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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8

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Ref: 8ENF-AT

MAR 10 2010

Barclay Cuthbert  
Vice President  
Earth Energy Resources  
Suite #740  
404 - 6 Avenue S.W.  
Calgary, AB T2P 0R9 Canada

Subject: Subpart Ja Applicability Determination Request - Earth Energy Resources, Inc., Oil Sand Mining and Processing - PR Spring Mine

Dear Mr. Cuthbert:

I am responding to your May 29, 2009, letter requesting an applicability determination for the Earth Energy Resources, Inc. (Earth Energy) PR Spring Mine with regards to New Source Performance Standard (NSPS) Subpart Ja.<sup>1</sup> Earth Energy proposes to operate an oil sand mine and processing facility (i.e., mill) in eastern Utah. The operation will include mining of the naturally occurring oil sands and extraction of the bitumen from these sands. As discussed below, EPA does not believe that the Earth Energy PR Spring Mine is subject to NSPS Subpart Ja.

Your May 29, 2009, letter explains that the Earth Energy PR Spring Mine extraction process will be as follows: (1) mined and conditioned oil sand ore is sent through a crusher/delumper and reduced to 2 inch-minus aggregate size; (2) crushed ore is augured or conveyed to a heated slurry mixer where the cleaning emulsion is introduced and the ore slurred to the consistency of a thick gritty milkshake; (3) oil sand slurry is then moved by screw conveyor to the slurry tank where primary separation of the bitumen from the sand occurs; (4) produced sand with residual bitumen is pumped through a series of separation towers where the last traces of bitumen are removed; (5) all the liberated bitumen is captured, polished with cyclones and/or centrifuges, and pumped to a storage tank; (6) the cleaning chemical is then

<sup>1</sup> Subpart Ja, 40 C.F.R. §§60.100a et seq., is entitled "Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After May 14, 2007."

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removed from the bitumen by distillation and recycled to the front of the process<sup>2</sup>; and (7) produced bitumen is pumped to a product (sales) tank for heated storage prior to transport.<sup>3</sup>

NSPS Subpart Ja applies to certain affected facilities in petroleum refineries. The definition of "petroleum refinery in 40 C.F.R. 60.101a reads: "Petroleum refinery means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, asphalt (bitumen) or other products through distillation of petroleum or through redistillation, cracking, or reforming of unfinished petroleum derivatives." Even though the Earth Energy PR Spring Mine will be producing bitumen, the operation will not be producing the bitumen "through distillation of petroleum or through redistillation, cracking, or reforming of unfinished petroleum derivatives." Although distillation will be occurring at the Earth Energy PR Spring Mine, it will be for the purpose of recovering the cleaning chemical from the bitumen and not to upgrade the bitumen to a refined product. Additionally, the produced bitumen will be sent off-site to a petroleum refinery for further processing. Therefore, EPA does not believe the Earth Energy PR Spring Mine would be considered a "petroleum refinery" and subject to NSPS Subpart Ja.

The above discussion is consistent with EPA's December 22, 2008 proposed revision to the definition of "petroleum refinery" in NSPS Subpart Ja (73 FR 78522). In the December 22, 2008 proposal notice (at 78526), EPA indicated that "Facilities that only produce oil shale or tar sands-derived crude oil for further processing using only solvent extraction and/or distillation to recover diluent that is then sent to a petroleum refinery are not themselves petroleum refineries. This is because they are only producing feed to a petroleum refinery as a product and not refined products. Facilities that produce oil shale or tar sands-derived crude oil and then upgrade these materials and produce refined products would be a petroleum refinery." The revised definition of "petroleum refinery" proposed on December 22, 2008, reads:

Petroleum refinery means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, asphalt (bitumen) or other products through distillation of petroleum or through redistillation, cracking, or reforming of unfinished petroleum derivatives. A facility that produces only oil shale or tar sands-derived crude oil for further processing at a petroleum refinery using only solvent extraction and/or distillation to recover diluent is not a petroleum refinery.

<sup>2</sup> Electronic communication (email) on November 2, 2009, from Mr. Erin Hallenburg, JBR Environmental, to Carol Smith, EPA, indicates that "any light ends from the bitumen that may accumulate in the TAI [cleaning chemical] would be recovered through a second stage distillation process. This process would distill any light boiling fractions from the TAI and these recovered fractions would be blended into our sales bitumen tank."

<sup>3</sup> In the email referenced in footnote 2, Mr. Hallenberg also indicated that "no further processing is performed on site. The final product, bitumen, will be headed to an oil refinery for further processing."

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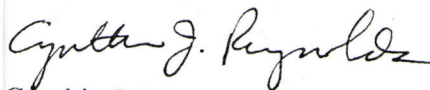
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If you have any questions or concerns regarding this letter, please contact Laurie Ostrand of my staff at (303) 312-6437 or by email at [ostrand.laurie@epa.gov](mailto:ostrand.laurie@epa.gov).

Sincerely,



Cynthia J. Reynolds, Director  
Technical Enforcement Program

cc: Donald Law, EPA Region 8

Mr. Erin Hallenburg, QEP, P.E.  
JBR Environmental Consultants, Inc.  
8160 S. Highland Dr.  
Sandy, UT 84093

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May 29, 2009

Ms. Cynthia Reynolds  
**USEPA REGION 8**  
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Denver, CO 80202

**Re: Subpart Ja Applicability Determination Request – Earth Energy Resources, Inc., Oil Sand Mining and Processing – PR Spring Mine**

Earth Energy Resources, Inc. (Earth Energy) is requesting an applicability determination for the Earth Energy PR Spring Mine with regards to CFR 40 Part 60 Subpart Ja - Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced after May 14, 2007.

Earth Energy has proposed to operate an oil sand mine and processing facility (i.e. mill) in eastern Utah. The operation will include mining of the naturally occurring oil sands and extraction of the bitumen from these sands. Earth Energy originally submitted a Notice of Intent (NOI) to the Utah Division of Air Quality (UDAQ) for a Permit to Construct (PTC) in October of 2007. After several months, the UDAQ informed Earth Energy in January of 2008 that the facility location was on Indian Jurisdictional lands and thus the EPA would be the permitting authority. There have been extensive conversations with the EPA, and several consultant-based determinations submitted, as well as a face-to-face meeting (July 15, 2008) at the EPA Region 8 offices, initiated by Earth Energy.

At the July meeting in Denver, Earth Energy and their consultant representatives were told that a determination would be made in regard to Subpart Ja and other issues in October 2008. Earth Energy and their consultants pressed for an answer from EPA in October 2008. As a result, Earth Energy was informed by the EPA Region 8 that a “determination request” in regards to the applicability of Subpart Ja would be need to be submitted to the EPA’s Compliance Division. The following information is being provided to EPA Compliance Division, in response to this request for a compliance determination on the applicability for 40 CFR Part 60 Subpart Ja.

**Process Description**

The extraction process begins when the mined and conditioned oil sand ore is sent through a crusher/delumper and reduced to a 2 inch-minus aggregate size. From there, the crushed ore is augured or conveyed to a heated slurry mixer where the cleaning emulsion is introduced and the ore slurried to the consistency of a thick gritty milkshake. The oil sand slurry is then moved by screw conveyor to

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the slurry tank where primary separation of the bitumen from the sand occurs. The produced sand with residual bitumen is then pumped through a series of separation towers where the last traces of bitumen are removed. All of the liberated bitumen is captured, polished with cyclones and/or centrifuges, and pumped to a storage tank. The cleaning chemical is then removed from the bitumen by distillation and recycled to the front of the process. Produced bitumen is pumped to a product (sales) tank for heated storage prior to transport.

The clean produced sand is de-watered on a shale shaker (or similar device) and the recovered water is pumped to a holding tank for recycle to the front of the process. Additional cleaning agent is added to the re-cycled water to bring it back to full strength. De-watered sand and clay fines are then conveyed to a stockpile for loading and backhaul to the mine pit. At this point, the discharged sand and clay fines contain between 10 and 20% water.

When the cleaning emulsion contacts the bitumen in the oil sand, the limonene and emulsifier partition into the hydrocarbon phase to promote the stripping and extraction of the bitumen from the solids matrix of the ore. Once the hydrocarbon phase is separated from the water phase and solids (both coarse sand and clays and fines), it is distilled to recover the limonene. The limonene is re-used in the process, while the emulsifier remains in the bitumen, which exits the process as the residual from the distillation step.

The composition of the cleaning emulsion is:

Component	Weight percent
D-Limonene	35.82%
Water	63.97%
Emulsifier	0.21%
<u>Anti-foam</u>	<u>0.00%</u>
Total	100.00%

The emulsifier is an alkylbenzenesulphonate, branched and straight chain and the anti-foam is a silicone based antifoam (such as those used in Jacuzzi spas).

Earth Energy has examined the applicability requirements and associated definitions in Subpart Ja and provided comments about the facility in italics.

60.100a *Applicability, designation of affected facility, and reconstruction.*

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- (a) The provisions of this subpart apply to the following affected facilities in petroleum refineries: fluid catalytic cracking units (FCCU), fluid coking units (FCU), delayed coking units, fuel gas combustion devices, including flares and process heaters, and sulfur recovery plants. The 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.

*The PR Springs Mine does not have FCCU or FCU, or a delayed coking unit. In addition, the processes at the facility including process heaters are not fueled by gases produced at the plant and the plant will not be involved in sulfur recovery. As such, there are no sources at the PR Spring Mine to which Ja is applicable.*

#### § 60.101a Definitions

Petroleum refinery means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, asphalt (bitumen) or other products through distillation of petroleum or through redistillation, cracking, or reforming of unfinished petroleum derivatives.

*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 involved is recovery of the d-limonene which does not result in a petroleum product.*

*There have been concerns raised about data that suggested that 3% of the bitumen light ends might be fractionated off during the solvent distillation. Earth Energy performed an assay on a sample of bitumen from the PR Spring mine site. The initial boiling point of the bitumen is 213°C/415°F [ASTM D2892/D5236], which is well above the distillation temperature used to recover the d-limonene. The data from the assay show good agreement with physical properties of PR Spring bitumen measured by the Utah Heavy Oil Center, University of Utah, where volatiles distilling below 204°C/399°F is less than 0.4%.*

Fuel gas means any gas which is generated at a petroleum refinery and which is combusted. Fuel gas 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, but does include gases from flexicoking unit gasifiers. Fuel gas does not include vapors that are collected and combusted to comply with the wastewater provisions in §60.692, 40 CFR 61.343 through 61.348, 40 CFR 63.647, or the marine tank vessel loading provisions in 40 CFR 63.562 or 40 CFR 63.651.

*The process does not involve the use of gas produced at the facility to operate any equipment.*

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Earth Energy has been working with the EPA for over 2 1/2 years to determine the permitting requirements for this facility. Based on previous communications with the EPA, the Subpart Ja applicability determination can only be performed by EPA and requires a formal request. It was our impression that EPA Region 8 Task Force was in the process of making the determination after our July 15, 2008 meeting and would decide by October, 2008. Since all future permitting and project feasibility is dependant on this determination, we respectfully request the EPA Compliance Division to inform us of the requirements for the PR Spring oil sand mine and processing facility in the very near future. Additional information on the process, permitting and/or timeline can be found either in your files, by contacting JBR Environmental (801-943-4144) or by contacting me directly.

Yours truly,  
Earth Energy Resources, Inc.



Barclay Cuthbert  
Vice President

Enclosures (2)

cc: Tim Wall, Earth Energy Resources, Inc.  
File

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