURCES

10/19/14
08:18:12

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_1

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.183000E-04
SOURCE HEIGHT (M) = 4.6000
LENGTH OF LARGER SIDE (M) = 9.1000
LENGTH OF SMALLER SIDE (M) = 6.1000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	8.690	4	1.0	1.0	320.0	4.60	0.
100.	3.281	5	1.0	1.0	10000.0	4.60	0.
200.	1.027	5	1.0	1.0	10000.0	4.60	0.
300.	0.5055	5	1.0	1.0	10000.0	4.60	0.
400.	0.3070	5	1.0	1.0	10000.0	4.60	0.
500.	0.2101	5	1.0	1.0	10000.0	4.60	0.
600.	0.1549	5	1.0	1.0	10000.0	4.60	0.
700.	0.1204	5	1.0	1.0	10000.0	4.60	0.
800.	0.9706E-01	5	1.0	1.0	10000.0	4.60	0.
900.	0.8052E-01	5	1.0	1.0	10000.0	4.60	0.
1000.	0.6830E-01	5	1.0	1.0	10000.0	4.60	0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:

25.	8.690	4	1.0	1.0	320.0	4.60	0.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	8.690	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:20:27

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_2

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.106000E-03
SOURCE HEIGHT (M) = 2.4000
LENGTH OF LARGER SIDE (M) = 1.5000
LENGTH OF SMALLER SIDE (M) = 1.5000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	6.611	5	1.0	1.0	10000.0	2.40	2.
100.	0.8938	5	1.0	1.0	10000.0	2.40	40.
200.	0.2513	5	1.0	1.0	10000.0	2.40	17.
300.	0.1210	5	1.0	1.0	10000.0	2.40	22.
400.	0.7296E-01	5	1.0	1.0	10000.0	2.40	6.
500.	0.4973E-01	5	1.0	1.0	10000.0	2.40	17.
600.	0.3661E-01	5	1.0	1.0	10000.0	2.40	17.
700.	0.2840E-01	5	1.0	1.0	10000.0	2.40	30.
800.	0.2288E-01	5	1.0	1.0	10000.0	2.40	41.
900.	0.1897E-01	5	1.0	1.0	10000.0	2.40	17.
1000.	0.1608E-01	5	1.0	1.0	10000.0	2.40	17.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:

25.	6.611	5	1.0	1.0	10000.0	2.40	2.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	6.611	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:22:58

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_3

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.214000E-04
SOURCE HEIGHT (M) = 7.3000
LENGTH OF LARGER SIDE (M) = 7.6000
LENGTH OF SMALLER SIDE (M) = 6.1000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	3.709	3	1.0	1.0	320.0	7.30	0.
100.	2.398	5	1.0	1.0	10000.0	7.30	4.
200.	0.9244	5	1.0	1.0	10000.0	7.30	7.
300.	0.4741	5	1.0	1.0	10000.0	7.30	4.
400.	0.2924	5	1.0	1.0	10000.0	7.30	6.
500.	0.2016	5	1.0	1.0	10000.0	7.30	4.
600.	0.1493	5	1.0	1.0	10000.0	7.30	4.
700.	0.1163	5	1.0	1.0	10000.0	7.30	4.
800.	0.9397E-01	5	1.0	1.0	10000.0	7.30	4.
900.	0.7807E-01	5	1.0	1.0	10000.0	7.30	4.
1000.	0.6629E-01	5	1.0	1.0	10000.0	7.30	5.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:
25. 3.709 3 1.0 1.0 320.0 7.30 0.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	3.709	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:25:28

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_4

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.661000E-04
SOURCE HEIGHT (M) = 2.4000
LENGTH OF LARGER SIDE (M) = 1.8000
LENGTH OF SMALLER SIDE (M) = 1.8000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	5.904	5	1.0	1.0	10000.0	2.40	2.
100.	0.8026	5	1.0	1.0	10000.0	2.40	8.
200.	0.2256	5	1.0	1.0	10000.0	2.40	43.
300.	0.1086	5	1.0	1.0	10000.0	2.40	28.
400.	0.6551E-01	5	1.0	1.0	10000.0	2.40	30.
500.	0.4466E-01	5	1.0	1.0	10000.0	2.40	21.
600.	0.3287E-01	5	1.0	1.0	10000.0	2.40	21.
700.	0.2550E-01	5	1.0	1.0	10000.0	2.40	27.
800.	0.2055E-01	5	1.0	1.0	10000.0	2.40	34.
900.	0.1704E-01	5	1.0	1.0	10000.0	2.40	34.
1000.	0.1444E-01	5	1.0	1.0	10000.0	2.40	24.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:

25.	5.904	5	1.0	1.0	10000.0	2.40	2.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	5.904	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:27:01

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_5

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.952000E-05
SOURCE HEIGHT (M) = 5.5000
LENGTH OF LARGER SIDE (M) = 6.1000
LENGTH OF SMALLER SIDE (M) = 4.6000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	1.658	4	1.0	1.0	320.0	5.50	1.
100.	0.7993	5	1.0	1.0	10000.0	5.50	2.
200.	0.2643	5	1.0	1.0	10000.0	5.50	4.
300.	0.1314	5	1.0	1.0	10000.0	5.50	3.
400.	0.8017E-01	5	1.0	1.0	10000.0	5.50	3.
500.	0.5496E-01	5	1.0	1.0	10000.0	5.50	3.
600.	0.4059E-01	5	1.0	1.0	10000.0	5.50	3.
700.	0.3156E-01	5	1.0	1.0	10000.0	5.50	3.
800.	0.2546E-01	5	1.0	1.0	10000.0	5.50	3.
900.	0.2113E-01	5	1.0	1.0	10000.0	5.50	0.
1000.	0.1793E-01	5	1.0	1.0	10000.0	5.50	4.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:
28. 1.727 4 1.0 1.0 320.0 5.50 1.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	1.727	28.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:30:38

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_6

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.995000E-05
SOURCE HEIGHT (M) = 9.1000
LENGTH OF LARGER SIDE (M) = 18.3000
LENGTH OF SMALLER SIDE (M) = 4.6000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	1.593	1	1.0	1.0	320.0	9.10	1.
100.	1.558	5	1.0	1.0	10000.0	9.10	0.
200.	0.7259	5	1.0	1.0	10000.0	9.10	0.
300.	0.3859	5	1.0	1.0	10000.0	9.10	0.
400.	0.2413	5	1.0	1.0	10000.0	9.10	0.
500.	0.1675	5	1.0	1.0	10000.0	9.10	0.
600.	0.1246	5	1.0	1.0	10000.0	9.10	0.
700.	0.9727E-01	5	1.0	1.0	10000.0	9.10	0.
800.	0.7872E-01	5	1.0	1.0	10000.0	9.10	0.
900.	0.6547E-01	5	1.0	1.0	10000.0	9.10	0.
1000.	0.5564E-01	5	1.0	1.0	10000.0	9.10	0.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:
48. 1.993 3 1.0 1.0 320.0 9.10 0.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	1.993	48.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:31:45

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_7

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.441000E-05
SOURCE HEIGHT (M) = 1.8000
LENGTH OF LARGER SIDE (M) = 1.5000
LENGTH OF SMALLER SIDE (M) = 1.2000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	0.3064	6	1.0	1.0	10000.0	1.80	5.
100.	0.3043E-01	6	1.0	1.0	10000.0	1.80	7.
200.	0.8416E-02	6	1.0	1.0	10000.0	1.80	7.
300.	0.4040E-02	6	1.0	1.0	10000.0	1.80	5.
400.	0.2433E-02	6	1.0	1.0	10000.0	1.80	7.
500.	0.1658E-02	6	1.0	1.0	10000.0	1.80	6.
600.	0.1220E-02	6	1.0	1.0	10000.0	1.80	7.
700.	0.9460E-03	6	1.0	1.0	10000.0	1.80	7.
800.	0.7621E-03	6	1.0	1.0	10000.0	1.80	7.
900.	0.6318E-03	6	1.0	1.0	10000.0	1.80	7.
1000.	0.5356E-03	6	1.0	1.0	10000.0	1.80	7.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:
25. 0.3064 6 1.0 1.0 10000.0 1.80 5.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.3064	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:32:58

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_8

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.245000E-05
SOURCE HEIGHT (M) = 3.0000
LENGTH OF LARGER SIDE (M) = 1.8000
LENGTH OF SMALLER SIDE (M) = 1.8000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	0.1445	5	1.0	1.0	10000.0	3.00	3.
100.	0.2890E-01	5	1.0	1.0	10000.0	3.00	8.
200.	0.8294E-02	5	1.0	1.0	10000.0	3.00	43.
300.	0.4010E-02	5	1.0	1.0	10000.0	3.00	30.
400.	0.2422E-02	5	1.0	1.0	10000.0	3.00	28.
500.	0.1652E-02	5	1.0	1.0	10000.0	3.00	21.
600.	0.1217E-02	5	1.0	1.0	10000.0	3.00	34.
700.	0.9442E-03	5	1.0	1.0	10000.0	3.00	27.
800.	0.7609E-03	5	1.0	1.0	10000.0	3.00	34.
900.	0.6310E-03	5	1.0	1.0	10000.0	3.00	34.
1000.	0.5350E-03	5	1.0	1.0	10000.0	3.00	24.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:
28. 0.1462 5 1.0 1.0 10000.0 3.00 3.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.1462	28.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:34:25

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_9

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.735000E-05
SOURCE HEIGHT (M) = 1.5000
LENGTH OF LARGER SIDE (M) = 1.8000
LENGTH OF SMALLER SIDE (M) = 1.8000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	1.035	6	1.0	1.0	10000.0	1.50	41.
100.	0.9211E-01	6	1.0	1.0	10000.0	1.50	8.
200.	0.2531E-01	6	1.0	1.0	10000.0	1.50	43.
300.	0.1213E-01	6	1.0	1.0	10000.0	1.50	12.
400.	0.7304E-02	6	1.0	1.0	10000.0	1.50	30.
500.	0.4975E-02	6	1.0	1.0	10000.0	1.50	21.
600.	0.3661E-02	6	1.0	1.0	10000.0	1.50	34.
700.	0.2839E-02	6	1.0	1.0	10000.0	1.50	27.
800.	0.2287E-02	6	1.0	1.0	10000.0	1.50	27.
900.	0.1896E-02	6	1.0	1.0	10000.0	1.50	34.
1000.	0.1607E-02	6	1.0	1.0	10000.0	1.50	24.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:

25.	1.035	6	1.0	1.0	10000.0	1.50	41.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	1.035	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:35:23

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_10

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.670000E-04
SOURCE HEIGHT (M) = 1.8000
LENGTH OF LARGER SIDE (M) = 1.5000
LENGTH OF SMALLER SIDE (M) = 1.2000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	4.655	6	1.0	1.0	10000.0	1.80	5.
100.	0.4623	6	1.0	1.0	10000.0	1.80	7.
200.	0.1279	6	1.0	1.0	10000.0	1.80	7.
300.	0.6137E-01	6	1.0	1.0	10000.0	1.80	5.
400.	0.3696E-01	6	1.0	1.0	10000.0	1.80	7.
500.	0.2518E-01	6	1.0	1.0	10000.0	1.80	6.
600.	0.1853E-01	6	1.0	1.0	10000.0	1.80	7.
700.	0.1437E-01	6	1.0	1.0	10000.0	1.80	7.
800.	0.1158E-01	6	1.0	1.0	10000.0	1.80	7.
900.	0.9598E-02	6	1.0	1.0	10000.0	1.80	7.
1000.	0.8137E-02	6	1.0	1.0	10000.0	1.80	7.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:

25.	4.655	6	1.0	1.0	10000.0	1.80	5.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	4.655	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:36:45

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_11

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.134000E-05
SOURCE HEIGHT (M) = 4.6000
LENGTH OF LARGER SIDE (M) = 3.0000
LENGTH OF SMALLER SIDE (M) = 3.0000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	0.1129	4	1.0	1.0	320.0	4.60	28.
100.	0.3929E-01	5	1.0	1.0	10000.0	4.60	31.
200.	0.1222E-01	5	1.0	1.0	10000.0	4.60	6.
300.	0.6001E-02	5	1.0	1.0	10000.0	4.60	4.
400.	0.3645E-02	5	1.0	1.0	10000.0	4.60	25.
500.	0.2494E-02	5	1.0	1.0	10000.0	4.60	4.
600.	0.1839E-02	5	1.0	1.0	10000.0	4.60	4.
700.	0.1429E-02	5	1.0	1.0	10000.0	4.60	6.
800.	0.1152E-02	5	1.0	1.0	10000.0	4.60	6.
900.	0.9559E-03	5	1.0	1.0	10000.0	4.60	7.
1000.	0.8109E-03	5	1.0	1.0	10000.0	4.60	17.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:

25.	0.1129	4	1.0	1.0	320.0	4.60	28.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.1129	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:42:55

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_12

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.476000E-04
SOURCE HEIGHT (M) = 1.8000
LENGTH OF LARGER SIDE (M) = 1.5000
LENGTH OF SMALLER SIDE (M) = 1.2000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	3.307	6	1.0	1.0	10000.0	1.80	5.
100.	0.3284	6	1.0	1.0	10000.0	1.80	7.
200.	0.9084E-01	6	1.0	1.0	10000.0	1.80	7.
300.	0.4360E-01	6	1.0	1.0	10000.0	1.80	5.
400.	0.2626E-01	6	1.0	1.0	10000.0	1.80	7.
500.	0.1789E-01	6	1.0	1.0	10000.0	1.80	6.
600.	0.1317E-01	6	1.0	1.0	10000.0	1.80	7.
700.	0.1021E-01	6	1.0	1.0	10000.0	1.80	7.
800.	0.8226E-02	6	1.0	1.0	10000.0	1.80	7.
900.	0.6819E-02	6	1.0	1.0	10000.0	1.80	7.
1000.	0.5781E-02	6	1.0	1.0	10000.0	1.80	7.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:

25.	3.307	6	1.0	1.0	10000.0	1.80	5.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	3.307	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/19/14
08:44:24
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_13

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.952000E-06
SOURCE HEIGHT (M) = 6.1000
LENGTH OF LARGER SIDE (M) = 3.0000
LENGTH OF SMALLER SIDE (M) = 3.0000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	0.4676E-01	3	1.0	1.0	320.0	6.10	1.
100.	0.2416E-01	5	1.0	1.0	10000.0	6.10	31.
200.	0.8334E-02	5	1.0	1.0	10000.0	6.10	6.
300.	0.4178E-02	5	1.0	1.0	10000.0	6.10	4.
400.	0.2557E-02	5	1.0	1.0	10000.0	6.10	25.
500.	0.1756E-02	5	1.0	1.0	10000.0	6.10	4.
600.	0.1298E-02	5	1.0	1.0	10000.0	6.10	4.
700.	0.1010E-02	5	1.0	1.0	10000.0	6.10	6.
800.	0.8151E-03	5	1.0	1.0	10000.0	6.10	6.
900.	0.6767E-03	5	1.0	1.0	10000.0	6.10	15.
1000.	0.5743E-03	5	1.0	1.0	10000.0	6.10	17.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:

25.	0.4676E-01	3	1.0	1.0	320.0	6.10	1.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.4676E-01	25.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

10/20/14
13:30:11

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

AGGREGATE INDUSTRIES -- AS_14

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 0.173000E-05
SOURCE HEIGHT (M) = 3.0000
LENGTH OF LARGER SIDE (M) = 3.0000
LENGTH OF SMALLER SIDE (M) = 2.4000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = URBAN
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
25.	0.2229	5	1.0	1.0	10000.0	3.00	2.
100.	0.4531E-01	5	1.0	1.0	10000.0	3.00	5.
200.	0.1301E-01	5	1.0	1.0	10000.0	3.00	4.
300.	0.6293E-02	5	1.0	1.0	10000.0	3.00	7.
400.	0.3801E-02	5	1.0	1.0	10000.0	3.00	7.
500.	0.2593E-02	5	1.0	1.0	10000.0	3.00	7.
600.	0.1909E-02	5	1.0	1.0	10000.0	3.00	5.
700.	0.1482E-02	5	1.0	1.0	10000.0	3.00	5.
800.	0.1194E-02	5	1.0	1.0	10000.0	3.00	7.
900.	0.9901E-03	5	1.0	1.0	10000.0	3.00	5.
1000.	0.8395E-03	5	1.0	1.0	10000.0	3.00	7.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 25. M:
28. 0.2265 5 1.0 1.0 10000.0 3.00 2.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.2265	28.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY) 03/31/2014

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
Aon Risk Services Southwest, Inc. Houston TX Office 5555 San Felipe Suite 1500 Houston TX 77056 USA	PHONE (A/C. No. Ext): (866) 283-7122	FAX (A/C. No.): (800) 363-0105
	E-MAIL ADDRESS:	

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
Aggregate Industries Management, Inc. 24 Crosby Drive Bedford MA 01730 USA	INSURER A: New Hampshire Ins Co	23841
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	
	INSURER F:	

COVERAGES **CERTIFICATE NUMBER:** 570053306528 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS. Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY			GL7046566	04/01/2014	04/01/2015	EACH OCCURRENCE	$2,000,000
	CLAIMS-MADE [X] OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$2,000,000
							MED EXP (Any one person)	$50,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PERSONAL & ADV INJURY	$2,000,000
	POLICY [ ] PRO-JECT [ ] LOC						GENERAL AGGREGATE	$4,000,000
	OTHER:						PRODUCTS - COMP/OP AGG	$4,000,000
A	AUTOMOBILE LIABILITY			CA 3314348 (AOS)	04/01/2014	04/01/2015	COMBINED SINGLE LIMIT (Ea accident)	$5,000,000
A	X ANY AUTO			CA 3314349 (VA)	04/01/2014	04/01/2015	BODILY INJURY (Per person)	
A	ALL OWNED AUTOS / SCHEDULED AUTOS			CA 3314350 (MA)	04/01/2014	04/01/2015	BODILY INJURY (Per accident)	
	HIRED AUTOS / NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	
	UMBRELLA LIAB [ ] OCCUR						EACH OCCURRENCE	
	EXCESS LIAB [ ] CLAIMS-MADE						AGGREGATE	
	DED [ ] RETENTION							
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY			WC026034879 (AOS)	04/01/2014	04/01/2015	X PER STATUTE [ ] OTH-ER	
A	ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N [N] N/A (Mandatory in NH)			WC026034880 (IL,NH,UT)	04/01/2014	04/01/2015	E.L. EACH ACCIDENT	$1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE-EA EMPLOYEE	$1,000,000
							E.L. DISEASE-POLICY LIMIT	$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

MONTGOMERY COUNTY
DEPARTMENT OF
ENVIRONMENTAL PROTECTION
255 ROCKVILLE PIKE, SUITE 120
ROCKVILLE MD 20850 USA

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Aon Risk Services Southwest Inc.

Holder Identifier :

Certificate No : 570053306528

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AGENCY CUSTOMER ID: 570000035837
LOC #:

ADDITIONAL REMARKS SCHEDULE

AGENCY	NAMED INSURED
Aon Risk Services Southwest, Inc.	Aggregate Industries Management, Inc.
POLICY NUMBER: See Certificate Number: 570053306528	
CARRIER: See Certificate Number: 570053306528 / NAIC CODE	EFFECTIVE DATE

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER	
INSURER	
INSURER	
INSURER	

ADDITIONAL POLICIES If a policy below does not include limit information, refer to the corresponding policy on the ACORD certificate form for policy limits.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	LIMITS	
	WORKERS COMPENSATION							
A		N/A		WC026034882 (MA, WI)	04/01/2014	04/01/2015		
A		N/A		WC026034883 (PA)	04/01/2014	04/01/2015		

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AGENCY CUSTOMER ID: 570000035837
LOC #:

ADDITIONAL REMARKS SCHEDULE

AGENCY	NAMED INSURED
Aon Risk Services Southwest, Inc.	Aggregate Industries Management, Inc.
POLICY NUMBER	
See Certificate Number: 570053306528	
CARRIER / NAIC CODE	EFFECTIVE DATE
See Certificate Number: 570053306528	

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance

Additional Named Insureds

Aggregate Industries 6 Northeast Region, Inc.
Tiger Minimix, Inc.
Aggregate Industries 6 MWR, Inc.
Kost, Inc.
Super Concrete Corporation
Bardon, Inc. D/B/A Aggregate Industries - Mar
Aggregate Industries Land Company, Inc.
Aggregate Industries 6 WCR, Inc.
Aggregate Industries Management, Inc.
Aggregate Industries - SWR (D/B/A Frehner Construction Company)
Meyer Material Company, LLC
Lattimore Materials Corp.

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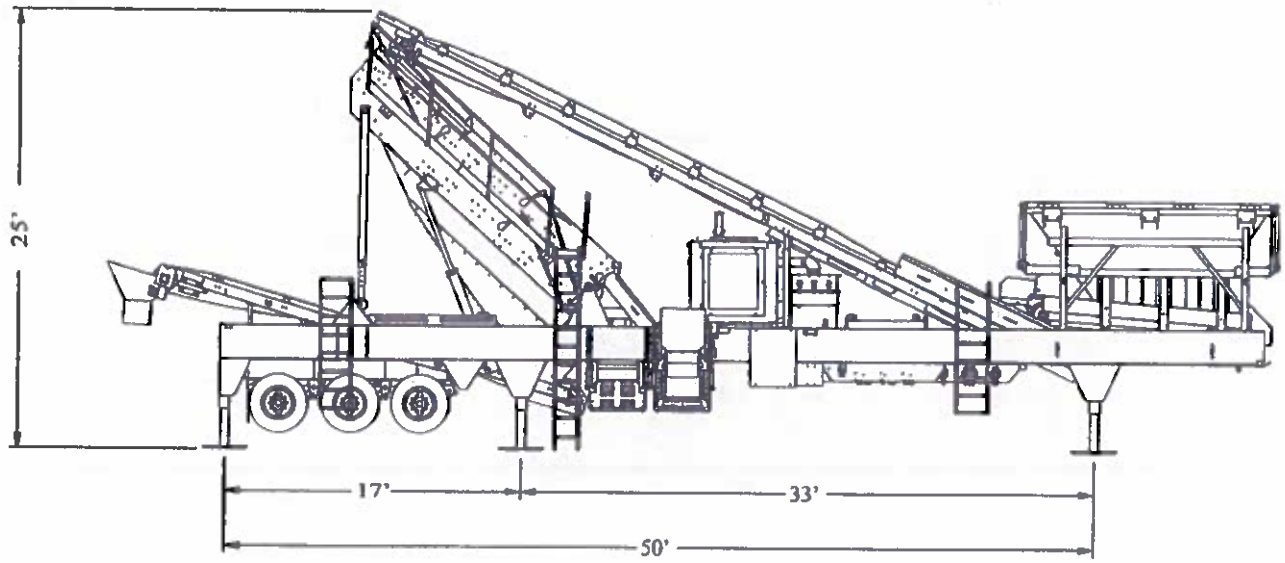
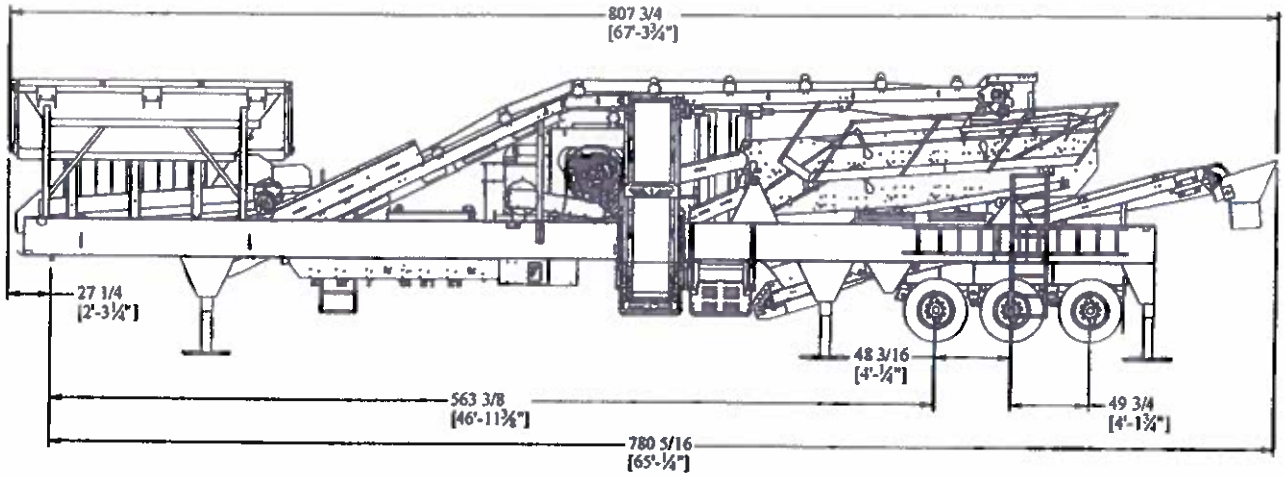
Model PSP 2618VM
Mobile Screening Plant
Model 2618VM Spec Sheet

Operational Mode



Transport Mode



DELIVERY CONVEYOR

- 42' x 36" conveyor, hydraulic drive (350 FPM)
- 220 PIW
- 1/8 x 1/16 cover belting, fold for transport

PRODUCT CONVEYORS

- Two (2) 16' x 24" transfer conveyors
- Hydraulic variable speed (0-350 FPM)
- 220 PIW
- 1/8 x 1/16 cover belting

FINES CONVEYOR

- 24' x 36" conveyor, hydraulic drive (350 FPM)
- 220 PIW
- 1/8 x 1/16 cover belting

FEEDER

- Hydraulic dump grizzly 6" opening
- 12' x 32" belt feeder
- Hydraulic variable speed drive (0-60 FPM)
- 330 PIW belting
- 3/16 x 1/16 cover

CHASSIS

- 24" I-beam with king pin type hitch
- Six (6) hydraulic jacks for level plant
- Twelve (12) 11 R22.5 tires and mud flaps
- Leaf spring suspension, air brakes, rear tail lights

NOTE: Specifications are subject to change without notice.

POWER SYSTEM 300 HP Cat C9 Tier III

- ~~498 HP Tier II John Deere~~ water cooled diesel engine with 60kW generator to power all plant functions and three off plant stacking conveyors
- 24 volt battery
- NEMA-4 rated instrument panel
- Emergency stop

VIBRATING SCREEN

- PEP Vari-Vibe 2618VM high-frequency
- Modified 6' x 18' top deck and 6' x 12' bottom deck
- Top deck driven by seven (7) variable speed hydraulic vibrators (0-4200 RPM)
- Vibrators have five (5) force amplitude settings on slip counterweights
- Hydraulic angle adjustment
- Top and bottom discharge chutes
- Aggregate spreader, step type walkway with ladder
- Separations range from 1" to 30M

HOPPER

- 12 cubic yard heaped capacity
- 8' x 14' top opening

PLANT CAPACITY

- 350 TPH (tonnages will vary with conditions)

PAINT

- One primer coat, finish coat of KPI beige

SERVICE CAPACITY

- 150 gal. fuel tank
- 150 gal. hydraulic styem

OPTIONS

- Bulkhead assisting ramping for loader feed to feed hopper
- Remote control grizzly
- Wings for funneling feed material onto feed hopper
- Dust cover
- Spray Valves and Nozzle System
- Screen Cloth
- CONSULT FACTORY FOR ADDITIONAL OPTIONS

PHYSICAL OPERATION CHARACTERISTICS

- Overall Length.....67'4"/20.52m
- Travel Length.....67'4"/20.52m
- Operating Height.....25'/7.62m
- Travel Height.....13'6"/4.15m
- Operating Width.....32'/9.75m
- Travel Width.....9'11"/2.78m
- Unit Weight.....68,900lbs/31,253 kg

ASTEC MOBILE SCREENS
2704 West LeFevre Road
Sterling, IL 61081
Phone: (815) 626-6374
FAX: (815) 626-6430
mail@kpijci.com
www.kpijci.com

NOTE: Specifications are subject to change without notice.

Because Astec Mobile Screens may use in its catalog & literature, field photographs of its products which may have been modified by the owners, products furnished by Astec Mobile Screens may not necessarily be as illustrated therein. Also continuous design progress makes it necessary that specifications be subject to change without notice. All sales of the products of Astec Mobile Screens are subject to the provisions of its standard warranty. Astec Mobile Screens does not warrant or represent that its product meet and federal, state, or local statutes, codes, ordinances, rules, standards or other regulations, including OSHA and MSHA, covering safety, pollution, electrical wiring, etc. Compliance with these statutes and regulations is the responsibility of the user and will be dependent upon the areas and the use to which the product is put by the user. In some photographs, guards may have been removed for illustrative purposes only. This equipment should not be operated without all guards attached in their normal position. Placement of guards and other safety equipment is often dependent upon the area and the use to which the product is put. A safety study should be made by the user of the application, and, if required additional guards, warning signs and other safety devices should be installed by the user, wherever appropriate before operating the products.

Mdl PSP 2618VM Printed in USA; 5/02/2013

PSP 2618VM HIGH FREQUENCY SCREEN

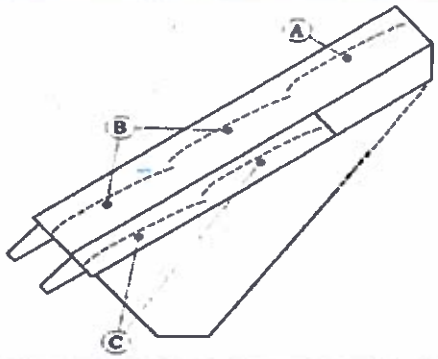
PLANT FEATURES

PLANT CONFIGURATION	Diesel / Hydraulic
AXLE CONFIGURATION	Triple Axle w/Spring Suspension
TIRES	(12) 11.00 x 22.5 Dual Mounted w/Air Brakes
GROUND SUPPORTS	Hydraulic with oversized bases
FEEDER HOPPER	8' x 14', 12 cubic yard capacity
ROLLER BELT FEEDER	12' long x 32" wide w/hydraulic variable speed
BELT FEEDER BELTING	2-ply 3/16" x 1/16" fastened w/mechanical fasteners
FEED CONVEYOR	36" wide hydraulically driven
SIDE DISCHARGE CONVEYORS	(2) 24" wide hydraulically driven
FINES DISCHARGE CONVEYOR	36" wide hydraulically driven
DISCHARGE CONVEYOR BELTING	2-ply 1/8" x 1/16" fastened w/mechanical fasteners
BELT CLEANER	Martin ClearChoice
DIESEL ENGINE	Caterpillar rated at 300 hp w/125 kw Genset
DIESEL BAGHOUSE	Pulse cleaning air-intake
FUEL TANK	***GET FROM AMS***
DUST SUPPRESSION	Complete with manifold, filtration, and on-plant shutoff

SCREEN FEATURES

- Modified 6' x 18' double deck
- Directly induced variable high frequency screen
- Heavy-duty 3/8" thick screen box sides
- Eleven variable speed hydraulic vibrators
- Five force amplitude settings on adjustable slip counter weights
- Hinged aggregate spreader
- 6' x 18' collecting hopper
- Discharge chutes and covers
- Hydraulic screen angle adjustments
- Removable 22 oz. black vinyl dust cover

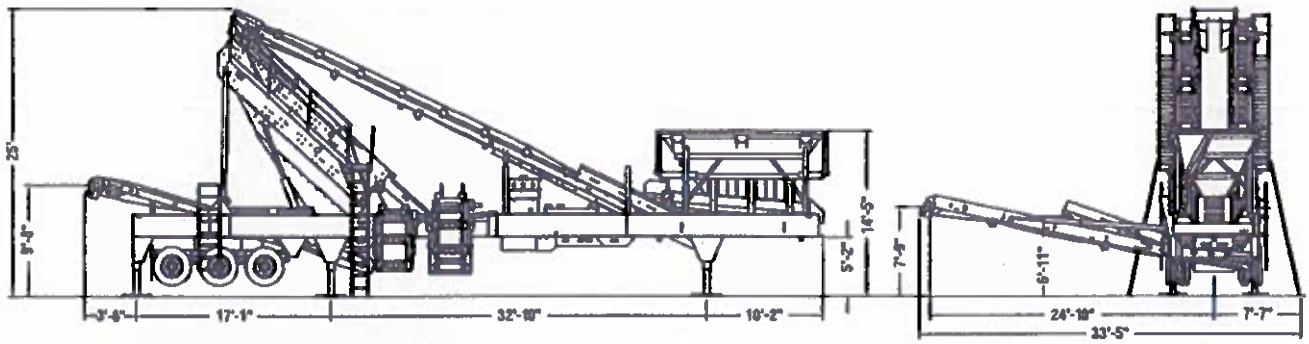
CAPACITIES



Through Deck Slotted Screen	B/C, TPH sq. ft.	Pre Screen Deck SECTION A TPH, 36 sq. ft.	Chip Deck SECTION B TPH, 72 sq. ft.	Post Screen Fine Deck SECTION C TPH, 72 sq. ft.
3/8"	4.60	165.6 TPH	301.5 TPH	265.0 TPH
1/4"	4.20	151.2 TPH	274.5 TPH	241.9 TPH
1/3"	3.81	137.1 TPH	247.5 TPH	219.5 TPH
1/8"	3.33	119.9 TPH	216.0 TPH	191.8 TPH
1/6"	2.91	104.8 TPH	189.0 TPH	167.6 TPH
1/4" (4M)	2.43	87.5 TPH	157.5 TPH	140.0 TPH
1/5" (5M)	1.60	57.6 TPH	103.5 TPH	92.2 TPH
1/6" (6M)	1.18	42.5 TPH	76.5 TPH	68.0 TPH
1/4" (10M)	0.90	32.4 TPH	58.5 TPH	51.8 TPH
1/2" (12M)	0.70	25.2 TPH	45.0 TPH	40.3 TPH
1/4" (16M)	0.55	19.8 TPH	36.0 TPH	31.7 TPH
1/3" (20M)	0.43	15.5 TPH	27.9 TPH	24.8 TPH
1/8" (30M)	0.33	11.9 TPH	21.4 TPH	19.0 TPH
1/4" (40M)	0.22	7.92 TPH	14.3 TPH	12.7 TPH

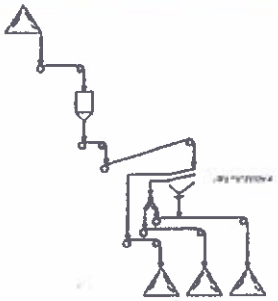
FastPack

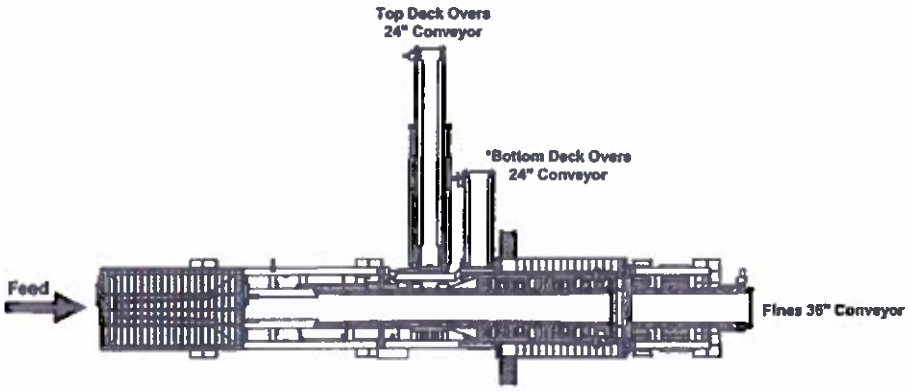
PSP 2618VM
HIGH FREQUENCY SCREEN



WEIGHTS AND DIMENSIONS	
AXLE SPACING	48 in. & 50 in.
KINGPIN	26,000 lbs.
REAR AXLE EACH	15,330 lbs.
REAR AXLE TOTAL	45,990 lbs.
TOTAL WEIGHT	71,990 lbs.
TRAVEL HEIGHT	13 ft. - 6 in.
TRAVEL LENGTH	65 ft. - 0 in.
TRAVEL WIDTH	10 ft. - 11 in.

MATERIAL FLOW





Both top deck and bottom deck overs conveyors can be mounted to discharge on either side of screen plant.

NOTE: SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

KPI/JCI 3.5 PG 02/00

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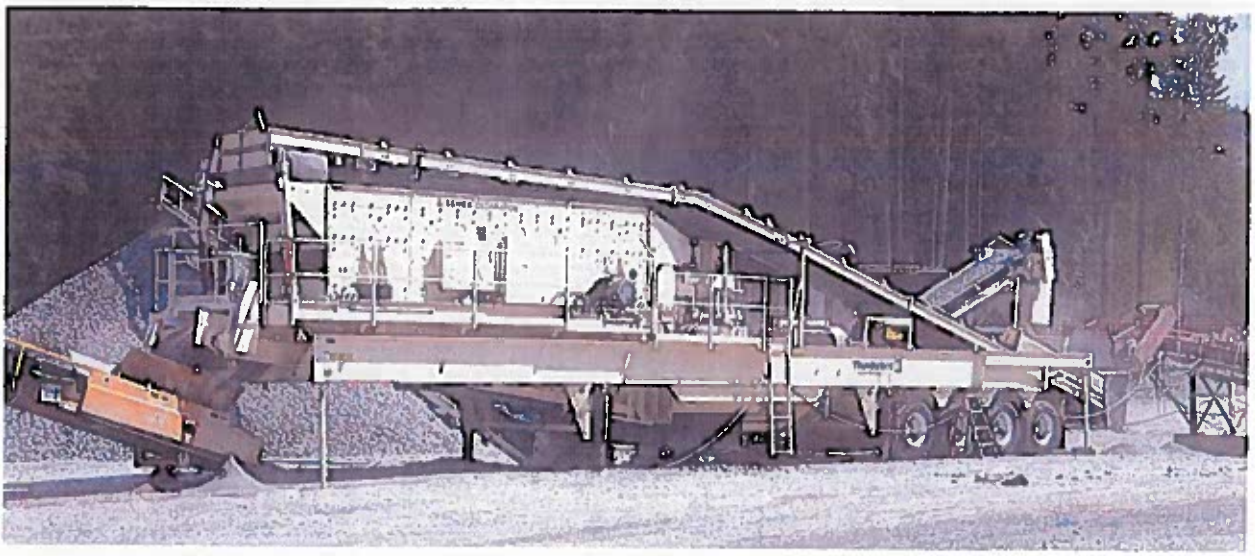
KPI-JCI ASTEC COMPANIES | ASTEC MOBILE SCREENS | BTI BREAKER TECHNOLOGY, LTD.

1-800-542-9311

ASTE NASDAQ Astec Industries Companies

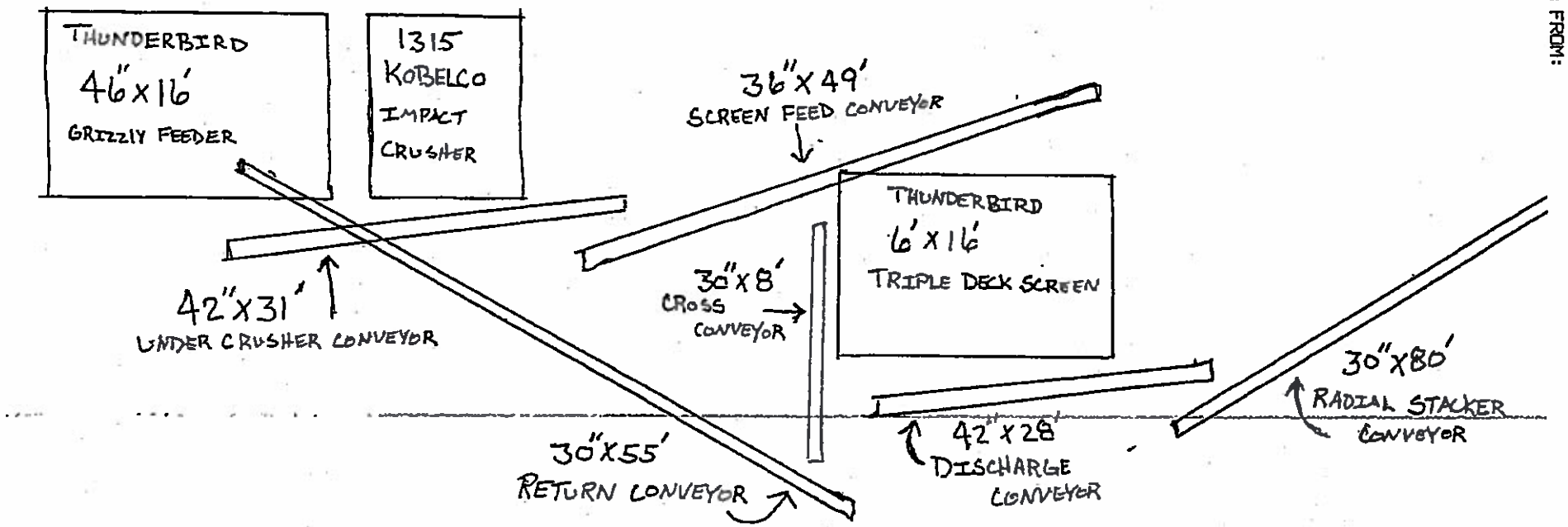


Thunderbird Plant Layout

Model 1315 Recycle Plant w/ Kobelco Impacter

Please Note:
Sample/Generic Plant Literature obtained from Vendor Thunderbird website.

Model 1315 Thunderbird Plant Layout



THUNDERBIRD PLANT

SERIAL# 853

MADE IN 1992

MAR-25-2011 11:20A FROM:
TO:13015130016
P.3/3