HW-38
EPA Radiological Data Summary Report
Dimock Residential Sampling
Sample Date: 2/8/2012

Sample Number	Analyte	Result		2σ Uncertainty	MDC	Unit	Trigger Level		EPA Primary MCL		DEP Primary MCL	
HW38	Alpha	2.37E-02	UJ	1.40E+00	1.30E+00	pCi/L			15	pCi/L	15	pCi/L
HW38	Beta	1.91E+00		1.20E+00	1.80E+00	pCi/L						
HW38	Th227-AS	3.46E-02	J	9.50E-02	1.70E-01	pCi/L						
HW38	Th228-AS	7.04E-02	UJ	7.70E-02	1.00E-01	pCi/L	49	pCi/L				
HW38	Th230-AS	2.82E-02	UJ	5.00E-02	6.10E-02	pCi/L	58	pCi/L				
HW38	Th232-AS	0.00E+00	J	3.00E-02	6.10E-02	pCi/L	52	pCi/L				
HW38	U234-AS	3.70E-02	UJ	6.60E-02	1.00E-01	pCi/L	75	pCi/L				
HW38	U235-AS	3.80E-02	UJ	6.70E-02	8.20E-02	pCi/L	76	pCi/L				
HW38	U238-AS	4.76E-02	UJ	6.40E-02	6.90E-02	pCi/L	83	pCi/L				
HW38	Bi212-GS	1.16E+01	J	1.20E+01	2.00E+01	pCi/L	7450	pCi/L				
HW38	Bi214-GS	1.62E+02	J*	5.20E+01	6.40E+01	pCi/L	27600	pCi/L				
HW38	K40-GS	2.00E+00	UJ	1.30E+01	2.00E+01	pCi/L	214	pCi/L				
HW38	Pb214-GS	1.98E+02	J*	6.20E+01	7.60E+01	pCi/L						
HW38	Ra226-GS	-1.31E+01	UJ, J*	8.00E+01	5.20E+01	pCi/L						
HW38	Ra228-GS	2.73E-01	UJ	3.60E+00	5.60E+00	pCi/L						
HW38	Th234-GS	-5.23E+01	UJ	4.40E+02	3.20E+02	pCi/L	229	pCi/L				
HW38	U235-GS	-2.03E-01	UJ, J*	5.10E+01	1.90E+01	pCi/L	76	pCi/L				
HW38	Ra226-RS	1.22E-01	J	9.20E-02	6.60E-02	pCi/L						
HW38	Ra228-RS	-2.44E-02	U	3.00E-01	5.30E-01	pCi/L						
HW38	Ra226 + Ra228	9.76E-02				pCi/L	5	pCi/L	5	pCi/L	5	pCi/L
HW38	Total Uranium	1.59E-01				ug/L	47	ug/L	30	ug/L	30	ug/L

See end of document for report key

28-Jun-12

Sample Number – Code that is used to identify the particular sample. See additional information below:

HW## – Identifies the sample location and indicates that it was collected at well head or closest point to the well head.

F – Indicates that the sample was filtered following collection. The purpose of filtering the sample is to remove any particulates in order to find what metals are actually dissolved in the water sample.

Z – Identifies a duplicate sample. Duplicate samples are collected for every ten samples collected to test the reproducibility of sampling and analytical procedures.

P – Indicates that the sample was collected at the kitchen tap. In some cases this may be following any treatment that the residence may have.

A/B – Designates which residence the sample was collected for sample locations with multiple residences using the same water source (may be a well or a spring).

RO – Indicated that the sample was collected from a residence containing a reverse osmosis treatment system.

Analyte – General term for a substance in the sample. The lab does testing to find specific analytes, or substance in the water sample. The report lists each analyte that the lab tested for and what amounts were found.

-AS Alpha Particle Spectroscopy

-GS Gamma Ray Spectroscopy

-RS Radionuclide Specific Activity

Ra226 + Ra228 is a combined result of specific radionuclides for direct comparison with the combined MCL in drinking water of 5 pCi/L

Total Uranium U (ug/L) - estimate caluclated based on Uranium alpha spectrometry results and uranium isotopic specific activity. Calculated by:

Total U (ug/L) = (U-234 pCi/L)/(6254) + (U-235 pCi/L)/(2.163) + (U-238 pCi/L)/(0.3362)

Result and Units – identifies the actual result for the particular analyte and the measurement used for the particular type of sample. Results are expressed in scientific notation. For example: $4.32 \times 10^3 = 4{,}320$; $2.75 \times 10^{-2} = 0.0275$

The results include the following units for radionuclide water sample analyses:

pCi/L - picocuries per liter

ug/L - micrograms per liter

MDC - Minimal detectable concentration

Uncertainty - Measurement of total error associated with the counting/measuring process.

Trigger Level – established for this project, the trigger levels are based on risk-based screening levels and/or standards for public water supplies. A yellow highlighted result represents an analytical result greater than the established trigger level. Results exceeding a trigger level are referred to an EPA toxicologist for further review.

EPA Primary MCLs – the primary maximum contaminant levels (MCLs) are legally enforceable standards established under the Safe Drinking Water Act to protect public health by limiting the levels of contaminants in public drinking water systems. The MCL is the amount of an analyte (substance) that can be present in a water sample that the government considers acceptable to drink. EPA considers the MCLs when evaluating results from residential drinking water wells.

DEP Primary MCLs – Chapter 109, Pennsylvania Safe Drinking Water Regulations, defines MCL as the maximum permissible level of a contaminant in water which is delivered to a user of a public water system, and includes the primary and secondary MCLs established under the Federal Safe Drinking Water Act, and MCLs

Validation Result Qualifiers - EPA performs a quality check on the lab results. This quality check evaluates the sample results at the 95% confidence level (the 2σ counting uncertainty). This information can apply to 1) how certain EPA is that the lab detected the analyte and 2) how certain EPA is of the measurement of the analyte once detected. If there is no qualifier by the result, the sample result is greater than its MDC and/or greater than its 2σ counting uncertainity.

U – The sample result is less than its MDC (the data user is accepting a 5% probability of a false negative result) and the sample result is less than its 2σ counting uncertainty.
J – This means that the analyte was detected, but the value of the result is an estimate.
J* - Laboratory indicates that this result may be significantly under or overestimated. Pb-214 and Bi-214 activity concentrations should be considered a gross estimate only. According to the laboratory performing the analyses, the half life for Rn-222 (3.842 days) was utilized to calculate activitiy and decay corrected to the individual sample collection date/time.
UJ - The U before the J means that the analyte was close to the MDC, however, some analyte may be present.
R – Indicates that the data has been rejected. Calculated negative results indicate that the activity is at or below the instrument background. Results are less than the 95% confidence interval MDC value.