NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET

(Pursuant to NAC 445A.874)

Type of Project:	**Geothermal**
Permit Number:	**UNEV89037**
Facility Name:	**Soda Lake I and II**
Facility Address:	**Churchill County, Nevada**
Permittee:	**AMOR IX Corporation**
Permittee Address:	**5500 Soda Lake Road** **Fallon, NV 89406**
Property Owner:	**Private and Public Land Ownership, see application**
Legal Description:	**Sections 28, 29, 33, NE ¼ Section 34 and the E½ of Section 32, T20N, R28E, MDB&M in Churchill County, Nevada**
Number of Injection Wells:	**Fifteen; including #77-29 (aka 1-29), #81-33, #45-28, #64-33, #55-33, #87-29 and #53-28.**
Permit Action:	**Second renewal with minor modification**
Other Discharges	**Surface discharge of cooling tower blowdown to an infiltration basin, NE ¼ of Section 34 , T20N, R28E MDB&M; and** **Surface discharges to basins adjacent to production and injection wells.**

A. Description of Discharge

Location: Fifteen injection wells, including eight proposed wells and seven existing injection wells. The seven existing wells include: #77-29 (1-29), #45-28, #81-33, #64-33, #55-33, #87-29 and #53-28 located in Sections 28, 29 and 33. Additionally, there is a surface infiltration basin located in the NE¼ of Section 34. All Sections are in T.20N, R.28E, Soda Lake Geothermal Power Plant, Churchill County, Nevada.

Characteristics: 1) All injectate is geothermal fluid which has passed through a binary geothermal power plant. The injectate water has a TDS concentration of approximately 5,040 mg/l. The major constituents are sodium (1,600 mg/l) and chloride (2,900 mg/l). Arsenic and iron levels in the injectate are above the Maximum Contaminant Levels (MCLs) with concentrations of 0.058 and 0.83 mg/L respectively. 2) Fluids discharged into the surface basin are cooling tower blow-down and geothermal fluids. Blow-down TDS concentration is approximately 1,640 mg/l. Major constituents include chloride (630 mg/l), bicarbonate (260 mg/l), arsenic (0.049 mg/L) and manganese (0.13 mg/L). Cooling tower blow-down may contain Division-approved scale inhibitors and biocides. All fluids discharged to the surface are of better overall quality than the receiving waters.

Table 1: Relative concentrations of injectate, surface discharge and injection zone compared to MCLs

Parameter	Drinking Water Standard (MCL*, mg/L)	Injectate (mg/L)	Surface Discharge from Cooling Tower (mg/L)	Injection Zone Baseline (mg/L)
TDS	1,000	5040*	1640*	4,500-6,500
Sodium	N/A	1600	450	1500
Chloride	400	2900*	630*	3,000*
Fluoride	4	1.2	0.9	0.9
Arsenic	0.010	0.058*	0.049*	0.094*
Boron	N/A	9.5	3.5	10.9
Manganese	0.1	0.07	0.13*	.026

* Exceeds MCL

B. Synopsis

2006: Renewal, no changes in operations.
1996: Renewal, combined NEV89037 (with seven injection wells and fifteen proposed injection wells) and NEV70008 (cooling water blowdown surface discharge) into UNEV 89037.
1990: Original permit issued for Soda Lake to injection to well #77-29 (1-29), twenty one other injection wells to be determined and a surface basin adjacent to #77-29 during maintenance.

At present, there are seven existing injection wells, four that are currently shut-in and three which are active. Four other injection wells have been plugged and abandoned. The maximum injection pressure at the wellhead is set at 250 psig/well. Average wellhead pressures have ranged from 3 to 200 psig with a maximum of 35 psig reported in the fourth quarter of 2005. The maximum daily volume of fluids to be injected is 20,000,000 gallons. Analysis of the waters from the production and injection wells indicates that the wells are completed in the same geothermal reservoir. The existing injection zones range in slotted liner or open hole construction between 890-7350 feet.

The geology within this area consists of eolian sand deposits at the surface which overlie and are interbedded with Quaternary lacustrine and deltaic sediments of ancient Lake Lahontan. Underlying these Lahontan deposits are Plio-Pleistocene unconsolidated and semi-consolidated clay, silt and sand, and Pliocene basalt. Below the basalt are Tertiary heterogeneous volcanic and sedimentary units. There are localized zones of diabase and granite. The two geothermal aquifers identified within the Soda Lake KGRA include a shallow aquifer between 500-1000 feet below ground surface (bgs) and a deep aquifer

between 2,500-4,500 feet bgs. From the surface to 500 feet, temperatures increase to about 350°F, and then consistently range between 350° and 400°F to 4000 feet.

The surface infiltration basin covers 193,600 square feet (approximately 4.4 acres). Currently, only a third of the infiltration basin is utilized for cooling tower blowdown. Depth to ground water is about 25 feet and the gradient is toward the northeast. Fluids discharged to the basin include cooling tower blow-down at a rate of less than 350 gpm for short intervals (annual average no greater than 300 gpm) and geothermal fluids produced during well testing and maintenance procedures on a infrequent, intermittent basis. Cooling tower water is produced from a well located on-site and meets all drinking water quality standards. Bermed infiltration basins are adjacent to each injection well and are used only during workovers, well or pipeline maintenance and well startups. Only non-toxic fluids are discharged to mud pits.

There are no public drinking water supply wells within seven thousand (7,000) linear feet of the area of review or the surface infiltration basin.

C. Receiving Water Characteristics

The receiving waters within the Soda Lake KGRA are of very poor water quality. Analysis of waters from wells in the area indicates TDS ranging from 4,500-6,500 mg/l, Chloride of 3,000 mg/l, Arsenic of 0.094 mg/l, and Boron of 10.9 mg/l.

D. Procedures for Public Comment

The Notice of the Division's intent to renew Underground Injection Control permit UNEV89037 was sent to the ***Lahontan Valley News*** and ***Reno Gazette-Journal*** for publication. The notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit modification can do so in writing for a period of 30 days following the date of the public notice.

A public hearing on the proposed determination can be requested by the applicant, any affected state, any affected interstate agency, the regional administrator 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.238.

The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445.274.

E. Proposed Determination

The Division has made the tentative determination reissue the permit with minor modifications.

F. Proposed Effluent Limitations and Special Conditions

See Part I.A of the permit.

G. Rationale for Permit Requirements

This permit will help to ensure that the fluid discharged to both the injection well and surface discharge area does not adversely affect the existing hydrologic regime.

Prepared by: Russ Land

Date: October 1995

Updated for permit renewal by Birgit Widegren on July 31, 2006