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

Topic: PNPS Updates as of November 22, 2013

Previous Plans: Results from groundwater monitoring well samples collected during the week of October 7, 2013 were reported by Entergy. Entergy results from the week of October 21, 2013 are pending, with the exception of results for MW 216 reported below. Split sample results for the weeks of October 7, 2013 and October 21, 2013 were reported by MERL.

Current Status:

Table 1[1]: Week of October 7th

Location	Date	MERL pCi/L	GEL pCi/L
MW 201	10/07/2013	412	NDA(351)*
MW 202	10/07/2013	-	-
MW 202 I	10/07/2013	-	-
MW 203	10/07/2013	-	-
MW 204	10/07/2013	-	-
MW 205	10/07/2013	551	NDA(354)*
MW 206	10/07/2013	409	NDA(349)*
MW 207	10/07/2013	-	-
MW 208-S	10/07/2013	-	-
MW 208-I	10/07/2013	-	-
MW 209	10/07/2013	894	1,020
MW 210	10/07/2013	-	-
MW 211	10/07/2013	1,272	1,170
MW 212	10/07/2013	-	-
MW 213	10/07/2013	-	-
MW 214	10/07/2013	-	-
MW 215	10/07/2013	1,258	1,010
MW 216	10/07/2013	5,609	5,820
MW 217	10/07/2013	-	-
MW 3	10/07/2013	-	-
MW 4	10/07/2013	-	-
SW-boat ramp	10/07/2013	-	-
SW-intake	09/30/2013	-	NDA(356)*

Table 2: Week of October 21st

Location	Date	MERL pCi/L	GEL pCi/L
MW 201	10/21/2013	NDA(300)*	**
MW 202	10/21/2013	-	-
MW 202 I	10/21/2013	-	-
MW 203	10/21/2013	-	-
MW 204	10/21/2013	-	-
MW 205	10/21/2013	804	**
MW 206	10/21/2013	314	**
MW 207	10/21/2013	-	-
MW 208-S	10/21/2013	-	-
MW 208-I	10/21/2013	-	-
MW 209	10/21/2013	760	**
MW 210	10/21/2013	-	-
MW 211	10/21/2013	1,085	**
MW 212	10/21/2013	-	-
MW 213	10/21/2013	-	-
MW 214	10/21/2013	-	-
MW 215	10/21/2013	1,070	**
MW 216	10/21/2013	5,130	4,960
MW 217	10/21/2013	-	-
MW 3	10/21/2013	-	-
MW 4	10/21/2013	-	-
SW-boat ramp	10/21/2013	-	-
SW-intake	10/14/2013	NDA(300)*	**

*** NDA = not detected at less than activity value listed**

**** Analysis pending**

- 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.

Beginning in September 2013, Entergy started using their own onsite lab to screen their groundwater samples before they are sent out for analysis at their contract laboratory (GEL). Groundwater samples that are higher than 1,500 pCi/L of tritium detected in their on-site laboratory will continue to be analyzed by their contract laboratory, GEL, under the same expected schedule as the past several years. Samples with tritium concentrations less than 1,500 pCi/L will be analyzed with a normal (30 day) turnaround rather than an expedited schedule. There will be no change in the timeline and analysis of split samples conducted by MERL.

The groundwater monitoring results for MW205 reported by Entergy show no tritium was detected during the week of October 7th (the previous Entergy result during the week of September 23rd indicated 451 pCi/L of tritium detected). During the week of October 21st, Entergy results are still pending for MW205, however, MERL split sample results indicated 804 pCi/L of tritium detected. Entergy results show that for the week of October 7th no tritium was detected in MW206 (the previous Entergy result during the week of September 23rd also indicated no detectible tritium). The October 21st Entergy results are still pending for MW206, however, MERL split sample results indicated 314 pCi/L of tritium detected. Weekly sampling results for MW216, MW209, and MW211 are discussed below. Results for other wells sampled during the weeks of October 7th (Entergy results) and October 21st (MERL results) were within typical ranges detected since the groundwater monitoring for tritium began. MERL split sample results for the week of October 7th were generally consistent with Entergy results.

Since its installation in September 2012, MW216 has been sampled weekly. MW216 continues to trend higher than most other groundwater monitoring wells on site. The most recent Entergy results for MW216 indicated 5,430 pCi/L of tritium detected the week of October 14, 2013 and 4,960 pCi/L of tritium detected the week of October 21, 2013. MERL split sample results for MW216 for the weeks of October 14, 2013 and October 21, 2013 were generally consistent with Entergy results. As previously noted, potential sources of tritium in groundwater in the area of MW216 include roof drain run off, the radwaste discharge line, the residual effects of a historical spill in the area (that

Entergy reported was remediated at the time of the spill), or a possible connection to the neutralization sump discharge line (which was confirmed to be separated) on the other side of the reactor building via a duct bank. Entergy continues to work with their hydrogeology contractor on a plan to further evaluate possible sources of tritium detected in MW216. As noted in the previous update, Entergy reported that dissolved oxygen and conductivity levels routinely measured in all groundwater monitoring wells are lower for MW216 than in other wells, and they are working with their contractor to better understand what this may mean in terms of identifying a potential source.

Weekly sampling results for MW209 and MW211 no longer seem to be trending with MW216, which suggests that something different may be occurring at MW216 than with these wells. The most recent Entergy results for MW209 indicated 1,020 pCi/L of tritium detected the week of October 7, 2013. Entergy samples for MW209 for the week of October 14, 2013 and October 21, 2013 are still being analyzed by their contract lab. MERL split sample results for MW209 for the weeks of October 14, 2013 and October 21, 2013 indicated 735 pCi/L and 760 pCi/L of tritium detected, respectively. The most recent Entergy results for MW211 indicated 1,170 pCi/L of tritium detected the week of October 7, 2013 and 1,060 pCi/L of tritium detected the week of October 14, 2013. Entergy samples for MW211 for the week October 21, 2013 are still being analyzed by their contract lab. MERL split sample results for MW211 for the week of October 21, 2013 indicated 1,085 pCi/L of tritium detected. MERL split sample results for MW209 and MW211 for the week October 7, 2013 were generally consistent with Entergy results and MERL split sample results for MW211 for the week of October 14, 2013 were generally consistent with Entergy results.

Entergy surface water sampling results for the intake canal downstream of MW205 for the week of September 30th indicated no detectable tritium and the Entergy surface water sample for the intake canal downstream of MW205 for the week of October 14th is currently being analyzed by their contract lab. MERL split sample results for the week of September 30th were unable to be analyzed due to the presence of decaying organic

matter than interfered with instrumentation. MERL split surface water sample results for the week of October 14th indicated no detectible tritium.

The last groundwater transducer study was conducted at PNPS in 2010, prior to installation of groundwater monitoring wells MW215 and MW216. Last month on November 4th, transducers were added to wells MW201, MW202, MW204, MW205, MW206, MW207, MW210, MW212, MW211, MW215, and MW216 by Entergy's hydrogeology contractor. Readings were taken frequently to study tidal and precipitation fluctuations in groundwater elevations until they were removed November 14th. Entergy will share results from the transducer study with MDPH when they are available. It should be noted that due to the transducer study, no groundwater samples were able to be taken from the monitoring wells during this time period (November 4th through November 14th).

MW4 was successfully re-installed in very close proximity to its original location the week of November 4th and the original MW4 was abandoned in place. The new well at this location will be referred to as MW4R. MW218 was successfully installed near the location of the neutralization sump discharge line break the week of November 11th. MDPH conducted a site visit to observe the installation of this well. Soil samples were collected at 3 depths (at approximately 5, 10, and 15 feet) during the installation of MW218 and split samples will be provided to MERL for analysis. MW219 was not able to be installed and Entergy plans to install this well the week of December 9th. MW219 will be located in close proximity to catch basin 10. At least 4 weekly groundwater samples will be taken from MW218 and MW219 (when installed) to determine baseline trends at the wells before MDPH, MEMA and Entergy agree on a sampling frequency for those new wells. Entergy reported that the installation of a deeper intermediate well to characterize the lower water table in the area of the neutralization sump discharge line is not possible at this time because they were unable to find a suitable location without conducting additional ground penetrating radar. Entergy will be revisiting this as part of their 2014 investigation planning.

Final results of soil samples collected as part of the neutralization sump discharge line investigation are still pending from Entergy. Entergy still plans to collect additional soil samples from the area of the neutralization sump discharge line break to better characterize any potential soil and/or groundwater contamination.

Entergy reported that MW203 was taken out of service due to its location near onsite construction activities. A replacement for MW203 is being considered and Entergy has been discussing various alternatives for replacement with their hydrogeology contractor.

Looking Forward:

MDPH will continue to closely follow all investigational activities that are currently underway at PNPS, notably any developments concerning the neutralization sump discharge line, tritium trends in MW216, transducer study results, the installation of MW219, additional soil sampling, and the potential replacement of MW203.