

Alton Coal Development, LLC

463 North 100 West, Suite 1

Cedar City, Utah 84720

Phone (435) 867-5331 • Fax (435) 867-1192

November 17, 2014

Jon L. Black
Engineer
Major Source Review Section
Utah Division of Air Quality
150 North 1950 West
Salt Lake City, UT 84114

UTAH DEPARTMENT OF
ENVIRONMENTAL QUALITY

NOV 24 2014

DIVISION OF AIR QUALITY

RE: Notice of Intent for Coal Hollow Underground facilities within the existing permit - Coal Hollow Mine Project ID: N140470002

Dear Mr. Black,

Alton Coal Development, LLC (ACD) is providing additional information needed by the Division of Air Quality (DAQ) in order to process changes proposed to permit # N140470002 for the Coal Hollow Mine located near Alton, Utah. ACD will be locating its Underground Facilities within an existing pit on the Coal Hollow Mine (CHM), Pit 10, which is located within the NE quarter of Section 30, Township 39 S, Range 6 W. The addition of the Underground Facilities at this location circumvents the mining of previously permitted surface pits 11 through 15 and the associated surface disturbance of approximately 95 acres. The CHM was permitted to disturb 435 acres, installation of the underground mine will reduce the surface disturbance to approximately 340 acres. Also, under the original permit, there were two primary haul roads planned. One primary haul road was approximately 3,000 linear feet, the second approximately 6,260 LF. The 3,000 LF primary haul road and 1,180 LF of the 6,260 LF haul road were built. With this NOI, The 3,000 LF, the 1,180 LF will remain and approximately 1,240 LF of primary haul road will be added to the 3,000 LF haul road to access the Underground Mine. In total this reduces the amount of haul road previously allowed by 3,840 LF that will not be constructed. The new 1,240 LF haul road will serve to transport approximately 725,000 tons of coal from the Underground mine to the Processing/Load out Facilities. Layout of the Primary Haul roads can be seen on Figure 1.

The Coal Hollow Underground Mine will be a typical underground coal mining operation. Coal will be brought to the surface portal by beltline to a stacker belt. The stacker will feed to coal stockpile to a maximum of 5,000 tons. Coal will be transferred from this stockpile to the existing coal sizing plant/ load-out facility via haul truck on a Primary Haul road similar to existing surface mining. The

requested equipment includes one stacker belt, two generators and an underground exhaust fan. Sources of emissions from the Underground Facilities include emissions from two transfer point for the stacker belt, and fuel combustion. Details of the Underground Facilities can be seen on Figure 2.

This NOI will be processed as an increase of air contaminants (R307-401-12). This NOI adds two generators to the existing five generators currently on permit #N140470002:

	<u>Description</u>	<u>Horse Power</u>	<u>Max. Hrs. Operation</u>
Generator #6	Underground Mining	2220	3600
Generator #7	Underground Fan	190	8760

Attached is Table 1 showing the annual emissions for NO_x utilizing 0.01 lb./hp-hr emission factor. This emission factor is conservative as compared to the manufactures Certified Engine Emissions for each generator. The table also indicates the maximum annual hours of operation anticipated for each generator if/when used.

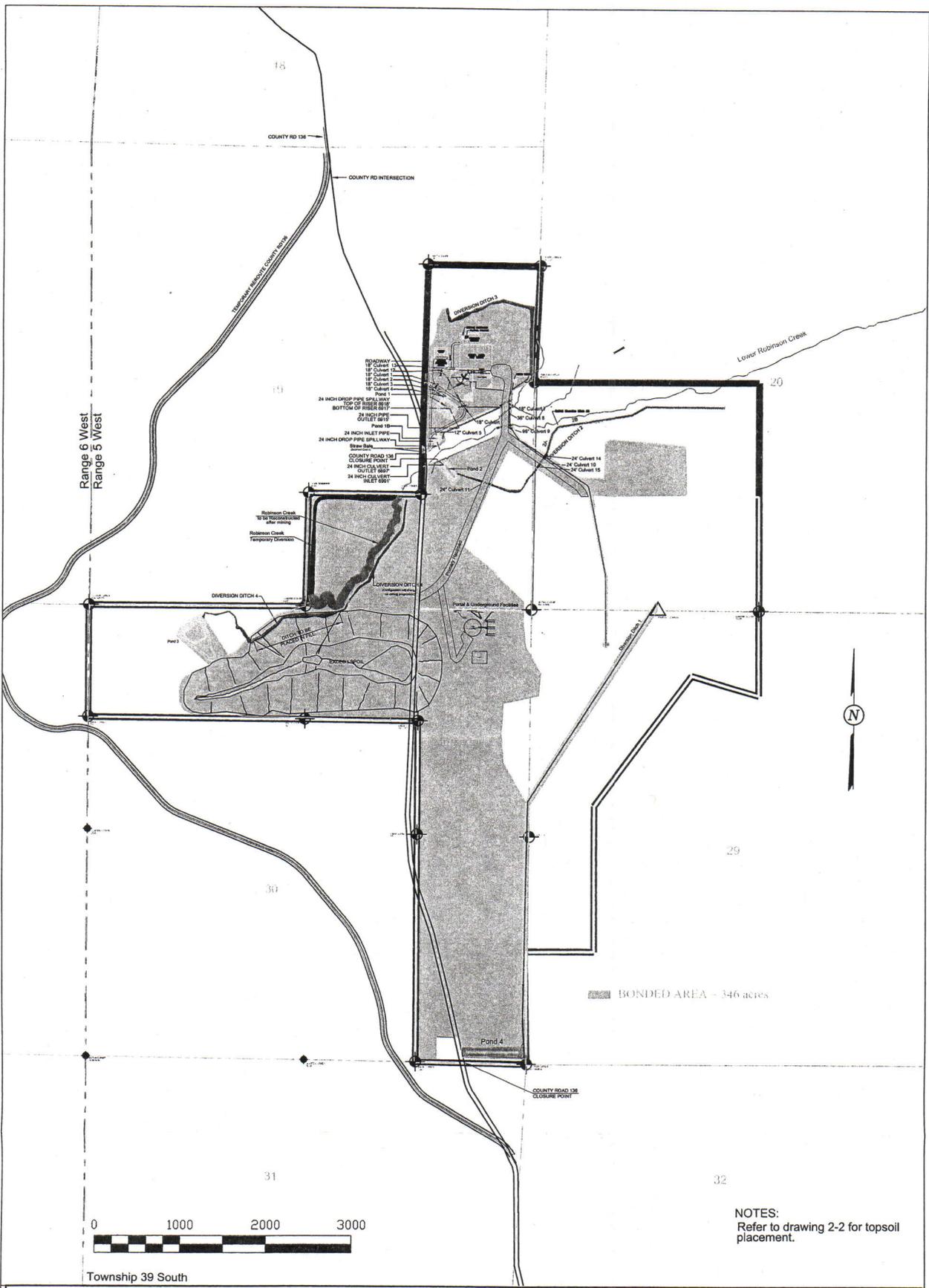
An underground product conveyer that transfers coal to a stacker belt will create two additional drop points. The stacker belt is rated at 1,000 tons per hour and will be operated for a maximum of 3600 hours per year. Also, the underground will be ventilated with an exhaust fan. This exhaust fan will be 125 hp and will operate 8760 hours per year.

ACD appreciates the opportunity to submit this information and looks forward to the subsequent processing of the NOI. Please do not hesitate to contact me if you have any questions. I can be reached at (435) 867-5331 or (435) 691-1551.

Sincerely,



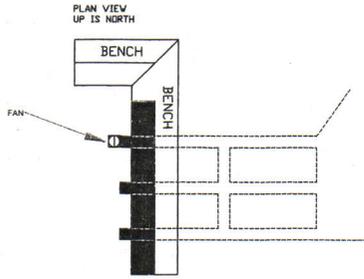
B. Kirk Nicholes
Environmental Specialist
Alton Coal Development, LLC



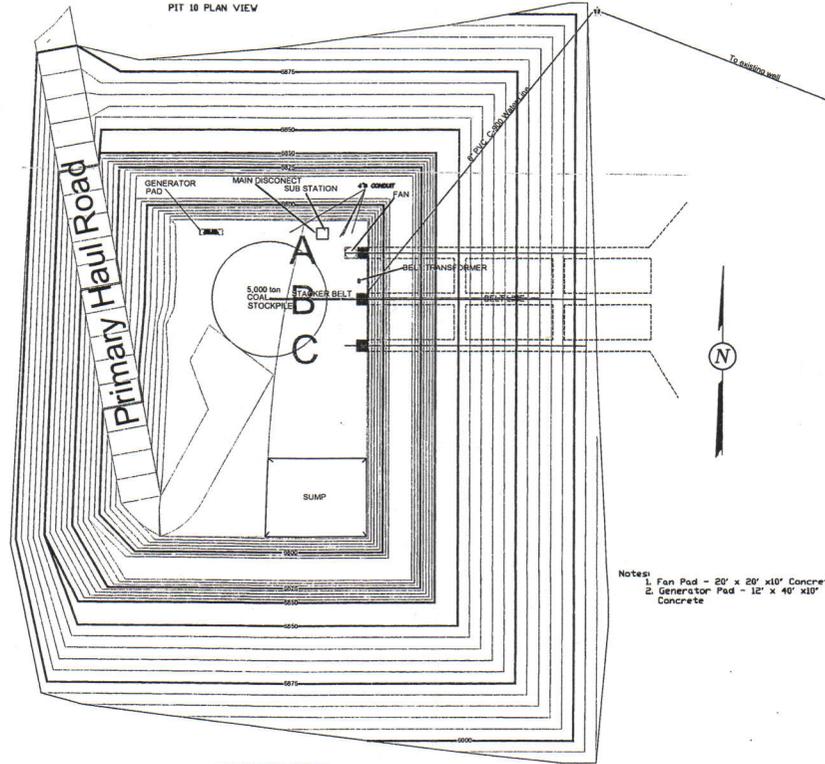
NOTES:
Refer to drawing 2-2 for topsoil placement.

Township 39 South

LEGEND: 	DRAWN BY: C. McCourt G. Grossman	CHECKED BY: LWJ	REVISIONS		FACILITIES & STRUCTURES LAYOUT COAL HOLLOW PROJECT ALTON, UTAH FIGURE 1	 Coal Hollow Project 463 North 100 West, Suite 1 Cedar City, Utah 84721 Phone (435)867-5331 Fax (435)867-1192												
	DRAWING: FIGURE 1	DATE: 11/10/08	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">DATE:</th> <th style="width: 50%;">BY:</th> </tr> <tr> <td>8/13/13</td> <td>KN</td> </tr> <tr> <td>10/18/13</td> <td>LWJ</td> </tr> <tr> <td>02/26/14</td> <td>KN</td> </tr> <tr> <td>07/02/14</td> <td>KN</td> </tr> <tr> <td>11/21/14</td> <td>KN</td> </tr> </table>	DATE:			BY:	8/13/13	KN	10/18/13	LWJ	02/26/14	KN	07/02/14	KN	11/21/14	KN	SCALE: 1" = 1000'
	DATE:	BY:																
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JOB NUMBER: 1400	SHEET																	

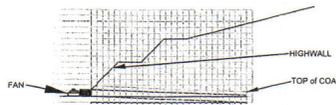


4"x4" 9ga. Wire Mesh Attached with 8" bolts UNDERGROUND PORTALS EXPOSED PORTALS

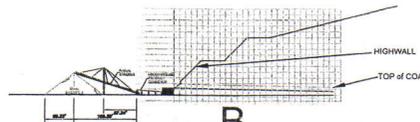


Notes:
1. Fan Pad - 20' x 20' x 10' Concrete
2. Generator Pad - 12' x 40' x 10' Concrete

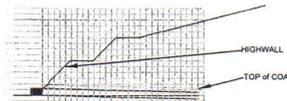
PROFILE OVER PORTALS



A



B



C



LEGEND:

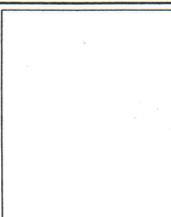
	SECTION LINE
	FOUND SECTION CORNER
	FOUND PROPERTY CORNER
	ELECTRICAL CONDUIT
	WATER TANK / WELL
	PROPOSED 6" PVC C-900 WATER LINE

DRAWN BY: K. Nicholes	CHECKED BY: LWJ
DRAWING: FIGURE 2	DATE: 07/02/14
JOB NUMBER:	SCALE: 1" = 200'
	SHEET

REVISIONS	
DATE:	BY:
07/02/14	KN
11/05/14	KN

UNDERGROUND FACILITIES & STRUCTURES	
LAYOUT	
COAL HOLLOW PROJECT	
ALTON, UTAH	
FIGURE 2	

UNDERGROUND FACILITIES & STRUCTURES	
LAYOUT	
COAL HOLLOW PROJECT	
ALTON, UTAH	
FIGURE 2	



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**Power
Generation**

**2014 & 2015 EPA Tier4F Certified
Exhaust Emission Compliance
Statement
1500DQGAS
Stationary Non-Emergency,
Tier4 Final (with DPF)
60 Hz Diesel Generator Set**

Compliance Information:

The engine used in this generator set complies with Tier 4 emissions limit of U.S. EPA New Source Performance Standards for stationary non-emergency engines under the provisions of 40 CFR 60 Subpart IIII when tested per ISO8178 D2.

Engine Manufacturer:	Cummins Inc.
EPA Certificate Number:	FCEXL78.0AAA-002
Effective Date:	04/10/2014
Date Issued:	04/10/2014
EPA Engine Family (Cummins Emissions Family):	FCEXL78.0AAA

Engine Information:

Model:	QSK50-G8	Bore:	6.25 in. (159 mm)
Engine Nameplate HP:	2220	Stroke:	6.25 in. (159 mm)
Type:	4 Cycle, 60°V, 16 Cylinder Diesel	Displacement:	3067 cu. in. (50.3 liters)
Aspiration:	Turbocharged and Low Temperature Aftercooled (2P/2L)	Compression Ratio:	15.0:1
Emission Control Device:	SCR & DPF		

**Diesel Fuel Emission Limits
D2 Cycle Exhaust
Emissions**

	Grams per BHP-hr				Grams per kWm-hr			
	<u>NOx</u>	<u>NMHC</u>	<u>CO</u>	<u>PM</u>	<u>NOx</u>	<u>NMHC</u>	<u>CO</u>	<u>PM</u>
Test Results - Diesel Fuel (< 15 ppm Sulfur)	0.40	0.01	1.04	0.00	0.54	0.02	1.4	0.00
EPA T4 F Emissions Limit	0.50	0.14	2.61	0.02	0.67	0.19	3.50	0.03

The CARB emission values are based on CARB approved calculations for converting EPA (500 ppm) fuel to CARB (15 ppm) fuel.

Test Methods: EPA/CARB Nonroad emissions recorded per 40CFR89 (ref. ISO8178-1) and weighted at load points prescribed in Subpart E, Appendix A for Constant Speed Engines (ref. ISO8178-4, D2)

Diesel Fuel Specifications: Cetane Number: 40-48. Reference: ASTM D975 No. 2-D.

Reference Conditions: Air Inlet Temperature: 25°C (77°F), Fuel Inlet Temperature: 40°C (104°F). Barometric Pressure: 100 kPa (29.53 in Hg), Humidity: 10.7 g/kg (75 grains H2O/lb) of dry air; required for NOx correction, Restrictions: Intake Restriction set to a maximum allowable limit for clean filter; Exhaust Back Pressure set to a maximum allowable limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results.

Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

EXHAUST EMISSION DATA SHEET

MQ POWER GENERATOR SET

Model: DCA-125SSI



The engine used in this generator set is certified to comply with United States EPA Tier 3 and CARB Mobile Off-Highway emission regulations.

ENGINE DATA		
Manufacturer	ISUZU	Bore: 4.53 in. (115 mm)
Model:	4HK1X	Stroke: 4.92 in. (125 mm)
Type:	4-Cycle, In-Line, 4-Cylinder, Diesel	Displacement: 317 cid (5.2 liters)
Aspiration:	Turbocharged, Charge Air Cooler, ECM	Compression Ratio: 17.5:1
PERFORMANCE DATA		
SAE Gross HP @ 1800 RPM (60 Hz)	170	
Rated Load Fuel Consumption (gal/Hr)	7.3	
Rated Load Exhaust Gas Flow (cfm)	738	
Rated Load Exhaust Gas Temperature (°F)	986	
United States EPA - Mobile Off-Highway Tier 3 Limits - ≥100 BHP ~ <174 BHP		
Criteria Pollutant	Emission Requirements	Certified Engine Emissions
NOx (Oxides of Nitrogen as NO ₂)	(2.98)* gr/bhp-hr	(1.94)* gr/bhp-hr
HC (Total Unburned Hydrocarbons)	(NOx + HC)* Combined	(NOx + HC)* Combined
CO (Carbon Monoxide)	3.73 gr/bhp-hr	0.82 gr/bhp-hr
PM (Particulate Matter)	0.22 gr/bhp-hr	0.13 gr/bhp-hr
EPA Engine Family:	ASZXL05.2IXB	
EPA Certificate of Conformance:	SZX-NRCI-10-08	
ARB Executive Order:	U-R-006-0331	
Effective Date:	Year 2010	
<i>Note: Engine operation with excessive air intake or exhaust restriction beyond factory published maximum limits, or with improper service maintenance, may result in higher emission levels.</i>		



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 OFFICE OF TRANSPORTATION AND AIR QUALITY
 WASHINGTON, DC 20460



CERTIFICATE OF CONFORMITY
 2010 MODEL YEAR

Manufacturer: **ISUZU MOTORS LIMITED**
 Engine Family: **ASZXL05.2IXB**
 Certificate Number: **SZX-NRCI-10-08**
 Intended Service Class: **NR 5 (75-130)**
 Fuel Type: **DIESEL**
 FELs: **NMHC +NOx: N/A NOx: N/A PM: N/A**
 Effective Date: **8/24/2009**
 Date Issued: **8/24/2009**

Karl J. Simon, Director
 Compliance and Innovative Strategies Division
 Office of Transportation and Air Quality

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 89, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR 89 and produced in the stated model year.

This certificate of conformity covers only those nonroad compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 89 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 89.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 89.129-96 and 89.506-96 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to a revocation or suspension of this certificate for reasons specified in 40 CFR Part 89. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void ab initio for other reasons specified in 40 CFR Part 89.

This certificate does not cover nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

	ISUZU MOTORS LIMITED	EXECUTIVE ORDER U-R-006-0331
		New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2010	ASZXL05.2IXB	5.2	Diesel	8000
SPECIAL FEATURES & EMISSION CONTROL SYSTEMS			TYPICAL EQUIPMENT APPLICATION	
Direct Diesel Injection, Turbocharger, Charge Air Cooler, Electronic Control Module, Exhaust Gas Recirculation			Generator Set	

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kW-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kW-hr)					OPACITY (%)		
			HC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
75 ≤ kW < 130	Tier 3	STD	N/A	N/A	4.0	5.0	0.30	N/A	N/A	N/A
		CERT	--	--	2.6	1.1	0.17	--	--	--

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

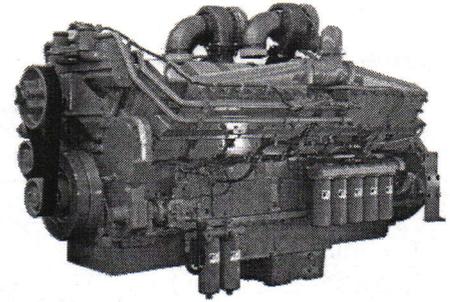
This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 10 day of September 2009.



Annette Hebert, Chief
Mobile Source Operations Division

KTA50-G9



> Specification sheet

Our energy working for you.™



Description

The KTA50-Series benefits from years of technical development and improvement to bring customers an innovative and future proof diesel engine that keeps pace with ever changing generator set requirements.

Recognised globally for its performance under even the most severe climatic conditions, the KTA50-Series is widely acknowledged as the most robust and cost-effective diesel engine in its power range for the generator set market.



This engine has been built to comply with CE certification.



This engine has been designed in facilities certified to ISO9001 and manufactured in facilities certified to ISO9001 or ISO9002.

Features

Coolpac Integrated Design - Products are supplied complete with cooling package and air cleaner kit for a complete power package. Each component has been specifically developed and rigorously tested for G-Drive products, ensuring high performance, durability and reliability.

Aftercooler – Large capacity integral aftercoolers are supplied with cooling water separate from the engine jacket. This provides cooler, denser intake air for more complete combustion and reduced engine stresses for longer life.

Cooling System – A one pump, two loop system must be employed; i.e. the engine jacket is cooled by one radiator or heat exchanger and the aftercoolers are cooled by a separate radiator or heat exchanger.

Pistons – Pistons are a dual Ni-resist, aluminium alloy, ground and shaped to compensate for thermal expansion, which assures a precise fit at all normal operating temperatures.

Service and Support - G-Drive products are backed by an uncompromising level of technical support and after sales service, delivered through a world class service network.

1800 rpm (60 Hz Ratings)

Gross Engine Output			Net Engine Output			Typical Generator Set Output					
Standby	Prime	Base	Standby	Prime	Base	Standby (ESP)		Prime (PRP)		Base (COP)	
kWm/BHP			kWm/BHP			kWe	kVA	kWe	kVA	kWe	kVA
1656/2220	1384/1855	1224/1640	1605/1252	1349/1809	1189/1594	1500	1875	1295	1619	1141	1427

Our energy working for you.™

www.cumminsdrive.com

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General Engine Data

Type	4 cycle, in line, Turbocharged and After-cooled
Bore mm	158.8
Stroke mm	158.8
Displacement Litre	50
Cylinder Block	16-cylinder, direct injection, 4-cycle diesel engine
Battery Charging Alternator	55A
Starting Voltage	24V
Fuel System	Direct injection
Fuel Filter	Dual spin on paper element fuel filters with standard water separator
Lube Oil Filter Type(s)	Spin on full flow filter
Lube Oil Capacity (l)	204
Flywheel Dimensions	SAE 0

Coolpac Performance Data

Cooling System Design	2 pump - 2 loop
Coolant Ratio	50% ethylene glycol; 50% water
Coolant Capacity (l)	240.0
Limiting Ambient Temp (°C)**	50.0
Fan Power (kWm)	33.0
Cooling System Air Flow (m ³ /s)**	28.2
Air Cleaner Type	Dry replaceable element with restriction indicator

** @ 13 mm HF0

Weight & Dimensions

Length	Width	Height	Weight (dry)
mm	mm	mm	kg
3497	2000	2703	6565

Fuel Consumption 1800 rpm (60 Hz)

%	kWm	BHP	L/ph	US gal/ph
Standby Power				
100	1656	2220	392	103.6
Prime Power				
100	1384	1855	330	87.3
75	1038	1391	257	68
50	692	928	180	47.6
25	346	463	111	29.2
Continuous Power				
100	1224	1640	299	79

Cummins G-Drive Engines

Asia Pacific

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Fax 65 6417 2399

Europe, CIS, Middle

East and Africa
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Manston Ramsgate
Kent CT12 5BF, UK
Phone 44 1843 255000
Fax 44 1843 255902

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Guarulhos, SP 07180-900
Brazil
Phone 55 11 2186 4552
Fax 55 11 2186 4729

Mexico

Cummins S. de R.L. de C.V.
Eje 122 No. 200 Zona Industrial
San Luis Potosí, S.L.P. 78090
Mexico
Phone 52 444 870 6700
Fax 52 444 870 6811

North America

1400 73rd Avenue N.E.
Minneapolis, MN 55432
USA
Phone 1 763 574 5000
USA Toll-free 1 877 769 7669
Fax 1 763 574 5298

Ratings Definitions

Emergency Standby Power (ESP):

Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Limited-Time Running Power (LTP):

Applicable for supplying power to a constant electrical load for limited hours. Limited-Time Running Power (LTP) is in accordance with ISO 8528.

Prime Power (PRP):

Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Base Load (Continuous) Power (COP):

Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) is in accordance with ISO 8528, ISO 3046, AS 2789, DIN6271 and BS 5514.

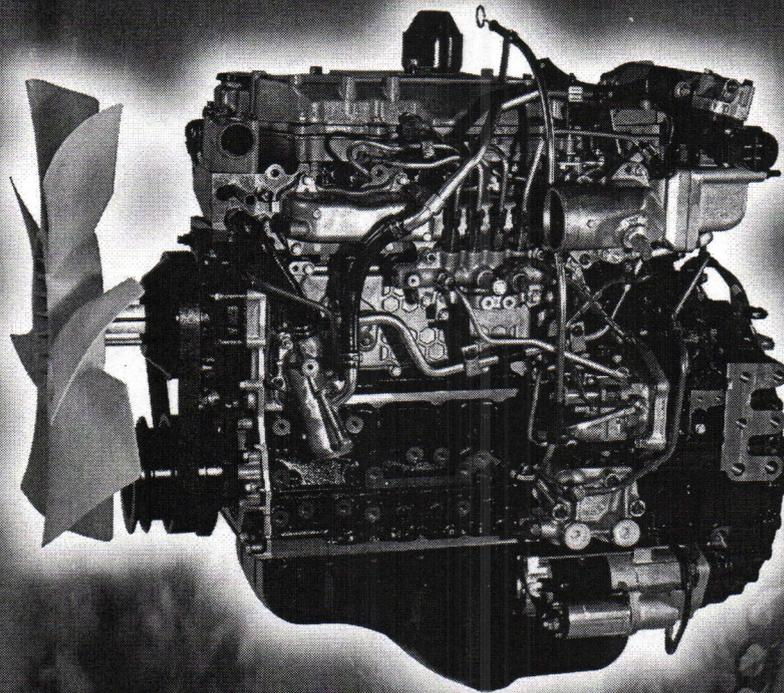
Our energy working for you.™

www.cumminsgdrive.com

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Isuzu Diesel Engines



4HK1X

Generator: 178.2 HP @ 1800 RPM

Industrial Drive: 203.0 HP @ 2100 RPM

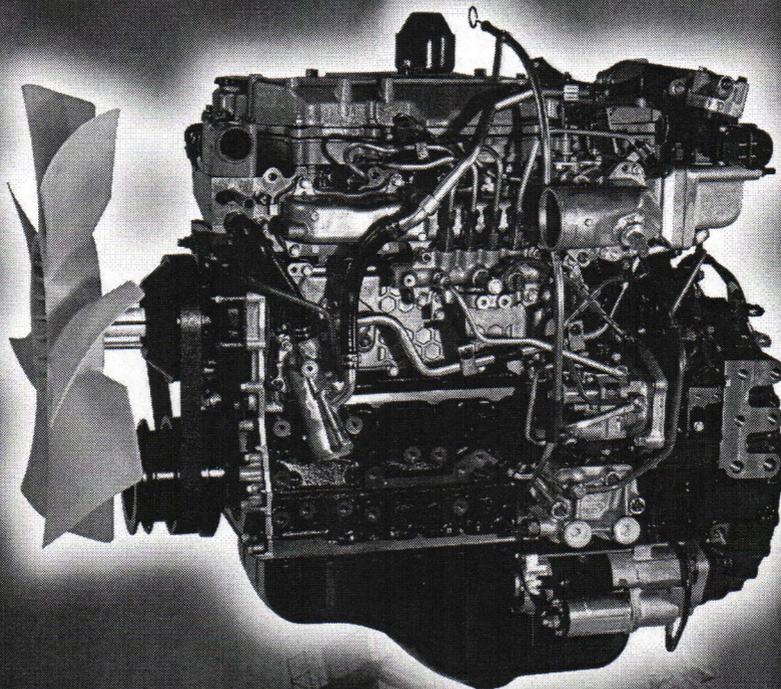
Standard features:

- U.S. EPA Tier 3
- Displacement: 5.2 L
- Turbo charged & charge air cooled
- Peak torque: 521.1 lb/ft @ 1500 RPM
- Fuel consumption: .356 LB/HP-HR
- Flywheel housing: SAE 3
- Electric & self-priming fuel lift pump
- 12V and 24V available
- Glow plug starting aid
- High angularity oil pan
- 500-hour service intervals
- 5-year / 5,000-hour warranty

The power behind it all.

ISUZU
DIESEL

Isuzu Diesel Engines



4HK1X

Generator: 178.2 HP @ 1800 RPM

Industrial Drive: 203.0 HP @ 2100 RPM

Standard features:

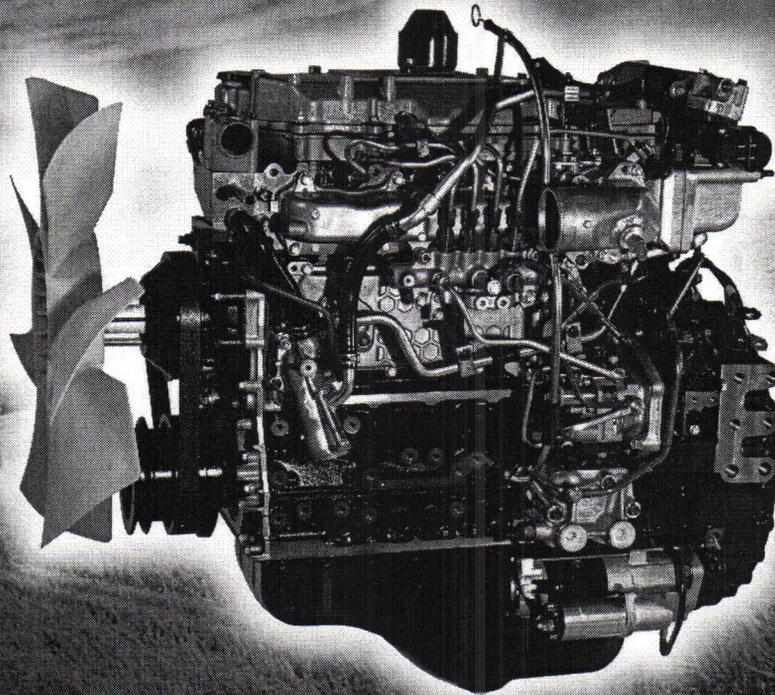
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ISUZU

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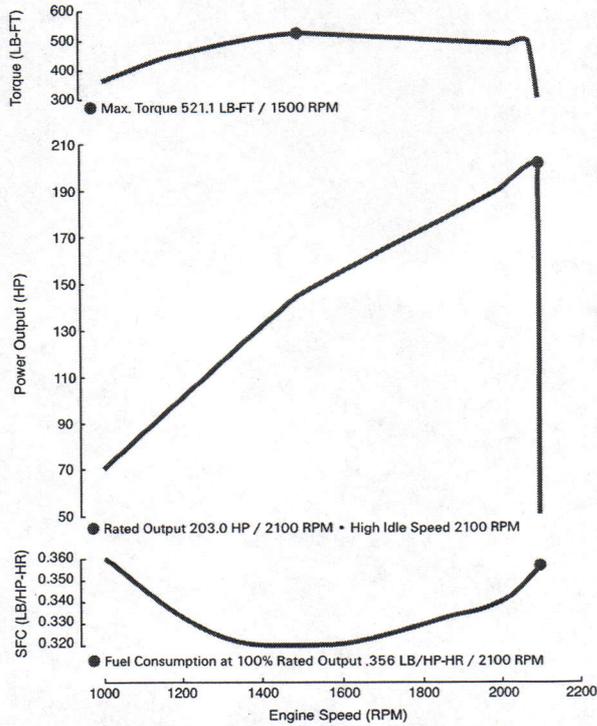
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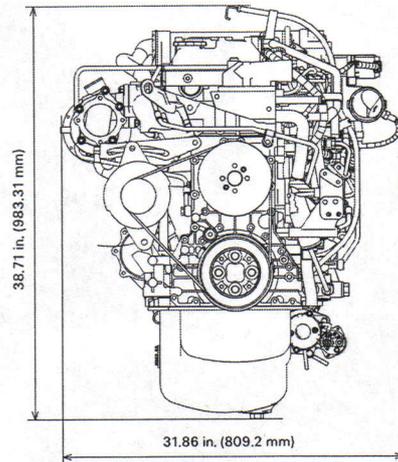
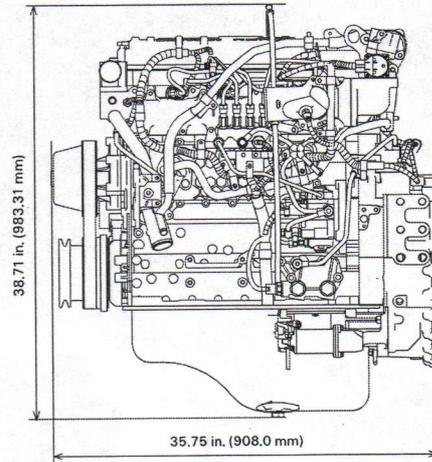
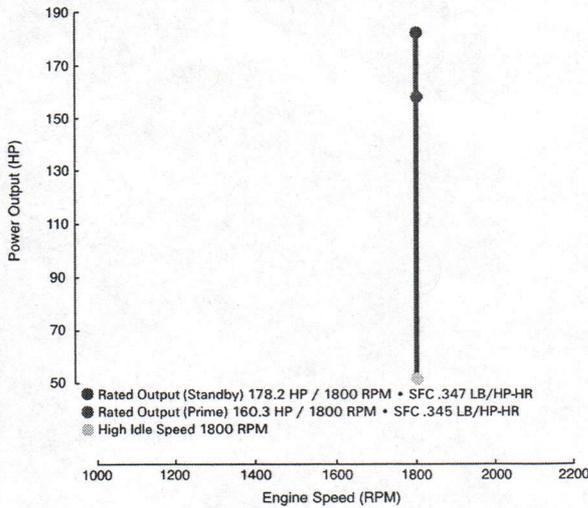
The power behind it all.

ISUZU
DIESEL

4HK1X Industrial Performance Curves:



4HK1X Genset Performance Curves:



Available options:

- Cooling system
- Air cleaner
- Exhaust system
- Front and rear mounts
- Skid base
- Instrument panel & extension harness
- Custom power unit

Horsepower comparison:

Engine Model	Cylinders	Displacement (L)	HP Range
4JJ1X	4	3.0	75-130
4HK1X	4	5.2	150-200
6HK1X	6	7.8	225-300

For additional information, please contact your local distributor or visit www.isuzuengines.com

Isuzu Motors America, LLC

46401 Commerce Center Drive
 Plymouth, Michigan 48170
 Phone: 734.582.9470
 Fax: 734.455.7581

ILS-4HK1X-E

www.isuzuengines.com

Alton Coal - Underground Mine Proposal
Generator Emissions

Source Name	Quantity	Annual Hours of Operation	Rated Power (kW)	Rated Power (hp)	Fuel Use (gal/hr)	PM ₁₀ Emissions (tpy)	PM _{2.5} Emissions (tpy)	SO _x Emissions (tpy)	NO _x Emissions (tpy)	HC Emissions (tpy)	CO Emissions (tpy)	CO ₂ Emissions (tpy)	CH ₄ Emissions (tpy)	N ₂ O Emissions (tpy)	CO ₂ e Emissions (tpy)	Control System and Comments
Generators	1	8760	142	190	7.3	0.241	0.241	0.010	3.593	3.593	1.522	717.710	0.029	0.018	723.79	Tier 3 Interim Compliant

Notes:

Pollutant	Emissions Factor	Units	Source
PM10 Emission Factor	0.18	gram/KW-hr	Emissions guarantee
PM2.5 Emission Factor	0.18	gram/KW-hr	Emissions guarantee
SO _x Emission Factor	0.00001	lb/hp-hr	AP-42 Chapter 3 Table 3.4-1
NO _x Emission Factor	2.62	gram/KW-hr	Emissions guarantee
HC Emission Factor	2.6	gram/KW-hr	Emissions guarantee
CO Emission Factor	1.1	gram/KW-hr	Emissions guarantee
CO ₂	73.25	kg/MMBtu	40 CFR 98.33 Table C-1
CH ₄	3.00E-03	kg/MMBtu	40 CFR 98.33 Table C-2
N ₂ O	6.00E-04	kg/MMBtu	40 CFR 98.33 Table C-2
Diesel heat rating	0.1390	MMBtu/gal	40 CFR 98.33 Table C-1
Fuel use	1.0	MMBtu/hr	
Fuel Use	8,888.8	MMBtu/yr	

Cummings Tier 4 Compliant Engine
Assumed 15 ppm Sulfur content in the diesel fuel
Conversions

1.314	hp/KW
453.592	gram/lb
1.1023	ton/tonne
3.412	Btu-hr/Watt

Equations:

CO₂ Emissions from 40 CFR 98.33:

$$CO_2 = 1.1 \times 10^{-3} \times \text{Fuel Use} \times \text{Heat Value} \times \text{CO}_2 \text{ Emission Factor}$$

Where:

CO₂ = Annual CO₂ mass emissions for a specific fuel type (metric tons).
Fuel = Mass or volume of the fuel combusted during the year, from company records as defined in §98.6 (express mass in short tons for solid fuel, volume in standard cubic feet for gaseous fuel, and volume in gallons for liquid fuel).
HHV = Annual average high heat value of the fuel (mmBtu per mass or volume). The average HHV shall be calculated according to the requirements of paragraph (d)(2)(ii) of this section.
EF = Fuel-specific default CO₂ emission factor, from Table C-1 of this subpart (kg CO₂/mmBtu).
1 × 10⁻³ = Conversion factor from kilograms to metric tons.

HAP Emissions

Pollutant	Emission Factor (lb/MMBtu)	Emissions (lb/hr)	Emissions (tpy)
Benzene	9.33E-04	9.47E-04	4.15E-03
Toluene	4.09E-04	4.15E-04	1.82E-03
Xylenes	2.85E-04	2.89E-04	1.27E-03
1,3-Butadiene	3.91E-05	3.97E-05	1.74E-04
Formaldehyde	1.18E-03	1.20E-03	5.24E-03
Acetaldehyde	7.67E-04	7.78E-04	3.41E-03
Acrolein	9.25E-03	9.39E-03	4.11E-02
Naphthalene	8.48E-05	8.60E-05	3.77E-04
Acenaphthylene	5.09E-06	5.13E-06	2.25E-05
Acenaphthene	1.42E-06	1.44E-06	6.31E-06
Fluorene	2.92E-05	2.96E-05	1.30E-04
Phenanthrene	2.94E-05	2.98E-05	1.31E-04
Anthracene	1.87E-06	1.90E-06	8.31E-06
Fluoranthene	7.61E-06	7.72E-06	3.38E-05
Pyrene	4.78E-06	4.85E-06	2.12E-05
Benz[<i>b</i>]anthracene	1.68E-06	1.70E-06	7.47E-06
Chrysene	3.53E-07	3.58E-07	1.57E-06
Benz[<i>a</i>]fluoranthene	9.91E-08	1.01E-07	4.40E-07
Benz[<i>k</i>]fluoranthene	1.55E-07	1.57E-07	6.89E-07
Benz[<i>a</i>]pyrene	1.88E-07	1.91E-07	8.36E-07
Indeno[1,2,3- <i>cd</i>]pyrene	3.75E-07	3.81E-07	1.67E-06
Dibenz[<i>a,h</i>]anthracene	5.65E-07	5.72E-07	2.51E-06
Benz[<i>ghi</i>]perylene	4.89E-07	4.96E-07	2.17E-06
Total		1.32E-02	5.79E-02

HAP emission factors taken from AP-42, Section 3.3, Tables 3.3-2.

**Alton Coal - Underground Mine Proposal
Generator Emissions**

Source Name	Quantity	Annual Hours of Operation	Rated Power (kW)	Rated Power (HP)	Fuel Use (gal/hr)	PM ₁₀ Emissions (tpy)	PM _{2.5} Emissions (tpy)	SO _x Emissions (tpy)	NO _x Emissions (tpy)	HC Emissions (tpy)	CO Emissions (tpy)	CO ₂ Emissions (tpy)	CH ₄ Emissions (tpy)	N ₂ O Emissions (tpy)	CO ₂ e Emissions (tpy)	Control System and Comments
Generators	1	3600	1655	2220	103.6	0.131	0.131	0.048	3.546	0.131	9.195	4185.858	0.171	0.103	4221.34	Tier 4-interim Compliant

Notes:

Pollutant	Emissions Factor	Units	Source
PM10 Emission Factor	0.02 gram/kW-hr	Emissions guarantee	
PM2.5 Emission Factor	0.02 gram/kW-hr	Emissions guarantee	
SO _x Emission Factor	0.00001 lb/HP-hr	AP-42 Chapter 3 Table 3.4-1	
NO _x Emission Factor	0.54 gram/kW-hr	Emissions guarantee	
HC Emission Factor	0.0 gram/kW-hr	Emissions guarantee	
CO Emission Factor	1.4 gram/kW-hr	Emissions guarantee	
CH ₄	73.25 kg/MMBtu	40 CFR 98.33 Table C-1	
N ₂ O	3.00E-03 kg/MMBtu	40 CFR 98.33 Table C-2	
Diesel heat rating	6.00E-04 kg/MMBtu	40 CFR 98.33 Table C-2	
Fuel use	0.1390 MMBtu/gal	40 CFR 98.33 Table C-1	
Fuel use	14.4 MMBtu/hr		
Fuel use	51,841.4 MMBtu/yr		

Cummings Tier 4 Compliant Engine
Assumed 15 ppm Sulfur content in the diesel fuel

Conversions
1.314 hp/kW
453.592 gram/lb
1.1023 ton/tonne
3.412 Btu-hr/Watt

Equations:

CO₂ Emissions from 40 CFR 98.33:

$$CO_2 = 110^{1.3} * PM_{10}^{0.25} * HP \quad (Eq. C-3)$$

Where:

CO₂ = Annual CO₂ mass emissions for a specific fuel type (metric tons).
Fuel = Mass or volume of the fuel combusted during the year, from company records as defined in §98.6 (express mass in short tons for solid fuel, volume in standard cubic feet for gaseous fuel, and volume in gallons for liquid fuel).
HHV = Annual average high heat value of the fuel (mmBtu per mass or volume). The average HHV shall be calculated according to the requirements of paragraph (a)(2)(ii) of this section.
EF = fuel-specific default CO₂ emission factor, from Table C-1 of this subpart (kg CO₂/mmBtu).
1 x 10⁻⁶ = Conversion factor from kilograms to metric tons.

HAP Emissions

Pollutant	Emission Factor (lb/MMBtu)	Emissions (lb/hr)	Emissions (tpy)
Benzene	9.33E-04	1.34E-02	2.42E-02
Toluene	4.09E-04	5.89E-03	1.06E-02
Xylenes	2.85E-04	4.10E-03	7.39E-03
1,3-Butadiene	3.91E-05	5.63E-04	1.01E-03
Formaldehyde	1.18E-03	1.70E-02	3.06E-02
Acetaldehyde	7.67E-04	1.10E-02	1.99E-02
Acrolein	9.25E-03	1.33E-01	2.40E-01
Naphthalene	8.48E-05	1.22E-03	2.20E-03
Acenaphthylene	5.06E-06	7.29E-05	1.31E-04
Acenaphthene	1.42E-06	2.04E-05	3.68E-05
Fluorene	2.92E-05	4.20E-04	7.57E-04
Phenanthrene	2.94E-05	4.23E-04	7.62E-04
Anthracene	1.87E-06	2.69E-05	4.85E-05
Fluoranthene	7.61E-06	1.10E-04	1.97E-04
Pyrene	4.78E-06	6.88E-05	1.24E-04
Benz[a]anthracene	1.68E-06	2.42E-05	4.35E-05
Chrysene	3.53E-07	5.08E-06	9.15E-06
Benzofluoranthene	9.91E-08	1.43E-06	2.57E-06
Benzofluoranthene	1.55E-07	2.23E-06	4.02E-06
Benzofluoranthene	1.88E-07	2.71E-06	4.87E-06
Indeno[1,2,3-cd]pyrene	3.75E-07	5.40E-06	9.72E-06
Dibenz[a,h]anthracene	5.83E-07	8.40E-06	1.51E-05
Benzofluoranthene	4.89E-07	7.04E-06	1.27E-05
Total		1.88E-01	3.38E-01

HAP emission factors taken from AP-42 Section 3.3, Tables 3.3-2.

HAP emission factors taken from AP-42 Section 3.3, Tables 3.3-2.

Alton Coal - Underground Mine Proposal
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Proposed Emissions Changes

Source Name	PM ₁₀ Emissions (tpy)	PM _{2.5} Emissions (tpy)	SOx Emissions (tpy)	NOx Emissions (tpy)	HC Emissions (tpy)	CO Emissions (tpy)	CO ₂ Emissions (tpy)	CH ₄ Emissions (tpy)	N ₂ O Emissions (tpy)	CO ₂ e Emissions (tpy)
Source Wide	-4.979	-0.209	0.128	12.223	3.913	23.896	10903.298	0.446	0.268	10995.74

Alton Coal - Underground Mine Proposal
Generator Emissions

Source Name	Quantity	Annual Hours of Operation	Rated Power (kW)	Rated Power (HP)	Fuel Use (gal/hr)	PM ₁₀ Emissions (tpy)	PM _{2.5} Emissions (tpy)	CO Emissions (tpy)	SOx Emissions (tpy)	NOx Emissions (tpy)	HC Emissions (tpy)	CO ₂ Emissions (tpy)	CH ₄ Emissions (tpy)	N ₂ O Emissions (tpy)	CO ₂ e Emissions (tpy)	Control System and Comments
Generator Emissions - 190 hp	1	8760	142	190	7.3	0.241	0.241	1.522	0.01	3.593	3.593	717.71	0.029	0.018	723.79	
Generator Emissions - 2220 hp	1	8760	1655	2220	103.6	0.320	0.320	22.374	0.118	8.630	0.320	10185.588	0.417	0.250	10271.85	Tier 4-interim Compliant
Total Emissions						0.561	0.561	23.896	0.128	12.223	3.913	10903.298	0.446	0.268	10995.64	

Alton Coal - Underground Mine Proposal
Unpaved Haul Road Emissions

Source Name	Length (ft)	PM ₁₀ Emissions (tpy)	PM _{2.5} Emissions (tpy)
Unpaved Haul Road Emissions	3840	-3.95	-0.24

Alton Coal - Underground Mine Proposal
Stockpile Emissions

Source Name	Material Processed (tons)	PM ₁₀ Emissions (tpy)	PM _{2.5} Emissions (tpy)
Stockpile Staker	750,000	0.04	0.01

Alton Coal - Underground Mine Proposal
Disturbed Areas - Reduction in Surface Area

Source Name	Area Disturbed (acres)	PM ₁₀ Emissions (tpy)	PM _{2.5} Emissions (tpy)
Disturbed Areas	31	-2.03	-0.61

**Alton Coal - Underground Mine Proposal
Stacker/Conveyor Transfer Point**

Source Name	Material Processed (tons)	PM ₁₀ Emissions (tpy)	PM _{2.5} Emissions (tpy)
Stacker / Conveyor Point	750,000	0.4	0.07

HAP Emissions - 190 hp and 2220 hp engines

Pollutant	Emission Factor (lb/MMBtu)	2220 hp Emissions (tpy)	190 hp Emissions (tpy)	Total HAP Emissions (tpy)
Benzene	9.33E-04	5.88E-02	4.15E-03	6.30E-02
Toluene	4.09E-04	2.58E-02	1.82E-03	2.76E-02
Xylenes	2.85E-04	1.80E-02	1.27E-03	1.93E-02
1,3-Butadiene	3.91E-05	2.47E-03	1.74E-04	2.64E-03
Formaldehyde	1.18E-03	7.44E-02	5.24E-03	7.96E-02
Acetaldehyde	7.67E-04	4.84E-02	3.41E-03	5.18E-02
Acrolein	9.25E-03	5.83E-01	4.11E-02	6.24E-01
Naphthalene	8.48E-05	5.35E-03	3.77E-04	5.73E-03
Acenaphthylene	5.06E-06	3.19E-04	2.25E-05	3.42E-04
Acenaphthene	1.42E-06	8.96E-05	6.31E-06	9.59E-05
Fluorene	2.92E-05	1.84E-03	1.30E-04	1.97E-03
Phenanthrene	2.94E-05	1.85E-03	1.31E-04	1.98E-03
Anthracene	1.87E-06	1.18E-04	8.31E-06	1.26E-04
Fluoranthene	7.61E-06	4.80E-04	3.38E-05	5.14E-04
Pyrene	4.78E-06	3.01E-04	2.12E-05	3.22E-04
Benz(a)anthracene	1.68E-06	1.06E-04	7.47E-06	1.13E-04
Chrysene	3.53E-07	2.23E-05	1.57E-06	2.39E-05
Benzo(b)fluoranthene	9.91E-08	6.25E-06	4.40E-07	6.69E-06
Benzo(k)fluoranthene	1.55E-07	9.78E-06	6.89E-07	1.05E-05
Benzo(a)pyrene	1.88E-07	1.19E-05	8.36E-07	1.27E-05
Indeno(1,2,3-cd)pyrene	3.75E-07	2.37E-05	1.67E-06	2.54E-05
Dibenz(a,h)anthracene	5.83E-07	3.68E-05	2.59E-06	3.94E-05
Benzo(g,h,i)perylene	4.89E-07	3.08E-05	2.17E-06	3.08E-05
Total		8.21E-01	5.79E-02	8.79E-01

HAP emission factors taken from AP-42 Section 3.3, Tables 3.3-2.