Air Quality Permitting
Technical Memorandum

Permit to Construct No. 777-00300

THE KIEWIT COMPANIES

Portable Concrete Batch Plant

Prepared By:

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Permit Writer

Project No. P-020008

Date Prepared:

April 2, 2002

Permit Status:

FINAL

PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, *Rules for the Control of Air Pollution in Idaho*, for issuing permits to construct (PTC).

PROJECT DESCRIPTION

The Kiewit Companies is proposing to commence construction of a portable concrete-batching facility. The Kiewit Companies is requesting a PTC be issued to cover the operations of the concrete-batching facility in both attainment and nonattainment areas throughout the state of Idaho. Note that the Standard PTC for a portable concrete-batching facility also includes provisions for collocated operations in attainment areas with one other portable source (i.e., rock crusher, hot-mix asphalt (HMA), or concrete batch plant). The concrete batch plant's maximum hourly throughput is 340 cubic yards per hour (cy/hr). The facility includes a 560 kilowatt/750 horsepower (560-kW/750-hp), diesel-fueled electrical generator set.

SUMMARY OF EVENTS

On 15 March, 2002, the Idaho Department of Environmental Quality (DEQ) received an application from The Kiewit Companies for a portable concrete batch plant, to be located at Question Mark Ranch near Mountain Home, Idaho (Section 31, Township 4, South Range 3E). On April 1, 2002, the application was determined complete.

DISCUSSION

1. Process Description

Concrete is produced by combining water, sand and gravel, and Portland cement. A portable concrete batch plant consists of storage bins for the sand and gravel, a storage silo for the cement, weigh bins that weigh each component, a conveyor, a water supply, and a control panel. Sand and gravel are either produced on site or purchased elsewhere. Typically, three or four different sizes of gravel and one or two different sizes of sand are stockpiled for varying job specifications. Cement is delivered by truck and pneumatically transferred to its storage silo. A baghouse is mounted above the silo to capture cement as air is displaced in the silo. For this source category, the baghouse is considered process equipment primarily, and air pollution control equipment secondarily. Power to run the facility is provided by the local utility, or a gasoline-fired or diesel-fired generator.

After all the storage bins are filled, the production process begins when sand and gravel are drop-fed into their respective weigh bins. When a pre-determined amount of each is weighed, the sand and gravel is drop-fed onto an inclined conveyor, which transfers the mixture into a cement truck. A predetermined amount of cement is also weighed and drop-fed through a rubber chute into the cement truck. The rubber chute directs the cement and provides a measure of dust control. Sometimes, a separate baghouse is used to capture cement dust from the cement weigh bin. Water is then added, and the components are mixed in the truck on the way to the job site.

The standard PTC requested will allow this concrete-batching facility to collocate and simultaneously operate with one other portable plant (i.e., rock crusher, HMA, or concrete batch plant) in attainment areas. It is important to note that during collocated operations, this concrete-batching facility is then part of a single, larger source engaged in the production of either concrete, aggregate and/or asphalt, depending upon which type of portable plant the concrete-batching facility is collocated with. While collocated, the two portable plants are now considered to be one source, and the emissions of this single source is the sum of the emissions from the two portable plants. This single, larger source must comply

with all applicable federal, state, and local requirements. To maintain compliance, specific requirements and limitations have been included in the standard PTC for this concrete-batching facility for collocated operations. As described in the following sections of this technical memorandum, specific conservative assumptions and calculations were made to determine these standard PTC collocation requirements. For this reason, the permit for the other portable plant with which this concrete-batching facility will collocate must also contain specific collocation requirements based on the same conservative assumptions and calculations used in this standard PTC.

2. Equipment Listing

The analysis upon which this facility is permitted assumes the following equipment would be used:

2.1 Portable Concrete Batch Plant

Manufacturer	Erie Strayer
Model	12 C.Y.
Maximum Capacity	340 cubic yards per hour (cy/hr)

2.2 Cement Storage Silo Baghouse

Stack Height:	20 feet (ft)
Stack Diameter:	1.69 ft (equivalent)
Exit Air Flowrate:	6,000 actual cubic feet per minute (acfm)
Capture Efficiency:	99.9%

2.3 Cement Weigh Bin Baghouse

Stack Height:	69 ft
Stack Diameter:	0.5 ft
Exit Air Flowrate:	1,600 acfm
Capture Efficiency:	99.9%

2.4 Generator

Manufacturer/Model:	Onan 750 hp
Rated Power Output:	750 hp
Stack Diameter:	0.5 ft
Stack Height:	69 ft
Exhaust Gas Flowrate:	1,600 acfm
Exhaust Gas Temperature:	1,030°F
Fuel Type:	Diesel
Fuel Usage:	34.9 gallons per hour (gal/hr)

When collocated, this concrete batch plant is then part of a single, larger source that produces either concrete, aggregate, and/or asphalt, depending upon which type of portable plant the concrete batch plant is collocated with. The equipment used by this single, larger source would include the concrete batch plant equipment listed above plus the equipment of the other portable plant. To see an equipment description for the other portable plant, see the corresponding permitting files for that plant.

3. Area Classification

The concrete-batching facility is a portable source and may operate in both attainment and nonattainment areas throughout the state of Idaho.

4. Emission Estimates

A spreadsheet has been developed specifically for concrete-batching facilities to determine their potential to emit (PTE). PTE is used to determine if Prevention of Significant Deterioration (PSD) or Title V Operating Permit requirements apply. In determining PTE, the spreadsheet uses production data supplied by the applicant and emission factors from EPA's AP-42. For concrete-batching facilities, PTE is based on emissions from the cement storage silo baghouse, and the cement weigh bin baghouse (if one is used). If the facility includes a generator, its emissions are also included in the determination of the facility's PTE. Because these facilities are not designated facilities or NSPS-affected facilities, fugitive emissions from concrete batch plants do not count toward determining PTE. This facility's PTE is 64.5 tons per any consecutive 12-month period (64.5 tons per year (T/yr) based on nitrogen oxides (NO_x) emissions.

The spreadsheet inherently limits emissions below certain triggering levels (i.e., PSD and Title V thresholds) by limiting throughput. If a generator is not used, throughput is solely limited to limit a facility's PTE below 99 T/yr of particulate matter with an aerodynamic diameter of less than or equal to a nominal 10 micrometers (PM_{10}) emissions. If a generator is used, throughput is limited to protect the National Ambient Air Quality Standards (NAAQS) and it is limited to keep emissions below the 99 T/yr triggering level. The throughput limits for this facility are presented below. The spreadsheet used to calculate the PTE and throughput limit is included as Appendix A of this document.

For collocated operations, a conservative approach is taken by limiting the emissions of each of the collocated units to half of the levels allowed when operating alone. Then the combined emissions of the two collocated sources will be within the allowable levels. See the information below for a more detailed description. This approach is designed to result in acceptable throughput limits for most collocation situations. In cases where the throughput limits are too restrictive, a site-specific analysis and permit amendment may be completed.

4.1 Attainment Area Operations

In the standard permit, two throughput limit options are available to choose from. One option limits annual throughput (annual is any consecutive 12-month period) only and the other option limits daily and annual throughput. The annual throughput limit option is chosen to limit emissions to 99 T/yr or less. This option is most likely chosen if the facility does not include a generator. The daily and annual limit is chosen when throughput has to be limited to protect the 24-hr PM_{10} NAAQS and to limit facility emissions to 99 T/yr or less.

For this concrete batch plant, the concrete throughput is unlimited while operating in any attainment or unclassifiable area.

4.2 Nonattainment Area Operations

For facilities that use a generator in a PM_{10} nonattainment area or proposed PM_{10} nonattainment area, throughput is limited to protect the PM_{10} nonattainment area 24-hour and annual ambient impact limits (5.0 micrometers per cubic meter ($\mu g/m^3$) and 1.0 $\mu g/m^3$, respectively). When a generator is not used, throughput is limited to keep PM_{10} emissions below 99 T/yr.

For this concrete batch plant, the concrete throughput is limited to 8,160 cubic yards per day (cy/day) and 2,978,400 cubic yards per consecutive 12-month period (cy/yr) while operating in PM_{10} nonattainment area or proposed PM_{10} nonattainment area.

4.3 Collocated Operations in Attainment Areas

Standard PTCs will only allow collocation with one other portable source (i.e., rock crusher, HMA plant, or concrete batch plant) which has also received a standard PTC that specifically allows collocation. When a combination of one portable concrete-batching unit and one other portable unit are operated at a single location, the emissions of both units must be added together when determining PTE. Consistent with the approach taken for attainment area operations, the spreadsheet inherently limits the combined emissions of the two portable units to below certain triggering levels (i.e., PSD and Title V thresholds) by limiting the maximum throughput of each. For collocated operations, half of the attainment area triggering levels are used as limits for calculating throughput for each source. The concrete batch plant throughput is then established based on the most limiting pollutant or pollutants (i.e., the pollutant whose emission rate is closest to 49.5 T/yr).

In the standard permit, two throughput limit options are available for collocated-attainment area operations. One is for an annual limit (annual is any consecutive 12-month period), and the other is for a daily and annual limit. The annual limit option is chosen only to limit the combined emissions to 99 T/yr or less. The daily and annual limit option is chosen to protect a 24-hour ambient standard, an annual ambient standard, and to limit emissions to 99 T/yr. Depending on the circumstances, one or both options may be required. For this concrete batch plant, the concrete throughput is limited to 8,160 cubic yards per day (cy/day) and 1,489,200 cubic yards per consecutive 12-month period (cy/yr) when collocated with another concrete batch plant, rock-crushing plant, or HMA plant in any attainment or unclassifiable area.

4.4 Fugitive Emissions

Even though fugitive dust emissions are not included to determine PTE, they must be reasonably controlled at all times. In order to ensure the air quality is not degraded beyond the facility boundary, the standard permit requires that no visible emissions be seen crossing the facility boundary. It is assumed if no emissions visibly cross the boundary, the air quality is protected. This provision is included in the standard permit in lieu of fugitive dust modeling.

5. Modeling of Point Sources

5.1 Baghouse(s)

The EPA-approved SCREEN3 model was used in this analysis using stack data provided by the applicant to predict the impact the baghouse emissions may have on the ambient air. A one pound-per-hour emission rate was input into the model which calculated a maximum one-hour concentration of 48.3 $\mu g/m^3$ for the cement silo baghouse. A one-hour concentration of 11 $\mu g/m^3$ was predicted for the weigh batch baghouse. This information was input into the spreadsheet, which calculated the allowable throughput.

5.2 Generator

The SCREEN3 model was used in this analysis using stack data provided by the applicant to predict the impact the generator emissions may have on the ambient air. A one pound-per-hour emission rate was input into the model, which calculated a maximum one-hour concentration of 20 $\mu g/m^3$. The one-hour concentration was then input into the spreadsheet, which was used to calculate the facility's allowable throughput.

The SCREEN3 output for each applicable point source is presented as Appendix B of this document.

5.3 Collocated Operations

For collocated operations in attainment areas, operation of the concrete batch plant and its generator (if used) are limited as needed so that the modeled impacts will be half of the available allowable ambient impact. Likewise for collocated operations; the modeled impacts of the other portable facility will also be limited to half of the available allowable, ambient impact so that the combined emissions of the two collocated sources will remain within the NAAQS. Using the 24-hour NAAQS standard for PM_{10} (attainment area) as an example, one half of the allowable available impact would be equal to 32 $\mu g/m^3$, as follows:

$$32\ \mu g/m^3 = 0.5 \times [150\ \mu g/m^3 - 86\ \mu g/m^3],$$

where 150 $\mu g/m^3$ is the 24-hour average standard and 86 $\mu g/m^3$ is the conservative statewide 24-hour average background value. Then operation of the concrete batch plant and its generator would be limited as needed, based on the specific ambient impact modeling, so that the modeled 24-hour concentration does not exceed 32 $\mu g/m^3$ at or beyond the facility's property boundary. This approach is designed to result in acceptable operational limits for most collocation situations. In cases where these limits are too restrictive, a site-specific analysis and permit amendment may be completed.

6. Facility Classification

This facility is not a major facility as defined in IDAPA 16.01.01.006.55 and IDAPA 58.01.01.008.10. Portable concrete batch plants are not designated facilities as defined in IDAPA 58.01.01.006.27. Concrete batch plants are not subject to federal New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAPS) regulation. The SIC code for concrete batch plants is 3273. The AIRS facility classification for this facility is "B" because the uncontrolled potential to emit is less than 100 tons per year. The spreadsheet included as Appendix A automatically determines the facility classification.

7. Regulatory Review

The following rules and regulations have been reviewed for this permit analysis:

a	IDAPA 58.01.01.201	Permit to Construct;
b.	IDAPA 58.01.01.202	Application Procedures;
c.	IDAPA 58.01.01.203	Permit Requirements for New and Modified Stationary Sources;
d.	IDAPA 58.01.01.209	Procedures for Issuing Permits;
e.	IDAPA 58.01.01.211	Conditions for Permits to Construct;
f.	IDAPA 58.01.01.212	Obligation to Comply;
g.	IDAPA 58.01.01.577	Ambient PM_{10} Air Quality Standard;
h.	IDAPA 58.01.01.625	Visible Emissions; and
i.	IDAPA 58.01.01.650	Rules for Control of Fugitive Dust.

8. Permit Coordination

This concrete-batching facility is not a major facility as defined by IDAPA 16.01.01.006.55 and IDAPA 58.01.01.008.10, and it is not an NSPS-affected facility. Therefore, coordination with the Operating Permit Section is not necessary.

9. AIRS Information

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

AIR PROGRAM / POLLUTANT	SIP [c]	PSD [d]	NSPS [e] (Part 60)	NESHAP [f] (Part 61)	MACT [g] (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
SO_2 [h]	B						Portable
No_x [i]	B						Portable
CO [j]	B						Portable
PM_{10} [k]	B						Portable
PT (Particulate) [l]	B						
VOC [m]	B						
THAP (Total HAPs) [n]	B						
			APPLICABLE SUBPART				

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:
- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

[c] State Implementation Plan
[d] Prevention of Significant Deterioration
[e] New Source Performance Standards
[f] National Emission Standards for Hazardous Air Pollutants
[g] Maximum Achievable Control Technology
[h] sulfur dioxide
[i] nitrogen oxides
[j] carbon monoxide
[k] particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[l] particulate matter
[m] volatile organic compounds
[n] hazardous air pollutants

FEES

The facility is not a major facility as defined in IDAPA 16.01.01.008.10. Therefore, registration and registration fees in accordance with IDAPA 58.01.01.526 are not applicable.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommends that The Kiewit Companies be issued a PTC for a portable concrete-batching facility. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD PTC requirements.

AJM/DS/bh Project No. 020008 G:\AIR PERMITS\P T C\KIEWIT CONCRETE\P-020008 TECH MEMO.DOC

cc: Matt Stoll, Boise Regional Office Sherry Davis, Technical Services Division
Joan Lechtenberg, Air Quality Division

APPENDIX A

Emission Estimate Calculations
Concrete Batch Plant, Portable

Company Name:	The Kiewit Companies	**Engineer:**	Concrete A.J. Maupin
Permit No.:	777-00300	**Date:**	01-Apr-02
Project:	P-020008 CONCRETE BATCH PLANTS	**File:**	BATCH.WK4

Ton per Year Emission Limit:	99 [=] Tons/yr	

Concrete Batch Plant Information

Facility Production Capacity:	340 [=] yd^3/hr	
Maximum Annual Hours of Operation	8,760 [=] hr/yr	
Cement Silo:		
Modeled 1-hr Concentration:	48.26 [=] $\mu g/m^3$, at emission rate of 1 lb/hr	
Baghouse Control Effcy.	99.9%	
Cement Hopper:		
Modeled 1-hr Concentration:	10.99 [=] $\mu g/m^3$, at emission rate of 1 lb/hr	
Baghouse Control Effcy.	99.9%	

Generator Set Information

Generator? (Y/N)	Y		
Generator Size:	750 [=] hp		
Units:	A	(A = Horsepower)	
		(B = Kilowatts)	
Fuel Type:	A	(A = Diesel-Fired Generator)	
		(B = Gasoline-Fired or Dual-Fired Generator)	
Fuel Useage:	34.9 [=] gal/hr		
		Conversion Factor	
Heat Output:	4.7487 [=] MMBtu/hr	750	
Modeled 1-hr Concentration:	20.04 [=] $\mu g/m^3$, at emission rate of 1 lb/hr		

Background Concentrations					
	1-hr	3-hr	8-hr	24-hr	Annual
PM_{10}				86	32.7
CO	11400		5130		
NO_x					40
SO_x		543		144	23.5
TOC					

INPUTS TO PERMIT TO CONSTRUCT (PTC)		Value	Units
Section B "Attainment Area When Not Collocated"			
Section B.1.1 Facility Throughput Limits:	Annual Throughput Limit	Unlimited	yd^3/yr
	<<OR>>		
	Daily Throughput Limit	8,160	yd^3/day
	Annual Throughput Limit	Unlimited	yd^3/yr
Section B.1.3 Generator Hours of Operation:	Annual Hours of Operation	8,760	hr/year
	<<AND/OR>>		
	Daily Hours of Operation	24.0	hr/day
Section C "Attainment Area When Collocated"			
Section C.1.3 Facility Throughput Limits:	Annual Throughput Limit	1,489,200	yd^3/yr
	<<OR>>		
	Daily Throughput Limit	8,160	yd^3/day
	Annual Throughput Limit	1,489,200	yd^3/yr
Section C.1.4 Generator Hours of Operation:	Annual Hours of Operation	4,380	hr/year
	<<AND/OR>>		
	Daily Hours of Operation	24.0	hr/day
Section D "Nonattainment Area"			
Section D.1.1 Facility Throughput Limits:	Annual Throughput Limits	Unlimited	yd^3/yr
	<<AND/OR>>		
	Daily Throughput Limits	8,160	yd^3/day
	Annual Throughput Limits	Unlimited	yd^3/yr
Section D.1.3 Generator Hours of Operation:	Annual Hours of Operation	8,760	hr/year
	<<AND/OR>>		
	Daily Hours of Operation	24.0	hr/day

PERMIT LIMITS TABLE

	Non-Attainment Area		Attainment Area		Collocated Attainment Area	
Production Rate:	340 yd³/hr		340 yd³/hr		340 yd³/hr	
Operational Schedule:	24.0 hr/day	8,760 hr/year	24.0 hr/day	8,760 hr/year	24.0 hr/day	4,380 hr/year
Throughput Limits:	8,160 yd³/day	Unlimited yd³/yr	8,160 yd³/day	Unlimited yd³/yr	8,160 yd³/day	1,489,200 yd³/yr
Limiting Pollutant:	None		None		None	
AIRS Facility Classification	B		B		B	

CO 1-hr Standard	SO_2 3-hr Standard	CO 8-hr Standard	
minutes/1-hr	hr/3-hr	hr/8-hr	
60.00	3.00	8.00	

OUTPUT

POTENTIAL TO EMIT – EMISSIONS ANALYSIS USING AMBIENT AIR QUALITY STANDARDS

Attainment/Non-Classifiable Areas

Generator

Pollutant	Permitted Controlled Emission Rates	
PM_{10}	0.27 lbs/hr	1.19 Tons/yr
CO	3.85 lbs/hr	16.85 Tons/yr
NO_X	14.72 lbs/hr	64.48 Tons/yr
SO_X	2.40 lbs/hr	10.50 Tons/yr
TOC	0.47 lbs/hr	2.08 Tons/yr

Concrete Batching Point Sources

PM_{10}	0.0476 lbs/hr	0.208 Tons/yr

	Uncontrolled	Controlled		Classification
Potential to Emit:	64.5 Tons/yr	64.5 Tons/yr	NOx	B

Enforceable Limits:

Production Rate:	340 yd³/hr			
Operational Schedule:	24.0 hr/day		8,760 hr/year	
Throughput Limits:	8,160 yd³/day	Unlimited	yd³/yr	
Limiting Pollutant:	None			

Non-Attainment Areas

Generator

Pollutant	Permitted Controlled Emission Rates	
PM_{10}	0.27 lbs/hr	1.19 Tons/yr
CO	3.85 lbs/hr	16.85 Tons/yr
NO_X	14.72 lbs/hr	64.48 Tons/yr
SO_X	2.40 lbs/hr	10.50 Tons/yr
TOC	0.47 lbs/hr	2.08 Tons/yr

Concrete Batching Point Sources

PM_{10}	0.0476 lbs/hr	0.208 Tons/yr

	Uncontrolled	Controlled		Classification
Potential to Emit:	64.5 Tons/yr	64.5 Tons/yr	NOx	B

Enforceable Limits:

Production Rate:	340 yd³/hr			
Operational Schedule:	24.0 hr/day		8,760 hr/year	
Throughput Limits:	8,160 yd³/day	Unlimited	yd³/yr	
Limiting Pollutant:	None			

ATTAINMENT/NON-CLASSIFIABLE AREAS

Concrete Batching Point Sources

Source	PM Emission Factor [=] lb/yd³ Concrete	Pre-Baghouse PM Emissions [=] lb/hr	Pre-Baghouse PM Emissions [=] T/yr	Given	Baghouse Control Efficiency	Post-Baghouse PM Emissions [=] lb/hr	Post-Baghouse PM Emissions [=] T/yr
Cement Silo Loading (Pneumatic)	0.07	23.8	104.2	8,760 hrs/yr	99.9%	0.024	0.10
Weigh Hopper Loading (Cement)	0.07	23.8	104.2	8,760 hrs/yr	99.9%	0.024	0.10
Total		47.6	208.5			0.048	0.21

Generator and Concrete Batching Point Source Emissions

Pollutant	Generator Emission Factor [=] lb/MMBtu	Generator Emission Rate [=] lb/hr	Allowable Impacts AAQS Hours of Operation [=] hr/day	AAQS Hours of Operation [=] hr/year	AAQS Other	<99 TPY Hours of Operation [=] hr/year	Hours of Operation [=] hr/day	Hours of Operation [=] hr/year	Generator & Site Allowable Impacts Emission Rates [=] lb/day	Emission Rates [=] Tons/year	Permitted Impacts AAQS Calculated 24-hr Impact [=] µg/m	AAQS Calculated Annual Impact [=] µg/m	AAQS Other	<99 TPY Calculated Emissions [=] ton/year
PM	0.0697	0.33	N/S	N/S		N/S	24.0	8,760	7.9	1.45	N/S	N/S		1.66
PM_{10}	0.0573	0.27	24.0	8,760		8,760	Based on: None	Based on: None	6.5	1.19	2.7	0.5		1.40
CO	0.8100	3.85	N/S	N/S		8,760			92.3	16.85	30.8	6.2		16.85
CO [1]					1.0								77.1	
CO [1]					8.0								54.0	
NO_X	3.1000	14.72	N/S	8,760		8,760			353.3	64.48	118.0	23.6		64.48
SO_2	0.5056	2.40	24.0	8,760		8,760			57.6	10.50	19.2	3.8		10.50
SO_2 [2]					3.0								43.3	
TOC	0.1000	0.47	N/S	N/S		8,760			11.4	2.08	3.8	0.8		2.08

Pollutant	Ambient Air Concentrations w/ Background Values (ug/m3)				
	1-hr	3-hr	8-hr	24-hr	Annual
PM					
PM_{10}				89	33
CO	11,477		5,184		
NO_2					64
SO_2		586		163	27
TOC					

Concrete Batch Plant Emission Calculations and Impact Estimates

NON-ATTAINMENT AREAS

Concrete Batching Point Sources

Source	PM Emission Factor [=] lb/yd m3 Concrete	Pre-Baghouse PM Emissions [=] lb/hr	Pre-Baghouse PM Emissions [=] T/yr	Given	Baghouse Control Efficiency	Post-Baghouse PM Emissions [=] lb/hr	Post-Baghouse PM Emissions [=] T/yr
Cement Silo Loading (Pneumatic)	0.07	23.8	104.24	8,760 hrs/yr	99.9%	0.024	0.10
Weigh Hopper Loading (Cement)	0.07	23.8	104.24	8,760 hrs/yr	99.9%	0.024	0.10
Total		47.6	208.49			0.048	0.21

Generator and Concrete Batching Point Source Emissions -- Non-Attainment Areas

Pollutant	Generator Emission Factor [=] lb/hp-hr	Generator Emission Rate [=] lb/hr	Allowable Impacts AAQS Hours of Operation [=] hr/day	Hours of Operation [=] hr/year	Hours of Operation Other [2,3,4]	<99 TPY Hours of Operation [=] hr/year	Generator & Silo Allowable Impacts Hours of Operation [=] hr/day	[=] hr/year	Emission Rates [=] lb/day	[=] Tons/year	Permitted Impacts AAQS Calculated 24-hr Impact [=] ug/m	Calculated Annual Impact [=] ug/m	Other	<99 TPY Calculated Emissions [=] ton/year
PM	0.0697	0.33	N/S	N/S		N/S	24.0	8,760	7.9	1.45	N/S	N/S		1.66
PM_{10}	0.0573	0.27	24.0	8,760		8,760	Based on:	Based on:	6.5	1.19	2.7	0.5		1.40
CO	0.8100	3.85	N/S	N/S		8,760	None	None	92.3	16.85	30.8	6.2		16.85
CO [2]					1.0								77.1	
CO [3]					8.0									
NO_2	3.1000	14.72	N/S	8,760		8,760			353.3	64.48	118.0	23.6		64.48
SO_2	0.5050	2.40	24.0	8,760		8,760			57.6	10.50	19.2	3.8		10.50
SO_2 [4]					3.0								43.3	
TOC	0.1000	0.47	N/S	N/S		8,760			11.4	2.08	3.8	0.8		2.08

Notes: [1] TPY calculations include concrete batching point source emissions.

[2] CO 1-hr Averaging Period

[3] CO 8-hr Averaging Period

[4] SO_2 3-hr Averaging Period

** Assumes ambient TSP concentrations exceed NAAQS in PM-10 Non-Attainment Areas

Attainment Area - Collocated Units - Calculations

Collocated Ambient Air Quality Standards - Calculations					
(1-hr, 3-hr, 8-hr, 24-hr standards are cut in half for collocation)					Annual (50% Attainment Hours)
Pollutant	1-hr	3-hr	8-hr	24-hr	
PM					
PM_{10}				29.25479678	7.787011747
CO	14222.91771		2381.042399		
NO_2					18.19974872
SO_2		335.2482725		91.27701002	26.327701
TOC					

Background Concentrations -- Attainment/Non-Classifiable Areas (ug/m3)					
Pollutant	1-hr	3-hr	8-hr	24-hr	Annual
PM					
PM_{10}				86	32.7
CO	11400		5130		
NO_2					40
SO_2		543		144	23.5
TOC					

APPENDIX B

Modeling
Concrete Batch Plant, Portable

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

The Keiwit Co.-777-00300-SiloBaghse

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	6.0960
STK INSIDE DIAM (M)	=	0.5151
STK EXIT VELOCITY (M/S)	=	13.5881
STK GAS EXIT TEMP (K)	=	293.1500
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 12.247 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)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.6179E-16	6	1.0	1.0	10000.0	16.75	1.73	1.73	NO
100.	34.44	3	4.0	4.0	1280.0	11.35	12.55	7.59	NO
200.	31.90	4	3.5	3.5	1120.0	12.10	15.66	8.67	NO
300.	40.40	5	1.0	1.0	10000.0	17.79	17.22	9.32	NO
400.	46.29	5	1.0	1.0	10000.0	17.79	22.26	11.32	NO
500.	45.11	5	1.0	1.0	10000.0	17.79	27.22	13.23	NO
600.	47.25	6	1.0	1.0	10000.0	16.75	21.45	10.15	NO
700.	48.26	6	1.0	1.0	10000.0	16.75	24.65	11.35	NO
800.	46.60	6	1.0	1.0	10000.0	16.75	27.80	12.36	NO
900.	44.20	6	1.0	1.0	10000.0	16.75	30.93	13.33	NO
1000.	41.51	6	1.0	1.0	10000.0	16.75	34.02	14.28	NO
1100.	38.74	6	1.0	1.0	10000.0	16.75	37.09	15.13	NO
1200.	36.11	6	1.0	1.0	10000.0	16.75	40.13	15.95	NO
1300.	33.67	6	1.0	1.0	10000.0	16.75	43.15	16.75	NO
1400.	31.41	6	1.0	1.0	10000.0	16.75	46.15	17.53	NO
1500.	29.36	6	1.0	1.0	10000.0	16.75	49.12	18.29	NO
1600.	27.48	6	1.0	1.0	10000.0	16.75	52.08	19.03	NO
1700.	25.76	6	1.0	1.0	10000.0	16.75	55.02	19.75	NO
1800.	24.20	6	1.0	1.0	10000.0	16.75	57.95	20.46	NO

1900.	22.77	6	1.0	1.0	10000.0	16.75	60.86	21.16	NO
2000.	21.47	6	1.0	1.0	10000.0	16.75	63.75	21.84	NO
2100.	20.31	6	1.0	1.0	10000.0	16.75	66.63	22.42	NO
2200.	19.26	6	1.0	1.0	10000.0	16.75	69.49	22.98	NO
2300.	18.29	6	1.0	1.0	10000.0	16.75	72.34	23.54	NO
2400.	17.40	6	1.0	1.0	10000.0	16.75	75.18	24.08	NO
2500.	16.57	6	1.0	1.0	10000.0	16.75	78.01	24.61	NO
2600.	15.81	6	1.0	1.0	10000.0	16.75	80.82	25.14	NO
2700.	15.11	6	1.0	1.0	10000.0	16.75	83.63	25.65	NO
2800.	14.45	6	1.0	1.0	10000.0	16.75	86.42	26.16	NO
2900.	13.85	6	1.0	1.0	10000.0	16.75	89.20	26.66	NO
3000.	13.28	6	1.0	1.0	10000.0	16.75	91.97	27.15	NO
3500.	11.04	6	1.0	1.0	10000.0	16.75	105.70	29.14	NO
4000.	9.383	6	1.0	1.0	10000.0	16.75	119.21	30.99	NO
4500.	8.114	6	1.0	1.0	10000.0	16.75	132.54	32.71	NO
5000.	7.117	6	1.0	1.0	10000.0	16.75	145.70	34.34	NO
5500.	6.315	6	1.0	1.0	10000.0	16.75	158.72	35.89	NO
6000.	5.658	6	1.0	1.0	10000.0	16.75	171.61	37.36	NO
6500.	5.112	6	1.0	1.0	10000.0	16.75	184.37	38.76	NO
7000.	4.651	6	1.0	1.0	10000.0	16.75	197.02	40.12	NO
7500.	4.270	6	1.0	1.0	10000.0	16.75	209.56	41.28	NO
8000.	3.942	6	1.0	1.0	10000.0	16.75	222.01	42.39	NO
8500.	3.656	6	1.0	1.0	10000.0	16.75	234.36	43.46	NO
9000.	3.404	6	1.0	1.0	10000.0	16.75	246.63	44.50	NO
9500.	3.182	6	1.0	1.0	10000.0	16.75	258.81	45.51	NO
10000.	2.985	6	1.0	1.0	10000.0	16.75	270.92	46.48	NO
15000.	1.793	6	1.0	1.0	10000.0	16.75	388.44	54.97	NO
20000.	1.276	6	1.0	1.0	10000.0	16.75	500.96	60.37	NO
25000.	0.9799	6	1.0	1.0	10000.0	16.75	609.76	64.93	NO
30000.	0.7897	6	1.0	1.0	10000.0	16.75	715.59	68.90	NO
40000.	0.5700	6	1.0	1.0	10000.0	16.75	920.23	74.55	NO
50000.	0.4429	6	1.0	1.0	10000.0	16.75	1117.43	79.25	NO

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

687.	48.28	6	1.0	1.0	10000.0	16.75	24.26	11.20	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

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

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	48.28	687.	0.

04/01/02
15:12:05

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

The Keiwit Co.-777-00300-ScaleBaghse

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	21.0312
STK INSIDE DIAM (M)	=	0.1524
STK EXIT VELOCITY (M/S)	=	41.4824
STK GAS EXIT TEMP (K)	=	293.1500
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 9.992 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)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.1	320.0	39.04	1.75	1.71	NO
100.	5.401	1	2.5	2.6	800.0	28.23	26.93	14.10	NO
200.	10.77	1	1.0	1.1	320.0	39.04	50.23	29.75	NO
300.	10.51	2	1.0	1.1	320.0	39.04	52.46	30.58	NO
400.	10.99	3	1.0	1.1	320.0	38.64	44.93	26.92	NO
500.	10.31	3	1.0	1.1	320.0	38.64	55.00	32.82	NO
600.	9.005	3	1.0	1.1	320.0	38.64	64.90	38.65	NO
700.	8.992	5	1.0	1.3	10000.0	31.05	36.88	16.76	NO
800.	9.806	5	1.0	1.3	10000.0	31.05	41.65	18.49	NO
900.	10.12	5	1.0	1.3	10000.0	31.05	46.36	20.17	NO
1000.	10.09	5	1.0	1.3	10000.0	31.05	51.02	21.82	NO
1100.	9.764	5	1.0	1.3	10000.0	31.05	55.64	23.15	NO
1200.	9.373	5	1.0	1.3	10000.0	31.05	60.22	24.43	NO
1300.	8.951	5	1.0	1.3	10000.0	31.05	64.76	25.68	NO
1400.	8.523	5	1.0	1.3	10000.0	31.05	69.27	26.89	NO
1500.	8.101	5	1.0	1.3	10000.0	31.05	73.75	28.08	NO
1600.	7.897	6	1.0	1.5	10000.0	29.71	52.05	18.94	NO
1700.	7.871	6	1.0	1.5	10000.0	29.71	55.00	19.67	NO
1800.	7.800	6	1.0	1.5	10000.0	29.71	57.92	20.38	NO

1900.	7.696	6	1.0	1.5	10000.0	29.71	60.83	21.08	NO
2000.	7.567	6	1.0	1.5	10000.0	29.71	63.72	21.77	NO
2100.	7.396	6	1.0	1.5	10000.0	29.71	66.60	22.35	NO
2200.	7.221	6	1.0	1.5	10000.0	29.71	69.47	22.92	NO
2300.	7.044	6	1.0	1.5	10000.0	29.71	72.32	23.47	NO
2400.	6.866	6	1.0	1.5	10000.0	29.71	75.16	24.02	NO
2500.	6.690	6	1.0	1.5	10000.0	29.71	77.99	24.55	NO
2600.	6.517	6	1.0	1.5	10000.0	29.71	80.80	25.08	NO
2700.	6.347	6	1.0	1.5	10000.0	29.71	83.61	25.59	NO
2800.	6.180	6	1.0	1.5	10000.0	29.71	86.40	26.10	NO
2900.	6.019	6	1.0	1.5	10000.0	29.71	89.18	26.60	NO
3000.	5.861	6	1.0	1.5	10000.0	29.71	91.96	27.09	NO
3500.	5.144	6	1.0	1.5	10000.0	29.71	105.68	29.09	NO
4000.	4.556	6	1.0	1.5	10000.0	29.71	119.20	30.94	NO
4500.	4.070	6	1.0	1.5	10000.0	29.71	132.53	32.67	NO
5000.	3.664	6	1.0	1.5	10000.0	29.71	145.69	34.30	NO
5500.	3.322	6	1.0	1.5	10000.0	29.71	158.71	35.84	NO
6000.	3.031	6	1.0	1.5	10000.0	29.71	171.60	37.32	NO
6500.	2.781	6	1.0	1.5	10000.0	29.71	184.36	38.72	NO
7000.	2.564	6	1.0	1.5	10000.0	29.71	197.01	40.08	NO
7500.	2.379	6	1.0	1.5	10000.0	29.71	209.55	41.24	NO
8000.	2.216	6	1.0	1.5	10000.0	29.71	222.00	42.35	NO
8500.	2.072	6	1.0	1.5	10000.0	29.71	234.35	43.43	NO
9000.	1.944	6	1.0	1.5	10000.0	29.71	246.62	44.47	NO
9500.	1.829	6	1.0	1.5	10000.0	29.71	258.81	45.47	NO
10000.	1.726	6	1.0	1.5	10000.0	29.71	270.91	46.45	NO
15000.	1.079	6	1.0	1.5	10000.0	29.71	388.44	54.94	NO
20000.	0.7808	6	1.0	1.5	10000.0	29.71	500.95	60.35	NO
25000.	0.6063	6	1.0	1.5	10000.0	29.71	609.76	64.90	NO
30000.	0.4926	6	1.0	1.5	10000.0	29.71	715.59	68.88	NO
40000.	0.3588	6	1.0	1.5	10000.0	29.71	920.23	74.53	NO
50000.	0.2805	6	1.0	1.5	10000.0	29.71	1117.43	79.23	NO

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

404.	10.99	3	1.0	1.1	320.0	38.64	45.44	27.22	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** INVERSION BREAK-UP FUMIGATION CALC. ***
CONC (UG/M**3) = 0.000
DIST TO MAX (M) = 173.90

DIST TO MAX IS < 2000. M. CONC SET = 0.0

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

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	10.99	404.	0.

04/01/02
15:11:32

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

The Keiwit Co.-777-00300-Gen

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	3.6576
STK INSIDE DIAM (M)	=	0.1524
STK EXIT VELOCITY (M/S)	=	102.4534
STK GAS EXIT TEMP (K)	=	827.5944
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 3.767 M**4/S**3; MOM. FLUX = 21.589 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)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	61.59	2.38	2.35	NO
100.	19.64	4	20.0	20.0	6400.0	6.55	8.24	4.71	NO
200.	16.80	4	8.0	8.0	2560.0	10.90	15.70	8.75	NO
300.	13.37	4	5.0	5.0	1600.0	15.24	22.85	12.54	NO
400.	11.04	4	4.0	4.0	1280.0	18.14	29.74	15.82	NO
500.	9.389	4	3.5	3.5	1120.0	20.21	36.45	18.90	NO
600.	8.178	4	3.0	3.0	960.0	22.97	43.07	21.92	NO
700.	7.265	4	2.5	2.5	800.0	26.83	49.63	24.93	NO
800.	6.475	4	2.5	2.5	800.0	26.83	55.97	27.59	NO
900.	5.946	4	2.0	2.0	640.0	32.62	62.43	30.61	NO
1000.	5.431	4	2.0	2.0	640.0	32.62	68.63	33.14	NO
1100.	4.961	4	2.0	2.0	640.0	32.62	74.77	35.11	NO
1200.	4.659	4	1.5	1.5	480.0	42.28	81.19	37.74	NO
1300.	4.776	6	1.0	1.0	10000.0	42.04	44.42	19.79	NO
1400.	5.007	6	1.0	1.0	10000.0	42.04	47.33	20.45	NO
1500.	5.200	6	1.0	1.0	10000.0	42.04	50.24	21.10	NO
1600.	5.357	6	1.0	1.0	10000.0	42.04	53.14	21.75	NO
1700.	5.482	6	1.0	1.0	10000.0	42.04	56.02	22.39	NO
1800.	5.578	6	1.0	1.0	10000.0	42.04	58.90	23.01	NO

1900.	5.648	6	1.0	1.0	10000.0	42.04	61.76	23.64	NO
2000.	5.695	6	1.0	1.0	10000.0	42.04	64.61	24.25	NO
2100.	5.685	6	1.0	1.0	10000.0	42.04	67.45	24.77	NO
2200.	5.664	6	1.0	1.0	10000.0	42.04	70.28	25.28	NO
2300.	5.632	6	1.0	1.0	10000.0	42.04	73.11	25.79	NO
2400.	5.593	6	1.0	1.0	10000.0	42.04	75.92	26.28	NO
2500.	5.547	6	1.0	1.0	10000.0	42.04	78.72	26.77	NO
2600.	5.494	6	1.0	1.0	10000.0	42.04	81.51	27.26	NO
2700.	5.438	6	1.0	1.0	10000.0	42.04	84.29	27.73	NO
2800.	5.377	6	1.0	1.0	10000.0	42.04	87.06	28.20	NO
2900.	5.313	6	1.0	1.0	10000.0	42.04	89.82	28.66	NO
3000.	5.247	6	1.0	1.0	10000.0	42.04	92.58	29.12	NO
3500.	4.854	6	1.0	1.0	10000.0	42.04	106.22	30.99	NO
4000.	4.487	6	1.0	1.0	10000.0	42.04	119.67	32.73	NO
4500.	4.154	6	1.0	1.0	10000.0	42.04	132.95	34.37	NO
5000.	3.853	6	1.0	1.0	10000.0	42.04	146.08	35.92	NO
5500.	3.584	6	1.0	1.0	10000.0	42.04	159.07	37.40	NO
6000.	3.343	6	1.0	1.0	10000.0	42.04	171.93	38.81	NO
6500.	3.127	6	1.0	1.0	10000.0	42.04	184.67	40.17	NO
7000.	2.932	6	1.0	1.0	10000.0	42.04	197.30	41.48	NO
7500.	2.757	6	1.0	1.0	10000.0	42.04	209.82	42.60	NO
8000.	2.600	6	1.0	1.0	10000.0	42.04	222.26	43.68	NO
8500.	2.457	6	1.0	1.0	10000.0	42.04	234.60	44.72	NO
9000.	2.328	6	1.0	1.0	10000.0	42.04	246.85	45.73	NO
9500.	2.211	6	1.0	1.0	10000.0	42.04	259.03	46.71	NO
10000.	2.103	6	1.0	1.0	10000.0	42.04	271.12	47.66	NO
15000.	1.391	6	1.0	1.0	10000.0	42.04	388.58	55.97	NO
20000.	1.032	6	1.0	1.0	10000.0	42.04	501.07	61.28	NO
25000.	0.8151	6	1.0	1.0	10000.0	42.04	609.85	65.78	NO
30000.	0.6703	6	1.0	1.0	10000.0	42.04	715.67	69.70	NO
40000.	0.4953	6	1.0	1.0	10000.0	42.04	920.29	75.29	NO
50000.	0.3910	6	1.0	1.0	10000.0	42.04	1117.48	79.95	NO

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

86.	20.04	3	10.0	10.0	3200.0	9.45	11.05	6.70	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

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

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	20.04	86.	0.