April 1, 2015

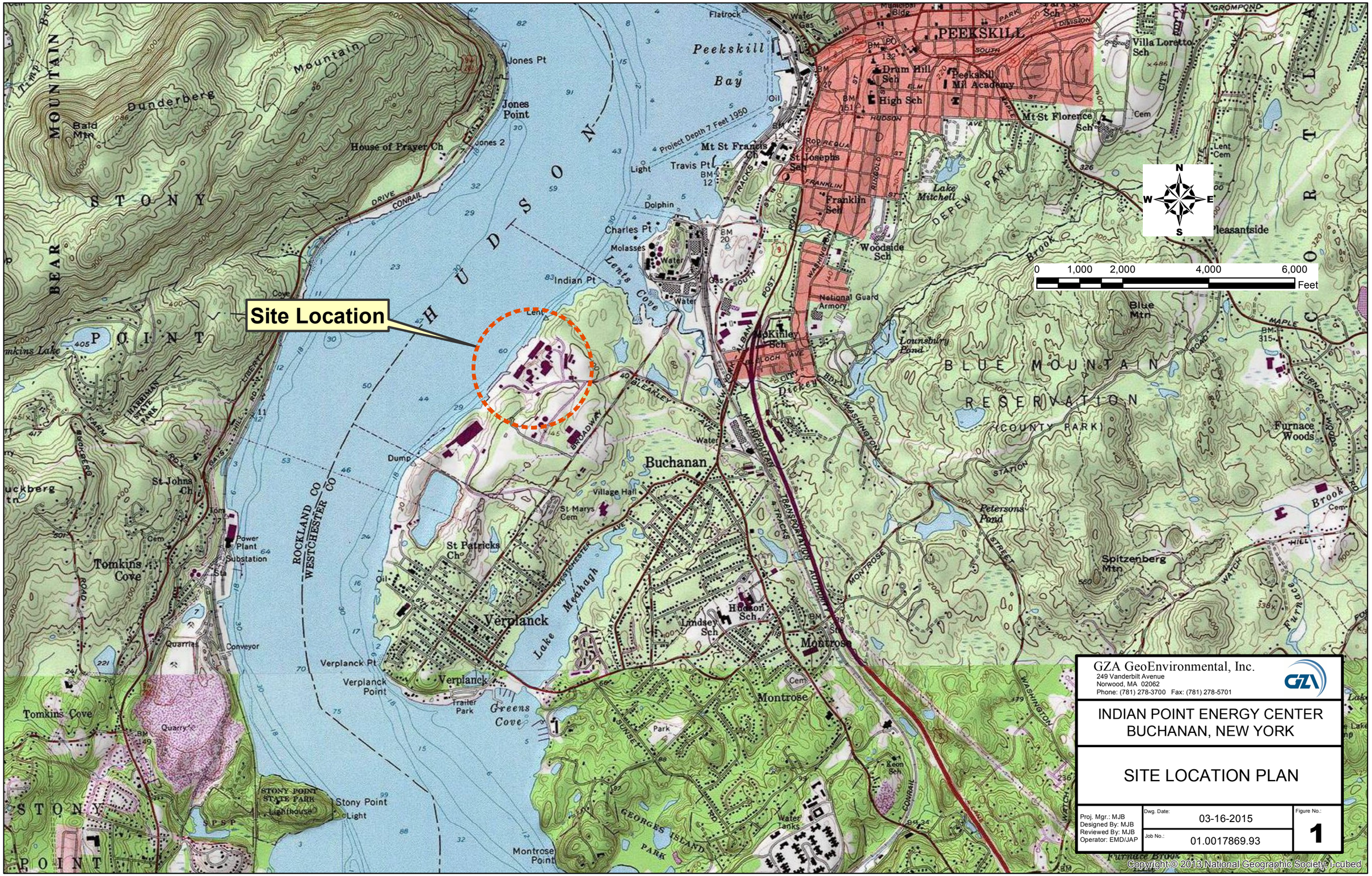
Memo To: File

From: Michael Wentzel

Subject: Figures from Indian Point Quarter 3 2014 Groundwater Monitoring Report

The following figures are from the 3rd quarter 2014 groundwater monitoring report for Indian Point (available at http://www.safesecurevital.com/uploads/15-3-20.pdf) and were made available to NRC staff by request as documented in an email from Dara Gray, Entergy, to Michael Wentzel, NRC, dated March 31, 2015. The files listed below, which were identified in the March 31, 2015 email, are not included because the NRC staff was unable to open the files:

FINAL Figure 4 - Q3 2014 Current and Potential Future SSC Source Locations.pdf
FINAL Figure 5A - Q3 2014 Longterm Transducer Monitoring Evaluation Map.pdf
FINAL Figure 5A - Q3 2014 Longterm Transducer Monitoring Evaluation M...LY].pdf



GZA GeoEnvironmental, Inc.
249 Vanderbilt Avenue
Norwood, MA 02062
Phone: (781) 278-3700 Fax: (781) 278-5701

INDIAN POINT ENERGY CENTER
BUCHANAN, NEW YORK

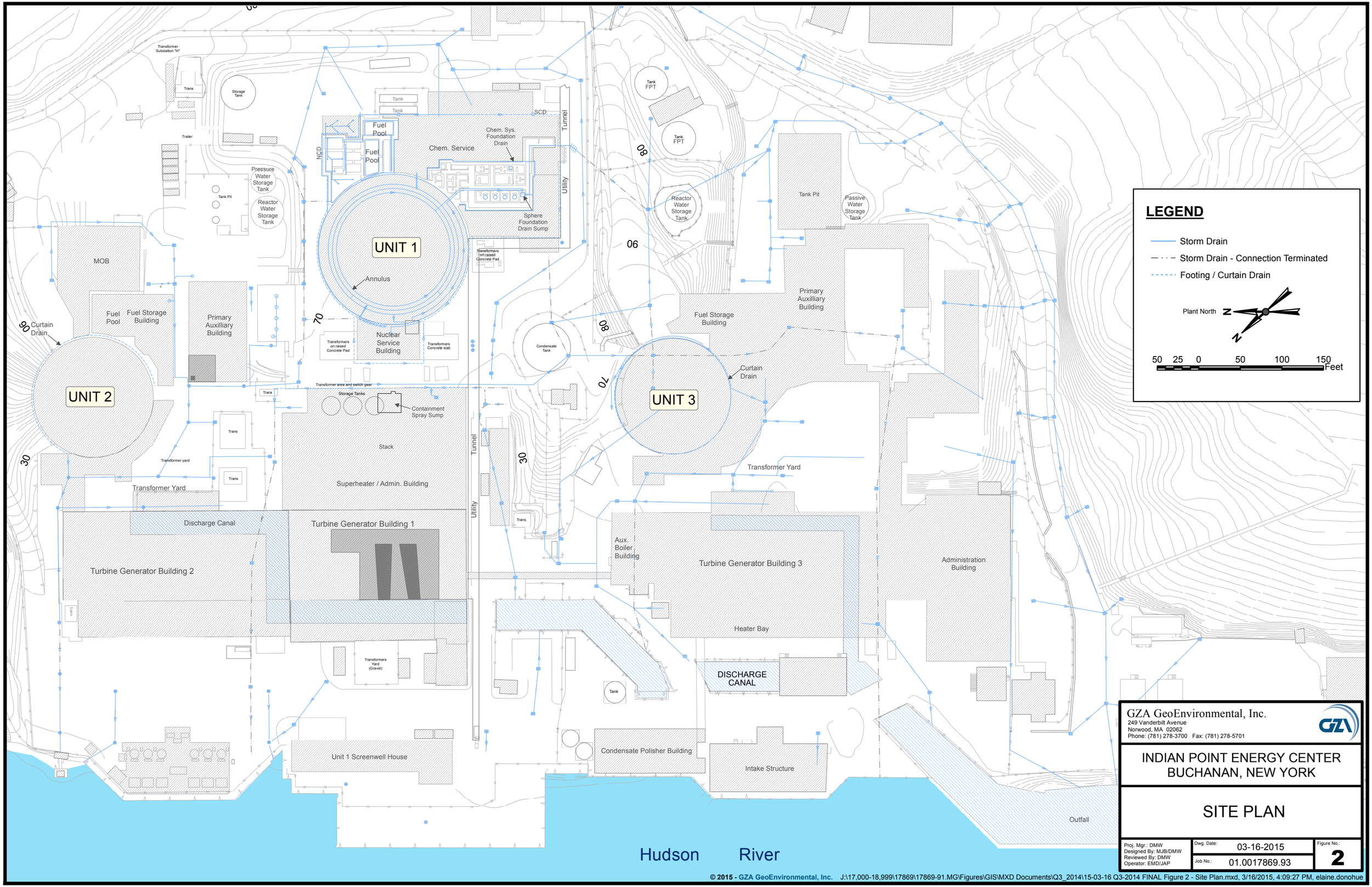
SITE LOCATION PLAN

Proj. Mgr.: MJB
Designed By: MJB
Reviewed By: MJB
Operator: EMD/JAP

Dwg. Date: 03-16-2015

Job No.: 01.0017869.93

Figure No.: 1



GZA GeoEnvironmental, Inc.
249 Vanderbilt Avenue
Norwood, MA 02062
Phone: (781) 278-3700 Fax: (781) 278-5701

INDIAN POINT ENERGY CENTER
BUCHANAN, NEW YORK

SITE PLAN

Proj. Mgr.: DMW Designed By: MJB/DMW Reviewed By: DMW Operator: EMD/JAP	Dwg. Date: 03-16-2015 Job No.: 01.0017869.93	Figure No.: 2

 J:\17,000-18,999\17869\17869-91.MG\Figures\GIS\MXD Documents\Q3_2014\15-03-16 Q3-2014 FINAL Figure 2 - Site Plan.mxd, 3/16/2015, 4:09:27 PM, elaine.donohue

IPEC

GEOLOGIC MAP OF NEW YORK, LOWER HUDSON SHEET, REPRINTED 1995, NEW YORK STATE MUSEUM AND SCIENCE SERVICE, MAP AND CHART SERIES NO. 15.

GZA GeoEnvironmental, Inc.
249 Vanderbilt Avenue
Norwood, MA 02062
Phone: (781) 278-3700 Fax: (781) 278-5701

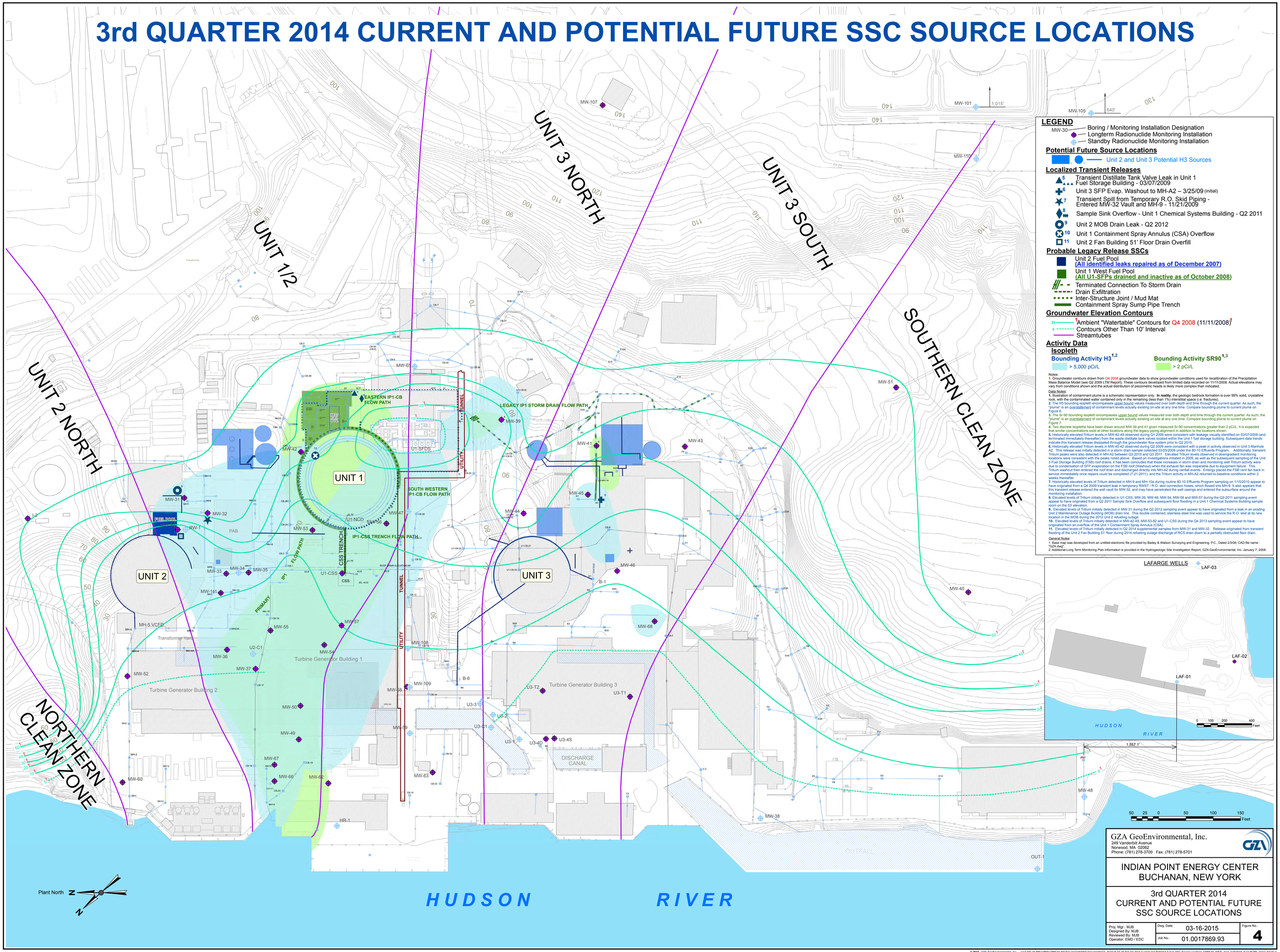
INDIAN POINT ENERGY CENTER
BUCHANAN, NEW YORK

LOWER HUDSON VALLEY GEOLOGIC MAP

Proj. Mgr.: DMW Designed By: SJC Reviewed By: DMW Operator: GAS/EMD	Dwg. Date: 3-16-2015 Job No.: 01.0017869.93	Figure No.: 3

GZA–J:\17,000–18,999\17869\17869–91.MG\Figures\CADD\3Q2014\15–03–16 FINAL Figure 3 – Q3–2014 Lower Hudson Valley Geologic Map.dwg [FIG–3] March 16, 2015 – 4:39pm elaine.donohue

3rd QUARTER 2014 CURRENT AND POTENTIAL FUTURE SSC SOURCE LOCATIONS



LEGEND

MW-30 — Boring / Monitoring Installation Designation
Longterm Radionuclide Monitoring Installation
Standby Radionuclide Monitoring Installation

Potential Future Source Locations

Unit 2 and Unit 3 Potential H3 Sources

Localized Transient Releases

5 Transient Distillate Tank Valve Leak in Unit 1 Fuel Storage Building - 03/07/2009
6 Unit 3 SFP Evap. Washout to MH-A2 – 3/25/09 (initial)
7 Transient Spill from Temporary R.O. Skid Piping - Entered MW-32 Vault and MH-9 - 11/21/2009
8 Sample Sink Overflow - Unit 1 Chemical Systems Building - Q2 2011
9 Unit 2 MOB Drain Leak - Q2 2012
10 Unit 1 Containment Spray Annulus (CSA) Overflow
11 Unit 2 Fan Building 51' Floor Drain Overfill

Probable Legacy Release SSCs

Unit 2 Fuel Pool
(All identified leaks repaired as of December 2007)
Unit 1 West Fuel Pool
(All U1-SFPs drained and inactive as of October 2008)
Terminated Connection To Storm Drain
Drain Exfiltration
Inter-Structure Joint / Mud Mat
Containment Spray Sump Pipe Trench

Groundwater Elevation Contours

20 [1] Ambient "Watertable" Contours for Q4 2008 (11/11/2008)[1]
5 Contours Other Than 10' Interval
Streamtubes

Activity Data

Isopleth

Bounding Activity H3[1,2]: > 5,000 pCi/L
Bounding Activity SR90[1,3]: > 2 pCi/L

Notes:
1. Groundwater contours drawn from Q4 2008 groundwater data to show groundwater conditions used for recalibration of the Precipitation Mass Balance Model (see Q2 2009 LTM Report). These contours developed from field data recorded on 11/11/2008. Actual elevations may vary from conditions shown and the actual distribution of piezometric heads is likely more complex than indicated.

Data Notes:
1. Illustration of contaminant plume is a schematic representation only. **In reality**, the geologic bedrock formation is over 99% solid, crystalline rock, with the contaminated water contained only in the remaining (less than 1%) interstitial space (i.e. fractures).
2. The H3 bounding isopleth encompasses upper bound values measured over both depth and time through the current quarter. As such, the "plume" is an overstatement of contaminant levels actually existing on-site at any one time. Compare bounding plume to current plume on Figure 6.
3. The Sr-90 bounding isopleth encompasses upper bound values measured over both depth and time through the current quarter. As such, the "plume" is an overstatement of contaminant levels actually existing on-site at any one time. Compare bounding plume to current plume on Figure 7.
4. Two discrete isopleths have been drawn around MW-39 and 41 given measured Sr-90 concentrations greater than 2 pCi/L. It is expected that similar concentrations exist at other locations along the legacy piping alignment in addition to the locations shown.
5. Historically elevated Tritium levels in MW-42-49 observed during Q1 2009 were consistent with leakage visually identified on 03/07/2009 (and terminated immediately thereafter) from the waste distillate tank valves located within the Unit 1 fuel storage building. Subsequent data trends indicate this transient release dissipated through the groundwater flow system prior to Q2 2010.
6. Historically elevated Tritium levels in MW-45-42 observed during Q2 2009 were consistent with a peak in activity observed in Unit 3 Manhole A2. This release was initially detected in a storm drain sample collected 03/25/2009 under the 80-10 Effluents Program. Additionally, transient Tritium peaks were also detected in MH-A2 between Q3 2010 and Q3 2011. Elevated Tritium levels observed in downgradient monitoring locations were consistent with the peaks noted above. Based on investigations initiated in 2009, as well as the subsequent sampling of the Unit 3 Fuel Storage Building (FSB) roof drains, it has been concluded that these increases in storm drain and monitoring well Tritium activity were due to condensation of SFP evaporation on the FSB roof (Washout) when the exhaust fan was inoperable due to equipment failure. This Tritium washout then entered the roof drain and discharged directly into MH-A2 during rainfall events. Entergy placed the FSB vent fan back in service immediately once repairs could be completed (7-21-2011), and the Tritium activity in MH-A2 returned to baseline conditions within 2 weeks thereafter.
7. Historically elevated levels of Tritium detected in MH-9 and MH-10a during routine 80-10 Effluents Program sampling on 1/15/2010 appear to have originated from a Q4 2009 transient leak in temporary RWST / R.O. skid connection hoses, which flowed into MH-9. It also appears that this transient release entered the well vault for MW-32, and may have penetrated the well casings and entered the subsurface around the monitoring installation.
8. Elevated levels of Tritium initially detected in U1-CSS, MW-39, MW-46, MW-54, MW-56 and MW-57 during the Q2-2011 sampling event appear to have originated from a Q2 2011 Sample Sink Overflow and subsequent floor flooding in a Unit 1 Chemical Systems Building sample room on the 53' elevation.
9. Elevated levels of Tritium initially detected in MW-31 during the Q2 2012 sampling event appear to have originated from a leak in an existing Unit 2 Maintenance Outage Building (MOB) drain line. This double contained, stainless steel line was used to service the R.O. skid at its new location in the MOB during the 2012 Unit 2 refueling outage.
10. Elevated levels of Tritium initially detected in MW-42-49, MW-53-82 and U1-CSS during the Q4 2013 sampling event appear to have originated from an overflow of the Unit 1 Containment Spray Annulus (CSA).
11. Elevated levels of Tritium initially detected in Q2 2014 supplemental samples from MW-31 and MW-32. Release originated from transient flooding of the Unit 2 Fan Building 51' floor during 2014 refueling outage discharge of RCS drain down to a partially obstructed floor drain.

General Notes:
1. Base map was developed from an untitled electronic file provided by Badey & Watson Surveying and Engineering, P.C., Dated 2/3/06; CAD file name : "GZA.dwg"
2. Additional Long Term Monitoring Plan information is provided in the Hydrogeologic Site Investigation Report, GZA GeoEnvironmental, Inc. January 7, 2008.

GZA GeoEnvironmental, Inc.
249 Vanderbilt Avenue
Norwood, MA 02062
Phone: (781) 278-3700 Fax: (781) 278-5701

INDIAN POINT ENERGY CENTER
BUCHANAN, NEW YORK

3rd QUARTER 2014
CURRENT AND POTENTIAL FUTURE
SSC SOURCE LOCATIONS

Proj. Mgr.: MJB
Designed By: MJB
Reviewed By: MJB
Operator: EMD / EDC

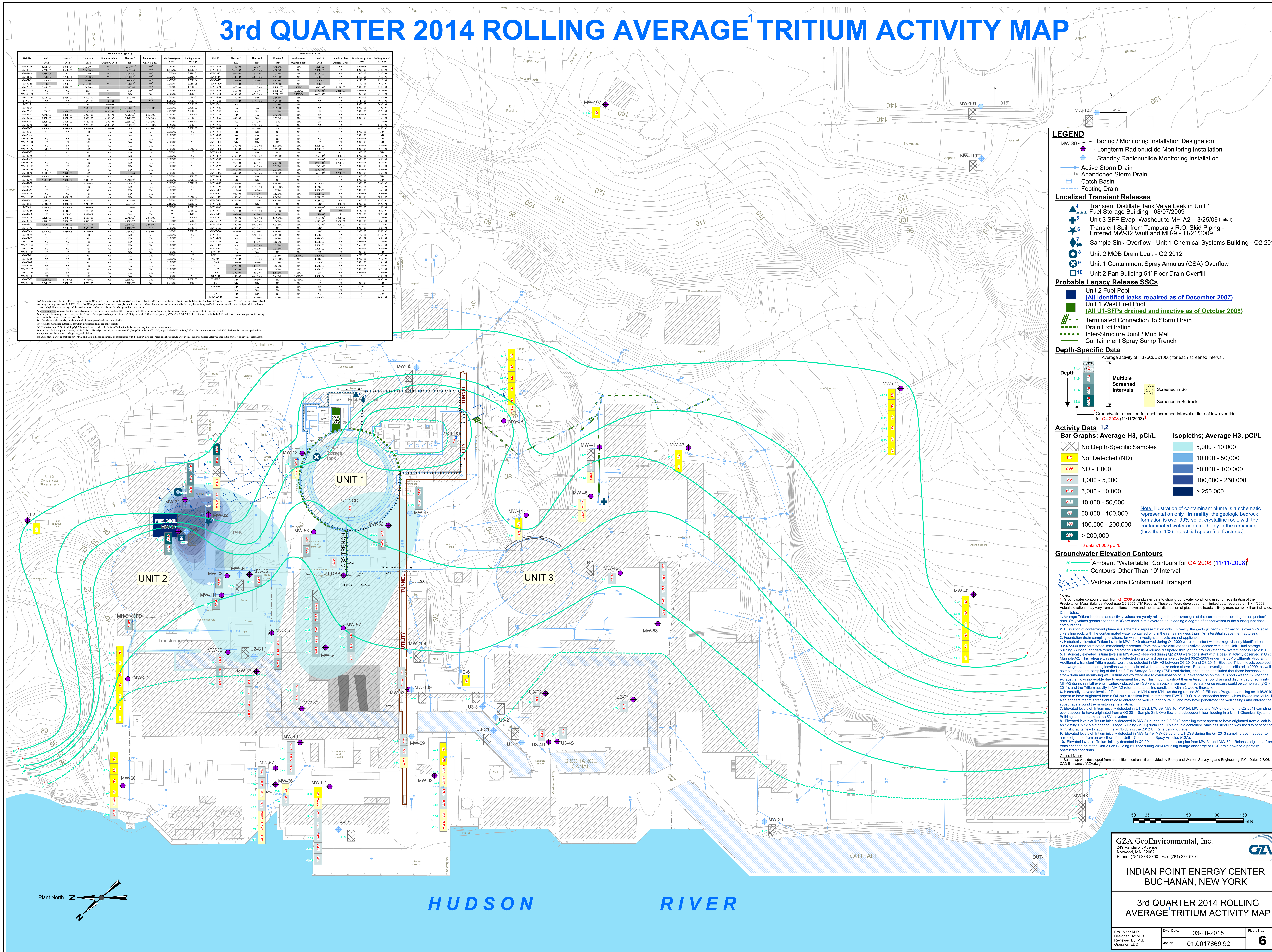
Dwg. Date: 03-16-2015
Job No.: 01.0017869.93
Figure No.: 4

3rd QUARTER 2014 ROLLING AVERAGE[1] TRITIUM ACTIVITY MAP

Well ID	Tritium Results (pCi/L) Quarter 4 2013	Quarter 1 2014	Quarter 2 2014	Supplementary Quarter 2 2014	Quarter 3 2014	Supplementary Quarter 3 2014	2014 Investigation Level	Rolling Annual Average
MW-30-69	5.46E+04	5.04E+04	1.13E+05[8]	***[8]	4.32E+05[7,8]	***[8]	1.29E+05	2.67E+05
MW-30-84	4.66E+03	4.69E+03	9.50E+03[8]	***[8]	1.47E+04	***[8]	8.57E+03	1.19E+04
MW-31-49	1.18E+04	ND	2.22E+03[8]	***[8]	2.23E+05[8]	***[8]	1.07E+04	8.49E+04
MW-31-63	3.32E+04	2.79E+04	1.22E+05[8]	***[8]	1.37E+05[8]	***[8]	3.32E+04	9.35E+04
MW-31-85	2.46E+03	1.19E+03	1.04E+04[8]	***[8]	4.38E+04[8]	***[8]	6.42E+03	2.59E+04
MW-32-59	2.03E+04	2.25E+03	2.15E+05[8]	***[8]	4.67E+05[8]	***[8]	1.00E+04	3.05E+05
MW-32-85	7.44E+03	8.49E+03	1.26E+04[8]	***[8]	1.76E+04	***[8]	1.58E+04	1.53E+04
MW-32-149	ND	ND	ND[8]	***[8]	ND	***[8]	2.00E+03	3.32E+02
MW-32-173	ND	ND	ND	***[8]	ND	NA	2.00E+03	3.40E+03
MW-32-190	1.22E+03	8.73E+02	7.21E+02	***[8]	5.56E+02	NA	2.26E+03	7.68E+02
MW-33	NA	NA	5.42E+03	1.54E+04	NA	***	6.98E+03	8.77E+03
MW-35	NA	NA	ND	1.60E+03	NA	***	2.00E+03	5.06E+03
MW-36-24	ND	ND	2.53E+03	3.70E+03	2.82E+03[8]	4.41E+03	2.00E+03	3.37E+03
MW-36-41	4.03E+03	4.82E+03	6.29E+03	5.40E+03	6.15E+03[8]	***	4.75E+03	6.19E+03
MW-36-52	4.44E+03	4.23E+03	5.00E+03	5.10E+03	4.82E+03[8]	5.13E+03	8.09E+03	4.79E+03
MW-37-22	1.15E+03	1.65E+03	3.60E+03	3.90E+03	3.14E+03[8]	3.84E+03	4.48E+03	2.88E+03
MW-37-32	1.53E+03	2.82E+03	3.68E+03	4.30E+03	3.86E+03[8]	4.07E+03	4.51E+03	3.38E+03
MW-37-40	3.24E+03	3.29E+03	2.77E+03	4.30E+03	3.63E+03[8]	3.95E+03	8.05E+03	3.53E+03
MW-37-57	3.30E+03	3.23E+03	3.00E+03	5.10E+03	4.00E+03[8]	4.18E+03	7.75E+03	3.80E+03
MW-39-67	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-84	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-102	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-124	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-183	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-195	9.04E+02	NA	ND	NA	NA	NA	2.00E+03	9.04E+02
MW-40-27	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-46	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-81	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-100	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-127	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-162	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-41-40	1.92E+03	3.54E+03	ND	NA	3.55E+03	NA	2.00E+03	3.00E+03
MW-41-63	6.12E+02	6.81E+02	ND	NA	ND	NA	2.00E+03	6.47E+02
MW-42-49	2.08E+03[3]	2.34E+04	7.84E+02	NA	5.96E+02[8]	NA	2.00E+03	6.72E+03
MW-42-78	ND	ND	6.29E+02	NA	6.74E+02[8]	NA	2.00E+03	6.52E+02
MW-43-28	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-43-62	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-44-66	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-44-102	6.46E+02	7.05E+02	ND	NA	ND	NA	2.00E+03	6.76E+02
MW-45-42	9.76E+02	5.91E+02	7.88E+02	NA	6.03E+02	NA	3.80E+03	7.40E+02
MW-45-61	4.01E+02	4.92E+02	5.74E+02	NA	6.44E+02	NA	2.16E+03	5.28E+02
MW-46	1.91E+03	1.77E+03	1.63E+03	NA	1.12E+03	NA	2.00E+03	1.61E+03
MW-47-56	NA	1.11E+03	1.48E+04	NA	NA	NA	**	7.96E+03
MW-47-80	NA	1.15E+04	7.37E+03	NA	NA	NA	**	9.44E+03
MW-49-26	3.12E+03	2.84E+03	2.60E+03	NA	2.64E+03[8]	2.57E+03	5.72E+03	2.75E+03
MW-49-42	4.21E+03	3.65E+03	3.69E+03	NA	4.10E+03[8]	3.97E+03	4.81E+03	3.92E+03
MW-49-65	4.30E+03	4.15E+03	3.53E+03	NA	3.84E+03[8]	3.86E+03	2.83E+03	3.94E+03
MW-50-42	ND	5.20E+02	3.67E+03	NA	2.11E+03[8]	***	2.00E+03	2.63E+03
MW-50-66	3.54E+03	4.08E+03	3.79E+03	NA	4.23E+03[8]	4.29E+03	5.66E+03	3.99E+03
MW-51-40	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-79	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-104	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-135	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-163	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-189	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-52-11	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-18	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-48	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-64	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-122	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-162	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-181	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-53-82	2.26E+03	1.14E+03	7.19E+02	NA	9.61E+02[8]	NA	2.00E+03	1.27E+03
MW-53-120	5.54E+03	5.85E+03	4.77E+03	NA	5.21E+03[8]	NA	8.24E+03	5.34E+03

Well ID	Tritium Results (pCi/L) Quarter 4 2013	Quarter 1 2014	Quarter 2 2014	Supplementary Quarter 2 2014	Quarter 3 2014	Supplementary Quarter 3 2014	2014 Investigation Level	Rolling Annual Average
MW-54-37	5.84E+03	4.33E+03	4.45E+03	NA	4.32E+03	NA	2.00E+03	4.74E+03
MW-54-58	7.01E+03	6.71E+03	6.98E+03	NA	6.43E+03	NA	2.00E+03	6.78E+03
MW-54-123	6.96E+03	7.53E+03	7.31E+03	NA	6.90E+03	NA	2.00E+03	7.18E+03
MW-54-144	5.18E+03	6.01E+03	5.55E+03	NA	5.90E+03	NA	2.41E+03	5.66E+03
MW-54-173	5.25E+03	5.79E+03	4.97E+03	NA	5.24E+03	NA	3.29E+03	5.31E+03
MW-54-190	4.31E+03	5.11E+03	5.19E+03	NA	5.49E+03	NA	3.39E+03	5.03E+03
MW-55-24	1.07E+03	1.13E+03	1.46E+03[8]	6.10E+03	1.68E+03[8]	1.29E+03	2.00E+03	2.12E+03
MW-55-35	1.26E+03	1.42E+03	1.80E+03[8]	1.80E+03	2.49E+03[8]	2.84E+03	2.62E+03	1.93E+03
MW-55-54	4.90E+03	4.21E+03	5.66E+03[8]	1.17E+04	6.42E+03[8]	***	1.05E+04	6.74E+03
MW-56-53	1.16E+03	ND	3.50E+03	NA	NA	NA	2.00E+03	2.33E+03
MW-56-83	3.51E+03	8.17E+03	9.42E+03	NA	NA	NA	3.34E+03	7.03E+03
MW-57-11	NA	NA	7.08E+03	NA	NA	NA	5.45E+03	7.08E+03
MW-57-20	NA	NA	5.19E+03	NA	NA	NA	2.00E+03	5.19E+03
MW-57-45	NA	NA	4.77E+03	NA	NA	NA	2.00E+03	4.77E+03
MW-58-26	ND	NA	3.42E+03	NA	NA	NA	2.00E+03	3.42E+03
MW-58-65	1.04E+03	NA	1.27E+03	NA	NA	NA	2.00E+03	1.16E+03
MW-59-32	NA	2.71E+03	NA	NA	NA	NA	**	2.71E+03
MW-59-45	NA	2.78E+03	NA	NA	NA	NA	**	2.78E+03
MW-59-68	NA	9.85E+02	NA	NA	NA	NA	**	9.85E+02
MW-60-35	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-60-53	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-60-72	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-60-135	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-60-154	4.27E+02	5.12E+02	5.07E+02	NA	5.32E+02	NA	2.00E+03	4.95E+02
MW-60-176	1.19E+03	7.64E+02	1.09E+03	NA	1.23E+03	NA	2.00E+03	1.07E+03
MW-62-18	ND	ND	ND	NA	ND[8]	ND	2.00E+03	ND
MW-62-37	6.15E+02	7.58E+02	1.02E+03	NA	1.36E+03[8]	6.00E+02	2.00E+03	8.71E+02
MW-62-53	9.84E+02	9.38E+02	1.11E+03	NA	1.10E+03[8]	1.10E+03	2.00E+03	1.05E+03
MW-62-71	1.95E+03	1.65E+03	2.03E+03	NA	2.03E+03[8]	1.90E+03	2.00E+03	1.91E+03
MW-62-92	1.99E+03	1.61E+03	2.25E+03	NA	1.73E+03[8]	***	2.00E+03	1.83E+03
MW-62-138	2.93E+03	2.71E+03	3.31E+03	NA	2.50E+03[8]	***	2.00E+03	2.46E+03
MW-62-182	1.65E+03	1.16E+03	1.38E+03	NA	1.41E+03[8]	2.70E+03	2.00E+03	1.66E+03
MW-63-18	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-63-34	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-63-50	5.23E+02	7.33E+02	6.89E+02	NA	1.07E+03	NA	2.00E+03	7.54E+02
MW-63-93	6.73E+02	7.37E+02	6.93E+02	NA	1.04E+03	NA	2.00E+03	7.86E+02
MW-63-112	1.52E+03	1.50E+03	1.37E+03	NA	1.75E+03	NA	2.00E+03	1.54E+03
MW-63-121	1.98E+03	2.17E+03	1.83E+03	NA	2.36E+03	NA	2.00E+03	2.09E+03
MW-63-163	8.85E+02	1.23E+03	8.36E+02	NA	9.69E+02	NA	2.00E+03	9.80E+02
MW-63-174	9.86E+02	1.18E+03	6.87E+02	NA	1.08E+03	NA	2.00E+03	9.83E+02
MW-66-21	ND	ND	ND	NA	ND[8]	8.00E+02	2.00E+03	8.00E+02
MW-66-36	1.16E+03	1.12E+03	1.35E+03	NA	9.15E+02[8]	1.20E+03	3.72E+03	1.15E+03
MW-67-39	1.21E+03	7.43E+02	1.24E+03	NA	ND[8]	***	2.34E+03	1.92E+03
MW-67-105	3.00E+03	2.95E+03	3.40E+03	NA	2.76E+03[8]	***	2.70E+03	2.87E+03
MW-67-173	6.40E+02	8.92E+02	8.79E+02	NA	5.81E+02[8]	8.00E+02	2.00E+03	7.58E+02
MW-67-219	1.14E+03	1.16E+03	1.26E+03	NA	8.55E+02[8]	9.00E+02	2.00E+03	1.06E+03
MW-67-276	8.60E+02	9.02E+02	8.97E+02	NA	8.47E+02[8]	9.00E+02	2.00E+03	8.81E+02
MW-67-323	4.28E+02	4.15E+02	ND	NA	ND[8]	ND	2.00E+03	4.22E+02
MW-67-340	4.08E+02	6.31E+02	6.86E+02	NA	ND[8]	ND	2.00E+03	5.75E+02
MW-68-19	NA	2.98E+03	2.67E+03	NA	1.72E+03	NA	6.19E+03	2.46E+03
MW-68-29	NA	1.78E+03	1.89E+03	NA	1.38E+03	NA	1.40E+04	1.68E+03
MW-68-57	NA	1.57E+03	1.85E+03	NA	1.93E+03	NA	7.02E+03	1.78E+03
MW-68-103	NA	3.02E+03	2.73E+03	NA	2.15E+03	NA	2.66E+03	2.63E+03
MW-68-132	NA	2.46E+03	2.97E+03	NA	2.52E+03	NA	2.92E+03	2.65E+03
MW-107	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-111	2.87E+03	NA	2.38E+03	5.80E+03	6.87E+03	***	3.77E+03	7.54E+03
U3-4D	1.37E+03	1.14E+03	6.91E+02	NA	1.01E+03	NA	2.00E+03	1.05E+03
U3-4S	1.80E+03	8.30E+02	1.12E+03	NA	6.64E+02	NA	2.00E+03	1.10E+03
U3-T1	2.99E+03	2.84E+03	1.55E+03	NA	1.26E+03	NA	2.00E+03	2.16E+03
U3-T2	2.29E+03	1.44E+03	1.24E+03	NA	1.78E+03	NA	2.08E+03	1.69E+03
U1-CSS	5.20E+03	1.85E+03	5.81E+03	NA	NA	NA	3.09E+03	4.29E+03
U1-NCD	3.25E+03	4.63E+03	3.41E+03	5.41E+03	1.49E+04	NA	*	6.32E+03
U1-SFDS	ND	7.80E+03	ND	9.94E+02	ND	NA	*	4.40E+03
I-2	ND	ND	ND	NA	ND	NA	1.00E+03	ND
LAF-002	ND	NA	ND	NA	NA	NA	positive	ND
B-1	NA	NA	NA	NA	NA	NA	*	NA
B-6	ND	ND	ND	NA	ND	NA	*	ND
MH-5 VCFD	ND	5.62E+03	5.31E+03	NA	5.26E+03	NA	*	5.40E+03

Notes:
1) Only results greater than the MDC are reported herein. ND therefore indicates that the analytical result was below the MDC and typically also below the standard deviation threshold of three times 1 sigma. The rolling average is calculated using only results greater than the MDC. Given that ND represents real groundwater sampling results where the radionuclide activity level is either positive but very low and unquantifiable, or not detectable above background, its exclusion results in a high bias to the average and thus adds a measure of conservatism to the subsequent dose computations.
2) A shaded value indicates that the reported activity exceeds the Investigation Level (I.L.) that was applicable at the time of sampling. NA indicates that data is not available for this time period.
3) An aliquot of this sample was re-analyzed for Tritium. The original and aliquot results were 2,180 pCi/L and 1,980 pCi/L, respectively (MW-42-49; Q4 2013). In conformance with the LTMP, both results were averaged and the average was used in the annual rolling average calculations.
4) * Foundation drain sampling locations, for which investigation levels are not applicable.
5) ** Standby monitoring installation, for which investigation levels are not applicable.
6) *** Multiple Sup-Q2 2014 and Sup-Q3 2014 samples were collected. Refer to Table 4 for the laboratory analytical results of these samples.
7) An aliquot of this sample was re-analyzed for Trtium. The original and aliquot results were 434,000 pCi/L and 418,000 pCi/L, respectively (MW-30-69; Q3 2014). In conformance with the LTMP, both results were averaged and the average was used in the annual rolling average calculations.
8) Sample aliquots were re-analyzed for Tritium at IPEC's in-house laboratory. In conformance with the LTMP, both the original and aliquot results were averaged and the average value was used in the annual rolling average calculations.



LEGEND
MW-30 Boring / Monitoring Installation Designation
Longterm Radionuclide Monitoring Installation
Standby Radionuclide Monitoring Installation
Active Storm Drain
Abandoned Storm Drain
Catch Basin
Footing Drain
Localized Transient Releases
4 Transient Distillate Tank Valve Leak in Unit 1 Fuel Storage Building - 03/07/2009
5 Unit 3 SFP Evap. Washout to MH-A2 – 3/25/09 (initial)
6 Transient Spill from Temporary R.O. Skid Piping - Entered MW-32 Vault and MH-9 - 11/21/2009
7 Sample Sink Overflow - Unit 1 Chemical Systems Building - Q2 2011
8 Unit 2 MOB Drain Leak - Q2 2012
9 Unit 1 Containment Spray Annulus (CSA) Overflow
10 Unit 2 Fan Building 51' Floor Drain Overfill
Probable Legacy Release SSCs
Unit 2 Fuel Pool
(All identified leaks repaired as of December 2007)
Unit 1 West Fuel Pool
(All U1-SFPs drained and inactive as of October 2008)
Terminated Connection To Storm Drain
Drain Exfiltration
Inter-Structure Joint / Mud Mat
Containment Spray Sump Trench
Depth-Specific Data
Average activity of H3 (pCi/L x1000) for each screened Interval.
Depth
Multiple Screened Intervals
Screened in Soil
Screened in Bedrock
Groundwater elevation for each screened interval at time of low river tide for Q4 2008 (11/11/2008)1
Activity Data 1,2
Bar Graphs; Average H3, pCi/L
No Depth-Specific Samples
Not Detected (ND)
ND - 1,000
1,000 - 5,000
5,000 - 10,000
10,000 - 50,000
50,000 - 100,000
100,000 - 200,000
> 200,000
H3 data x1,000 pCi/L
Isopleths; Average H3, pCi/L
5,000 - 10,000
10,000 - 50,000
50,000 - 100,000
100,000 - 250,000
> 250,000
Note: Illustration of contaminant plume is a schematic representation only. In reality, the geologic bedrock formation is over 99% solid, crystalline rock, with the contaminated water contained in the remaining (less than 1%) interstitial space (i.e. fractures).
Groundwater Elevation Contours
1 Ambient "Watertable" Contours for Q4 2008 (11/11/2008)1
Contours Other Than 10' Interval
Vadose Zone Contaminant Transport
UNIT 1
UNIT 2
UNIT 3
U1-NCD
U1-SFDS
U1-CSS
CSS TRENCH
TUNNEL
UTILITY
PAB
FUEL POOL
Water Storage Tank
Transformer Yard
DISCHARGE CANAL
OUTFALL
HUDSON RIVER
Plant North
MW-30
MW-31
MW-32
MW-33
MW-34
MW-35
MW-36
MW-37
MW-38
MW-39
MW-40
MW-41
MW-42
MW-43
MW-44
MW-45
MW-46
MW-47
MW-48
MW-49
MW-50
MW-51
MW-52
MW-53
MW-54
MW-55
MW-57
MW-58
MW-59
MW-60
MW-62
MW-63
MW-65
MW-66
MW-67
MW-68
MW-101
MW-105
MW-107
MW-108
MW-109
MW-110
MW-111
MH-5 VCFD
I-2
B-1
B-6
U2-C1
U3-C1
U3-1
U3-2
U3-3
U3-4D
U3-4S
U3-T1
U3-T2
HR-1
OUT-1
50 25 0 50 100 150 Feet

Notes:
1. Groundwater contours drawn from Q4 2008 groundwater data to show groundwater conditions used for recalibration of the Precipitation Mass Balance Model (see Q2 2009 LTM Report). These contours developed from limited data recorded on 11/11/2008. Actual elevations may vary from conditions shown and the actual distribution of piezometric heads is likely more complex than indicated.

Data Notes:
1. Average Tritium isopleths and activity values are yearly rolling arithmetic averages of the current and preceding three quarters' data. Only values greater than the MDC are used in this average, thus adding a degree of conservatism to the subsequent dose computations.
2. Illustration of contaminant plume is a schematic representation only. In reality, the geologic bedrock formation is over 99% solid, crystalline rock, with the contaminated water contained only in the remaining (less than 1%) interstitial space (i.e. fractures).
3. Foundation drain sampling locations, for which investigation levels are not applicable.
4. Historically elevated Tritium levels in MW-42-49 observed during Q1 2009 were consistent with leakage visually identified on 03/07/2009 (and terminated immediately thereafter) from the waste distillate tank valves located within the Unit 1 fuel storage building. Subsequent data trends indicate this transient release dissipated through the groundwater flow system prior to Q2 2010.
5. Historically elevated Tritium levels in MW-45-42 observed during Q2 2009 were consistent with a peak in activity observed in Unit 3 Manhole A2. This release was initially detected in a storm drain sample collected 03/25/2009 under the 80-10 Effluents Program. Additionally, transient Tritium peaks were also detected in MH-A2 between Q3 2010 and Q3 2011. Elevated Tritium levels observed in downgradient monitoring locations were consistent with the peaks noted above. Based on investigations initiated in 2009, as well as the subsequent sampling of the Unit 3 Fuel Storage Building (FSB) roof drains, it has been concluded that these increases in storm drain and monitoring well Tritium activity were due to condensation of SFP evaporation on the FSB roof (Washout) when the exhaust fan was inoperable due to equipment failure. This Tritium washout then entered the roof drain and discharged directly into MH-A2 during rainfall events. Entergy placed the FSB vent fan back in service immediately once repairs could be completed (7-21-2011), and the Tritium activity in MH-A2 returned to baseline conditions within 2 weeks thereafter.
6. Historcally elevated levels of Tritium detected in MH-9 and MH-10a during routine 80-10 Effluents Program sampling on 1/15/2010 appear to have originated from a Q4 2009 transient leak in temporary RWST / R.O. skid connection hoses, which flowed into MH-9. It also appears that this transient release entered the well vault for MW-32, and may have penetrated the well casings and entered the subsurface around the monitoring installation.
7. Elevated levels of Tritium initially detected in U1-CSS, MW-39, MW-46, MW-54, MW-56 and MW-57 during the Q2-2011 sampling event appear to have originated from a Q2 2011 Sample Sink Overflow and subsequent floor flooding in a Unit 1 Chemical Systems Building sample room on the 53' elevation.
8. Elevated levels of Tritium initially detected in MW-31 during the Q2 2012 sampling event appear to have originated from a leak in an existing Unit 2 Maintenance Outage Building (MOB) drain line. This double contained, stainless steel line was used to service the R.O. skid at its new location in the MOB during the 2012 Unit 2 refueling outage.
9. Elevated levels of Tritium initially detected in MW-42-49, MW-53-82 and U1-CSS during the Q4 2013 sampling event appear to have originated from an overflow of the Unit 1 Containment Spray Annulus (CSA).
10. Elevated levels of Tritium initially detected in Q2 2014 supplemental samples from MW-31 and MW-32. Release originated from transient flooding of the Unit 2 Fan Building 51' floor during 2014 refueling outage discharge of RCS drain down to a partially obstructed floor drain.

General Notes:
1. Base map was developed from an untitled electronic file provided by Badey and Watson Surveying and Engineering, P.C., Dated 2/3/06; CAD file name : "GZA.dwg".

GZA GeoEnvironmental, Inc.
249 Vanderbilt Avenue
Norwood, MA 02062
Phone: (781) 278-3700 Fax: (781) 278-5701

INDIAN POINT ENERGY CENTER
BUCHANAN, NEW YORK

3rd QUARTER 2014 ROLLING AVERAGE[1] TRITIUM ACTIVITY MAP

Proj. Mgr.: MJB Designed By: MJB Reviewed By: MJB Operator: EDC	Dwg. Date: 03-20-2015	Job No.: 01.0017869.92	Figure No.: 6

3rd QUARTER 2014 ROLLING AVERAGE[1] TRITIUM ACTIVITY MAP

Well ID	Tritium Results (pCi/L) Quarter 4 2013	Quarter 1 2014	Quarter 2 2014	Supplementary Quarter 2 2014	Quarter 3 2014	Supplementary Quarter 3 2014	2014 Investigation Level	Rolling Annual Average
MW-30-69	5.46E+04	5.04E+04	1.13E+05[8]	***[8]	4.32E+05[7,8]	***[8]	1.29E+05	2.67E+05
MW-30-84	4.66E+03	4.69E+03	9.50E+03[8]	***[8]	1.47E+04	***[8]	8.57E+03	1.19E+04
MW-31-49	1.18E+04	ND	2.22E+03[8]	***[8]	2.23E+05[8]	***[8]	1.07E+04	8.49E+04
MW-31-63	3.32E+04	2.79E+04	1.22E+05[8]	***[8]	1.37E+05[8]	***[8]	3.32E+04	9.35E+04
MW-31-85	2.46E+03	1.19E+03	1.04E+04[8]	***[8]	4.38E+04[8]	***[8]	6.42E+03	2.59E+04
MW-32-59	2.03E+04	2.25E+03	2.15E+05[8]	***[8]	4.67E+05[8]	***[8]	1.00E+04	3.05E+05
MW-32-85	7.44E+03	8.49E+03	1.26E+04[8]	***[8]	1.76E+04	***[8]	1.58E+04	1.53E+04
MW-32-149	ND	ND	ND[8]	***[8]	ND	***[8]	2.00E+03	3.32E+02
MW-32-173	ND	ND	ND	***[8]	ND	NA	2.00E+03	3.40E+03
MW-32-190	1.22E+03	8.73E+02	7.21E+02	***[8]	5.56E+02	NA	2.26E+03	7.68E+02
MW-33	NA	NA	5.42E+03	1.54E+04	NA	***	6.98E+03	8.77E+03
MW-35	NA	NA	ND	1.60E+03	NA	***	2.00E+03	5.06E+03
MW-36-24	ND	ND	2.53E+03	3.70E+03	2.82E+03[8]	4.41E+03	2.00E+03	3.37E+03
MW-36-41	4.03E+03	4.82E+03	6.29E+03	5.40E+03	6.15E+03[8]	***	4.75E+03	6.19E+03
MW-36-52	4.44E+03	4.23E+03	5.00E+03	5.10E+03	4.82E+03[8]	5.13E+03	8.09E+03	4.79E+03
MW-37-22	1.15E+03	1.65E+03	3.60E+03	3.90E+03	3.14E+03[8]	3.84E+03	4.48E+03	2.88E+03
MW-37-32	1.53E+03	2.82E+03	3.68E+03	4.30E+03	3.86E+03[8]	4.07E+03	4.51E+03	3.38E+03
MW-37-40	3.24E+03	3.29E+03	2.77E+03	4.30E+03	3.63E+03[8]	3.95E+03	8.05E+03	3.53E+03
MW-37-57	3.30E+03	3.23E+03	3.00E+03	5.10E+03	4.00E+03[8]	4.18E+03	7.75E+03	3.80E+03
MW-39-67	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-84	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-102	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-124	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-183	ND	NA	ND	NA	NA	NA	2.00E+03	ND
MW-39-195	9.04E+02	NA	ND	NA	NA	NA	2.00E+03	9.04E+02
MW-40-27	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-46	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-81	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-100	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-127	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-40-162	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-41-40	1.92E+03	3.54E+03	ND	NA	3.55E+03	NA	2.00E+03	3.00E+03
MW-41-63	6.12E+02	6.81E+02	ND	NA	ND	NA	2.00E+03	6.47E+02
MW-42-49	2.08E+03[3]	2.34E+04	7.84E+02	NA	5.96E+02[8]	NA	2.00E+03	6.72E+03
MW-42-78	ND	ND	6.29E+02	NA	6.74E+02[8]	NA	2.00E+03	6.52E+02
MW-43-28	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-43-62	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-44-66	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-44-102	6.46E+02	7.05E+02	ND	NA	ND	NA	2.00E+03	6.76E+02
MW-45-42	9.76E+02	5.91E+02	7.88E+02	NA	6.03E+02	NA	3.80E+03	7.40E+02
MW-45-61	4.01E+02	4.92E+02	5.74E+02	NA	6.44E+02	NA	2.16E+03	5.28E+02
MW-46	1.91E+03	1.77E+03	1.63E+03	NA	1.12E+03	NA	2.00E+03	1.61E+03
MW-47-56	NA	1.11E+03	1.48E+04	NA	NA	NA	**	7.96E+03
MW-47-80	NA	1.15E+04	7.37E+03	NA	NA	NA	**	9.44E+03
MW-49-26	3.12E+03	2.84E+03	2.60E+03	NA	2.64E+03[8]	2.57E+03	5.72E+03	2.75E+03
MW-49-42	4.21E+03	3.65E+03	3.69E+03	NA	4.10E+03[8]	3.97E+03	4.81E+03	3.92E+03
MW-49-65	4.30E+03	4.15E+03	3.53E+03	NA	3.84E+03[8]	3.86E+03	2.83E+03	3.94E+03
MW-50-42	ND	5.20E+02	3.67E+03	NA	2.11E+03[8]	***	2.00E+03	2.63E+03
MW-50-66	3.54E+03	4.08E+03	3.79E+03	NA	4.23E+03[8]	4.29E+03	5.66E+03	3.99E+03
MW-51-40	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-79	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-104	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-135	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-163	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-51-189	ND	ND	ND	NA	ND	NA	1.00E+03	ND
MW-52-11	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-18	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-48	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-64	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-122	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-162	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-52-181	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-53-82	2.26E+03	1.14E+03	7.19E+02	NA	9.61E+02[8]	NA	2.00E+03	1.27E+03
MW-53-120	5.54E+03	5.85E+03	4.77E+03	NA	5.21E+03[8]	NA	8.24E+03	5.34E+03

Well ID	Tritium Results (pCi/L) Quarter 4 2013	Quarter 1 2014	Quarter 2 2014	Supplementary Quarter 2 2014	Quarter 3 2014	Supplementary Quarter 3 2014	2014 Investigation Level	Rolling Annual Average
MW-54-37	5.84E+03	4.33E+03	4.45E+03	NA	4.32E+03	NA	2.00E+03	4.74E+03
MW-54-58	7.01E+03	6.71E+03	6.98E+03	NA	6.43E+03	NA	2.00E+03	6.78E+03
MW-54-123	6.96E+03	7.53E+03	7.31E+03	NA	6.90E+03	NA	2.00E+03	7.18E+03
MW-54-144	5.18E+03	6.01E+03	5.55E+03	NA	5.90E+03	NA	2.41E+03	5.66E+03
MW-54-173	5.25E+03	5.79E+03	4.97E+03	NA	5.24E+03	NA	3.29E+03	5.31E+03
MW-54-190	4.31E+03	5.11E+03	5.19E+03	NA	5.49E+03	NA	3.39E+03	5.03E+03
MW-55-24	1.07E+03	1.13E+03	1.46E+03[8]	6.10E+03	1.68E+03[8]	1.29E+03	2.00E+03	2.12E+03
MW-55-35	1.26E+03	1.42E+03	1.80E+03[8]	1.80E+03	2.49E+03[8]	2.84E+03	2.62E+03	1.93E+03
MW-55-54	4.90E+03	4.21E+03	5.66E+03[8]	1.17E+04	6.42E+03[8]	***	1.05E+04	6.74E+03
MW-56-53	1.16E+03	ND	3.50E+03	NA	NA	NA	2.00E+03	2.33E+03
MW-56-83	3.51E+03	8.17E+03	9.42E+03	NA	NA	NA	3.34E+03	7.03E+03
MW-57-11	NA	NA	7.08E+03	NA	NA	NA	5.45E+03	7.08E+03
MW-57-20	NA	NA	5.19E+03	NA	NA	NA	2.00E+03	5.19E+03
MW-57-45	NA	NA	4.77E+03	NA	NA	NA	2.00E+03	4.77E+03
MW-58-26	ND	NA	3.42E+03	NA	NA	NA	2.00E+03	3.42E+03
MW-58-65	1.04E+03	NA	1.27E+03	NA	NA	NA	2.00E+03	1.16E+03
MW-59-32	NA	2.71E+03	NA	NA	NA	NA	**	2.71E+03
MW-59-45	NA	2.78E+03	NA	NA	NA	NA	**	2.78E+03
MW-59-68	NA	9.85E+02	NA	NA	NA	NA	**	9.85E+02
MW-60-35	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-60-53	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-60-72	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-60-135	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-60-154	4.27E+02	5.12E+02	5.07E+02	NA	5.32E+02	NA	2.00E+03	4.95E+02
MW-60-176	1.19E+03	7.64E+02	1.09E+03	NA	1.23E+03	NA	2.00E+03	1.07E+03
MW-62-18	ND	ND	ND	NA	ND[8]	ND	2.00E+03	ND
MW-62-37	6.15E+02	7.58E+02	1.02E+03	NA	1.36E+03[8]	6.00E+02	2.00E+03	8.71E+02
MW-62-53	9.84E+02	9.38E+02	1.11E+03	NA	1.10E+03[8]	1.10E+03	2.00E+03	1.05E+03
MW-62-71	1.95E+03	1.65E+03	2.03E+03	NA	2.03E+03[8]	1.90E+03	2.00E+03	1.91E+03
MW-62-92	1.99E+03	1.61E+03	2.25E+03	NA	1.73E+03[8]	***	2.00E+03	1.83E+03
MW-62-138	2.93E+03	2.71E+03	3.31E+03	NA	2.50E+03[8]	***	2.00E+03	2.46E+03
MW-62-182	1.65E+03	1.16E+03	1.38E+03	NA	1.41E+03[8]	2.70E+03	2.00E+03	1.66E+03
MW-63-18	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-63-34	ND	ND	ND	NA	ND	NA	2.00E+03	ND
MW-63-50	5.23E+02	7.33E+02	6.89E+02	NA	1.07E+03	NA	2.00E+03	7.54E+02
MW-63-93	6.73E+02	7.37E+02	6.93E+02	NA	1.04E+03	NA	2.00E+03	7.86E+02
MW-63-112	1.52E+03	1.50E+03	1.37E+03	NA	1.75E+03	NA	2.00E+03	1.54E+03
MW-63-121	1.98E+03	2.17E+03	1.83E+03	NA	2.36E+03	NA	2.00E+03	2.09E+03
MW-63-163	8.85E+02	1.23E+03	8.36E+02	NA	9.69E+02	NA	2.00E+03	9.80E+02
MW-63-174	9.86E+02	1.18E+03	6.87E+02	NA	1.08E+03	NA	2.00E+03	9.83E+02
MW-66-21	ND	ND	ND	NA	ND[8]	8.00E+02	2.00E+03	8.00E+02
MW-66-36	1.16E+03	1.12E+03	1.35E+03	NA	9.15E+02[8]	1.20E+03	3.72E+03	1.15E+03
MW-67-39	1.21E+03	7.43E+02	1.24E+03	NA	ND[8]	***	2.34E+03	1.92E+03
MW-67-105	3.00E+03	2.95E+03	3.40E+03	NA	2.76E+03[8]	***	2.70E+03	2.87E+03
MW-67-173	6.40E+02	8.92E+02	8.79E+02	NA	5.81E+02[8]	8.00E+02	2.00E+03	7.58E+02
MW-67-219	1.14E+03	1.16E+03	1.26E+03	NA	8.55E+02[8]	9.00E+02	2.00E+03	1.06E+03
MW-67-276	8.60E+02	9.02E+02	8.97E+02	NA	8.47E+02[8]	9.00E+02	2.00E+03	8.81E+02
MW-67-323	4.28E+02	4.15E+02	ND	NA	ND[8]	ND	2.00E+03	4.22E+02
MW-67-340	4.08E+02	6.31E+02	6.86E+02	NA	ND[8]	ND	2.00E+03	5.75E+02
MW-68-19	NA	2.98E+03	2.67E+03	NA	1.72E+03	NA	6.19E+03	2.46E+03
MW-68-29	NA	1.78E+03	1.89E+03	NA	1.38E+03	NA	1.40E+04	1.68E+03
MW-68-57	NA	1.57E+03	1.85E+03	NA	1.93E+03	NA	7.02E+03	1.78E+03
MW-68-103	NA	3.02E+03	2.73E+03	NA	2.15E+03	NA	2.66E+03	2.63E+03
MW-68-132	NA	2.46E+03	2.97E+03	NA	2.52E+03	NA	2.92E+03	2.65E+03
MW-107	NA	NA	ND	NA	NA	NA	1.00E+03	ND
MW-111	2.87E+03	NA	2.38E+03	5.80E+03	6.87E+03	***	3.77E+03	7.54E+03
U3-4D	1.37E+03	1.14E+03	6.91E+02	NA	1.01E+03	NA	2.00E+03	1.05E+03
U3-4S	1.80E+03	8.30E+02	1.12E+03	NA	6.64E+02	NA	2.00E+03	1.10E+03
U3-T1	2.99E+03	2.84E+03	1.55E+03	NA	1.26E+03	NA	2.00E+03	2.16E+03
U3-T2	2.29E+03	1.44E+03	1.24E+03	NA	1.78E+03	NA	2.08E+03	1.69E+03
U1-CSS	5.20E+03	1.85E+03	5.81E+03	NA	NA	NA	3.09E+03	4.29E+03
U1-NCD	3.25E+03	4.63E+03	3.41E+03	5.41E+03	1.49E+04	NA	*	6.32E+03
U1-SFDS	ND	7.80E+03	ND	9.94E+02	ND	NA	*	4.40E+03
I-2	ND	ND	ND	NA	ND	NA	1.00E+03	ND
LAF-002	ND	NA	ND	NA	NA	NA	positive	ND
B-1	NA	NA	NA	NA	NA	NA	*	NA
B-6	ND	ND	ND	NA	ND	NA	*	ND
MH-5 VCFD	ND	5.62E+03	5.31E+03	NA	5.26E+03	NA	*	5.40E+03

Notes:

1) Only results greater than the MDC are reported herein. ND therefore indicates that the analytical result was below the MDC and typically also below the standard deviation threshold of three times 1 sigma. The rolling average is calculated using only results greater than the MDC. Given that ND represents real groundwater sampling results where the radionuclide activity level is either positive but very low and unquantifiable, or not detectable above background, its exclusion results in a high bias to the average and thus adds a measure of conservatism to the subsequent dose computations.

2) A shaded value indicates that the reported activity exceeds the Investigation Level (I.L.) that was applicable at the time of sampling. NA indicates that data is not available for this time period.

3) An aliquot of this sample was re-analyzed for Tritium. The original and aliquot results were 2,180 pCi/L and 1,980 pCi/L, respectively (MW-42-49; Q4 2013). In conformance with the LTMP, both results were averaged and the average was used in the annual rolling average calculations.

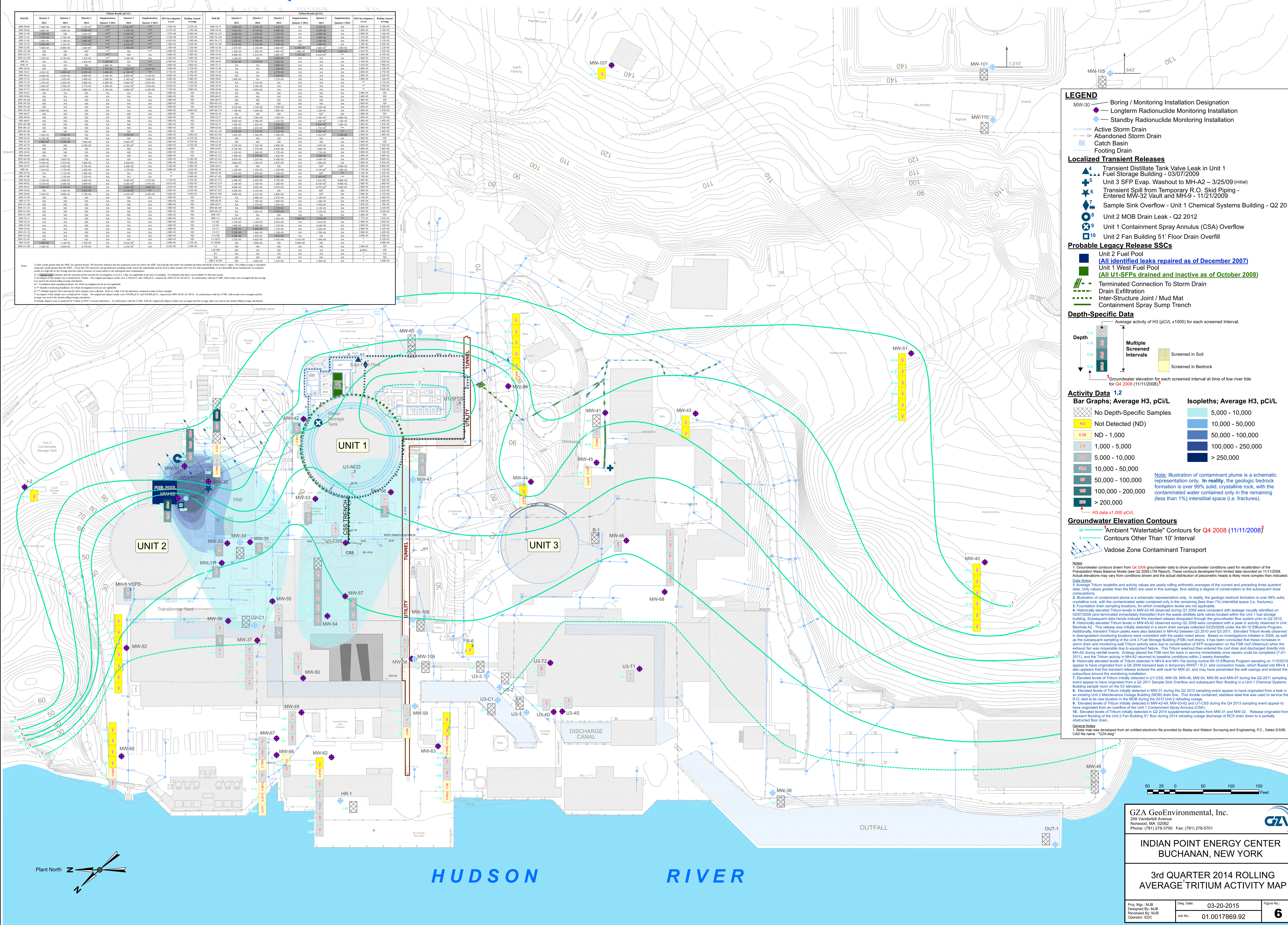
4) * Foundation drain sampling locations, for which investigation levels are not applicable.

5) ** Standby monitoring installation, for which investigation levels are not applicable.

6) *** Multiple Sup-Q2 2014 and Sup-Q3 2014 samples were collected. Refer to Table 4 for the laboratory analytical results of these samples.

7) An aliquot of this sample was re-analyzed for Trtium. The original and aliquot results were 434,000 pCi/L and 418,000 pCi/L, respectively (MW-30-69; Q3 2014). In conformance with the LTMP, both results were averaged and the average was used in the annual rolling average calculations.

8) Sample aliquots were re-analyzed for Tritium at IPEC's in-house laboratory. In conformance with the LTMP, both the original and aliquot results were averaged and the average value was used in the annual rolling average calculations.



UNIT 1
UNIT 2
UNIT 3
HUDSON
RIVER
DISCHARGE CANAL
OUTFALL
Plant North
LEGEND
Boring / Monitoring Installation Designation
Longterm Radionuclide Monitoring Installation
Standby Radionuclide Monitoring Installation
Active Storm Drain
Abandoned Storm Drain
Catch Basin
Footing Drain
Localized Transient Releases
Transient Distillate Tank Valve Leak in Unit 1 Fuel Storage Building - 03/07/2009
Unit 3 SFP Evap. Washout to MH-A2 – 3/25/09 (initial)
Transient Spill from Temporary R.O. Skid Piping - Entered MW-32 Vault and MH-9 - 11/21/2009
Sample Sink Overflow - Unit 1 Chemical Systems Building - Q2 2011
Unit 2 MOB Drain Leak - Q2 2012
Unit 1 Containment Spray Annulus (CSA) Overflow
Unit 2 Fan Building 51' Floor Drain Overfill
Probable Legacy Release SSCs
Unit 2 Fuel Pool
(All identified leaks repaired as of December 2007)
Unit 1 West Fuel Pool
(All U1-SFPs drained and inactive as of October 2008)
Terminated Connection To Storm Drain
Drain Exfiltration
Inter-Structure Joint / Mud Mat
Containment Spray Sump Trench
Depth-Specific Data
Average activity of H3 (pCi/L x1000) for each screened Interval.
Multiple Screened Intervals
Screened in Soil
Screened in Bedrock
Groundwater elevation for each screened interval at time of low river tide for Q4 2008 (11/11/2008)
Activity Data 1,2
Bar Graphs; Average H3, pCi/L
No Depth-Specific Samples
Not Detected (ND)
ND - 1,000
1,000 - 5,000
5,000 - 10,000
10,000 - 50,000
50,000 - 100,000
100,000 - 200,000
> 200,000
H3 data x1,000 pCi/L
Isopleths; Average H3, pCi/L
5,000 - 10,000
10,000 - 50,000
50,000 - 100,000
100,000 - 250,000
> 250,000
Note: Illustration of contaminant plume is a schematic representation only. In reality, the geologic bedrock formation is over 99% solid, crystalline rock, with the contaminated water contained only in the remaining (less than 1%) interstitial space (i.e. fractures).
Groundwater Elevation Contours
Ambient "Watertable" Contours for Q4 2008 (11/11/2008)
Contours Other Than 10' Interval
Vadose Zone Contaminant Transport
Notes:
1. Groundwater contours drawn from Q4 2008 groundwater data to show groundwater conditions used for recalibration of the Precipitation Mass Balance Model (see Q2 2009 LTM Report). These contours developed from limited data recorded on 11/11/2008. Actual elevations may vary from conditions shown and the actual distribution of piezometric heads is likely more complex than indicated.
Data Notes:
1. Average Tritium isopleths and activity values are yearly rolling arithmetic averages of the current and preceding three quarters' data. Only values greater than the MDC are used in this average, thus adding a degree of conservatism to the subsequent dose computations.
2. Illustration of contaminant plume is a schematic representation only. In reality, the geologic bedrock formation is over 99% solid, crystalline rock, with the contaminated water contained only in the remaining (less than 1%) interstitial space (i.e. fractures).
3. Foundation drain sampling locations, for which investigation levels are not applicable.
4. Historically elevated Tritium levels in MW-42-49 observed during Q1 2009 were consistent with leakage visually identified on 03/07/2009 (and terminated immediately thereafter) from the waste distillate tank valves located within the Unit 1 fuel storage building. Subsequent data trends indicate this transient release dissipated through the groundwater flow system prior to Q2 2010.
5. Historically elevated Tritium levels in MW-45-42 observed during Q2 2009 were consistent with a peak in activity observed in Unit 3 Manhole A2. This release was initially detected in a storm drain sample collected 03/25/2009 under the 80-10 Effluents Program. Additionally, transient Tritium peaks were also detected in MH-A2 between Q3 2010 and Q3 2011. Elevated Tritium levels observed in downgradient monitoring locations were consistent with the peaks noted above. Based on investigations initiated in 2009, as well as the subsequent sampling of the Unit 3 Fuel Storage Building (FSB) roof drains, it has been concluded that these increases in storm drain and monitoring well Tritium activity were due to condensation of SFP evaporation on the FSB roof (Washout) when the exhaust fan was inoperable due to equipment failure. This Tritium washout then entered the roof drain and discharged directly into MH-A2 during rainfall events. Entergy placed the FSB vent fan back in service immediately once repairs could be completed (7-21-2011), and the Tritium activity in MH-A2 returned to baseline conditions within 2 weeks thereafter.
6. Historcally elevated levels of Tritium detected in MH-9 and MH-10a during routine 80-10 Effluents Program sampling on 1/15/2010 appear to have originated from a Q4 2009 transient leak in temporary RWST / R.O. skid connection hoses, which flowed into MH-9. It also appears that this transient release entered the well vault for MW-32, and may have penetrated the well casings and entered the subsurface around the monitoring installation.
7. Elevated levels of Tritium initially detected in U1-CSS, MW-39, MW-46, MW-54, MW-56 and MW-57 during the Q2-2011 sampling event appear to have originated from a Q2 2011 Sample Sink Overflow and subsequent floor flooding in a Unit 1 Chemical Systems Building sample room on the 53' elevation.
8. Elevated levels of Tritium initially detected in MW-31 during the Q2 2012 sampling event appear to have originated from a leak in an existing Unit 2 Maintenance Outage Building (MOB) drain line. This double contained, stainless steel line was used to service the R.O. skid at its new location in the MOB during the 2012 Unit 2 refueling outage.
9. Elevated levels of Tritium initially detected in MW-42-49, MW-53-82 and U1-CSS during the Q4 2013 sampling event appear to have originated from an overflow of the Unit 1 Containment Spray Annulus (CSA).
10. Elevated levels of Tritium initially detected in Q2 2014 supplemental samples from MW-31 and MW-32. Release originated from transient flooding of the Unit 2 Fan Building 51' floor during 2014 refueling outage discharge of RCS drain down to a partially obstructed floor drain.
General Notes:
1. Base map was developed from an untitled electronic file provided by Badey and Watson Surveying and Engineering, P.C., Dated 2/3/06; CAD file name : "GZA.dwg".
50 25 0 50 100 150
Feet
GZA GeoEnvironmental, Inc.
249 Vanderbilt Avenue
Norwood, MA 02062
Phone: (781) 278-3700 Fax: (781) 278-5701
INDIAN POINT ENERGY CENTER
BUCHANAN, NEW YORK
3rd QUARTER 2014 ROLLING AVERAGE TRITIUM ACTIVITY MAP
Proj. Mgr.: MJB
Designed By: MJB
Reviewed By: MJB
Operator: EDC
Dwg. Date: 03-20-2015
Job No.: 01.0017869.92
Figure No.: 6