TANK VOC EMISSIONS

4-500 bbl. Crude Storage Tanks

Composition	Average Throughput (BCPD)	Working Losses (Lb/Yr)	Breathing Losses (Lb/Yr)	Working Losses (TPY)	Breathing Losses (TPY)	Total Losses (Lb/Hr)	Total Losses (TPY)
Crude	2000	14526.04	823.52	7.26	0.41	1.75	7.67

Earth Energy Resources PR Springs Mine NOI

TANK TO TRUCK LOADING EMISSIONS

LL= 12.46 * S P M /T

LL = Loading loss (Lb/1,000 gal.), of liquid loaded
S = Saturation factor (from AP-42 Table 5.2-1)
P = True vapor pressure of liquid loaded (psia), (from AP-42 Table 7.1-2)
M = Molecular weight of vapors (Lb/Lb-mole)
T = Temperature of liquid loaded (0R = 460 + 0F)

S= 0.6 (For dedicated Hydrocarbon service)
P= 2.8 True Vapor Pressure (psia) @ T=60 for a RVP=10 fluid
M= 50 Lb/Lb-mole (from composition of vapor phase as per Tanks 4.09)
T= 60 0F or 520 0R

LL= 2.01277 Lb/1,000 gal. Loaded

-For a production facility making: 730,000 bbl/yr

LL (TPY) = LL (Lb/1,000 gal) * annual production (bbl/yr) * 42 gal/bbl * 1ton/2000Lbs

Truck Load out Emissions = 30.86 TPY of VOC

LL (lb/hr) = LL (Lb/1,000 gal) * 240 bbl tank truck * 42 gal/bbl * 1 hr load out duration

Truck Load out Emissions = 20.29 lb/hr of VOC

BURNER EMISSIONS

Source	Burner Rating (MMBtu/Hr)	Annual Op Time (hours)	Fuel Type	Fuel Htg Value (Btu/scf)
Process Heater	10.000	8760	Field	1000
Water Heater	10.000	8760	Field	1000
TAI Boiler	10.000	8760	Field	1000

Emission Factors

Source	Burner Rating (MMBtu/Hr)	Emission Factors				
		NOx (Lb/MMFt^3)	CO (Lb/MMFt^3)	SO_2 (Lb/MMFt^3)	PM (Lb/MMFt^3)	VOC [3] (Lb/MMFt^3)
Process Heater	10.000	100.0	84.0	0.6	7.6	8.0
Water Heater	10.000	100.0	84.0	0.6	7.6	8.0
TAI Boiler	10.000	100.0	84.0	0.6	7.6	8.0
EF Source		AP-42	AP-42	AP-42	AP-42	AP-42

[1]AP-42, 5th Ed., Table 1.4-1,2

Emissions (Lb/Hr) = E.F. (Lb/MMft^3) * FHV/1000 * Burner Rating (MMbtu/Hr) * 1/FHV (btu/scf) * 1 MMft^3/1x10^6 ft^3 * 1x10^6 Btu/MMbtu

Emissions (TPY) = Emissions (Lb/Hr) * Annual Operating Time (Hr/Yr) * 1 ton/2,000 Lb

Emissions

Source	Source Emissions									
	NOx		CO		SO_2		PM		VOC	
	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)	(Lb/Hr)	(TPY)
Process Heater	1.00	4.38	0.84	3.68	0.01	0.03	0.08	0.33	0.08	0.35
Water Heater	1.00	4.38	0.84	3.68	0.01	0.03	0.08	0.33	0.08	0.35
TAI Boiler	1.00	4.38	0.84	3.68	0.01	0.03	0.08	0.33	0.08	0.35
Total	**3.00**	**13.14**	**2.52**	**11.04**	**0.02**	**0.08**	**0.23**	**1.00**	**0.24**	**1.05**

Reference Information

Site Rating (HP)	Manufacture	Model	Annual Op Time (hours)	Fuel Type	Fuel Htg Value (Btu/scf)	BSFC[1] (Btu/hp-hr)	Fuel Use (MMSCF/yr)	Power (MMBtu/hr)
671	TBD	TBD	8760	Field	1000	3,500	20.57	2.3485

Example Calculation:

Power (MMBtu/hr) = BSFC (Btu/hp-hr) * HP * 1/10^6 (MMBtu/Btu)

Fuel Consumption (MMSCF/yr) = BSFC (Btu/hp-hr) * Annual Operating Hrs (hrs/yr) * HP * 1/Fuel htg Value (SCF/Btu) * 1/10^6 (MMSCF/SCF)

Uncontrolled Air Pollutant Summary Table

Pollutant	Case #	AP-42 EF (lb/MMBtu)	EF (gm/hp-hr)	lbs/hr	Tons/yr
Criteria Air Pollutants					
NOx		2.27E+00	3.60E+00	5.331	23.3502
CO		3.51E+00	5.57E+00	8.243	36.1054
PM-10		9.50E-03	1.51E-02	0.022	0.0977
SO2		5.88E-04	9.33E-04	0.001	0.0060
VOC		2.96E-02	4.70E-02	0.070	0.3045
Hazardous Air Pollutants					
1,1,2,2 - Tetrachloroethane	79345	2.53E-05	4.02E-05	0.000	0.0003
1,1,2 - Trichloroethane	79005	1.53E-05	2.43E-05	0.000	0.0002
1,3 - Butadiene	106990	6.63E-04	1.05E-03	0.002	0.0068
1,3 - Dichloropropene	542756	1.27E-05	2.02E-05	0.000	0.0001
Acetaldehyde	75070	2.79E-03	4.43E-03	0.007	0.0287
Acrolein	107028	2.63E-03	4.18E-03	0.006	0.0271
Benzene	71432	1.58E-03	2.51E-03	0.004	0.0163
Carbon Tetrachloride	56235	1.77E-05	2.81E-05	0.000	0.0002
Chlorobenzene	108907	1.29E-05	2.05E-05	0.000	0.0001
Chloroform	67663	1.37E-05	2.17E-05	0.000	0.0001
Ethylbenzene	100414	2.48E-05	3.94E-05	0.000	0.0003
Ethylene Dibromide	106934	2.13E-05	3.38E-05	0.000	0.0002
Formaldehyde	50000	2.05E-02	1.30E-01	0.192	0.8423
Methanol	67561	3.06E-03	4.86E-03	0.007	0.0315
Methylene Chloride	75092	4.12E-05	6.54E-05	0.000	0.0004
Naphthalene	91203	9.71E-05	1.54E-04	0.000	0.0010
PAH		1.41E-04	2.24E-04	0.000	0.0015
Styrene	100425	1.19E-05	1.89E-05	0.000	0.0001
Toluene	108883	5.58E-04	8.86E-04	0.001	0.0057
Vinyl Chloride	75014	7.18E-06	1.14E-05	0.000	0.0001
Xylene	1330207	1.95E-04	3.10E-04	0.000	0.0020
Totals				0.22	0.96

Notes: 1 - AP-42 emission factors are from AP-42 Chapter 3, table 3.2-3 dated July 2000.

2 - The formaldehyde emission factor is provided by the manufacturer

Example Calculation:

EF (gm/hp-hr) = AP-42 Emission Factor (Lb/MMBtu) * 1/10^6 (MMBtu/Btu) * BSFC (Btu/hp-hr) * 453.59/1 (gm/Lb)

lbs/yr = EF (gm/hp-hr) * Site Rating (hp) * Annual Operation Time (hrs/yr) * Gram-to-pound conversion (1 lb/453.59 gm)

Tons/yr = lbs/yr * (1 Standard U.S. Ton/2000 lbs)

Natural Gas Generator

Reference Information

Site Rating (HP)	Manufacture	Model	Annual Op Time (hours)	Fuel Type	Fuel Htg Value (Btu/scf)	BSFC[1] (Btu/hp-hr)	Fuel Use (MMSCF/yr)	Power (MMBtu/hr)
671	TBD	TBD	8760	Field	1000	3,500	20.57	2.3485

Example Calculation:

Power (MMBtu/hr) = BSFC (Btu/hp-hr) * HP * 1/10^6 (MMBtu/Btu)

Fuel Consumption (MMSCF/yr) = BSFC (Btu/hp-hr) * Annual Operating Hrs (hrs/yr) * HP * 1/Fuel htg Value (SCF/Btu) * 1/10^6 (MMSCF/SCF)

Controlled Air Pollutant Summary Table

Pollutant	Case #	AP-42 EF (lb/MMBtu)	EF (gm/hp-hr)	lbs/hr	Tons/yr
Criteria Air Pollutants					
NOx			1.00E+00	1.479	6.4794
CO			1.00E+00	1.479	6.4794
PM-10		9.50E-03	1.51E-02	0.022	0.0977
SO2		5.88E-04	9.33E-04	0.001	0.0060
VOC		2.96E-02	4.70E-02	0.070	0.3045
Hazardous Air Pollutants					
1,1,2,2 - Tetrachloroethane	79345	2.53E-05	4.02E-05	0.000	0.0003
1,1,2 - Trichloroethane	79005	1.53E-05	2.43E-05	0.000	0.0002
1,3 - Butadiene	106990	6.63E-04	1.05E-03	0.002	0.0068
1,3 - Dichloropropene	542756	1.27E-05	2.02E-05	0.000	0.0001
Acetaldehyde	75070	2.79E-03	4.43E-03	0.007	0.0287
Acrolein	107028	2.63E-03	4.18E-03	0.006	0.0271
Benzene	71432	1.58E-03	2.51E-03	0.004	0.0163
Carbon Tetrachloride	56235	1.77E-05	2.81E-05	0.000	0.0002
Chlorobenzene	108907	1.29E-05	2.05E-05	0.000	0.0001
Chloroform	67663	1.37E-05	2.17E-05	0.000	0.0001
Ethylbenzene	100414	2.48E-05	3.94E-05	0.000	0.0003
Ethylene Dibromide	106934	2.13E-05	3.38E-05	0.000	0.0002
Formaldehyde	50000	2.08E-02	1.30E-01	0.192	0.8423
Methanol	67561	3.06E-03	4.86E-03	0.007	0.0315
Methylene Chloride	75092	4.12E-05	6.54E-05	0.000	0.0004
Naphthalene	91203	9.71E-05	1.54E-04	0.000	0.0010
PAH		1.41E-04	2.24E-04	0.000	0.0015
Styrene	100425	1.19E-05	1.89E-05	0.000	0.0001
Toluene	108883	5.58E-04	8.86E-04	0.001	0.0057
Vinyl Chloride	75014	7.18E-06	1.14E-05	0.000	0.0001
Xylene	1330207	1.95E-04	3.10E-04	0.000	0.0020
Totals				0.22	0.96

Notes: 1 - AP-42 emission factors are from AP-42 Chapter 3, table 3.2-3 dated July 2000.

2 - The formaldehyde emission factor is provided by the manufacturer

Example Calculation:

EF (gm/hp-hr) = AP-42 Emission Factor (Lb/MMBtu) * 1/10^6 (MMBtu/Btu) * BSFC (Btu/hp-hr) * 453.59/1 (gm/Lb)

lbs/yr = EF (gm/hp-hr) * Site Rating (hp) * Annual Operation Time (hrs/yr) * Gram-to-pound conversion (1 lb/453.59 gm)

Tons/yr = lbs/yr * (1 Standard U.S. Ton/2000 lbs)

DIESEL GENERATOR EMISSIONS

Generator Set	kW	hp	Hours of Operation	Emission Factors (g/hp-hr)(lb/hr)				
				PM_{10}[1]	NO_x[1]	SO_2[1,2]	CO[1]	VOC[1,2]
Generator Set	250	335	250	1.50E-01	4.80E+00	4.05E-04	2.60E+00	1.32E-03
TOTAL	250	335						

Notes: 1 EPA Tier 2 Emission factors for nonroad diesel engines
2 EPA AP-42 Table 3.3-1 diesel industrial engine emission factors for engines less than 600 hp

Emissions

	PM_{10}		NO_x		SO_2		CO		VOC		Total HAPs	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Generator Set	0.111	0.014	3.548	0.443	0.000	0.017	1.922	0.240	0.001	0.055	0.015	0.002
Total	**0.111**	**0.014**	**3.548**	**0.443**	**0.000**	**0.017**	**1.922**	**0.240**	**0.001**	**0.001**	**0.015**	**0.002**

HAPS

Generator Set	kW	hp	Hours of Operation	Emission Factors lb/MMBtu[1]						Emissions (lb/hr)						
				HCHO	Benzene	Toluene	Xylenes	Propylene	Acetald.	Acrolein	HCHO	Benzene	Toluene	Xylenes	Propylene	Acetald.	Acrolein
Generator Set	250	335	250	1.18E-03	9.33E-04	4.09E-04	2.85E-04	2.58E-03	7.67E-04	9.25E-05	0.003	0.002	0.001	0.001	0.006	0.002	0.000
TOTAL	**250**	**335**									**0.003**	**0.002**	**0.001**	**0.001**	**0.006**	**0.002**	**0.000**

Notes: 1 AP-42, 5th Edition, Table 3.3-1,2

Generator Set	kW	hp	Hours of Operation	Annual Emissions (tpy)						
				HCHO	Benzene	Toluene	Xylenes	Propylene	Acetald.	Acrolein
Generator Set	250	335	250	0.000	0.000	0.000	0.000	0.001	0.000	0.000
TOTAL	**250**	**335**		**0.0003**	**0.0003**	**0.0001**	**0.0001**	**0.0008**	**0.0002**	**0.0000**

UNPAVED HAUL ROADS

Unpaved Haul Roads	70% Controlled			Uncontrolled		
Pollutant	Gram/sec	Lbs/hr	Tons/yr	Gram/sec	Lbs/hr	Tons/yr
Total Particulate	0.21	1.70	3.37	0.72	5.67	11.23
PM_{10}	0.05	0.43	0.86	0.18	1.45	2.86
$PM_{2.5}$	0.01	0.04	0.09	0.02	0.14	0.29

PM= (k((s/12)^0.7)((W/3)^0.45)*((365-P)/365) Pounds per VMT

PM_{10}= (k'((s/12)^0.9)((W/3)^0.45)*((365-P)/365) Pounds per VMT

$PM_{2.5}$= (k2((s/12)^0.9)((W/3)^0.45)*((365-P)/365) Pounds per VMT

WHERE

k=	particle size factor 30 um from Table 13.2.2-2	4.9
k'=	particle size factor <10 um from Table 13.2.2-2	1.5
k2=	particle size factor <2.5 um from Table 13.2.2-2	0.15
s=	silt content default mean value page 13.2.2-2	4.8
W=	Mean vehicle weight (tons)	25
P=	number of days in a year with at least 0.01 inches of precip	42 Average of two WRCC Stations (1 in Grand ;1 in Uinta County)

PM=	5.9281089	Lbs/VMT	(lbs per vehicle mile traveled)
PM_{10}=	1.510857	Lbs/VMT	(lbs per vehicle mile traveled)
$PM_{2.5}$=	0.1510857	Lbs/VMT	(lbs per vehicle mile traveled)

VMT/YEAR= 3788

Length of road (ft)	1000	
Miles/Trip	0.2	Miles
Trips/year	20000	
Control Efficiency for roads	0.7	

HOURS OF OPERATION

Hours per day	12
Days per week	Varied
Weeks per year	Varied
Hours per year	3960

Materials and Trucks

Ore[1]

TPY

Material (tons/year)	600,000
Empty Weight (tons)	10
Loaded Weight (tons)	40
Mean Vehicle Weight	25
Trips/year	20000
% of Total Trucks	100%

Materials and Trucks

Ore[1]

TPH

Trips/hr	5
Road Length (ft)	1000
Miles/Trip	0.2
VMT/HOUR	0.96

AP-42 Fifth Edition Volume 1, Supplement E December 2003
Section 13 Miscellaneous Sources, 11/2006 Revision
13.2 Fugitive Dust Sources
13.2.2 Unpaved Roads

UNPAVED HAUL ROADS

Unpaved Haul Roads	70% Controlled			Uncontrolled		
Pollutant	Gram/sec	Lbs/hr	Tons/yr	Gram/sec	Lbs/hr	Tons/yr
Total Particulate	11.81	93.62	185.37	39.35	312.06	617.89
PM_{10}	3.01	23.86	47.24	10.03	79.53	157.48
$PM_{2.5}$	0.30	2.39	4.72	1.00	7.95	15.75

PM= (k((s/12)^0.7)((W/3)^0.45)*((365-P)/365) Pounds per VMT

PM_{10}= (k'((s/12)^0.9)((W/3)^0.45)*((365-P)/365) Pounds per VMT

$PM_{2.5}$= (k2((s/12)^0.9)((W/3)^0.45)*((365-P)/365) Pounds per VMT

WHERE

k=	particle size factor 30 um from Table 13.2.2-2	4.9
k'=	particle size factor <10 um from Table 13.2.2-2	1.5
k2=	particle size factor <2.5 um from Table 13.2.2-2	0.15
s=	silt content default mean value page 13.2.2-2	4.8
W=	Mean vehicle weight (tons)	25
P=	number of days in a year with at least 0.01 inches of precip	42 Average of two WRCC Stations (1 in Grand ; 1 in Uinta County)

PM=	5.928108873	Lbs/VMT	(lbs per vehicle mile traveled)
PM_{10}=	1.510856956	Lbs/VMT	(lbs per vehicle mile traveled)
$PM_{2.5}$=	0.151085696	Lbs/VMT	(lbs per vehicle mile traveled)

VMT/YEAR= 208460

Length of road roundtrip(ft)	12700
Miles/Trip	2.4 Miles
Trips/year	86667
Control Efficiency for roads	0.7

HOURS OF OPERATION

Hours per day	12
Days per week	Varied
Weeks per year	Varied
Hours per year	3960

Materials and Trucks

Ore & Overburnden[1]

TPY

Material (tons/year)	2,600,000
Empty Weight (tons)	10
Loaded Weight (tons)	40
Mean Vehicle Weight	25
Trips/year	86667
% of Total Trucks	100%

Materials and Trucks

Ore & Overburnden[1]

TPH

Trips/hr	22
Road Length (ft)	12700
Miles/Trip	2.4
VMT/HOUR	52.64

AP-42 Fifth Edition Volume 1, Supplement E December 2003
Section 13 Miscellaneous Sources, 11/2006 Revision
13.2 Fugitive Dust Sources
13.2.2 Unpaved Roads

EXPOSED AREA WIND EROSION

Area: 175 acres

Control Efficiency 50%
TSP= 0.38 Ton/acre/yr Table 11-9-4
PM10= TSP x 0.5 0.114
Usage 365 Days/yr

Pollutant	Controlled emissions		
	Grams/sec	Lbs/hr	Tons/yr
Total Particulate	0.957	7.591	33.25
PM10	0.287	2.277	9.98

Pollutant	Uncontrolled emissions		
	Grams/sec	Lbs/hr	Tons/yr
Total Particulate	1.913	15.183	66.50
PM10	0.574	4.555	19.95

AP-42 Sept 91
Section 11 Mineral Products Industry
Chapter 11.9 - Western Surface Coal Mining

ORE FRONT END LOADING/STOCKPILE DISTURBANCE EMISSIONS

Drop Point Emissions	Emissions		
Pollutant	Gram/sec	Lbs/hr	Tons/yr
Total Particulate	0.23	1.82	3.65
PM10	0.11	0.86	1.73
PM2.5	0.02	0.13	0.26

Throughput Rates		
Hourly	300	tons
Annual	1,200,000	tons

PM=(k)*(0.0032)*((U/5)^1.3)/((M/2)^1.4) 13.2.4-4 Equation (1)
PM10=(k')*(0.0032)*((U/5)^1.3)/((M/2)^1.4) 13.2.4-4 Equation (1)
PM2.5=(k)*(0.0032)*((U/5)^1.3)/((M/2)^1.4) 13.2.4-4 Equation (1)

Where

k=	Particle size multiplier for TSP	0.74	Page 13.2.4-4
k'=	Particle size multiplier for PM10	0.35	Page 13.2.4-4
k=	Particle size multiplier for PM2.5	0.053	Page 13.2.4-4
U=	Mean wind speed	7.5	DAQ Default (Average of Uintah & Grand Counties)
M=	Material moisture content	4	Natural moisture
n=	Number of drop points	4	Two dozers, two loaders

PM= 0.00152 lbs/ton
PM10= 0.000719 lbs/ton
PM2.5= 0.000109 lbs/ton

AP-42 Fifth Edition Jan 95
Section 13 Miscellaneous Sources
13.2 Fugitive Dust Sources, 11/2006 Revision
13.2.4 Aggregate Handling and Storage Piles, 11/2006 Revision

OVERBURDEN FRONT END LOADING/STOCKPILE DISTURBANCE EMISSIONS

Drop Point Emissions	Emissions		
Pollutant	Gram/sec	Lbs/hr	Tons/yr
Total Particulate	0.06	0.46	4.26
PM10	0.03	0.22	2.01
PM2.5	0.00	0.03	0.30

Throughput Rates		
Hourly	300	tons
Annual	1,400,000	tons

PM=(k)*(0.0032)*((U/5)^1.3)/((M/2)^1.4) 13.2.4-4 Equation (1)
PM10=(k')*(0.0032)*((U/5)^1.3)/((M/2)^1.4) 13.2.4-4 Equation (1)
PM2.5=(k)*(0.0032)*((U/5)^1.3)/((M/2)^1.4) 13.2.4-4 Equation (1)

Where

k=	Particle size multiplier for TSP	0.74	Page 13.2.4-4
k'=	Particle size multiplier for PM10	0.35	Page 13.2.4-4
k=	Particle size multiplier for PM2.5	0.053	Page 13.2.4-4
U=	Mean wind speed	7.5	DAQ Default (Average of Uintah & Grand Counties)
M=	Material moisture content	4	Natural moisture
n=	Number of drop points	4	Two dozers, two loaders
PM=	0.00152 lbs/ton		
PM10=	0.000719 lbs/ton		
PM2.5=	0.000109 lbs/ton		

AP-42 Fifth Edition Jan 95
Section 13 Miscellaneous Sources
13.2 Fugitive Dust Sources, 11/2006 Revision
13.2.4 Aggregate Handling and Storage Piles, 11/2006 Revision

PROCESS EMISSIONS

Ore

Process [4]	Throughput		PM_{10} Emission Factor	PM Emission Factor	$PM_{2.5}$ Emission Factor	PM Emissions		PM_{10} Emissions		$PM_{2.5}$ Emissions		E-Factor Reference
	tph	tpy				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Fines Crushing - Controlled [1]	300	1,200,000	0.0012 lb/ton	0.003 lb/ton	0.00007 lb/ton	0.90	1.80	0.36	0.72	0.02	0.04	AP-42, 5th Edition, Table 11.19.2-2 [3]
Fines Screening - Contolled	300	1,200,000	0.0022 lb/ton	0.0036 lb/ton		1.08	2.16	0.66	1.32	0.00	0.00	AP-42, 5th Edition, Table 11.19.2-2
Conveyor Transfers [1,2]	300	1,200,000	0.00014 lb/ton/point	0.000046 lb/ton/point		0.13	0.25	0.04	0.08			AP-42, 5th Edition, Table 11.19.2-2

[1] Moisture content assumed to be 4%; above the moisture content for controlled crushing in the Emission Factor Reference provided.
[2] Assumption is that a total of 5 drop points are in use at the plant.
[3] AP-42 footnotes indicate no data available for primary/secondary crushing, but emission factors for PM_{10} for tertiary crushers can be used as an upper limit for primary/secondary crushing.

Overburden for Road base (One Time Event)

Process	Throughput		PM_{10} Emission Factor	PM Emission Factor	PM Emissions		PM_{10} Emissions		E-Factor Reference
	tph	tpy			lb/hr	tpy	lb/hr	tpy	
Secondary Crushing - Controlled [1]	150	1,400,000	0.00054 lb/ton	0.0012 lb/ton	0.18	0.84	0.08	0.38	AP-42, 5th Edition, Table 11.19.2-2 [3]
Conveyor Transfers [1,2]	150	1,400,000	0.00014 lb/ton/point	0.000046 lb/ton/point	0.11	0.49	0.03	0.16	AP-42, 5th Edition, Table 11.19.2-2

[1] Moisture content assumed to be 4%; above the moisture content for controlled crushing in the Emission Factor Reference provided.
[2] Assumption is that a total of 5 drop points are in use at the plant.
[3] AP-42 footnotes indicate no data available for primary/secondary crushing, but emission factors for PM_{10} for tertiary crushers can be used as an upper limit for primary/secondary crushing.
[4] Crushing conveying unit is a Werkin Miner that removes and mills ore and conveys the milled material into a truck for hauling, the screen is a delumper to loosen the milled material after it has been hauled to the hopper for processing. As per conversations with Tim Blanchard and Tim DeJulius with the UDAQ it was suggested that fines crushing and screening emission factors could be used for this process.

Uncontrolled Emissions

Process [4]	Throughput		PM_{10} Emission Factor	PM Emission Factor	$PM_{2.5}$ Emission Factor	PM Emissions		PM_{10} Emissions		$PM_{2.5}$ Emissions		E-Factor Reference
	tph	tpy				lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Fines Crushing - Controlled [1]	300	1,200,000	0.015 lb/ton	0.039 lb/ton	0.00007 lb/ton	11.70	23.40	4.50	9.00	0.02	0.04	AP-42, 5th Edition, Table 11.19.2-2 [3]
Fines Screening - Contolled	300	1,200,000	0.072 lb/ton	0.3 lb/ton		90.00	180.00	21.60	43.20	0.00	0.00	AP-42, 5th Edition, Table 11.19.2-2
Conveyor Transfers [1,2]	300	1,200,000	0.0011 lb/ton/point	0.003 lb/ton/point		0.99	1.98	2.70	5.40			AP-42, 5th Edition, Table 11.19.2-2

[1] Moisture content assumed to be 4%; above the moisture content for controlled crushing in the Emission Factor Reference provided.
[2] Assumption is that a total of 5 drop points are in use at the plant.
[3] AP-42 footnotes indicate no data available for primary/secondary crushing, but emission factors for PM_{10} for tertiary crushers can be used as an upper limit for primary/secondary crushing.

Overburden for Road base (One Time Event)

Process	Throughput		PM_{10} Emission Factor	PM Emission Factor	PM Emissions		PM_{10} Emissions		E-Factor Reference
	tph	tpy			lb/hr	tpy	lb/hr	tpy	
Secondary Crushing - Controlled [1]	150	1,400,000	0.0024 lb/ton	0.0054 lb/ton	0.81	3.78	0.36	1.68	AP-42, 5th Edition, Table 11.19.2-2 [3]
Conveyor Transfers [1,2]	150	1,400,000	0.0011 lb/ton/point	0.003 lb/ton/point	0.83	3.85	2.25	10.50	AP-42, 5th Edition, Table 11.19.2-2

[1] Moisture content assumed to be 4%; above the moisture content for controlled crushing in the Emission Factor Reference provided.
[2] Assumption is that a total of 5 drop points are in use at the plant.
[3] AP-42 footnotes indicate no data available for primary/secondary crushing, but emission factors for PM_{10} for tertiary crushers can be used as an upper limit for primary/secondary crushing.
[4] Crushing conveying unit is a Werkin Miner that removes and mills ore and conveys the milled material into a truck for hauling, the screen is a delumper to loosen the milled material after it has been hauled to the hopper for processing. As per conversations with Tim Blanchard and Tim DeJulius with the UDAQ it was suggested that fines crushing and screening emission factors could be used for this process.

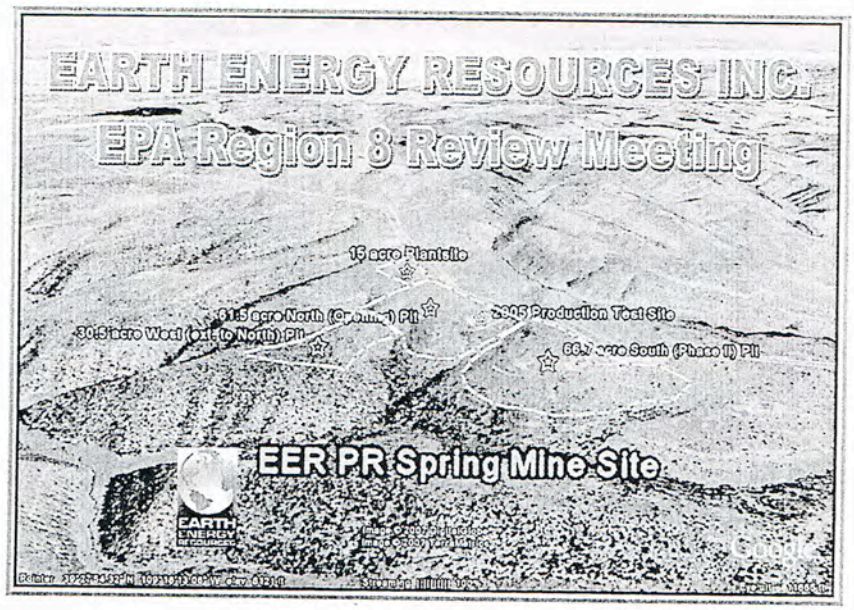
Year 1 with Overburden Crushing

CONTROLLED EMISSIONS SUMMARY

Source		PM		PM_{10}		$PM_{2.5}$		NO_x		SO_2		CO		VOC		Total HAPs	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Secondary Crushing - Controlled	Non-Fugitive	0.90	1.80	0.36	0.72	0.02	0.04										
Fines Screening - Controlled	Non-Fugitive	1.08	2.16	0.66	1.32	0.00	0.00										
Conveyors	Non-Fugitive	0.13	0.25	0.04	0.08	0.00	0.00										
Overburden Secondary Crushing - Controlled	Fugitive	0.18	0.84	0.08	0.38												
Overburden Conveyors - Controlled	Fugitive	0.11	0.49	0.03	0.16												
Stockpile Load-Unload (Overburden)	Fugitive	0.46	4.26	0.22	2.01	0.03	0.30										
Stockpile Load-Unload (Ore)	Fugitive	1.82	3.65	0.86	1.73	0.13	0.26										
Exposed Area Wind Erosion	Fugitive	7.59	33.25	2.28	9.98												
Diesel Generators	Non-Fugitive	0.11	0.01	0.11	0.01			3.55	0.44	0.00	0.02	1.92	0.24	0.00	0.00	0.01	0.00
Natural Gas Generator	Non-Fugitive	0.02	0.10	0.02	0.10			1.48	6.48	0.00	0.01	1.48	6.48	0.07	0.30	0.22	0.96
Unpaved Haul Roads	Fugitive	93.62	185.37	23.86	47.24	2.39	4.72										
Tar Sand Loader Haul Roads	Fugitive	1.70	3.37	0.43	0.86	0.04	0.09										
External Combustion Emissions	Non-Fugitive	0.23	1.00	0.23	1.00			3.00	13.14	2.52	11.04	0.02	0.08	0.23	1.00	0.00	0.00
Tank Emissions	Non-Fugitive																
Tank to Truck Loading Emissions	Non-Fugitive																
Totals	Fugitive	105.48	231.22	27.76	62.35	2.59	5.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Non-Fugitive	2.11	4.07	1.15	2.15	0.02	0.04	5.03	6.92	0.00	0.02	3.40	6.72	0.07	0.31	0.23	0.97
Total		107.59	235.29	28.92	64.51	2.61	5.42	5.03	6.92	0.00	0.02	3.40	6.72	0.07	0.31	0.23	0.97

UNCONTROLLED EMISSIONS SUMMARY

Source		PM		PM_{10}		$PM_{2.5}$		NO_x		SO_2		CO		VOC		Total HAPs	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Secondary Crushing	Non-Fugitive	11.70	23.40	4.50	9.00	0.02	0.04										
Screening	Non-Fugitive	90.00	180.00	21.60	43.20												
Conveyors	Non-Fugitive	0.99	1.98	2.70	5.40												
Overburden Secondary Crushing - Controlled	Fugitive	0.81	3.78	0.36	1.68												
Overburden Conveyors - Controlled	Fugitive	0.83	3.85	2.25	10.50												
Stockpile Load-Unload (Overburden)	Fugitive	0.46	4.26	0.22	2.01	0.03	0.30										
Stockpile Load-Unload (Ore)	Fugitive	1.82	3.65	0.86	1.73	0.13	0.26										
Exposed Area Wind Erosion	Fugitive	15.18	66.50	4.55	19.95												
Diesel Generators	Non-Fugitive	0.11	0.01	0.11	0.01			3.55	0.44	0.00	0.02	1.92	0.24	0.00	0.00	0.01	0.00
Natural Gas Generator	Non-Fugitive	0.02	0.10	0.02	0.10			5.33	23.35	0.00	0.01	8.24	36.11	0.07	0.30	0.22	0.96
Unpaved Haul Roads	Fugitive	312.06	617.89	79.53	157.48	7.95	15.75										
Tar Sand Loader Haul Roads	Fugitive	5.67	11.23	1.45	2.86	0.14	0.29										
External Combustion Emissions	Non-Fugitive	0.23	1.00	0.23	1.00			3.00	13.14	2.52	11.04	0.02	0.08	0.23	1.00	0.00	0.00
Tank Emissions	Non-Fugitive													1.75	7.67	0.00	0.00
Tank to Truck Loading Emissions	Non-Fugitive													20.29	30.86	0.00	0.00
Totals	Fugitive	335.20	703.52	86.61	184.03	8.26	16.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Non-Fugitive	103.05	206.49	29.16	58.71	0.02	0.04	11.88	36.93	2.52	11.06	10.18	36.42	22.34	39.83	0.23	0.97
Total		438.25	910.01	115.77	242.74	8.28	16.64	11.88	36.93	2.52	11.06	10.18	36.42	22.34	39.83	0.23	0.97



EARTH ENERGY RESOURCES INC.

EPA Region 8
Review Meeting

July 15, 2008

www.earthenergyresources.com

AGENDA

- Introductions
- Overview of Earth Energy Resources
- Discussion of emissions factors to be used in air quality modeling
- Timeline for application and approval
- Discussion and questions

CORPORATE OVERVIEW

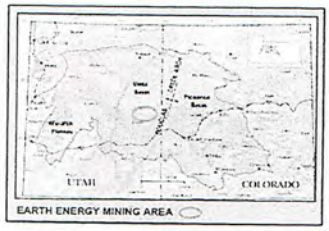
- Earth Energy is a private company with a patent-pending oil sands processing technology which it intends to use on its oil sands property in Utah
- Developed and owns a patent-pending hydrocarbon extraction technology (the "Ophus Process")
  - Environmentally friendly chemical formulation is used to separate bitumen from oil sands ore
  - 98%+ of active chemical recovered and recycled
  - 95%+ of the water is recycled in 10 minutes, minimizing heat loss
  - Tailings ponds are eliminated, enabling concurrent mine reclamation
  - Environmental impact and future liabilities are minimized
- Stantec Engineering engaged to scale process to a 2,000 bbl/d commercial unit for first bitumen production in Spring 2009
  - Demonstration plants have successfully processed both Utah and Athabasca oil sands ore
- ~ 200 million barrels of recoverable bitumen on 100% owned Utah oil sands lease
- Business Plan
  - Primary – Use patent pending technology to exploit its Utah oil sands resource
  - Secondary – Acquire, or use technology to earn working interest in, other oil sands properties
    - Develop other fee for services opportunities

OVERVIEW OF UTAH OIL SANDS

5

- **Utah contains almost 55% of known oil sands in the US**
  - Estimated 20 billion barrels of resource in place in 6 principal deposits
  - Oil sands regarded as pre-cursor to oil shale development
  - Industry friendly regulatory and business climate in Utah

- **PR Spring deposits are shallow, oxidized and "oil-wet"**
  - Average 25 ft overburden with outcroppings throughout leased lands
  - Cannot use traditional Athabasca processes to recover bitumen
  - Bitumen quality comparable to Athabasca, much lower sulphur content
- **100% interest in 7,835 acres of oil sand leases in PR Spring deposit of N.E. Utah**
  - ~ 200 million barrels of recoverable bitumen (based on core holes, resistivity and field outcrop mapping)
  - Only 2 of 4 known ore beds factored into current resource estimate due to lack of deep core holes
  - Deeper core hole drilling program in summer 2008 to prepare independent resource estimate



EARTH ENERGY MINING AREA

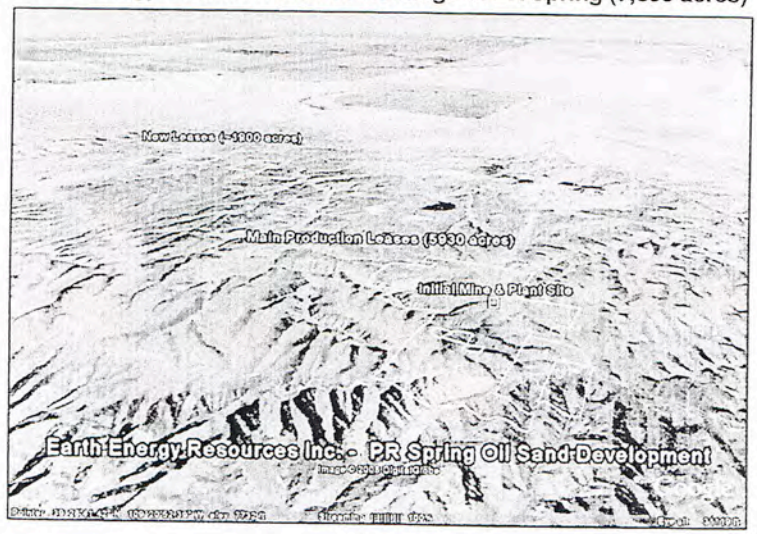
Principal Uinta Basin Tar Sand Deposits	Estimated In-Place Resources (Billion Barrels)	
	Known Resources	Total Estimated Resources
Asphalt Ridge	0.82	1.13
Sunnyside	4.40	6.10
PR Spring	2.14	4.73
Circle Cliffs	0.59	1.73
Tar Sand Triangle	2.50	2.92
Other	1.41	2.94
Total	11.86	19.19

Source: US Dept of Interior, Bureau of Land Management

LEASE HOLDINGS

6

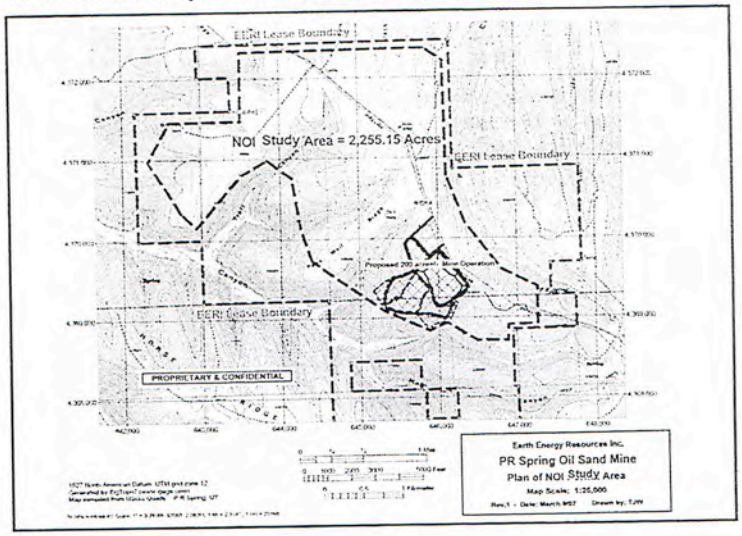
Earth Energy's combined lease holdings at PR Spring (7,835 acres)



PERMITTING

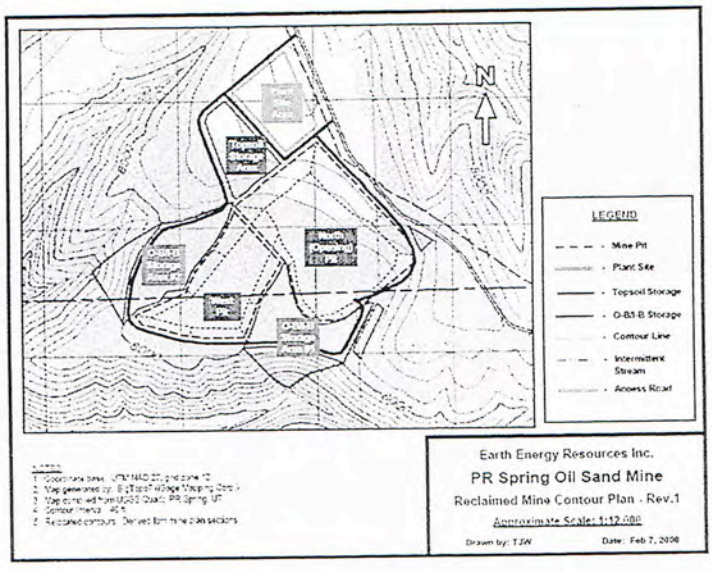
7

Area studied for potential mine development (dashed in blue)



INITIAL PERMIT (AFFECTED) AREA IN DOGM NOI

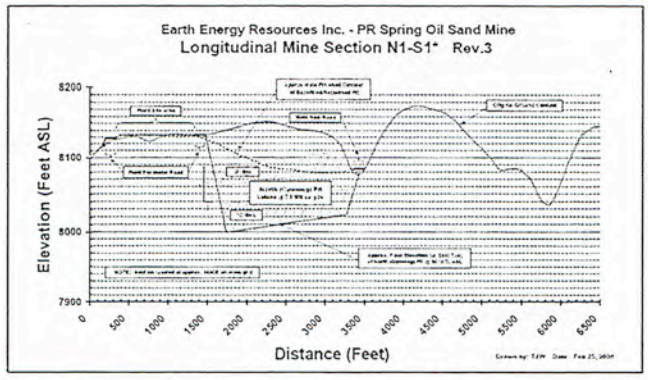
8



PR SPRING MINE PLAN

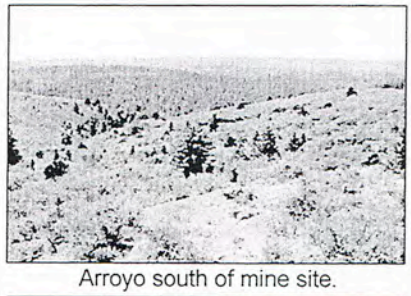
9

- Initial mine planned as 2-pit development
  - 95 acres of estimated 3,900 producible acres
  - Total Volume / Bitumen in Place ratio ("TV/BIP") ~7.5 (comparable to the best leases in Athabasca)
  - 7.2 million bbls estimated recoverable in initial 2 pits
  - Production life 6-13 years (contingent on number of 2,000 bbl/d process units deployed)
  - Ophus Process allows concurrent reclamation of the mine site



PR SPRING MINE SITE

10



Arroyo south of mine site.

North view across test pit and facilities.

Exposed oil sand "D" bed.

PERMITTING

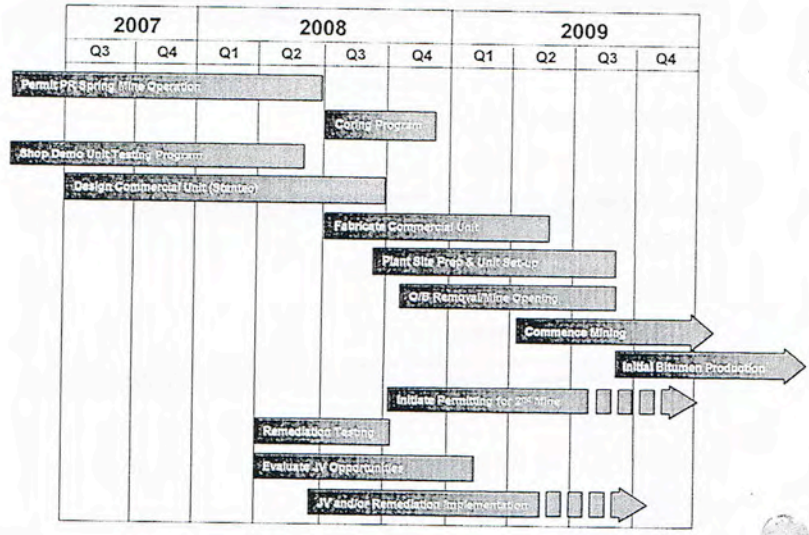
Large Mine Permits	
Notice of Intent (NOI)	• Initial draft submitted in September 2007 • Review with DOGM staff in December 2007 • Revised draft submitted in May 2008
Groundwater Discharge	• Permit by rule granted by DWQ
NOI – Air Quality	• Application review transferred to EPA from DAQ
Water Rights	
Water Right Assignment	• Completed
Drilling Permit	• Approved
BLM Right-of-way	• Under review
Other Permits	
Uintah County CUP	• Granted
Grand County CUP	• Subject to State permitting
Exploration Permit (Coring)	• Under final review

PERMITTING

Other Permitting Matters	
EPA - Stormwater	• Permit not required, all runoff will be contained; per 11/29/07 EPA Issue Paper 'The Applicability of the Oil and Gas Stormwater Final Regulations to Facilities that Process [of] Oil from Oil Shale and Tar Sands'
EPA - SPCC	• Tank farm designed with secondary containment • SPCC plan will be implemented
NEPA	• Not required, project located on State land • Water well and pipeline right-of-way permitted by Utah Division of Water Rights/BLM
RCRA	• Waste solids will be damp dry and chemically benign (non-hazardous)
USFWS	• Colorado River Endangered Fishes Recovery Program Depletion Fees • Not required for water sources at depths greater than 500 feet • Estimated depth of production water well >1,000 feet

TIMELINE

13



THE OPHUS PROCESS TECHNOLOGY

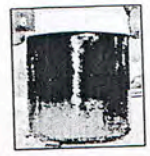
14

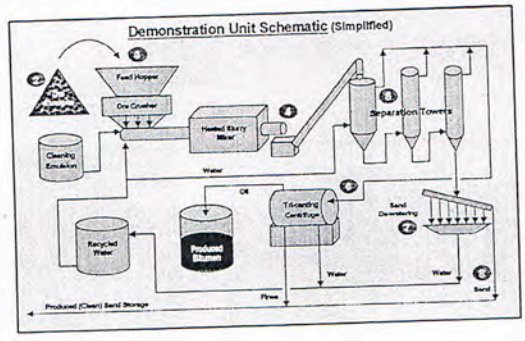
- **Earth Energy has developed and owns a patent-pending hydrocarbon extraction technology**
  - Environmentally friendly active chemical, derived from the agricultural industry, is used to separate bitumen from oil sands
  - Stantec Engineering has been engaged to scale a commercial 2,000 bbl/d bitumen extraction plant
- **North American patent-pending**
  - The Ophus Process patent filed with World Intellectual Property Organization (WIPO)
- **Efficient, recirculating system**
  - Low water consumption
    - 95%+ of the water in the system is recycled
    - 1.5-2 bbl water / bbl bitumen versus 3-7 bbl water / bbl bitumen for traditional oil sands mining operations
  - Favourable energy usage compared to large-scale oil sands mining operations
    - Minimized requirement to heat makeup water
    - Maximized use of thermal energy via waste heat capture
  - 98%+ of active chemical recovered and recycled
  - 96% bitumen recovery (compared to 93% for traditional oil sands mining operations)
- **Process outcomes**
  - Bitumen (~ 12° API) tested and deemed acceptable feedstock to local Salt Lake City refinery
  - Clean, recyclable water
  - Clean, "damp-dry" tailings for immediate reclamation
- **No requirement for tailings ponds –> no long term environmental liability**

THE OPHUS PROCESS TECHNOLOGY

15



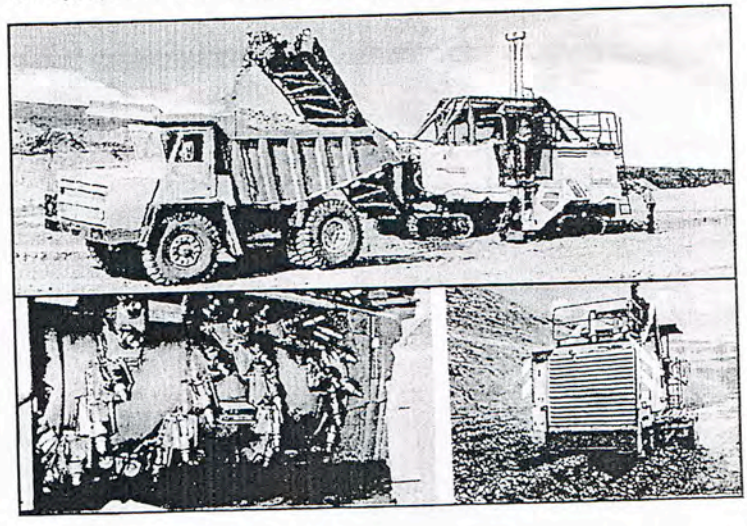


Earth Energy – EPA Region 8 Review Meeting

MINING EQUIPMENT - WIRTGEN SURFACE MINER

16

Self-propelled/self-loading mining & ore conditioning machine

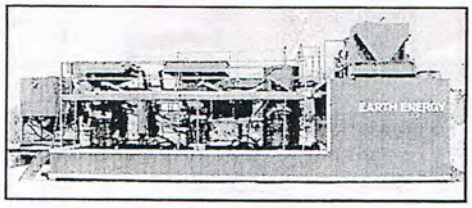


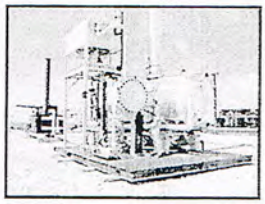
Earth Energy – EPA Region 8 Review Meeting

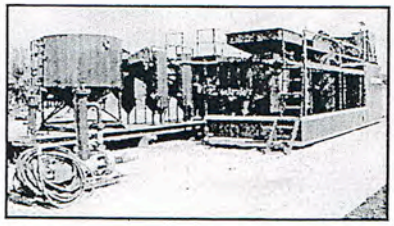
THE OPHUS PROCESS TECHNOLOGY

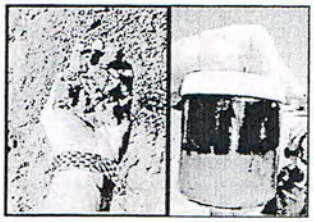
17

2005 production test, PR Spring mine site





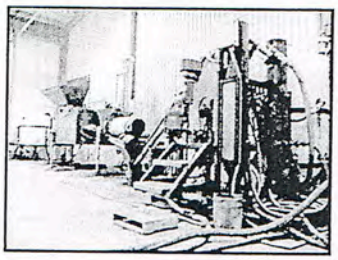


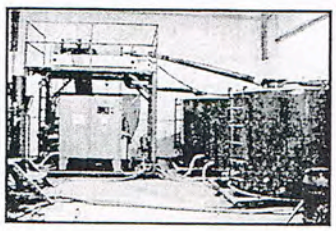


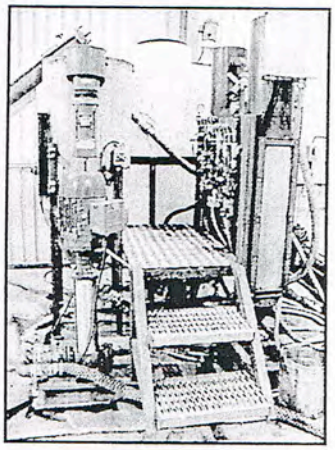
THE OPHUS PROCESS TECHNOLOGY

18

Shop Demonstration Unit, Grande Prairie R&D facility

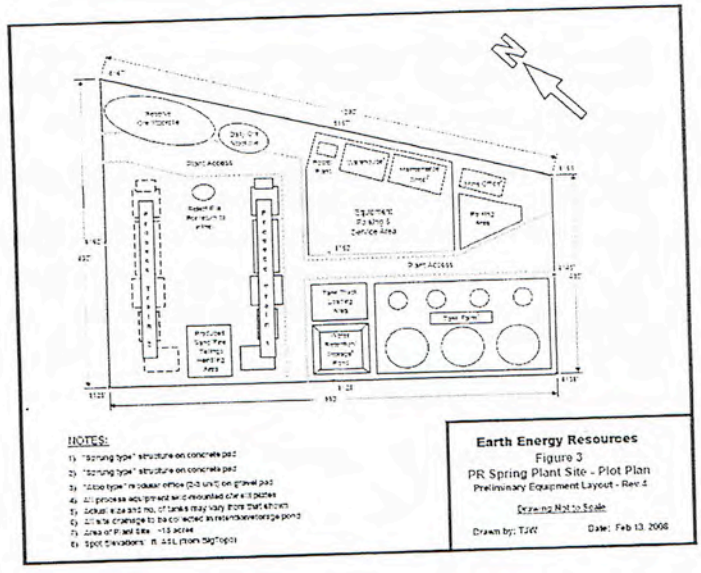






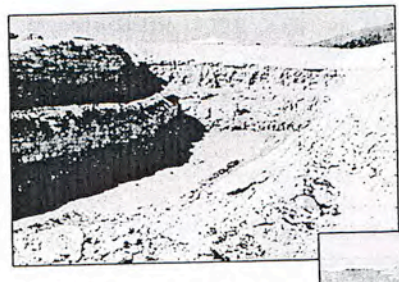
PR SPRING PROCESSING SITE

19

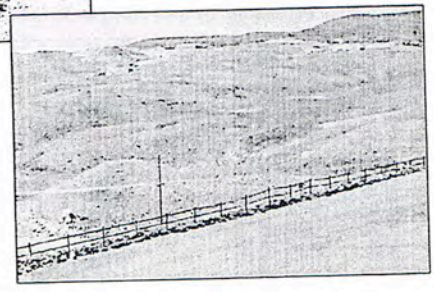


CONCURRENT RECLAMATION

20



Active pit operation, Simplot Phosphate Mine, Vernal, Utah. Similar in size and configuration to planned EER PR Spring oil sand mine operation.



Reclaimed mine pit areas, Simplot Phosphate Mine. Award winning example of concurrent reclamation. Same concept planned for EER PR Spring reclamation.

COMMERCIALIZATION STATUS – SHOP DEMO UNIT

21

- Prototype development unit semi-automated and equipped with SCADA system and database for comprehensive real-time capture of key operating metrics
- Inclined plate separators recently incorporated to emulate energy efficient commercial plant configuration
- Process water and cleaning emulsion heaters used to provide heat to incoming ore (more energy efficient compared to direct-fired heating)
- Modifying/replacing components to reduce water and energy consumption
- Final stages of testing program to validate the commercial process design
- Additional bay added to the Grande Prairie R&D facility to enable year-round testing operations
- Multiple demonstrations of the shop demo unit to outside parties:
  - Investment bankers and potential investors
  - Stantec Consulting
  - Shareholder demonstration day (~ 85 attendees)

COMMERCIALIZATION STATUS - ENGINEERING

22

- Engaged Stantec Consulting Ltd. on July 6, 2007 to provide scale-up engineering services
- Deliverables provided by Stantec:
  - Validation of commercial viability of the Ophus Process
  - Material balance at commercial scale
  - Process flow diagram (PFD) for the commercial unit
  - Initial energy balance at commercial scale
  - Process design basis (PDB) for detailed design
  - Identification of specialized equipment vendors
- Activities going forward
  - Completion of detailed engineering
  - Class II cost estimate
  - Final selection of equipment vendors
  - Placement of long lead component orders
  - Commencement of fabrication

EARTH ENERGY RESOURCES INC.

Barclay Cuthbert, Vice President, Operations
(403) 233-9366, ext. 223
barclay.cuthbert@earthenergyresources.com

www.earthenergyresources.com

RE: Air emissions/permitting questions for Earth Energy

Erin Hallenburg to Donald Law 03/17/2008 08:13 AM

Cc: "Linda Matthews", "Denise Kohtala"

History: This message has been forwarded.

Donald,

Thanks for the response, we look forward to meeting with you on these subjects in the near future.

FYI, Linda Matthews/JBR is the PM on this project and should be cc'ed on all emails.

Happy St. Patty's Day!

--
Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

-----Original Message-----
From: Law.Donald@epamail.epa.gov [mailto:Law.Donald@epamail.epa.gov]
Sent: Monday, March 17, 2008 7:17 AM
To: Erin Hallenburg
Cc: Paser.Kathleen@epamail.epa.gov
Subject: RE: Air emissions/permitting questions for Earth Energy

Erin,

I am in the process of preparing comments to your letter. As a part of that, I have asked staff at HQ for input on a couple regulatory interpretations. I am hoping that we can have those back sometime this week. After I have received those, I will contact you about setting up a time for a meeting.

Thanks for getting back to me.

DJ Law, Environmental Engineer
Phone: (303) 312-7015

Protecting the environment is everyone's responsibility. Help EPA fight pollution by reporting possible harmful environmental activity. To do so, visit EPA's website at
http://www.epa.gov/compliance/complaints/index.html

"Erin

Hallenburg"
<ehallenburg@jbr
env.com>

03/14/2008 02:43
PM

To
Donald Law/R8/USEPA/US@EPA

cc
Kathleen Paser/P2/R8/USEPA/US@EPA

Subject
RE: Air emissions/permitting questions for Earth Energy

DJ,

We sent responses back to EPA on 2/28/08. Wondering if there are responses to our answers or if a meeting can be set up to address the path forward.

--
Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

-----Original Message-----
From: Law.Donald@epamail.epa.gov [mailto:Law.Donald@epamail.epa.gov]
Sent: Tuesday, February 19, 2008 12:11 PM
To: Denise Kohtala; Linda Matthews; Erin Hallenburg
Cc: Paser.Kathleen@epamail.epa.gov
Subject: Air emissions/permitting questions for Earth Energy

Here is a list of questions on your proposed Earth Energy project. I know you have discussed some of these issues with the state of Utah, but I have not been keeping up on the responses to those.

I am aware that you are concerned about this project being subject to PSD review. I understand and can appreciate those concerns. As I am sure you have become aware, permitting on tribal lands has some challenges that make the process different from what you might have previously has experience with permitting on state land.

Please feel free to call me if you have any questions or concerns. In addition, I will be at the 2008 Western U.S. Oil Sands Technology Transfer Meeting on Feb 22nd in Salt Lake City if you wish to discuss some of these issues in person.

(See attached file: Earth Energy questions.doc)

DJ Law, Environmental Engineer
Phone: (303) 312-7015

Protecting the environment is everyone's responsibility. Help EPA fight pollution by reporting possible harmful environmental activity. To do so, visit EPA's website at
http://www.epa.gov/compliance/complaints/index.html

RE: Air emissions/permitting questions for Earth Energy

Erin Hallenburg to Donald Law 03/14/2008 02:42 PM

Cc: Kathleen Paser

History: This message has been replied to and forwarded.

DJ,

We sent responses back to EPA on 2/28/08. Wondering if there are responses to our answers or if a meeting can be set up to address the path forward.

--
Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

-----Original Message-----
From: Law.Donald@epamail.epa.gov [mailto:Law.Donald@epamail.epa.gov]
Sent: Tuesday, February 19, 2008 12:11 PM
To: Denise Kohtala; Linda Matthews; Erin Hallenburg
Cc: Paser.Kathleen@epamail.epa.gov
Subject: Air emissions/permitting questions for Earth Energy

Here is a list of questions on your proposed Earth Energy project. I know you have discussed some of these issues with the state of Utah, but I have not been keeping up on the responses to those.

I am aware that you are concerned about this project being subject to PSD review. I understand and can appreciate those concerns. As I am sure you have become aware, permitting on tribal lands has some challenges that make the process different from what you might have previously has experience with permitting on state land.

Please feel free to call me if you have any questions or concerns. In addition, I will be at the 2008 Western U.S. Oil Sands Technology Transfer Meeting on Feb 22nd in Salt Lake City if you wish to discuss some of these issues in person.

(See attached file: Earth Energy questions.doc)

DJ Law, Environmental Engineer
Phone: (303) 312-7015

so, visit EPA's website at
http://www.epa.gov/compliance/complaints/index.html

Earth Energy Air Quality Issues

Erin Hallenburg to Kathleen Paser, Donald Law 02/28/2008 02:43 PM

Cc: Dan Jackson, Sandra Stavnes, Carl Daly, Tom Aalto, Gregory Davis

History: This message has been forwarded.

Dear Kathleen and DJ,

Enclosed are Earth Energy and JBR's responses to the questions sent to us by DJ. We hope this addresses all your concerns. Our responses are all in Green font, which some previous responses sent in all CAPITALS.

We have also inserted requests that agreement on emission factors and a proper Federal permit application (as opposed to the Utah's Minor Source application) submittal may help get this application to the next step.

Please call if you have any questions.

--
Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

Earth Energy questions_final.doc

FW: Earth Energy Meeting Tar Sands

Erin Hallenburg to Donald Law 02/08/2008 08:27 AM

History: This message has been forwarded.

DJ,

Can we call you to discuss the crux of the upcoming meeting, as referenced in our email on 2/6/08?

--
Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

-----Original Message-----
From: Paser.Kathleen@epamail.epa.gov
[mailto:Paser.Kathleen@epamail.epa.gov]
Sent: Friday, February 08, 2008 8:09 AM
To: Erin Hallenburg
Cc: Paser.Kathleen@epamail.epa.gov; Law.Donald@epamail.epa.gov; Denise Kohtala; Linda Matthews
Subject: Re: Earth Energy Meeting Tar Sands

Erin,

I wanted to let you know that I got your voice-mail. I've stayed home sick today and will call you on monday morning. In the mean time, my responses to your questions below.

Kathleen Paser
Environmental Engineer
Air Technical Assistance Unit
Air and Radiation Program
US EPA Region 8
303-312-6526
****
US EPA Region 8
1595 Wynkoop Street
M/C 8P-AR
Denver, Colorado 80202
****

"Erin Hallenburg" <ehallenburg@jbrenv.com>
02/06/2008 01:25 PM

To

Kathleen Paser/P2/R8/USEPA/US@EPA, Donald Law/R8/USEPA/US@EPA
cc
"Denise Kohtala" <DKohtala@jbrenv.com>, "Linda Matthews" <lmatthews@jbrenv.com>
Subject
Earth Energy Meeting Tar Sands

Kathleen,

I have reviewed the information sent to my associated on 2/1/08. Thanks for the response on the modeling from your associates.

In regard to the upcoming meeting, a little clarification would be helpful. Denise and I can give you a call after you or DJ read and digest this. If you can address items listed below it would be helpful in preparing for this meeting.

First off, I think a meeting in early February may be pre-mature. The air program still needs to get our list of concerns with the information from Utah to you.

1) Overall purpose and objectives for this meeting (what do we want want to achieve).

This is a kick-off meeting and by no means mandatory. I like to look at it as compliance assistance. It's also a good way for the company and EPA to gain important contacts for future potential issues. In the Air program, we always try to meet with potential new sources so we can all get a lay of the land. We invite the other media (water, NEPA, RCRA) as a convenience to the companies (time and travel cost savings). The last meeting we had with an oil shale company was very successful for all involved and has led to good working relationships and helping with compliance certainties in all the media.

There is no rush on our part, but if the company has a timeline for commencing construction I think it important that we have this discussion sooner rather than later just in case there are pre-construction permitting requirements. Maybe it would help if DJ and I first put together our questions on the information we received from Utah send that to you before we have a meeting so you guys are more prepared in regards to what our concerns may be and what we would like to talk about (from an air standpoint).

We would like to learn more about this industry and we would like this company to learn more about it's CAA responsibilities when operating in Indian Country. We would like the company to present to us their specific proposal (Where, When, How, etc.....) and give us a little lesson in this particular Tar Sands Operation. This is all new to us and I'm sure CAA permitting in Indian Country is new to them....it's very different than in the States' in regards to how PTE is calculated and the tools available to us for regulation.

Issues for the other media that came up in the last meeting included (bear with me I not very adept at their issues) storm water run off, waters of the US, and Bevill exemption (RCRA).

2) Is the meeting just for air quality issues, or are additional media and permitting issues going to be discussed?

The meeting would be multi-media. UIC, NPDES, Stormwater, other water concerns, NEPA, RCRA, Air. We usually have an attorney as well in case the company has legal questions.

3) What type of personnel from Earth Energy should attend this meeting? Plant Manager, Designer, Industrial Engineer?

All of the above mentioned looks good and anybody else who can provide detailed information in response to questions about intentions, plans, operations, etc.....

I'll send out an internal email to my contacts asking if they interested in attending and what issues they want to talk about before scheduling the meeting and then send you the list of topics to be discussed so you can be prepared.

From an air stand point, we will have read the information that Utah sent to us and will already be discussing our concerns less formally. In addition, we will have outlined what kind of additional information we may need, how that data should be calculated, and how it should be presented. We want to know what this company is doing, where, and what the impacts are for all the media. We also want to convey to this company that there are environmental obligations in IC. So, it would be good to also come with folks that know the various enviromental laws.

The rest deal with our air segment of this project

4) Is the UDAQ application that you have acceptable or changing this into Federal application required?

If this source ends up being subject to Federal PSD requirements, we will definitely be needing an official PSD application with all the bells and whistles. However, we haven't made that determination yet and that's a big reason for this meeting. To help us understand if we all need to be moving in that direction.

5) Are different emission factors up for discussion? Please note, the factors used are not representative of the material or operations.

Yes. Everything is up for discussion.

6) Can we submit additional air quality information prior to the meeting? Several issues in the UDAQ's email have been resolved with just a little regulatory review.

Yes! We can and are happy to discuss any concerns you have whether it be by email, phone call, face-to-face, at any time. If you have more information that you would like our modeler to look at send it to me and will be happy to get him engaged in further discussion.....ideally directly with your modeler.

I've become the defacto "regional lead" for coordinating information exchange for the oil shale and tar sands companies because of the efforts the air program puts into pre-meetings and early on discussions. So, if there are folks you need to talk to and issues you'd like to discuss (even in other media) I will try to hook you up! I have a growing internal contact list and I'm happy to try to facilitate

contacts for you guys so you can talk to the experts directly.

The more discussions prior to a face-to-face meeting the more beneficial the meeting. That's why I suggested above that we should hold off a bit if you or the company feel the need to get more questions answered first. But let's not wait too long.

7) Will it be helpful to have access to our modeler to answer modeling questions?

Yes.

Now or during our meeting?

Now is always good. I'd like to see our modeler and yours working directly together behind the scenes now on the issues. During the meeting might be necessary depending on where we're at at that time. If all the modeling issues are resolved by then, we probably wouldn't invite our modeler.

--
Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

Earth Energy Meeting Tar Sands

Erin Hallenburg to Kathleen Paser, Donald Law 02/06/2008 01:24 PM

Cc: "Denise Kohtala", "Linda Matthews"

History: This message has been forwarded.

Kathleen,

I have reviewed the information sent to my associated on 2/1/08. Thanks for the response on the modeling from your associates.

In regard to the upcoming meeting, a little clarification would be helpful. Denise and I can give you a call after you or DJ read and digest this. If you can address items listed below it would be helpful in preparing for this meeting.

1) Overall purpose and objectives for this meeting (what do we want want to achieve).
2) Is the meeting just for air quality issues, or are additional media and permitting issues going to be discussed?
3) What type of personnel from Earth Energy should attend this meeting? Plant Manager, Designer, Industrial Engineer ?

The rest deal with our air segment of this project

4) Is the UDAQ application that you have acceptable or changing this into Federal application required?
5) Are different emission factors up for discussion? Please note, the factors used are not representative of the material or operations.
6) Can we submit additional air quality information prior to the meeting? Several issues in the UDAQ's email have been resolved with just a little regulatory review.
7) Will it be helpful to have access to our modeler to answer modeling questions? Now or during our meeting?

--

Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental

RE: Air emissions/permitting questions for Earth Energy

Donald Law to: Erin Hallenburg
Cc: Kathleen Paser
Bcc: paser.kathleen

03/17/2008 07:17 AM

Erin,

I am in the process of preparing comments to your letter. As a part of that, I have asked staff at HQ for input on a couple regulatory interpretations. I am hoping that we can have those back sometime this week. After I have received those, I will contact you about setting up a time for a meeting.

Thanks for getting back to me.

DJ Law, Environmental Engineer
Phone: (303) 312-7015

"Erin Hallenburg" <ehallenburg@jbrenv.com>

"Erin Hallenburg"
<ehallenburg@jbrenv.com>
03/14/2008 02:43 PM

To Donald Law/R8/USEPA/US@EPA
cc Kathleen Paser/P2/R8/USEPA/US@EPA
Subject RE: Air emissions/permitting questions for Earth Energy

DJ,

We sent responses back to EPA on 2/28/08. Wondering if there are responses to our answers or if a meeting can be set up to address the path forward.

--

Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

-----Original Message-----
From: Law.Donald@epamail.epa.gov [mailto:Law.Donald@epamail.epa.gov]
Sent: Tuesday, February 19, 2008 12:11 PM
To: Denise Kohtala; Linda Matthews; Erin Hallenburg
Cc: Paser.Kathleen@epamail.epa.gov
Subject: Air emissions/permitting questions for Earth Energy

Here is a list of questions on your proposed Earth Energy project. I know you have discussed some of these issues with the state of Utah, but I have not been keeping up on the responses to those.

I am aware that you are concerned about this project being subject to PSD review. I understand and can appreciate those concerns. As I am sure you have become aware, permitting on tribal lands has some challenges that make the process different from what you might have previously has experience with permitting on state land.

Please feel free to call me if you have any questions or concerns. In addition, I will be at the 2008 Western U.S. Oil Sands Technology Transfer Meeting on Feb 22nd in Salt Lake City if you wish to discuss some of these issues in person.

(See attached file: Earth Energy questions.doc)

DJ Law, Environmental Engineer
Phone: (303) 312-7015

Protecting the environment is everyone's responsibility. Help EPA fight pollution by reporting possible harmful environmental activity. To do so, visit EPA's website at http://www.epa.gov/compliance/complaints/index.html

Earth Energy Air Quality Issues

Erin Hallenburg to: Kathleen Paser, Donald Law 02/28/2008 02:43 PM

Cc: Dan Jackson, Sandra Stavnes, Carl Daly, Tom Aalto, Gregory Davis

Bcc: paser.kathleen

History: This message has been forwarded.

Dear Kathleen and DJ,

Enclosed are Earth Energy and JBR's responses to the questions sent to us by DJ. We hope this addresses all your concerns. Our responses are all in Green font, which some previous responses sent in all CAPITALS.

We have also inserted requests that agreement on emission factors and a proper Federal permit application (as opposed to the Utah's Minor Source application) submittal may help get this application to the next step.

Please call if you have any questions.

--

Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

JBR Environmental

Response Memorandum

To: EPA Region 8: Tar Sands/Oil Shale Task Force

From: Erin C. Hallenburg P.E./JBR

CC: Linda Matthews; Barclay Cuthbert

Date: February 18, 2010

Re: Response to DJ Law Questions on Air Issue in Regard to Earth Energy's Minor Source Permit Application to Utah Division of Air Quality (UDAQ)

JBR is please to provide the following answers to the questions submitted by EPA Region 8 on February 19, 2008. The questions submitted were from D.J. Law of Region 8's Technical Assistance Group, Tar Sands and Oil Shale Task Force. JBR and Earth Energy have answered these questions to the best of our ability.

Please note, many questions have arisen because we discussed, negotiated, and complied with the requirements of presumed lead state agency. For instance, we work closely with UDAQ on emission factors, modeling protocol, and Earth Energy's new technology to ensure consistency. To move forward in this changed jurisdiction, it will require discussions and agreements with EPA. The change in jurisdictions after application submittal represents a cost to our client that seems potentially unfair.

The question on PSD increments for minor sources could also have broad implications. Virtually all fugitive dominated sources, even the single crusher aggregate plants, have ambient air impacts greater than 30 ug/m3 at the property boundary. Emission factors need to be representative of these operations and to my knowledge, AP-42 has 1) no representative tar sand emission factors, and 2) paved and unpaved road emissions are considered seriously flawed by most air quality professionals.

JBR and Earth Energy's answers are documented below. We have distinguished our answers in green, while keeping the questions and regulations in black font. Our previous answers to Kevin Golden's modeling inquiry are separated by CAPITAL font (see Question 6).

EPA Air Quality Questions:

1. What is the volume of extraction solvent to be contained in system? What is the expected amount of fresh make-up solvent to be required?

Please see:
Earth Energy Resources Inc.: Tar Sand Removal Process CONFIDENTIAL submittal, which was forwarded with UDAQ's Minor Source Permit Application.

We do not believe there are solvents that are classified as [illegible] solvents involved [illegible] process: Limonene [illegible] is a terpene [illegible], so the material that is use is approxima[illegible]

97% terpene, 2-3% terpenoids, and trace (<0.5%) aldehydes (octanal and decanal) and alcohols (linalool).
Please also see http://www.earthenergyresources.com/technology.htm

System volumes of D-Limonene are designed at 500 bbl and make-up volumes are planned at 1,000 bbl.

2. Is the distillation operating under vacuum or atmospheric? Is it routed to any type of control device?

Distillation circuit is a closed loop, atmospheric system, patented by Earth Energy as part of the Ophus Process. It is not vented to a control device; the overhead condenser is considered process equipment.
Please see http://www.earthenergyresources.com/technology.htm

3. What, if any, solvent storage will be contained onsite?

Solvent volumes, in terms of the cleaning emulsion active ingredient (D-Limonene), are indicated in question 1. There are no petrochemical solvents used in the Ophus Process. We do expect to have minor amounts of solvent on site in our maintenance shop, but these volumes would not exceed those expected to be found in such a facility (i.e. 1 – 4 drums of solvent on hand to wash parts, etc).

4. What is the date of construction of the separation equipment to be used at the facility?

Construction of the process equipment is scheduled to commence in July or August of 2008, once detailed engineering and shop drawings are complete. Fabrication should be completed in the first quarter of 2009.

5. Will there be any further refining of produced crude onsite? (sweetening, dewatering, etc.) If not, how is transport planned and to where?

The produced crude (bitumen) will be dewatered as part of the processing to meet a specification of < 1% BS&W (basic sediment and water). There will be no refining, sweetening, or other processing of the crude on site, other than to recover the D-Limonene in the distillation process equipment discussed in question 2.

6. Has modeling been done with new models as per Kevin Golden's request?

The original modeling applied ISCST3 consistent with the approved UDAQ modeling protocol. Discussions with UDAQ during preparation of that modeling protocol indicated a lack of meteorological data (Met-data) files sufficient to support an AERMOD application at the time of our modeling evaluation. JBR will be able to apply AERMOD if Met-data files capable of supporting AERMOD are identified. JBR will work with EPA to identify Met-data files that could support an AERMOD application, including AERMET and AERMAP processing in an update to the original approved modeling protocol, if recommended.

The responses here represent part of an ongoing process JBR can undertake to verify an emission inventory consistent with tar sands Ophus Process, EPA requirements and

What does that data show?

1) Modeled fugitive dust concentrations from the project (including background) consume approximately 96 percent of the PM10 24 hour average NAAQS. For this reason it is important to accurately characterize fugitive PM10 emissions from the project. Emission calculations from traffic on unpaved haul roads, wind erosion, overburden handling, etc were based on input factors developed in the State of Wyoming, or were simply based on generic factors from EPAs AP-42 document. Rather than use these estimated "generic" factors, site specific information for soil silt content, moisture content, and particle size distributions should be used in calculating project related fugitive emissions. It is conceivable that soil conditions in the project area may be more conducive to dust generation than generic default values indicate.

MODELED FUGITIVE DUST IMAPCTS WERE LESS THAN HALF THE NAAQS. PROJECT PROPONENTS ACCEPTED AN OVERLY CONSERVATIVE BACKGROUND CONCENTRATION IN THIS DATA-SPARSE AREA BECAUSE IT ALLOWED FOR A COMPLIANCE DEMONSTRATION CONSISTENT WITH THE MODELING PROTOCOL.

2) The text notes that ISCST3 is EPA's approved model for this type of application. The ISC model has been replaced by AERMOD for all applications after December 2006. Unless the modeling protocol was approved prior to December 2006 AERMOD would be the appropriate model to use in this application.

WHILE ISCST3 IS NO LONGER AN EPA APPROVED MODEL, IT REMAINS RECOMMENDED FOR MINOR SOURCES IN UTAH, AND WAS APPLIED CONSISTENT WITH UDAQ APPROVING JBR'S SUBMITTED MODELING PROTOCOL.

3) The incremental PM10 impact from the proposed project (67.1 ug/m3) exceeds the PSD 24 hour average Class II increment by more than a factor of two. While cumulative PSD increment tracking is not normally conducted in permitting for minor sources, PSD increment is consumed by minor sources and the 30 ug/m3 PSD threshold would need to be maintained by the project.

FUGITIVE DUST EMISSIONS, WHICH MAKE UP ALMOST ALL THE IMPACTS, DO NOT CONSUME PSD INCREMENT. MINOR SOURCES ARE NOT REQUIRED TO DEMONSTRATE COMPLIANCE WITH PSD INCREMENT LIMITS.

7. NOI is confusing on number of process lines? One? Two? If staggered construction, what is the time scale for completed facility?

8. Has the facility looked at applicability of NSPS? Some of concerns include the K series (storage tanks), appropriate engines, NSPS J, and or Ja (oil refining), UU (asphalt

processing), GGG (equipment leaks from refineries), OOO (non-metallic mineral processing).

JBR completed a regulatory review prior to submittal of the NOI.

The facility is not refining oil, thus the facility is not subject to 40CFR 60 Subparts J or Ja; below is an applicability analysis of J and Ja.; they are not processing asphalt so the facility would not be subject to Subpart UU; the facility is not a refinery thus Subpart GGG is not applicable. Subpart OOO requires further review by EPA, but is JBR's determination that OOO is not applicable. The facility is potentially subject to Kb

Subpart J—Standards of Performance for Petroleum Refineries

§ 60.100 Applicability, designation of affected facility, and reconstruction.

(a) The provisions of this subpart are applicable to the following affected facilities in petroleum refineries: fluid catalytic cracking unit catalyst regenerators [JBR: Not a part of the process], fuel gas combustion devices [JBR: Processes at the facility are not fueled by gases produced at the plant], and all Claus sulfur recovery plants except Claus plants of 20 long tons per day (LTD) or less [No Claus plants at facility]. The Claus sulfur recovery plant need not be physically located within the boundaries of a petroleum refinery to be an affected facility, provided it processes gases produced within a petroleum refinery [JBR: The process does not include Claus sulfur recovery].

§ 60.101 Definitions.

(a) Petroleum refinery means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through distillation of petroleum or through redistillation, cracking or reforming of unfinished petroleum derivatives. [JBR: The process does not produce gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through distillation or redistillation of petroleum. The only distillation process used is to separate the D-Limonene which does not result in a petroleum product].

(d) Fuel gas means any gas which is generated at a petroleum refinery and which is combusted. Fuel gas also includes natural gas when the natural gas is combined and combusted in any proportion with a gas generated at a refinery

Fuel gas does not include gases generated by catalytic cracking unit catalyst regenerators and fluid coking burners.

In regard to UDAQ's comments contained in the January 2, 2008 email from Jim DeJulius@UDAQ to JBR and cc'ed to EPA:

Apparently you've missed several New Source Performance Standards. It appears as though 40 CFR 60 Subparts Dc, Kb, OOO, and XXXX apply to the project as proposed."

JBR has reviewed the comments and has determined Subparts Dc and OOO do not apply. Subpart XXXX is neither a NSPS nor NESHAP regulation. Subpart Kb is potentially applicable, as is Subpart III.

9. Has the facility looked at applicability of Part 61 Benzene NESHAPs? In particular the application of Subpart FF – Benzene Waste Operations?

Benzene or benzene waste products are not part of this process (see Ophus Process). Although the emulsion used in separation process contains 0.21% alkylbenzenesulphonate, this facility is neither a major HAP emitter nor a benzene waste operation. Below is an Applicability Analysis:

Subpart FF—National Emission Standard for Benzene Waste Operations

Source: 55 FR 8346, Mar. 7, 1990,

§ 61.340 Applicability.

(a) The provisions of this subpart apply to owners and operators of chemical manufacturing plants, coke by-product recovery plants, and petroleum refineries. [JBR: Does not apply, with possibility of "petroleum refinery"]

(b) The provisions of this subpart apply to owners and operators of hazardous waste treatment, storage, and disposal facilities that treat, store, or dispose of hazardous waste generated by any facility listed in paragraph (a) of this section. The waste streams at hazardous waste treatment, storage, and disposal facilities subject to the provisions of this subpart are the benzene-containing hazardous waste from any facility listed in paragraph (a) of this section. A hazardous waste treatment, storage, and disposal facility is a facility that must obtain a hazardous waste management permit under subtitle C of the Solid Waste Disposal Act. [JBR: Does not apply: not a facility listed in paragraph (a), will not produce benzene-containing hazardous waste]

Based on examples of regulated entities (i.e. NAIC codes), citation 40CFR § 61.340, and the definition of a Petroleum Refinery (Subpart UUU was determined to have the best definition of a "Petroleum Refinery") Subpart FF does not apply to Barth Energy's operations.

40 CFR 63 Subpart UUU (Refinery MACT [aka MACT II])

Applicability:

(a) You are subject to this subpart if you own or operate a petroleum refinery that is located at a major source of HAP emission.

(1) A petroleum refinery is an establishment engaged primarily in petroleum refining as defined in the Standard Industrial Classification (SIC) code 2911 and the North American Industry Classification (NAIC)

(2) A major source of HAP is a plant site that emits or has the potential to emit any single HAP at a rate of 9.07 megagrams (10 tons) or more per year or any combination of HAP at a rate of 22.68 megagrams (25 tons) or more per year.

10. Have controls been applied when generating the emissions stated in Table 4.0-1? Emissions should be stated as uncontrolled and based upon 8760 hours of operation per year.

A discussion on the most representative emission factors should precede any discussion on controlled or uncontrolled emissions. The emission factors are not representative of the raw material, operations or final products; JBR had several documented discussions with UDAQ, who directed us to use one set of emission factors, then required another selection of emission factors for the final permit application.

Clearly, we have an opportunity here to set precedence for "representative" emission factors for (Tar Sands) operations. Based on my discussions with EPA Region 8, that is one reason this EPA task force was initiated. There are similar facilities in Nevada and Canada, which could serve as a base for establishing a representative and regulatory acceptable way to characterize emissions from this and future Tar Sand facilities. This is a patented process and will not likely "fit" into an antiquated set of emission factors established in EPA AP-42.

JBR will re-calculate emissions as uncontrolled, once agreed upon emission factors are established and EPA Region 8 provides guidance on what is EPA's definition of pollution control equipment versus what EPA's definition of process control equipment.

11. The discussion of controls on crushing and sizing operations is confusing. Is water spray to be used or is inherent moisture content the primary means of control?

Water sprays are used at certain process points; inherent moisture content is used elsewhere based on which process steps for the raw, intermediate, or final products and/or spent sands. In addition, the raw source-material is not homogeneous. Water sprays are available and portable if significant visible emissions are observed, in order to be compliant with UAC R307-205-6.

12. What are the lb/MMBtu emission rates for the diesel-fired generator and natural gas internal combustion engines? Please see Appendix D of the UDAQ Minor Source Permit Application: Natural Gas Generator Emissions spreadsheet for Natural gas internal combustion engines.

Diesel Generators: PM_{10} = 0.13 lbs/MMBtu; NOx = 4.16 lbs/MMBtu; SO_2 = 0.00047 lbs/MMBtu; VOC = 0.002 lbs/MMBtu; and, Total HAPs = 0.0017 lbs/MMBtu

13. What about energy sources used to drive the reboiler portion of the distillation unit?

The reboiler portion of the distillation unit will be a natural gas fired unit. A field gas transmission pipeline runs adjacent to our proposed facility site. All other power requirements – to run all pumps and other electric powered equipment – will be provided from the generators noted in question 12.

14. What is to be the cooling media for the overheads off of the distillation unit? Is that media to be reused or further processed?

Process water will be used to cool the condensers on the distillation unit. This waste heat capture will assist to maintain process water at proper operating temperatures.

15. Are the haul roads and associated emissions the full extent of unpaved roads on the property or are there others that would not be used for mining purposes.

In our discussions with Earth Energy, these roads and emissions are conservative and represent or exceed the potential activity and emissions from these proposed operations. Please see answers to Kevin Golden's inquiry following Question #6 of this document. The NOI application documents the full extent of all roads associated with mining and processing operations; no other roads are contemplated for Earth Energy's operations at PR Spring.

RE: Air emissions/permitting questions for Earth Energy

Donald Law to: Erin Hallenburg 10/26/2009 09:17 AM
Cc: Carl Daly, Cynthia Reynolds

Erin,

As I stated in my email, my office does not have the ability to grant the determination request you are seeking. That can only come from our enforcement office. Also, as I stated, you will need to submit an official request directly to them. While I can, and did, discuss this issue with them on an informal basis, only by receiving an official request will you receive an official determination.

This is their contact info:

Cynthia Reynolds
USEAP Region 8
1595 Wynkoop St., 8ENF-AT
Denver, CO 80202

Cynthia's phone number is 303-312-6206.

They will assign staff to work with you directly on this issue.

DJ Law, Environmental Engineer
Phone: (303) 312-7015

"Erin Hallenburg" Cynthia and DJ, The EPA determination/decisio... 10/23/2009 09:02:04 AM

From:	"Erin Hallenburg" <ehallenburg@jbrenv.com>
To:	Donald Law/R8/USEPA/US@EPA
Cc:	Cynthia Reynolds/R8/USEPA/US@EPA
Date:	10/23/2009 09:02 AM
Subject:	RE: Air emissions/permitting questions for Earth Energy

Cynthia and DJ,

The EPA determination/decision on whether Subpart Ja applies is still pending for Earth Energy.
According to our 2008 records EPA was to make a decision on this Tar Sands process in the near future. I have attached the last unofficial correspondence from EPA to JBR. That was 1 year ago.

We need to know if anyone is working on this determination and if a decision will come soon.
Patience is a virtue - but this is getting excessive.

Mr. Erin C. Hallenburg QEP, P.E.
Division Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

-----Original Message-----
From: Law.Donald@epamail.epa.gov [mailto:Law.Donald@epamail.epa.gov]
Sent: Wednesday, October 22, 2008 9:30 AM
To: Erin Hallenburg
Cc: Daly.Carl@epamail.epa.gov
Subject: RE: Air emissions/permitting questions for Earth Energy

Erin,

Sorry for the delay, I needed to verify a few things.

First, given the information presented to the region, I am still of the opinion that this facility does not qualify as a refinery as defined under the PSD regulations. As such, it would be considered a 250 ton PSD source and not have to factor in fugitive emissions when making that determination. Given the data presented to date the "first" process train would not require a PSD permit. It does appear that a second train would push you over the 250 ton threshold, and depending on the time differential between train #1 and train #2 it is a distinct possibility that this would be looked upon as a single project and require the first train to go through PSD review.

Second, we still have no timeline for the Tribal Minor Source Rule. With that as the case, we currently do not have a mechanism to place federally enforceable PTE limits on this process during the construction phase.

What this means is, based on the information you provided it appears that the first train does not need a pre-construction permit for construction on tribal lands.

NSPS applicability for this process is much more difficult to determine.

You submitted technical information to the region stating that potentially 3% of the bitumen light ends could be fractionated off during the solvent distillation step. It is this fractionation/distillation of the bitumen that appears to potentially qualify this process for applicability to NSPS Subpart Ja.

However, in investigating this issue, I have discovered that my unit does not have the authority to give an official determination on the applicability of this rule to your process. That must come out of our compliance division. I have discussed this with staff there, but will need you to submit a applicability determination request to

Cynthia Reynolds
USEAP Region 8
1595 Wynkoop St., 8ENF-AT
Denver, CO 80202,

She heads up our enforcement division and will get your request to the appropriate staff.

If you have any questions, please feel free to contact me.

DJ Law, Environmental Engineer
Phone: (303) 312-7015

Protecting the environment is everyone's responsibility. Help EPA fight pollution by reporting possible harmful environmental activity. To do so, visit EPA's website at
http://www.epa.gov/compliance/complaints/index.html

"Erin Hallenburg" <ehallenburg@jbrenv.com>
10/06/2008 01:50 PM

To: Donald Law/R8/USEPA/US@EPA
cc:
Subject: RE: Air emissions/permitting questions for Earth Energy

DJ,

Can we get an update on the Earth Energy progress?

--
Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

-----Original Message-----
From: Law.Donald@epamail.epa.gov [mailto:Law.Donald@epamail.epa.gov]
Sent: Tuesday, February 19, 2008 12:11 PM
To: Denise Kohtala; Linda Matthews; Erin Hallenburg
Cc: Paser.Kathleen@epamail.epa.gov
Subject: Air emissions/permitting questions for Earth Energy

Here is a list of questions on your proposed Earth Energy project. I know you have discussed some of these issues with the state of Utah, but I have not been keeping up on the responses to those.

I am aware that you are concerned about this project being subject to PSD review. I understand and can appreciate those concerns. As I am sure you have become aware, permitting on tribal lands has some challenges that make the process different from what you might have previously has experience with permitting on state land.

Please feel free to call me if you have any questions or concerns. In addition, I will be at the 2008 Western U.S. Oil Sands Technology Transfer Meeting on Feb 22nd in Salt Lake City if you wish to discuss some of these issues in person.

(See attached file: Earth Energy questions.doc)

DJ Law, Environmental Engineer
Phone: (303) 312-7015

01/03/2008 09:37 AM

cc

Subject Fw: Another Oil Shale Project - Earth Energy Resources

Hi Lucita. Here is another site on the U&O that we need to figure out if it is on disputed lands, etc. Can you run this down?

Thanks.
- Pete

****

Peter Ornstein, Deputy Regional Counsel
Office of Regional Counsel, EPA Region VIII
1595 Wynkoop Street [R8-ORC]
Denver, Colorado 80202-1129
303-312-6854 (fax: 303-312-6859)
ornstein.peter@epa.gov

-----Forwarded by Peter Ornstein/RC/R8/USEPA/US on 01/03/2008 09:36AM -----

To: Brian Caruso/EPR/R8/USEPA/US@EPA, Dan Jackson/P2/R8/USEPA/US@EPA, David Hogle/RA/R8/USEPA/US@EPA, Steve Tuber/P2/R8/USEPA/US@EPA, Melanie Pallman/P2/R8/USEPA/US@EPA, Debrah Thomas/P2/R8/USEPA/US@EPA, Callie Videtich/P2/R8/USEPA/US@EPA, Donald Law/R8/USEPA/US@EPA, Monica Morales/P2/R8/USEPA/US@EPA, Gregory Davis/P2/R8/USEPA/US@EPA, Kimi Matsumoto/RC/R8/USEPA/US@EPA, Peter Ornstein/RC/R8/USEPA/US@EPA, Wes Wilson/EPR/R8/USEPA/US@EPA, Sandra Stavnes/P2/R8/USEPA/US@EPA, Tom Aalto/P2/R8/USEPA/US@EPA, Carl Daly/P2/R8/USEPA/US@EPA, Larry Svoboda/EPR/R8/USEPA/US@EPA, Kathleen Paser/P2/R8/USEPA/US@EPA, Alexis North/P2/R8/USEPA/US@EPA, Claudia Smith/P2/R8/USEPA/US@EPA
From: Kathleen Paser/P2/R8/USEPA/US
Date: 01/02/2008 11:36AM
Subject: Another Oil Shale Project - Earth Energy Resources

Heads-up to everybody,

I was just informed by the State of Utah of another oil shale project on the U&O.

Please stay tuned for more information. We are expecting a package from the State with in the next 2 days. Utah is eager to work with us on this one as all the modeled air impacts are in State jurisdiction while the actual ops are in IC.....according to the State's analysis of jurisdiction.

Company name - Earth Energy Resources.
Process - Oil Shale Mining, Crushing, and Processing (traditional retort?)
Location - Secs 35 & 36, T15, R23E

Kathleen Paser
Environmental Engineer
Air Technical Assistance Unit
Air and Radiation Program
US EPA Region 8
303-312-6526

****

Fw: Earth Energy Jurisdiction Issues
Kathleen Paser to: Donald Law

11/02/2009 10:43 AM

****
Kathleen Paser
Region 8 Air Program
303-312-6526
****
US EPA Region 8
1595 Wynkoop Street
M/C 8P-AR
Denver, Colorado 80202
****

----- Forwarded by Kathleen Paser/R8/USEPA/US on 11/02/2009 10:39 AM -----

"Tim Dejulis"
<tdejulis@utah.gov>

01/02/2008 03:42 PM

To <dkohtala@jbrenv.com>, "Erin Hallenburg" <ehallenburg@jbrenv.com>
cc Kathleen Paser/P2/R8/USEPA/US@EPA, <uitaq@ubtanet.com>, "Christian Stephens" <CSTEPHENS@utah.gov>, "Reginald Olsen" <RDOLSEN@utah.gov>, "Tim Blanchard" <TBLANCHARD@utah.gov>
Subject Earth Energy

Greetings,

I was able to review Earth Energy's application that you prepared and submitted to DAQ in October. I have several concerns and questions.

The Earth Energy property is in both Indian Country jurisdiction (therefore EPA by extension) and Utah DAQ jurisdiction, with the majority being in the former. Based on the site plan provided, all emitting units are in Indian Country jurisdiction and normally that would be the end of Utah DAQ's involvement in the matter. According to the demonstration of off-property impacts that was offered however, the largest impacts are in Utah DAQ jurisdiction. Due to this unique situation we are placing the process of issuing an AO on hold until consultation with USEPA results in a concrete course of action. Be advised that Earth Energy is obligated to coordinate this request with USEPA Region 8 in any event.

With this as the backdrop we can discuss other matters that form the basis of the PTE calculations. In the suggested permit conditions, condition 13 you reference a haul road length of 14,376 feet in combined length. In emission estimate calculations for these roads a value of 12,700 feet is listed. Which value is the correct value?

The BACT analysis is rather vague with regards to diesel fueled power generation. The criteria for decision making are, as you correctly point out,

economics, feasibility, and energy. While the TIER standards for engines are in place, they do not constitute BACT by themselves. Given that Earth Energy has elected to install both diesel and NG fueled power generators, their comparative effectiveness in terms of $/ton of removed pollutant are to be considered. In other words, the relative effectiveness of each cannot be considered separately. The BACT is for the category of power generation, not by fuel type. If add on controls to the diesel engine cannot result in a suitable outcome from an operations perspective, then a NG engine must be considered.

Apparently you've missed several New Source Performance Standards. It appears as though 40 CFR 60 Subparts Dc, Kb, OOO, and XXXX apply to the project as proposed.

We here at Utah DAQ appreciate that our counterparts at Wyoming DAQ are involved with surface coal mining on a large scale and may have developed their own set of emission factors that represent a reasonable approximation of those activities being proposed by Earth Energy. We were unable to locate these on the Wyoming DEQ website. AP-42 emission factors for western surface coal mining were derived from this type of activity in Wyoming. Could you offer an explanation of why any Wyoming specific factors were used in preference to AP-42 factors? Utah DAQ personnel will be required to obtain this Wyoming information independently and compare the results from the Wyoming factors to the results from the use of AP-42 emission factors. Utah DAQ will consider the most conservative result. This will introduce delays in the engineering review, and may change inputs to the air dispersion modeling already performed.

AP-42 emission factors were used to predict wind erosion. These factors do not make a distinction between uncontrolled and controlled emission rates. In other words, it appears as though credit for control is being taken when that is not an option.

We are concerned that this proposed operation creates off property impacts in Utah DAQ jurisdiction that are 96% of the 24 hour PM-10 NAAQS. Please submit electronic versions of the modeling information as soon as possible.

Please contact me at your earliest convenience so that we might discuss these issues over the phone or in person. Thank you.

Regards,

Timothy DeJulis
Engineer III
Utah Department of Environmental Quality
Division of Air Quality
New Source Review Section
150 North 1950 West
Salt Lake City, Utah 84116
P: 801-536-4012
F: 801-536-4099
tdejulis@utah.gov

Re: Earth Energy Meeting Tar Sands

Kathleen Paser to: Erin Hallenburg

Cc: Kathleen Paser, Donald Law, "Denise Kohtala", "Linda Matthews"

Bcc: paser.kathleen

02/08/2008 08:08 AM

Erin,

I wanted to let you know that I got your voice-mail. I've stayed home sick today and will call you on monday morning. In the mean time, my responses to your questions below.

Kathleen Paser
Environmental Engineer
Air Technical Assistance Unit
Air and Radiation Program
US EPA Region 8
303-312-6526
****
US EPA Region 8
1595 Wynkoop Street
M/C 8P-AR
Denver, Colorado 80202
****

"Erin Hallenburg" <ehallenburg@jbrenv.com>
02/06/2008 01:25 PM

To
Kathleen Paser/P2/R8/USEPA/US@EPA, Donald Law/R8/USEPA/US@EPA
cc
"Denise Kohtala" <DKohtala@jbrenv.com>, "Linda Matthews" <lmatthews@jbrenv.com>
Subject
Earth Energy Meeting Tar Sands

Kathleen,

I have reviewed the information sent to my associated on 2/1/08. Thanks for the response on the modeling from your associates.

In regard to the upcoming meeting, a little clarification would be helpful. Denise and I can give you a call after you or DJ read and digest this. If you can address items listed below it would be helpful in preparing for this meeting.

First off, I think a meeting in early February may be pre-mature. The air program still needs to get our list of concerns with the information from Utah to you.

1) Overall purpose and objectives for this meeting (what do we want want to achieve).

This is a kick-off meeting and by no means mandatory. I like to look at it as compliance assistance. It's also a good way for the company and EPA to gain important contacts for future potential issues. In the Air program, we always try to meet with potential new sources so we can all get a lay of the land. We invite the other media (water, NEPA, RCRA) as a convenience to the companies (time and travel cost savings). The last meeting we had with an oil shale company was very successful for all involved and has led to good working relationships and helping with compliance certainties in all the media.

There is no rush on our part, but if the company has a timeline for commencing construction I think it important that we have this discussion sooner rather than later just in case there are pre-construction permitting requirements. Maybe it would help if DJ and I first put together our questions on the information we received from Utah send that to you before we have a meeting so you guys are more prepared in regards to what our concerns may be and what we would like to talk about (from an air standpoint).

We would like to learn more about this industry and we would like this company to learn more about it's CAA responsibilities when operating in Indian Country. We would like the company to present to us their specific proposal (Where, When, How, etc.....) and give us a little lesson in this particular Tar Sands Operation. This is all new to us and I'm sure CAA permitting in Indian Country is new to them....it's very different than in the States' in regards to how PTE is calculated and the tools available to us for regulation.

Issues for the other media that came up in the last meeting included (bear with me I not very adept at their issues) storm water run off, waters of the US, and Bevill exemption (RCRA).

2) Is the meeting just for air quality issues, or are additional media and permitting issues going to be discussed?

The meeting would be multi-media. UIC, NPDES, Stormwater, other water concerns, NEPA, RCRA, Air. We usually have an attorney as well in case the company has legal questions.

3) What type of personnel from Earth Energy should attend this meeting? Plant Manager, Designer, Industrial Engineer?

All of the above mentioned looks good and anybody else who can provide detailed information in response to questions about intentions, plans,

operations, etc.....

I'll send out an internal email to my contacts asking if they interested in attending and what issues they want to talk about before scheduling the meeting and then send you the list of topics to be discussed so you can be prepared.

From an air stand point, we will have read the information that Utah sent to us and will already be discussing our concerns less formally. In addition, we will have outlined what kind of additional information we may need, how that data should be calculated, and how it should be presented. We want to know what this company is doing, where, and what the impacts are for all the media. We also want to convey to this company that there are environmental obligations in IC. So, it would be good to also come with folks that know the various enviromental laws.

The rest deal with our air segment of this project

4) Is the UDAQ application that you have acceptable or changing this into Federal application required?

If this source ends up being subject to Federal PSD requirements, we will definitely be needing an official PSD application with all the bells and whistles. However, we haven't made that determination yet and that's a big reason for this meeting. To help us understand if we all need to be moving in that direction.

5) Are different emission factors up for discussion? Please note, the factors used are not representative of the material or operations.

Yes. Everything is up for discussion.

6) Can we submit additional air quality information prior to the meeting? Several issues in the UDAQ's email have been resolved with just a little regulatory review.

Yes! We can and are happy to discuss any concerns you have whether it be by email, phone call, face-to-face, at any time. If you have more information that you would like our modeler to look at send it to me and will be happy to get him engaged in further discussion.....ideally directly with your modeler.

I've become the defacto "regional lead" for coordinating information exchange for the oil shale and tar sands companies because of the efforts the air program puts into pre-meetings and early on discussions. So, if there are folks you need to talk to and issues you'd like to discuss (even in other media) I will try to hook you up! I have a growing internal contact list and I'm happy to try to facilitate contacts for you guys so you can talk to the experts directly.

The more discussions prior to a face-to-face meeting the more beneficial the meeting. That's why I suggested above that we should hold off a bit if you or the company feel the need to get more questions answered first. But let's not wait too long.

7) Will it be helpful to have access to our modeler to answer modeling questions?

Yes.

Now or during our meeting?

Now is always good. I'd like to see our modeler and yours working directly together behind the scenes now on the issues. During the meeting might be necessary depending on where we're at at that time. If all the modeling issues are resolved by then, we probably wouldn't invite our modeler.

Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

Earth Energy Meeting Tar Sands
Erin Hallenburg
to:
Kathleen Paser, Donald Law
02/06/2008 01:24 PM
Cc:
"Denise Kohtala", "Linda Matthews"
Bcc:
paser.kathleen
Show Details

Kathleen,

I have reviewed the information sent to my associated on 2/1/08. Thanks for the response on the modeling from your associates.

In regard to the upcoming meeting, a little clarification would be helpful. Denise and I can give you a call after you or DJ read and digest this. If you can address items listed below it would be helpful in preparing for this meeting.

1) Overall purpose and objectives for this meeting (what do we want want to achieve).
2) Is the meeting just for air quality issues, or are additional media and permitting issues going to be discussed?
3) What type of personnel from Earth Energy should attend this meeting? Plant Manager, Designer, Industrial Engineer ?

The rest deal with our air segment of this project

4) Is the UDAQ application that you have acceptable or changing this into Federal application required?
5) Are different emission factors up for discussion? Please note, the factors used are not representative of the material or operations.
6) Can we submit additional air quality information prior to the meeting? Several issues in the UDAQ's email have been resolved with just a little regulatory review.
7) Will it be helpful to have access to our modeler to answer modeling questions? Now or during our meeting?

--
Mr. Erin C. Hallenburg QEP, P.E.
Compliance Group Manager
JBR Environmental
(801) 943-4144
(801) 554-8071 Cell
(801) 942-1852 Fax

Kathleen
Paser/P2/R8/USEPA/US
01/28/2008 03:07 PM

To DKohtala@jbrenv.com
cc Kathleen Paser/P2/R8/USEPA/US@EPA, Donald Law/R8/USEPA/US@EPA
bcc paser.kathleen@epa.gov
Subject Modeling Comments on Earth-Energy Tar Sands Mine UT NOI

Denise,

It was suggested that I send you comments as I get them from the various folks reviewing the material on Earth Energy's proposed project.

So, I've attached comments I received on the modeling portion of the package.

We have had a slight reorganization of the roles on the oil shale sector and another engineer, DJ Law (303-312-7015), of our office will be reviewing the technical aspects. However, I will be organizing things.....can you keep both me and DJ on your contact list?

Also, can we start thinking about a face-to-face? I was thinking sometime in Mid February.....possibly the week of February 11 or the week of Febraury 18?

Kathy

Kathleen Paser
Environmental Engineer
Air Technical Assistance Unit
Air and Radiation Program
US EPA Region 8
303-312-6526
****
US EPA Region 8
1595 Wynkoop Street
M/C 8P-AR
Denver, Colorado 80202
****

----- Forwarded by Kathleen Paser/P2/R8/USEPA/US on 01/28/2008 02:56 PM -----

Kevin
Golden/P2/R8/USEPA/US
01/09/2008 12:45 PM

To Kathleen Paser/P2/R8/USEPA/US@EPA
cc
Subject Comments on Earth-Energy Tar Sands Mine UT NOI

1) Modeled fugitive dust concentrations from the project (including background) consume approximately 96 percent of the PM10 24 hour average NAAQS. For this reason it is important to accurately characterize fugitive PM10 emissions from the project. Emission calculations from traffic on unpaved haul roads, wind erosion, overburden handling, etc were based on input factors developed in the State of Wyoming, or were simply based on generic factors from EPAs AP-42 document. Rather than use these estimated "generic" factors, site specific information for soil silt content, moisture content, and particle size distributions should be used in calculating project related fugitive emissions. It is conceivable that soil conditions in the project area may be more conducive to dust generation than generic default values indicate.

2) The text notes that ISCST3 is EPA's approved model for this type of application. The ISC model has been replaced by AERMOD for all applications after December 2006. Unless the modeling protocol was approved prior to December 2006 AERMOD would be the appropriate model to use in this application.

3)The incremental PM10 impact from the proposed project (67.1 ug/m3) exceeds the PSD 24 hour

average Class II increment by more than a factor of two. While cumulative PSD increment tracking is not normally conducted in permitting for minor sources, PSD increment is consumed by minor sources and the 30 ug/m3 PSD threshold would need to be maintianed by the project.

Kathleen
Paser/P2/R8/USEPA/US
01/28/2008 07:46 AM

To "Tim Dejulis" <tdejulis@utah.gov>
cc Donald Law/R8/USEPA/US@EPA, Kathleen Paser/P2/R8/USEPA/US@EPA
bcc paser.kathleen@epa.gov
Subject Re: Fwd: RE: Earth Energy Resources, Inc.

Tim,

Thank you for the additional info. Donald Law in our office is going to be taking the lead on oil shale, so I've been forwarding everything to him. His number is 303-312-7015.

I would like to call you to introduce you two. He has lots of questions. He's a particular interesting one with regard to Red Leaf Resources and the Green River Refinery.

DJ is a sharp, experienced engineer who spent many years working in Region 5's Air Enforcement Division. His specialties include oil refineries, ethanol production, among a laundry list of others.....

For Earth Energy I did have the modeling looked at by our Modeler to get feed back on their methods. Let me look for his comments and I will forward them on to you.

Are you going to be around this week?

Kathleen Paser
Environmental Engineer
Air Technical Assistance Unit
Air and Radiation Program
US EPA Region 8
303-312-6526
****
US EPA Region 8
1595 Wynkoop Street
M/C 8P-AR
Denver, Colorado 80202
****

"Tim Dejulis" <tdejulis@utah.gov>

"Tim Dejulis"
<tdejulis@utah.gov>
01/25/2008 01:18 PM

To Kathleen Paser/P2/R8/USEPA/US@EPA
cc
Subject Fwd: RE: Earth Energy Resources, Inc.

Hi,

Here's some information from Earth Energy via JBR about the process solvent. I will call you next week to see if there is any additional information you might need from the source.

Regards,

Timothy DeJulis

----- Message from "Denise Kohtala" <DKohtala@jbrenv.com> on Fri, 25 Jan 2008 11:45:36 -0700 -----

To: "Tim Dejulis" <tdejulis@utah.gov>

cc: "Linda Matthews" <lmatthews@jbrenv.com>

Subject: RE: Earth Energy Resources, Inc.

Tim,

Attached is a description of the Earth Energy tar removal process and an MSDS of the chemical use. Earth Energy is requesting that both the description of the process and the MSDS be confidential! If there is anything else they need to do to ensure that this information is listed as confidential please let me know ASAP!

As always feel free to call with questions.

Thanks and have a great weekend!

--

Denise Kohtala
JBR Environmental Consultants, Inc.
Office: 801-943-4144 x111
Cell: 801-450-2908
Fax: 801-942-1852
dkohtala@jbrenv.com

-----Original Message-----
From: Tim Dejulis [mailto:tdejulis@utah.gov]
Sent: Wednesday, January 16, 2008 1:39 PM
To: Denise Kohtala
Subject: RE: Earth Energy Resources, Inc.

Hello,

We can keep any and all information confidential except for details related to emissions to the atmosphere. You would simply segregate the confidential information and indicate that you expect it to be protected. We need enough detail to be able to understand and evaluate the potential emissions. With respect, I have yet to encounter any process of any kind that is perfect, although some are very good.

40 CFR 60 Subpart IIII (not XXXX - sorry for my confusion) Standards of Performance for Stationary Compression Ignition Internal Combustion Engines would apply to the diesel fueled power generator.

The location of the plant equipment is obviously within Indian Country as proposed. It is doubtful that EPA will be surrendering their authority to write a permit, though they haven't given me a firm answer as of this writing. The question remains as to whether they are able to write a permit under their rules for this project. The ultimate answer to this question lays in the process details that will be provided. I encourage Earth Energy, through JBR to continue coordinating details, and etc. with me, in addition to EPA. It just so happens that I may be able to expedite to some degree. I am glad to do so.

Regards,

Timothy DeJulis

>>> "Denise Kohtala" <DKohtala@jbrenv.com> 1/16/2008 12:40 PM >>>
Tim,

The process is a completely enclosed process and as such has not air emissions. I will have the client provide a more detailed description however due to proprietary processes they want to ensure that the chemical and process used are kept confidential - is there a way to do that with the UDAQ (I know other states have forms that you can fill out).

As for the heater yes it will only operate on NG, and I am glad we are on the same page with the Subpart DC. Could you please let me know what subpart XXXX is - I am at a loss on that one - never heard of it!

Also any word from the EPA? The last we talked with Kathleen she informed us that they were still deciding if it was Indian land or not and had not yet received the NOI materials from you. Our client is obviously anxious to know what their path forward at this point needs to be.

Thank you so much for your time, have a great afternoon!
Denise Kohtala

-----Original Message-----
From: Tim Dejulis [mailto:tdejulis@utah.gov]
Sent: Monday, January 07, 2008 5:18 PM
To: Denise Kohtala
Subject: Earth Energy Resources, Inc.

Hi,

After digging through the NOI for Earth Energy on Friday, I discovered other questions I hope you'll be able to resolve for me.

What is the "cleaning emulsion / cleaning chemical" employed to isolate the bitumen? Please describe this part of the process in greater detail related to any VOC / HAP emissions.

The calculations for the process heater indicate NG use only. Will this be the only fuel for this unit? BTW - I can see now that the unit is intended as a process heater and not a steam generating unit, and so 40 CFR 60 Subpart Dc would not apply to this unit.

Regards,

Timothy DeJulis


CONFIDENTIAL MSDS.pdf


Additional Process Information.doc

"Tim Dejulis"
<tdejulis@utah.gov>
01/28/2008 02:23 PM

To Kathleen Paser/P2/R8/USEPA/US@EPA
cc
bcc paser.kathleen@epa.gov
Subject Re: Fwd: RE: Earth Energy Resources, Inc.

History: This message has been forwarded.

Hello,

Thanks for sharing. I'll pass along any new information that may come my way from Earth Energy on to DJ. You might not be surprised to discover that we have met by phone already. DJ had some specific questions about Earth Energy that I think I was able to answer. I'll give him a call so he can ask about Red Leaf Resources, EcoDomaine, and anything else he might want to.

Did Earth Energy's consultant JBR get copied on your modeler's concerns? I'm sure they'll enjoy hearing about the need to obtain Aermod atmospheric data to satisfy PSD modeling requirements.

Regards,

Timothy DeJulis

>>> <Paser.Kathleen@epamail.epa.gov> 1/28/2008 7:46 AM >>>
Tim,

Thank you for the additional info. Donald Law in our office is going to be taking the lead on oil shale, so I've been forwarding everything to him. His number is 303-312-7015.

I would like to call you to introduce you two. He has lots of questions. He's a particular interesting one with regard to Red Leaf Resources and the Green River Refinery.

DJ is a sharp, experienced engineer who spent many years working in Region 5's Air Enforcement Division. His specialties include oil refineries, ethanol production, among a laundry list of others.....

For Earth Energy I did have the modeling looked at by our Modeler to get feed back on their methods. Let me look for his comments and I will forward them on to you.

Are you going to be around this week?

Kathleen Paser
Environmental Engineer
Air Technical Assistance Unit
Air and Radiation Program
US EPA Region 8
303-312-6526
****
US EPA Region 8
1595 Wynkoop Street
M/C 8P-AR
Denver, Colorado 80202
****

"Tim Dejulis"
<tdejulis@utah.g
ov>

To