

**ATTACHMENT O**

## **PLUGGING AND WELL ABANDONMENT PLAN**

## **GENERAL PLUGGING AND ABANDONMENT PROCEDURE**

Prior to the plugging and abandonment of the injection wells the applicant will submit a revised plugging and abandonment plan to the Director of the California UIC for review and approval.

### Procedure:

Conduct a pressure mechanical integrity test on the well. The pressure test will be witnessed by the UIC and the test procedure will follow UIC Procedure UICI-6 for pressure testing a Class I disposal well. If leakage is indicated by the test, the location of the leakage will be identified, the impact to the environment evaluated and this information will be submitted to UIC.

An environmental remediation plan and implementation schedule and/or a repair plan will be submitted to the UIC for review and approval. No work will commence until the plan has been approved by the UIC.

The tubing and packers will be removed from the well.

A cement bond log and a gamma ray-neutron log will be run on the well and any other tests or logs determined necessary by UIC. The logs and test results will be submitted to UIC for review and approval. The logs and test results will include an interpretation of the log and tests by a person with the technical expertise to evaluate the data.

Based on the evaluation of the logs and tests conducted on the well, a plan for remedial work must be submitted to UIC for review and approval. The remedial work, determined necessary by UIC, will be performed. Remedial work will not commence until the plan has been approved by the UIC.

A cement retainer will be set at the base of the longstring casing just above the injection interval. Cement will be displaced through the retainer, squeezing the injection interval with cement.

After cementing the injection interval, the bottom of the retainer will be closed and the cementing pipe disconnected from the top of the retainer.

The casing will be filled with cement from the retainer to ground surface by pumping cement through the cementing tubing and slowly withdrawing the tubing from the well. Cement will be circulated to surface.

The cementing tubing will be removed from the well. The casing will be filled with cement back to surface.

The cement level will be observed in the casing after cement has set for 24 hours. If cement has fallen back, the casing will be filled with cement back to surface.

The wellhead equipment will be removed.

A metal cap will be welded to the casing inscribed with the UIC permit number and the date the well plugging was completed.

A map showing the tri-coordinate location (includes elevation) of the remaining wellhead prepared by a licensed professional land surveyor or professional engineer licensed to practice will be submitted to the UIC.

A plugging report with related details will be submitted to the UIC within 30 days of completing the plugging operation on a form provided by UIC. The work done with appropriate service company cementing reports and "day" reports will be submitted to the UIC.

## **PROPOSED PLUGGING AND ABANDONMENT ACTIVITIES**

- 1 Install blowout prevention equipment.
- 2 Rig up working platform and crane equipment.
- 3 Pick up 1-1/4" Hydril tubing.
- 4 Go into hole to 5,600'.
- 5 Set 1,500' cement plug from 5,600' to 4,100'.
- 6 Displace drilling mud into wellbore.
- 7 Locate and identify top of cement plug. UIC to witness.
- 8 Set 200' BFW cement plug at 1,200' to 1,000'.
- 9 Set 100' cement plug at surface.
- 10 Rig down equipment.
- 11 Remove wellhead. Weld steel plate onto 9-5/8" casing.
- 12 Remove cellar and restore location. Notify UIC.

### Agency Approval of Plan

Before proceeding with the abandonment program, the applicant will have received EPA approval of the final abandonment procedure. The EPA will be notified at least 30 days prior to the scheduled abandonment:

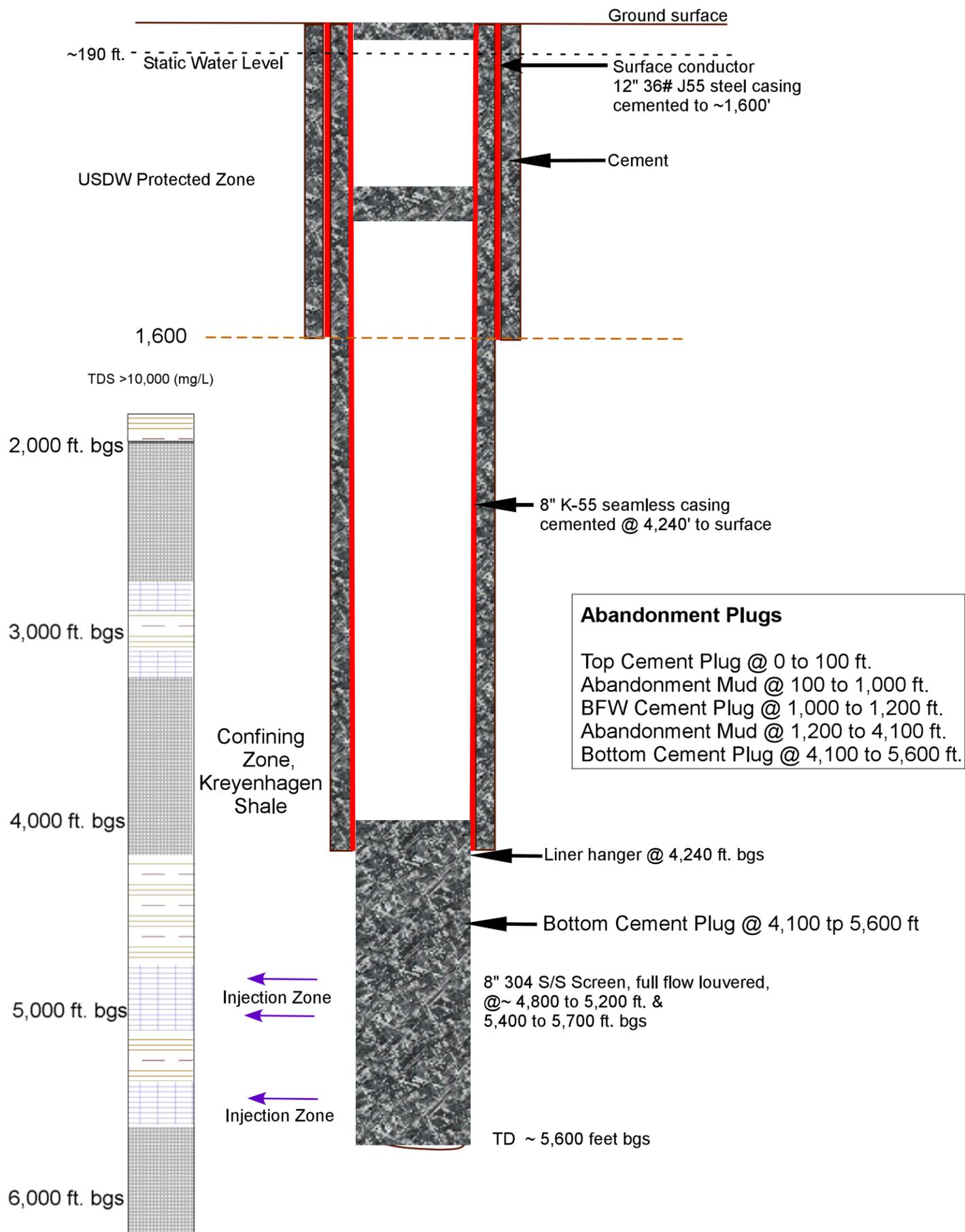
- To witness the location and hardness of the cement plug at 3,050'.
- Upon restoration of the location to near original conditions so that a final environmental inspection can be made.

### Schedule for Agency Approval and Reporting of Well Plugging Operations

- 1 Plugged with cement from 5,600' to 4,100'.
- 2 Plugged with cement from 1,200' to 1,000'.
- 3 Plugged with cement 100' to surface.

**A PROVISIONAL WELL SCHEMATIC FOR THE PLUGGING AND  
ABANDONMENT OF ALL INJECTION WELLS**

### Injection Well Schematic



**LEGEND**

- Sand
- Sand and Shale
- Shale



**GENERAL ABANDONMENT PLAN FOR ALL WELLS  
PROPOSED PANOCHÉ ENERGY CENTER**



CREATED BY: DH	DATE: 08-27-06	FIG. NO:	
PM:	PROJ. NO: 28906795.00200	O1	

## **ABANDONMENT COST ESTIMATE PER WELL**

<b><u>INTANGIBLES:</u></b>	<b>COST</b>
Rig Time: 48 hours	\$ 12,000
Rig Pump	\$ 4,200
Transportation	\$ 4,000
Tank Rental	\$ 1, 800
Cement Services	\$ 11,700
Work String	\$ 3,500
Casing Cutter	\$ 2,300
Surface Labor	\$ 5,000
Total Intangibles	<u>\$35,500</u>
<b><u>TANGIBLES: COST:</u></b>	
Abandonment Mud	\$ 1,500
Total Tangibles	\$ 1,500
Total Workover Costs	\$30,000
<b>Total Amount (Per Well)</b>	<b>\$56,500</b>