Application for an Air Quality Control Minor Permit

for the:

Wishbone Hill Coal Mining and Processing Operation

prepared for:

Usibelli Coal Mine, Inc.

prepared by:

June 2013

Application for an Air Quality Control Minor Permit for the Wishbone Hill Coal Mining and Processing Operation

June 2013

prepared for

Usibelli Coal Mine, Inc.
Fairbanks, Alaska

prepared by

SLR International Corp
2700 Gambell Street, Suite 200
Anchorage, Alaska 99503
(907) 563-2137

USIBELLI COAL MINE, INC.

PO Box 1000 • Healy, Alaska 99743
Telephone (907) 683-2226 • Facsimile (907) 683-2253

June 27, 2013

Mr. John Kuterbach
Alaska Department of Environmental Conservation (ADEC)
Air Permits Program
410 Willoughby Ave., Suite 303
P.O. Box 111800
Juneau, Alaska 99811-1800

Re: Wishbone Hill Coal Mining and Processing Operation Minor Air Permit Application – Minor Air Permit Application for Coal Preparation Plant and Response to Request for Additional Information

Dear Mr. Kuterbach:

Usibelli Coal Mine, Inc. (Usibelli) is submitting the enclosed revised minor air permit application for the planned Wishbone Hill Coal Mining and Processing Operation associated with the development of mining leases located eight miles north of Palmer, Alaska.

The enclosed application is based on the Usibelli December 2011 Modeling Protocol as amended by comments from ADEC's Approval of the Wishbone Hill Air Quality Modeling Protocol dated February 21, 2013.

Please contact me at rob@usibelli.com or (907) 745-6028 or Al Trbovich of SLR International Corporation (SLR) at (907) 563-2140 if you have any questions regarding this application.

Sincerely,

Robert Brown
VP, Business Development

cc: Al Trbovich, SLR, w/enc.

Alaska Department of Environmental Conservation Air Quality Minor Permit Application	**ADEC USE ONLY** Receiving Date: ADEC Control Number AQ MSS :

STATIONARY SOURCE IDENTIFICATION FORM

Section 1 Stationary Source Information

Stationary Source Name:Usibelli Coal Mine, Inc.			SIC:1221
Project Name (if different): Wishbone Hill Coal Mining and Processing Operation	Stationary Source Contact:Robert Brown		
Source Physical Address:Eight miles North of Palmer, Alaska Section 27, Township 19N Range 2E, Seward Meridian	City:Palmer	State:AK	Zip:99645
	Telephone:907-745-6028		
	E-Mail Address:rob@usibelli.com		
UTM Coordinates (m) or Latitude/Longitude:	Northing:	Easting:	Zone:
	Latitude:	Longitude:	

Section 2 Legal Owner

Name:Usibelli Coal Mine, Inc		
Mailing Address:PO Box 1000		
City:Healy	State:AK	Zip:99743
Telephone #:907-683-2226		
E-Mail Address:		

Section 3 Operator *(if different from owner)*

Name:		
Mailing Address:		
City:	State:	Zip:
Telephone #:		
E-Mail Address:		

Section 4 Designated Agent *(for service of process)*

Name:Robert Brown		
Mailing Address:634 South Bailey Street, Suite 204		
City Palmer	State:AK	Zip:99645
Physical Address:same		
City:	State:	Zip:
Telephone #:(907)745-6028		
E-Mail Address:rob@usibelli.com		

Section 5 Billing Contact Person *(if different from owner)*

Name:		
Mailing Address:		
City:	State:	Zip:
Telephone #:		
E-Mail Address:		

Section 6 Application Contact

Name:Robert Brown			
Mailing Address:634 South Bailey Street, Suite 204.	City:Palmer	State:AK	Zip:99645
	Telephone:907-745-6028		
	E-Mail Address:rob@usibelli.com		

Section 7 Desired Process Method *(Check only one – see 18 AAC 50.542(a) for process descriptions and restrictions)*

☐ Fast Track [18 AAC 50.542(b)] ☒ Public Comment [18 AAC 50.542(d)]

Section 8 Project Description

Provide/attach a short narrative describing the project. Discuss the purpose for conducting this project, what emission units/activities will be added/modified under this project (i.e., project scope), and the project timeline. If the project is a modification to an existing stationary source, describe how this project will affect the existing process. Include any other discussion that may assist the Department in understanding your project or processing your application. Include a schedule of construction and the desired date for permit issuance.

If this application includes an Owner Requested Limit or a request to revise an existing permit term or condition, describe the intent of the limit, and provide sample language for the limit, and for monitoring, record keeping, and reporting for showing compliance with the limit.

Add additional pages if necessary.

A project description is provided in Attachment A. This applicabtion does not include Owner Requested Limits.

Section 9 Source Classification(s) *(Check all that apply)*

[18 AAC 50.502(b)]

- ☐ Asphalt Plant [≥ 5 ton per hour]
- ☐ Thermal Soil Remediation Unit [≥ 5 ton per hour]
- ☐ Rock Crusher [≥ 5 ton per hour]
- ☐ Incinerator(s) [total rated capacity ≥ 1000 lb/hour]
- ☒ Coal preparation plant
- ☐ Port of Anchorage Facility

If you checked any of the above, is (are) the emission unit(s) ☒ new, ☐ relocated*, or ☐ existing?

[18 AAC 50.502(c)(1)]

New or relocated* stationary source with potential emissions greater than:

- ☒ 40 tons per year (TPY) NOx
- ☐ 40 tons per year SO_2
- ☐ 15 tons per year PM-10
- ☐ 0.6 tons per year lead
- ☐ 100 tons per year CO in a nonattainment area

[18 AAC 50.502(c)(2)]

Construction or relocation* of a:

- ☐ Portable oil and gas operation
- ☐ 10 MMBtu/hr fuel burning equipment in a SO_2 special protection area

**Relocation does NOT include moving equipment from one place to another within your current stationary source boundary.*

Section 10 Modification Classification(s) (*Check all that apply)*

[18 AAC 50.502(c)(3)]

- ☐ NO_x Increase > 10 TPY [and existing PTE > 40 tons per year]
- ☐ SO_2 Increase > 10 TPY [and existing PTE > 40 tons per year]
- ☐ PM-10 Increase > 10 TPY [and existing PTE > 15 tons per year]
- ☐ CO Increase > 100 TPY [and existing PTE > 100 tons per year in a nonattainment area]

Basis for calculating modification:

- ☐ Projected actual emissions - baseline actual emissions
- ☐ New potential emissions - existing potential emissions

Section 11 Permit Action Request (*Check all that apply)*

[18 AAC 50.508]

- ☐ ~~Clean Unit designation~~ *(vacated by Court)*
- ☐ ~~Pollution Control Project designation~~ *(vacated by Court)*
- ☐ Establish Plantwide Applicability Limitation
- ☐ Establish emission reductions to offset nonattainment pollutant
- ☐ Owner Requested Limit*
- ☐ Revise or Rescind Title I Permit Conditions*

Permit Number: Date: Condition #:

**Which to use? See* http://www.dec.state.ak.us/air/ap/docs/orlrtc.pdf

Section 12 Existing Permits and Limits

For an existing stationary source, do you have an existing:
(Check any that apply)

- ☐ Air quality permit Number(s)*:
- ☐ Owner Requested Limit Number(s):
- ☐ Pre Approved (Emission) Limit Number(s)**:

** All valid construction, Title V, and minor permit numbers.*
***Optional. Please provide this number if possible.*
See http://www.state.ak.us/dec/air/ap/pals.htm

Section 13 Other Application Material

The information listed below must be included in your air quality control minor permit application. *Note: These must be attached in order for your application to be complete.*

If required to submit an analysis of ambient air quality under 18 AAC 50.540(c)(2), or if otherwise requested by the department:

☒ Attached are maps, plans, and/or aerial photographs as necessary to show the locations and distances of

- emissions units, buildings, emitting activities and boundaries of the associated with the stationary source, and
- nearby or adjacent residences, roads, other occupied structures and general topography within 15 kilometers.

(Indicate compass direction and scale on each.)

☒ Attached is a document (eg., spreadsheet) showing coordinates and elevations of each modeled unit, along with parameters necessary to characterize each unit for dispersion modeling.

☒ Attached is an electronic copy of all modeling files.

Section 14 Certification

This certification applies to the Air Quality Control Minor Permit Application for the Wishbone Hill Coal Mining and Processing Operation (Stationary Source Name)

submitted to the department on: June 2013 .

Type of Application

☒ Initial Application

☐ Change to Initial Application

The application is **NOT** complete unless the certification of truth, accuracy, and completeness on this form bears the **signature of a responsible official** of the firm making the application. (18 AAC 50.205)

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

"Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete."

Signature: Robert M Brown	Date: 06/27/2013
Printed Name: Robert M. Brown	Title: Vice President, Business Development

Section 15 Attachments

☒ Attachments Included. List attachments:

- A – Project Description
- B – Emission Unit Information and Emissions Summary Forms
- C – Emission Calculations
- D – Demonstration of Compliance with 18 AAC 50.055
- E – Caterpillar Engine Specifications
- F – Ambient Air Quality Analysis
- G – Fugitive Dust Control Plan
- H – Public Access Control Plan
- I – Supporting Documentation
- J – Electronic Files

Section 16 Mailing Address

Submit the minor permit application to the Permit Intake Clerk in the department's Anchorage office. Submitting to a different office will delay processing. The mailing address and phone number for the Anchorage office is:

Permit Intake Clerk
Alaska Department of Environmental Conservation
Air Permit Program
619 E. Ship Creek, Suite 249
Anchorage, Alaska 99501

(907) 269-6881

Attachment A

Project Description

Usibelli Coal Mine
Wishbone Hill Coal Mining and Processing Operation
Project Description

Usibelli Coal Mine Inc. (Usibelli) is planning to operate a coal mining and processing facility at the Wishbone Hill located northeast of Palmer, Alaska. Exploration and development work on the Wishbone Hill Project has been in progress since 1983. Exploration drilling has defined a reserve of high quality bituminous coal permitted to be mined up to 1.0 million metric tons of clean coal per year.

The area to be mined lies at the western end of the Wishbone Hill coal district on the southwestern extent of Wishbone Hill. A location map is provided in Figure A-1. Wishbone Hill is a synclinal structure bisected by several major transverse and low angle thrust faults. Four main coal seam groups are proposed for mining during the life of the project. These groups are, in descending order, the Jonesville, Premier, Eska, and Burning Bed groups, with the majority of the recoverable coal located in the Premier group. An individual coal seam not associated with any of the coal groups, the Midway seam, which lies between the Premier and Eska groups is also planned for mining. A more detailed map of the planned mine is provided in Figure A-2.

The mining method for the Wishbone Hill Project has been selected after careful consideration of the geologic conditions, climatic conditions, and mine plan for the project. The overall mining method has been designed to allow for optimal equipment utilization and coal recovery to accomplish a continuous pattern from topsoil removal through reclamation while ensuring environmental protection.

Topsoil will be removed with dozers, truck/shovel, or scrapers and will either be used immediately for reclamation or stockpiled for later use. Overburden and coal will be removed with a hydraulic excavator and placed into 150-ton capacity haul trucks. Due to steeply dipping seams and the depth of the mining pit, direct haul back of overburden and interburden material is not always possible, and so these materials may be temporarily stockpiled in designated areas.

The coal will be washed or cleaned using simple washing and separation techniques without the use of chemicals. Coarse coal refuse generated at the wash plant will be hauled back to the mine area for backfill in the pit. Fine coal refuse will be deposited in a storage pond. The clean coal will be hauled offsite using road-legal trucks.

The main elements of the coal processing plant are a run-of-mine stockpile, a run-of-mine hopper, the crushing and screening plant, the preparation plant, and the clean coal stockpile. A plot plan of the coal processing plant facilities is provided in Figure A-3. A process flow diagram of the coal treatment process is provided in Figure A-4.

The coal will be transported to the wash plant from the pit area in 150-ton capacity haul trucks. At the wash plant, the coal will be either stockpiled or direct loaded into the run-of-mine hopper for processing through the wash plant. The run-of-mine stockpile has a capacity of 100,000 tons to enable continued plant operation during any unexpected lapses in haulage from the pit area. A front end loader will be used to load the stockpiled coal into the hopper for processing.

The hopper will feed coal to a grizzly for sizing, then onto a feed breaker to further reduce the material size to a maximum of 8 inches. This feed will proceed to the crushing and screening circuit for sizing at 3-inch and 3/8-inch. The material falling between 3-inch and 3/8-inch will be the feed to the preparation circuit. Plus 3-inch material will pass through a grizzly and be crushed to a maximum 3-inch size. These two streams will be recombined before entering the preparation circuit. The minus 3/8-inch material will be separated and will either be blended into the feed stream for the washing circuit or blended with the clean coal being shipped from the facility. The 3-inch to 3/8-inch material will be processed through the wash plant which will consist of heavy media cyclones and spirals to separate the coal from the parting material. The final step will be to centrifuge the fine clean coal to reduce the moisture content.

Under maximum production, the plant will be operated seven days per week, three 8-hour shifts per day. No chemicals, other than inert flocculent used to settle the fine coal waste, will be used in the washing process. Drying will be accomplished using a centrifuge. No thermal drying of washed coal is planned.

Coarse coal refuse will be loaded from the coarse coal refuse bin into the same trucks hauling coal to the plant for transport back to the pit area. The refuse will be directly placed in areas of current backfilling and will be buried a minimum of four feet below the regarded surface of the overburden material.

Onsite coal storage will be located as shown on Figure A-3, adjacent to the processing plant. A truck loadout bin will be used to load the stockpiled coal into highway-legal, covered trucks for delivery.

Figure A-1. Wishbone Hill Location Map

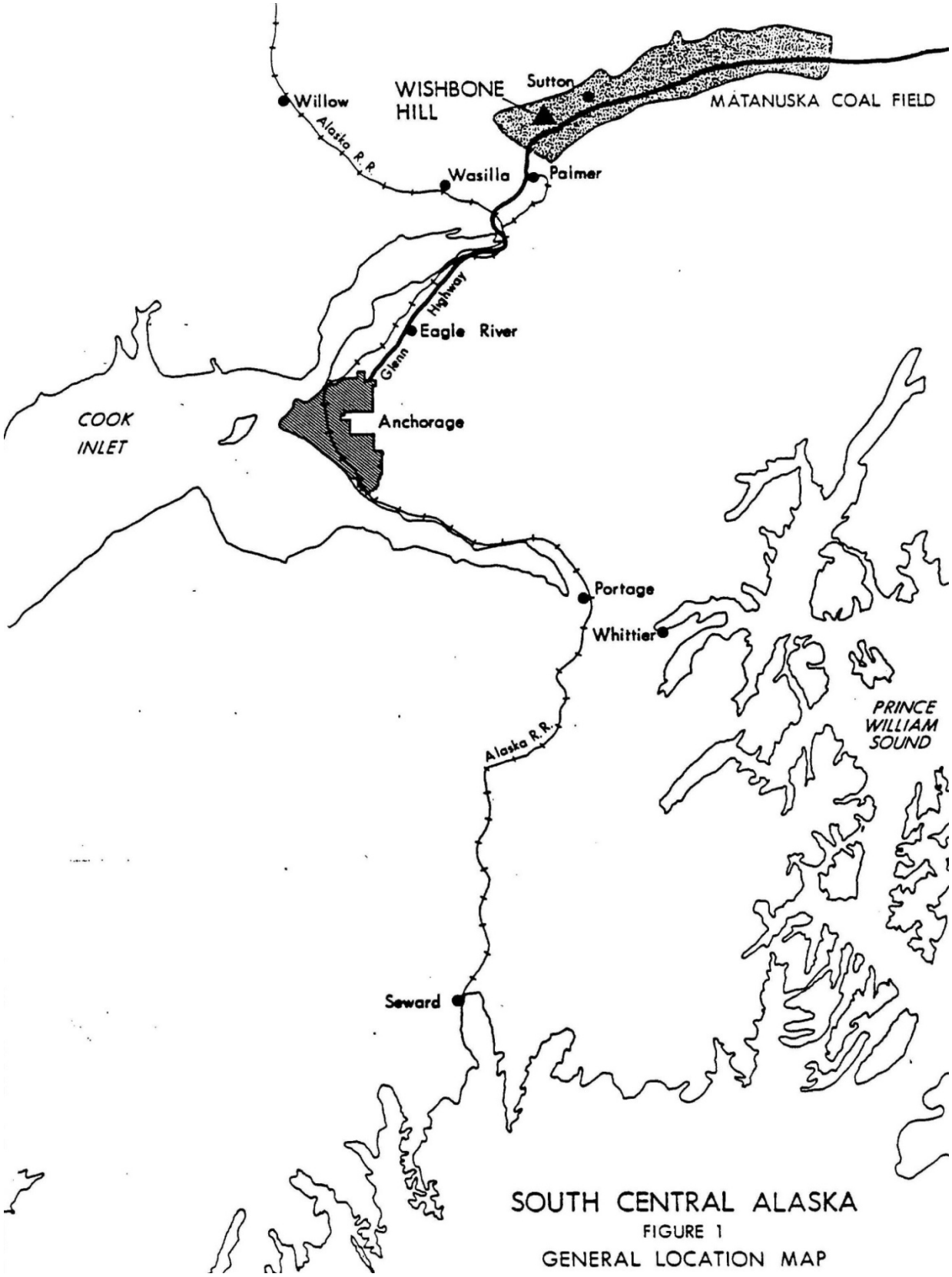


Figure A-2. Wishbone Hill Facility Map

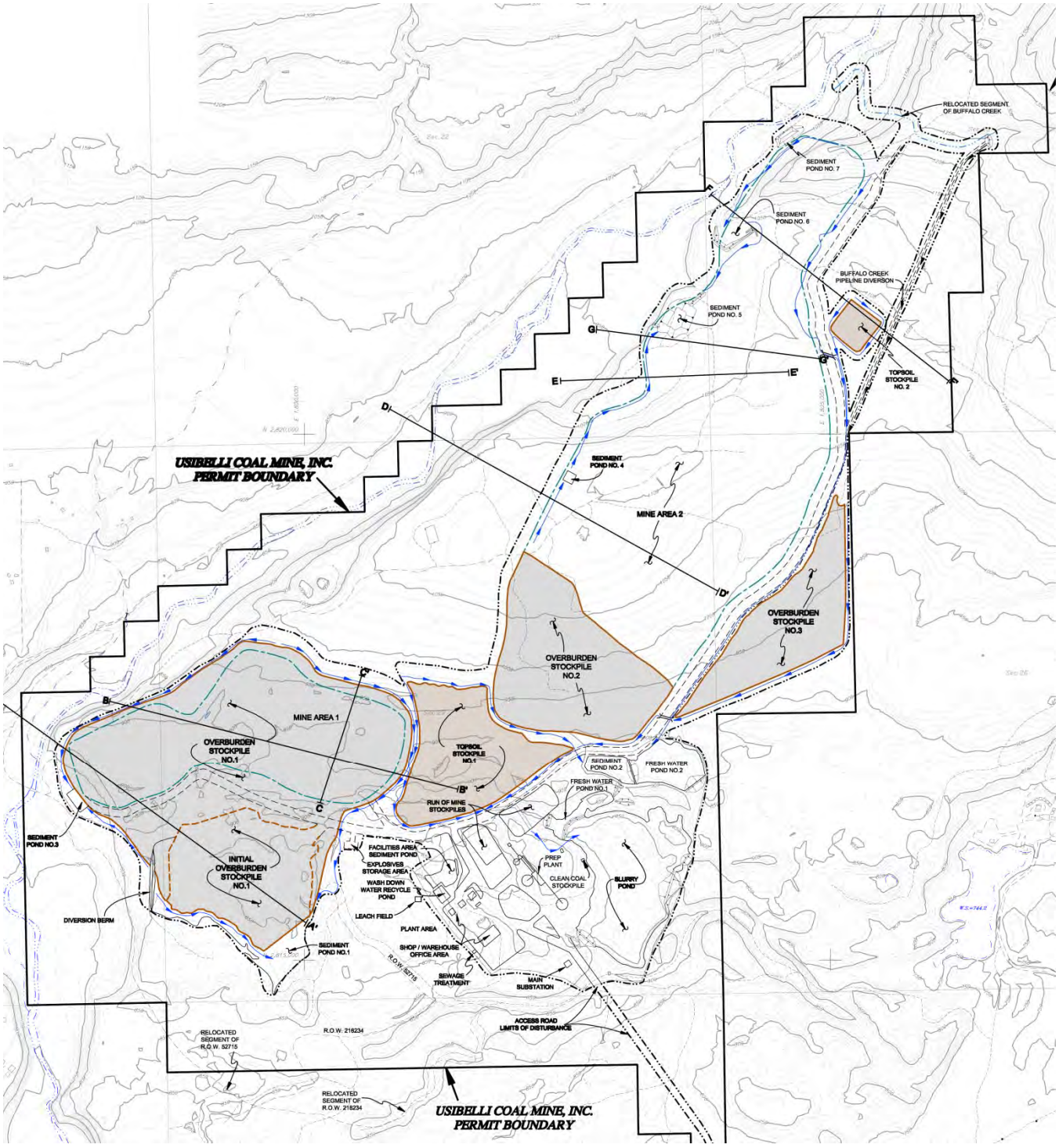


Figure A-3. Wishbone Hill Coal Processing Plant Arrangement

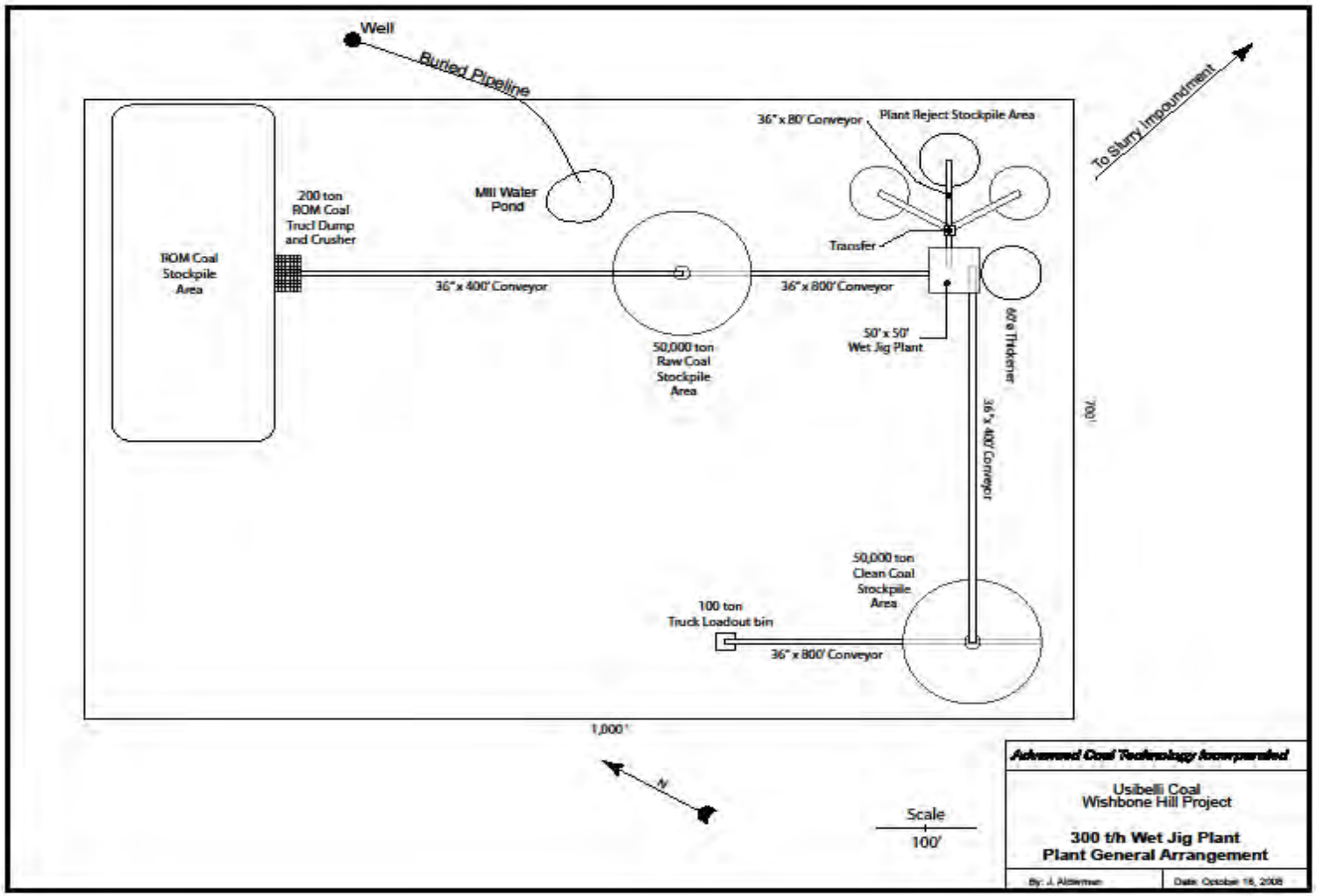
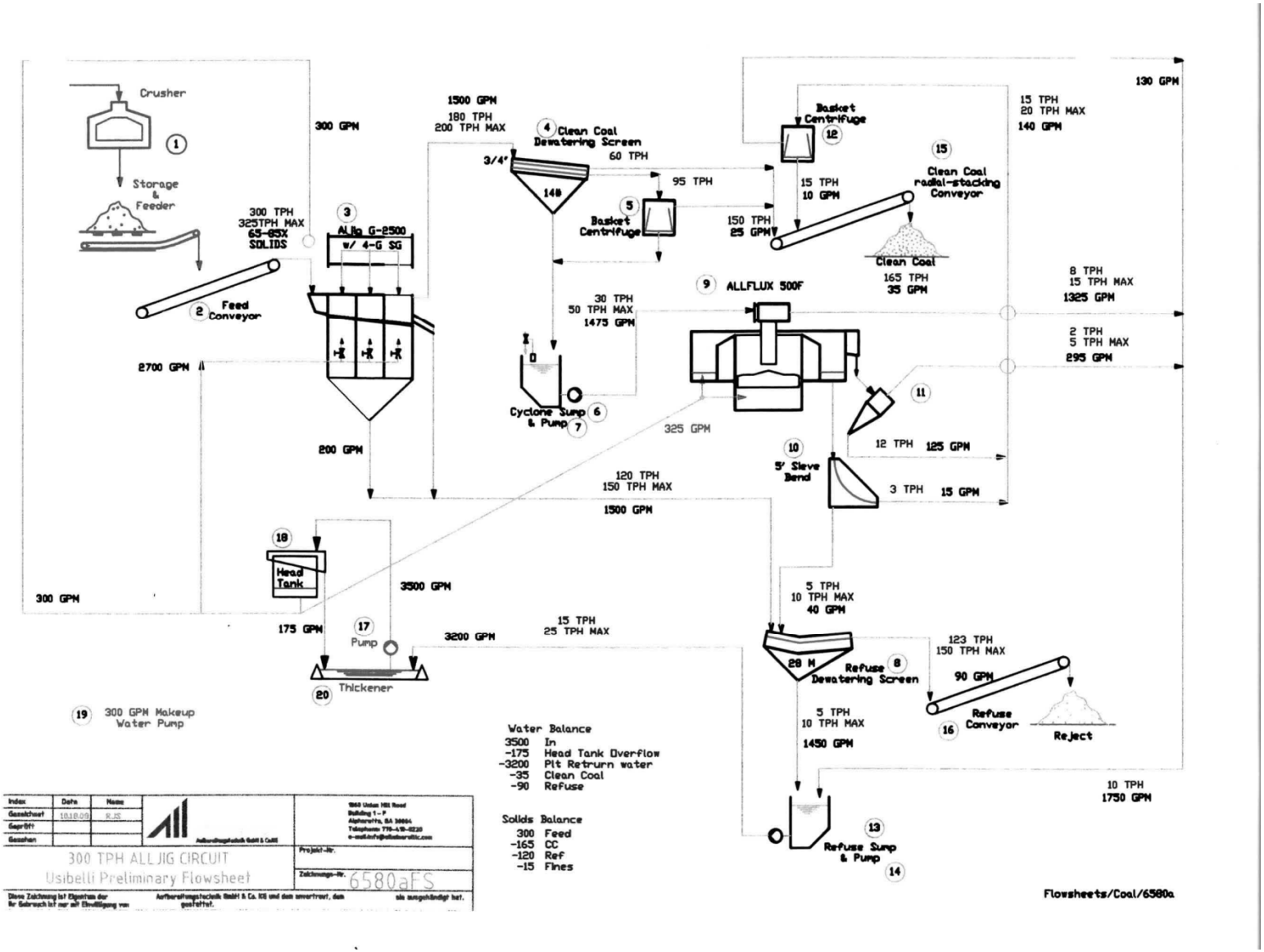


Figure A-4. Wishbone Hill Coal Processing Plant Flow Diagram



Attachment B

Emission Unit Information and Emission Summary Forms

Alaska Department of Environmental Conservation Air Quality Control Minor Permit Application	ADEC USE ONLY Receiving Date: ADEC Control #:

EMISSIONS SUMMARY FORM
NEW STATIONARY SOURCE

Section 1 Stationary Source Information

Stationary Source Name: Usibelli Coal Mine, Inc.	Stationary Source Physical Address: 8 miles North of Palmer, AK	City: N/A

Section 2 Potential to Emit – CO, NO_x, PM-10, SO_2, lead

Emission Unit No.	Capacity	Potential to Emit (TPY)				
		CO *(If within 10 km of nonattainment area)*	NO_X	PM-10	SO_2	lead
1	900 hp		61.3	0.8	0.04	0.0
2	10 MMBtu/hr		6.5	0.6	0.07	0.0
3 through 35	N/A - Fugitives		27.0	198.2	0.0	0.0
TOTAL TONS PER YEAR:			94.8	199.7	0.1	0.0

☒ Detailed emissions calculations are attached. *Note: For calculations other than (rated capacity) times (emission factor), these must be attached in order for your application to be complete. You may give an example calculation where the method of calculation is identical for multiple emission units..*

Include multiple copies of this page if more space is required.

Alaska Department of Environmental Conservation
Air Quality Control Minor Permit Application

ADEC USE ONLY
Receiving Date:
ADEC Control #:

MINOR PERMIT APPLICATION – EMISSION UNIT INFORMATION

FOR A NEW STATIONARY SOURCE: Complete this form for all emission units.

FOR A MODIFICATION TO AN EXISTING STATIONARY SOURCE:

IF YOU HAVE A TITLE V PERMIT: Complete this form for each emissions unit that is new or that is affected by a physical change or change in the method of operation.

IF YOU DO NOT HAVE A TITLE V PERMIT: Complete this form for all emissions units.

Section 1 Stationary Source Information

Source Name: Usibelli Coal Mine, Inc.
Source Physical Address: 8 miles North of Palmer, AK
City: N/A

Section 2 Emission Unit Identification and Description

Emission Unit No.	Equipment Type	Make	Model	Serial No.	Max. Rated Capacity or Max. Design Throughput
1	IC Engine	Caterpillar	C-18	To Be Determined	900 hp
2	Heaters	To Be Determined	To Be Determined	To Be Determined	10 MMBtu/hr (total capacity, all units)
3 through 35	Fugitive Emissions	N/A	N/A	N/A	N/A

Section 3 Emission Unit Use

Emission Unit No.	Is unit portable?		If portable, is unit:						Is this unit a:		If limited operation, is the unit:			
[List same emissions= units as in Section 2.]	Yes	No	- a non road engine? Yes	No	- classified as intermittently used oil field support equipment per Policy 04.02.105? Yes	No	- classified as an oil field construction unit per Policy 04.02.104? Yes	No	primary (base load) unit?	or limited operation unit?	peaking unit?	black start unit?	Emergency / back-up unit?	or other?
1	☐	☒	☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐
2	☐	☒	☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐
3 through 35	☐	☒	☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Section 4 Fuels

Complete Section 4a or 4b for each emissions unit, as appropriate.

Section 4a Fuel Burning Equipment not including flares

Emission Unit Number	Fuel Type(s)	Maximum fuel sulfur content*	Fuel Density (if liquid fuel) lb/gal	Higher Heating Value**	Maximum design fuel consumption rate
1	ULSD	15 ☐ wt. % ☒ ppm	6.8	135K ☒ btu/gal ☐ Btu/dscf Other	43 gal/hr
2	ULSD	15 ☐ wt. % ☒ ppm	6.8	135K ☒ btu/gal ☐ Btu/dscf Other	74 gal/hr total
3 through 35	N/A	N/A ☐ wt. % ☐ ppm	N/A	N/A ☐ btu/gal ☐ Btu/dscf Other	N/A
		☐ wt. % ☐ ppm		☐ btu/gal ☐ Btu/dscf Other	
		☐ wt. % ☐ ppm		☐ btu/gal ☐ Btu/dscf Other	
		☐ wt. % ☐ ppm		☐ btu/gal ☐ Btu/dscf Other	
		☐ wt. % ☐ ppm		☐ btu/gal ☐ Btu/dscf Other	
		☐ wt. % ☐ ppm		☐ btu/gal ☐ Btu/dscf Other	
		☐ wt. % ☐ ppm		☐ btu/gal ☐ Btu/dscf Other	
		☐ wt. % ☐ ppm		☐ btu/gal ☐ Btu/dscf Other	
		☐ wt. % ☐ ppm		☐ btu/gal ☐ Btu/dscf Other	

**Use Weight percent sulfur for liquid fuels. Use parts per million H_2S for gaseous fuels.*
***Use Btu per gallon for liquid fuels. Use Btu per dry standard cubic foot for gaseous fuels.*

Use more than one sheet if necessary.

Section 4b Flares

Complete this section if the stationary source contains a flare.

Emission Unit Number:	Heat release rate for pilot / purge operation (MMBtu/hr)	Maximum heat release rate (MMBtu/hr)	Flare gas heat content (Btu/scf)	Flare gas H_2S content (ppm)
None				

☐ See attached for additional details

Section 5 Materials Processed and Methods of Operation

Emission Unit Number	Materials Processed	Maximum Material Processing rate	Describe Method of Operation
	Coal	350 tons per hour	Coal crushing operating with conveyors for transfers

☒ See attached for additional details.

Use more than one sheet if necessary.

Section 6 Emission Control Information (if applicable)

Emission Unit Number:	Control equipment	Pollutant(s) Controlled:	Description of the Control equipment	Describe significant operating parameters and set points for the control equipment	The Control equipment is Necessary:		
					To comply with an emission standard?	To avoid a project classification	Other – give purpose of control equipment
1	N/A	N/A	N/A	N/A	☐	☐	
2	N/A	N/A	N/A	N/A	☐	☐	
3 through 35	N/A	N/A	N/A	N/A	☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	
					☐	☐	

☐ See attached for additional details

Section 7 Emission Factors

Give exact citations of emission factor sources.

Emission Unit Number:	Emission factor for NOx:	Emission factor source*	Emission Factor for SO2	Emission factor source*	Emission factor for PM-10	Emission factor source*	Emission Factor for CO (if within 10 km of nonattainment area)	Emission factor source*	E mission factor for Lead (if new Stationary Source)	Emission factor source*
1	14 lb/hr	Vendor	15 ppm S (ULSD)	mass balance	0.18 lb/hr	Vendor	N/A	N/A	N/A	N/A
2	20 lb/1,000 gal	AP-42 Table 1.3-1	15 ppm S (ULSD)	mass balance	2 lb/1,000 gal	AP-42 Table 1.3-1	N/A	N/A	N/A	N/A
3 through 35	N/A	N/A	N/A	N/A	Various	AP-42, See Attachment C	N/A	N/A	N/A	N/A

☒ For Emission factors from sources other than published data (such as AP-42), documentation is attached.

*Emission factor source: e.g., AP-42, vendor, source test etc.

Use more than one sheet if necessary.

Section 8 Emission Unit Limits

Emission Unit Number:	Existing Operational Limit if any	Proposed Operational Limit if any	Is the emission unit designated a Clean Unit?	Are you applying for Clean Unit designation?	If emission unit is or would be a Clean Unit, for which pollutant(s)?	Is the emission unit designated as part of a Pollution Control Project?	Are you applying for designation as a Pollution Control Project?
1	N/A	N/A	☐ Yes ☒ No	☐ Yes ☒ No	N/A	☐ Yes ☒ No	☐ Yes ☒ No
2	N/A	N/A	☐ Yes ☒ No	☐ Yes ☒ No	N/A	☐ Yes ☒ No	☐ Yes ☒ No
3 though 35	N/A	N/A	☐ Yes ☒ No	☐ Yes ☒ No	N/A	☐ Yes ☒ No	☐ Yes ☒ No
			☐ Yes ☐ No	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No
			☐ Yes ☐ No	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No
			☐ Yes ☐ No	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No
			☐ Yes ☐ No	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No
			☐ Yes ☐ No	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No
			☐ Yes ☐ No	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No
			☐ Yes ☐ No	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No
			☐ Yes ☐ No	☐ Yes ☐ No		☐ Yes ☐ No	☐ Yes ☐ No

☐ Further explanation is attached. *(Attach if necessary)*

Is your stationary source subject to a Plantwide Applicability Limitation? ☐ Yes ☒ No

If yes: Which pollutant(s)? _____

Describe the limitation.

Are you applying for a PAL? ☐ Yes ☒ No If yes, which pollutnat(s)?

Section 9 Applicable State Emission Limits (listed in 18 AAC 50.050 through 18 AAC 50.090)

Complete this section for emissions units that are new or are affected by the physical change or change in operation.

Emission Unit Number:	**Emission Limit or Standard**	**Regulation Citation**
1	Visible Emissions, Particulate Matter, and Sulfur Compound Emissions	18 AAC 50.055(a)(1), (b)(1), and (c)
2	Visible Emissions, Particulate Matter, and Sulfur Compound Emissions	18 AAC 50.055(a)(1), (b)(1), and (c)

☒ A demonstration of compliance for each emission limit or standard must be attached in order for the application to be considered complete.

Use more than one sheet if necessary.

Section 10 Incinerators

In addition to Sections 1 – 9, complete this section if the stationary source contains an incinerator.

Emission Unit Number:	Rated capacity in lbs / hour	Type of waste burned
None		
☐ See attached for additional details		

Section 11 Asphalt Plant

If the stationary source is an asphalt plant, complete this section instead of Section 2.

	Make and Model	Primary burner size (Btu per hour)	Chamber Size (Cubic Feet)	Maximum Fuel Feed: ☐Gallon/hr ☐Scf/hr
☐ Dryer:	None			
☐ Afterburner :				
☐ Dryer:				
☐ Afterburner :				

If emission unit is an asphalt plant, identify each piece of installed equipment by placing an "x" in the box beside the piece of equipment. If the equipment listed has a place to provide the size and capacity, provide that additional information. List only diesel engines that are stationary.

Material handling devices:
- ☐ Conveyors,
- ☐ Loaders,
- ☐ Bins,
- ☐ Elevators,
- ☐ Screens, or
- ☐ Chutes

Dryer Control Devices:
- ☐ Baghouse
- ☐ Cyclone
- ☐ Scrubber
- ☐ Knockout box

Any of the following:
- ☐ Asphalt cement heaters,
- ☐ Fuel Fired Silo Heaters
- ☐ Mixers
- ☐ Pug mills
- ☐ Other Emission Control Equipment. List:

_____
_____
_____

☐Diesel Engines:

Make & model _____, Size _____hp, Max fuel rate_____gal/hr
Make & model _____, Size _____hp, Max fuel rate_____gal/hr
Make & model _____, Size _____hp, Max fuel rate _____gal/hr

Distance from dryer exhaust outlet to:

Nearest residence _____
Other occupied structure _____

Was the asphalt plant last constructed, modified or reconstructed before or after June 11, 1973?

Before?
After?

If requested by the department:

- ☐ Attached is a copy of the operation and maintenance plan for the unit.
- ☐ Attached is
  - ☐ a copy of the most recent particulate matter source test if within the last five years; or
  - ☐ a schedule for conducting the test.
- ☐ For an asphalt plant within one mile of the nearest residence or occupied structure, a fugitive dust control plan is attached.

Section 12 Soil Remediation Unit

If the stationary source is a soil remediation unit, complete this section instead of Section 2.

	Make and Model	Primary burner size (Btu per hour)	Chamber Size (Cubic Feet)	Maximum Fuel Feed: ☐Gallon/hr ☐Scf/hr
☐ Dryer, rotary kiln, combustion device in fluidized bed, etc.:	None			
☐ Afterburner :				
☐ Dryer, rotary kiln, combustion device in fluidized bed, etc.:				
☐ Afterburner :				

Identify each piece of installed equipment by placing an "x" in the box beside the piece of equipment. If the equipment listed has a place to provide the size and capacity, provide that additional information. List only diesel engines that are stationary.

Material handling devices:
- ☐ Conveyors,
- ☐ Loaders,
- ☐ Bins,
- ☐ Elevators,
- ☐ Screens, or
- ☐ Chutes

Dryer Control Devices:
- ☐ Baghouse
- ☐ Cyclone
- ☐ Scrubber
- ☐ Knockout box

☐ Other Emission Control Equipment. List:

_____

_____

_____

☐ Diesel Engines:

Make & model _____, Size _____hp, Max fuel rate_____gal/hr

Make & model _____, Size _____hp, Max fuel rate_____gal/hr

Make & model , Size hp, Max fuel rate gal/hr

Storage areas for
- ☐ Untreated soils (Describe)
  If storage bin provide the date installed:
- ☐ Treated soils (Describe)
  If storage bin provide the date installed:

☐ Enclosed truck loading station Date Installed:

☐ Railcar loading station Date Installed:

Distance from emission unit outlet to:

Nearest residence _____

Other occupied structure _____

☐ Attached is a VOC and dust control plan. ☐ Attached is a carbon monoxide continuous emission monitor performance test report, or schedule for conducting the test. ☐ Attached is an approval from Spill Protection and Response (SPAR) of your facility Contaminated Sites Workplan.	If requested by the department: ☐ Attached is a copy of the operation and maintenance plan for the unit. ☐ Attached is ☐ a copy of the most recent particulate matter source test if within the last five years; or ☐ a schedule for conducting the test.

Section 13 Rock Crushers

If the stationary source is a rock crusher, complete this section instead of Section 2.

Initial Crushers			**Other Crushers**	
Equipment Id.	Rated capacity (Tons per hour)		Equipment Id.	Rated capacity (Tons per hour)
None				
Other Grinding Mills			**Screening Operations**	
Equipment Id.	Rated capacity (Tons per hour)		Equipment Id.	Rated capacity (Tons per hour)
Belt Conveyors			**Belt Conveyors**	
Equipment Id.	Rated capacity (Tons per hour)		Equipment Id.	Rated capacity (Tons per hour)

Bucket Elevators			**Storage Bins**	
Equipment Id.	Rated capacity (Tons per hour)		Equipment Id.	Rated capacity (Tons per hour)
Bagging Operations			**Enclosed Truck or Railcar Loading Stations**	
Equipment Id.	Rated capacity (Tons per hour)		Equipment Id.	Rated capacity (Tons per hour)
Distance from equipment listed above to: Nearest residence _____ Other occupied structure _____			If requested by the department: ☐ For a rock crusher, a fugitive dust control plan is attached.	

NOTE: Rock Crushers and Asphalt Plants may be subject to federal New Source Performance Standards (40 C.F.R. 60, Subparts I and OOO.) The department no longer enforces these standards through minor permit. Address all correspondence about compliance with these standards to EPA.

Attachment C

Emission Calculations

Table C-1. Usibelli Coal Mine - Wishbone Hill Emission Unit Inventory

ID	Classification	Description	Type	Capacity	Expected Operation
1	Power Generation	Diesel-fired Engine	Point	900 hp	8,760 hr/yr
2	Heaters	Diesel-fired Heaters	Point	10.0 MMBtu/hr	8,760 hr/yr
3	Topsoil Operations	Topsoil Removal to Storage	Fugitive	N/A	2,660 hr/yr
4	Blasting Operations	Overburden Blasting[1]	Fugitive	13,423 ft^2/blast	240 blast/yr[2]
5	Blasting Operations	Coal Blasting[1]	Fugitive	13,423 ft^2/blast	120 blast/yr[2]
6	Overburden	Overburden Truck Loading[1]	Fugitive	6,351,000 yd^3/yr	4,234,000 tpy
7	Overburden	Overburden Dumping[1]	Fugitive	6,351,000 yd^3/yr	4,234,000 tpy
8	Coal Mining	Coal Removal	Fugitive	1,815,000 tpy	8,760 hr/yr
9	Coal Mining	Coal Dumping - Crusher Feeder	Fugitive	1,815,000 tpy	8,760 hr/yr
10	Coal Mining	Coal Dumping - Run-of-Mine Pile	Fugitive	605,000 tpy	8,760 hr/yr
11	Coal Mining	Coal Reclaim from Run-of-Mine Pile	Fugitive	605,000 tpy	8,760 hr/yr
12	Coal Processing	Crusher	Fugitive	350 tph	1,815,000 tpy
13	Coal Processing	Transfer - Crusher to Conveyor 1	Fugitive	350 tph	1,815,000 tpy
14	Coal Processing	Transfer - Conveyor 1 to Raw Stockpile	Fugitive	350 tph	1,815,000 tpy
15	Coal Processing	Transfer - Raw Stockpile to Conveyor 2	Fugitive	350 tph	1,815,000 tpy
16	Coal Processing	Transfer - Conveyor 2 to Jig Plant	Fugitive	350 tph	1,815,000 tpy
17	Coal Processing	Transfer - Jig Plant to Conveyor 3	Fugitive	350 tph	815,000 tpy
18	Coal Processing	Transfer - Conveyor 3 to Reject Stockpile	Fugitive	350 tph	815,000 tpy
19	Coal Processing	Transfer - Jig Plant to Conveyor 4	Fugitive	350 tph	1,000,000 tpy
20	Coal Processing	Transfer - Conveyor 4 to Clean Stockpile	Fugitive	350 tph	1,000,000 tpy
21	Coal Processing	Transfer - Clean Stockpile to Conveyor 5	Fugitive	350 tph	1,000,000 tpy
22	Coal Processing	Transfer - Conveyor 5 to Loadout Bin	Fugitive	350 tph	1,000,000 tpy
23	Coal Processing	Transfer - Loadout Bin to Truck	Fugitive	350 tph	1,000,000 tpy
24	Wind Erosion	Mine Area	Fugitive	168 acres	40 /yr[3]
25	Wind Erosion	Run-of-Mine Coal Stockpile	Fugitive	4 acres	40 /yr[3]
26	Wind Erosion	Raw Coal Stockpile	Fugitive	1.5 acres	40 /yr[3]
27	Wind Erosion	Clean Coal Stockpile	Fugitive	1.5 acres	49 /yr[3]
28	Wind Erosion	Reject Stockpile	Fugitive	0.1 acres	40 /yr[2]
29	Mobile Equipment	Grader Operations	Fugitive	13,122 VMT/yr	8,760 hr/yr
30	Mobile Equipment	Overburden Hauling - Backfill	Fugitive	19,340 VMT/yr	8,760 hr/yr
31	Mobile Equipment	Overburden Hauling - Stockpile	Fugitive	137,413 VMT/yr[4]	8,760 hr/yr
32	Mobile Equipment	Coal Hauling within Mine	Fugitive	14,103 VMT/yr	8,760 hr/yr
33	Mobile Equipment	Misc. Mine Traffic	Fugitive	50,000 VMT/yr	8,760 hr/yr
34	Mobile Equipment	Other Vehicle Traffic	Fugitive	236,520 VMT/yr	8,760 hr/yr
35	Mobile Equipment	Coal Truck Haul - Loop Road	Fugitive	4,410 VMT/yr	8,760 hr/yr
36	Off-Source	Coal Truck Haul - Access Road	Fugitive	101,430 VMT/yr	8,760 hr/yr

Notes:

[1]Based on daily mining rate of 725 bcy/hr, 24 hrs/day, 35 ft depth, 365 days/year.

[2]The number of actual blasts is expected to be lower than the number stated in this table and Table C-5. The numbers of blasts in Table C-5 is overstated to conservatively overestimate fugitive PM_{10} emissions.

[3]The number of occurrences per year of wind erosion are based on Palmer 2-minute wind data.

[4]Based on 2-mile roundtrip and 150 ton capacity trucks.

Table C-2. Usibelli Coal Mine - Wishbone Hill Potential Emission Summary

ID	Classification	Description	Potential Emissions (tpy)				
			NO_X	CO	PM_{10}	VOC	SO_2
1	Power Generation	Diesel-fired Engine	61.3	7.8	0.8	0.6	0.04
2	Heaters	Diesel-fired Heaters	6.5	1.6	0.6	0.1	0.07
3	Topsoil Operations	Topsoil Removal to Storage	0.0	0.0	8.5	0.0	0.0
4	Blasting Operations	Overburden Blasting	0.0	0.0	1.359	0.0	0.0
5	Blasting Operations[1]	Coal Blasting	27.0	0.0	0.679	0.0	0.0
6	Overburden	Overburden Truck Loading	0.0	0.0	0.8	0.0	0.0
7	Overburden	Overburden Dumping	0.0	0.0	0.8	0.0	0.0
8	Coal Mining	Coal Removal	0.0	0.0	16.1	0.0	0.0
9	Coal Mining	Coal Dumping - Crusher Feeder	0.0	0.0	16.1	0.0	0.0
10	Coal Mining	Coal Dumping - Run-of-Mine Pile	0.0	0.0	5.4	0.0	0.0
11	Coal Mining	Coal Reclaim from Run-of-Mine Pile	0.0	0.0	5.4	0.0	0.0
12	Coal Processing	Coal Crusher	0.0	0.0	2.2	0.0	0.0
13	Coal Processing	Transfer - Crusher to Conveyor 1	0.0	0.0	0.2	0.0	0.0
14	Coal Processing	Transfer - Conveyor 1 to Raw Stockpile	0.0	0.0	0.2	0.0	0.0
15	Coal Processing	Transfer - Raw Stockpile to Conveyor 2	0.0	0.0	0.2	0.0	0.0
16	Coal Processing	Transfer - Conveyor 2 to Jig Plant	0.0	0.0	0.2	0.0	0.0
17	Coal Processing	Transfer - Jig Plant to Conveyor 3	0.0	0.0	0.1	0.0	0.0
18	Coal Processing	Transfer - Conveyor 3 to Reject Stockpile	0.0	0.0	0.1	0.0	0.0
19	Coal Processing	Transfer - Jig Plant to Conveyor 4	0.0	0.0	0.1	0.0	0.0
20	Coal Processing	Transfer - Conveyor 4 to Clean Stockpile	0.0	0.0	0.1	0.0	0.0
21	Coal Processing	Transfer - Clean Stockpile to Conveyor 5	0.0	0.0	0.1	0.0	0.0
22	Coal Processing	Transfer - Conveyor 5 to Loadout Bin	0.0	0.0	0.1	0.0	0.0
23	Coal Processing	Transfer - Loadout Bin to Truck	0.0	0.0	0.1	0.0	0.0
24	Wind Erosion[2]	Mine Area	0.0	0.0	39.3	0.0	0.0
25	Wind Erosion[2]	Run-of-Mine Coal Stockpile	0.0	0.0	0.9	0.0	0.0
26	Wind Erosion[2]	Raw Coal Stockpile	0.0	0.0	0.4	0.0	0.0
27	Wind Erosion[2]	Clean Coal Stockpile	0.0	0.0	0.7	0.0	0.0
28	Wind Erosion[2]	Reject Stockpile	0.0	0.0	0.02	0.0	0.0
29	Mobile Equipment	Grader Operations	0.0	0.0	1.0	0.0	0.0
30	Mobile Equipment[3]	Overburden Hauling - Backfill	0.0	0.0	8.6	0.0	0.0
31	Mobile Equipment[3]	Overburden Hauling - Stockpile	0.0	0.0	61.3	0.0	0.0
32	Mobile Equipment	Coal Hauling within Mine	0.0	0.0	26.3	0.0	0.0
33	Mobile Equipment	Misc. Mine Traffic	0.0	0.0		0.0	0.0
34	Mobile Equipment	Other Vehicle Traffic	0.0	0.0		0.0	0.0
35	Mobile Equipment	Coal Truck Haul - Loop Road	0.0	0.0	1.1	0.0	0.0
		Total Potential Emissions from Point Emission Units	67.8	9.3	1.4	0.7	0.1
		Total Potential Emissions from Fugitive Emission Units	27.0	0.0	198.2	0.0	0.0
		Total Potential Emissions from All Emission Units	94.8	9.3	199.7	0.7	0.1

Notes:

[1]Fugitive NO_X emissions for blasting operations were calculated and included in Table C-12.

[2]Wind erosion PM_{10} emission calculations were revised.

[3]Overburden hauling, backfill and stockpile, PM_{10} emission calculations were revised.

Table C-3. Usibelli Coal Mine - Wishbone Hill Potential Emissions from Fuel-fired Emission Units

Table C-3.a. Diesel-fired Caterpillar C18 Engine (Emission Unit 1)

Pollutant	Maximum Capacity	Maximum Operation	Emission Factor		Potential Emissions
				Reference	
NO_X	900 hp	8,760 hr/yr	14.0 lb/hr	Vendor Data	61.3 tpy
CO	900 hp	8,760 hr/yr	1.77 lb/hr	Vendor Data	7.8 tpy
PM_{10}	900 hp	8,760 hr/yr	0.18 lb/hr	Vendor Data	0.8 tpy
VOC	900 hp	8,760 hr/yr	0.14 lb/hr	Vendor Data	0.6 tpy
SO_2	900 hp	8,760 hr/yr	15 ppmw	Mass Balance	0.04 tpy

Table C-3.b. Diesel-fired Heaters and Boilers (Emission Unit 2)

Pollutant	Maximum Capacity	Maximum Operation	Emission Factor		Potential Emissions
			Value	Reference	
NO_X	10.0 MMBtu/hr	8,760 hr/yr	20 lb/1,000 gal	AP-42 Table 1.3-1	6.5 tpy
CO	10.0 MMBtu/hr	8,760 hr/yr	0.036 lb/MMBtu	AP-42 Table 1.3-1	1.6 tpy
PM_{10}	10.0 MMBtu/hr	8,760 hr/yr	2 lb/1,000 gal	AP-42 Table 1.3-1	0.6 tpy
VOC	10.0 MMBtu/hr	8,760 hr/yr	0.002 lb/MMBtu	AP-42 Table 1.3-3	0.1 tpy
SO_2	10.0 MMBtu/hr	8,760 hr/yr	15 ppmw	Mass Balance	0.07 tpy

Notes: 1. Fuel consumption is assumed to be 74 gallons per hour.

Table C-4. Usibelli Coal Mine - Wishbone Hill Potential PM_{10} Emissions from Topsoil Removal to Storage

Emission Unit		Expected Operation	Emission Reduction for Water Application	Emission Factor		Potential PM_{10} Emissions
ID	Description			Value	Reference	
3	Topsoil Removal to Storage	2,660 hr/yr	80 percent	32.0 lb/hr	AP-42, Table 11-9.1	8.5 tpy
					Total Potential PM_{10} Emissions	8.5 tpy

Notes:
1. Topsoil is removed and piled for storage using bulldozers.
2. Topsoil silt content is 65 percent.
3. Topsoil moisture content is 6 percent.

Table C-5. Usibelli Coal Mine - Wishbone Hill Potential PM_{10} Emissions from Blasting Operations

Emission Unit		Capacity	Expected	Emission Factor		Potential
ID	Description		Operation	Value	Reference	PM_{10} Emissions
4	Overburden Blasting	13,423 ft^2/blast	240 blast/yr	11.32 lb/blast	AP-42, Table 11.9-1	1.36 tpy
5	Coal Blasting	13,423 ft^2/blast	120 blast/yr	11.32 lb/blast	AP-42, Table 11.9-1	0.68 tpy
					Total Potential PM_{10} Emission	2.0 tpy

Note: The number of actual blasts is expected to be lower than the number stated in Table C-5. The numbers of blasts in Table C-5 is overstated to conservatively overestimate fugitive PM_{10} emissions.
The daily blast area (A) is calculated based on 725 bcy/hr; 24 hours per day;35 foot depth.

Table C-6. Usibelli Coal Mine - Wishbone Hill Potential PM_{10} Emissions from Overburden Removal Operations

Emission Unit ID	Emission Unit Description	Expected Operation	Emission Factor Value	Emission Factor Reference	Potential PM_{10} Emissions
6	Overburden Truck Loading	4,234,000 tpy	0.000391306 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.8 tpy
7	Overburden Dumping	4,234,000 tpy	0.000391306 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.8 tpy
				Total Potential PM_{10} Emission	1.7 tpy

Notes: 1. Average annual wind speed is 4.36 miles per hour.
2. Overburden moisture content is 8 percent.
3. Frequency of loading and dumping operations: 30 days per year

Table C-7. Usibelli Coal Mine - Wishbone Hill Potential PM_{10} Emissions from Coal Mining Operations

Emission Unit		Expected Operation	Emission Factor		Potential PM_{10} Emissions
ID	Description		Value	Reference	
8	Coal Truck Loading	1,815,000 tpy	0.0178 lb/ton	AP-42, Table 11.9-1	16.1 tpy
9	Coal Dumping - Crusher Feeder	1,815,000 tpy	0.0178 lb/ton	AP-42, Table 11.9-1	16.1 tpy
10	Coal Dumping - Run-of-Mine Pile	605,000 tpy	0.0178 lb/ton	AP-42, Table 11.9-1	5.4 tpy
11	Coal Reclaim - Run-of-Mine Pile	605,000 tpy	0.0178 lb/ton	AP-42, Table 11.9-1	5.4 tpy
				Total Potential PM_{10} Emission	43.1 tpy

Notes: 1. Run-of-mine coal moisture content is 6 percent.
2. Frequency of coal mining operations: 365 days per year

Table C-8. Usibelli Coal Mine - Wishbone Hill Potential PM_{10} Emissions from Coal Processing Operations

Emission Unit		Expected	Emission Factor		Potential	Potential	Potential
ID	Description	Operation	Value	Reference	PM_{10} Emissions	PM_{10} Emissions	PM_{10} Emissions
12	Coal Crusher	1,815,000 tpy	0.0024 lb/ton	AP-42, Table 11.19.2-2	2.2 tpy	0.84 lb/hr	0.1058 g/s
13	Transfer - Crusher to Conveyor 1	1,815,000 tpy	0.0002013 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.2 tpy	0.07 lb/hr	0.0089 g/s
14	Transfer - Conveyor 1 to Raw Stockpile	1,815,000 tpy	0.0002013 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.2 tpy	0.07 lb/hr	0.0089 g/s
15	Transfer - Raw Stockpile to Conveyor 2	1,815,000 tpy	0.0002013 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.2 tpy	0.07 lb/hr	0.0089 g/s
16	Transfer - Conveyor 2 to Jig Plant	1,815,000 tpy	0.0002013 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.2 tpy	0.07 lb/hr	0.0089 g/s
17	Transfer - Jig Plant to Conveyor 3	815,000 tpy	0.0001346 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.1 tpy	0.05 lb/hr	0.0059 g/s
18	Transfer - Conveyor 3 to Reject Stockpile	815,000 tpy	0.0001346 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.1 tpy	0.05 lb/hr	0.0059 g/s
19	Transfer - Jig Plant to Conveyor 4	1,000,000 tpy	0.0001346 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.1 tpy	0.05 lb/hr	0.0059 g/s
20	Transfer - Conveyor 4 to Clean Stockpile	1,000,000 tpy	0.0001346 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.1 tpy	0.05 lb/hr	0.0059 g/s
21	Transfer - Clean Stockpile to Conveyor 5	1,000,000 tpy	0.0001346 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.1 tpy	0.05 lb/hr	0.0059 g/s
22	Transfer - Conveyor 5 to Loadout Bin	1,000,000 tpy	0.0001346 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.1 tpy	0.05 lb/hr	0.0059 g/s
23	Transfer - Loadout Bin to Truck	1,000,000 tpy	0.0001346 lb/ton	AP-42, Section 13.2.4, Eq. 1	0.1 tpy	0.05 lb/hr	0.0059 g/s
				Total Potential PM_{10} Emission	3.4 tpy	1.5 lb/hr	0.1829 g/s

Notes: 1. Average annual wind speed is 4.36 miles per hour.
2. Run-of-mine coal moisture content is 6 percent.
3. Clean coal moisture content is 8 percent.
4. Frequency of coal processing operations: 365 days per year
5. Short term throughput of 350 ton/hour for all operations

Table C-9. Usibelli Coal Mine - Wishbone Hill Potential PM_{10} Emissions from Wind Erosion

Emission Unit		Expected	Emission Factor		Potential
ID	Description	Operation	Value	Reference	PM_{10} Emissions
24	Mine Area	168 acres	52.4 $g/m^2/yr$	AP-42, Section 13.2.5, Eq. 3	39.3 tpy
25	Run-of-Mine Coal Stockpile	4 acres	52.4 $g/m^2/yr$	AP-42, Section 13.2.5, Eq. 3	0.9 tpy
26	Raw Coal Stockpile	1.5 acres	52.4 $g/m^2/yr$	AP-42, Section 13.2.5, Eq. 3	0.4 tpy
27	Clean Coal Stockpile	1.5 acres	124.8 $g/m^2/yr$	AP-42, Section 13.2.5, Eq. 3	0.7 tpy
28	Reject Stockpile	0.1 acres	52.4 $g/m^2/yr$	AP-42, Section 13.2.5, Eq. 3	0.0 tpy
				Total Potential PM_{10} Emission	41.3 tpy

Notes: Potential wind erosion calculated for each pile applying methods from AP-42 13.2.5

Table C-10. Usibelli Coal Mine - Wishbone Hill Potential PM_{10} Emissions from Mobile Equipment Operations

Emission Unit ID	Emission Unit Description	Expected Operation	Emission Factor Value	Emission Factor Reference	Emission Reduction for Water Application	Potential PM_{10} Emissions
29	Grader Operations	13,122 VMT/yr	0.765 lb/VMT	AP-42, Table 11.9.1	80 percent	1.0 tpy
30	Overburden Hauling - Backfill	19,340 VMT/yr	4.46 lb/VMT	AP-42, Section 13.2.2, Eq. 1a	80 percent	8.6 tpy
31	Overburden Hauling - Stockpile	137,413 VMT/yr	4.46 lb/VMT	AP-42, Section 13.2.2, Eq. 1a	80 percent	61.3 tpy
32	Coal Hauling within Mine	14,103 VMT/yr	0.874 lb/VMT	AP-42, Section 13.2.2, Eq. 1a	80 percent	26.3 tpy
33	Misc. Mine Traffic	50,000 VMT/yr				
34	Other Vehicle Traffic	236,520 VMT/yr				
35	Coal Hauling - Loop Road	4,410 VMT/yr	2.42 lb/VMT	AP-42, Section 13.2.2, Eq. 1a	80 percent	1.1 tpy
					Total Potential PM_{10} Emission	98.3 tpy

Notes:
1. Average speed of grader is 5 miles per hour.
2. Road surface material silt content is 5 percent.
3. Based on 150 ton capacity haul truck. Empty = 120 ton. Full = 270 ton. Average = 195 tons.
4. Average weight of coal haul truck is 50 tons.
5. Average weight of miscellaneous mine traffic and other vehicle traffic is 3 tons.
6. Frequency of mobile equipment operations: 365 days per year
7. The emission factor for Overburden Hauling - Backfill was revised to AP-42, Section 13.2.2, Eq. 1a.
8. The emission factor for Overburden Hauling - Stockpile was revised to AP-42, Section 13.2.2, Eq. 1a.

Table C-11. Usibelli Coal Mine - Wishbone Hill Potential PM_{10} Emissions from Haul Trucks on Mine Access Road

Emission Unit ID	Emission Unit Description	Expected Operation	Emission Factor Value	Emission Factor Reference	Emission Reduction for Water Application	Potential PM_{10} Emissions
36	Coal Hauling - Mine Access Road	101,430 VMT/yr	2.42 lb/VMT	AP-42, Section 13.2.2, Eq. 1a	80 percent	24.5 tpy
					Total Potential PM_{10} Emission	24.5 tpy

Notes:
1. Average weight of coal haul truck is 50 tons.
2. Road surface material silt content is 5 percent.
3. Frequency of mine access road use: 365 days per year

Table C-12. Usibelli Coal Mine - Wishbone Hill Potential NO_X Emissions from Blasting Operations

Emission Unit		Expected	Emission Factor		Potential
ID	Description	Operation	Value	Reference	NO_X Emissions
5	Coal Blasting - annual	6,351,000 yd^3/yr	17 lb/ton of ANFO	AP-42, Table 13.3-1	27.0 tpy
5	Coal Blasting - short term	17400 yd^3/day	17 lb/ton of ANFO	AP-42, Table 13.3-1	147.9 lb/hr
				Total Potential NO_X Emission	27.0 tpy

Notes: 1. Ammonium nitrate and fuel oil (ANFO) is the blasting agent at 1 lb ANFO per bulk cubic yard of overburden.
2. Blasting rate is based on 725 bcy/hr times 24 hr/day.

Table C-13. Usibelli Coal Mine - Wishbone Hill Modeled PM10 Emissions Summary

ID	Classification	Description	Emission Factor Basis	Emission Factor		Percent Control	Modeled Emissions (g/s)				Modeled Emissions (g/s)			
				value	units		Annual PM_{10}	24-Hour PM_{10}	Model ID	Modeled Rate	Annual NOx	1-Hour NOx	Model ID	Modeled Rate
1	Power Generation	Diesel-fired Engine	Vendor Data	0.18	lb/hr		0.023	0.023	powergen	0.023	1.766	1.766	powergen	1.766
2	Heaters	Diesel-fired Heaters	AP-42 Table 1.3-1	2	lb/1,000 gal		0.019	0.019	heater	0.019	0.223	0.223	heater	0.223
3	Topsoil Operations	Topsoil Removal to Storage	AP-42, Table 11-9.1	32.0	lb/hr	80	0.25	0.81	topsoil	0.81	0.00	0.00	topsoil	
4	Blasting Operations	Overburden Blasting	AP-42, Table 13.3-1	11.32	lb/blast		0.0391	1.426	blast7	0.119	0.8	18.635	blast7	18.635
5	Blasting Operations	Coal Blasting	AP-42, Table 13.3-1	11.32	lb/blast		0.0196	1.426	blast7		0.8	18.635	blast7	
6	Overburden	Overburden Truck Loading	AP-42, Section 13.2.4, Eq. 1	0.0004	lb/ton		0.024	0.29	overbrl1	0.65	0.000	0.00	overbrl1	
7	Overburden	Overburden Dumping	AP-42, Section 13.2.4, Eq. 1	0.0004	lb/ton		0.024	0.29	overbrl2	0.65	0.000	0.00	overbrl2	
8	Coal Mining	Coal Removal	AP-42, Table 11.9-1	0.0178	lb/ton		0.465	0.465	mine1	2.23E-06	0.000	0.000	mine1	
9	Coal Mining	Coal Dumping - Crusher Feeder	AP-42, Table 11.9-1	0.0178	lb/ton		0.465	0.465	mine1		0.000	0.000	mine1	
10	Coal Mining	Coal Dumping - Run-of-Mine Pile	AP-42, Table 11.9-1	0.0178	lb/ton		0.155	0.155	mine1		0.000	0.000	mine1	
11	Coal Mining	Coal Reclaim from Run-of-Mine Pile	AP-42, Table 11.9-1	0.0178	lb/ton		0.155	0.155	mine1		0.000	0.000	mine1	
12	Coal Processing	Crusher	AP-42, Table 11.19.2-2	0.0024	lb/ton		0.063	0.106	coalproc	0.183	0.003	0.000	coalproc	
13	Coal Processing	Transfer - Crusher to Conveyor 1	AP-42, Section 13.2.4, Eq. 1	0.00020	lb/ton		0.005	0.009	coalproc		0.000	0.000	coalproc	
14	Coal Processing	Transfer - Conveyor 1 to Raw Stockpile	AP-42, Section 13.2.4, Eq. 1	0.00020	lb/ton		0.005	0.009	coalproc		0.000	0.000	coalproc	
15	Coal Processing	Transfer - Raw Stockpile to Conveyor 2	AP-42, Section 13.2.4, Eq. 1	0.00020	lb/ton		0.005	0.009	coalproc		0.000	0.000	coalproc	
16	Coal Processing	Transfer - Conveyor 2 to Jig Plant	AP-42, Section 13.2.4, Eq. 1	0.00020	lb/ton		0.005	0.009	coalproc		0.000	0.000	coalproc	
17	Coal Processing	Transfer - Jig Plant to Conveyor 3	AP-42, Section 13.2.4, Eq. 1	0.00013	lb/ton		0.002	0.006	coalproc		0.000	0.000	coalproc	
18	Coal Processing	Transfer - Conveyor 3 to Reject Stockpile	AP-42, Section 13.2.4, Eq. 1	0.00013	lb/ton		0.002	0.006	coalproc		0.000	0.000	coalproc	
19	Coal Processing	Transfer - Jig Plant to Conveyor 4	AP-42, Section 13.2.4, Eq. 1	0.00013	lb/ton		0.002	0.006	coalproc		0.000	0.000	coalproc	
20	Coal Processing	Transfer - Conveyor 4 to Clean Stockpile	AP-42, Section 13.2.4, Eq. 1	0.00013	lb/ton		0.002	0.006	coalproc		0.000	0.000	coalproc	
21	Coal Processing	Transfer - Clean Stockpile to Conveyor 5	AP-42, Section 13.2.4, Eq. 1	0.00013	lb/ton		0.002	0.006	coalproc		0.000	0.000	coalproc	
22	Coal Processing	Transfer - Conveyor 5 to Loadout Bin	AP-42, Section 13.2.4, Eq. 1	0.00013	lb/ton		0.002	0.006	coalproc		0.000	0.000	coalproc	
23	Coal Processing	Transfer - Loadout Bin to Truck	AP-42, Section 13.2.4, Eq. 1	0.00013	lb/ton		0.002	0.006	coalproc		0.000	0.000	coalproc	
24	Wind Erosion	Mine Area 1	AP-42, Section 13.2.5, Eq. 3	52.43	g/m2/yr		1.130	8.596	topwind	8.596	0.000	0.000	topwind	
	Wind Erosion	Mine Area 2	AP-42, Section 13.2.5, Eq. 3	52.43	g/m2/yr		0.027	8.596	overwind	8.596	0.000	0.000	overwind	
25	Wind Erosion	Run-of-Mine Coal Stockpile	AP-42, Section 13.2.5, Eq. 3	52.43	g/m2/yr		0.027	0.409	runcwind	0.409	0.000	0.000	runcwind	
26	Wind Erosion	Raw Coal Stockpile	AP-42, Section 13.2.5, Eq. 3	52.43	g/m2/yr		0.010	0.153	rawwind	0.153	0.000	0.000	rawwind	
27	Wind Erosion	Clean Coal Stockpile	AP-42, Section 13.2.5, Eq. 3	124.81	g/m2/yr		0.021	0.179	cleanwnd	0.179	0.000	0.000	cleanwnd	
28	Wind Erosion	Reject Stockpile	AP-42, Section 13.2.5, Eq. 3	52.43	g/m2/yr		0.001	0.010	rjctwind	0.010	0.000	0.000	rjctwind	
29	Mobile Equipment	Grader Operations	AP-42, Table 11.9.1	0.77	lb/VMT	80	0.03	0.03	mobile	0.82	0.00	0.00	mobile	
30	Mobile Equipment	Overburden Hauling - Backfil	AP-42, Section 13.2.2, Eq. 1a	4.46	lb/VMT	80	0.25	0.25	overbrd1	0.65	0.00	0.00	overbrd1	
31	Mobile Equipment	Overburden Hauling - Stockpile	AP-42, Section 13.2.2, Eq. 1a	4.46	lb/VMT	80	1.77	1.77	overbrd2	0.65	0.00	0.00	overbrd2	
32	Mobile Equipment	Coal Hauling within Mine	AP-42, Section 13.2.2, Eq. 1a	0.87	lb/VMT	80			mobile		0.00	0.0	mobile	
33	Mobile Equipment	Misc. Mine Traffic	AP-42, Section 13.2.2, Eq. 1a	0.87	lb/VMT	80	0.76	0.76	mobile		0.00	0.00	mobile	
34	Mobile Equipment	Other Vehicle Traffic	AP-42, Section 13.2.2, Eq. 1a	0.87	lb/VMT	80			mobile		0.00	0.0	mobile	
35	Mobile Equipment	Coal Truck Haul - Loop Road	AP-42, Section 13.2.2, Eq. 1a	2.42	lb/VMT	80	0.031	0.03	mobile		0.00	0.00	mobile	
36	Off-Source	Coal Truck Haul - Access Road	AP-42, Section 13.2.2, Eq. 1a	2.42	lb/VMT	80	0.71	0.71	road 1-21	0.034	0.00	0.00	road 1-21	

Attachment D

Demonstration of Compliance with 18 AAC 50.055

Usibelli Coal Mine
Wishbone Hill Coal Mining and Processing Operation
Wishbone Hill Demonstration of Compliance with 18 AAC 50.055

(Emission Standard – Particulate Loading of 0.05 gr/scf)

Emission Unit 1: Caterpillar C-18 Diesel-fired Engine

- From vendor data, PM emission factor = 0.18 lb/hr

- From vendor data, exhaust gas flow rate = 1,584 scfm

  Emission Rate = 0.18 lb/hr x 7,000 gr/lb = 1,260 gr/hr
  Concentration = 1,260 gr/hr / (1,584 scf/min x 60 min/hr) = 0.01 gr/scf

Emission Unit 2: Diesel-fired Heaters

- From AP-42, Table 1.3-1, PM emission factor = 2 lb/1,000 gal

  Converting emission factor assuming 135,000 Btu/gal,
  PM emission factor = 2 lb/1,000 gal/0.135 MMBtu/gal = 0.015 lb/MMBtu

- From 40 CFR 60, Method 19,

  $E = CF[20.9/(20.9-O_2)]$

  where: E = pollutant emission rate (lb/MMBtu)
  C = pollutant concentration in stack gas (lb/scf)
  F = F-factor (scf/MMBtu)
  O_2 = % oxygen in stack gas

- Solving for C, converting to gr/scf

  where: E = 0.015 lb/MMBtu
  F = 9,190 scf/MMBtu (factor for diesel combustion)
  O_2 = 0% (conservative; some excess air required for good combustion; not dilution of stack gas)

  C = 0.015/9,190/[20.9/(20.9-0)] = 1.6E-6 lb/scf

  C = 0.01 gr/scf

- Assumptions/Comments

  Based on the level of particulate matter emissions above, the emission units will comply with the 20 percent visible emission standard under 18 AAC 50.055(a)(1).

DEMONSTRATION OF COMPLIANCE WITH 18 AAC 50.055

(Emission Standard – 500 ppm SO_2 Stack Gas Concentration)

Diesel-fired Emission Units 1 and 2

- From 40 CFR 60, Method 19,

  F-factor for diesel fuel = 9,190 scf/MMBtu
  1 ppm SO_2 = 1.660E-7 lb SO_2/scf (conversion factor)

- Converting ppm SO_2 in stack gas to wt. pct. S in fuel

  (500 ppmv SO_2)(1.667E-7) = 8.3E-5 lb SO_2/scf

  (8.3E-5 lb SO_2/scf)(9,190 scf/MMBtu fuel)(0.0193 MMBtu/lb fuel)

  = 1.48E-2 lb SO_2/lb fuel

  (1.48E-2 lb SO_2/lb fuel)(mole SO_2/64 lb SO_2)(mole S/mole SO_2)(32 lb S/mole S)

  = 0.0074 lb S/lb fuel

  = 0.74 wt. pct S

- Therefore, if fuel sulfur is less than 0.74 wt. pct., the resulting SO_2 stack concentration is less than 500 ppm. The stationary source will use ULSD exclusively, and will comply with the standard.

- Assumptions/Comments

  Calculation conservatively assumes that no excess air is present in stack gas even though diesel-fired equipment is operated with excess air (measured as O_2) in the stack gas as a requirement for good combustion.

Attachment E

Caterpillar Engine Specifications

Gen Set Package Performance Data [C18DE97]

October 26, 2007

For Help Desk Phone Numbers Click here

Performance Number: DM8518

Change Level: 00

Sales Model: C18 DITA
Combustion: DI
Aspr: TA
Engine Power: 600 W/F EKW 622 W/O F EKW 900 HP
Speed: 1,800 RPM
After Cooler: ATAAC
Manifold Type: DRY
Governor Type: ELEC
After Cooler Temp(F): 120
Turbo Quantity: 2
Engine App: GP
Turbo Arrangement:
Hertz: 60
Engine Rating: PGS
Strategy:
Rating Type: STANDBY
Certification: EPA TIER-2 2006 - ----

General Performance Data 1

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL RATE LB/ BHP-HR	FUEL RATE GPH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
600.0	100	900	358	0.332	42.7	120.2	69.4	1,673.9	1,296.3	994.3	4,781.6
540.0	90	808	322	0.339	39.1	118.8	66.3	1,628.0	1,245.6	957.7	4,527.3
480.0	80	718	286	0.350	35.9	114.4	63.5	1,596.2	1,207.0	930.7	4,347.2
450.0	75	674	268	0.356	34.3	112.8	61.9	1,575.0	1,187.2	917.1	4,244.8
420.0	70	629	250	0.361	32.4	111.6	59.7	1,543.3	1,164.9	902.7	4,103.6
360.0	60	541	215	0.369	28.5	109.2	53.8	1,447.9	1,112.0	870.4	3,757.5
300.0	50	455	181	0.373	24.2	106.7	45.7	1,313.7	1,046.3	833.0	3,305.5
240.0	40	371	148	0.367	19.5	100.4	33.2	1,098.3	946.0	779.2	2,669.8
180.0	30	287	114	0.358	14.7	94.1	20.5	879.3	836.1	713.3	2,027.1
150.0	25	244	97	0.351	12.2	90.9	14.1	769.9	777.0	675.5	1,702.2
120.0	20	201	80	0.354	10.1	93.2	9.7	688.6	717.3	634.5	1,455.0
60.0	10	113	45	0.413	6.7	110.5	5.3	593.3	593.1	542.8	1,144.2

General Performance Data 2

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BHP	COMPRESS OUT PRESS KPA	COMPRESS OUT TEMP DEG F
600.0	100	900	254	412.3
540.0	90	808	242	394.7
480.0	80	718	233	382.3
450.0	75	674	227	375.6
420.0	70	629	219	366.6
360.0	60	541	198	343.2
300.0	50	455	169	310.5
240.0	40	371	125	255.6
180.0	30	287	80	199.8

150.0	25	244	57	171.5
120.0	20	201	41	151.0
60.0	10	113	25	126.7

Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW BTU/ MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO 350F BTU/ MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
600.0	100	10,748.0	6,768.0	34,691.0	20,303.0	4,931.0	8,246.0	38,160.0	92,527.0	98,556.0
540.0	90	9,782.0	6,369.0	32,075.0	18,483.0	4,498.0	7,564.0	34,293.0	84,509.0	90,025.0
480.0	80	8,985.0	5,858.0	30,084.0	17,175.0	4,129.0	7,222.0	30,482.0	77,571.0	82,632.0
450.0	75	8,587.0	5,516.0	29,061.0	16,549.0	3,941.0	6,995.0	28,549.0	73,931.0	78,765.0
420.0	70	8,189.0	5,232.0	27,809.0	15,696.0	3,725.0	6,654.0	26,672.0	69,950.0	74,556.0
360.0	60	7,279.0	4,720.0	24,852.0	13,819.0	3,276.0	5,744.0	22,975.0	61,476.0	65,514.0
300.0	50	6,313.0	4,208.0	21,269.0	11,545.0	2,781.0	4,493.0	19,279.0	52,150.0	55,562.0
240.0	40	5,516.0	4,038.0	16,492.0	8,530.0	2,235.0	2,900.0	15,753.0	41,970.0	44,700.0
180.0	30	4,720.0	3,185.0	11,943.0	5,744.0	1,683.0	1,592.0	12,170.0	31,563.0	33,610.0
150.0	25	4,322.0	2,445.0	9,838.0	4,493.0	1,399.0	1,024.0	10,350.0	26,274.0	28,037.0
120.0	20	3,867.0	2,047.0	8,132.0	3,469.0	1,160.0	682.0	8,530.0	21,781.0	23,203.0
60.0	10	2,843.0	1,763.0	5,630.0	1,990.0	762.0	171.0	4,777.0	14,331.0	15,298.0

EMISSIONS DATA

EPA TIER-2 2006 - ---- ********** B5

Gaseous emissions data measurements are consistent with those described in
EPA 40 CFR PART 89 SUBPART D and ISO 8178 for measuring HC, CO, PM, and NOx

Gaseous emissions values are WEIGHTED CYCLE AVERAGES and are in compliance
with the following non-road regulations:

LOCALITY	AGENCY/LEVEL	MAX LIMITS - g/kW-hr		
U.S. (incl Calif)	EPA/TIER-2	CO:3.5	NOx + HC:6.4	PM:0.2

EXHAUST STACK DIAMETER	--
WET EXHAUST MASS	7,707.4 LB/HR
WET EXHAUST FLOW (993.20 F STACK TEMP)	4,785.14 CFM
WET EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	1,584.00 STD CFM
DRY EXHAUST FLOW RATE (32 DEG F AND 29.98 IN HG)	1,450.73 STD CFM
FUEL FLOW RATE	43 GAL/HR

RATED SPEED "Not to exceed data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/ HR	TOTAL CO LB/ HR	TOTAL HC LB/ HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT
600.0	100	900	14.0100	1.7700	.0300	.1300	8.9000
450.0	75	674	6.1000	1.2700	.0600	.1800	10.8000
300.0	50	455	3.3800	.4700	.1400	.1000	12.4000
150.0	25	244	4.3600	.5000	.0800	.0400	13.7000
60.0	10	113	2.8600	.7900	.0800	.0400	15.8000

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/ HR	TOTAL CO LB/ HR	TOTAL HC LB/ HR	TOTAL CO2 LB/ HR	PART MATTER LB/HR	OXYGEN IN EXHAUST PERCENT
600.0	100	900	11.5800	.9500	.0200	939.8	.0700	8.9000
450.0	75	674	5.0400	.6800	.0300	748.9	.0900	10.8000
300.0	50	455	2.7900	.2500	.0800	530.1	.0500	12.4000
150.0	25	244	3.6100	.2700	.0400	270.9	.0200	13.7000
60.0	10	113	2.3600	.4200	.0400	148.2	.0200	15.8000

Altitude Capability Data(Corrected Power Altitude Capability)

Ambient Operating Temp. / Altitude	50 F	68 F	86 F	104 F	122 F	NORMAL
0 F	900 hp	900 hp	900 hp	900 hp	900 hp	900 hp
984 F	900 hp	900 hp	900 hp	900 hp	890 hp	900 hp
1,640 F	900 hp	900 hp	900 hp	897 hp	870 hp	900 hp
3,281 F	900 hp	900 hp	873 hp	845 hp	819 hp	890 hp
4,921 F	880 hp	849 hp	821 hp	795 hp	771 hp	848 hp
6,562 F	826 hp	798 hp	772 hp	747 hp	724 hp	806 hp
8,202 F	776 hp	750 hp	725 hp	703 hp	680 hp	766 hp
9,843 F	730 hp	704 hp	681 hp	660 hp	638 hp	727 hp
11,483 F	684 hp	661 hp	638 hp	618 hp	599 hp	689 hp
13,123 F	641 hp	620 hp	599 hp	579 hp	562 hp	654 hp
14,764 F	601 hp	581 hp	561 hp	543 hp	526 hp	620 hp

The powers listed above and all the Powers displayed are Corrected Powers

Identification Reference and Notes

Engine Arrangement:	2726915	**Lube Oil Press @ Rated Spd(PSI):**	69.6
Effective Serial No:	EST00001	**Piston Speed @ Rated Eng SPD(FT/Min):**	2,165.4
Primary Engine Test Spec:	0K7257	**Max Operating Altitude(FT):**	2,952.8
Performance Parm Ref:	TM5739	**PEEC Elect Control Module Ref**	
Performance Data Ref:	DM8518	**PEEC Personality Cont Mod Ref**	
Aux Coolant Pump Perf Ref:			
Cooling System Perf Ref:		**Turbocharger Model**	S310S089
Certification Ref:	EPA TIER 2	**Fuel Injector**	
Certification Year:	2006	**Timing-Static (DEG):**	--
Compression Ratio:	14.5	**Timing-Static Advance (DEG):**	--
Combustion System:	DI	**Timing-Static (MM):**	--
Aftercooler Temperature (F):	120	**Unit Injector Timing (MM):**	--
Crankcase Blowby Rate(CFH):	--	**Torque Rise (percent)**	--
Fuel Rate (Rated RPM) No Load(Gal/HR):	--	**Peak Torque Speed RPM**	--
Lube Oil Press @ Low Idle Spd(PSI):	55.1	**Peak Torque (LB/FT):**	--

Reference Number: DM8518

CORE ARRANGEMENT: 2726916
EPA TIER-2 2006----B5

Parameters Reference: TM5739

GEN SET - PACKAGED - DIESEL
TOLERANCES:
AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES.

ENGINE POWER	+/- 3%
EXHAUST STACK TEMPERATURE	+/- 8%
GENERATOR POWER	+/- 5%
INLET AIR FLOW	+/- 5%
INTAKE MANIFOLD PRESSURE - GAGE	+/- 10%
EXHAUST FLOW	+/- 6%
SPECIFIC FUEL CONSUMPTION	+/- 3%
FUEL RATE	+/- 5%
HEAT REJECTION	+/- 5%
HEAT REJECTION EXHAUST ONLY	+/- 10%

CONDITIONS:
ENGINE PERFORMANCE IS CORRECTED TO INLET AIR STANDARD CONDITIONS OF 99 KPA (29.31 IN HG) AND 25 DEG C (77 DEG F).

THESE VALUES CORRESPOND TO THE STANDARD ATMOSPHERIC PRESSURE AND
TEMPERATURE IN ACCORDANCE WITH SAE J1995. ALSO INCLUDED IS A CORRECTION TO STANDARD FUEL GRAVITY OF 35 DEGREES API HAVING A LOWER HEATING VALUE OF 42,780 KJ/KG (18,390 BTU/LB) WHEN USED AT 29 DEG C (84.2 DEG F) WHERE THE DENSITY IS 838.9 G/L (7.002 LB/GAL).

THE CORRECTED PERFORMANCE VALUES SHOWN FOR CATERPILLAR ENGINES WILL
APPROXIMATE THE VALUES OBTAINED WHEN THE OBSERVED PERFORMANCE DATA IS CORRECTED TO SAE J1995, ISO 3046-2 & 8665 & 2288 & 9249 & 1585, EEC 80/1269 AND DIN70020 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL, FUEL PUMP AND JACKET WATER PUMP. THE POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS, AND CHARGING ALTERNATORS.

RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON
THE PERFORMANCE DATA SET.

GEN SET - PACKAGED - DIESEL
ALTITUDE:
ALTITUDE CAPABILITY - THE RECOMMENDED REDUCED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC ALTITUDE LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.
NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS IS FOUND ON TM2001.

THE GENERATOR POWER CURVE TABULAR DATA REPRESENTS THE NET ELECTRICAL POWER OUTPUT OF THE GENERATOR.

GENERATOR SET RATINGS
EMERGENCY STANDBY POWER (ESP)

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY
OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE ESP RATING. TYPICAL OPERATION IS 50 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 200 HOURS PER YEAR.

STANDBY POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR THE DURATION OF AN EMERGENCY
OUTAGE. AVERAGE POWER OUTPUT IS 70% OF THE STANDBY POWER RATING. TYPICAL OPERATION IS 200 HOURS PER YEAR, WITH MAXIMUM EXPECTED USAGE OF 500 HOURS PER YEAR.

PRIME POWER RATING

OUTPUT AVAILABLE WITH VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70% OF THE PRIME POWER RATING. TYPICAL PEAK DEMAND IS 100% OF PRIME RATED EKW WITH 10% OVERLOAD CAPABILITY FOR EMERGENCY
USE FOR A MAXIMUM OF 1 HOUR IN 12. OVERLOAD OPERATION CANNOT EXCEED 25 HOURS PER YEAR.

CONTINUOUS POWER RATING

OUTPUT AVAILABLE WITH NON-VARYING LOAD FOR AN UNLIMITED TIME. AVERAGE POWER OUTPUT IS 70-100% OF THE CONTINUOUS POWER RATING. TYPICAL PEAK DEMAND IS 100% OF CONTINUOUS RATED EKW FOR 100% OF OPERATING HOURS.

Attachment F

Ambient Air Quality Analysis

Usibelli Coal Mine, Inc.
Wishbone Hill – Air Quality Impacts Assessment – Dispersion Modeling Report

Usibelli Coal Mine, Inc. (Usibelli) has completed a dispersion modeling assessment of its planned Wishbone Hill mining project to demonstrate compliance with the applicable Alaska Ambient Air Quality Standards (AAAQS) in accordance with an approved modeling protocol.

The results of the modeling demonstrate that emissions from the planned mining operations will not interfere with the maintenance of ambient air quality standards in the vicinity of the Wishbone Hill project site. Therefore, Usibelli believes it has satisfied its requirements with this demonstration of compliance.

1.0 Summary of Modeling

Usibelli Coal Mine, Inc. (Usibelli) is planning to operate a coal mining and processing facility located northeast of Palmer, Alaska. The operation will include a rock crusher and coal preparation plant with sufficient capacity to require an air quality permit under Title 18 of the Alaska Administrative Code, Section 50.502 (18 AAC 50.502), the minor permitting program. This need to obtain an air quality construction permit from the Alaska Department of Environmental Conservation (ADEC) includes a provision for the demonstration that emissions associated with the planned activities at the Usibelli Wishbone Hill project site will not interfere with maintenance of the Alaska Ambient Air Quality Standards (AAAQS).

This demonstration of compliance with the AAAQS was completed using dispersion modeling techniques and approved models. The compliance demonstration methodology included:

- Determination of a representative mine activity emission profile that is representative of a reasonable daily activity level in comparison to a potential activity level;
- Application of AERMET (version 12345) along with one year of Wishbone Hill approved on-site meteorological data (1990) together with filling procedures for missing data to include sky cover from Palmer as well as the incorporation of Anchorage upper air data;
- Use of AERMAP (version 11103) to determine terrain elevations for receptor locations;
- Modeling of mine activity in AERMOD (version 12345) to calculate ambient nitrogen dioxide (NO_2) and coarse fraction particulate matter (PM_{10}) concentrations for comparison with the AAAQS;
- Use of particle deposition parameters in the dispersion simulation of fugitive particulate matter emissions;

- Use of alternate emission factors to better represent wind erosion, haul road activity, and reflect the Usibelli dust control plan;
- Application of ambient PM_{10} background concentrations collected at the Eagle River monitoring station;
- Determining compliance with the AAAQS based on the modeled impacts resulting from mine activity emissions and the addition of background concentrations.

These methodologies were approved by the ADEC in a letter dated February 21, 2013.

2.0 Usibelli Wishbone Hill Mining Plan Overview

The proposed Usibelli Wishbone Hill mine activity site is shown in Figure 1. The mining plan which includes the mining, processing and cleaning of coal requires a number of related activities including preparation of the mine area, retrieval of the coal, processing and cleaning the coal, and hauling the cleaned coal offsite. Many of these processes require interaction with soils/rock such as topsoil removal and blasting as well as scraping and hauling/dumping, all which disturb dirt/rock and can generate fugitive dust.

The mining plan includes description of the soil removal, overburden handling, coal removal, and reclamation activities. The plan outlines two distinct operational areas within the Wishbone Hill site and discusses mining timelines and coal throughput targets.

The plan presents operational statistics and targets based on annual periods. The PM_{10} AAAQS has a shorter 24-hour (calendar day) averaging period. Because not all mining activities will occur at all times during the year nor at all times of the day, daily mining activity levels may be significantly different from one day to the next. Further, some activities described in the mining plan are sequential while other activities occur concurrently.

The coal seams at the Wishbone Hill mine site are located beneath layers of top soil and overburden comprised primarily of glacial gravels. The active coal mining depths are anticipated to be between 180 and 500 feet below the existing surface. As a result, soil and overburden removal will occur to remove the material between the surface and the active mine depths.

The overburden will be loaded onto large trucks and hauled to specific overburden stockpiles until such time as the mine reclamation activities can occur. At that time, the overburden will be returned to the mined area and used to fill the mine. The hauling of the overburden will occur completely within the Wishbone Hill mine site and will be conducted in accordance with the fugitive dust control plan.

The mined coal will also be transported by these same large trucks to the coal processing area, and then washed and cleaned to contract specifications. Electrical power purchased from the local utility will provide primary power to the coal processing plant. Small diesel-fired heaters will provide space and comfort heat in some areas. The diesel-fired heaters and generator engine will emit combustion byproducts to the atmosphere.

As noted, the emissions to the atmosphere of regulated air pollutants will occur from combustion emission units used to provide operational support for the coal processing plant. These emissions will be released to the atmosphere from "point" sources. However, the majority of the PM_{10} emissions will be fugitive dust generated by materials handling activities. The combination of these emission unit types and overlapping operations makes modeling of mining activities at Wishbone Hill non-standard vis-a-vis more typical industrial processes.

3.0 Usibelli Wishbone Hill Emission Unit Inventory

As noted earlier, the need for an air quality construction permit is based on the installation and operation of certain types of equipment such as a rock crusher or coal preparation plant above certain thresholds as described in 18 AAC 50.502 and 18 AAC 50.990. The permit applicability thresholds include a 5 ton per day (tpd) level for a rock crusher and a 200 tpd threshold for a coal preparation plant.

The Usibelli Wishbone Hill emission unit inventory is shown in Table 1, with the calculated potential emissions resulting from the inventory assumptions being provided in Table 2. As seen in Table 1, many of the operations are listed as being active for 8,760 hours per year to allow for operational flexibility and to calculate the emissions shown in Table 2 for comparison to the permitting and fee thresholds that are an element of the ADEC air quality permitting process.

The potential emissions in Table 2 were calculated by applying readily available and generally acceptable emission factors, such as the EPA AP-42 factors. These EPA AP-42 emission factors are generally applicable because the factors typically cover a range of source types and activity parameters within a broad source type category. However, more appropriate emission factors and vendor emissions data are available that can be applied to specific emission units or activities. Use of the AP-42 factors is a conservative methodology and refinement of those assumptions can be applied, if warranted.

Some of the assumptions used for the potential emission calculations in Table 2 are very conservative, such as 8,760 hours per year of mining or hauling activities. However, applying these assumptions results in a conservative annual potential emission value that is appropriate for comparison to the various permit applicability thresholds.

Based on the potential emissions presented in Table 2, the potential PM_{10} emissions associated with the equipment that triggers that requirement to obtain an air quality construction permit (specifically the coal processing plant) are less than 2 ton per year (tpy), while the potential PM_{10} of all activities is almost 200 tpy. The potential PM_{10} emissions from the coal processing plant account for less than 1 percent of the total potential PM_{10} emissions on an annual basis.

Table 1. Usibelli Coal Mine – Wishbone Hill Emission Unit Inventory

ID	Classification	Description	Type	Capacity	Expected Operation
1	Power Generation	Diesel-fired Engine	Point	900 hp	8,760 hr/yr
2	Heaters	Diesel-fired Heaters	Point	10.0 MMBtu/hr	8,760 hr/yr
3	Topsoil Operations	Topsoil Removal to Storage	Fugitive	N/A	2,660 hr/yr
4	Blasting Operations	Overburden Blasting	Fugitive	13,423 ft^2/blast	240 blast/yr
5	Blasting Operations	Coal Blasting	Fugitive	13,423 ft^2/blast	120 blast/yr
6	Overburden	Overburden Truck Loading	Fugitive	6,351,000 yd^3/yr	4,234,000 tpy
7	Overburden	Overburden Dumping	Fugitive	6,351,000 yd^3/yr	4,234,000 tpy
8	Coal Mining	Coal Removal	Fugitive	1,815,000 tpy	8,760 hr/yr
9	Coal Mining	Coal Dumping - Crusher Feeder	Fugitive	1,815,000 tpy	8,760 hr/yr
10	Coal Mining	Coal Dumping - Run-of-Mine Pile	Fugitive	605,000 tpy	8,760 hr/yr
11	Coal Mining	Coal Reclaim from Run-of-Mine Pile	Fugitive	605,000 tpy	8,760 hr/yr
12	Coal Processing	Crusher	Fugitive	350 tph	1,815,000 tpy
13	Coal Processing	Transfer - Crusher to Conveyor 1	Fugitive	350 tph	1,815,000 tpy
14	Coal Processing	Transfer - Conveyor 1 to Raw Stockpile	Fugitive	350 tph	1,815,000 tpy
15	Coal Processing	Transfer - Raw Stockpile to Conveyor 2	Fugitive	350 tph	1,815,000 tpy
16	Coal Processing	Transfer - Conveyor 2 to Jig Plant	Fugitive	350 tph	1,815,000 tpy
17	Coal Processing	Transfer - Jig Plant to Conveyor 3	Fugitive	350 tph	815,000 tpy
18	Coal Processing	Transfer - Conveyor 3 to Reject Stockpile	Fugitive	350 tph	815,000 tpy
19	Coal Processing	Transfer - Jig Plant to Conveyor 4	Fugitive	350 tph	1,000,000 tpy
20	Coal Processing	Transfer - Conveyor 4 to Clean Stockpile	Fugitive	350 tph	1,000,000 tpy
21	Coal Processing	Transfer - Clean Stockpile to Conveyor 5	Fugitive	350 tph	1,000,000 tpy
22	Coal Processing	Transfer - Conveyor 5 to Loadout Bin	Fugitive	350 tph	1,000,000 tpy

ID	Classification	Description	Type	Capacity		Expected Operation	
23	Coal Processing	Transfer - Loadout Bin to Truck	Fugitive	350	tph	1,000,000	tpy
24	Wind Erosion	Mine Area	Fugitive	168	acres	40	hr/yr
25	Wind Erosion	Run-of-Mine Coal Stockpile	Fugitive	4	acres	40	hr/yr
26	Wind Erosion	Raw Coal Stockpile	Fugitive	1.5	acres	40	hr/yr
27	Wind Erosion	Clean Coal Stockpile	Fugitive	1.5	acres	49	hr/yr
28	Wind Erosion	Reject Stockpile	Fugitive	0.1	acres	40	hr/yr
29	Mobile Equipment	Grader Operations	Fugitive	13,122	VMT/yr	8,760	hr/yr
30	Mobile Equipment	Overburden Hauling - Backfill	Fugitive	19,340	VMT/yr	8,760	hr/yr
31	Mobile Equipment	Overburden Hauling - Stockpile	Fugitive	137,413	VMT/yr	8,760	hr/yr
32	Mobile Equipment	Coal Hauling within Mine	Fugitive	14,103	VMT/yr	8,760	hr/yr
33	Mobile Equipment	Misc. Mine Traffic	Fugitive	50,000	VMT/yr	8,760	hr/yr
34	Mobile Equipment	Other Vehicle Traffic	Fugitive	236,520	VMT/yr	8,760	hr/yr
35	Mobile Equipment	Coal Truck Haul - Loop Road	Fugitive	4,410	VMT/yr	8,760	hr/yr
36	Off-Source	Coal Truck Haul - Access Road	Fugitive	101,430	VMT/yr	8,760	hr/yr

Table Note: Emission units shown for completeness, operational schedules, and potential to emit calculations using standard AP-42 vendor values for consistency and to determine permit applicability threshold emission levels.

Table 2. Usibelli Coal Mine – Wishbone Hill Emission Unit Inventory – Potential Emissions for Comparison With Permitting Threshold Levels

ID	Classification	Description	Potential Emissions (tpy)				
			NO_X	CO	PM_{10}	VOC	SO_2
1	Power Generation	Diesel-fired Engine	61.3	7.8	0.8	0.6	0.04
2	Heaters	Diesel-fired Heaters	6.5	1.6	0.6	0.1	0.07
3	Topsoil Operations	Topsoil Removal to Storage	0.0	0.0	8.5	0.0	0.0
4	Blasting Operations	Overburden Blasting	0.0	0.0	1.359	0.0	0.0
5	Blasting Operations	Coal Blasting	27.0	0.0	0.679	0.0	0.0
6	Overburden	Overburden Truck Loading	0.0	0.0	0.8	0.0	0.0
7	Overburden	Overburden Dumping	0.0	0.0	0.8	0.0	0.0
8	Coal Mining	Coal Removal	0.0	0.0	16.1	0.0	0.0
9	Coal Mining	Coal Dumping - Crusher Feeder	0.0	0.0	16.1	0.0	0.0
10	Coal Mining	Coal Dumping - Run-of-Mine Pile	0.0	0.0	5.4	0.0	0.0
11	Coal Mining	Coal Reclaim from Run-of-Mine Pile	0.0	0.0	5.4	0.0	0.0
12	Coal Processing	Coal Crusher	0.0	0.0	2.2	0.0	0.0
13	Coal Processing	Transfer - Crusher to Conveyor 1	0.0	0.0	0.2	0.0	0.0
14	Coal Processing	Transfer - Conveyor 1 to Raw Stockpile	0.0	0.0	0.2	0.0	0.0
15	Coal Processing	Transfer - Raw Stockpile to Conveyor 2	0.0	0.0	0.2	0.0	0.0
16	Coal Processing	Transfer - Conveyor 2 to Jig Plant	0.0	0.0	0.2	0.0	0.0
17	Coal Processing	Transfer - Jig Plant to Conveyor 3	0.0	0.0	0.1	0.0	0.0
18	Coal Processing	Transfer - Conveyor 3 to Reject Stockpile	0.0	0.0	0.1	0.0	0.0
19	Coal Processing	Transfer - Jig Plant to Conveyor 4	0.0	0.0	0.1	0.0	0.0
20	Coal Processing	Transfer - Conveyor 4 to Clean Stockpile	0.0	0.0	0.1	0.0	0.0
21	Coal Processing	Transfer - Clean Stockpile to Conveyor 5	0.0	0.0	0.1	0.0	0.0

ID	Classification	Description	Potential Emissions (tpy)				
			NO_X	CO	PM_{10}	VOC	SO_2
22	Coal Processing	Transfer - Conveyor 5 to Loadout Bin	0.0	0.0	0.1	0.0	0.0
23	Coal Processing	Transfer - Loadout Bin to Truck	0.0	0.0	0.1	0.0	0.0
24	Wind Erosion	Mine Area	0.0	0.0	39.3	0.0	0.0
25	Wind Erosion	Run-of-Mine Coal Stockpile	0.0	0.0	0.9	0.0	0.0
26	Wind Erosion	Raw Coal Stockpile	0.0	0.0	0.4	0.0	0.0
27	Wind Erosion	Clean Coal Stockpile	0.0	0.0	0.7	0.0	0.0
28	Wind Erosion	Reject Stockpile	0.0	0.0	0.02	0.0	0.0
29	Mobile Equipment	Grader Operations	0.0	0.0	1.0	0.0	0.0
30	Mobile Equipment	Overburden Hauling - Backfill	0.0	0.0	8.6	0.0	0.0
31	Mobile Equipment	Overburden Hauling - Stockpile	0.0	0.0	61.3	0.0	0.0
32	Mobile Equipment	Coal Hauling within Mine	0.0	0.0	26.3	0.0	0.0
33	Mobile Equipment	Misc. Mine Traffic	0.0	0.0		0.0	0.0
34	Mobile Equipment	Other Vehicle Traffic	0.0	0.0		0.0	0.0
35	Mobile Equipment	Coal Truck Haul - Loop Road	0.0	0.0	1.1	0.0	0.0
		Total Potential Emissions from Point Emission Units	67.8	9.3	1.4	0.7	0.1
		Total Potential Emissions from Fugitive Emission Units	27.0	0.0	198.2	0.0	0.0
		Total Potential Emissions from All Emission Units	94.8	9.3	199.7	0.7	0.1

4.0 Representative Mining Emission Inventory for Compliance Demonstrations

The annualized operations noted in Table 1 cannot all occur at the same time because of various constraints such as equipment availability, safety considerations, and operational sequencing. Characterizing the mining operations that will produce the most likely daily activity and emission levels can be done by capturing a “snapshot” of the most likely overlapping or simultaneously occurring daily operations. This snapshot can then be used to represent the mining activity as if occurring all day every day over the year.

Surface mining is inherently a sequential operation during which access to mined material (coal in this case) is gained by exposing the material through blasting and the removal of overburden. As noted, the activity levels shown in Table 1 and emissions calculated in Table 2 were prepared to account for the various mining activities that could occur and to develop an overall emission unit inventory. Not all of the activities shown can occur at the same time due to safety precautions (e.g., blasting), limitations in equipment availability, activity sequencing, or other constraints. Modeling the complete emission unit inventory as if all activities occur simultaneously for short-term (i.e., daily) compliance would overstate the modeled ambient impacts. Therefore, a reasonable emission profile is usually developed to simulate a number of activities that typically could occur simultaneously.

An accurate representation of the daily mining activity is important with respect to PM_{10} emissions because of the existence of the 24-hour PM_{10} AAAQS. Even though all mining activities will not occur simultaneously or during the same 24-hour period, a representative mining emissions profile must be developed to determine modeled impacts to ambient air resulting from many of these activities as if occurring simultaneously.

To mine an area first requires the removal of topsoil and overburden, which exposes the coal to be mined and processed. Blasting is undertaken to loosen the material, as needed. The mined chunks of coal are transported to the coal processing plant with the finished product being loaded into trucks for off-site delivery.

Some of the described activities can occur concurrently, such as the processing of coal while actively mining. Similarly, as the mine plan progresses, reclaim activities can begin at one location within the mine while coal removal is occurring at another location within the mine. Some mine activities are sequential. For example, active coal removal cannot occur until topsoil and much overburden removal has been completed.

Table 3. Usibelli Coal Mine – Wishbone Hill – Modeled Daily Mine Activity Emission Inventory

ID	Classification	Description	Model ID	PM10 Emissions (g/s)			NOx Emissions (g/s)		
				Annual Emissions	24-Hour Emissions	Modeled Emission Rate	Annual Emissions	1-Hour Emissions	Modeled Emission Rate
1	Power Generation	Diesel-fired Engine	powergen	0.023	0.023	0.023	1.766	1.766	1.766
2	Heaters	Diesel-fired Heaters	heater	0.019	0.019	0.019	0.223	0.223	0.223
3	Topsoil Operations	Topsoil Removal to Storage	topsoil	0.25	0.81	0.81	0.00	0.00	
4	Blasting Operations	Overburden Blasting	blast7	0.0391	1.426	0.119	0.8	18.635	18.635
5	Blasting Operations	Coal Blasting	blast7	0.0196	1.426		0.8	18.635	
6	Overburden	Overburden Truck Loading	overbrl1	0.024	0.29	0.65	0.000	0.00	
7	Overburden	Overburden Dumping	overbrl2	0.024	0.29	0.65	0.000	0.00	
8	Coal Mining	Coal Removal	mine1	0.465	0.465	2.23E-06	0.000	0.000	
9	Coal Mining	Coal Dumping - Crusher Feeder	mine1	0.465	0.465		0.000	0.000	
10	Coal Mining	Coal Dumping - Run-of-Mine Pile	mine1	0.155	0.155		0.000	0.000	
11	Coal Mining	Coal Reclaim from Run-of-Mine Pile	mine1	0.155	0.155		0.000	0.000	
12	Coal Processing	Crusher	coalproc	0.063	0.106	0.183	0.000	0.000	
13	Coal Processing	Transfer - Crusher to Conveyor 1	coalproc	0.005	0.009		0.000	0.000	
14	Coal Processing	Transfer - Conveyor 1 to Raw Stockpile	coalproc	0.005	0.009		0.000	0.000	
15	Coal Processing	Transfer - Raw Stockpile to Conveyor 2	coalproc	0.005	0.009		0.000	0.000	
16	Coal Processing	Transfer - Conveyor 2 to Jig Plant	coalproc	0.005	0.009		0.000	0.000	
17	Coal Processing	Transfer - Jig Plant to Conveyor 3	coalproc	0.002	0.006		0.000	0.000	
18	Coal Processing	Transfer - Conveyor 3 to	coalproc	0.002	0.006		0.000	0.000	

ID	Classification	Description	Model ID	PM10 Emissions (g/s)			NOx Emissions (g/s)		
				Annual Emissions	24-Hour Emissions	Modeled Emission Rate	Annual Emissions	1-Hour Emissions	Modeled Emission Rate
		Reject Stockpile							
19	Coal Processing	Transfer - Jig Plant to Conveyor 4	coalproc	0.002	0.006		0.000	0.000	
20	Coal Processing	Transfer - Conveyor 4 to Clean Stockpile	coalproc	0.002	0.006		0.000	0.000	
21	Coal Processing	Transfer - Clean Stockpile to Conveyor 5	coalproc	0.002	0.006		0.000	0.000	
22	Coal Processing	Transfer - Conveyor 5 to Loadout Bin	coalproc	0.002	0.006		0.000	0.000	
23	Coal Processing	Transfer - Loadout Bin to Truck	coalproc	0.002	0.006		0.000	0.000	
24	Wind Erosion	Mine Area 1	topwind	1.130	8.596	8.596	0.000	0.000	
	Wind Erosion	Mine Area 2	overwind	0.027	8.596	8.596	0.000	0.000	
25	Wind Erosion	Run-of-Mine Coal Stockpile	runcwind	0.027	0.409	0.409	0.000	0.000	
26	Wind Erosion	Raw Coal Stockpile	rawwind	0.010	0.153	0.153	0.000	0.000	
27	Wind Erosion	Clean Coal Stockpile	cleanwnd	0.021	0.179	0.179	0.000	0.000	
28	Wind Erosion	Reject Stockpile	rjctwind	0.001	0.010	0.010	0.000	0.000	
29	Mobile Equipment	Grader Operations	mobile	0.03	0.03	0.82	0.00	0.00	
30	Mobile Equipment	Overburden Hauling - Backfill	overbrd1	0.25	0.25	0.65	0.00	0.00	
31	Mobile Equipment	Overburden Hauling - Stockpile	overbrd2	1.77	1.77	0.65	0.00	0.00	
32	Mobile Equipment	Coal Hauling within Mine	mobile				0.00	0.0	
33	Mobile Equipment	Misc. Mine Traffic	mobile	0.76	0.76		0.00	0.00	
34	Mobile Equipment	Other Vehicle Traffic	mobile				0.00	0.0	
35	Mobile Equipment	Coal Truck Haul - Loop Road	mobile	0.031	0.03		0.00	0.00	
36	Off-Source	Coal Truck Haul - Access Road	road 1-21	0.71	0.71	0.034	0.00	0.00	

The overlapping and concurrent daily mine activity profile that Usibelli modeled to demonstrate compliance with the applicable AAAQS is shown in Table 3. The activity profile suggested in Table 3 represents a reasonable description of daily mine activity.

In summary, a representative, conservative, daily mine activity PM_{10} emission profile has been identified that adequately characterizes a reasonable determination of the impact to ambient air quality in the vicinity of the Wishbone Hill site due to mining and related activities and the associated PM_{10} emissions.

5.0 Proposed Modeled Emission Unit Inventory Parameters

The modeled emission unit inventory for the Usibelli Wishbone Hill site is shown in Table 4. Modeling for the point source emission units was completed by locating the emission units within the mine boundary and applying characteristic exhaust parameters for those types of units (diesel-fired generator engines and diesel-fired heaters).

Modeling for the fugitive emission units was done using a variety of open pit and volume source characterizations. The mine access and haul road were modeled as a series of spaced volume sources along the length of the road.

Unlike the standard exhaust parameters associated with point source type emission units (stack height, exhaust temperature, exhaust exit velocity, stack exit diameter), the exhaust parameters associated with fugitive type emissions as characterized by volume sources include initial lateral and vertical dispersion parameters as descriptors of the size of the volume source. The initial lateral dimension (σy) and initial vertical dimension (σz) are calculated by dividing the length of the side of the volume source by 4.3 and dividing the vertical dimension by 2.15. Because of the relatively large operational areas associated with mining, the volume sources used have commensurately large initial lateral dimensions. The vertical dimensions were determined based on many activities involving loading, unloading, and moving, which all potentially generate tall, transient, dust-filled volumes.

The open pit algorithm in AERMOD allows for further definition of the physical orientation and size of the mine area. The modeled PM_{10} emission rates shown for the open pit emission unit includes portions of overburden removal, blasting, and mining operations emissions.

The fugitive emissions of disturbed particulate matter typically result in different sized particle diameters. Once these different sized particles are in the atmosphere the material will settle out differentially depending on the particle size. AERMOD allows for the characterization of this plume depletion. This option will be invoked in AERMOD as described in Section 10.

Table 4. Usibelli Coal Mine – Wishbone Hill Modeled Emission Unit Parameters – PM_{10} Emission Units

Model ID	Type	Location			PM_{10} Emission Rate (g/s)	Exhaust Parameters for Point and Volume Sources				
		X (m)	Y (m)	Z (m msl)		Height (m)	Temp (K) σy0	Exit Velocity (m/s) σz0	Diameter (m)	
powergen	POINT	390821	6842671	268.8	0.023	3.65	750	40.00	0.15	
heater	POINT	390709	6842890	281.3	0.019	3.65	750	40.00	0.1	
coalproc	VOLUME	390709	6842890	281.3	0.183	3.65	15.8	1.69		
mobile	VOLUME	390609	6842990	285.3	0.820	3	275	1.69		
topsoil	VOLUME	390486	6843250	285.3	0.810	3.65	140	1.69		
overbrl1	VOLUME	390006	6842997	270.0	0.650	6.1	140	2.84		
overbrl2	VOLUME	390006	6842737	270.0	0.650	6.1	140	2.84		
overbrd1	VOLUME	390706	6843507	290.0	0.650	6.1	140	2.84		
overbrd2	VOLUME	391136	6843717	295.0	0.650	6.1	140	2.84		
topwind	VOLUME	390486	6843250	285.3	8.596	10.1	135.5	4.65		
overwind	VOLUME	390685	6842710	281.0	8.596	10.1	135.5	4.65		
runcwind	VOLUME	390700	6842800	280.0	0.179	5	30	4.65		
cleanwnd	VOLUME	390710	6842890	281.0	0.153	5	19	4.65		
rawwind	VOLUME	390700	6842890	281.0	0.409	5	19	4.65		
rjctwind	VOLUME	390705	6842900	281.0	0.01	5	1.9	4.65		
blast7	VOLUME	389411	6843277	250.4	0.1188	30.4	25	15		
mine1	OPENPIT	389411	6843277	280.4	2.23E-06	0	745	745	8369100	50
ROAD1	VOLUME	390700	6842897	281.7	0.034	2	7.1	1.69		
ROAD2	VOLUME	390881	6842747	270.9	0.034	2	7.1	1.69		
ROAD3	VOLUME	391041	6842577	257.1	0.034	2	7.1	1.69		
ROAD4	VOLUME	391122	6842297	244.2	0.034	2	7.1	1.69		
ROAD5	VOLUME	391141	6842027	243.0	0.034	2	7.1	1.69		
ROAD6	VOLUME	391141	6841717	243.0	0.034	2	7.1	1.69		
ROAD7	VOLUME	391293	6841627	231.7	0.034	2	7.1	1.69		
ROAD8	VOLUME	391563	6841487	198.7	0.034	2	7.1	1.69		
ROAD9	VOLUME	391804	6841357	184.5	0.034	2	7.1	1.69		
ROAD10	VOLUME	391984	6841277	189.8	0.034	2	7.1	1.69		
ROAD11	VOLUME	392256	6841167	189.1	0.034	2	7.1	1.69		

Model ID	Type	Location			PM_{10} Emission Rate (g/s)	Exhaust Parameters for Point and Volume Sources				
		X (m)	Y (m)	Z (m msl)		Height (m)	Temp (K) σy0	Exit Velocity (m/s) σz0	Diameter (m)	
ROAD12	VOLUME	392516	6841087	194.2	0.034	2	7.1	1.69		
ROAD13	VOLUME	392787	6840927	188.7	0.034	2	7.1	1.69		
ROAD14	VOLUME	392958	6840837	185.8	0.034	2	7.1	1.69		
ROAD15	VOLUME	393099	6840687	183.0	0.034	2	7.1	1.69		
ROAD16	VOLUME	393219	6840497	182.0	0.034	2	7.1	1.69		
ROAD17	VOLUME	393198	6840337	182.0	0.034	2	7.1	1.69		
ROAD18	VOLUME	393118	6840247	181.6	0.034	2	7.1	1.69		
ROAD19	VOLUME	393008	6840157	173.6	0.034	2	7.1	1.69		
ROAD20	VOLUME	392917	6840087	165.7	0.034	2	7.1	1.69		
ROAD21	VOLUME	392858	6840037	162.2	0.034	2	7.1	1.69		
Model Time Periods Adjusted by Emission Factors (Wind Speed and Hour of Day)										
EMISFACT	topwind	WSPEED	0	0	0	0	1	1		
EMISFACT	overwind	WSPEED	0	0	0	0	1	1		
Deposition Parameters Applied										
PARTDIAM	powergen	1	10							
MASSFRAX	powergen	0.95	0.05							
PARTDENS	powergen	1	1							
PARTDIAM	heater	1	10							
MASSFRAX	heater	0.95	0.05							
PARTDENS	heater	1	1							
PARTDIAM	coalproc	1	10							
MASSFRAX	coalproc	0.2	0.8							
PARTDENS	coalproc	1.2	1.2							
PARTDIAM	mobile	1	10							
MASSFRAX	mobile	0.2	0.8							
PARTDENS	mobile	2	2							
PARTDIAM	topsoil	1	10							
MASSFRAX	topsoil	0.2	0.8							

Model ID	Type	Location			PM_{10} Emission Rate (g/s)	Exhaust Parameters for Point and Volume Sources				
		X (m)	Y (m)	Z (m msl)		Height (m)	Temp (K) σy0	Exit Velocity (m/s) σz0	Diameter (m)	
PARTDENS	topsoil	2	2							
PARTDIAM	overbrl1	1	10							
MASSFRAX	overbrl1	0.2	0.8							
PARTDENS	overbrl1	2	2							
PARTDIAM	overbrl2	1	10							
MASSFRAX	overbrl2	0.2	0.8							
PARTDENS	overbrl2	2	2							
PARTDIAM	overbrd1	1	10							
MASSFRAX	overbrd1	0.2	0.8							
PARTDENS	overbrd1	2	2							
PARTDIAM	overbrd2	1	10							
MASSFRAX	overbrd2	0.2	0.8							
PARTDENS	overbrd2	2	2							
PARTDIAM	topwind	1	10							
MASSFRAX	topwind	0.2	0.8							
PARTDENS	topwind	2	2							
PARTDIAM	overwind	1	10							
MASSFRAX	overwind	0.2	0.8							
PARTDENS	overwind	2	2							
PARTDIAM	cleanwnd	1	10							
MASSFRAX	cleanwnd	0.2	0.8							
PARTDENS	cleanwnd	2	2							
PARTDIAM	rawwind	1	10							
MASSFRAX	rawwind	0.2	0.8							
PARTDENS	rawwind	2	2							
PARTDIAM	runcwind	1	10							
MASSFRAX	runcwind	0.2	0.8							
PARTDENS	runcwind	2	2							
PARTDIAM	rjctwind	1	10							
MASSFRAX	rjctwind	0.2	0.8							

Model ID	Type	Location			PM_{10} Emission Rate (g/s)	Exhaust Parameters for Point and Volume Sources				
		X (m)	Y (m)	Z (m msl)		Height (m)	Temp (K) σy0	Exit Velocity (m/s) σz0	Diameter (m)	
PARTDENS	rjctwind	2	2							
PARTDIAM	mine1	1	10							
MASSFRAX	mine1	0.2	0.8							
PARTDENS	mine1	2	2							
PARTDIAM	blast7	1	10							
MASSFRAX	blast7	0.2	0.8							
PARTDENS	blast7	2	2							
PARTDIAM	ROAD1-ROAD21	1	10							
MASSFRAX	ROAD1-ROAD21	0.2	0.8							
PARTDENS	ROAD1-ROAD21	2	2							

Table Notes: Parameters for openpit source include release height (m), length of X side of open pit (m), length of Y side of open pit (m), pit volume (m^3), pit orientation angle of rectangular pit area (degrees from North).

6.0 Receptor Grid and AERMAP

Modeled pollutant concentrations in the ambient air are determined at receptor locations beginning at the ambient air boundary, which is that boundary that demarcates an industrial area from a public area. The definition of ambient air is that air to which the general public has access. Typically, a boundary fence would denote an ambient air boundary. Within that area which the owner controls and has the ability to limit access to the public, the area is not ambient air.

The Wishbone Hill mine area is fairly extensive. The boundary and topography of the area are shown in Figure 1. As noted above, mining activity is not planned to occur everywhere within the boundary at once, but rather mining will be located nearest the active mine area and then when completed will switch to the other active mine area.

Access to non-active areas of the mine can be granted as long as public safety and compliance with regulations is maintained. Within the Usibelli boundary are portions of a maintained and public trail as well as access areas along Moose Creek that would be considered publicly accessible and therefore ambient air. Therefore, Usibelli has placed receptors along those areas even though within the boundary, reflecting the definition of ambient air.

Because of the sequencing of the mining operations Usibelli is opting to allow access to other portions within its boundary especially the northern part during the first phases of the mining during which the southern and western portions of the mine site will be active. Hence Usibelli will model ambient impacts at receptors within its boundary to show that public access is allowed. This temporary boundary will likely change as the mining progresses and may change its shape once to the active mine areas change but for now Usibelli will apply the boundary as shown in Figure 2 as ambient air and begin the AAAQS compliance modeling there.

Also shown in Figure 2 are the Usibelli Wishbone Hill mine area boundary (light blue line), the ambient air receptor locations (light green crosses), the public access receptor locations including the trails and Moose Creek locations (dark blue crosses), and the emission unit modeled locations (red stars). The air quality receptors are located along the boundary and outward into ambient air in areas that include the nearby Moose Creek- Soapstone neighborhoods as well as the Ya Ne Dah Ne tribal school and other areas around the Wishbone Hill mine site.

The topography, receptor elevations, and critical hill heights were obtained from 1-degree USGS digital elevation model (DEM) data for the area. The shaded relief of the two sections is shown in Figure 3. The DEM data was processed in AERMAP (version 11103) and used to determine heights for each of the over 1,000 modeled receptors.

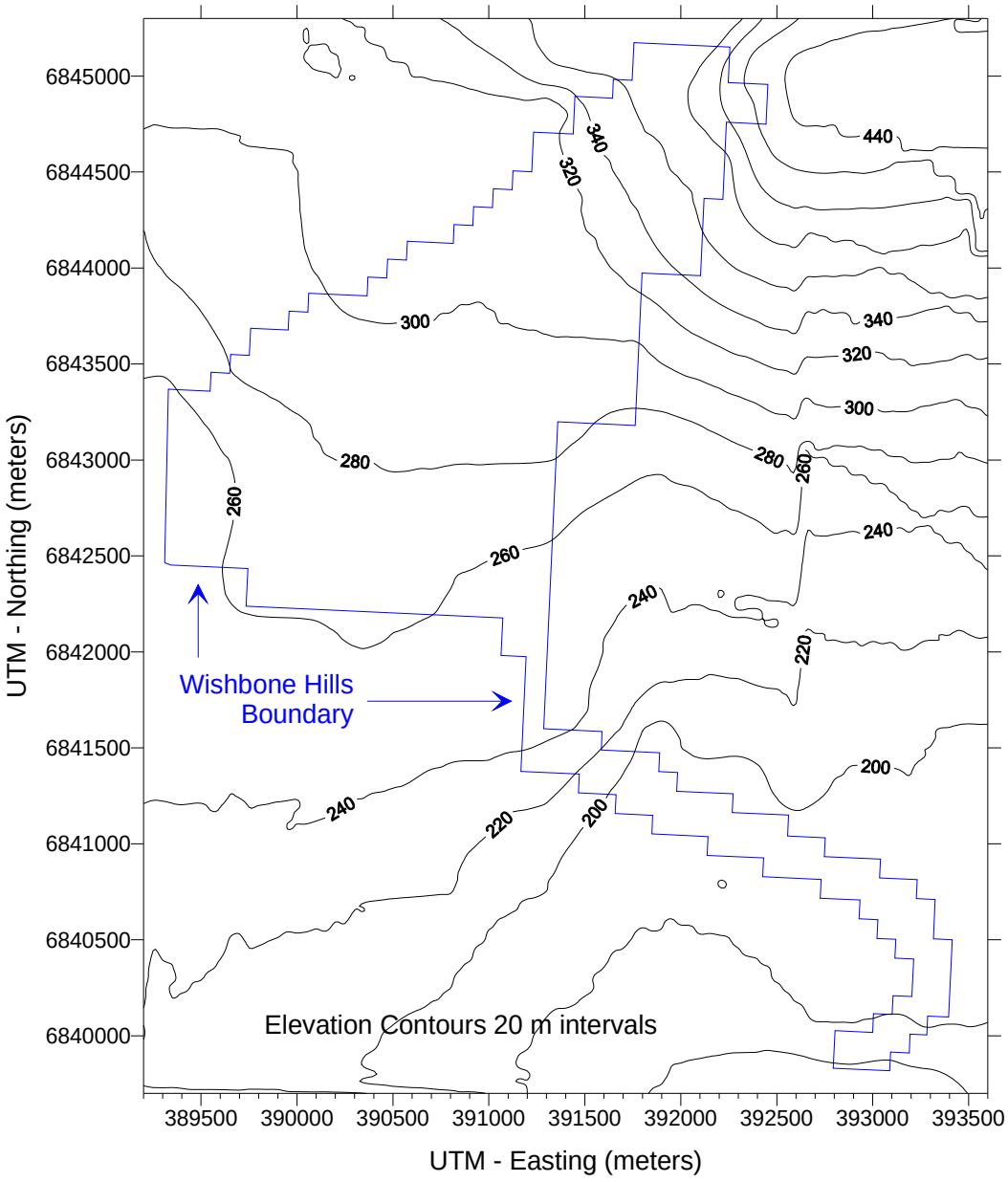


Figure 1. Usibelli Coal Mine – Wishbone Hill Topography and Boundary

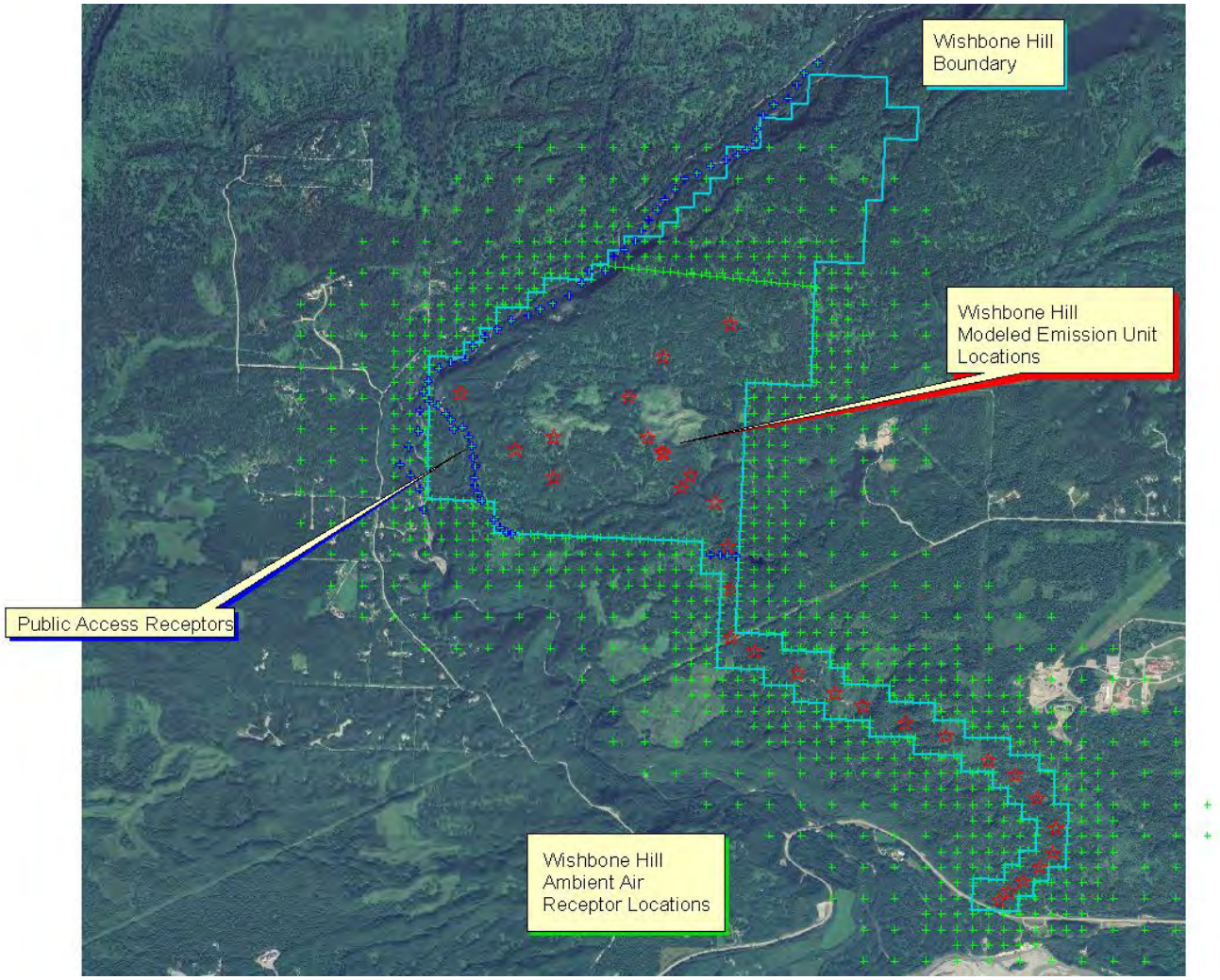


Figure 2. Usibelli Coal Mine – Wishbone Hill Ambient Air Quality Boundary, Modeled Locations, and Modeled Emission Unit Locations

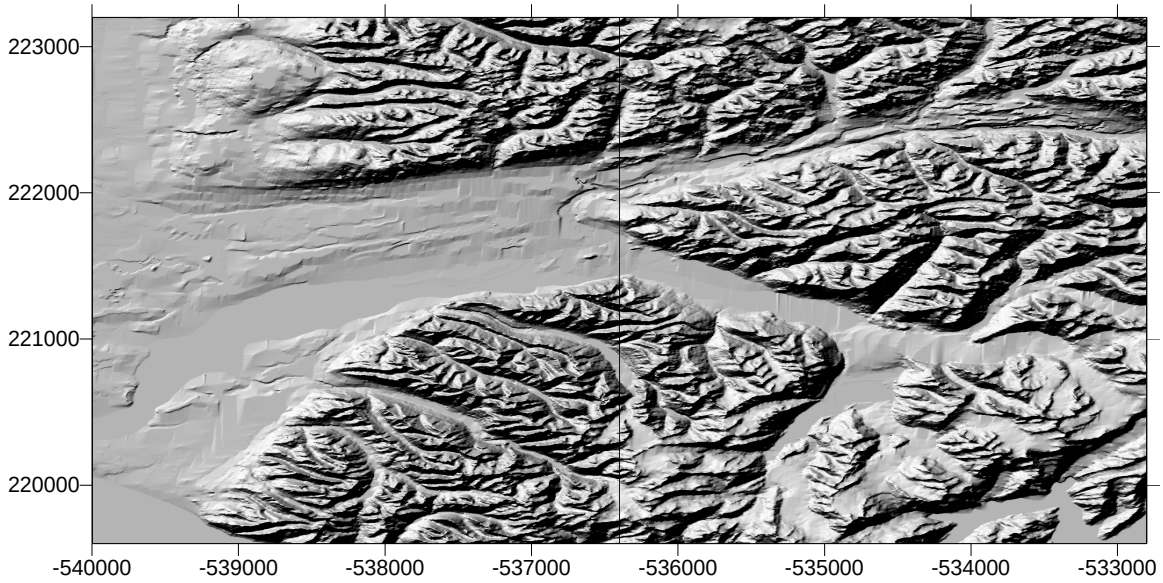


Figure 3. Shaded Relief from 1-degree DEM used in AERMAP.

7.0 On Site Meteorological Data Preparation in AERMET

On site meteorological data were collected from October 23, 1988 through October 31, 1991 as part of the Idemitsu Alaska Inc. Wishbone Hill Air Quality and Meteorological Monitoring Program. The meteorological monitoring site location, shown in Figures 4 and 5, is located near Wishbone Lake. The tower site, data collection site, and the cessation of the monitoring operation were reviewed and approved by ADEC in correspondence from Gerry Guay (March 1989 and October 1990).

Data collection during the period for the measured values of wind speed, wind direction, temperature, precipitation, and sigma theta were found to exceed 90 percent data capture rates during the full (January through December) 1990 period.

This hourly collected surface meteorological data from 1990 was used as the basis for this dispersion modeling analysis. This data set is on-site and representative of conditions found at the mine site. Because the data are site-specific, only a single year of data are needed to satisfy the requirements for an ambient air quality assessment.

Figure 4. Location of Wishbone Hill Meteorological Monitoring Station Relative to Surroundings

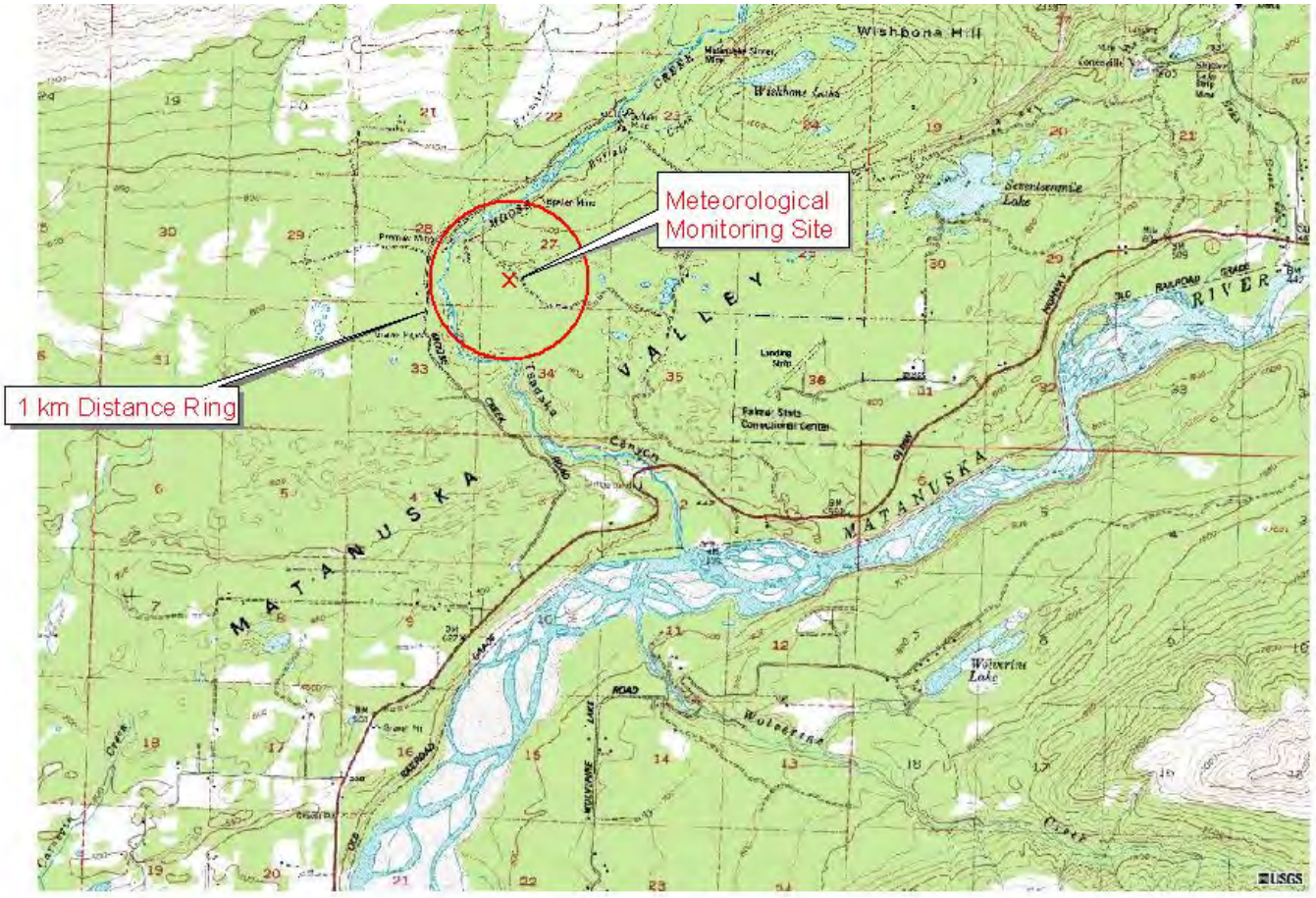


Figure 5. Wishbone Hill Meteorological Monitoring Site and 1-km Distance Ring

The 1990 surface data was coupled with coincident cloud cover data from the Palmer airport as well as upper air data from the Anchorage International Airport. AERMET version 12345 was used to process these data. The AERMET stage 3 parameters are shown in Table 5 employing a single sector, varying values on a monthly basis to better capture the Alaskan winter period of October through April. A second set of parameters was used to depict the Palmer airport geophysical parameters.

Table 5. Usibelli Coal Mine – Wishbone Hill AERMET Stage 3 Geophysical Parameters

FREQ_SECT	MONTHLY	1			
SECTOR	1	0	360		
	Month	Sector	Albedo	Bowen Ratio	Surface Roughness
SITE_CHAR	1	1	0.43	2	0.9
SITE_CHAR	2	1	0.43	2	0.9
SITE_CHAR	3	1	0.43	2	0.9
SITE_CHAR	4	1	0.43	2	0.9
SITE_CHAR	5	1	0.12	1.5	1.15
SITE_CHAR	6	1	0.12	1.5	1.15
SITE_CHAR	7	1	0.12	0.6	1.3
SITE_CHAR	8	1	0.12	0.6	1.3
SITE_CHAR	9	1	0.12	1.8	1.05
SITE_CHAR	10	1	0.43	2	0.9
SITE_CHAR	11	1	0.43	2	0.9
SITE_CHAR	12	1	0.43	2	0.9

Values are average of deciduous and coniferous provided in AERMET User's Guide Tables 4.1, 4.2a, and 4.3.

8.0 Procedure to Fill Missing Cloud Cover Data – 1990 Year of Meteorological Data

The Usibelli Wishbone Hill on-site meteorological data set has been deemed complete and representative of site-specific conditions, was collected in an appropriate manner, has been approved for dispersion modeling at the Wishbone Hill site, and fulfills the requirements of one-year of on-site meteorological data in accordance with the Guideline on Air Quality Modeling. The tower site, data collection site, and the cessation of the monitoring operation were reviewed and approved by ADEC in correspondence from Gerry Guay (March 1989 and October 1990).

However, processing in AERMET requires certain parameters for on-site data to allow the calculation of surface heat fluxes. These parameters were not measured during the Wishbone Hill meteorological data collection. Instead, cloud cover data from the Palmer

airport was substituted to allow AERMET to calculate necessary surface parameters for AERMOD.

The Palmer airport cloud cover data set has data gaps. During periods of missing data no AERMET calculations can be made. Usibelli filled those missing periods so that a more complete modeling assessment can be made.

The 1990 Palmer sky cover data set has 4,767 missing hours of cloud cover. Of the remaining valid hours, 822 hours are clear skies, 494 hours are 3/10 cover, 731 hours are labeled 9/10 cover, and 1,946 hours are noted as overcast.

Usibelli has examined nine other years of Palmer meteorological data and used the following approach to fill the missing periods:

- For each year of the period 1986 through 1995, process the Palmer surface and Anchorage upper air data in AERMET to obtain sky cover values;
- For each hour of a valid sky cover value over the 10 year period determine the minimum sky cover value;
- Substitute the valid minimum sky cover value for any missing value in the 1990 sky cover record; and
- Calculate the average sky cover for each year of the 10 year period and apply the minimum calculated average sky cover to the remaining missing periods of data.

Using this approach for the 1990 period replaced approximately 1,900 hours of missing data with valid hourly sky cover data from the coincident hour from one of the other nine years of sky cover data. This substitution left approximately 2,885 hours of missing sky cover. The average sky cover value from each of the 10 years of Palmer data ranges from 6.89 to 7.92 for a sky cover value of between 7 and 8. Based on this analysis, the value of 7 was used to fill the remaining missing hours.

The revised and filled hourly sky cover were processed in stage 1 AERMET on the on-site data record and consisted of valid 1990 Palmer sky cover data, augmented with minimum recorded coincident hour sky cover data from one of the other nine years of data to fill the missing values, and a minimum average annual sky cover value to fill the remaining missing cloud cover data.

The AERMET stage 1 instructions included one year (1990) of upper air data from Anchorage International Airport, one year of surface (1990) data collected at the Palmer

airport, and one year (1990) of on-site data collected at Wishbone Hill. The on-site data included the measured values at Wishbone Hill of ambient temperature, precipitation amount, wind speed, wind direction, sigma theta, and included the Palmer sky cover data as if measured at Wishbone Hill. The threshold wind speed was set to 0.5 meters per second (m/s) and standard audit ranges were invoked. The AERMET processing files are being provided the ADEC. Palmer wind data were not used in the AERMET processing.

This meteorological data set was used in AERMOD to model the emissions from combustion emission units as well as the daily mining profile associated with the PM_{10} and NO_x emissions resulting from the planned operations at Wishbone Hill.

A wind rose of the 1990 wind speeds and direction coupled with Palmer surface meteorological data to include cloud cover is shown in Figure 6.

9.0 Wind Erosion and Modeled Emissions

A number of planned storage piles are primarily associated with overburden and topsoil stockpiling while awaiting mine reclamation. Stockpiles are susceptible to wind erosion, more so if routinely disturbed because any erosion mitigation efforts may be altered and the freshly exposed material become more easily airborne.

To cause erosion, the wind speeds must be sufficiently high and exceed a threshold value known as the threshold friction velocity. This threshold velocity can be calculated based on the surface roughness parameters in the vicinity of the intended stockpiles.

Currently the method includes applying fastest mile assumptions to pile configurations and pile disturbances to calculate an emission factor as provided in Chapter 13 of AP-42. Applying the formulaic approach described in AP-42 suggests that measured wind speeds must be strong enough to cause significant wind erosion.

Occurrences of high winds and surface erosion and long distance transport of glacial loess dust from the Matanuska Valley have been documented (e.g., letter from Stephen Morris, Manager Air Quality Program, Municipality of Anchorage to Barbara Trost, ADEC, Air Monitoring Section, dated January 8, 2009, regarding Exceptional Event Flagged PM_{10} Data) and shown to occur under certain wind conditions (direction and speed/gustiness).

The area surrounding the Wishbone Hill mine site is more rugged than smooth and is characterized by a larger surface roughness. The AERMET processing stage 3 files

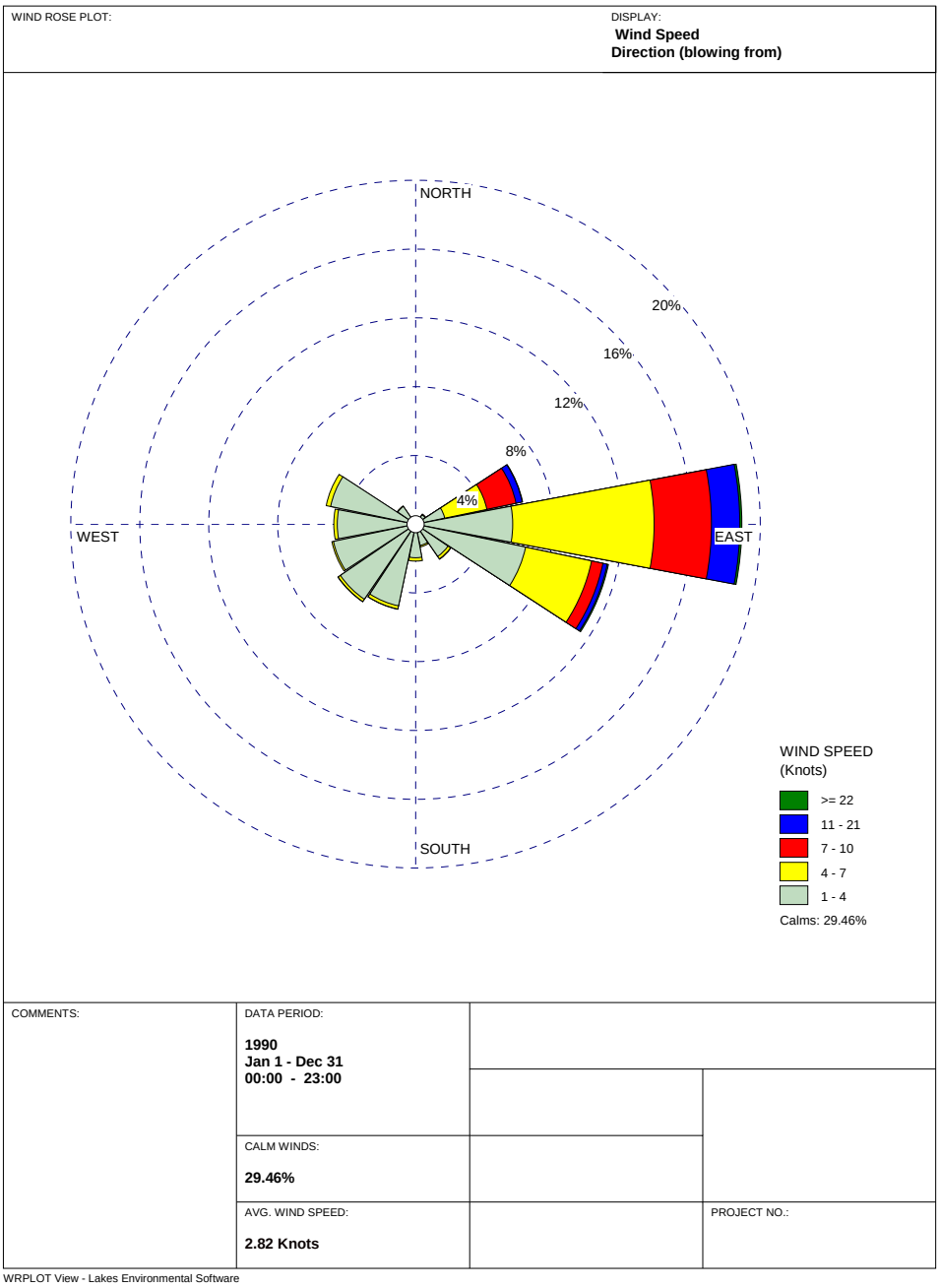


Figure 6. Wishbone Hill – 1990 Wind Rose

used a variety of roughness parameters depending on wind direction, with the lowest value used of 0.9 m. Examining AP-42 Table 13.2.5-2 Threshold Friction Velocities suggests that the threshold wind velocity at 10 m above the surface must be approximately 20 m/s to exceed the threshold friction velocity at the surface for overburden and over 15 m/s to exceed the threshold friction velocity for ground coal or the coal surrounding a coal pile.

Examining the meteorological data collected at Wishbone Hill as well as the specific values to be used in the hourly meteorological data file for modeling suggests that no measured hourly wind speeds exceed 20 m/s [45 miles per hour (mph)] and that wind speed during less than 10 hours per year would exceed 15 m/s. Furthermore, the time that these few higher wind speeds occurred (all in November and most on a single day) coincides with likely snow cover in the area which tends to mitigate dust erosion.

However, the erosion potential is not based on hourly wind speeds but rather shorter-term values and a fastest mile wind approach as suggested in AP-42. This fastest mile approach which can be simulated by applying short duration wind speed data can be calculated from 2-min wind speed averages as obtained from the Palmer airport site.

The procedures outlined in AP-42 Section 13.2.5 and the values relating to threshold friction velocity as contained in Table 13.2.5-2 Threshold Friction Velocities (TFV) to determine the suggested wind speeds necessary for re-entrainment of dust from the planned storage piles at Wishbone Hill were examined.

Shown in Table 13.2.5-2 the TFV for Scoria is listed as 1.33 m/s corresponding to a required wind speed at 10 m of about 25 m/s. For an uncrusted coal pile the TFV is 1.12 m/s and a corresponding wind speed is 21 m/s.

As mentioned previously, the storage piles to be established at Wishbone Hill are intended as long term non-disturbed standing piles that will be controlled and allowed to crust, thereby reducing the re-suspension potential. Scoria was used as it was deemed the most representative of the materials shown because of the nature of the planned Wishbone Hill piles – large, low piles with limited erosion potential.

To calculate the erosion potential from the planned storage piles at Wishbone Hill, the ASOS wind summaries were obtained from the National Climatic Data Center for the Palmer airport site for the years 2005-2011 and the reported two-minute wind speeds were examined and used in the wind erosion calculations. Spreadsheets were developed for each of the storage piles and for each day of the 2005-2011 meteorological data period wind erosion potentials were calculated based on pile size and 2-min wind speeds and TFV appropriate for the storage material.

These spreadsheets are being provided as part of the supporting documentation and are the basis for the emission rates calculated and shown in Table 3.

10.0 Particulate Matter Deposition, Particle Size Speciation, Alternate Emission Factors

The types of activities associated with mining can disturb surface material and cause particulate matter to become airborne. These surface disturbances either through penetrative excavation, travel over, or transient handling (e.g., loading and dumping) generate fugitive emissions because the emissions are not released through a defined opening to the atmosphere but rather dispersed are into and through the atmosphere within the operational area.

Larger disturbed particles will settle to the ground more quickly than smaller particles due to higher settling velocities. Applying a particle size speciation to account for this phenomenon was approved by ADEC in its protocol approval letter for use in the dispersion modelin methodology. AERMOD is coded to simulate these activities and account for the downwind plume depletion and deposition mechanics that remove material from the plume as the plume is transported downwind.

The primary activities at Wishbone Hill that will disturb surface dust are those activities associated with overburden removal and hauling, active open pit mining, and truck hauling. Combustion related particulate will tend to be smaller than the fugitive type of material.

The size speciation used to simulate the activities at Wishbone Hill included two size classifications of 1 micrometer (micron or µm), and 10 microns in diameter. The density chosen is that associated with either unknown (1) or coal and aggregates (2). The percentage in each size class also varied by activity so that combustion related sizes were primarily smaller particles and fugitive particulate matter emissions were primarily larger particles.

Surface material initially disturbed by haul road traffic can be represented by an EPA AP-42 equation using the input parameters to reflect the conditions extant, (e.g. silt content). As more of the same types of trucks travel the same roadway the initial friable road dust is displaced from the active road bed. This traffic reduces the amount of dust generated and, with the addition of surface wetting as further control, the emission factor used to describe the initial condition may not best represent the repetitive activity.

Most of the PM_{10} emissions at Wishbone will be the result of fugitive activities, with much of those emissions the result activity associated with haul roads. The dust control plan for the Wishbone Hill site includes a description of controls to be applied and notes that

active dust suppression in the form of chemical suppressants or watering will occur to mitigate dust re-entrainment.

The AP-42 equations as described in Attachment C were used to develop the emissions calculated for hauling and the assumption of wetting or other dust suppressants. The AERMOD model was run with deposition parameters to simulate the downwind transport of emitted dust from haul road and other surface disturbing operations at Wishbone.

11.0 Background Concentrations

The selection of ambient background concentrations is important in that the data should be representative of the activity area and include the effects of non-specifically modeled emission units. The addition of ambient background concentrations along with an inventory of modeled emission units forms an aggregate impact for comparison with the AAAQS and assures the public of air quality protection under the permit authority of ADEC.

The Wishbone Hill project area is remote, located away from any significant nearby emission units other than those units proposed to support the mining operations. Because of the predominant wind directions at the site, most air arriving at the project location will be from relatively “clean” upwind areas affected only by occasional, naturally occurring, wind-blown dust.

Under the requirements of the State Implementation Plans (SIP) which are ADEC approved, concentrations of naturally occurring pollutants can be removed from monitor records for the purposes of demonstrating compliance with ambient air quality standards. Therefore, even though the Wishbone Hill site may be influenced by episodic wind driven dust events, the allowable discounting of naturally occurring elevated dust events suggests that the ambient background should be relatively clean at the project site.

The paucity of monitoring data within Alaska required Usibelli to suggest use of a monitor located along the Alaska North Slope as representative of background concentrations given the predominant wind flow pattern at Wishbone and the lack of upwind emission sources. Upon review ADEC suggested that Usibelli should apply measurements from a more regional monitor rather than a station located more distant, such as the North Slope.

During discussions, ADEC suggested that using measured PM_{10} values from 2009 obtained at the Eagle River Parkgate monitor site may provide usable information. In suggesting the possibility of using the Eagle River data, ADEC noted that elevated PM_{10} concentrations during wind driven transport events at Eagle River could be dismissed in

a manner analogous to that used for other data sets and other projects on the Alaska North Slope. This methodology examines meteorological conditions and monitored concentrations, removes values from consideration according to a protocol, and re-averages the remaining values to form daily concentrations for use as background concentrations.

Usibelli continues to believe that, given the location of the mine site, applying a monitored concentration from a distant site is more likely to represent a truer background once naturally occurring wind-blown dust is discounted. However, Usibelli understands the ADEC concern and has reviewed the more regional Eagle River particulate matter data from 2009. Usibelli proposes to apply the average hourly background PM_{10} concentration as measured at Eagle River together with the specifically modeled mine activity being modeled.

The daily monitored PM_{10} concentrations for 2009 are shown in Figure 7. As shown in this figure, some seasonality exists with higher values in the spring and fall and a peak in summer as well. With the exception of two distinct daily concentrations, all values are less than 80 micrograms per cubic meter ($\mu g/m^3$). The average of all hourly values is 20 $\mu g/m^3$. The statistics are shown in Table 6.

Table 6. Eagle River Parkgate – 2009
PM_{10} Monitored Concentration ($\mu g/m^3$) Statistics

Statistic	All Hourly Values	All Daily Average Values
Average	20	20
Maximum	547	163
Minimum	0	2
N	8,571	543
Max	547	163.4

As shown in both Table 6 and Figure 7, variability exists across the year with two high occurrence periods skewing maximum hourly and daily average values.

The two high value periods shown in Figure 7 occurring in October 2009 (October 30 and 31) are associated with high winds and predominantly northeast flows, which suggest wind-driven dust from the Matanuska-Susitna Valley. These values (163 and 137 $\mu g/m^3$, respectively) can be eliminated from the monitoring data because these events are naturally occurring elevated concentration periods. The daily monitored

concentrations in descending order are shown in Table 7. The daily average PM_{10} monitored concentrations (last column) are shown along with meteorological data from Palmer, Alaska, and the day of occurrence.

Three days exist with high wind speeds and favorable directions for elevated particulate matter concentrations that could be influenced by wind driven events. These days occur at the end of October. However, a number of days exist with elevated concentrations and directions not typically associated with wind-driven events in the area. These events may be associated with fugitive type dust activities similar to activities likely to occur with mining at Wishbone Hill.

The Eagle River Parkgate monitoring site has been described in Section 2.5 of the "Alaska's 2011 Air Monitoring Network Plan Chapter 2 – Anchorage," noting that "the site is located in a suburban/commercial use area with monitoring site classified as neighborhood scale, population-oriented monitoring site. The document also notes the proximity to the four lane asphalt Old Glenn Highway.

"This site is located approximately 44 meters east of the Old Glenn Highway which carries an average daily traffic volume of 22,700. Re-entrained roadway dust from this road is a significant source of coarse particulate matter. Traffic is a major source of CO. The site 2-18 is also located near a number of retail and employee parking areas which are a source of cold start emissions. The Alaska Railroad passes within 4 kilometers of the site. Like other sites in the MOA, Eagle River is seasonally affected by wind-blown glacial loess, and occasionally affected by wildfire smoke and volcanic eruptions."

Examining some of the higher concentration periods in Figure 7 that are not associated with wind-driven glacial soils, suggests that roadway dust re-entrainment may indeed be significant with most of the loading occurring in just a few short hours. The April period of higher monitored values, is shown in Figure 8 spanning April 15 through 22, 2009. This figure is a plot of the hourly monitored concentrations as well as the daily average monitor value, versus time of day.

Table 7. Eagle River Parkgate – Highest PM_{10} Daily Monitored Concentrations – Comparison with Palmer Wind Directions and Wind Speeds

Date of Occurrence (YYYYMMDY)	Daily Average Palmer Wind Direction (degrees from)	Daily Average Palmer Wind Speed (knots)	Daily Average Monitored Concentration ($\mu g/m^3$)
20091030	24.2	26.2	163.4
20091031	31.7	31.7	136.8
20090422	209.2	5.6	78.0
20090416	160.4	4.9	73.5
20090417	101.7	3.4	73.2
20090420	153.8	5.0	68.3
20090409	127.9	9.3	67.3
20090415	137.5	4.6	66.5
20091104	150.4	15.5	64.5
20091101	10.4	3.6	58.3
20091102	72.9	1.8	56.5
20090430	152.5	4.9	54.2
20091103	105.0	4.4	53.2
20091106	63.8	1.2	52.8
20090501	143.8	5.4	52.5
20090414	125.0	14.7	52.3
20090317	128.8	7.8	51.6
20091022	255.0	12.0	50.4
20090401	235.0	5.0	49.9
20090421	132.9	8.0	49.3
20090708	114.6	3.5	46.9
20090526	117.5	6.2	46.5
20090429	139.2	6.1	46.3
20091021	55.8	6.2	45.6
20090406	164.2	3.6	44.7
20090428	157.1	3.4	44.0
20090709	77.5	2.4	43.6
20090407	210.4	5.6	43.4
20090423	108.8	3.2	43.4
20090408	209.6	4.3	42.0
20091105	64.2	5.8	41.7
20091029	25.8	22.4	41.3
20090707	90.8	3.8	40.7
20090402	189.2	5.9	40.6
20090710	100.0	3.2	40.5

As seen in Figure 8, a number of elevated monitor values are found early in the morning hours coincident with “rush hour” traffic. These higher values are likely the result of higher traffic volumes along Old Glenn Highway and the re-entrainment of residual sand and grit from traction enhancing formulas used on the highways.

The re-entrainment of dust from roadways because of winter sanding has been detailed in a number of technical papers in the literature. The cost effectiveness of studded snow tires has been reviewed in the state of Alaska and elsewhere. These studies have shown that re-entrainment is higher for studded tires than non-studded tires (Zubeck, et.al, 2004, Johansson, 2008).

While the exact traffic and tire mix in Eagle River is not known, the hourly monitored concentrations appear to indicate that significant spikes in short term PM_{10} concentrations can occur due to roadway dust, especially in spring as residual dust loading is high at the end of the winter driving season (Gertler, et.al, 2006), and decreases from late spring to early summer. This conclusion is supported by the trend shown in Figure 7 between late spring and early summer.

The change in monitored concentrations in spring can occur quickly, as shown in Figure 8, during which near-zero overnight monitored values can exceed 200 $\mu g/m^3$ or more in a few hours, as seen on April 15, 16, 17, 20, and 22. This change is a dramatic increase in particulate matter loading of the very near source atmosphere. Given the roof top location of the Eagle River Parkgate monitor inlet, the data suggest that the dust loading extends sufficiently to a height similar to the fugitive dust height of the re-entrained dust cloud associated with large truck hauling.

The Eagle River Parkgate data are influenced heavily by re-entrained dust due to vehicle traffic. These values are seasonal and can be of short duration but can return large PM_{10} concentrations over a short period, skewing daily values above the results the data would show without the short-term high values.

Usibelli is required to demonstrate compliance with the AAAQS by modeling project emissions and then adding a representative ambient background concentration. Without any nearby PM_{10} sources other than the planned mining activity, Usibelli believes an appropriate background concentration can be obtained from the Eagle River Parkgate station if the influences of re-entrained dust due to vehicle traffic are removed. This approach is appropriate because Usibelli has already modeled specific hauling and other mine traffic already accounted for in the Eagle River data. Applying the Eagle River Parkgate monitoring data that includes the influences of vehicle traffic would “double count” the effects of vehicle traffic against the Wishbone Hill operations.

To avoid the double counting of the effects of vehicle traffic, Usibelli proposes to examine the periods of higher concentrations in the hourly data and then determine the uniqueness of wind characteristics associated with those values and re-average all hourly data found within the range of those wind characteristics to form hourly average concentrations suitable for use as background concentrations. This procedure is the same as that used by Phillips Alaska Inc., described in "Short-term PM_{10} Background Determination for the Proposed Alpine CDN & CDS Satellite Drilling Pads, Colville River Unit, Alaska" prepared for ADEC in March 2002.

Following the accepted procedures which invoke the Guideline Background Determination Method (Guideline on Air Quality Models) hourly Eagle River PM_{10} data was examined to:

- Determine a significant monitor concentration level (95^{th} percentile);
- Examine the significant monitor concentration levels to determine characteristics associated with those concentrations (e.g., meteorological, time of day, season);
- Define characteristics appropriate for those significant monitor concentrations; and
- Re-average all the hourly PM_{10} data defined by those characteristics and calculate background concentration values coincident with those characteristics.

The Eagle River Parkgate hourly PM_{10} data set described above was examined to determine the significant monitor concentration. Consistent with the approved approach, the 95^{th} percentile level calculated to be 56 $\mu g/m^3$. This significant monitor concentration value line is shown atop the hourly PM_{10} monitored concentration values in Figure 9.

Once the significant monitor concentration value was determined the hourly data was sorted to include only those values deemed significant (i.e, greater than or equal to 56 $\mu g/m^3$). The data were then examined for correlative characteristics.

As described earlier, wind driven dust events are known to occur and high daily PM_{10} concentrations have been shown in Table 8. The wind direction and speed dependencies of hourly PM_{10} data were examined for the significant monitor concentration values. The correlation of direction and concentration were evaluated and two wind directions were found to be associated with most of the highest PM_{10} concentration values, specifically:

- Wind directions of 010 to 050 degrees primarily associated with wind driven valley dust; and
- Wind directions of 340 to 360 degrees primarily associated with roadway re-entrained dust.

As significant monitor concentration values occurred with nearly all wind speeds, the direction dependency only was applied and all hourly monitored concentration values within those wind directions were re-averaged to calculate concentrations associated with each of those wind directions.

The results of those re-averaging calculations are shown in Table 8.

Table 8. Eagle River Parkgate – Wind Direction Dependent Hourly Average Concentration Values

Wind Direction (degrees from North)	Re-averaged Hourly Concentration ($\mu g/m^3$)
010 to 050	28.5
340 to 360	19.3
060 to 330	19.2

The average of all hourly monitored concentrations at Eagle River is 20 $\mu g/m^3$, Accounting for wind direction dependencies based on a 95th percentile significant monitor concentration approach suggests that the average hourly concentrations are most influenced by values associated with the directions 010 to 050. Guidance could allow use of directional dependent background concentrations. Instead of applying that approach, Usibelli will conservatively apply the re-averaged 28.5 $\mu g/m^3$ PM_{10} concentration as ambient background.

12.0 Nearby Sources

A survey of the Wishbone Hill area determined that no nearby stationary sources of emissions exist which would likely impact the mine area. As a result, no off-site stationary sources were explicitly modeled.

13.0 Model Results

The results of the modeling conducted for the Wishbone Hill project are shown in Table 9. The modeled concentrations are compared with the AAAQS and shown to demonstrate compliance using appropriate averaging period and reporting values. The modeled concentrations are based on modeling the input parameters described above along with the meteorological data as presented. Isopleths of the modeled particulate concentrations are shown in Figure 10 and 11, indicating that modeled concentrations are confined near the project area.

Because the results demonstrate compliance with the ambient air quality standards, Usibelli believes that this satisfies the requirements and suggests that air quality in the vicinity of the Wishbone Hill project site will not be adversely affected.

Table 9. Wishbone Hill – Modeled Concentrations

Pollutant	Averaging Period	Reporting Value	Modeled Concentration (µg/m3)	Location of Modeled Concentration		Background (µg/m3)	AAAQS (µg/m3)
				X (m)	Y (m)		
PM_{10}	24-hour	H1H	85.5	389243	6843505		150
	24-hour	H2H	69.0	389463	6842996	28.5	150
	Annual	Maximum	19.3	391170	6847746		50
NO_2	1-hour	H8H	148.4	389487	6843601	37.6	188
	Annual	Maximum	47.9	389222	6843287	18.8	100

Figure 7. Eagle River Parkgate – Daily Average PM_{10} Monitored Concentration Values 2009

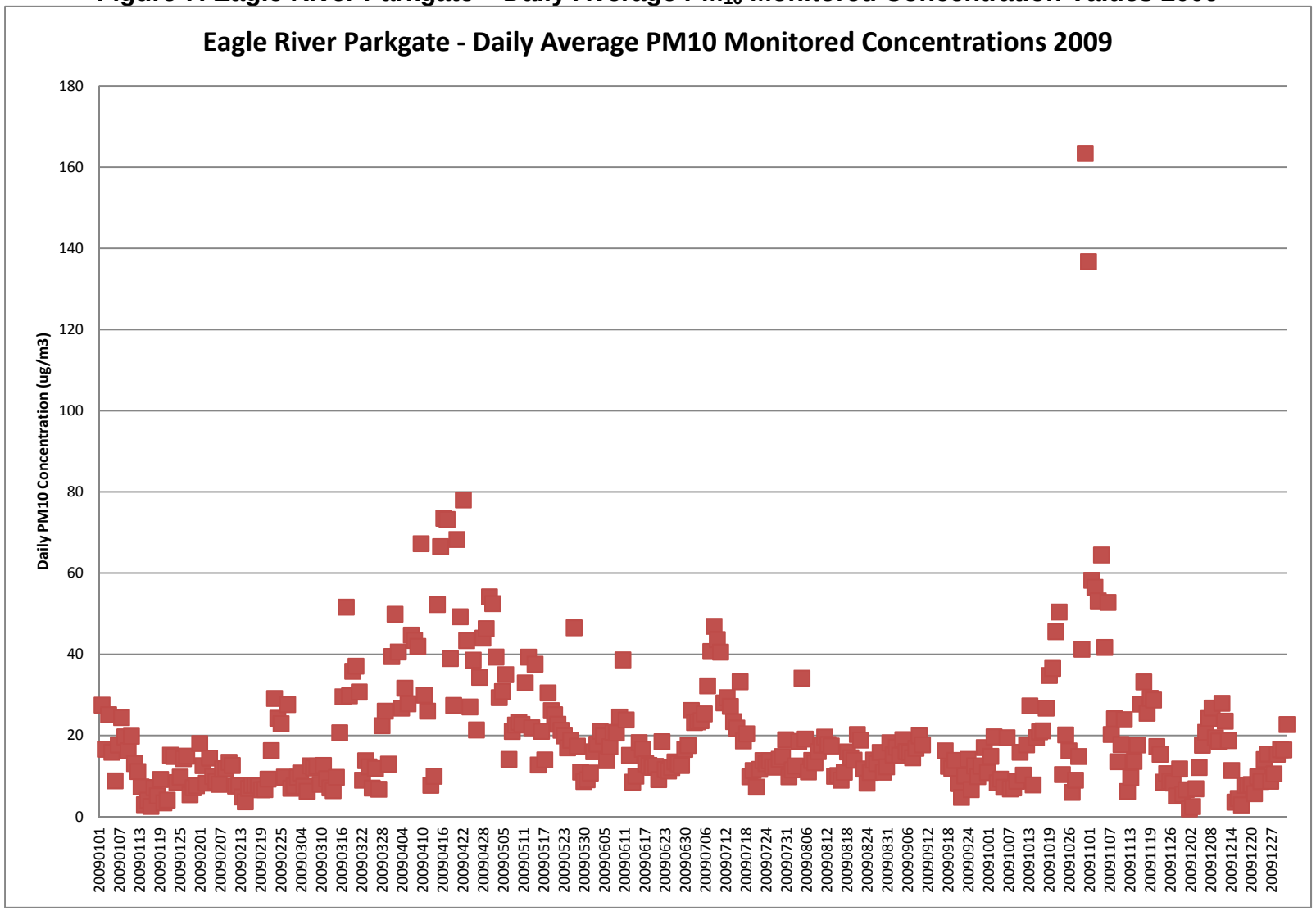


Figure 8. Eagle River Parkgate – Hourly and Daily Average PM_{10} Monitored Concentration Values April 15 through 22, 2009

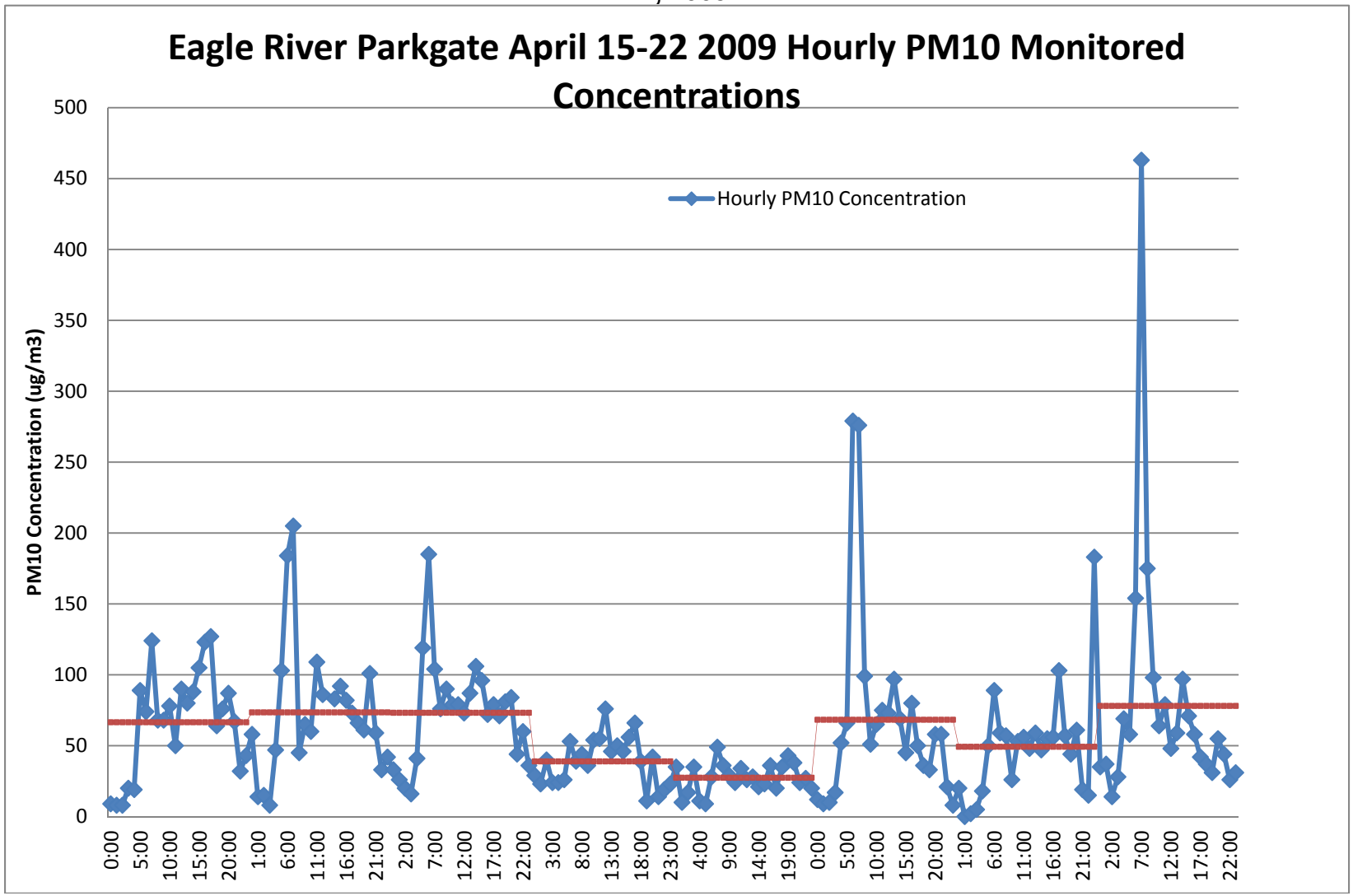


Figure 9. Eagle River Parkgate – Hourly PM_{10} Monitored Concentrations with 95th Percentile Concentration

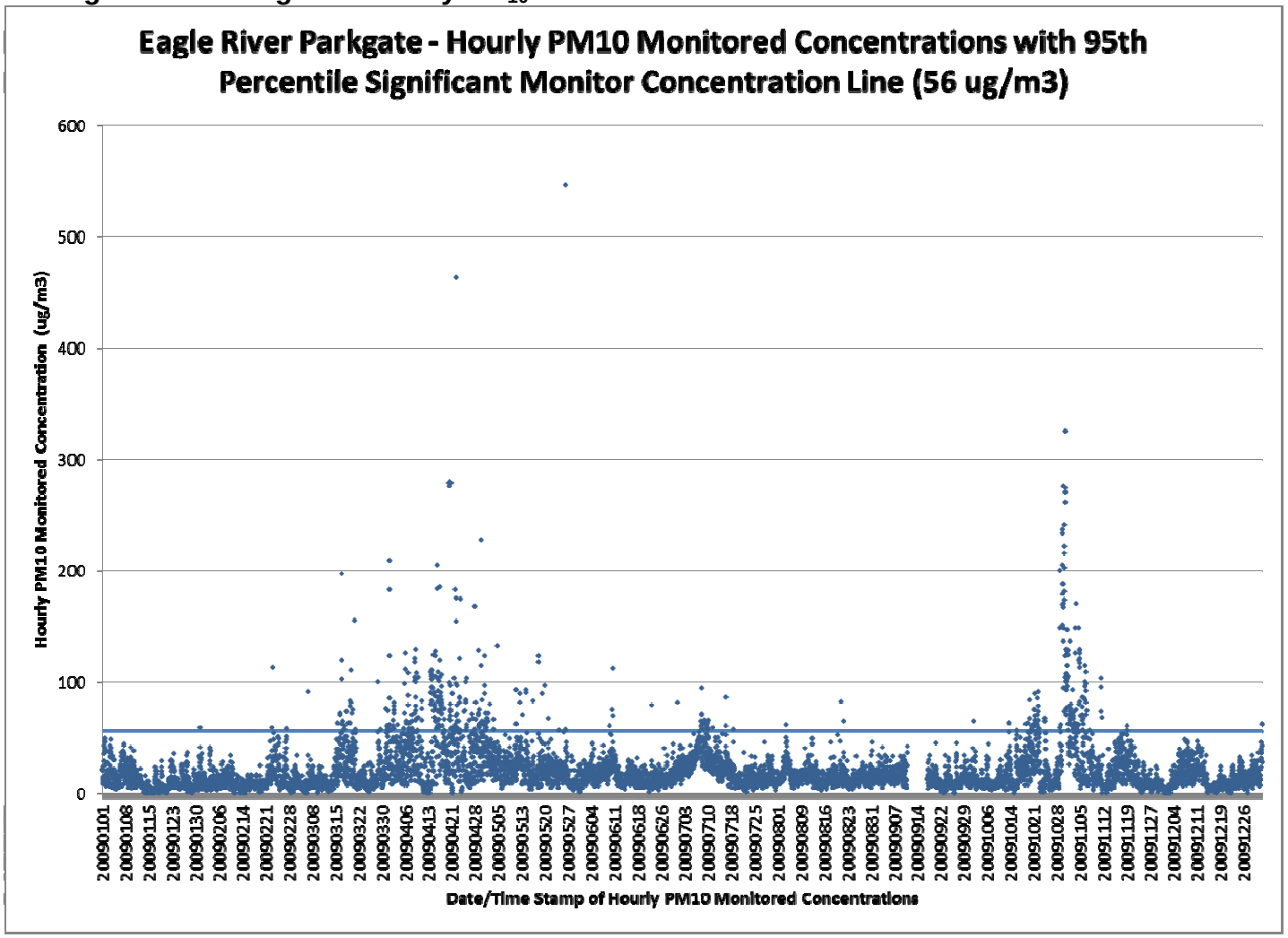


Figure 10 – Wishbone Hill Modeled PM10 24-hour Concentration Isopleths

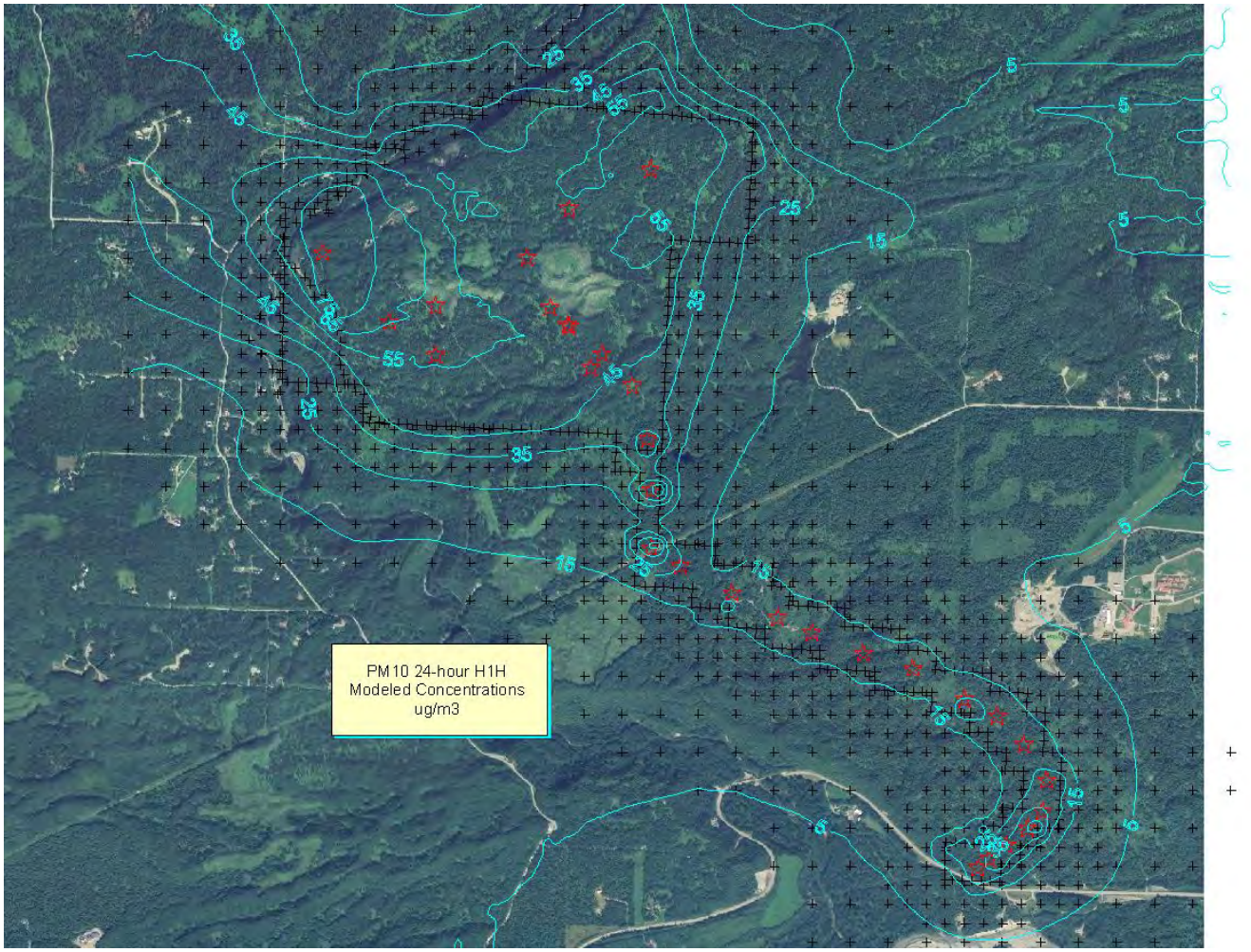
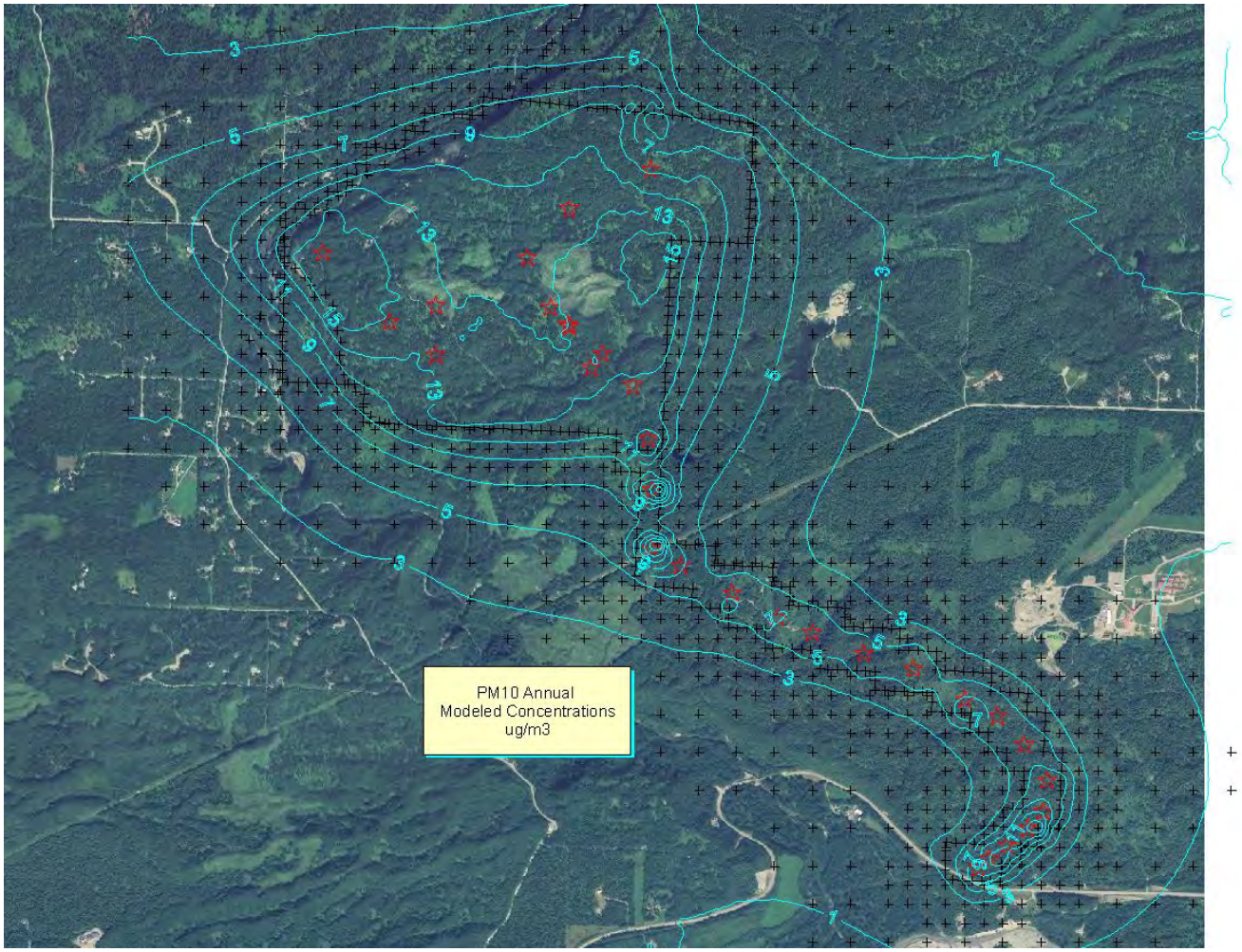


Figure 11 – Wishbone Hill Modeled PM10 Annual Concentration Isopleths



Attachment G

Fugitive Dust Control Plan

Usibelli Coal Mine, Inc.
Wishbone Hill Coal Mining and Processing Operation
Fugitive Dust Control Plan

Overview

Usibelli Coal Mine Inc. (Usibelli) will implement active controls to reduce fugitive dust emissions from the Wishbone Hill Coal Mining and Processing Operation. These active controls will require continuous action by Usibelli to effectively reduce fugitive dust emissions. This plan describes the active controls that will be used to reduce dust emissions from the mine haul roads.

Active Fugitive Dust Controls

Fugitive dust emissions from haul roads will be controlled by watering the roads when daily minimum, ambient air temperatures are consistently above 32° Fahrenheit (F). To improve the effectiveness of haul road watering, hygroscopic dust suppressants (e.g., calcium and/or magnesium chloride) may be used. To prevent icing and safety hazards, watering will be suspended when the daily minimum ambient air temperatures are below 32° F. Regular evaluations will be conducted by Usibelli to determine the effectiveness of the watering operations.

Vehicle Speed

Fugitive dust emissions from haul roads will be controlled by imposing vehicle speed limits on the mine haul roads. Vehicle speed limits will be 25 miles per hour.

Attachment H

Public Access Control Plan

Usibelli Coal Mine
Wishbone Hill Coal Mining and Processing Operation
Public Access Control Plan

Purpose

The purpose of this document is to describe the Public Access Control Plan that will be used to protect the general public from health and safety hazards incident to the industrial activities planned at the Wishbone Hill Coal Mining and Processing Operation (Wishbone Hill). Usibelli Coal Mine Inc. (Usibelli) proposes to mine the western end of the Wishbone Hill coal district on the southwestern extent of Wishbone Hill. The permitted area for the project is located on lands leased from the State of Alaska and the Matanuska Susitna Borough and also on land owned by Usibelli. This plan describes the access control plan that will be used to implement the access restrictions.

Usibelli is fully committed to meeting the applicable Alaska Ambient Air Quality Standards (AAAQS) at the ambient air quality boundary of the project. A primary purpose of this plan is to delineate the area to be protected and controlled for occupational health and safety (within the ambient air quality boundary) from the area that is subject to unrestricted, general public access where the AAAQS are applicable (outside the ambient air quality boundary). A secondary purpose is to ensure that measures are in place to restrict public access within the ambient air quality boundary.

General Information

Usibelli coal mining operations will be conducted on the western end of the Wishbone Hill coal district on the southwestern extent of Wishbone Hill. Currently, access to the property is by a gravel road from the Glenn Highway. The nearest community to the site is Palmer, which is located approximately eight miles to the southwest.

Dispersion modeling has been conducted and demonstrates modeled compliance with all applicable AAAQS at all points on and outside of the ambient air quality boundary.

Public Access Control Measures

Physical Barriers

The land within the ambient air quality boundary encompasses approximately 900 acres of the nearly 1,300 acres within the Wishbone Hill Mine Boundary, (See Figure 1). At the Glenn Highway intersection, public access on this road will be controlled by a gate that will be locked

when the road is not in use. Where public right-of-way 52715 crosses the mine access road south of the facilities area, a set of automated gates will be placed on each side of the crossing. Controlled access at the crossing will be maintained with either 4 way stop signs or a large diameter culvert under the access road.

Security fencing will also be constructed around the facilities area and at the west end of Mine Area 1 (See Figure 1). The fencing will be periodically marked with identification and no trespassing signs.

Posting

In addition to the physical barriers cited above, public access to the site will be restricted using strategically located signs. Signs restricting public access and warning of potential health hazards will be posted at intersection of the Glenn Highway and the mine access road, the intersection of public right-of-way 52715 and the mine access road, at all trails showing active use along the ambient air quality boundary, and approximately every 100 yards along the ambient air quality boundary in locations where overland access could reasonably occur due to the lack of natural obstructions. The sign specifications will be as follows:

- Each sign will be 2 feet by 4 feet and will be mounted on posts.
- Each sign will be inspected semi-annually and will be repaired or replaced, as necessary.
- Each sign will be free of visible obstructions.
- Each sign will read:

DANGER

RESTRICTED ACCESS
AMBIENT AIR QUALITY BOUNDARY
AUTHORIZED PERSONNEL ONLY
PLEASE CHECK IN WITH SECURITY

Proposed Surveillance

For all operations, all on-site personnel will be informed of the air permitting requirements to maintain an exclusion zone at the location. All personnel will be asked to observe the location perimeter as they conduct their regular duties. Any suspected violation of the exclusion zone by unauthorized personnel will be immediately reported to mine management.

Mine personnel will periodically observe the perimeter of the facilities area. If unauthorized people are observed, a log of the time and date of the observation will be recorded on the attached form. A record of the completed logs will be maintained on location in the Wishbone Hill Mine office.

Trespass Individuals

If a mine employee observes unauthorized personnel within the ambient air quality boundary, appropriate measures will be taken by the employee to address potential health and safety concerns. If safety is not of immediate concern, mine employees will be instructed to use the following protocol when dealing with unauthorized entry. A log of the incidence will be recorded on the attached form and filed at the mine office for future reference.

- Approach the unauthorized person (or persons) and request that they leave the area immediately.

- If the unauthorized individual(s) refuse to leave the area after the above request, the individuals(s) will be informed that they are in an area in which the AAAQS may not be met and that State regulations require Usibelli to restrict entry to the posted area to authorized personnel only. The unauthorized person or persons will again be asked to leave the exclusion zone area.

- If the unauthorized individual(s) still refuse to leave, the individual(s) will be informed that Usibelli will not be liable or responsible for any harm they may encounter by being in a restricted entry area.

- The mine personnel will also request the name or names of the unauthorized personnel at that time. The mine individual will then log the encounter with the unauthorized person or persons on the surveillance form. The data to be logged in such a situation will include:

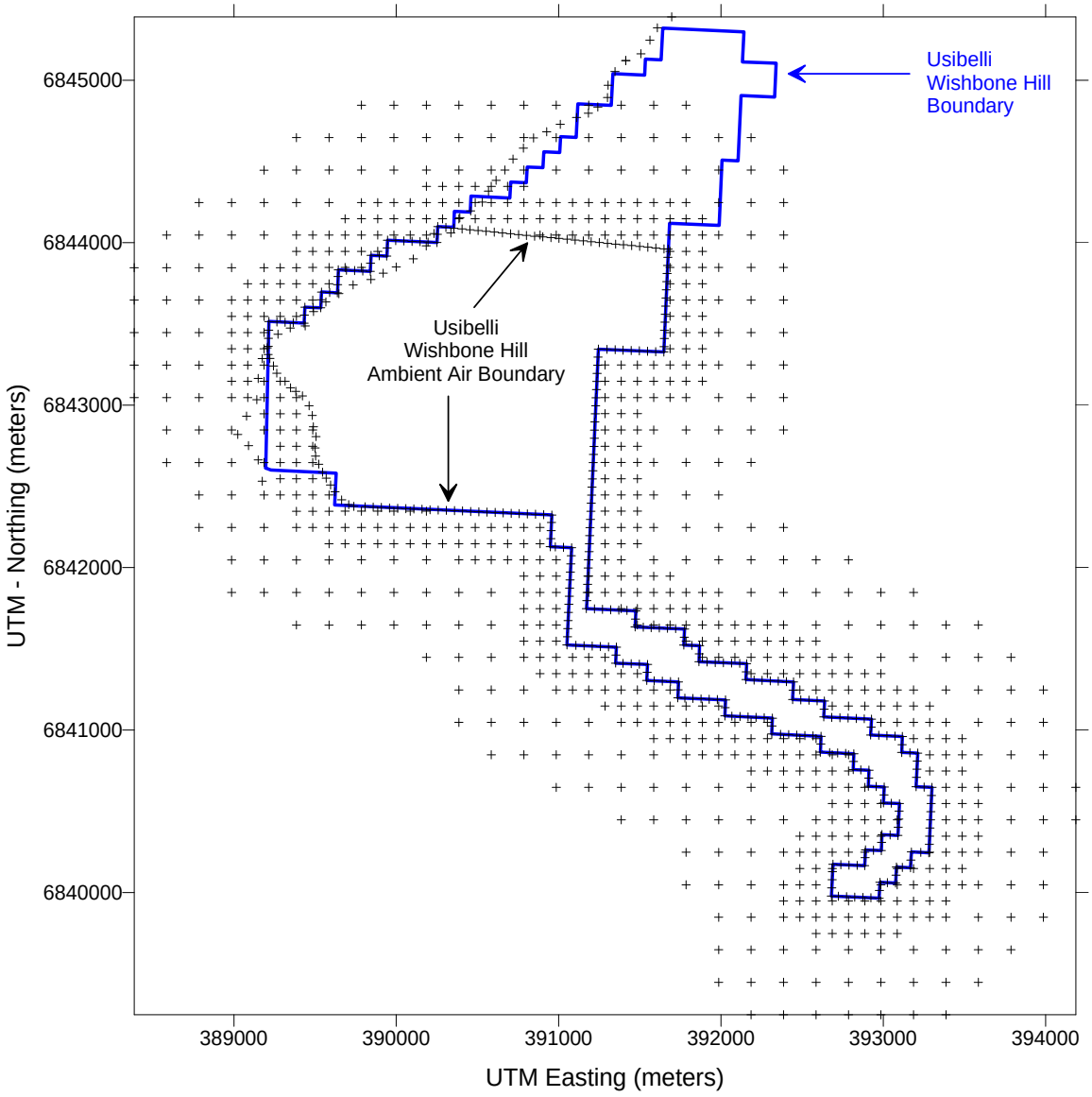
    1. Day and time;
    2. The name of the individual(s) (if known or otherwise provided);
    3. The method of entry into the property (e.g. by foot, snow machine, etc.);
    4. Duration of unauthorized presence within the ambient air boundary; and
    5. Other pertinent information as appropriate.

    The mine individual will also report such incidents to mine management.

Air Exclusion Zone
Surveillance Monitoring Form

Date and Time	Pad Surveillance Conducted by	Surveillance Comments

Figure 1. Usibelli Coal Mine Inc.
Wishbone Hill Mining Boundary and Ambient Air Boundaries



Attachment I

Supporting Documentation

USIBELLI COAL MINE, INC.

WISHBONE HILL COAL MINING AND PROCESSING OPERATION

SUPPORTING OPERATIONAL INFORMATON

The proposed Wishbone Hill surface coal mining operation will utilize a truck/shovel, direct haul back mining system. The major project components include a surface coal mine removing 1,815,000 U.S. tons per year of raw coal at full production and a coal washing plant for improvement of coal quality. Approximately 1,000,0000 U.S. tons per year of processed coal will be delivered to market.

The mine will use standard surface mining techniques. Before mining begins in an area, the ground will be cleared of vegetation and the topsoil will be removed and stored for later reclamation activities. Cleared vegetation will be either incorporated into the topsoil or buried in the mine pits. No burning will be done. The overburden and coal will be loosened for removal by drilling and blasting with a combination of ammonium nitrate and fuel oil (ANFO). Both coal and overburden will be removed from the active mining areas with hydraulic excavators and/or shovels and loaded into 150 ton haul trucks. The overburden will be hauled to backfill areas or stockpiles for temporary storage. The coal will be hauled to the processing plant.

On the return trip from the processing plant, trucks will pick up waste from the coal wash facility and dispose of the material in the backfill areas. Coal from the mine will be dumped in either a feed hopper or a run-of-mine (ROM) coal storage pile near the wash plant. Approximately 2/3 of the coal coming from the mine face (1,210,000 tons/year) will be placed directly in the hopper while the other 1/3 (605,000 tons/year) will be placed in the ROM storage pile. The coal in storage will be later removed with a front-end loader and place in the hopper.

The total volume of coal removed from the mine will eventually pass through the coal feed hopper. The actual volume of coal will change somewhat form year to year as the mine develops but at full scale production, the coal fee rate is expected to average 1,815,00 U.S. tons per year. The moisture content of the ROM coal is approximately 6%.

The coal hopper will feed a conveyor belt which transfers coal to a feeder breaker and then a secondary crushing/screening operation which will segregate the crushed ROM coal into 3 streams: a refuse or rock stream; raw coal fines; and a raw coal stockpile for wash plant feed stock. Approximately 0.8% of the ROM coal leaving the breaker (14,520 tons) will contain rock and refuse and will be diverted into a refuse pile before entering the secondary crusher/screening operation. This refuse will be eventually hauled back to the mine for disposal in the backfill areas. Raw coal from the secondary crushing/screening operation will be placed in a stockpile and conveyed from there to the wash plant. The coal fines from the secondary crushing/screening operation will be blended back in with the final product.

Coal entering the wash plant will be immediately wetted and no longer a source of dust emissions. The wash plant separates the shale from coal with water, screens and centrifuges. There are no thermal dryers at this facility. Coal exiting the plant will go via conveyor either directly to a truck loadout facility or to a clean coal storage pile. The moisture content of the

clean coal product will be approximately 8%. Coal placed in the clean coal storage pile will be reclaimed by a front-end loader and will pass to the truck loadout on a conveyor system.

Waste from the wash plant will be hauled back to the mine for placement in the backfill areas. The coal haul trucks will be used to transport the waste back on their return trip during delivery of coal from the mine face to the wash plant. Materials balance computes a total of 815,000 tons per year of waste generated in the wash plant. Approximately 15% of this waste exits the plant with the slurry water and settles in a slurry pond. The remaining 85% (678,230 tons per year) will be hauled back to the mine along with the 14,520 tons per year of refuse from the feeder breaker (total haul back – 692,750 tons per year).

Product coal (1,000,000 tons/year) will be place in covered trucks by a telescoping chute at the loadout facility and hauled approximately 2.7 miles on the project access road to the Glenn Highway. The haul trucks will be covered, road-legal highway trucks.

The only pollutant emitted in significant quantities by the project will be particulate matter, mostly in the form of fugitive dust. A total of 36 quantifiable sources of emission have been identified. For the computation of emission estimates, year 4 of mining was used. This year was determined to be the worst case year in terms of total emissions because the largest volume of overburden material requiring the longest haul distance will be moved during this year. In addition, the mining operation as well as the coal processing facilities will be at full production.

Attachment C presents the emission calculations and parameters used in the computations. Additional information concerning the major operational sources is summarized below.

- ***Topsoil Operations*** – One dozer and two scrapers will be used in topsoil removal activities. Each unit will be used 5 days per week, for a period of four months (16 weeks), and will be operated for two working shifts per day (6.5 hours of operation per shift). The operating hours on an annual basis are assumed to be 85% of the working hours above to account for mechanical availability of the equipment. This equipment will only operate during the summer months. The average moisture content of the topsoil is 6%. The average silt content of the topsoil is 65%.

- ***Blasting Operations*** – Both the overburden and coal will be blasted using a combination of ammonium nitrate and fuel oil (ANFO). The overburden and coal will require a total of 240 blasts and 120 blasts per year, respectively. The capacity of each blasted is estimated at 13,423 square feet.

- ***Overburden Removal*** – Two hydraulic excavators with 23 cubic yard buckets will be used to lift the overburden material into the back of 150 ton end-dump haul trucks. A total of 15,459,000 bank cubic yards (10,306,000 tons) per year of overburden will be

removed in the worst case year (year 4). The average moisture of the overburden is approximately 8%.

- ***Coal Removal*** – A hydraulic excavator will be used to lift the coal into the back of 150 ton end-dump haul trucks. These are the same trucks used in the overburden hauling operation. Although the capacity is 150 tons for materials of the density of the overburden, the coal is lighter and the full 150 ton weight capacity will not fit in the bed of the truck. As a result, the actual capacity of the trucks for hauling coal is only 110 tons. A total of 1,815,000 tons per year of raw coal will be removed during full scale production.

- ***Coal Dumping*** – The coal that is removed from the mining areas will be dumped at the wash plant. As discussed earlier on, approximately 2/3 of the mined coal (1,210,000 tons/year) will be placed directly in the coal feed hopper at the wash plant while the remaining 1/3 (605,000 tons/year) will be placed in the ROM storage pile near the coal washing facility. The coal in storage will have to be reclaimed with a front-end loader and placed in the coal feed hopper.

- ***Wind Erosion*** – The quantifiable sources of fugitive dust emissions from wind erosion are summarized below:

Location	Area (Acres)
Mine Area (Year 4)	168
ROM Coal Stockpile	4
Raw Coal Stockpile	1.5
Clean Coal Stockpile	1.5
Reject Stockpile	0.1

- ***Mobile Equipment*** – The quantifiable sources of emissions from the operation of mobile equipment are summarized below:

Operation Description	Vehicle Miles Traveled per Year
Grader Operations	13,122
Overburden Hauling – Backfill	19,340
Overburden Hauling – Stockpile	137,413
Coal Hauling within Mine	14,103
Coal Truck Haul – Loop Road	4,410
Coal Truck Haul – Access Road	101,430
Misc. Mine Traffic	50,000
Other Vehicle Traffic	236,520

- *Grader* Operations – One grader will be used for road maintenance and construction. The grader will be operated 19 shifts per week for 50 weeks (6.5 hours of operation per shift). The operating hours on an annual basis are assumed to be 85% of the working hours above to account for mechanical availability of the equipment. The average grader speed is estimated at 5 mph. The approximate road surface silt content is 5%.

- *Overburden* Hauling – For overburden hauling, a total of 6,351,000 - bank cubic yards (BCY) will be removed. Of this total 5,461,860 BCY will be transported to the stockpile area while the remaining 889,140 BCY will be directly hauled back to the pit area. A waste density of 1.5 tons BCY is used to compute the quantity of waste in tons.

- *Coal Hauling* – As noted above, only 110 tons of coal will be loaded in each of the 150 ton capacity haul trucks. After loading of the trucks, the coal will be hauled to the wash plant and dumped either in the coal feed hopper or at the coal storage pile.

  Product coal will be delivered to market via the 2.7 mile mine access road. This mileage includes a 0.2 mile loop at the truck loadout facility. Fifty-ton haul trucks with double bottom-dump trailers (approximately 25 tons per trailer) will be used to transport the coal. When the trucks are loaded, they will have a gross vehicle weight of 75 tons and 25 tons unloaded. Therefore, average vehicle weight for a round trip will be 50 tons.

- *Misc. Mine Traffic* – This traffic includes supervisor pickup trucks, fuel-lube trucks, maintenance vehicles, and other small vehicles that will occasionally travel the mine roads during normal operations.

- *Other Vehicle Traffic* – In addition to the road legal coal haul trucks, employees will use the access road for going to and from the mine as well as other mine support vehicles. A total of 120 round trips per day are assumed for the access road.

Attachment J

Electronic Files


SLR