NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

TEST PLAN

TITLE:	Revision: **0**
Long-Term Arsenic Characterization at NC-EWDP-4PD	Date: **8/26/2010** Page: **1 of 6**

TEST PLAN NUMBER:	SUPERSEDES:
TPN-11.5	**None**

APPROVAL

Director — Date: 8/24/10

CONCURRENCE

Geoscience Manager — Date: 8/26/10

Principal Investigator — Date: 8/26/10

Quality Assurance Officer — Date: 8/24/10

1.0 BACKGROUND

NC-EWDP-4PD Zone 2 (Figure 1) is a candidate to supply water for the Amargosa Valley Science and Technology Park (AVSTP). Several rounds of water sampling have been conducted in the well, with the most recent results indicating that Arsenic (As) levels are below the EPA standard of 10 ppb (Table 1). However, during the recent sampling 4PD was pumped for a relatively short period of time, and As levels exhibited an upward trend.

Table 1. Total As results from sampling conducted in May 2010

Date	Time	Arsenic concentration (mg/L)	Arsenic concentration (ppb)
5/10/10	17:25	0.0069	6.9
5/10/10	21:38	0.0068	6.8
5/11/10	01:39	0.0070	7.0
5/11/10	05:31	0.0071	7.1
5/11/10	09:31	0.0076	7.6

2.0 PURPOSE

To increase confidence that As levels will remain below the EPA standard during production of water for the AVSTP, further pumping and sampling is required. The scope of this project is to pump the well at production rates (i.e., 100-200 gpm) for approximately 30 days, sampling for total As and total Iron (Fe) at the schedule prescribed below. The pumping/sampling period may be extended until December 31, 2010 at the discretion of the Geoscience Manager and Project Engineer.

All pumping and sampling is being conducted under State of Nevada Department of Environmental Protection (NDEP) Temporary Discharge Permit TNEV2010499. Suitable erosion control will be maintained at all times. In addition, daily discharge rates, total flow, As, and Fe data must be reported to NDEP on a monthly basis.

3.0 EQUIPMENT

Table 2 contains the major components necessary to accomplish the pumping and sampling described above. Other minor equipment and supplies may also be required.

Table 2. Major equipment necessary for long-term pumping and sampling at 4PD

Item	Quantity
Submersible pump, Crown (30 HP)	1
Olympian XQ-105 generator set	1
Westbay pressure transducers (250 psi and 1,000 psi and associated cables)	2
Westbay data logger	1
In-Situ Level Trolls (30 psi and 100 psi) and associated cables	2
3-inch totalizing flow meter	1
Oakton pH/CON 300 Series water quality meter	1
Field computer	1
Packer (Tam 550-LW21)	1
Fuel tank (1,000 gallon)	1
Sample bottles (250 ml HDPE pre-preserved with nitric acid)	20

Nitrogen, compressed, T-size cylinders	6
Electric sounding tape, 500 ft length	1

4.0 PROCESS

4.1 Testing Setup

The steps necessary to complete the testing are described below. This workflow assumes that the packer is set below screen 2, that the submersible pump is set at approximately 650 ft bgs, and that Westbay transducers are already installed in 4PD Zone 2 and below the packer.

1. Build containment for fuel tank to specifications contained in the project Site-Specific Health and Safety Plan (SSHASP).
2. Direct fuel delivery contractor to set tank on containment using a crane or other approved hoisting device.
3. Plumb the tank to the gen-set fuel system.
4. Wire pump control panel to XQ-105 generator set.
5. Measure the depth to water in each of the wells on site (i.e., 4PA, 4PB, and if possible 4PD Zones 1, 2, and 3) using an electric sounder and record the results in the scientific notebook.
6. Verify that the totalizing flow meter is installed in the discharge assembly and record the initial reading in the scientific notebook.
7. Install the Level Troll transducers in piezometer wells 4PA and 4PB to depth of approximately 50 ft below the top of the water table and begin logging at the schedule described below.
8. Install Westbay data logger and begin logging at the schedule described below.

4.2 Pumping and Sampling

The steps below describe the pumping and sampling process.

1. Inflate packer to 300 psi on pressure gauge using compressed Nitrogen and verify that packer maintains pressure.
2. After collecting the required background pressure data, turn the submersible pump on; use the valve on the discharge assembly to regulate the discharge rate to no more than 200 gpm.
3. Purge 3 well volumes from Zone 2, then collect one As/Fe sample. Record water quality parameters (i.e., temperature, electrical conductivity, pH) at the time the sample is collected.
4. Record the pump rate (based on the totalizer readings) in the scientific notebook.
5. Conduct a timed flow test (e.g., using a 55-gallon barrel or similar) at the discharge point to verify totalizer flow readings and record the result in the scientific notebook. This step may be omitted if it is not possible.

6. Photograph the discharge point, to comply with permit requirements.
7. Continue to monitor pumping parameters until the end of shift on the first day.
8. Collect one additional As/Fe sample. Record water quality parameters (i.e., temperature, electrical conductivity, pH) at the time the sample is collected.
9. For the remaining days and weeks, collect As/Fe samples according to the schedule in Table 4. Record water quality parameters (i.e., temperature, electrical conductivity, pH) at the time each sample is collected.

4.3 Data Collection

Data shall be collected at the frequencies shown in Table 3 for the Level Troll and Westbay probes. Prior to inflating the packer, collect at least 5 minutes of background data with both the Westbay and Level Troll transducers. After starting the pump, verify that the packer seal is intact by checking the pressures in Zones 3 and 2. Data shall be downloaded from the Westbay and Level Trolls at least weekly (i.e., no more than 7 days between downloads).

To comply with permit requirements, totalizer flow rates and cumulative pumpage readings must be taken at least once per shift. Additionally, perform the timed flow test and record the results in the scientific notebook at least once per shift.

Table 3. Data collection schedule

Equipment	Data collection frequency	Duration
Westbay probes	5 seconds	First 5 minutes of pumping
	30 seconds	Remainder of test
Level Trolls	30 seconds	Entire test
Totalizer rate / cumulative	Once per shift	Entire test
Timed flow test	Once per shift	Entire test

4.4 Sample Collection and Shipping

The sample collection schedule is shown in Table 4. Samples shall be collected in accordance with TP-8.1, *Field Collection and Handling of Water Samples* and applicable analytical laboratory requirements. Samples must be kept cool (i.e., in a cooler with blue ice in the field, or refrigerated at the NWRPO prior to shipping). Ship samples to the analytical laboratory listed below on a weekly basis:

ACZ Laboratories
Attn: Tony Antalek
2773 Downhill Drive
Steamboat Springs, CO 80487
Phone: 800-334-5493
Fax: 815-301-3857

Table 4. Sample collection schedule

Days	Number of samples	Frequency
1	2	2/day
2-5	4	1/day
6-30	9	3/week

5.0 DOCUMENTATION

All records generated as part of the work described in this procedure shall be archived in the NWRPO Quality Assurance Records Center. All work described herein shall be documented in the appropriate scientific notebook. Records generated during this work shall include:

- Scientific notebook
- Chain-of-Custody forms
- Analytical results
- Electronic pressure and temperature data

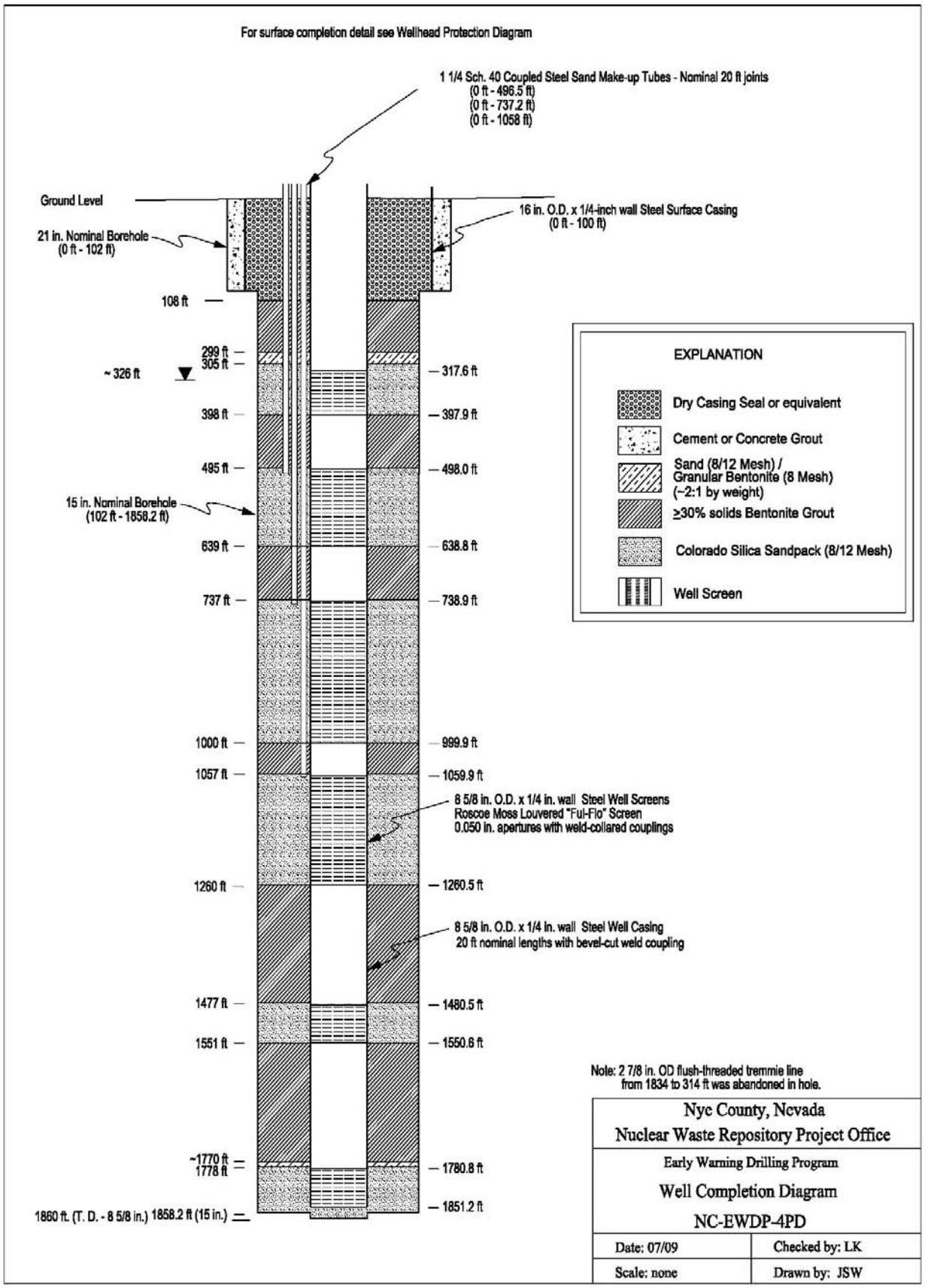

Figure 1. Well completion diagram for NC-EWDP-4PD