

Mark Novak - RE: Earth Energy Resources - Ground Water Discharge Permit-by-Rule

From: "Barclay Cuthbert" <barclay.cuthbert@earthenergyresources.com>
To: "Mark Novak" <mnovak@utah.gov>
Date: 2/9/2011 8:14 AM
Subject: RE: Earth Energy Resources - Ground Water Discharge Permit-by-Rule
CC: "John Davis" <john.davis@hro.com>, "Christopher R. Hogle" <Chris.Hogle@hro.com>
Attachments: Earth Energy Resources NOI Approved 09_09_19 Figures.pdf

Mark,

Attached, please find the figures included in the NOI submission to DOGM.

Regards,

Barclay

Best regards,
Earth Energy Resources Inc.

Barclay Cuthbert
Vice President, Operations
Tel: + 1.403.233.9366
Cell: + 1.403.619.4230
Fax: + 1.403.290.0045
E-mail: barclay.cuthbert@earthenergyresources.com

Suite 950, 633 - 6th Avenue SW
Calgary, AB T2P 2Y5

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From: Mark Novak [mailto:mnovak@utah.gov]
Sent: February 08, 2011 5:50 PM
To: Barclay Cuthbert
Subject: RE: Earth Energy Resources - Ground Water Discharge Permit-by-Rule

Can you send the figures that go with this report?

>>> "Barclay Cuthbert" <barclay.cuthbert@earthenergyresources.com> 2/8/2011 3:48 PM >>>
Mark,

As you suggested, I have attached the text portion of the Notice of Intent prepared for DOGM to provide information on the PR Spring mine project. Discussion of tailings disposal is included on pages 19-21, 32, and 47-49 of the NOI (pages 22-24, 35, and 50-52 of the attached .pdf file). The information in the NOI is more of an evolution of our plans for tailings handling, rather than changes to the plan; at any rate, you have the

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From: Mark Novak
To: Barclay Cuthbert
Date: 2/8/2011 5:49 PM
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>>> "Barclay Cuthbert" <barclay.cuthbert@earthenergyresources.com> 2/8/2011 3:48 PM >>>
Mark,

As you suggested, I have attached the text portion of the Notice of Intent prepared for DOGM to provide information on the PR Spring mine project. Discussion of tailings disposal is included on pages 19-21, 32, and 47-49 of the NOI (pages 22-24, 35, and 50-52 of the attached .pdf file). The information in the NOI is more of an evolution of our plans for tailings handling, rather than changes to the plan; at any rate, you have the information supplied to DOGM.

Let me know if you require additional information.

Thanks,

Barclay

Best regards,
Earth Energy Resources Inc.

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Mark Novak - Re: Earth Energy Resources - Ground Water Discharge Permit-by-Rule

From: Mark Novak
To: Barclay Cuthbert
Date: 2/8/2011 3:17 PM
Subject: Re: Earth Energy Resources - Ground Water Discharge Permit-by-Rule
CC: rherbert

Barclay,

Can you provide some information on the changes to planned tailings disposal you have made since March '08? What you have already provided to DOGM would probably be enough information for us.

>>> "Barclay Cuthbert" <barclay.cuthbert@earthenergyresources.com> 2/8/2011 2:12 PM >>>
Robert and Mark:

By letter dated March 4, 2008, Earth Energy Resources, Inc.'s ("Earth Energy") PR Spring Tar Sand Project (the "Project") received Ground Water Discharge Permit-By-Rule status from the Utah Department of Environmental Quality, Division of Water Quality ("DWQ"). In the time since this determination was granted, Earth Energy has continued its work on development of the "Ophus Process" and related permitting work with other agencies, principally the Utah Department of Natural Resources, Division of Oil, Gas and Mining. I have prepared a letter that outlines changes to our process and the site configuration over this time period. Please review this letter and attachments and confirm that the original Ground Water Discharge Permit-By-Rule status granted on March 4, 2008 remains valid and in effect.

I will drop an original of this package in the mail to you today. Copies are distributed electronically to those individuals noted on the copy list at the end of the letter.

If you require any further information, please contact me at your convenience.

Best regards,
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Mark Novak - Earth Energy Resources - Ground Water Discharge Permit-by-Rule

From: "Barclay Cuthbert" <barclay.cuthbert@earthenergyresources.com>
To: <rherbert@utah.gov>, <mnovak@utah.gov>
Date: 2/8/2011 2:14 PM
Subject: Earth Energy Resources - Ground Water Discharge Permit-by-Rule
CC: "Bob Bayer" <rbayer@jbrenv.com>, <danadean@utah.gov>, "Paul Baker" <paulbaker@utah.gov>, "John Davis" <john.davis@hro.com>
Attachments: 110208herbert.pdf; DWQ letter March 4 2008.pdf; Florachem MSDS.pdf; Frutech MSDS.pdf; NOI Figure 7 Water Features.pdf

Robert and Mark:

By letter dated March 4, 2008, Earth Energy Resources, Inc.'s ("Earth Energy") PR Spring Tar Sand Project (the "Project") received Ground Water Discharge Permit-By-Rule status from the Utah Department of Environmental Quality, Division of Water Quality ("DWQ"). In the time since this determination was granted, Earth Energy has continued its work on development of the "Ophus Process" and related permitting work with other agencies, principally the Utah Department of Natural Resources, Division of Oil, Gas and Mining. I have prepared a letter that outlines changes to our process and the site configuration over this time period. Please review this letter and attachments and confirm that the original Ground Water Discharge Permit-By-Rule status granted on March 4, 2008 remains valid and in effect.

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From: "Barclay Cuthbert" <barclay.cuthbert@earthenergyresources.com>
To: <rherbert@utah.gov>, <mnovak@utah.gov>
Date: 2/5/2011 12:19 PM
Subject: Earth Energy Resources - Ground Water Discharge Permit-by-Rule
CC: "John Davis" <john.davis@hro.com>
Attachments: DWQ letter March 4 2008.pdf; Florachem MSDS.pdf; Frutech MSDS.pdf; NOI Figure 7 Water Features.pdf

Rob and Mark:

By letter dated March 4, 2008, Earth Energy Resources, Inc.'s ("Earth Energy") PR Spring Tar Sand Project (the "Project") received Ground Water Discharge Permit-By-Rule status from the Utah Department of Environmental Quality, Division of Water Quality ("DWQ"). The letter, a copy of which is attached, enumerated 4 factors used in determining that the Project "will have a *de minimis* effect on ground water quality or beneficial uses of ground water resources."

First, based on Material Safety Data Sheets, (which are attached), the reagent used in the extraction process is non-toxic, volatile, and most of it will be recovered and recycled in the extraction process.

Second, extraction will occur using tanks and equipment at a processing facility at the mine site, no impoundments or process water ponds are planned, and most of the water used in the process will be recovered and recycled.

Third, the process tailings will not be free draining, with moisture content in the 10-20% range, and "will not contain any added constituents that are not present naturally in the rock, other than trace amounts of the reagent used for bitumen extraction."

Fourth, the letter addressed the hydrologic setting of the Project.

The letter also states that "[i]f any of these factors change because of changes in your operation or from additional knowledge of site conditions, this permit-by-rule determination may not apply and you should inform DWQ of the changes."

Over the last three years, Earth Energy has continually refined the process for extracting bitumen in an effort to improve recovery and reduce the potential for impacts to the environment. Several of the process improvements that reduce the potential for environmental impacts differ from the description of the process provided to DWQ in the Ground Water Permit-by-Rule Demonstration ("GWDPRD"). These changes include:

Removal of Witconate, a stabilizer component of the emulsion described in the GWDPRD.

Storage of some process tailings within impoundment cells located in the overburden/interburden storage areas only until space is available for process tailings in the pit.

The refinement of the dewatering process (originally identified as "shale shaker (or similar device)") to improve the recovery of water from the process tailing for re-use in the extraction process. We now contemplate using belt or disk filters.

Witconate is an alkyl aryl sulphonate, and is oil soluble, so when the cleaning emulsion was mixed with oil sand, the Witconate would dissolve into the oil phase and would not be present in the tailings. Removal of Witconate has no effect on bitumen recovery and removes a chemical from the process stream. In our process development, we determined that the emulsion can be formed concurrently with introduction to the tar sands, so pre-mixing and stabilization of the emulsion is no longer required.

In our initial request for Permit-by-Rule Determination, we stated that the processed sands and fines remaining after bitumen extraction would be used to backfill the open pit. Initially, the pit opening will not be sufficiently large to accept processed sands and fines, so some of these tailings will be placed in the overburden/interburden storage areas. Earth Energy has worked closely with JBR Environmental Consultants and the Utah Department of Natural Resources, Division of Oil, Gas, and Mining ("DOG M") to ensure that these tailings will be encapsulated within the coarser overburden and interburden, will not migrate, and will not impact surface or ground water below the storage areas.

The Permit-by-Rule Determination stated that the overburden/interburden storage areas would be approximately 25 acres each. Our final approved site design includes two overburden/interburden storage areas of 36 and 34 acres.

These process improvements do not affect the factors used in determining the Projects permit-by-rule status, and, for that reason, had not been reported to DWQ. However, in a challenge to the DOGM's approval of Earth Energy's Notice of Intent to Commence Large Mining Operations ("NOI"), by Living Rivers and its counsel, Western Resources Advocates, these improvements have been raised in an attempt to show that DOGM should not have relied on DWQ's determination in approving the NOI.

Living Rivers and its counsel also focus on the portion of the March 4, 2008 letter, which states: "There are no springs in the Earth Energy leased area." It is true that no springs have been found in the 213-acre mine site. Earth Energy's lease, however, encompasses a much broader area: 5,930 acres, and there are two USGS mapped springs in that area. A map submitted and approved by DOGM, which shows water features in the vicinity, is attached.

If you are available Monday morning, Earth Energy would appreciate the opportunity to discuss these improvements in greater detail to explain how they reduce the potential for environmental impact from the Project, and obtain DWQ's confirmation that these improvements provide further support for Earth Energy's Permit-by-rule status.

Best regards,
Earth Energy Resources Inc.

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From: Mark Novak
To: Barclay Cuthbert
Date: 3/27/2008 10:20 AM
Subject: Re: Locations of water seeps at our PR Spring project site

Thanks, Barclay, I will ask our monitors to sample one or two of these seeps when they go out there.

>>> Barclay Cuthbert <barclay.cuthbert@earthenergyresources.com> 3/27/2008 9:36 AM >>>
Hi Mark,

In April 2007, during one of our trips to PR Spring, we walked down tributary arroyos to Main Canyon where we plan to construct overburden storage repositories. Our geologist, Jerry Park, recorded field notes and locations of observations and plotted these notes on a topographical map, a copy of which is attached to this message. In the south eastern arroyo, we did not see evidence of water seeps. In the other arroyo, on the southeast flank adjacent to Pope Well Ridge, there were three areas where seeps of water were observed:

Seep #1: T15S, R23E, Section 35, 3575' EWL and 1475' NSL, elevation 8040'

Seep #2: T15S, R23E, Section 35, 3230' EWL and 870' NSL, elevation 7950'

Seep #3: T15.5S, R24E, Section 31, 845' EWL and 5215' NSL, elevation 7500'

The walk down into the arroyos is fairly rugged and anyone walking down to the seeps should wear some good hiking boots. We will be up at the site once the snow melts this spring and we will check back in the arroyos to see if there is any change in the water flows from these seeps.

Hope this helps to locate the areas of water flow.

Regards,

Barclay

Best regards,

Earth Energy Resources Inc.

Barclay Cuthbert

Vice President, Operations

Tel: + 1.403.233.9366

Cell: + 1.403.619.4230

Fax: + 1.403.668.5097

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Subject: FW: sampling plan

-----Original Message-----

From: Barclay Cuthbert
[mailto:barclay.cuthbert@earthenergyresources.com]
Sent: Thursday, April 05, 2007 3:46 PM
To: Bob Bayer; Linda Matthews
Subject: FW: sampling plan

Copy of response from Mark Novak.

Regards,

Barclay

Best regards,
Earth Energy Resources Inc.

Barclay Cuthbert
Vice President, Operations
Tel: + 1.403.233.9366
Cell: + 1.403.619.4230
Fax: + 1.403.668.5097
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-----Original Message-----

From: Mark Novak [mailto:mnovak@utah.gov]
Sent: March 30, 2007 4:41 PM
To: Barclay Cuthbert
Cc: Jodi Garberg; Paul Baker
Subject: sampling plan

Using Crown Ridge samples for the testing would be acceptable for the permit application, but you should mention the sample source in the application, and any known differences between it and the PR Spring tar sand. (for example, stratigraphic position) Once the operation is up and running, I would like similar tests run on the PR Spring tailings, and the proposed tailings management plan modified if the results are any different from the Crown Ridge samples.

I am also concerned with salinity, and would like the SELP leachate analyzed for TDS and major ions (Na, Ca, Mg, K, Cl, SO4 and alkalinity).

I should be in the office all next week if you would like to call (801 538 6513).

Thank you for this information:

ark

>>> Barclay Cuthbert <barclay.cuthbert@earthenergyresources.com>
>>> 3/30/2007

1

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SEP 19 2009

DIV. OIL GAS & MINING

IR - 000395

Subject: FW: sampling plan

-----Original Message-----

From: Barclay Cuthbert
[mailto:barclay.cuthbert@earthenergyresources.com]
Sent: Thursday, April 05, 2007 3:46 PM
To: Bob Bayer; Linda Matthews
Subject: FW: sampling plan

Copy of response from Mark Novak.

Regards,

Barclay

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Vice President, Operations
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I am also concerned with salinity, and would like the SFLP leachate analyzed for TDS and major ions (Na, Ca, Mg, K, Cl, SO4 and alkalinity).

I should be in the office all next week if you would like to call (801 538 6518).

Thank you for this information:

ark

>>> Barclay Cuthbert <barclay.cuthbert@earthenergyresources.com>
>>> 3/30/2007

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SEP 19 2009

DIV. OIL GAS & MINING

10:34 AM >>>
Hi Mark,

I've put together a proposal for the SPLP and Oil & Grease testing required for our permit application and I'd like to discuss this proposal with you. Once you've had a chance to review the attachment, please let me know of a good time to call and we can discuss.

Hope you have a good weekend.

Regards,

Barclay

Best regards,

Earth Energy Resources Inc.

Barclay Cuthbert

Vice President, Operations

el: + 1.403.233.9366

Cell: + 1.403.619.4230

Fax: + 1.403.668.5097

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-----Original Message-----

From: Mark Novak [mailto:mnovak@utah.gov]

Sent: January 31, 2007 8:43 AM

To: barclay.cuthbert@earthenergyresources.com

Cc: Jodi Gardberg

Subject: RE: MSDS received

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SEP 19 2009

DIV. OIL GAS & MINING



www.earthenergyresources.com

To: Mark Novak
State of Utah, Division of Water Quality
Via e-mail: mnovak@utah.gov

From: Barclay Cuthbert

Date: 30 March 2007

Subject: Testing of processed and unprocessed tar sand

Pages: 2

Mark,

In the time since our correspondence concerning testing methods for the chemical we use in our bitumen extraction process, we have completed modifications to our shop demonstration unit in Grande Prairie, Canada. We have commenced run testing with our shop unit and are in position to conduct SPLP testing on both raw tar sand and the solids generated from the process.

The tar sand that we are using for our tests was obtained from the pit at the Crown Asphalt Ridge facility in Vernal. This tar sand is similar in composition to the ore at our leased acreage in PR Spring; we chose to use this sand for our tests because of its availability in the existing pit and the comparatively easier logistics of moving equipment into the pit near Vernal and subsequently trucking the tar sand to Canada.

For our testing program for the Division of Water Quality, I propose that we conduct the SPLP (metals) testing on solids samples from two different runs our our equipment. Testing will include:

- Both SPLP (metals) and Oil & Grease (EPA Method 1664A) on each of the samples

Suite #740, 404 - 6 Avenue S.W., Calgary, AB T2P 0R9 Canada Office 403.233.9366 Fax 403.668.5007

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IR - 000398



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- Tests on the raw ore sample (no processing) and on the solids produced from the extraction process, which are recovered separately as sands and fines.
- Representative samples of the sands and fines produced over the course of each run – typically about one hour in duration, processing about one and a half tons of tar sand
- The SPLP and Oil & Grease testing will be conducted by American West Analytical Laboratories and I have discussed proper sample handling and shipping procedures with the laboratory.

I would like to review this proposal with you and ensure that it meets the requirements for our permit application; once you have had a chance to review this information, please let me know of a convenient time to call you.

Best regards,

Barclay

Barclay

Suite #740, 404 – 6 Avenue S.W., Calgary, AB T2P 0R9 Canada Office 403.233.9366 Fax 403.668.5097

APPROVED
SEP 19 2009
DIV. OIL GAS & MINING

IR - 000399

From: Mark Novak
To: Barclay Cuthbert
CC: Jodi Gardberg; Paul Baker
Date: 3/30/2007 4:41 PM
Subject: sampling plan

Using Crown Ridge samples for the testing would be acceptable for the permit application, but you should mention the sample source in the application, and any known differences between it and the PR Spring tar sand. (for example, stratigraphic position) Once the operation is up and running, I would like similar tests run on the PR Spring tailings, and the proposed tailings management plan modified if the results are any different from the Crown Ridge samples.

I am also concerned with salinity, and would like the SPLP leachate analyzed for TDS and major ions (Na, Ca, Mg, K, Cl, SO4 and alkalinity).

I should be in the office all next week if you would like to call (801 538 6518).

Thank you for this information.

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>>> Barclay Cuthbert <barclay.cuthbert@earthenergyresources.com> 3/30/2007 10:34 AM >>>
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Suite # 740, 404 - 6 Avenue SW

From: Mark Novak
To: Barclay Cuthbert
CC: jgardberg
Date: 1/31/2007 8:42 AM
Subject: RE: MSDS received

Because the material is an oil, your management plan for the spent tailings should prevent it from being released to surface water. This should include covering the tailings with topsoil for final disposal and establishing a vegetative cover, and preventing runoff from the tailings from discharging into surface water while the tailings are exposed before final burial. (Berms around the temporary storage area should take care of this.) When you characterize the tailings leachate (from Synthetic Precip. Leaching Procedure) for the permit application, you should analyze it for the parameter Oil & Grease (EPA Method 1664A).

Thank you for sending in this information, and please contact me if you have any questions about other material needed for the permit application.

Best Wishes,

Mark

>>> Barclay Cuthbert <barclay.cuthbert@earthenergyresources.com> 1/30/2007 3:57 PM >>>
Hi again Mark,

To follow up on the second part of your message, I do not foresee a problem with citing specific properties of the chemical, such as its biodegradability, in public documents issued by DWQ. We would not want the public documents to contain any information that would enable other to determine the identity of our process chemical. We would like to work with you to agree on suitable text for any public document to be issued by the Division of Water Quality, so that we can meet the requirements of your work to show that you are protecting waters of the state while complying with our wish not to divulge the identity of the chemical.

Best regards,

Barclay

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Earth Energy Resources Inc.

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From: Mark Novak [<mailto:mnovak@utah.gov>]
Sent: January 30, 2007 3:24 PM
To: barclay.cuthbert@earthenergyresources.com

Calgary, Alberta T2P 0R9

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Mark

From: Mark Novak
To: barclay.cuthbert@earthenergyresources.com
CC: jgardberg
Date: 1/30/2007 3:24 PM
Subject: MSDS received

Thank you for sending the MSDS on your process.chemical. The material looks pretty benign.

In any public documents that DWQ Issues regarding this case, such as a permit, statement of basis, permit-by-rule letter, or other correspondence during the permit process, I would like to be able to cite specific properties of this material that are relevant to the potential for ground or surface water pollution. (An example might be the fact that it is biodegradable.) This way the public can be assured that we have made appropriate decisions in this case to protect waters of the state.