STATE OF NEVADA
Department of Conservation & Natural Resources
DIVISION OF ENVIRONMENTAL PROTECTION
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NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
Underground Injection Control Program

UIC PERMT FACT SHEET
(Pursuant to NAC 445A.874)

Project Name: **Tuscarora Geothermal**
Permit Number: **UNEV2005203**
Permittee Name: **ORNI 42 LLC**
Type of Project: **geothermal power plant**
Address: **Spanish Ranch, Tuscarora Elko Co.**
Permit Action: **UIC Major Modification 2011**
Permitted Injection Wells (#): **five (5)**

A. Description of Discharge

Three injection wells and surface basins located in: T42N R52E Sections 32 & 33, T41N R52E Sections 4, 5, 6, 7, 8, 9, 16, 17 & 18, & portions of 19, 20, 21 MDBM (see page 1 of UIC U200 attachments)

Characteristics: Injectate will be:

1) Geothermal fluid which has passed through a geothermal binary power plant,
    a. Produced from geothermal production wells from similar depths and open hole intervals as injection wells
    b. Injectate has a TDS values range from 700-1000 mg/L, total alkalinity range from 300-400 mg/L. The major constituents are fluoride (12-18 mg/L), chloride (22-40 mg/L), arsenic (0.040-0.042 mg/L), boron (0.9-1.3 mg/L), and silica (250-320 mg/L).
2) Cooling tower (CT) blowdown
    a. Source of CT water will be groundwater pumped from 2 water wells (MUW-1 & MUW-2) to the east of plant in valley.
    b. CT water will be cycled approximately 3 times through system and discharged to one of the injection wells (53-8 currently planned).

Production wells – 65-8, 65A-8, 65B-8
Injection wells – 66-5, 66A-5, 72-8

(Wells drilled by TGP LLC, 53-8, 57-8, 65-8 (HSS-2??), and 72-8)

B. Receiving Water Characteristics

Fluid chemistry of the production and injection wells has been shown to be similar, of geothermal temperature and chemistry. Analysis of the receiving zone (72-8) indicates total dissolved solids of 766 mg/l; pH of 9.40; boron of 1.0 mg/l; fluoride of ?? mg/1; arsenic of 0.018 mg/l; and chloride of 64 mg/l. There is shallow non-geothermal ground water surrounding the project site, with the only documented quality in the Independence Valley east of project site near Spanish Ranch. The South Fork of Owyhee River is 1.5-2 miles southwest of project area.

An aquifer exemption was requested in the 2007 amendment application from TG Power LLC and 2011 by Ormat, however, will most likely be denied since exemption should not be necessary and degradation will not be allowed.

Public Water System wells – no geothermal injection wells are within 10-year WHPA or DWPA 1, 2, 3.

C. Synopsis

September 2, 2011, major modification application from Ormat. Power plant being constructed and specific wells requested for injection. Only three (3) injection wells could be approved at this time as current permit lists three (3). Major mod process will add addition wells and expand legal description.
April 1, 2008 – Issue original UIC permit UNEV2005203
January 23, 2008 – Temp Permit TNEV2008425 GW discharge via reserve pit and pasture irrigation
November 1, 2004 – Original application received – requested 3 wells

Past Temporary permits:
TNEV2008463 – work in water way
TNEV2008425 – discharge via irrigation drain to pasture
TNEV2008303 – discharge via irrigation drain to pasture
TNEV2007455 – working in water way, roadway culverts replacement
TNEV2007425 – discharge via (1.152 MGD 10-day average)

The Hot Sulphur Springs Geothermal Area is located in Independence Valley, near the town of Tuscarora, 70 miles north of Elko, in Elko County. Lease consists of 7,500 acres of fee and federal leases. Plant is planned to be a 32 MW (possible expansion to 48MW) power plant. As of later 2007, there are five geothermal wells (flow tested) Geothermal springs naturally discharge to Hot Creek north end of Independence Valley, flows southerly through project area, terminating into the South Fork of the Owyhee River. Total hot spring discharge to Hot Creek has been estimated in the 1,000 to 1,500 gpm range.

The geothermal reservoir is confined to Tertiary Volcanics and underlying fractured Paleozoic rocks.

In addition to confirming the injection zone waters are similar in quality to the production fluids (i.e. both are within the geothermal reservoir), the other

major concern is that the production and injection fluids do not cause degradation to the surrounding surface or ground waters.

D. Procedures for Public Comment

The Notice of the Division's intent to modify and reissue a permit authorizing the facility to discharge to the ground water of the State of Nevada subject to the conditions contained within the permit, is being sent to the *Elko Daily Times* for publication no later than November 30, 2011. The notice is being mailed to interested persons on our mailing list (see Attachment A). Anyone wishing to comment on the proposed permit issuance can do so in writing for a period of 30 days following the date of the public notice – ending December 30, 2011.

All written comments received during the comment period will be retained and considered in the final determination. A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected interstate agency, the regional administrator of EPA or any interested agency, person or group of persons.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings will be conducted in accordance with NAC 445A.605.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

E. Proposed Determination

The Division has made the tentative determination to issue the permit, with conditions under the new monitoring program.

F. Proposed Effluent Limitations and Special Conditions

Injected water will not require treatment prior to injection to improve water quality since the injection zones are of similar quality and geothermal in nature. Extensive monitoring of wells in surrounding are shall be required to ensure offsite degradation does not occur due to injection practices.

G. Rationale for Permit Requirements

Verification that the quality of fluid discharged to the injection well(s) remains constant. Confirmation that fluids disposal does not adversely effect the existing hydrologic regime.

Prepared by: Russ Land
Date: October 2011