Issue/Title: Pilgrim Nuclear Power Station (PNPS): Tritium in Groundwater Monitoring Wells

Topic: PNPS Updates as of July 8, 2011

Previous Plans: Results from groundwater monitoring well samples collected during the weeks of June 21st and June 28th, 2011 were reported by Entergy (see tables below). Split sample results for the week of June 21st and June 28th, 2011 were also reported by MERL.

Current Status:

Table 1[1]: June 21st

Location	Date	MERL[2] pCi/L	GEL[3] pCi/L
MW 201	6/21/2011	529	399
MW 202	6/21/2011	NDA<300	NDA<329
MW 202 I	6/21/2011	387	NDA<313
MW 203	6/21/2011	NDA<300	NDA<319
MW 204	6/21/2011	405	NDA<318
MW 205	**6/21/2011**	**2,004**	**1,950**
MW 206	**6/21/2011**	**958**	**620**
MW 207	6/21/2011	426	521
MW 208-S	6/21/2011	NDA<300	NDA<318
MW 208-I	6/21/2011	NDA<300	NDA<317
MW 209 **new**	6/21/2011	959	1080
MW 210 **new**	6/21/2011	432	312
MW 211 **new**	6/21/2011	1062	979
MW 212 **new**	6/21/2011	707	428
MW 213 **new**	6/21/2011	NDA<300	377
MW 214 **new**	6/21/2011	NDA<300	NDA<318
MW 3	6/21/2011	NDA<300	NDA<319
MW 4	6/21/2011	531	NDA<320
SW-boat ramp	6/21/2011	NDA<300	NDA<319
SW-intake	6/21/2011	NDA<300	NDA<318

Table 2: June 28th

Location	Date	MERL pCi/L	GEL pCi/L
MW 201	6/28/2011	694	541
MW 202	6/28/2011	-	-
MW 202 I	6/28/2011	-	-
MW 203	6/28/2011	-	-
MW 204	6/28/2011	-	-
MW 205	**6/28/2011**	**9,929**	**7,900**
MW 206	**6/28/2011**	**1,238**	**953**
MW 207	6/28/2011	-	-
MW 208-S	6/28/2011	-	-
MW 208-I	6/28/2011	-	-
MW 209 **new**	6/28/2011	899	969
MW 210 **new**	6/28/2011	-	-
MW 211 **new**	6/28/2011	***	***
MW 212 **new**	6/28/2011	-	-
MW 213 **new**	6/28/2011	-	-
MW 214 **new**	6/28/2011	-	-
MW 3	6/28/2011	-	-
MW 4	6/28/2011	-	-
SW-boat ramp	6/28/2011	-	-
SW-intake	6/28/2011	-	-

*** NDA = not detected at less than activity value listed**
**** results pending**
***** well inaccessible due to scheduled equipment use**
- not analyzed this week

[1] PNPS screening level for tritium in groundwater monitoring wells is 3,000 pCi/L, which is 1/10th of the NRC-approved Pilgrim Offsite Dose Calculation Manual standard for tritium in non-drinking water sources. The EPA drinking water standard is 20,000 pCi/L. The nearest drinking water wells are approximately 2.5 miles from the plant.
[2] Results from the Massachusetts Environmental Radiation Laboratory (MERL)
[3] GEL Laboratories are a radioanalytical laboratory contracted by PNPS

The latest groundwater monitoring results reported by Entergy show continued fluctuations in MW205, which had a level of 1,950 pCi/L of tritium detected on June 21st and increased to 7,900 pCi/L of tritium detected on June 28th (the previous result on June 15th was 6,710 pCi/L). Results for MW206 show 620 pCi/L of tritium detected on June 21st and 953 pCi/L of tritium detected on June 28th (the previous result on June 15th was 1,250 pCi/L). Results for MW201 indicated 399 pCi/L of tritium detected on June 21st and 541 pCi/L of tritium detected on June 28th. Tritium results for MW209 and MW211 continue to be detected in the 1,000 pCi/L range. Specifically, for MW209, 1,080 pCi/L of tritium was detected on June 21st, and 969 pCi/L of tritium was detected on June 28th. For MW211, 979 pCi/L of tritium was detected on June 21st, and MW211 was not accessible due to scheduled use of equipment in the area of MW211 on June 28th. June 21st was also a comprehensive round, and all other wells were at or below detection limits (see table above). Also, no tritium was detected in surface water samples for the week of June 21st. For the weeks of June 21st and June 28th split sample results from MERL were once again fairly consistent with Entergy results (see table above).

As previously reported, the charcoal samplers placed in monitoring wells for the dye testing effort continue to be collected weekly to determine whether the dyes are present in the groundwater. While no positive dye detections have been reported to date, MDPH has requested and received additional information on detection criteria from the lab conducting this work. MDPH is in the process of evaluating this additional information. Also, surprisingly, the dye that was introduced to the French drain in February has still not shown up in any wells down stream. This dye was introduced directly to the soil in order to help characterize groundwater flow in the area between the reactor building and the ocean. MDPH will have continued discussions with Entergy and the lab conducting the dye testing in terms of detection criteria, and the detection of dye from the French drain.

Split soil results from MERL indicated one detection of Cs-137 in a sample at a depth of 5 feet from the sample near MW205. The concentration was 128 pCi/kg. This concentraton is consistent with Cs-137 soil levels in surface soil that resulted from atmospheric bomb testing in the 1950s and 1960s. According to US EPA, background levels of Cs-137 in surface soil range from 10 – 1,000 pCi/kg. Soil sampling is no longer required by nuclear power plants, however, in the most recent soil sampling survey reported by Entergy in their 2000 Environmental Monitoring Report, Cs-137 was detected at a background surface soil location in East Weymouth at 290 pCi/kg, which is within this US EPA background range. Since this area around MW205 was previously excavated, surface soil is likely to have been mixed into the subsurface.

MDPH continues to explore with Entergy the possible reason for ongoing fluctuations in MW205 and MW206. A possible source that is still under active investigation is the rad-waste discharge line, which is upstream from the affected groundwater monitoring wells. Future actions are currently being considered by the technical team at PNPS, which may include additional monitoring wells, excavations near the rad-waste discharge line in order to inspect and test it, and/or additional soil sampling in the rad-waste discharge line area. These future actions will be a major part of the agenda during the upcoming meeting with Entergy and Agency staff proposed for mid August.

Looking Forward:

A tentative date in mid August for a meeting between agency staff and Entergy to evaluate all tritium in groundwater data has been proposed. Groundwater monitoring data over the past year will be reviewed, and next steps will be discussed, which may include new monitoring wells, more soil sampling, or other activities.