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State-Licensed Disposal Area at West Valley: 2014 Annual Report

Final Report

March 2015

NYSERDA's Promise to New Yorkers:

NYSERDA provides resources, expertise, and objective information so New Yorkers can make confident, informed energy decisions.

Mission Statement:

Advance innovative energy solutions in ways that improve New York's economy and environment.

Vision Statement:

Serve as a catalyst – advancing energy innovation, technology, and investment; transforming New York's economy; and empowering people to choose clean and efficient energy as part of their everyday lives.

State-Licensed Disposal Area at West Valley: 2014 Annual Report

Prepared by:

New York State Energy Research and Development Authority

West Valley Site Management Program

West Valley, NY

March 2015

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Acronyms and Abbreviations List

AMSL	Above Mean Sea Level
BGS	Below Ground Surface
BOD	Biological Oxygen Demand
CMS	Corrective Measures Study
COD	Chemical Oxygen Demand
Consent Order	Administrative Order on Consent
Deg C	Degrees Celsius
DOT	U.S. Department of Transportation
ft	Feet
GMP	*Groundwater Monitoring Plan for the State-Licensed Disposal Area (SDA) at West Valley*
IM	Interim Measure
LiDAR	Light Detection and Ranging
LMP	*Leachate Monitoring Plan for the State-Licensed Disposal Area (SDA) at West Valley*
MDC	Minimum Detectable Concentration
mg/L	Milligrams per Liter
NAD	North American Datum
NGVD	National Geodetic Vertical Datum
NDA	Nuclear Regulatory Commission-Licensed Disposal Area
NRC	Nuclear Regulatory Commission
NTU	Nephelometric Turbidity Unit
NYCRR	New York State Codes, Rules & Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSERDA	New York State Energy Research and Development Authority
RCP	Radiation Control Program
RCRA	Resource Conservation and Recovery Act
SDA	State-Licensed Radioactive Waste Disposal Area
SPDES	State Pollution Discharge Elimination System
SU	Standard Units
TKN	Total Kjeldahl Nitrogen
TLD	Thermoluminescent Dosimeter
TSS	Total Suspended Solids
µCi/mL	Microcuries per Milliliter
µrem/hr	Microrem (Roentgen Equivalent Man) per hour
µmhos/cm	Micromhos per Centimeter

Acronyms and Abbreviations List

USACOE	United States Army Corp of Engineers
USEPA	United States Environmental Protection Agency
UTL	Upper Tolerance Limit
VLDPE	Very-Low Density Polyethylene
VOC	Volatile Organic Compound
WNYNSC	Western New York Nuclear Service Center
WVDP	West Valley Demonstration Project
WVSMP	West Valley Site Management Program
XR-5	Ethylene Interpolymer Alloy Geomembrane

1 INTRODUCTION

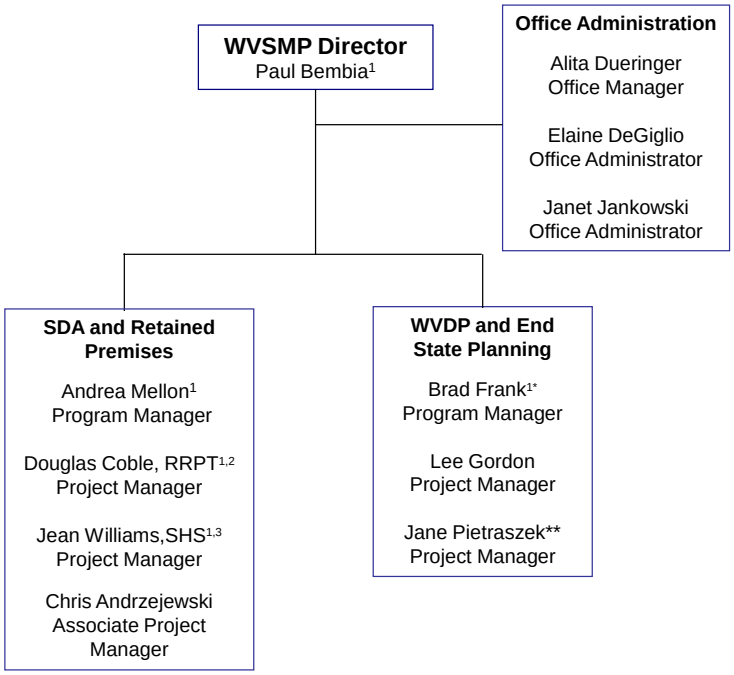
The New York State Energy Research and Development Authority (NYSERDA) maintains and monitors the State-Licensed Radioactive Waste Disposal Area (SDA) to protect public health, safety and the environment. This report summarizes the results of environmental monitoring, erosion monitoring, facility operations and maintenance, and waste management activities conducted during calendar year 2014 at the SDA, which is located at the Western New York Nuclear Service Center (WNYNSC).

This report is prepared in accordance with New York State Department of Environmental Conservation (NYSDEC) radiation control regulations and the SDA radiation control program (RCP). Annual reporting requirements are specified in:

- Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR) Part 380, Rules and Regulations for Prevention and Control of Environmental Pollution by Radioactive Materials, February 2, 2002.
- NYSDEC RCP #137-6, Permit No. 9-0422-00011/00011, October 14, 2014.

1.1 WEST VALLEY SITE MANAGEMENT PROGRAM

NYSERDA's West Valley Site Management Program (WVSMP) is comprised of eleven professionals with diverse talents and expertise. The mission of the WVSMP is to be responsible stewards of the



* Brad Frank began employment with NYSERDA on January 15, 2015.
** Jane Pietraszek began employment with NYSERDA on February 23, 2015.

[1] Radiation Safety Committee Member
[2] Radiation Safety Officer
[3] Safety & Health Supervisor

WNYNSC, including the SDA, by using objective analysis, and soliciting multiple perspectives to identify, assess, and implement effective, enduring approaches to protect the environment, and the well-being of our workers and neighbors.

1.2 SDA DESCRIPTION

The SDA occupies approximately 15 acres of the WNYNSC (Figure 1-1) immediately adjacent to the West Valley Demonstration Project (WVDP). The SDA consists of three filled lagoons and two sets of parallel trenches that contain radioactive waste: 1 through 7 in the northern area and 8 through 14 in the southern area (see Figure 1-2). The SDA is surrounded by an eight-foot-high, chain-link fence. NYSERDA controls access to the SDA by limiting the issuance of keys to the five, locked SDA gates. In addition, a contracted security service conducts routine patrols of the SDA's perimeter.

Between 1963 and 1975, Nuclear Fuel Services, Inc. (the SDA operator at that time), placed approximately 2.4 million cubic feet (ft) of radioactive waste in trenches constructed in the native silty-clay soil. These trenches are 450 to 650 ft in length and are approximately 20 ft deep. Trench cross-sections are trapezoidal in shape, with a top width of 35 ft and a bottom-floor width of 20 ft. During construction, the trench floors were sloped along their length to allow water to drain to a low point where a trench sump was located. A vertical pipe, which extends from above the trench cap to each sump, provides a way to routinely monitor trench water (leachate) elevations. The sump pipe also serves as a conduit through which leachate can be sampled or removed from the trenches.

Differing in both physical form and construction from other trenches, Trenches 6 and 7 were built to hold high-activity wastes that required immediate shielding. Trench 6 is a series of individual holes in which waste was placed, while Trench 7 is a narrow, shallow trench where waste containers were placed and encased in concrete. A sump was not installed in either of these two trenches.

Each trench is covered with an eight- to 10-ft-thick mounded cap of compacted clay, and a drainage swale is located between adjacent trenches to direct precipitation away from the trenches. Efforts to minimize erosion of the clay caps and infiltration of water into the trenches began in the late 1970s and early 1980s. These efforts included rolling and reseeding the trench caps as well as several larger-scale regrading, recapping and water infiltration control projects. Rising leachate elevations in Trenches 13 and 14 led NYSERDA to investigate additional water management measures, and, in 1990, NYSERDA began implementing several projects aimed at reducing water accumulation in the SDA trenches.

Figure 1-1. Map of the Western New York Nuclear Service Center

Source: NYSERDA

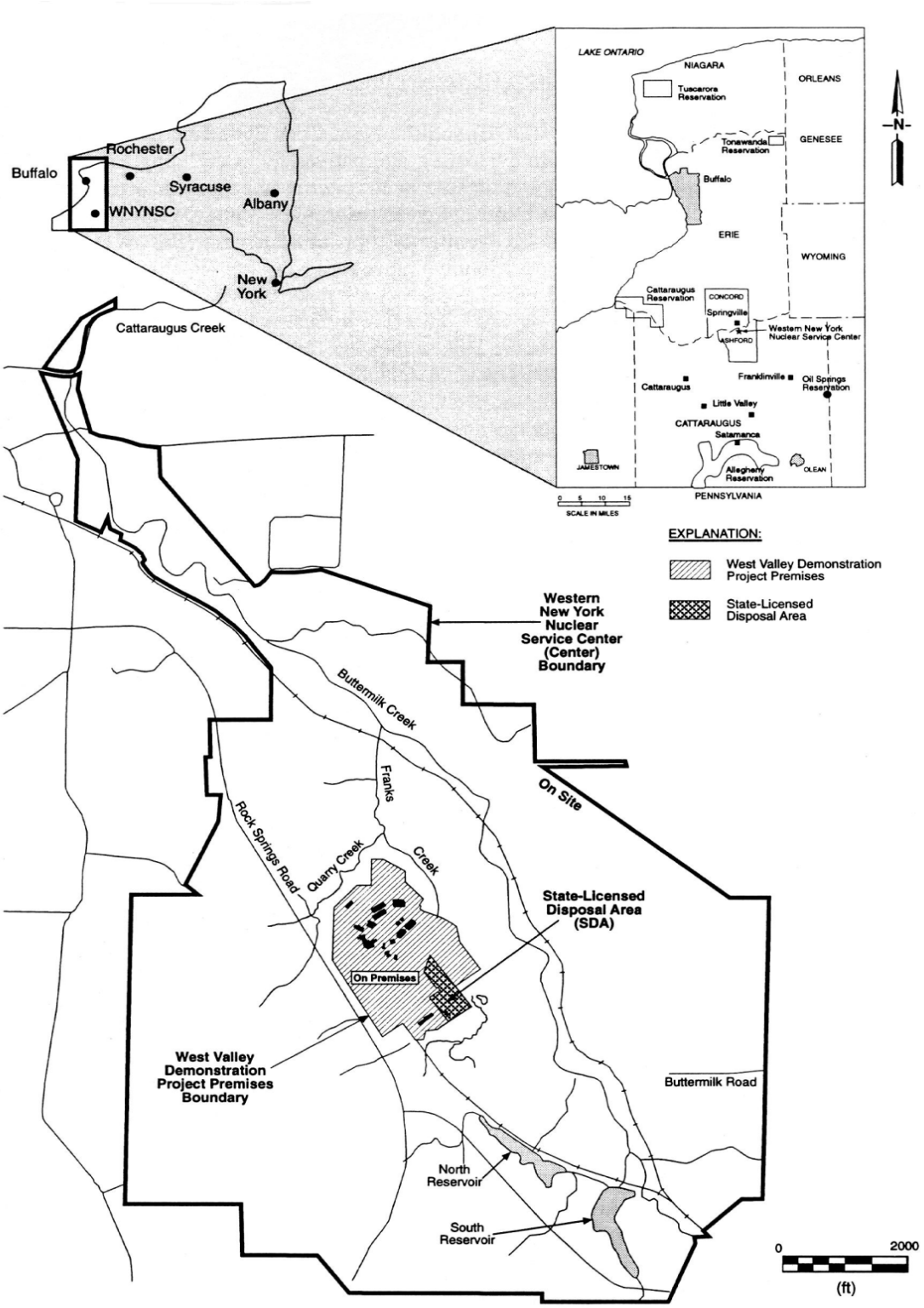


Figure 1-2. Aerial Photograph of the State-Licensed Disposal Area

Source: NYSERDA

1.2.1 Leachate Management

Between 1990 and 1991, NYSERDA installed three tanks in two adjoining buildings at the SDA. In 1991, 8,000 gallons of leachate were pumped from Trench 14 into a 9,200-gallon fiberglass tank, located in the smaller of the two buildings. In 2009, the 8,000 gallons of leachate were removed from the fiberglass tank, placed in U.S. Department of Transportation (DOT)-approved shipping containers, and shipped to a licensed and permitted treatment and disposal facility. The empty tank was removed in 2010 and shipped to a licensed facility for off-site disposal. The remaining two tanks are located inside the Frac Tank Building, and have never been used to store any radiological, mixed or hazardous waste.

1.2.2 Trench Water Infiltration Controls

In September 1992, NYSERDA installed a soil-bentonite subsurface barrier wall along the western side of Trench 14 to divert groundwater flow away from the south trenches (eight through 14). In June 1993, the project was completed with the installation of an exposed, very low-density polyethylene (VLDPE) geomembrane cover extending from the centerline of Trench 12, across Trenches 13 and 14, and the barrier wall, and terminating in a stormwater drainage swale excavated just beyond the barrier wall. Between trenches, perforated piping was placed on top of the geomembrane in the drainage swale and backfilled with sand. Slit-trench monitoring wells were also installed on either side of the barrier wall to monitor for possible groundwater mounding upgradient of the wall. This project was conducted as an interim measure (IM) under the Resource Conservation and Recovery Act (RCRA) 3008(h) Administrative Order on Consent (Docket No. II RCRA-3008(h)92-0202) (Consent Order). The Consent Order authorized the U.S. Environmental Protection Agency (EPA) and NYSDEC to issue orders requiring corrective action or such other responses as necessary to protect human health or the environment.

In 1995, NYSERDA expanded the use of geomembrane covers at the SDA with the installation of an exposed, reinforced, ethylene interpolymer alloy geomembrane (XR-5) cover over Trenches 1 through 8, and 10 through 12. As part of this project, NYSERDA installed a stormwater management system consisting of five, geomembrane-lined stormwater basins to detain and release precipitation without increasing peak runoff from preproject conditions. This project was also conducted as an IM under the Consent Order.

In the fall of 1999, NYSERDA installed an XR-5 geomembrane cover on Trench 9, replacing a bioengineering management cover that was installed as a pilot project in September 1993.

Nondestructive testing of the VLDPE geomembrane material in 2008 confirmed the cover was nearing the end of its useful life. In 2010, NYSERDA installed a new XR-5 geomembrane cover over the existing VLDPE to ensure continuation of effective water infiltration controls in this area of the SDA.

1.2.3 Corrective Measures Study (CMS)

The SDA trenches are known to contain materials that are classified as hazardous constituents under RCRA. Because there is a possibility that these materials could be released from the trenches, NYSERDA is obligated to prepare a CMS under the requirements of the Consent Order. On October 6, 2010, NYSERDA submitted the *Final Focused Corrective Measures Study for the State-Licensed Disposal Area at the Western New York Nuclear Service Center West Valley, New York*[1]. NYSERDA will be required to prepare a Final CMS under the requirements of the Consent Order at the time a decision is made on the final disposition of the SDA.

1.2.4 Hazardous Waste Management Permit Application

In 2010, NYSDEC requested that NYSERDA move from an interim status permit to a final status permit. In response, on January 6, 2011, NYSERDA submitted a draft 6 NYCRR Part 373 Hazardous Waste Management Permit Application (i.e., Corrective Action Permit Application). On February 10, 2011, NYSDEC requested that the timeframe for review and processing of NYSERDA's Hazardous Waste Management Permit be suspended per 6 NYCRR Part 621 of the Uniform Procedures Act. NYSERDA agreed to suspend the timeframes for this application on February 23, 2011. NYSERDA met with NYSDEC on July 18, 2012, to discuss the regulatory path forward, and on October 23, 2012, NYSDEC informed NYSERDA that a new regulatory document (i.e., Corrective Action Only Order) for the WNYNSC would be developed when information from the Phase 1 Studies is available to better inform additional corrective action activities.

1 Ecology and Environment, Inc. for NYSERDA, October 4, 2010, Final Focused Corrective Measures Study for the State-Licensed Disposal Area at the Western New York Nuclear Service Center West Valley, New York.

2 Environmental Monitoring

2.1 Trench Leachate Elevations

2.1.1 Leachate Elevation Monitoring

One SDA trench sump is located in Trenches 1 through 5, 8, and 9, and 11 through 14. Two sumps, designated 10N and 10S, are located in Trench 10 (see Figure 2-1).

Leachate elevations are measured in the 13 trench sumps at the SDA in accordance with the *Leachate Monitoring Plan for the State-Licensed Disposal Area (SDA) at West Valley* (LMP). In addition to requiring the leachate elevation measurements, the LMP specifies data assessment, notification and reporting requirements. Table A-1 presents leachate elevation data for 2014. Graphical presentations of leachate elevations over the time period (2005-2014) are presented in Figures A-1 through A-13.

Leachate elevation measurements for 2014 were collected quarterly in March, May, September and December (see Table A-1). Monthly leachate elevation measurements were taken in Trenches 13 and 14 (see discussion below).

2.1.2 Leachate Elevation Trend Assessment

The LMP requires an annual assessment of long-term leachate elevation trends. The long-term statistical data assessment for 2014 (*Annual Statistical Assessment of SDA Water Elevations - Data Through 2014*[2]) indicates that from 2000 through 2014, most trenches show a decreasing long-term leachate elevation trend (Figure 2-2). Trench 1 shows an increasing long-term trend, though leachate elevations in Trench 1 have been at or near the bottom of the sump for several years. NYSERDA will continue to monitor and evaluate the leachate elevation in Trench 1. As described below, an increase in the Trench 14 leachate elevation has been observed since 2011, but this shorter-term trend was not identified in the trend analysis using the Mann-Kendall with Sen's method test; therefore, NYSERDA is presently evaluating statistical assessment improvements, which may include the use of prediction intervals (see Figure 2-3a and 2-3b).

2 Ecology and Environment, Inc., February 2015, Annual Statistical Assessment of SDA Water Elevations – Data Through 2014.

Figure 2-1. Trench Sump and Groundwater Monitoring Locations

Source: NYSERDA

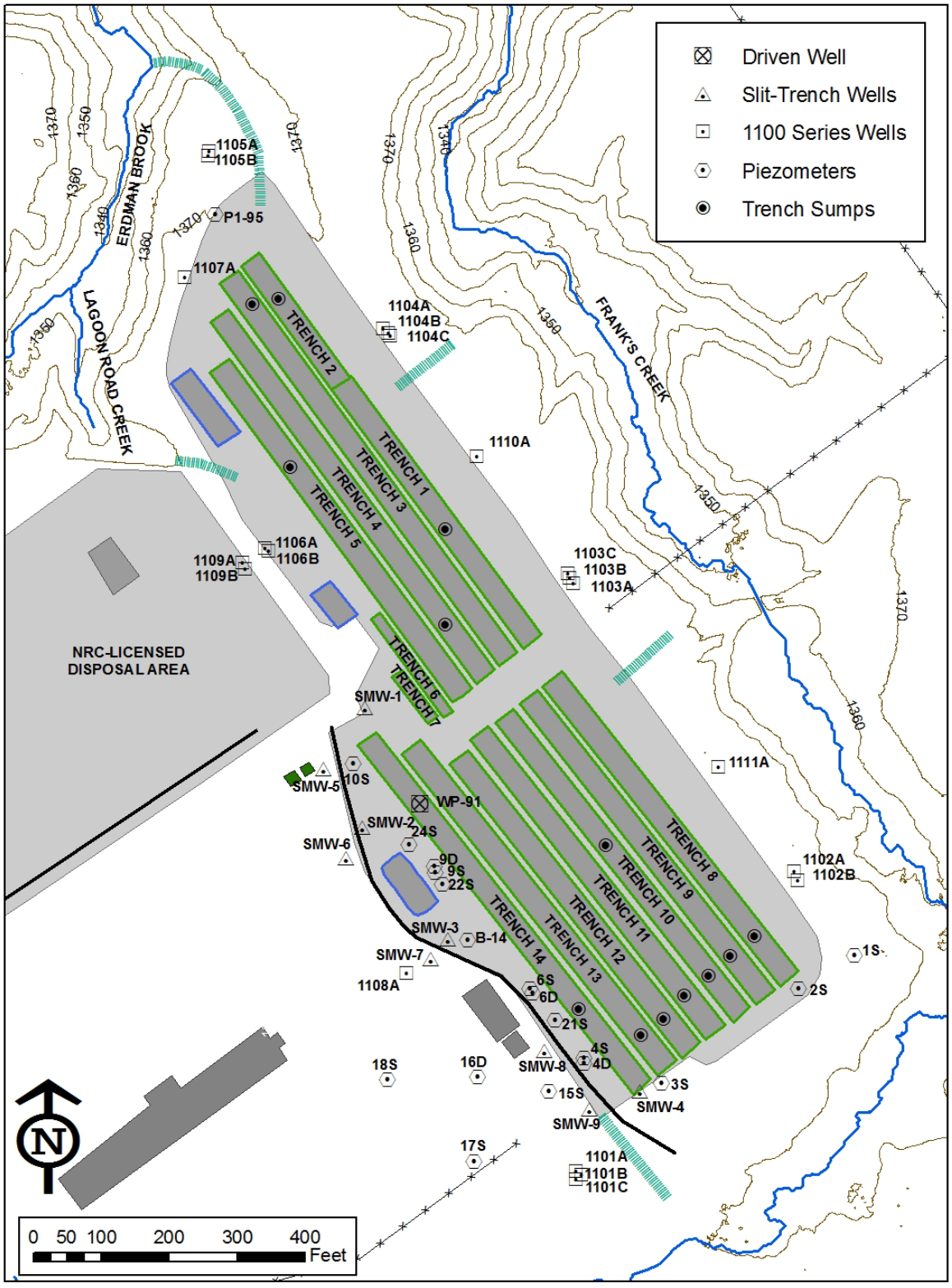


Figure 2-2. SDA Water Elevation Trends

Source: NYSERDA

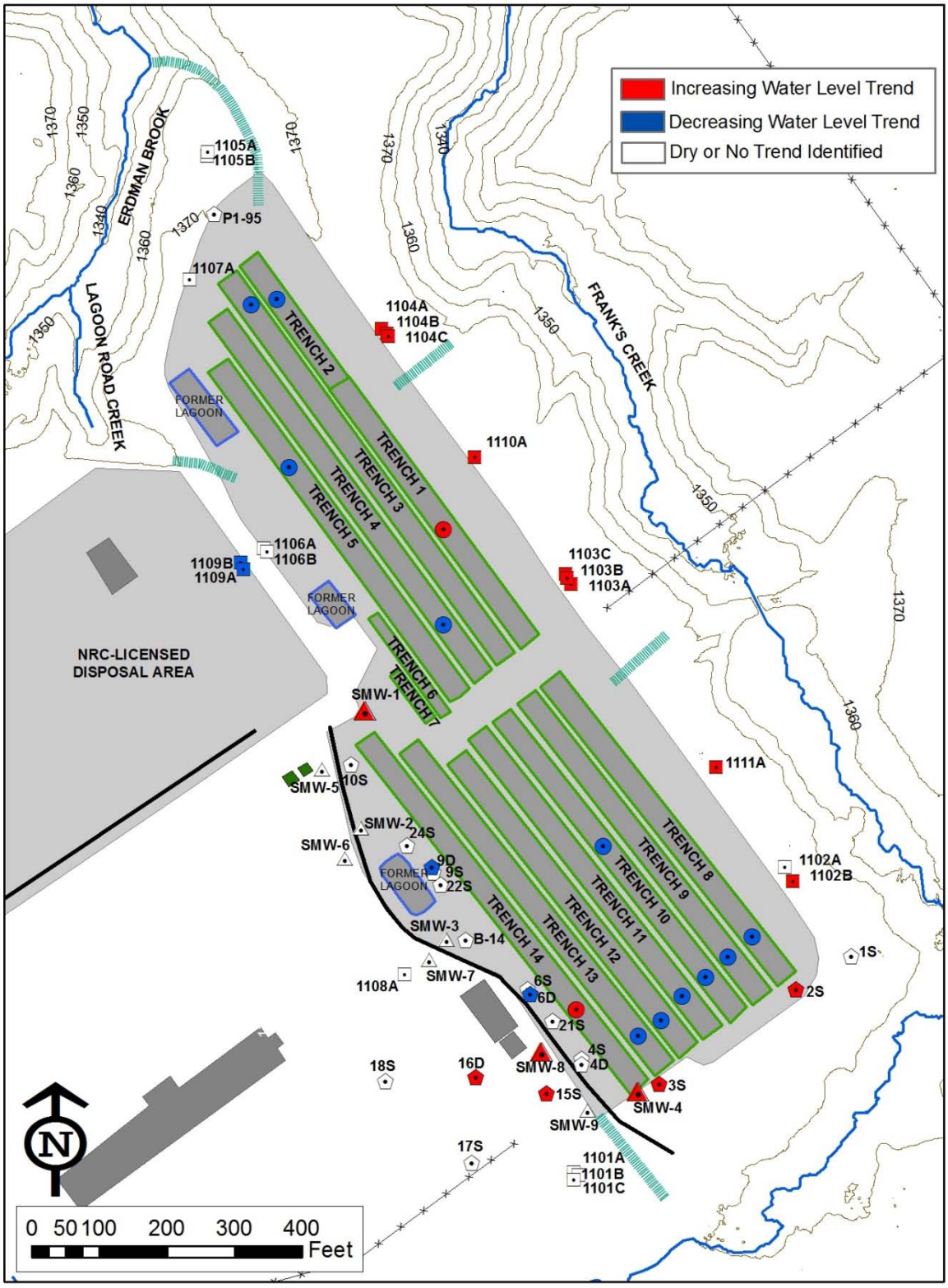


Figure 2-3a. Trench 14 Leachate (Water) Elevations for the Period 1997 to 2008, Inclusive.

Regression line (red) for data for the period January 1997 to May 2008. R^2 = 0.97. 95% Prediction intervals shown in green. Predicted change in leachate elevation from this regression line is –1.32 inches per year.

Source: NYSERDA

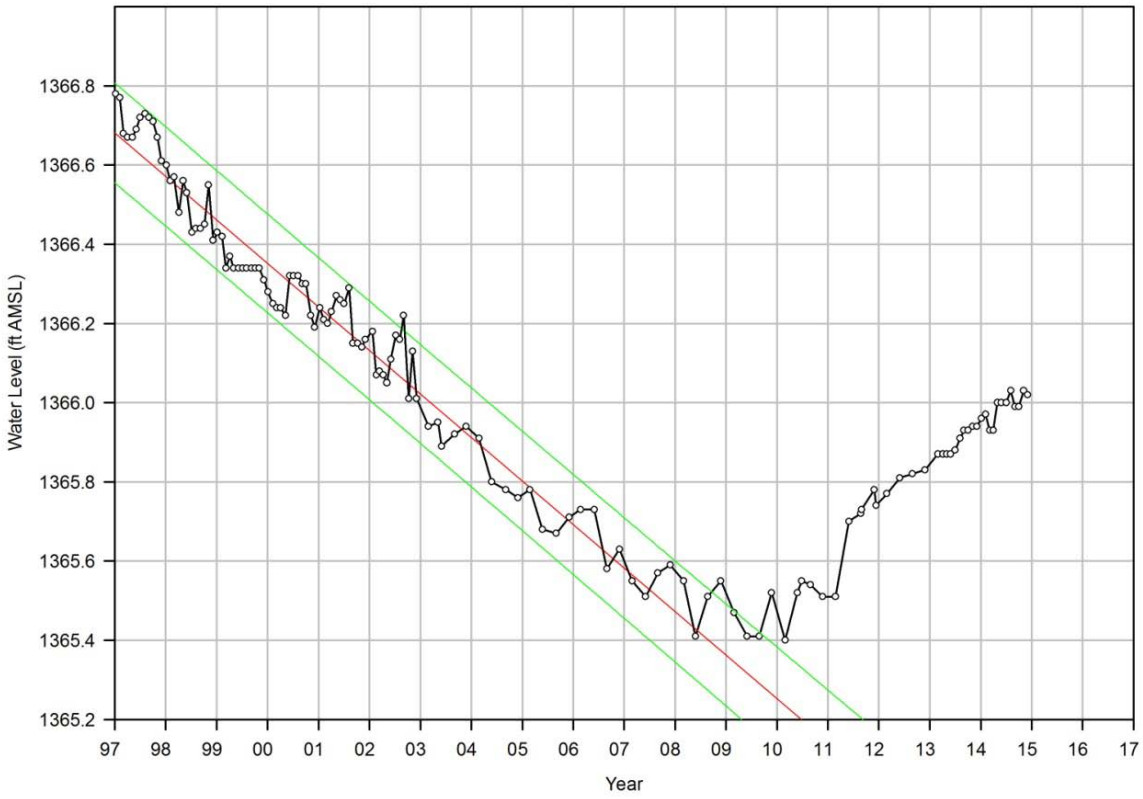
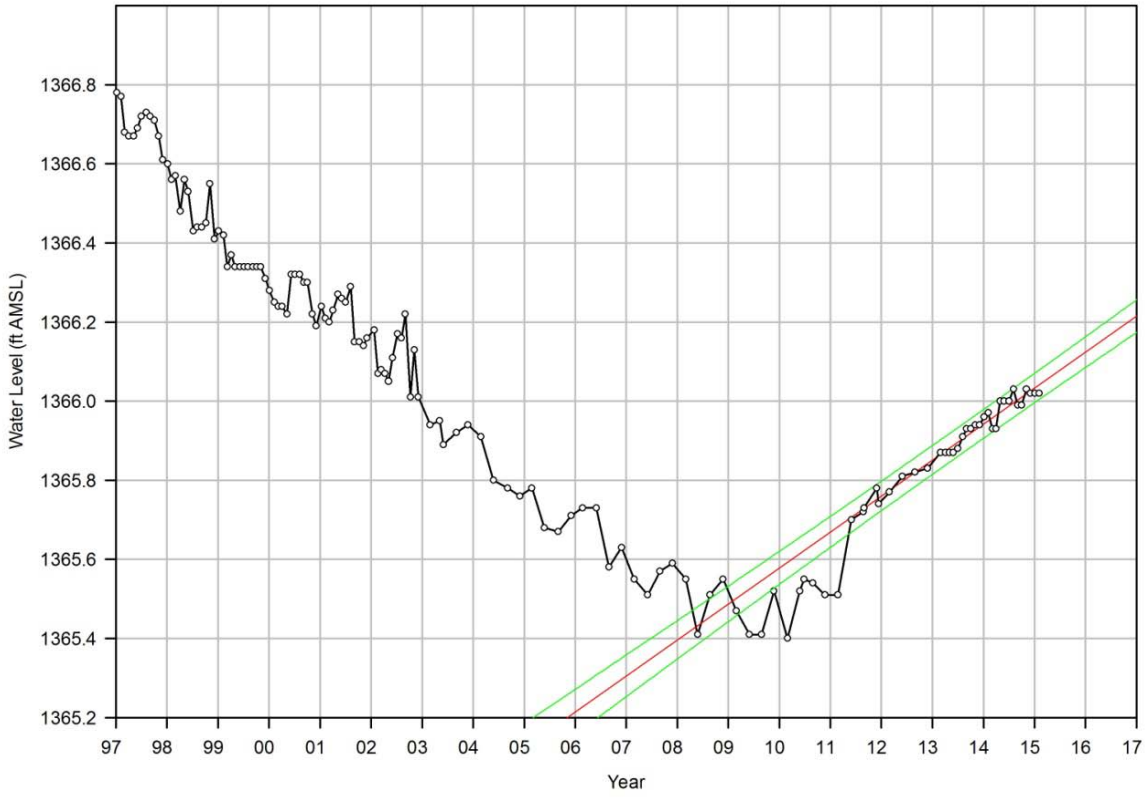


Figure 2-3b. Trench 14 Leachate (Water) Elevations for the Period 2011 to 2014, Inclusive.

Regression line (red) for data for the period June 2011 to December 2014. R^2 = 0.97. 95% Prediction intervals shown in green. Predicted change in leachate elevation from this regression line is +1.09 inches per year.

Source: NYSERDA



2.1.3 Trench 14 Leachate Elevation

Following the installation of infiltration controls in the mid-1990s, the Trench 14 leachate elevation followed a consistent and generally predictable decreasing trend (Figure 2-3a). A noteworthy change in behavior of this trend occurred in approximately 2008-2009 when the decreasing trend stopped.

In early 2011, the leachate elevation increased by two inches. Small increases and decreases have been observed since 2011, but overall, the Trench 14 leachate elevation has continued to increase each year. Although none of the increases were large enough to trigger regulatory reporting requirements, the 2014 data set shows that the small increases are continuing, and have been consistent and predictable since mid-2011 (Figure 2-3b). During 2014, the leachate in Trench 14 increased by 0.72 inches. None of the nearby trenches are showing a similar increase.

The highest leachate elevation observed in Trench 14 was in 1992, when it was 1.5 ft higher than it is today. Even at this higher elevation, there was no release of leachate from the trench. As such, this current leachate elevation increase in Trench 14 does not present a threat to public health and safety, or the environment; however, NYSERDA is investigating the increase.

NYSERDA has taken the following actions as a result of the change in leachate elevation trend in Trench 14:

- **Notified the Regulators and Public** - NYSERDA informed NYSDEC, the New York State Department of Health (NYSDOH), EPA and the Nuclear Regulatory Commission (NRC) of the change in the Trench 14 leachate elevation trend in March 2013. None of the leachate elevation measurements exceeded the established regulatory reporting thresholds, but the notifications were made to ensure that the regulators were informed of the change in trench behavior. NYSERDA also informed the West Valley Citizen Task Force of the Trench 14 leachate elevation increase at the March 2013 CTF meeting.
- **Increased Water Elevation Monitoring Frequency** – NYSERDA increased the frequency of water elevation measurements in Trenches 13 and 14, and in groundwater monitoring wells located over approximately the western half of the SDA from quarterly to monthly. These water elevation data are reported to NYSDEC on a monthly basis.
- **Resumed Leachate Measurements at a Second Location in Trench 14** – NYSERDA initiated monthly measurements of leachate elevations at a second location within Trench 14 (WP-91). These additional measurements (conducted in a driven well point at the north end of Trench 14) are being conducted to assess whether a change in condition within the trench caused a localized increase in the leachate elevation near the Trench 14 sump (at the southern end of the trench). The resulting measurements at the two locations show similar leachate elevations, demonstrating that the Trench 14 leachate elevation increase is not localized, and

that measurements at the Trench 14 sump are representative of conditions along the entire trench. Monthly measurements at WP-91 will continue.

- **Inspect SDA Stormwater Drainage Piping** – In November 2014, the SDA stormwater drainage piping between the detention basins and outfalls were video-inspected for discrepancies (e.g., blockage, misalignment or broken piping). Two minor maintenance items were identified, neither of which were located near Trench 14. These items have been added to NYSERDA's maintenance log for repair in the spring of 2015.
- **Geomembrane Inspection and Repairs** - NYSERDA routinely inspects the entire SDA geomembrane cover for rips, tears, boot penetrations and blockage of stormwater detention basins. Any minor tears identified are repaired in a timely manner. In 2014, an open seam approximately eight ft long just north of Trenches 13 and 14 was identified and repaired (see Section 4).
- **Conducted a Hydrogeologic Analysis** – NYSERDA issued a contract with an independent hydrogeologist to conduct a review of the leachate, groundwater and precipitation data for both the SDA and Nuclear Regulatory Commission-Licensed Disposal Area (NDA). This activity included an evaluation of the near-surface geology and geohydrology, and the potential for groundwater movement in the vicinity of the SDA and the NDA. Groundwater and leachate elevation changes were also evaluated with respect to timing of the various physical changes that have occurred in the vicinity of Trench 14 since the increase in Trench 14 leachate elevations began.

At NYSERDA's request, the analysis also included the evaluation of a very slow increase in the leachate elevation in SDA Trench 1 that has been observed for several years. This report is currently being finalized and will be submitted to NYSDEC for their review in 2015.

In 2015, NYSERDA will complete a more thorough evaluation of the increases in order to identify a cause or potential cause for the leachate increase, and to recommend actions to mitigate the increase.

2.2 Groundwater Monitoring

The SDA groundwater monitoring network consists of 21 groundwater monitoring wells (the 1100-series wells), 19 piezometers and nine slit-trench wells. The location of each monitoring well is shown in Figure 2-1. The purpose of the groundwater monitoring program is twofold: (1) to provide data of sufficient quality and quantity to allow detection of the migration of radionuclides or volatile organic compounds (VOCs) from the SDA via groundwater; and, (2) to provide information on hydrologic conditions near the disposal trenches. The Groundwater Monitoring Program is conducted in accordance with the *Groundwater Monitoring Plan for the State-Licensed Disposal Area (SDA) at West Valley* (GMP). The 1100-series wells, piezometers, and slit-trench wells are inspected and maintained as described in the GMP.

2.2.1 Groundwater Elevation Monitoring

The GMP requires quarterly groundwater elevation measurements in the 1100-series wells, the piezometers and the slit-trench wells. In 2014, measurements were taken in March, May, September and December; and the results for each well are presented in Tables B-2, B-4 and B-6, respectively. In addition, monthly groundwater elevation measurements were taken at a number of locations in support of the Trench 14 leachate investigation (see Section 2.1.3).

Groundwater elevation data are used to construct quarterly groundwater elevation contour maps for the weathered Lavery till and the Kent recessional sequence (see Figures B-1 through B-8). The 2014 groundwater contour maps show the hydraulic gradient in the weathered Lavery till, in the vicinity of the disposal trenches, to be inward toward the trenches. The path of the groundwater movement in the Kent recessional sequence is northeasterly. These trends are consistent with historical data.

2.2.2 Groundwater Elevation Trend Assessment

An assessment of upward or downward trends in groundwater elevations was conducted for the data collected in 2014 (*Annual Statistical Assessment of SDA Water Elevations – Data through 2014*[3]). The statistical assessment used groundwater elevation data from January 2000 through December 2014, and the results of the trend assessment show an increasing water elevation trend in: Wells 1101C, 1102B, 1103A, 1103B, 1103C, 1104A, 1104B, 1104C, 1110A, and 1111A; Piezometers 2S, 3S, 15S, and 16D; and Slit-Trench Wells SMW-1, SMW-4 and SMW-8. A decreasing water elevation trend was observed in: Wells 1109A, Well 1109B and Piezometers 6D and 9D. Piezometers 4S and 9S, and Slit-Trench Wells SMW-2 and SMW-3 have been dry throughout the statistical assessment period. No upward or downward trends were found in the remaining groundwater wells at the SDA.

As Figure 2-2 shows, the majority of the wells located within the area covered by the geomembrane and immediately downgradient of the slurry wall are dry, or exhibit no trend. Several wells located on the upgradient side of the slurry wall show an increasing trend. This distribution of groundwater elevations near the west side of Trench 14, and the decreasing leachate elevation trends in all but two of the SDA trenches, reflect the continued effectiveness of the water infiltration controls system (i.e., subsurface barrier wall and geomembrane cover).

3 Ibid.

2.2.3 Groundwater Parameter Monitoring

In accordance with the GMP, the 1100-series wells were sampled semiannually (June and December) during 2014. Analytical parameters monitored semiannually included gross alpha, gross beta, and tritium; and field water quality parameters (conductivity, pH, temperature and turbidity). Analytical parameters monitored annually in 2014 included gamma-emitting radionuclides (by gamma spectroscopy); four beta-emitting radionuclides (carbon-14, iodine-129, strontium-90 and technetium-99); and VOCs. Checklists of the parameters sampled at each well are presented in Tables B-7 and B-8. Groundwater analytical results for all parameters, except VOCs, are presented in Tables B-9 and B-10.

2.2.3.1 Gross Alpha

The gross alpha sampling results from all wells did not exceed the reporting criteria set forth in the GMP. None of the UTLs or Upper Predictive Limits were exceeded for any of the sampled wells. Gross alpha results were assessed using the statistical intrawell comparison protocol described in the GMP. Results of gross alpha monitoring are consistent with historical results.

2.2.3.2 Gross Beta

The gross beta sampling results in all wells did not exceed the reporting criteria set forth in the GMP. Gross beta results were assessed using the statistical intrawell comparison protocol described in the GMP. In June, the Upper Tolerance Limit (UTL) for gross beta was exceeded for Well 1110A. In the case of this exceedance, resampling was not conducted as the result is consistent with historical data and within the range of general environmental levels.

2.2.3.3 Tritium

The tritium sampling results in all wells did not exceed the reporting criteria set forth in the GMP. Tritium results were assessed using the statistical intrawell comparison protocol described in the GMP. In June, the UTL for Tritium was exceeded for Well 1104B. In the case of this exceedance, resampling was not conducted as the result is consistent with historical data and within the range of general environmental levels.

2.2.3.4 Gamma-Emitting Radionuclides

The gamma-emitting radionuclide sampling results in all wells did not exceed the reporting criteria set forth in the GMP. Calculation of statistics (mean, standard deviation and control charting) for the 14

routinely reported gamma emitters was not required because five positive detections (as defined in the GMP) had not occurred for any gamma-emitting radionuclide.

2.2.3.5 Beta-Emitting Radionuclides

The results from all other beta-emitting radionuclides (carbon-14, iodine-129, strontium-90 and technetium-99) sampled did not exceed the reporting criteria set forth in the GMP, except for Well 1107A, which exceeded the Strontium-90 (Sr-90) value.

The Sr-90 result for Well 1107A (9.26E-09±9.92E-10 µCi/mL) exceeded the criteria in the GMP, but was similar to historical results. After the fifth value above the GMP for Sr-90 in the well (2002) was reported, control charting was initiated. The current calculated mean and control limits are based upon the initial five positive detections. Based upon the control chart for Sr-90 in Well 1107A, no trends in the data have been identified.

2.2.3.6 Volatile Organic Compounds

VOC results for samples collected in 2014 did not exceed the reporting criteria set forth in the GMP and were generally consistent with historical results. Toluene was detected above the minimum detection limit in three wells: 1.3 µg/L for Well 1101B, 0.61 µg/L for Well 1102B, and 1.2 µg/L for Well 1106A. Toluene has not been previously detected in these wells, and there were no other 2014 sampling results that were indicative of changing groundwater conditions in these areas. NYSERDA will continue to monitor and report the results for these and all SDA wells. These toluene results are below the Class GA (i.e., fresh groundwater or potable) NYSDEC groundwater quality standard of 5 µg/L. Because the VOC results area all “non-detects” except for the wells mentioned here, the VOC data tables are not included in this report.

2.2.3.7 Field Water Quality Parameters

Conductivity, temperature, turbidity and pH are measured in the field during groundwater sampling. The 2014 water quality measurements were consistent with historical results and are reported in Table B-10.

2.3 SURFACE WATER MONITORING

During 2014, quarterly surface water samples for gross alpha, gross beta, and tritium analyses were collected at the four SDA monitoring locations (WNNDADR, WNERB53, WNFRC67 and WNDCELD).

A background sampling location south (and upgradient) of the SDA on Buttermilk Creek (WFBCBKG), also collected quarterly, is used for data comparison. An annual sample was also collected at WFBCANL in 2014, approximately 0.75 miles northeast (and downgradient) of the SDA on Buttermilk Creek.

As shown in Figure 2-4, WNNDADR, located in Lagoon Road Creek adjacent to both the SDA and the NDA within the WVDP premises, and WNERB53, located in Erdman Brook downstream of WNNDADR, monitor surface water runoff from the SDA and NDA, and portions of the WVDP premises. WNDCELD, located in Frank's Creek on the south side of the SDA, monitors surface water from areas adjacent to the WVDP Drum Cell upstream of the SDA. WNFRC67, located farther downstream on Frank's Creek, monitors surface water on the eastern and southern portions of the SDA.

Surface water monitoring data are presented in Tables C-1 through C-6. A statistical assessment of radiological constituents (gross alpha, gross beta and tritium) for the SDA surface water was conducted using the data collected in 2014 (*Statistical Assessment of SDA Surface Water Constituents for 2014*[4]).

2.3.1 Radiological Parameters

2.3.1.1 Gross Alpha

The 2014 gross alpha results at all four SDA surface water sampling locations (WNDCELD, WNNDADR, WNFRC67 and WNERB53) were statistically indistinguishable from background. These findings are consistent with previous annual statistical assessments. All results were below the 6 NYCRR 703.5 - Table 1 Water Quality Standards for Surface Waters and Groundwater (1.5E-08 µCi/mL), which is used as a comparative value for gross alpha.

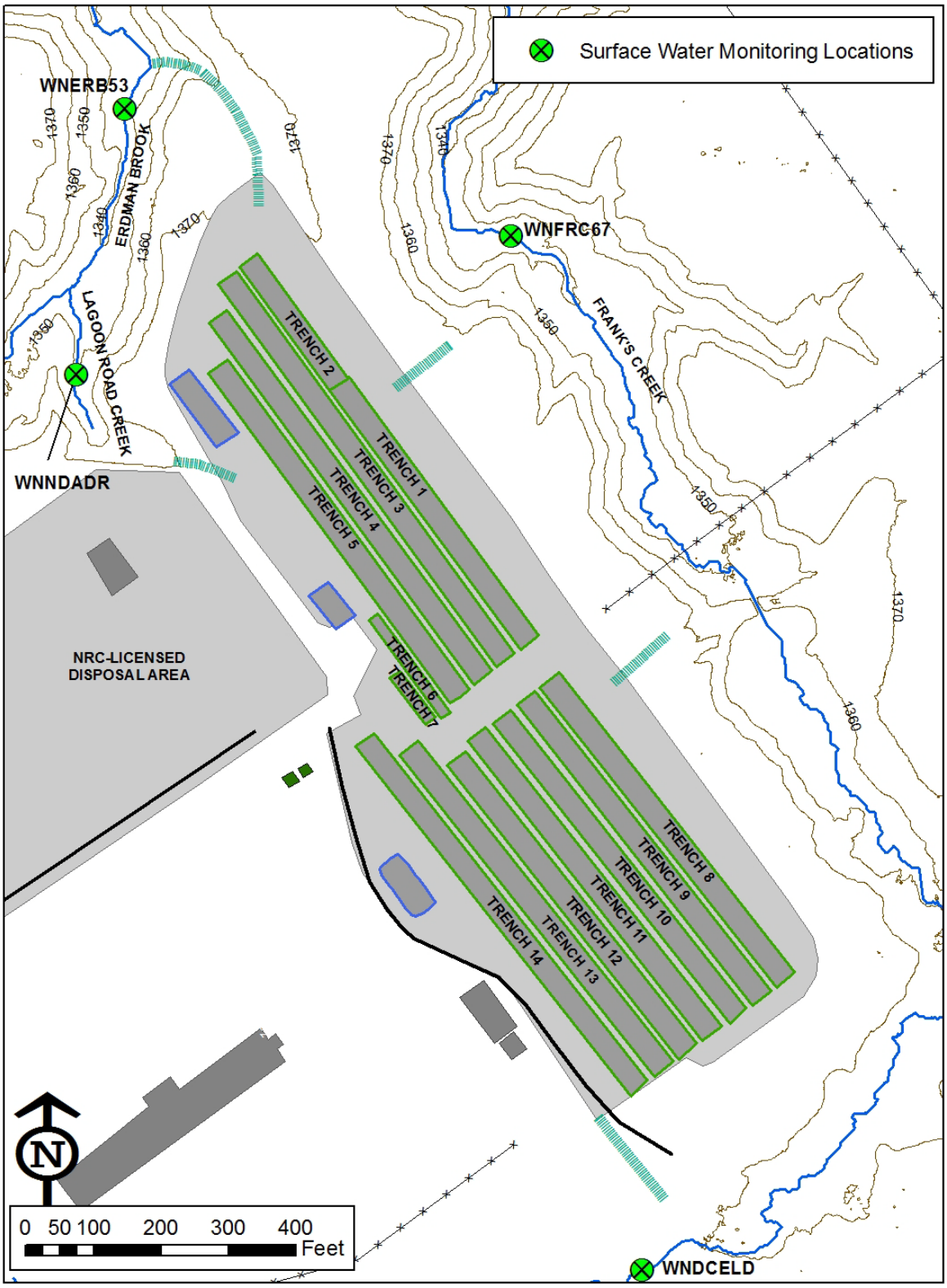
2.3.1.2 Gross Beta

The 2014 gross beta results from WNNDADR were statistically higher than the background location, which is consistent with historical results, although levels at WNNDADR have fallen by a factor of three since the NDA geomembrane cover and subsurface barrier wall were installed in 2008. Gross beta results for WNERB53 were also significantly higher than background in 2014, although quarterly reports have shown a statistically decreasing trend since May 2010. The 2014 gross beta results at WNFRC67 and WNDCELD were statistically indistinguishable from results observed at the WFBCBKG background

4 Ecology and Environment, Inc., Statistical Assessment of SDA Surface Water Constituents for 2014, February 2015.

Figure 2-4. Surface Water Monitoring Locations

Source: NYSERDA



location. These findings are consistent with previous annual statistical assessments. All gross beta results were below the 6-NYCRR 703.5 - Table 1 Water Quality Standards for Surface Waters and Groundwater (1.0E-06 µCi/mL), which is used as a comparative value for gross beta.

2.3.1.3 Tritium

The tritium result for WNNDADR was significantly higher than background in 2014, while the results for the remaining locations were statistically indistinguishable from background. These results are consistent with previous annual assessments.

Since 2008, quarterly reports have shown a statistically decreasing trend over time for the WNDADR location. All tritium results were below the 6-NYCRR 703.5 Table 1 Water Quality Standards Surface Waters and Groundwater (2.0E-05 µCi/mL), which is used as a comparative value for tritium.

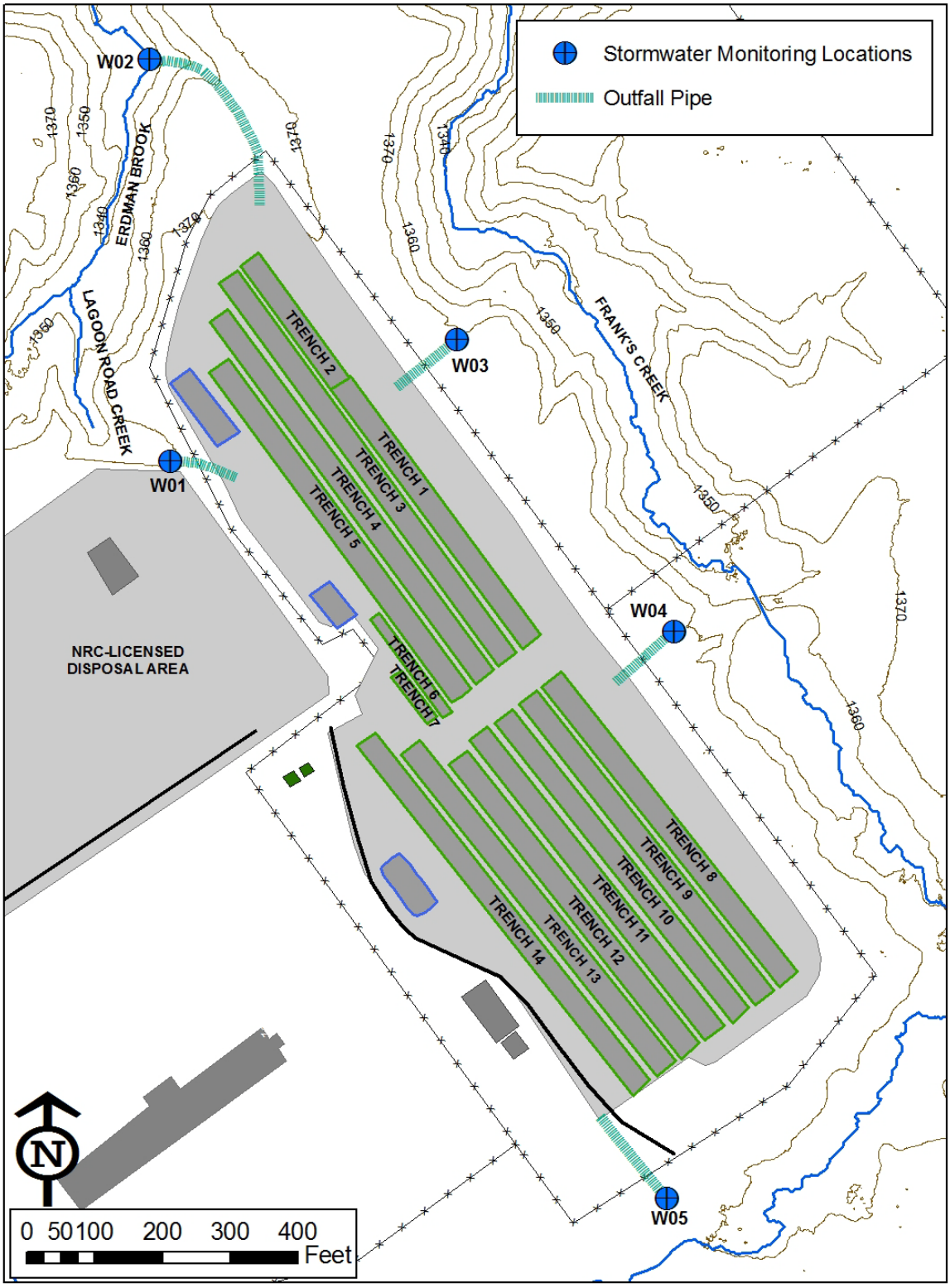
2.4 STORMWATER MONITORING

As required by the SDA State Pollution Discharge Elimination System (SPDES) Permit No. NY-026971, semiannual sampling is conducted at one of the five designated SDA stormwater outfalls (as shown in). During 2014, semiannual stormwater samples were collected from Outfall W01 during qualified storm events on April 22 and a nonqualifying storm event on July 7. The total rainfall for the July 7 rain event was 0.93 inches, which was not within 50 percent from the average rainfall event, therefore making it a "nonqualifying" event. However, the storm sampling event was accepted as qualifying because the majority of the permit requirements were met.

Composite samples from both events were analyzed for biological oxygen demand (BOD), chemical oxygen demand (COD), total nitrate-nitrite and total Kjeldahl nitrogen (TKN), total phosphorus, total suspended solids (TSS), gross alpha, gross beta, tritium and gamma spectroscopy. Grab samples from both events were analyzed for BOD, COD, total nitrate-nitrite and TKN, oil and grease, total phosphorus, TSS, pH, and temperature. Ambient rainfall samples from both events were analyzed for pH and temperature. Stormwater monitoring data for 2014 are reported in Tables C-7 and C-8.

Figure 2-5: Stormwater Monitoring Locations

Source: NYSERDA



2.4.1 Radiological Parameters

2.4.1.1 Gross Alpha

Gross alpha results from both semiannual sampling events were below the minimum detectable concentration (MDC). Statistical trend analysis for gross alpha results did not identify any significant trends. All results were below the 6 NYCRR 703.5 - Table 1 Water Quality Standards for Surface Waters and Groundwater (1.5E-08 µCi/mL), which is used as a comparative value for gross alpha.

2.4.1.2. Gross Beta

The gross beta result for the April 2014 sampling event (6.78E -09 µCi/mL) was above the reported MDC (1.86E -09 µCi/mL). The gross beta result for the July 2014 storm event (9.66E-08 µCi/mL) was also above the reported MDC (1.92E-09 µCi/mL). Statistical trend analyses for gross beta results did not identify any significant trends for either event. All gross beta results were below the 6-NYCRR 703.5 – Table 1 Water Quality Standards for Surface Waters and Groundwater (1.0E-06 µCi/mL), which is used as a comparative value for gross beta.

2.4.1.3 Tritium

Detectable tritium concentrations were measured in samples from both semiannual sampling events. The April and July 2014 results (2.12E-07µCi/mL and 1.53E-07 µCi/mL, respectively) exceeded the MDC for each sampling period (9.48E-08 µCi/mL and 8.32E-08 µCi/mL, respectively). Statistical trend analyses for tritium results from both sampling events did not identify any significant trends. All tritium results were below the 6-NYCRR 703.5 Table 1 Water Quality Standards Surface Waters and Groundwater (2.0E-05 µCi/mL), which is used as a comparative value for tritium.

2.4.1.4 Gamma Spectroscopy

The results for three gamma emitters (Cesium-137 [Cs-137], Cobalt-60 [Co-60] and Potassium-40 [K-40]) are reported for each stormwater sampling event. In addition, gamma spectroscopy results were reviewed for an additional 145 gamma-emitting radionuclides. During 2014, Cs-137, Co-60, and K-40 results were not above their respective MDC and no spectral peaks were identified for the remaining 145 gamma-emitting radionuclides.

2.4.2 Chemical and Physical Parameters

Results for all chemical and physical parameters were below the SPDES permit limits. As required by the SPDES permit, chemical and physical results were reported to NYSDEC's Division of Water in the Discharge Monitoring Report after each semiannual sampling event.

2.5 GAMMA RADIATION MONITORING

2.5.1 Overland Gamma Radiation Surveys

Gamma radiation surveys are performed semiannually at the SDA to maintain current data on gamma exposure levels and to monitor for changing conditions at the SDA.

As shown on Figure 2-6, radiation levels are measured at 51 fixed-survey locations in and around the SDA including:

- 32 monument markers located on the north and south ends of each trench (designated as T1s, T1n, etc.), and the three filled lagoons (SDA2, SDA3 and SDA4) to monitor the contribution of underground radioactive materials to the area radiation levels within the SDA.
- 16 SDA perimeter survey points (P-1 through P-16) marked on the chain-link fence surrounding the SDA to monitor external radiation from all sources, including the WVDP.
- One survey point (T-1) inside the T-1 Building. This location was previously used to track radiation levels from the stored Trench 14 leachate. Because the leachate was removed from the tank in 2009 and the Tank was removed in 2010, this measurement is taken in the middle of the now-vacant concrete tank pad.
- Two survey points (DC-[G] and DC-dr) at the WVDP Drum Cell, located west of the SDA, to provide the information on the radiation levels near the Drum Cell. Historically, waste in the Drum Cell created elevated radiation levels at nearby SDA monitoring points. Radiation levels have fallen since the waste was removed from the Drum Cell in 2007.

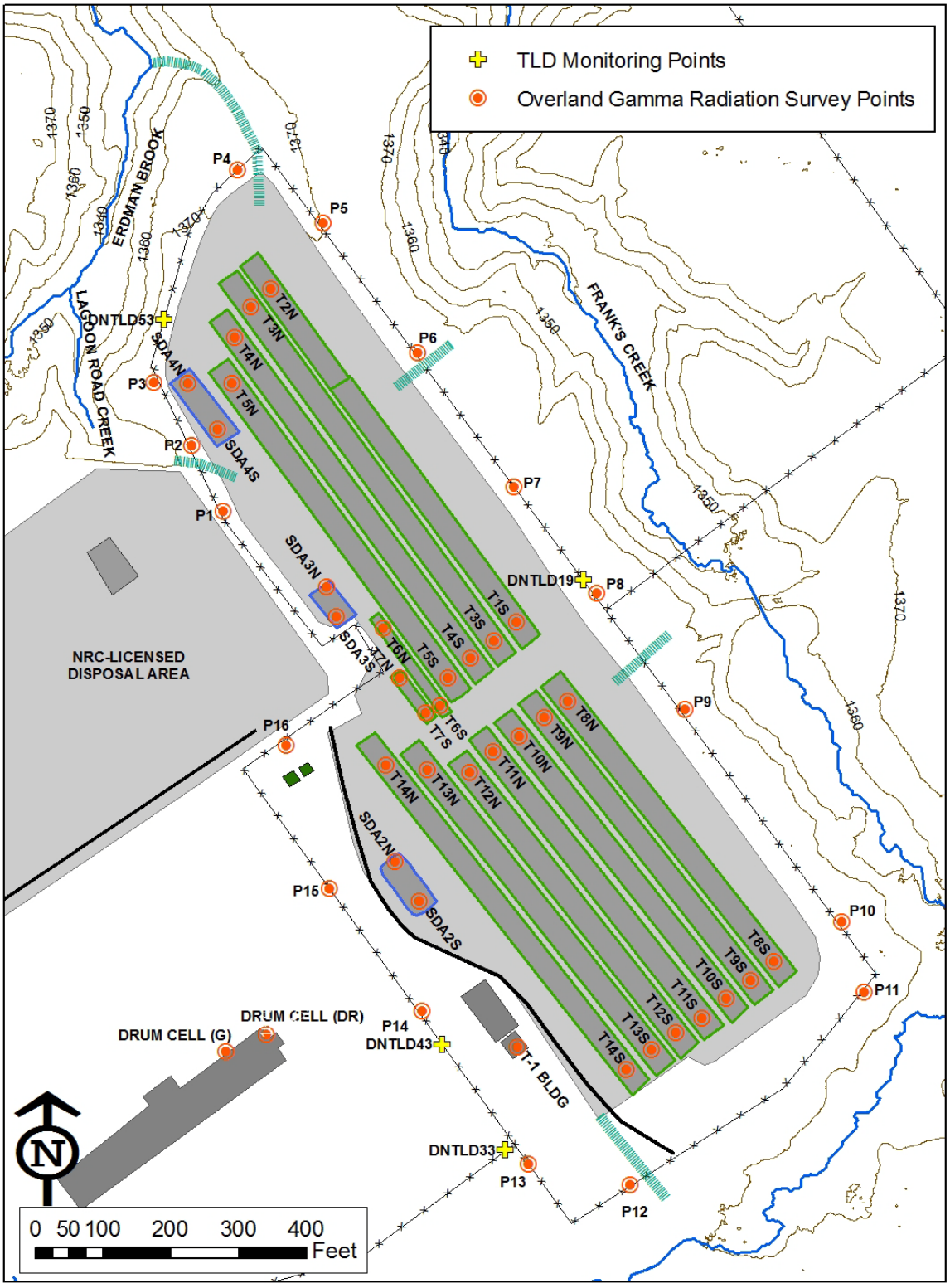
At each fixed survey point, radiation levels are measured at one meter and one centimeter above the ground, floor or building surface.

Radiation detection instruments are also monitored continuously between fixed-survey locations to identify any anomalous reading(s) exceeding three times those of the nearby fixed-survey monitoring points; any such fluctuations are noted on the survey report form. Survey readings for the 2014 semiannual surveys (April and September) are provided in Table D-1.

Gamma radiation levels observed during both of the semiannual surveys were consistent with recently reported data.

Figure 2-6. Gamma Radiation Monitoring Locations

Source: NYSERDA



2.5.2 Thermoluminescent Dosimetry Monitoring

Each calendar quarter, four environmental thermoluminescent dosimeters (TLDs) placed around the SDA are processed to obtain the integrated gamma radiation exposure from each location (see Figure 2-6). TLD monitoring locations DNTLD43 and DNTLD33 are located north and south of the SDA Tank Buildings, respectively, on the western SDA perimeter fence. DNTLD19 is located midway along the SDA east perimeter fence and is farthest from WVDP radiation sources. DNTLD53 monitors the northwestern corner of the SDA and is the closest to the WVDP and the NDA, which are potential sources of external radiation exposure. In addition to the on-site TLD locations, a background location, NYTLDBK, is located approximately 3.5 miles southwest of the SDA outside of the Ashford Office Complex. Environmental TLD monitoring results for 2014 are included in Table D-2.

Quarterly environmental TLD results for 2014 were first assembled and reviewed for completeness and accuracy, and to determine whether any data points (e.g., qualified results or other unique results) merited special handling prior to the statistical assessment. There was an instance in 2014 where the data set was considered uncertain and qualified with a "J" code (analyte identified). Delivery of the exposed first quarter 2014 (1Q14) TLDs was inadvertently delayed by the United States Postal Service by approximately six weeks. Upon receipt of the shipment, the TLD provider examined the TLDs and did not identify any damage to the TLDs; therefore, the TLDs were read and reported, consistent with routine practices.

Due to the increased transit exposure time and the additional handling and transport conditions, the quarterly measurement results were qualified with a "J" code. Results of the adjusted 1Q14 exposures were generally similar to results from previous quarters. The result for DNTLD43 was also lower than background, which has been observed many times in the recent past. No notable statistical exceedances or trends were identified, and all of the reported 1Q14 environmental TLD data are considered acceptable and usable.

Various outlier tests were performed for the 2014 results for each location and no outliers were confirmed. Also, similar outlier tests were performed at the time of quarterly reporting, and no outliers were confirmed; therefore, no results were removed from the 2014 data set.

The results of the statistical tests show that radiation exposures for DNTLD 19, 33, 43, and 53 were consistent with background in 2014. This statistical outcome is generally consistent with the quarterly results reported throughout 2014 and what is known about radiation exposure conditions at and near the

SDA. The statistical results are generally different from those reported prior to 2011, at least in part because exposure conditions have been changing at and near the SDA. Most notably, the nearby Drum Cell wastes were removed in 2007, infiltration control measures were installed at the nearby NDA in 2008, leachate was removed from SDA Tank T-1 in 2009 and the tank was removed in 2010. No activities were performed at or near the SDA in 2014 that would have been expected to affect routine ambient radiation exposure.

2.5.3 Meteorological and Stream Flow Monitoring

NYSERDA operates and maintains a suite of meteorological instruments at the SDA, including instruments to measure total precipitation (i.e., rain, snow and sleet); temperature; relative humidity; barometric pressure; wind speed; and wind direction. The instruments are equipped with a battery-powered backup system to ensure data continuity during power outages. Quarterly daily precipitation at the SDA is provided in Tables E-1, E-2, E-3 and E-4. There were no interruptions in meteorological data collection in 2014.

NYSERDA operates and maintains a water elevation stage recorder on Buttermilk Creek at Thomas Corners Road Bridge (near the confluence with Cattaraugus Creek) to measure stream flow.

Data are logged at these stations every ten minutes and transmitted via cellular modem to NYSERDA's offices. NYSERDA maintains an interactive meteorological and stream flow database on the internet at: (https://wqdatalive.com/public/334).

3 EROSION MONITORING

In accordance with the requirements of the Part 380 Permit #9-0422-00011/00011, NYSERDA has established a comprehensive erosion monitoring program at the SDA, inclusive of the surrounding slopes and streams. The objective of the program is to monitor active erosion processes that could threaten the integrity of the SDA. The monitoring ensures that erosion features are clearly identified, inspected, quantified, and, if necessary, mitigated before erosion damage can occur at the SDA.

3.1 Visual Inspections

3.1.1 General Visual Inspection of the SDA

The SDA and the surrounding land, slopes, gullies and streams are inspected for erosion at least five times per year under NYSERDA's *Walkover Inspection of the SDA* procedure. Wherever erosion is observed, WVSMP staff determine whether maintenance, mitigation and/or additional monitoring are necessary. Additional unscheduled inspections are conducted after abnormally large precipitation events (>2.5 inches/24 hours) to check for significant erosion or mass wasting. Field observations are documented and follow-up actions, if necessary, are tracked using NYSERDA's dedicated maintenance log database.

NYSERDA conducted five regularly scheduled SDA walkover inspections in 2014.

3.1.2 Visual Inspections of Surrounding Stream Channels

In 2014, NYSERDA conducted visual inspections of the creeks that flow around three sides of the SDA (Erdman Brook, Frank's Creek and Lagoon Road Creek) monthly, as well as immediately following several large precipitation events. Stream channel inspections included inspections of installed erosion control structures. No adverse erosion impacts to stream channels or to erosion control structures were identified in 2014.

3.1.3 Quantitative Measurements

Survey data for the North Slope and Trench Cap was collected on November 5 and 13, 2014 by Clear Creek Land Surveying, LLC. Survey data contained herein is being reported in North American Datum (NAD 27) for horizontal positioning, and the National Geodetic Vertical Datum (NGVD 29) for vertical positioning or elevation.

3.1.3.1 North Slope Survey

In accordance with the requirements of the Part 380 Permit #9-0422-00011/00011, NYSERDA conducts an annual elevation survey of the ground surface at established points on the SDA North Slope of the SDA to detect slope movement. The survey and periodic field inspections of the North Slope area during 2014 confirmed no reportable horizontal or vertical movement (e.g., slumping).

The 2014 elevations of the North Slope monitoring points (see Figure 3-1) are provided in Table F-1. A comparison of the 2014 elevation data with the 2013 data did not show any reportable changes (>0.5 feet) in the elevations of the monitoring points. A few of the numeric location points absent from Table F-1 are due to the physical point markers being damaged and removed during erosion mitigation construction activities.

3.1.3.2 SDA Trench Cap Survey

NYSERDA also surveys the ground surface elevations along the SDA trench centerlines and monuments to monitor for trench cap settlement. NYSERDA has established fixed-trench cap elevation survey points that are easily surveyed from year to year. The annual results are compared to the previous year's data for indications of trench cap subsidence. A map identifying the location of the trench cap elevation survey points is shown in Figure 3-2.

All trench cap surveys begin at the centerline mark of the south monument plaque, and continue northerly at 100-ft stationing along the centerline of the trench until reaching the centerline mark of the north monument plaque. Results of the trench cap survey are provided in Table F-2. A comparison of the 2014 trench cap centerline elevations with 2013 elevation data did not indicate any significant elevation changes (>0.5 feet). An area of settlement on the southern portion of Trench 13 was observed in 2013. Two points in the area were initially surveyed in 2013 for horizontal and vertical positioning, and when compared to data for the same points in 2014, it was confirmed that subsidence in the trench cap was 0.5 inch. Also in 2014, NYSERDA conducted a focused topographic survey of 70 additional data points in the area between the southern monument on Trench 13 and the 100 ft-stationing mark. NYSERDA will monitor these additional data points on a quarterly basis and report any significant results to NYSDEC.

Figure 3-1. North Slope Ground Surface Elevation Survey Points

Source: NYSERDA

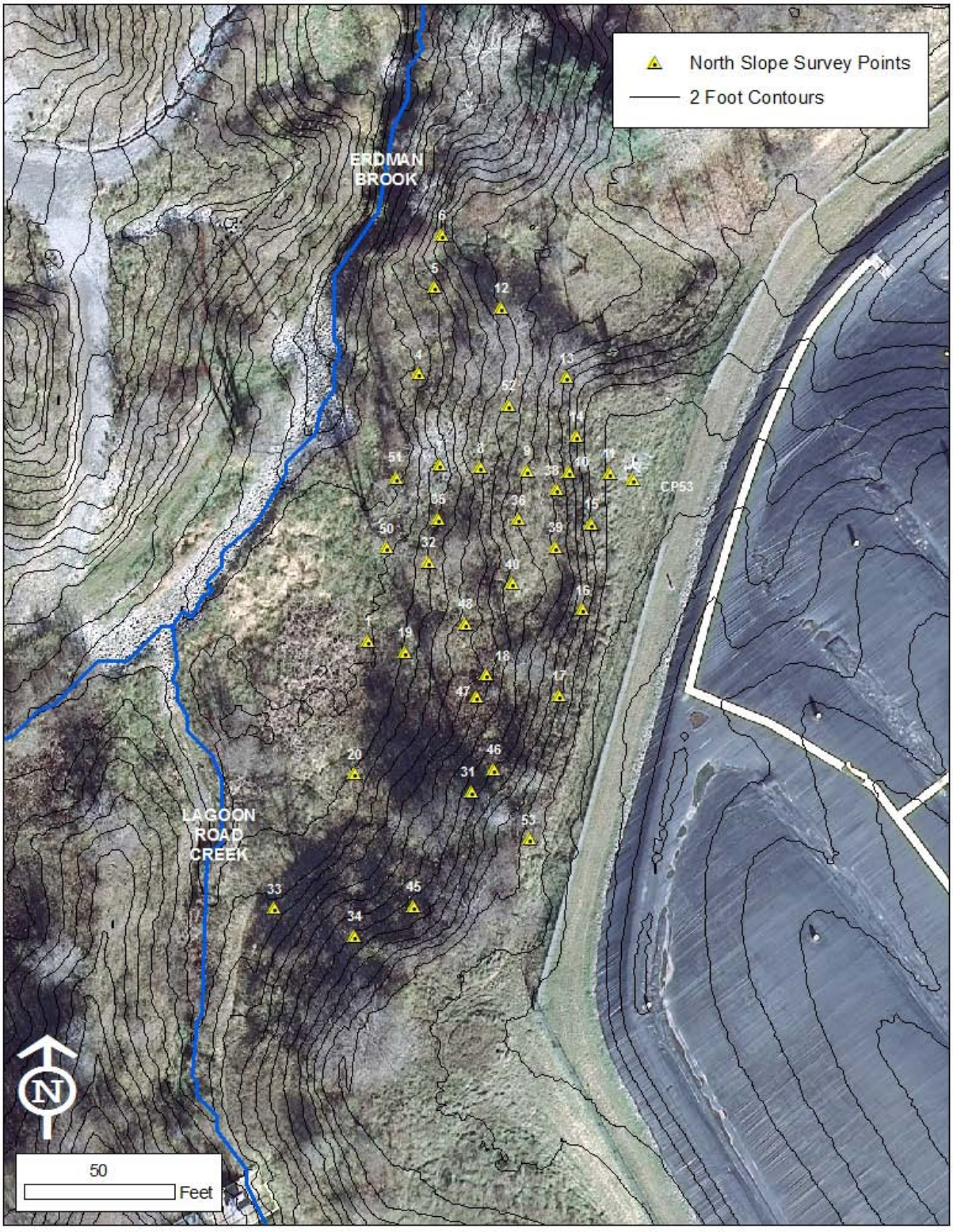
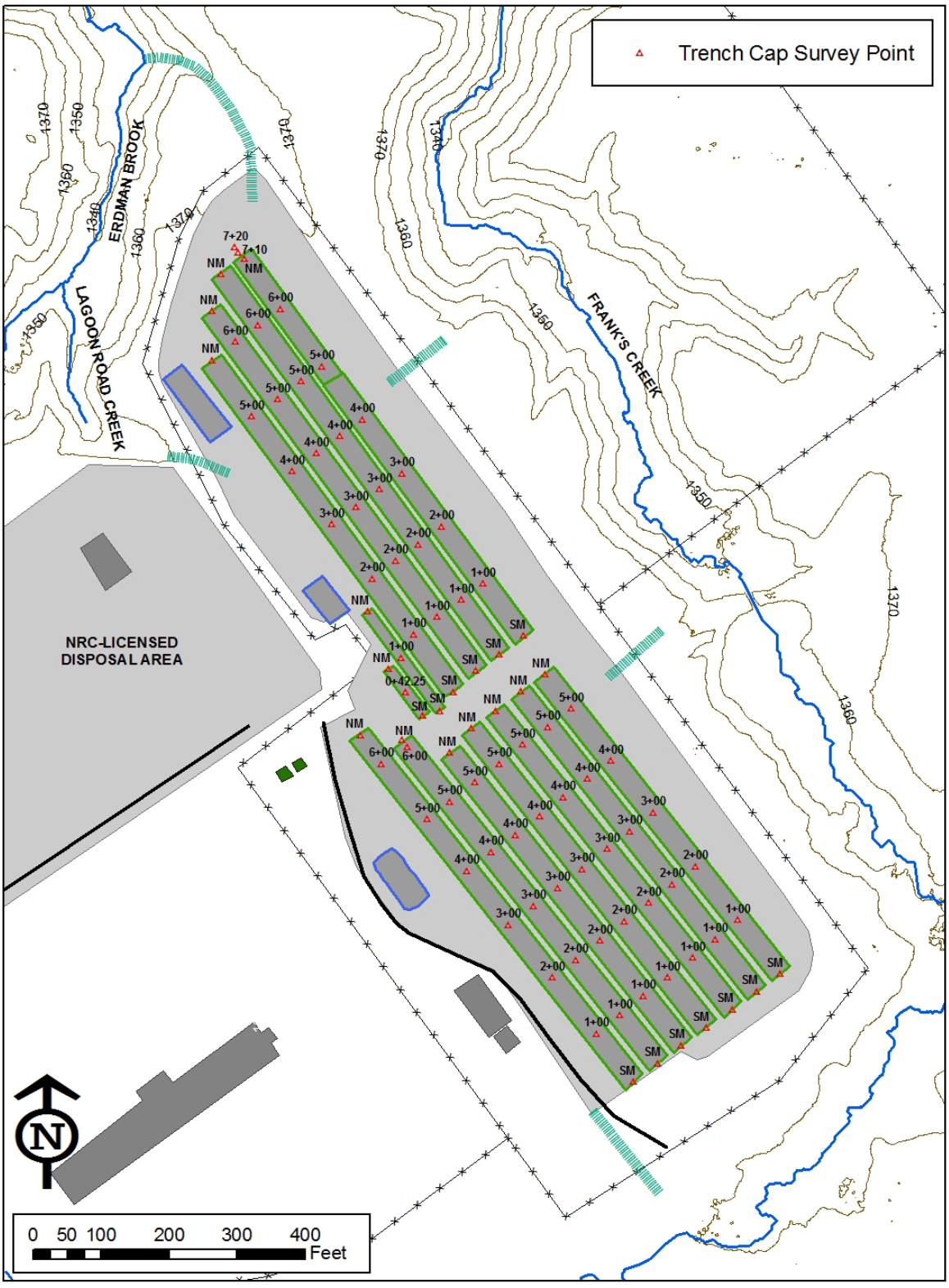


Figure 3-2. Trench Cap Ground Surface Elevation Survey Points

Source: NYSERDA

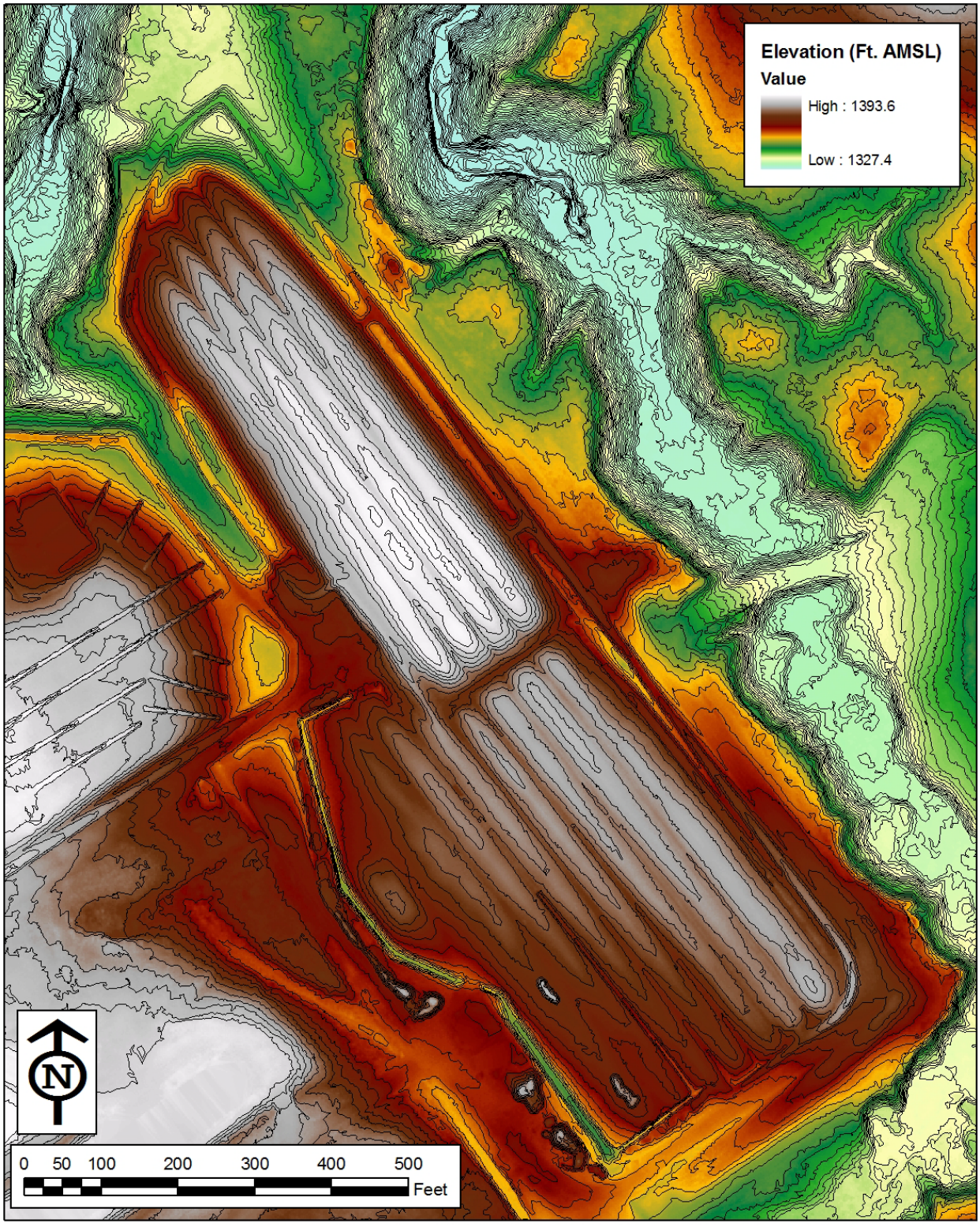


3.1.4 LiDAR Mapping and Orthophotography

In 2010, NYSERDA conducted an aerial Light Detection and Ranging (LiDAR) mapping and orthoimagery project. A detailed topographic map of the Buttermilk Creek watershed was developed with a resolution (grid size) of 1.0 meter. For the WNYNSC and the SDA, a resolution of 0.5 meters was achieved. Figure 3-3 is a high quality topographic map of the SDA and the surrounding area that was derived from a subset of the LiDAR data. This project represents the most accurate and comprehensive large-scale topographic mapping of the SDA ever completed. NYSERDA plans to fly a new LiDAR survey in 2015 to update and supplement the 2010 survey of the Buttermilk Creek watershed. The survey will extend to include the neighboring Connoisarauley Creek watershed and the Cattaraugus Creek corridor from the WNYNSC to Lake Erie.

Figure 3-3: LiDAR-Derived Topographic Map of the SDA and Surrounding Area

Source: NYSERDA



4 FACILITY OPERATIONS AND MAINTENANCE

NYSERDA is responsible for the safety, operations and maintenance of the buildings and grounds at the SDA. Both routine and nonroutine facility inspections and maintenance activities are implemented to ensure that the facility is operating as designed. In 2014, facility operations and maintenance at the SDA included:

- Inspections and Testing.
- Maintenance.
- Engineer's Report to address the life expectancy of the originally installed XR-5 Geomembrane Cover on Trenches 1 through 12 (excluding Trench 9).

4.1 Inspections and Testing

NYSERDA actively maintains the facilities at the SDA through routine inspections and testing of all physical and mechanical systems, followed by prompt corrective actions, as needed. All inspections are documented on standard forms and maintained as WVSMP records. Any deficiencies noted during these inspections and tests are tracked in the WVSMP Maintenance Log, scheduled for completion and closed out in a timely manner.

In 2014, NYSERDA completed the following inspections and tests:

- Monthly SDA Building inspections.
- Monthly and annual fire extinguisher inspection and testing.
- Five walkover inspections of the entire SDA, and surrounding slopes and streams.
- Annual geomembrane cover system inspection.
- Five-year physical property testing of the geomembrane cover.

All systems and operations at the SDA are performing as designed.

4.2 Maintenance

In 2014, NYSERDA completed the following routine and preventative maintenance at the SDA:

- Repaired miscellaneous punctures and tears on the XR-5 geomembrane covers, including the replacement of several sections of deteriorated walkway.
- Snowplowing and vegetation control at the SDA and Bulk Storage Warehouse.
- Supported tasks for the annual deer hunting program on the WNYNSC (see Figure 4-1).
- Repaired approximately 25,000 ft of barbed wire fencing on the Retained Premises, and posted the perimeter with new “No Trespassing” signs.

- Cleared approximately 15,000 linear ft of brush and woody vegetation on each side of the Retained Premises fence.

NYSERDA completed the following nonroutine maintenance activities at the SDA in 2014:

- Diagnosed and repaired the meteorological station.
- Removed obsolete electrical panels and conduit from within the SDA T-1 Building (see Figure 4-2).
- Repaired the roof leak in SDA T-1 Building and installed new insulation.
- Replaced the wooden walkways at the SDA.
- Replaced the nonslip textured walkway on the SDA Geomembrane.
- Leveled the concrete steps at the SDA.
- Extended the stormwater roof leader from the SDA Buildings to provide proper drainage.
- Performed minor maintenance and inspections of the Erdman Brook erosion controls.
- Performed electrical service maintenance at the SDA.
- Performed a Focused Topographic Survey of southern end of Trench 13 geomembrane cap to evaluate Trench 13 subsidence.

All nonroutine maintenance actions are tracked from start to finish in the WVSMP maintenance log database.

4.2.1 Geomembrane Cover Inspection and Repair

In June 2014, a drainage swale on the SDA geomembrane cover north of Trenches 13 and 14 was inspected for rips and weld integrity. During an inspection, the drainage swale containing stone ballast was emptied of stone and found to contain an open seam approximately eight ft long (see Figure 4-3). It appears that the seam was not properly welded (sealed) at the time this section of the geomembrane cover was installed in 1995; however, it is not possible to determine exactly when this seam failed (see Figure 4-3). The seam does not appear to have been physically disturbed or stressed. The entire 34-ft-long drainage swale was covered with new geomembrane material that was welded to the existing geomembrane in a manner that eliminated the seam in the bottom of the swale.

4.3 Engineered Construction Projects

4.3.1 Frank's Creek Erosion Mitigation Design

NYSERDA completed the stream restoration and enhancement activities along the Frank's Creek corridor in October 2013. As part of the regulatory requirements set forth in the U.S. Army Corp of Engineers (USACOE) wetland permit (Nationwide Permit #27), NYSERDA was required to photo-document the vegetative growth at one-month and one-year post-construction intervals. NYSERDA submitted the one-

year post-construction documentation required by USACOE on November 12, 2014, effectively closing out the wetland disturbance permit for this erosion mitigation project.

Figure 4-1. Tree Trimming by National Grid

Source: NYSERDA

Figure 4-2. SDA Electrical Inspection Repairs

Source: NYSERDA

Figure 4-3. Open seam in SDA geomembrane.

Source: NYSERDA

5 WASTE MANAGEMENT

NYSERDA has developed and implemented both systems and procedures to manage the SDA in a manner that minimizes the generation of radioactive or hazardous waste.

In 2014, waste management at the SDA included:

- Inspections.
- Waste generation and storage.

5.1 Inspections

In 2014, NYSERDA completed four waste inspections. No deficiencies were noted during these inspections.

On February 9, 2012, NYSERDA submitted a protective filing certification and supporting documentation for Tanks T-2 and T-3 located within the Frac Tank Building at the SDA. On April 24, 2012, NYSDEC approved NYSERDA's Protective Filer Certification for the unused portion of the Leachate Treatment Facility (two Frac tanks); and with the combined clean-closure certification and approval of protective filing status, NYSERDA has no further closure actions to complete. NYSERDA is currently awaiting an amendment of the operational status of this unit to "no further action."

5.2 Waste Removal and Disposal

NYSERDA is not a routine generator of waste. No low-level radioactive or hazardous wastes were generated in 2014.

The total volume of waste currently in storage is 0.16 m^3. This waste is low-level radioactive waste.

6 SUMMARY – 2014 PERFORMANCE

As discussed in the narrative and shown in the supporting figures and data tables, the SDA continues to perform well under active management by the WVSMP. The 2014 environmental monitoring data (from groundwater, surface water, stormwater, and gamma radiation measurements) indicate radioactive and/or chemical constituents in the SDA trenches are being effectively contained. The subsurface barrier wall located along the west side of the southern trenches and the geomembrane cover are generally effective at keeping water out of the SDA trenches, although increases in Trenches 1 and 14 are being evaluated. Inspections indicate that slopes surrounding the SDA and the trench caps remain stable, and the additional erosion control measures are keeping the stream channels and slopes stable. WVSMP operations and maintenance actions keep SDA systems functioning properly, and the grounds in good condition.

A Part 380 Permit inspection was conducted on November 12 and 13, 2014; and due to severe winter weather, was completed on December 2, 2014. The inspection included a records review, visual walkover inspection of the facility and surrounding slopes and streams, and surface water and soil sample collection. The inspector noted that NYSERDA operations at the SDA were in compliance with Part 380 regulations and the conditions of the permit.

Appendix A – Trench Leachate Elevation Data

Table A-1. 2014 Trench Leachate Elevation Data

Elevations are referenced to the National Geodetic Vertical Datum (NGVD) of 1929.

Source: NYSERDA

Trench	Jan. 6	Feb. 4	March 6	April 1	May 1	May 28
Trench 1			1365.75			1365.76
Trench 2			1361.06			1361.02
Trench 3			1360.38			1360.38
Trench 4			1362.76			1362.76
Trench 5			1363.32			1363.30
Trench 8			1361.45			1361.42
Trench 9			1360.61			1360.57
Trench 10s			1360.77			1360.76
Trench 10n			1361.68			1361.61
Trench 11			1360.40			1360.35
Trench 12			1361.11			1361.11
Trench 13	1363.72	1363.58	1363.62	1363.61	1363.59	1363.56
Trench 14	1365.96	1365.97	1365.93	1365.93	1366.00	1366.00
Wp-91	1366.00	1366.00	1365.90	1365.91	1365.92	1365.94

Table A-1 continued

Trench	July 2	August 4	Sept. 3	October 1	Nov. 4	Dec. 2
Trench 1			1365.76			1365.75
Trench 2			1361.01			1361.03
Trench 3			1360.39			1360.39
Trench 4			1362.75			1362.72
Trench 5			1363.28			1363.30
Trench 8			1361.40			1361.39
Trench 9			1360.55			1360.54
Trench 10s			1360.73			1360.73
Trench 10n			1361.63			1361.64
Trench 11			1360.35			1360.34
Trench 12			1361.12			1361.10
Trench 13	1363.56	1363.54	1363.54	1363.53	1363.52	1363.54
Trench 14	1366.00	1366.03	1365.99	1365.99	1366.03	1366.02
Wp-91	1365.94	1365.95	1365.93	1365.97	1365.99	1366.00

Figure A-1. 2005-2014 Leachate Elevations, Trench 1

Source: NYSERDA

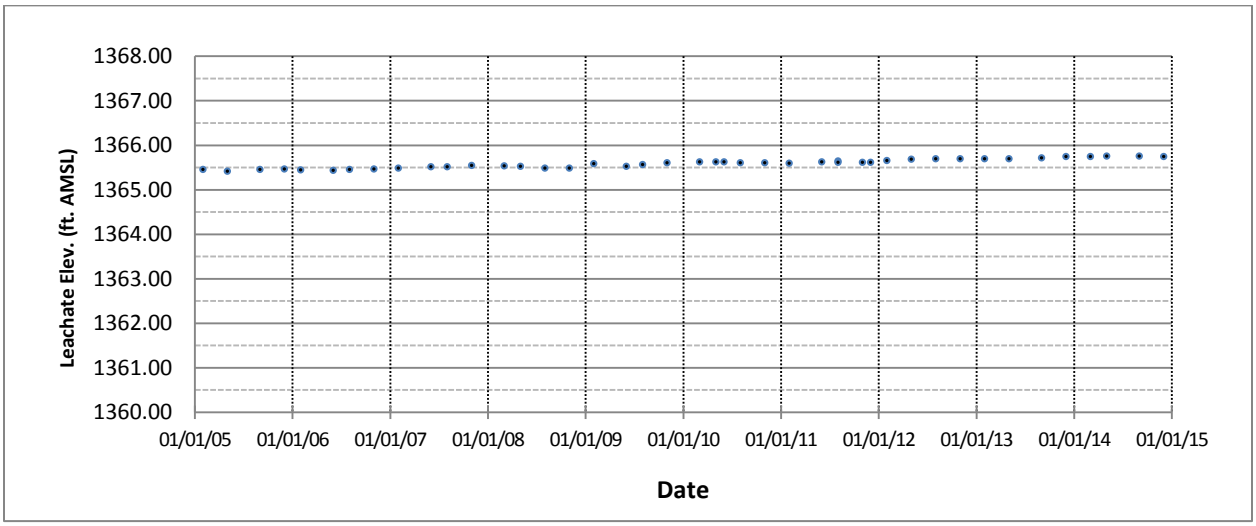


Figure A-2. 2005-2014 Leachate Elevations, Trench 2

Source: NYSERDA

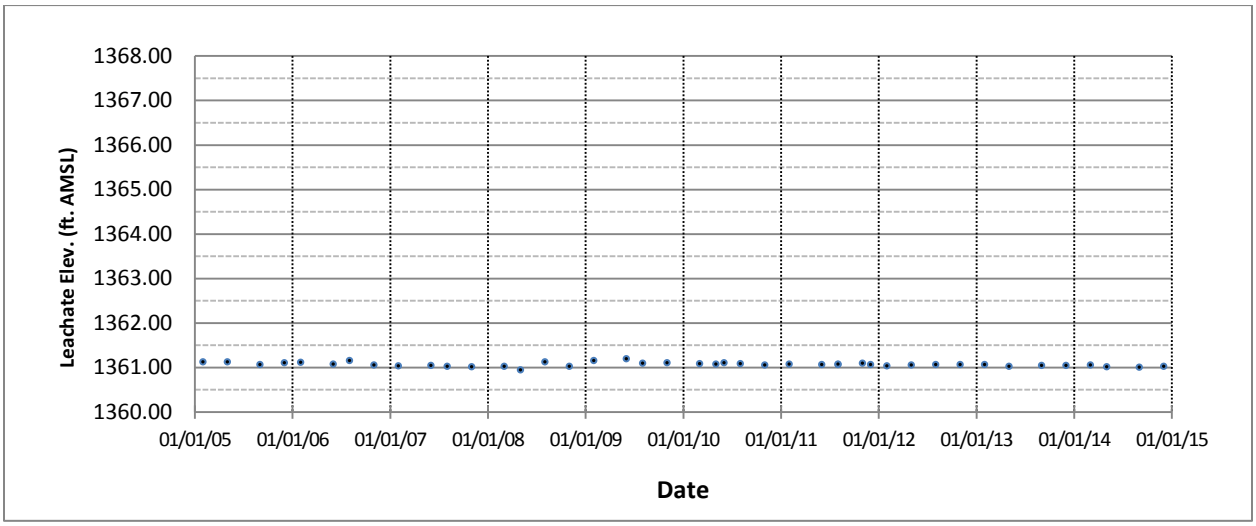


Figure A-3. 2005-2014 Leachate Elevations, Trench 3

Source: NYSERDA

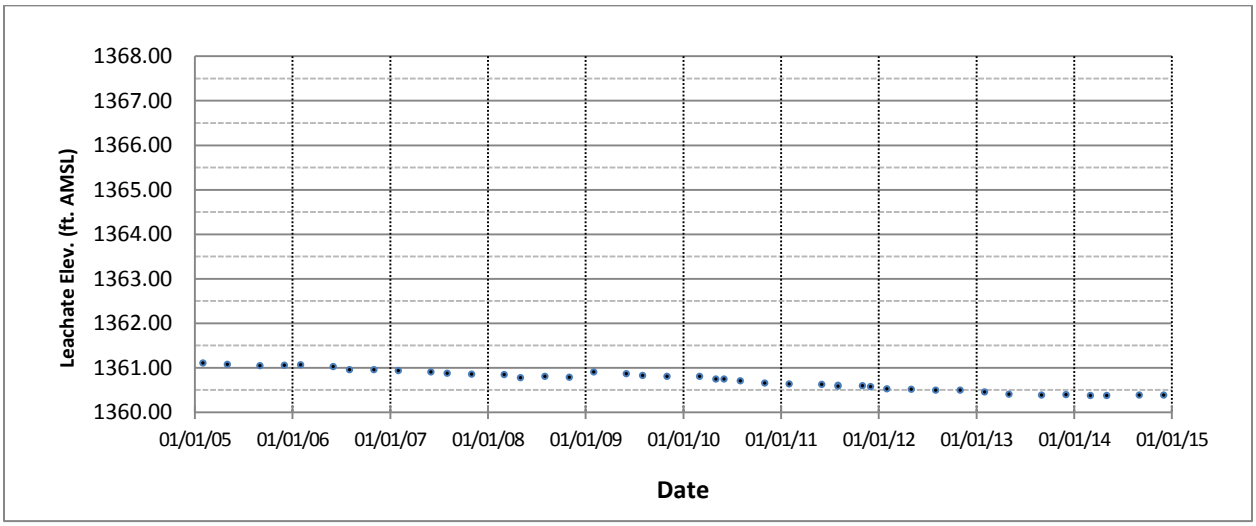


Figure A-4. 2005-2014 Leachate Elevations, Trench 4

Source: NYSERDA

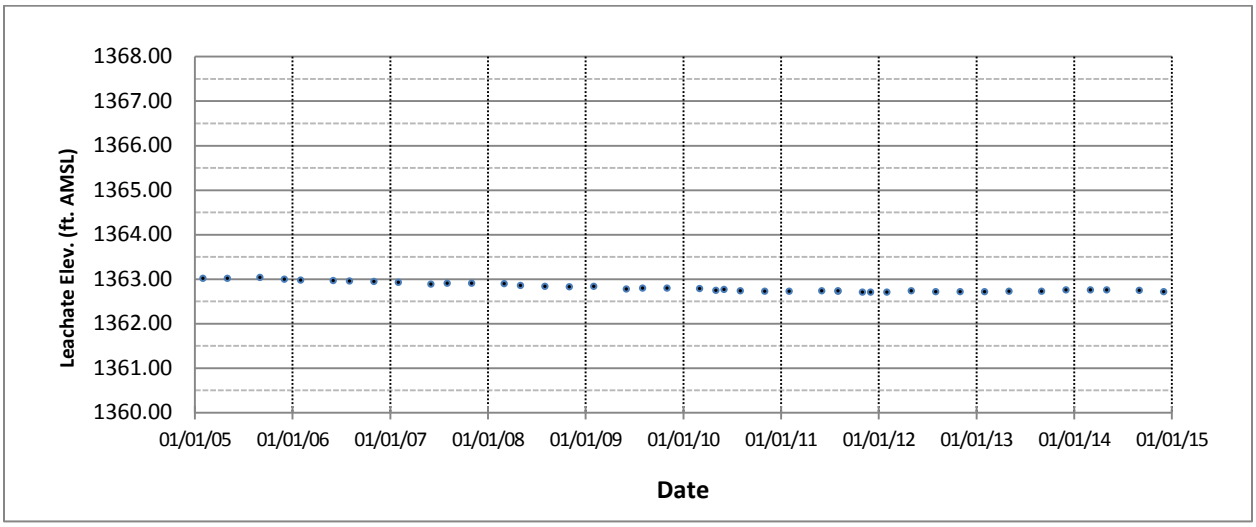


Figure A-5. 2005-2014 Leachate Elevations, Trench 5

Source: NYSERDA

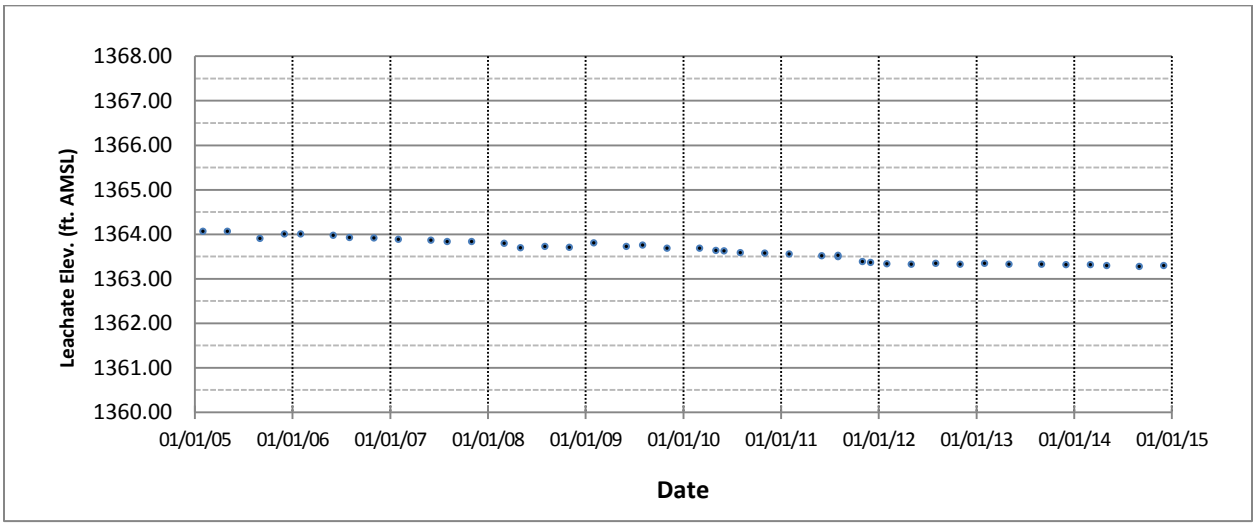


Figure A-6. 2005-2014 Leachate Elevations, Trench 8

Source: NYSERDA

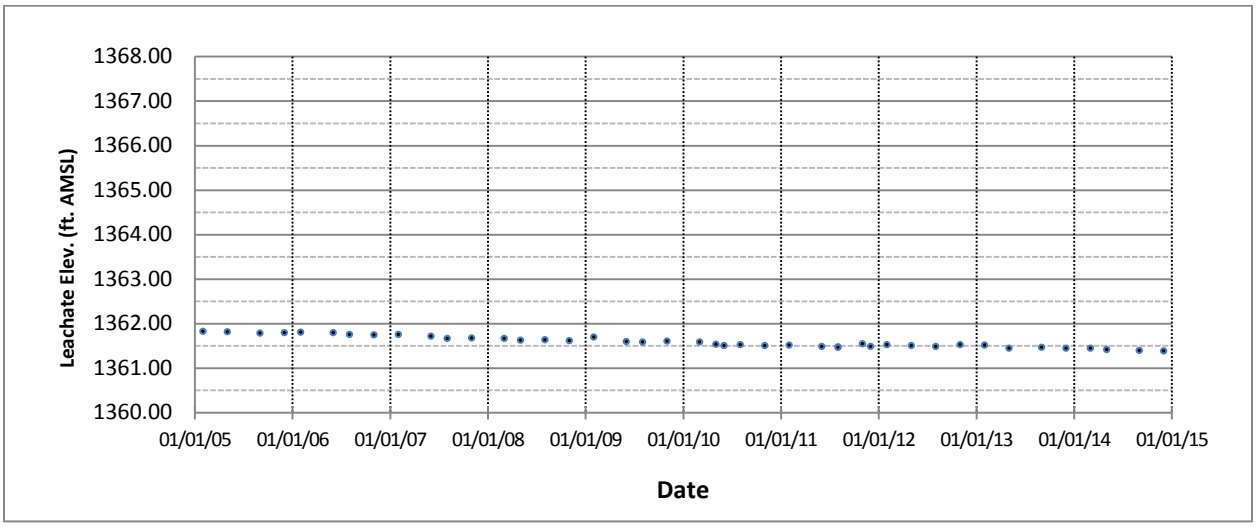


Figure A-7. 2005-2014 Leachate Elevations, Trench 9

Source: NYSERDA

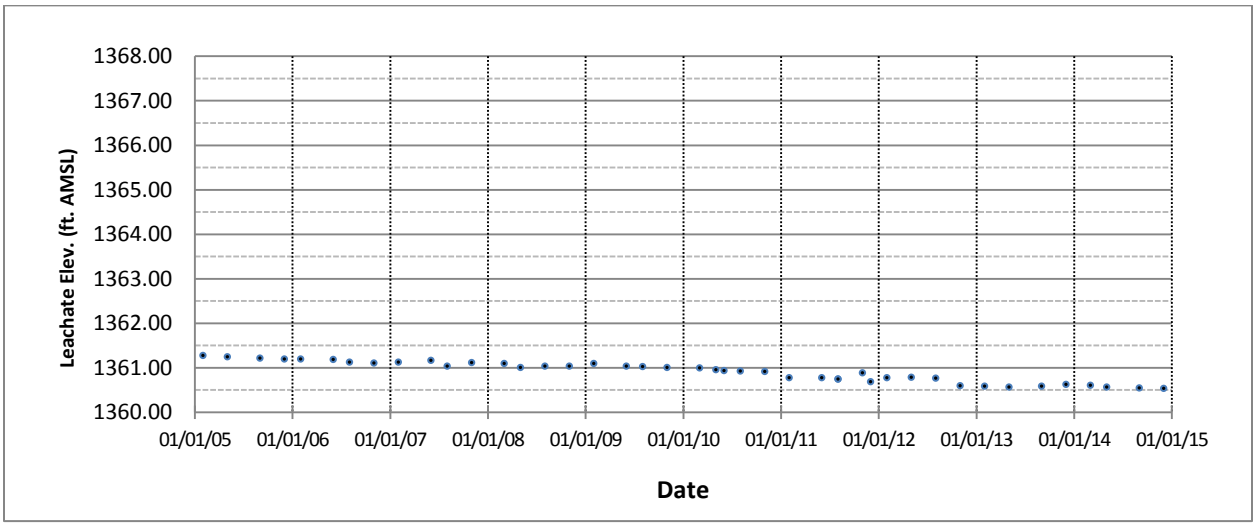


Figure A-8. 2005-2014 Leachate Elevations, Trench 10N

Source: NYSERDA

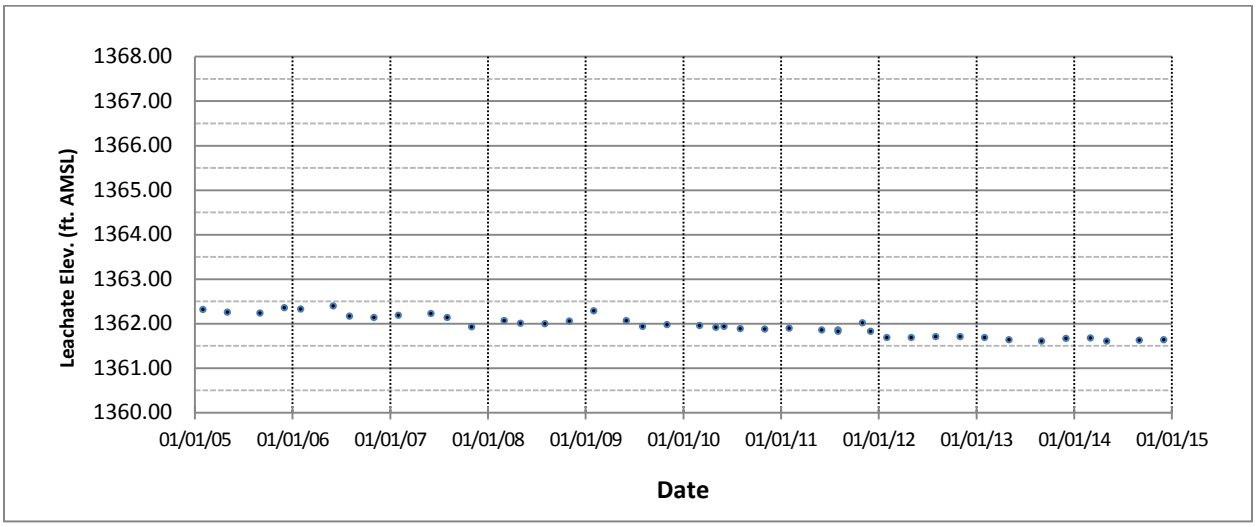


Figure A-9. 2005-2014 Leachate Elevations, Trench 10S

Source: NYSERDA

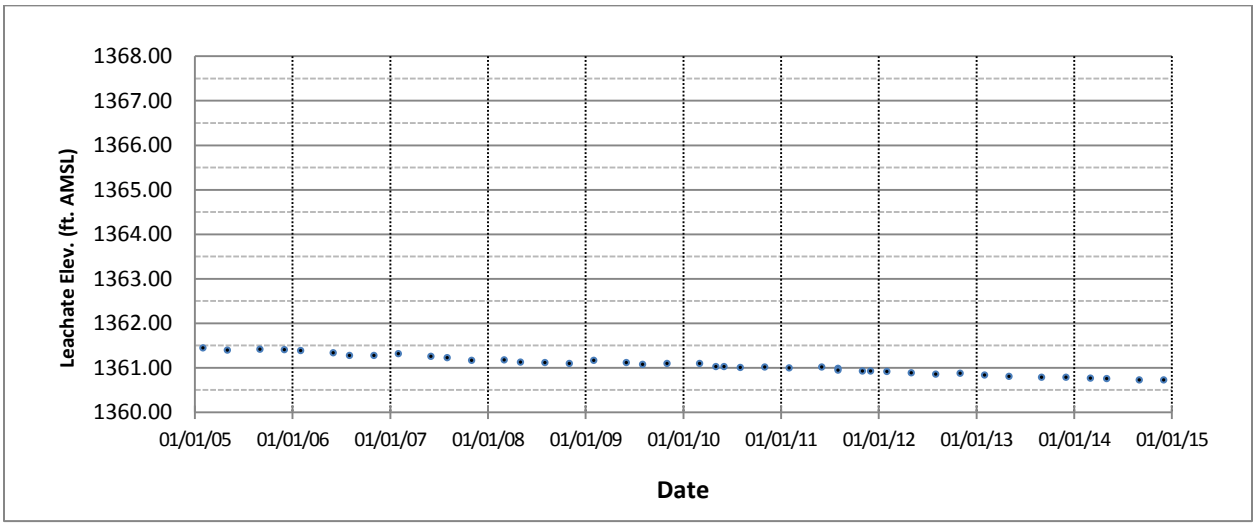


Figure A-10. 2005-2014 Leachate Elevations, Trench 11

Source: NYSERDA

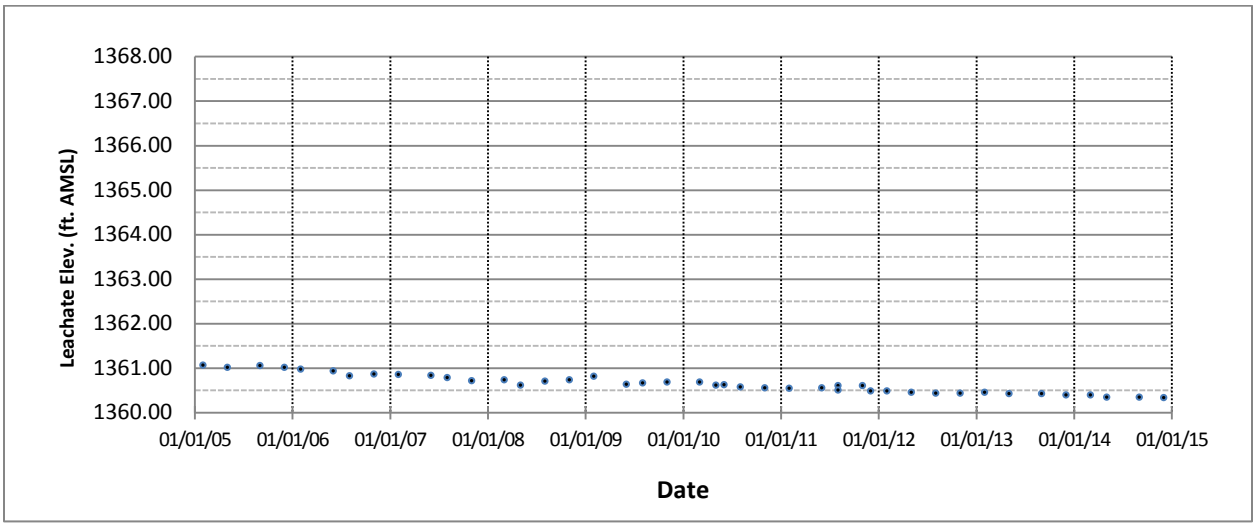


Figure A-11. 2005-2014 Leachate Elevations, Trench 12

Source: NYSERDA

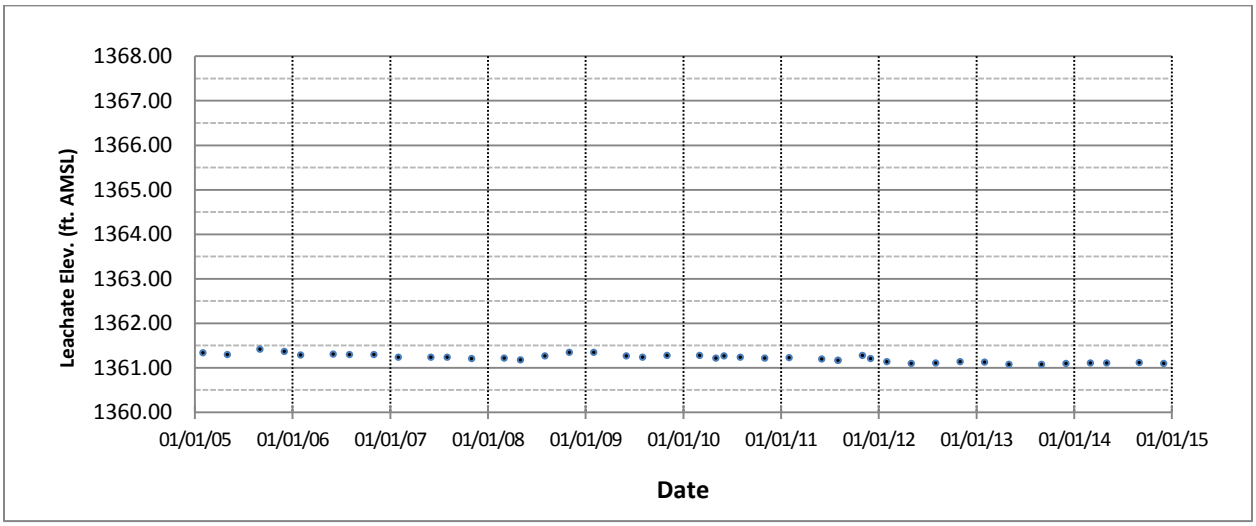


Figure A-12. 2005-2014 Leachate Elevations, Trench 13

Source: NYSERDA

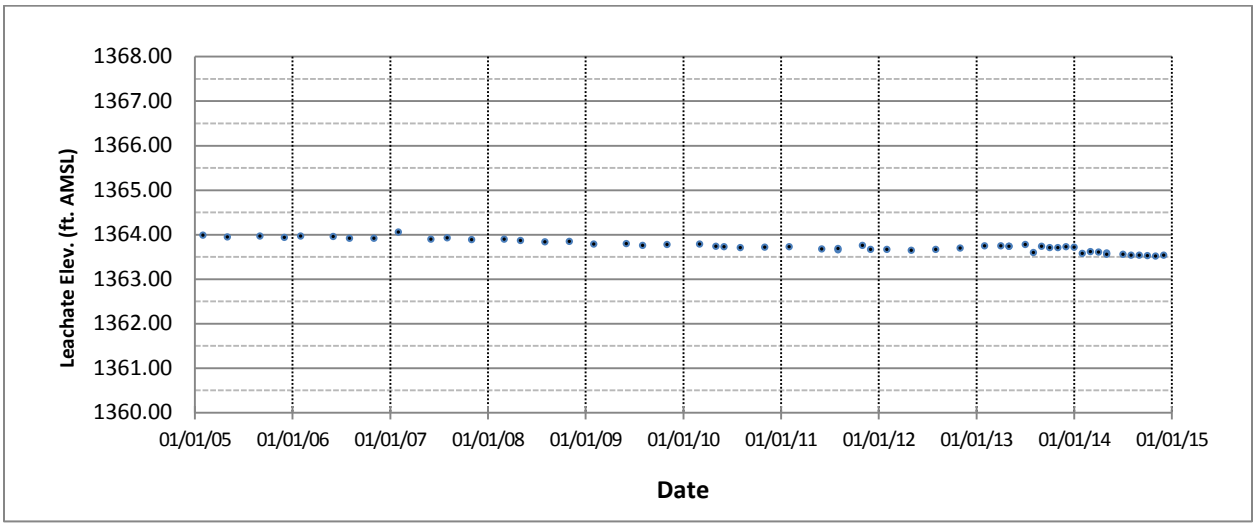
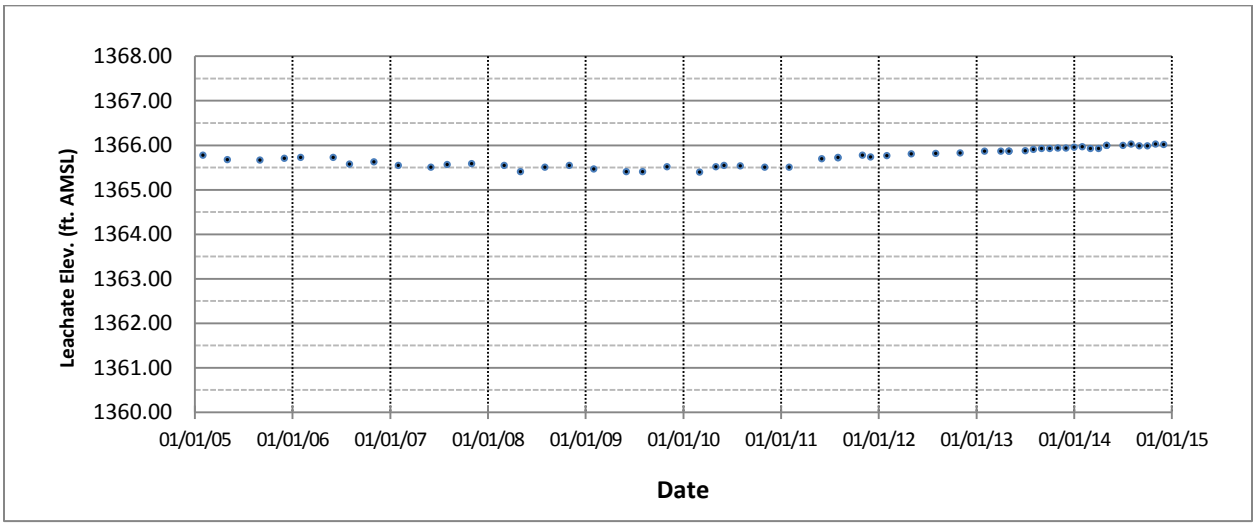


Figure A-13. 2005-2014 Leachate Elevations, Trench 14

Source: NYSERDA



Appendix B – Groundwater Monitoring

Table B-1. Groundwater Monitoring Well Summary – SDA 1100 Series Wells

No table of figures entries found.Well depths are rounded. Elevations are referenced to the National Geodetic Vertical Datum (NGVD) of 1929 and based on well construction details.

Source: NYSERDA

Well	Well Depth (ft BGS)	Well Bottom Elevation (ft AMSL)	Screened Interval Elevations (ft AMSL)	Geologic Unit Screened
1101A	16	1363.46	1363.88 - 1373.88	W/U
1101B	30	1349.51	1349.93 – 1359.93	U
1101C	109	1270.22	1270.64 - 1285.64	L
1102A	17	1365.80	1366.22 - 1376.22	W/U
1102B	31	1351.68	1352.10 - 1362.10	U
1103A	16	1363.99	1364.41 – 1374.41	W/U
1103B	36	1343.92	1344.34 - 1359.34	U
1103C	121	1258.60	1259.02 - 1274.02	L/O
1104A	19	1357.21	1357.63 – 1372.63	W/U
1104B	36	1340.19	1340.61 - 1355.61	U
1104C	124	1252.05	1252.47 - 1262.47	L/O
1105A	21	1344.90	1345.32 - 1355.32	U
1105B	36	1330.53	1330.53 - 1345.53	U
1106A	16	1358.45	1358.87 – 1368.87	W/U
1106B	31	1343.71	1344.13 - 1354.13	U
1107A	19	1358.26	1358.68 – 1373.68	W/U
1108A	16	1365.02	1365.44 - 1375.44	W/U
1109A	16	1358.95	1359.37 - 1369.37	W/U
1109B	31	1343.11	1343.53 - 1358.53	U
1110A	20	1357.14	1357.56 - 1367.56	W/U
1111A	21	1359.31	1359.73 - 1369.73	U

Key:

L	Lacustrine Unit (Kent recessional sequence)
L/O	Lacustrine/Outwash - Kame Sand and Gravel (Kent recessional sequence)
U	Unweathered Till
W/U	Weathered/Unweathered Till

Table B-2. 2014 Groundwater Elevations - SDA 1100-Series Wells – (Feet Above Mean Sea Level)

Elevations are referenced to the National Geodetic Vertical Datum (NGVD) of 1929. Entries are blank for locations/dates for which water elevation was not measured.

Source: NYSERDA

Well	Feb. 4	March 6	April 1	May 1	May 28	July 2
1101A	1376.87	1377.28	1378.00	1378.14	1377.95	1371.43
1101B	1362.12	1363.45	1363.68	1363.84	1363.80	1355.97
1101C	1282.00	1281.94	1282.17	1282.40	1282.36	1282.36
1102A		1379.30			1379.74	
1102B		1367.36			1367.38	
1103A		1378.71			1379.11	
1103B		1365.92			1365.68	
1103C		1259.95			1260.05	
1104A		1373.31			1374.08	
1104B		1362.15			1362.47	
1104C		1253.61			1253.92	
1105A		1354.10			1355.89	
1105B		1339.83			1341.24	
1106A	1370.73	1371.36	1372.19	1372.06	1371.64	1366.96
1106B	1358.03	1357.68	1357.38	1357.42	1357.51	1355.51
1107A		1369.00			1369.80	
1108A	1373.59	1374.64	1375.65	1376.61	1376.71	1370.10
1109A	1363.16	1362.96	1362.89	1362.90	1363.24	1361.71
1109B	1363.18	1362.91	1362.91	1362.99	1363.28	1361.89
1110A		1359.68			1359.41	
1111A		1377.60			1378.02	

Table B-2 continued.

Well	Aug. 4	Sept. 3	Oct. 1	Nov. 4	Dec. 2
1101A	1376.23	1377.07	1376.44	1377.36	1378.20
1101B	1359.04	1362.31	1363.76	1364.17	1364.63
1101C	1282.20	1282.40	1282.40	1282.20	1282.08
1102A		1378.74			1379.75
1102B		1367.11			1367.88
1103A		1378.34			1379.80
1103B		1365.67			1366.19
1103C		1260.10			1260.05
1104A		1372.15			1373.61
1104B		1362.31			1361.66
1104C		1253.91			1253.65
1105A		1354.26			1356.00
1105B		1338.83			1340.87
1106A	1370.73	1370.94	1371.10	1371.41	1372.59
1106B	1358.08	1358.96	1359.35	1359.40	1359.16
1107A		1369.52			1369.65
1108A	1373.02	1374.43	1374.90	1374.77	1374.18
1109A	1363.74	1364.33	1364.45	1364.40	1364.10
1109B	1363.77	1364.36	1364.49	1364.44	1364.13
1110A		1360.08			1360.62
1111A		1373.65			1378.02

Table B-3. Groundwater Monitoring Well Summary – SDA Piezometers

Elevations are referenced to the National Geodetic Vertical Datum (NGVD) of 1929 and based on the piezometer construction details.

Source: NYSERDA

Piezometer	Well Depth (ft BGS)	Well Bottom Elevation (ft AMSL)	Screened Interval Elevations (ft AMSL)	Geologic Unit Screened
1S-91	14	1369.56	1369.56 - 1377.06	W/U
2S-91	16	1369.55	1369.55 - 1379.55	W/U
3S-91	13.5	1365.78	1365.78 - 1373.28	W/U
4S-91	11	1370.16	1370.16 - 1375.16	W/U
4D-91	29	1352.16	1352.16 - 1367.16	U
6S-91	11	1371.20	1371.20 - 1376.20	W/U
6D-91	25	1357.20	1357.20 - 1367.20	U
9S-91	9	1372.71	1372.71 - 1377.71	W/U
9D-91	25	1356.71	1356.71 - 1366.71	U
10S-91	12.4	1367.75	1367.75 - 1375.25	W/U
15S-91	13	1366.59	1366.59 - 1374.09	W/U
16D-91	25	1354.99	1354.99 - 1364.99	U
17S-91	11	1373.23	1373.23 - 1378.23	W/U
18S-91	14	1367.20	1367.20 - 1374.70	U
21S-91	16	1366.20	1366.20 - 1371.20	U
22S-91	21	1362.42	1362.42 - 1367.42	U
24S-91	18	1363.00	1363.00 - 1373.00	W/U
B-14	24	1356.57	1356.57 - 1366.57	U
P1-95[a]	7.7	1360.89	1360.89 - 1365.89	W

Key:

U	Unweathered Till
W	Weathered Till
W/U	Weathered/Unweathered Till

a P1-95 was installed using the direct push method.

Table B-4. 2014 Groundwater Elevations - SDA Piezometers – (Feet Above Mean Sea Level)

Elevations are referenced to the National Geodetic Vertical Datum (NGVD) of 1929. Entries are blank for locations/dates for which water elevation was not measured.

Source: NYSERDA

Well/ Piezometer	Feb. 4	March 6	April 1	May 1	May 28	July 2
1S		1380.93			1381.55	
2S		1379.78			1382.05	
3S	1373.28	1374.10	1375.27	1375.98	1375.96	1375.90
4S	dry	dry	dry	dry	dry	dry
4D	1356.68	1356.17	1356.01	1356.04	1356.10	1356.43
6S	dry	dry	dry	dry	dry	dry
6D	1361.79	1361.32	1361.02	1360.82	1360.79	1361.11
9S	dry	dry	dry	dry	dry	dry
9D	1357.98	1357.69	1357.52	1357.14	1358.28	1357.10
10S	1372.18	1371.92	1371.93	1372.72	1374.08	1376.03
15S	1379.94	1378.68	1380.43	1380.49	1379.32	1379.46
16D	1363.90	1363.81	1363.54	1363.27	1363.11	1363.08
17S	1382.27	1382.23	1382.95	1382.94	1382.63	1380.96
18S	1377.85	1378.12	1378.47	1378.83	1378.79	1378.26
21S	dry	dry	dry	dry	dry	dry
22S	dry	dry	dry	dry	dry	dry
24S	dry	dry	dry	dry	dry	dry
B-14	1361.13	1360.73	1360.52	1360.35	1360.19	1360.29
P1		1364.35			1364.28	

Table B-4 continued.

Well/ Piezometer	Aug. 4	Sept. 3	Oct. 1	Nov. 4	Dec. 2
1S		1380.60			1381.11
2S		1381.31			1379.16
3S	1373.41	1375.29	1374.05	1373.59	1374.04
4S	dry	dry	dry	dry	dry
4D	1356.91	1357.42	1357.86	1358.08	1357.83
6S	dry	dry	dry	dry	dry
6D	1362.16	1362.63	1363.17	1363.27	1362.96
9S	dry	dry	dry	dry	dry
9D	1357.23	1357.72	1358.10	1358.23	1359.35
10S	1376.96	1376.80	1376.30	1375.04	1373.78
15S	1380.13	1380.29	1378.77	1380.19	1380.31
16D	1363.44	1363.85	1364.44	1364.92	1364.89
17S	1381.26	1381.29	1380.39	1381.76	1382.52
18S	1377.72	1377.34	1376.68	1376.08	1376.76
21S	dry	dry	dry	dry	dry
22S	dry	dry	dry	dry	dry
24S	dry	dry	dry	dry	dry
B-14	1360.62	1361.04	1361.41	1361.69	1361.36
P1		1364.07			1364.64

Table B-5. Groundwater Monitoring Well Summary - SDA Slit-Trench Wells

Elevations are referenced to the National Geodetic Vertical Datum (NGVD) of 1929 and based on the slit-trench well construction details.

Source: NYSERDA

Slit Trench Well	Well Depth (ft BGS)	Well Bottom Elevation (ft AMSL)	Screened Interval Elevations (ft AMSL)	Geologic Unit Screened
SMW-1	7	1373.77	1373.97 - 1376.17	W
SMW-2	6	1375.00	1375.20 - 1377.40	W
SMW-3	6	1374.44	1374.64 - 1376.84	W
SMW-4	11	1367.05	1367.25 - 1369.45	W/U
SMW-5	7	1371.65	1371.85 - 1373.85	W
SMW-6	7	1373.21	1373.41 - 1375.61	W
SMW-7	6.5	1373.41	1373.61 - 1375.81	W
SMW-8	7	1370.19	1370.39 - 1373.39	W
SMW-9	6	1370.66	1370.86 - 1373.06	W

Key:

W	Weathered Till
W/U	Weathered/Unweathered Till

Table B-6. 2014 Groundwater Elevations - SDA Slit-Trench Wells – (Feet Above Mean Sea Level)

Elevations are referenced to the National Geodetic Vertical Datum (NGVD) of 1929. Entries are blank for locations/dates for which water elevation was not measured.

Source: NYSERDA

Well	Feb. 4	March 6	April 1	May 1	May 28	July 2
SMW-1	1378.94	1379.33	1380.14	1380.47	1380.51	1380.67
SMW-2	dry	dry	dry	dry	dry	dry
SMW-3	dry	dry	dry	dry	dry	dry
SMW-4	1372.25	1372.79	1374.05	1375.32	1375.59	1375.77
SMW-5	1376.42	1376.71	1377.05	1377.32	1377.00	1376.75
SMW-6	1379.06	1379.22	1380.45	1380.51	1379.56	1379.04
SMW-7	1376.52	1377.67	1378.68	1377.61	1377.22	1376.95
SMW-8	1373.91	1373.89	1373.94	1374.80	1375.81	1377.37
SMW-9	1373.43	1376.81	1377.59	1376.91	1376.82	1376.63

Well	Aug. 4	Sept. 3	Oct. 1	Nov. 4	Dec. 2
SMW-1	1379.94	1379.72	1378.88	1378.55	1378.71
SMW-2	dry	dry	dry	dry	dry
SMW-3	dry	dry	dry	dry	dry
SMW-4	1375.38	1374.82	1374.06	1372.57	1371.69
SMW-5	1376.63	1376.57	1376.37	1376.45	1376.33
SMW-6	1378.50	1379.36	1377.48	1378.58	1379.47
SMW-7	1376.39	1376.34	1376.00	1375.60	1375.27
SMW-8	1377.66	1377.70	1377.23	1376.08	1374.59
SMW-9	1375.79	1375.30	1374.14	1374.35	1376.56

Figure B-1. First Quarter 2014 Weathered Lavery Till Groundwater Contour Map

Source: NYSERDA

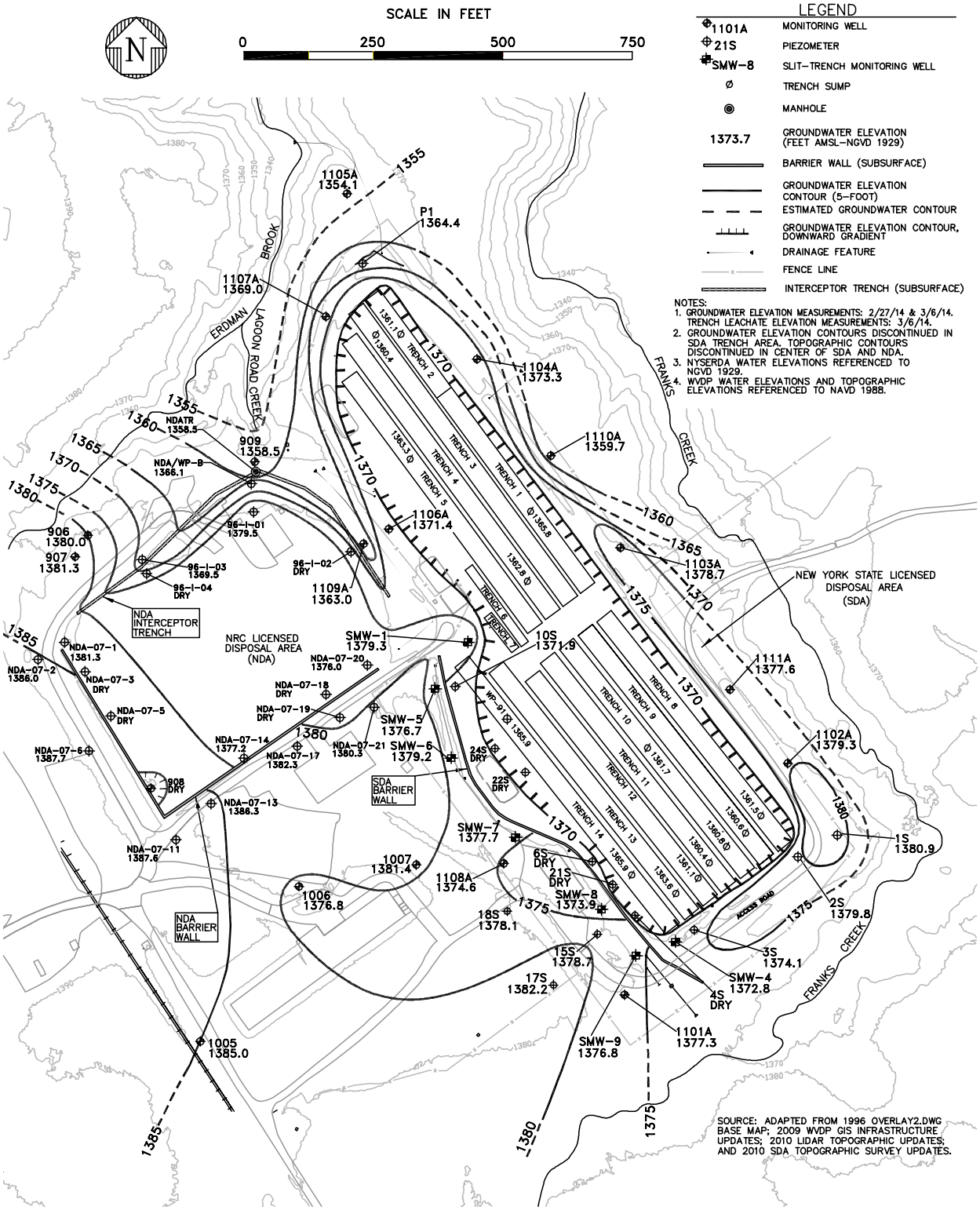


Figure B-2. First Quarter 2014 Kent Recessional Sequence Groundwater Contour Map

Source: NYSERDA

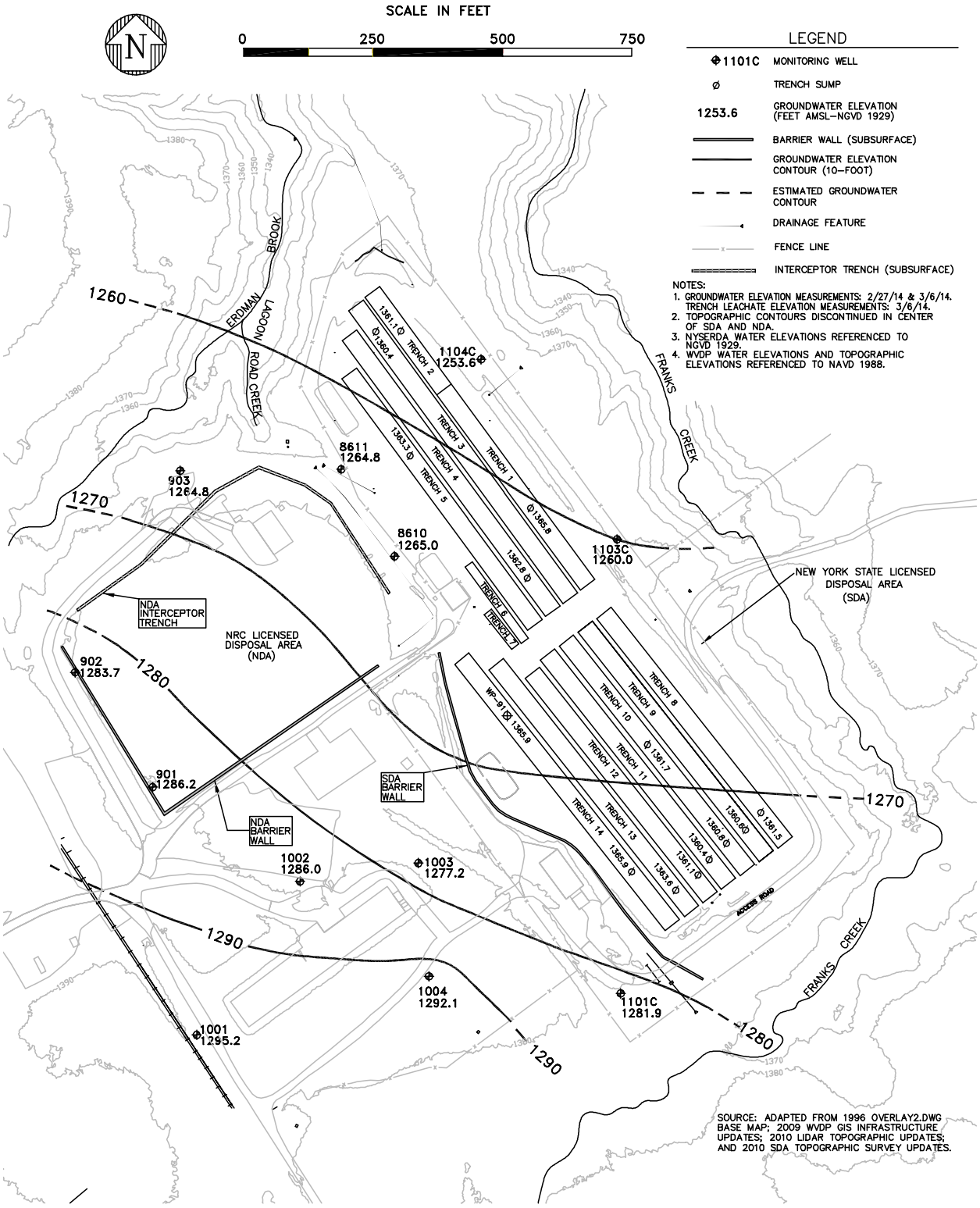


Figure B-3. Second Quarter 2014 Weathered Lavery Till Groundwater Contour Map

Source: NYSERDA

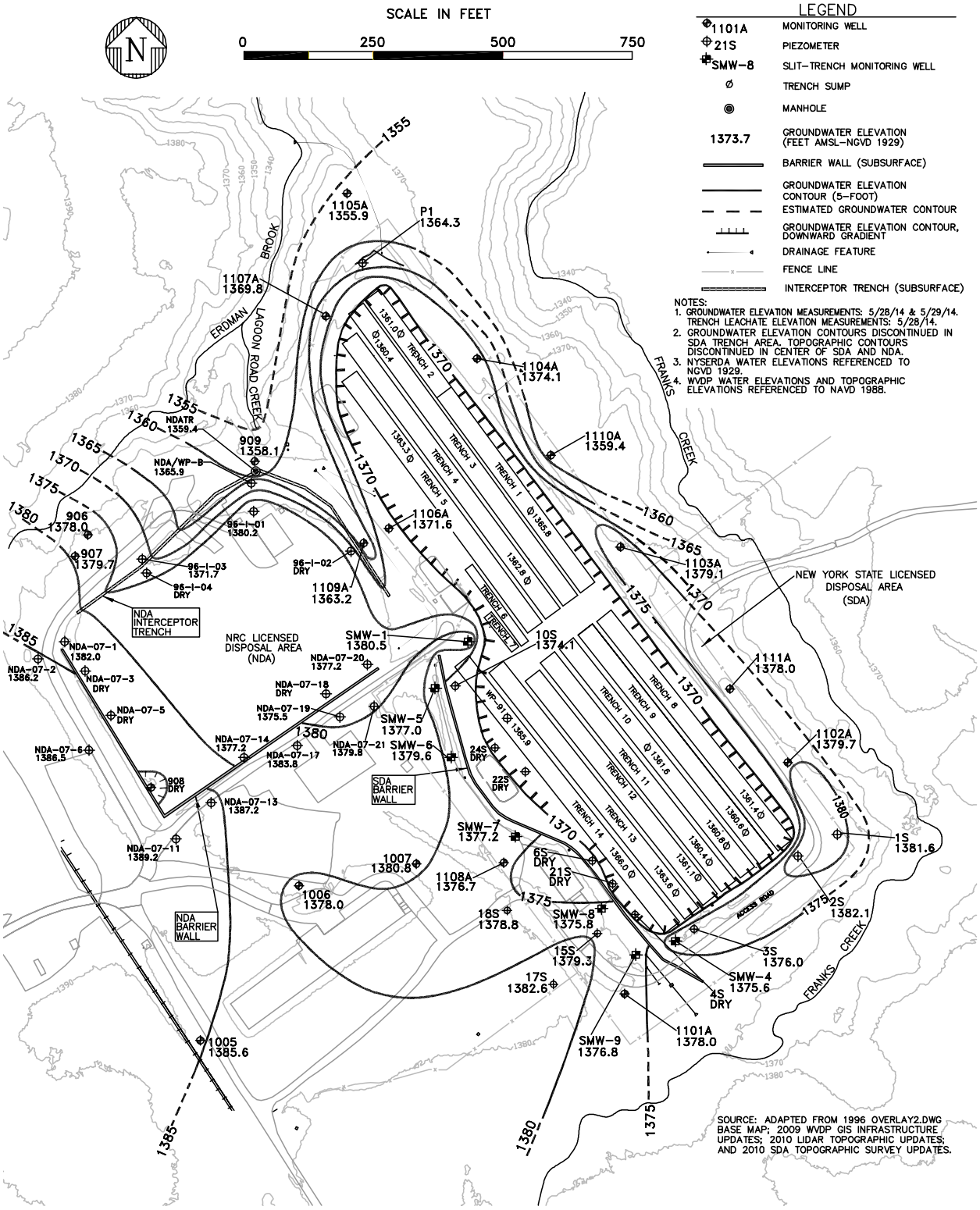


Figure B-4. Second Quarter 2014 Kent Recessional Sequence Groundwater Contour Map

Source: NYSERDA

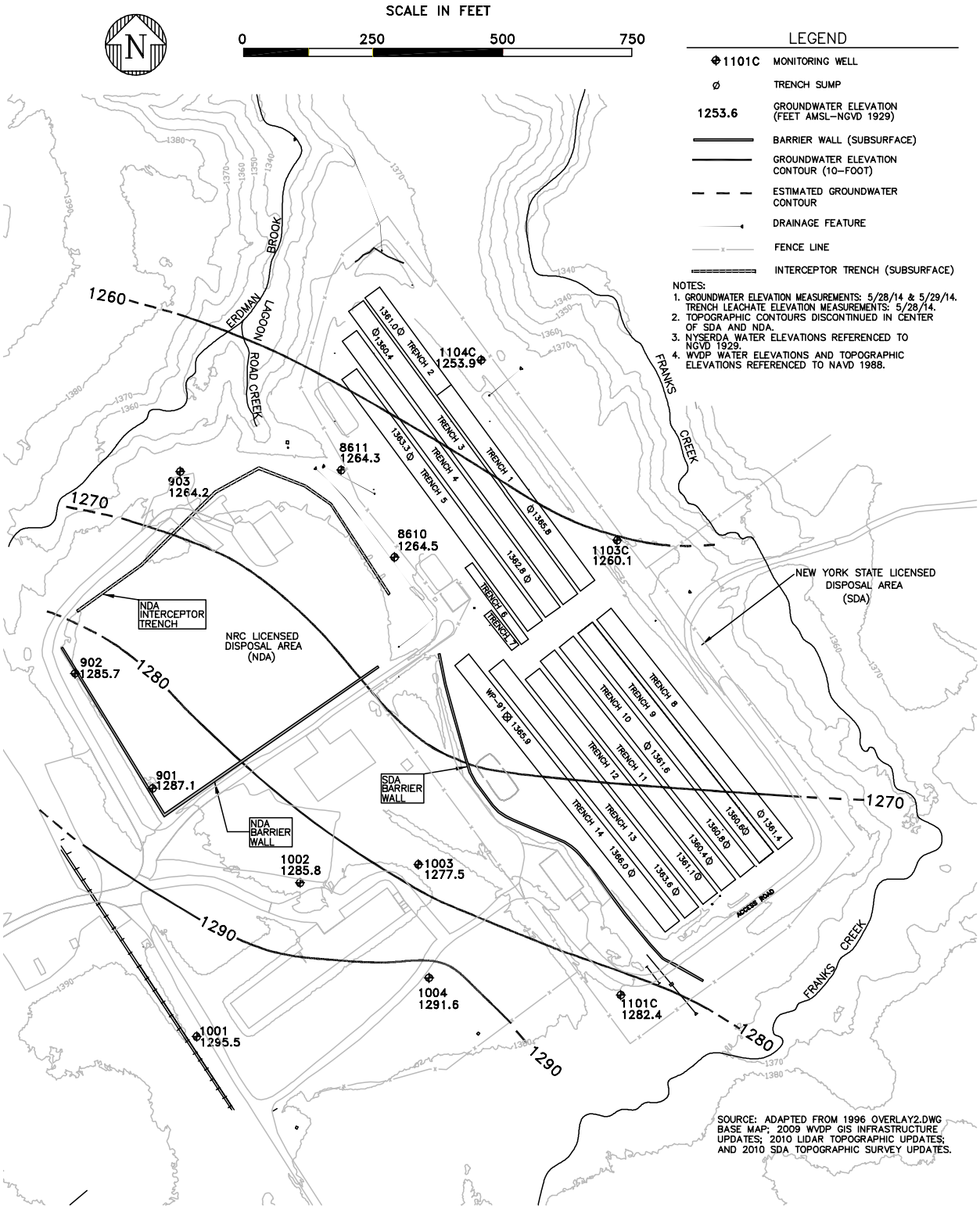


Figure B-5. Third Quarter 2014 Weathered Lavery Till Groundwater Contour Map

Source: NYSERDA

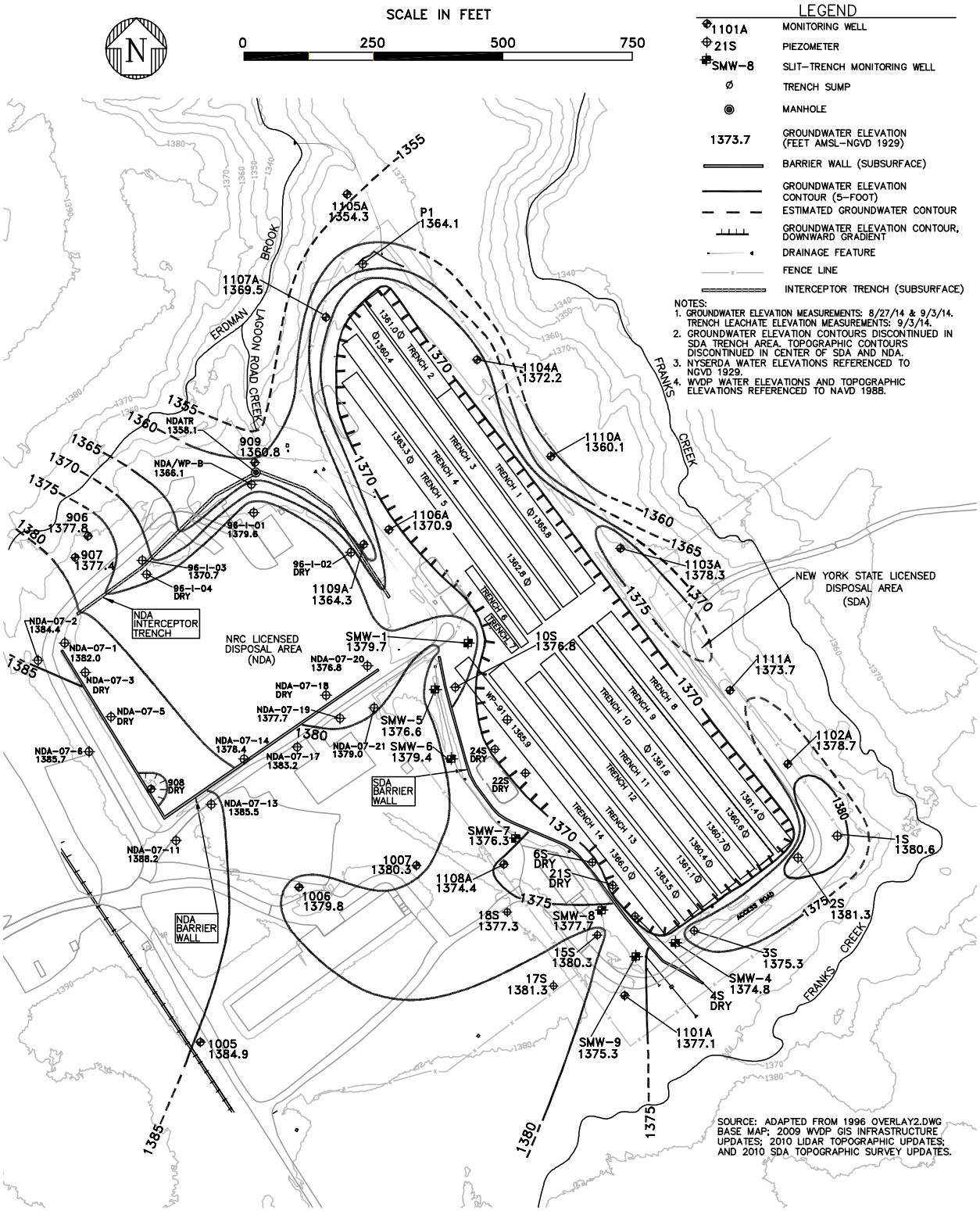


Figure B-6. Third Quarter 2014 Kent Recessional Sequence Groundwater Contour Map

Source: NYSERDA

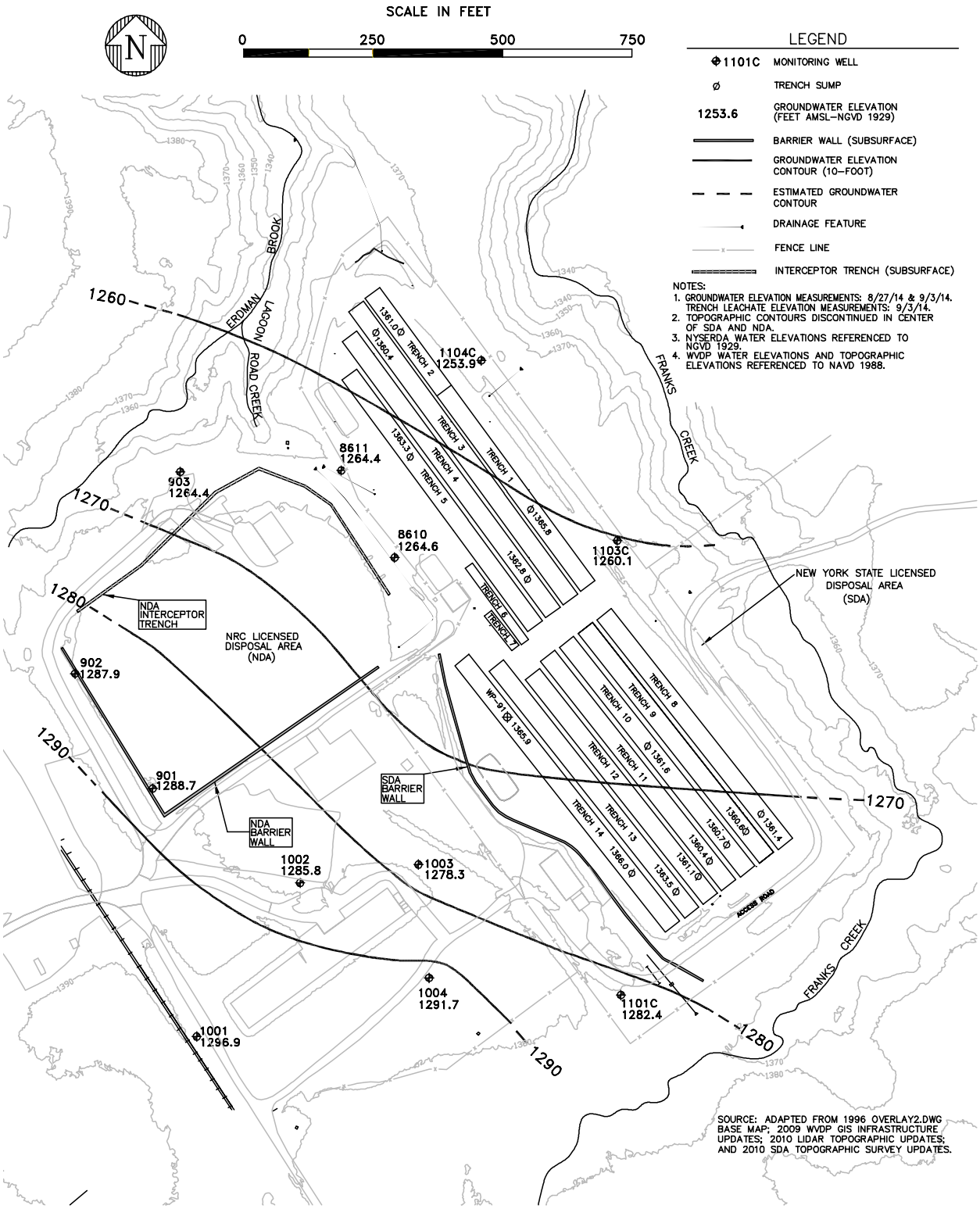


Figure B-7. Fourth Quarter 2014 Weathered Lavery Till Groundwater Contour Map

Source: NYSERDA

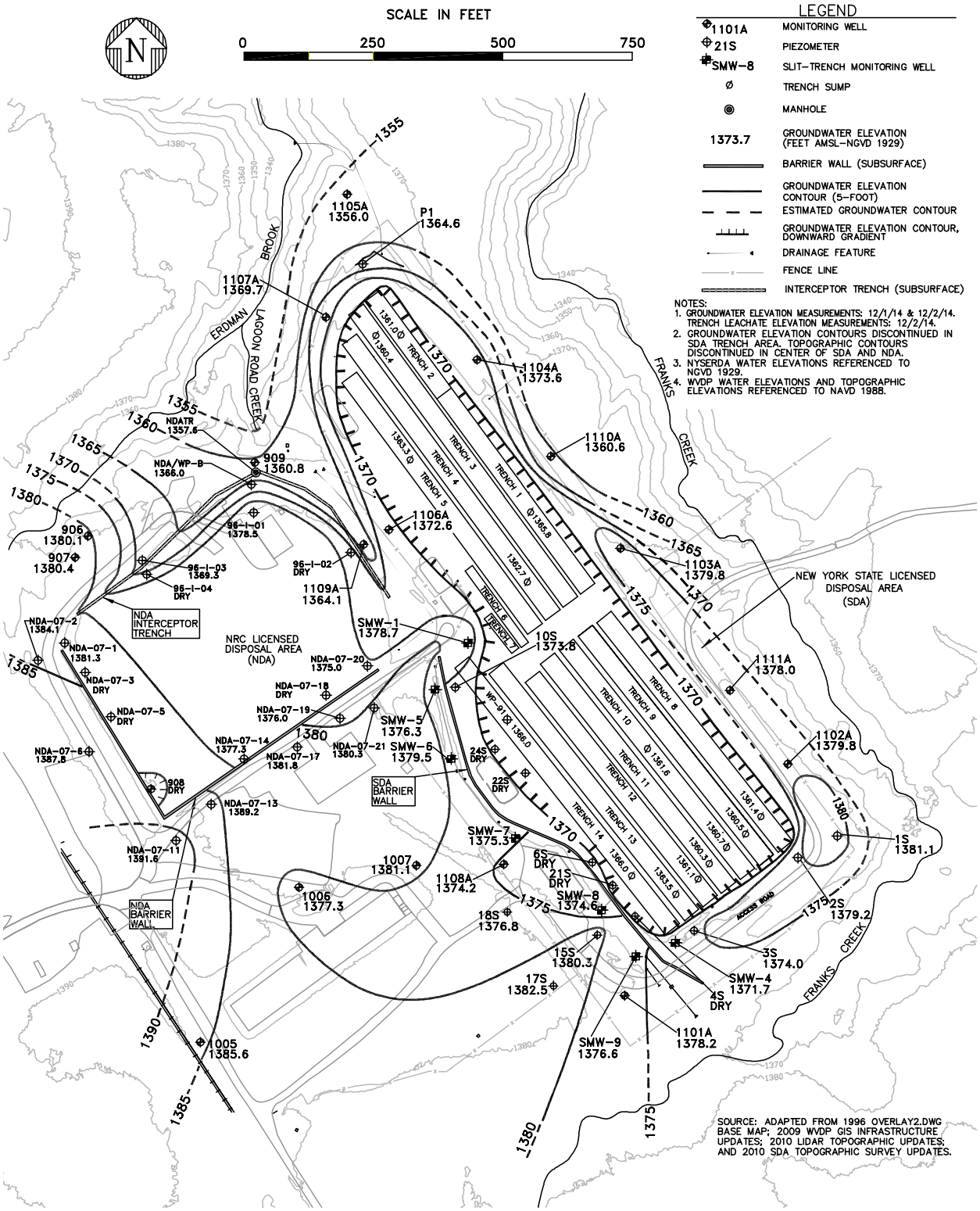


Figure B-8. Fourth Quarter 2014 Kent Recessional Sequence Groundwater Contour Map

Source: NYSERDA

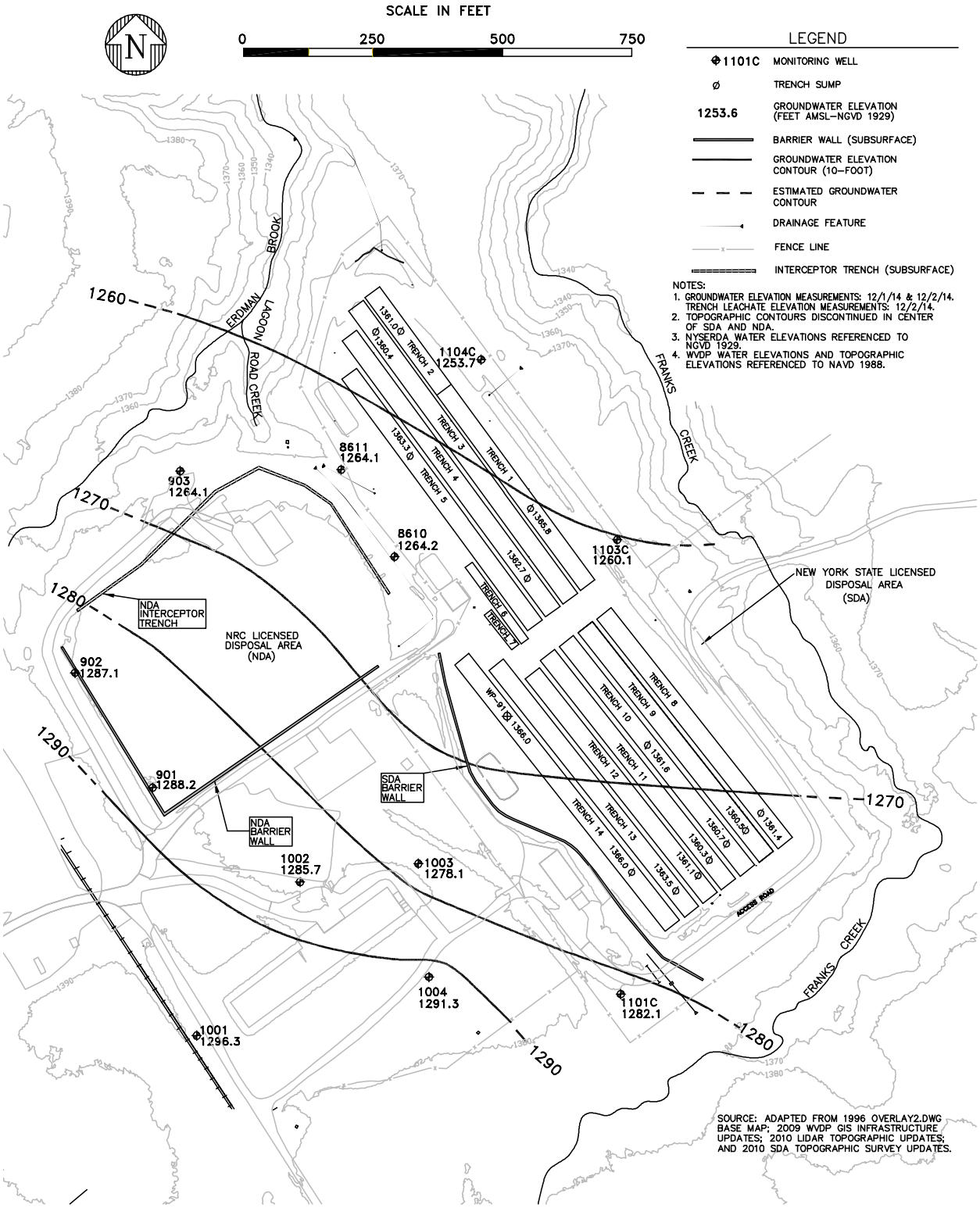


Table B-7. Semiannual Groundwater Sampling Performed in 2014

Source: NYSERDA

Well	Gross Alpha (June)	Gross Alpha (Dec)	Gross Beta (June)	Gross Beta (Dec)	Tritium (June)	Tritium (Dec)	Field Water Quality Parameters (June)	Field Water Quality Parameters (Dec)
1101A	✓	✓	✓	✓	✓	✓	✓	✓
1101B	✓	✓	✓	✓	✓	✓	✓	✓
1101C	✓	✓	✓	✓	✓	✓	✓	✓
1102A	✓	✓	✓	✓	✓	✓	✓	✓
1102B	✓	✓	✓	✓	✓	✓	✓	✓
1103A	✓	✓	✓	✓	✓	✓	✓	✓
1103B	✓	✓	✓	✓	✓	✓	✓	✓
1103C	✓	✓	✓	✓	✓	✓	Insufficient Volume	Insufficient Volume
1104A	✓	✓	✓	✓	✓	✓	✓	✓
1104B	✓	✓	✓	✓	✓	✓	✓	✓
1104C	✓	✓	✓	✓	✓	✓	Insufficient Volume	Insufficient Volume
1105A	✓	✓	✓	✓	✓	✓	✓	✓
1105B	✓	✓	✓	✓	✓	✓	✓	✓
1106A	✓	✓	✓	✓	✓	✓	✓	✓
1106B	✓	✓	✓	✓	✓	✓	✓	✓
1107A	✓	✓	✓	✓	✓	✓	✓	✓
1108A	✓	✓	✓	✓	✓	✓	✓	✓
1109A	✓	✓	✓	✓	✓	✓	✓	✓
1109B	✓	✓	✓	✓	✓	✓	✓	✓
1110A	✓	✓	✓	✓	✓	✓	Insufficient Volume	✓
1111A	✓	✓	✓	✓	✓	✓	✓	✓

Table B-8. Annual Groundwater Sampling Performed in 2014

Source: NYSERDA

Well	Gamma Emitters	Beta Emitters				Volatile Organic Compounds
		C-14	I-129	Sr-90	Tc-99	
1101A	✓	✓	✓	✓	✓	✓
1101B	✓	✓	✓	✓	✓	✓
1101C	✓	✓	✓	✓	✓	✓
1102A	✓	✓	✓	✓	✓	✓
1102B	✓	✓	✓	✓	✓	✓
1103A	✓	✓	✓	✓	✓	✓
1103B	✓	✓	✓	✓	✓	✓
1103C	Insufficient Volume	Insufficient Volume	Insufficient Volume	Insufficient Volume	Insufficient Volume	✓
1104A	✓	✓	✓	✓	✓	✓
1104B	✓	✓	✓	✓	✓	✓
1104C	✓	✓[1]	Insufficient Volume	Insufficient Volume	✓[a]	✓
1105A	✓	✓	✓	✓	✓	✓
1105B	✓	✓	✓	✓	✓	✓
1106A	✓	✓	✓	✓	✓	✓
1106B	✓	✓	✓	✓	✓	✓
1107A	✓	✓	✓	✓	✓	✓
1108A	✓	✓	✓	✓	✓	✓
1109A	✓	✓	✓	✓	✓	✓
1109B	✓	✓	✓	✓	✓	✓
1110A	✓	✓	✓	✓	✓	✓
1111A	✓	✓	✓	✓	✓	✓

a Sample was collected in December 2014 due to insufficient sample volume in June 2014.

Table B-9. 2014 Groundwater Radiological Data - SDA 1100-Series Wells

Blank entries indicate a result was not obtained, typically due to insufficient sample volume. Duplicate samples on the same date indicate a field duplicate was collected and analyzed.

Source: NYSERDA

Sample Location	Sample Date	Gross Alpha (µCi/mL)	Q	Gross Beta (µCi/mL)	Q	Tritium (µCi/mL)	Q
1101A	06/03/14	2.51E-09±1.22E-09		8.60E-10±8.91E-10	U	7.37E-08±5.31E-08	U
1101A	12/10/14	2.18E-09±1.94E-09	U	2.42E-09±1.33E-09	J	3.36E-08±5.30E-08	U
1101B	06/03/14	1.10E-09±9.17E-10	U	3.66E-09±9.29E-10		2.17E-08±5.01E-08	U
1101B	12/10/14	2.38E-09±1.91E-09	U	2.62E-09±1.30E-09		-6.95E-09±5.01E-08	U
1101C	06/03/14	2.26E-10±1.40E-09	U	2.73E-09±1.42E-09	J	-2.81E-08±5.25E-08	U
1101C	12/08/14	9.76E-10±8.02E-10	U	1.23E-09±6.89E-10	J	2.20E-08±4.91E-08	U
1102A	06/03/14	4.65E-09±1.19E-09		2.16E-09±8.78E-10		1.53E-07±5.92E-08	
1102A	12/08/14	8.40E-10±1.13E-09	U	1.75E-09±7.40E-10		1.54E-07±5.93E-08	
1102B	06/03/14	8.69E-10±6.82E-10	U	1.34E-09±5.21E-10		4.60E-10±4.70E-08	U
1102B	12/08/14	-2.84E-10±1.04E-09	U	4.87E-10±7.22E-10	U	5.25E-08±5.14E-08	U
1103A	06/04/14	8.63E-09±3.75E-09		6.11E-09±2.46E-09		1.36E-07±5.56E-08	
1103A	06/04/14	7.27E-09±2.96E-09		4.63E-09±1.59E-09		2.02E-07±5.93E-08	
1103A	12/08/14	7.77E-09±2.15E-09		5.70E-09±1.39E-09		1.68E-07±5.95E-08	
1103B	06/04/14	2.24E-09±1.99E-09	U	-2.04E-09±1.77E-09	U	-3.71E-08±5.21E-08	U
1103B	12/08/14	2.83E-09±1.14E-09		2.17E-09±9.23E-10		3.19E-08±5.04E-08	U
1103C	06/02/14	4.65E-10±9.32E-10	U	3.01E-09±7.18E-10		5.48E-08±5.22E-08	U
1103C	12/08/14	1.98E-09±1.88E-09	U	3.09E-09±1.73E-09	J	2.37E-09±5.08E-08	U
1104A	06/04/14	2.11E-09±1.63E-09	U	2.98E-09±1.02E-09		7.03E-08±5.79E-08	U
1104A	12/09/14	1.59E-09±1.38E-09	U	2.30E-09±1.03E-09		6.23E-08±5.39E-08	U
1104B	06/04/14	1.44E-09±1.02E-09	U	1.89E-09±6.90E-10		6.03E-08±5.36E-08	U
1104B	12/09/14	1.76E-09±1.20E-09	U	1.61E-09±1.02E-09	U	1.29E-09±4.71E-08	U
1104C	06/02/14	9.36E-09±2.62E-09		4.41E-09±2.09E-09		7.11E-08±4.97E-08	U
1104C	12/08/14	3.46E-09±4.71E-09	UJ	6.24E-09±2.62E-09		-3.52E-08±4.79E-08	U
1105A	06/05/14	1.45E-09±1.77E-09	U	1.20E-09±1.11E-09	U	1.20E-07±5.48E-08	
1105A	12/09/14	1.16E-09±1.69E-09	U	1.92E-09±1.20E-09	J	1.01E-07±5.91E-08	J
1105B	06/05/14	2.13E-09±1.94E-09	U	4.63E-09±1.98E-09		-5.37E-08±5.10E-08	U
1105B	12/09/14	1.49E-09±1.22E-09	U	2.37E-09±1.03E-09		1.61E-08±4.87E-08	U
1106A	06/05/14	4.19E-09±2.35E-09	J	2.71E-09±1.26E-09		2.46E-07±6.48E-08	
1106A	12/09/14	1.78E-09±1.43E-09	U	3.85E-09±9.57E-10		3.06E-07±6.83E-08	

Table B-9 continued.

Sample Location	Sample Date	Gross Alpha (µCi/mL)	Q	Gross Beta (µCi/mL)	Q	Tritium (µCi/mL)	Q
1106B	06/05/14	2.27E-09±9.62E-10		3.01E-09±9.40E-10		5.30E-08±5.16E-08	U
1106B	12/09/14	1.87E-09±1.30E-09	U	3.11E-09±9.86E-10		1.01E-08±4.82E-08	U
1107A	06/04/14	9.09E-09±2.50E-09		2.09E-08±1.90E-09		3.47E-06±1.68E-07	
1107A	12/09/14	9.35E-09±2.80E-09		1.67E-08±2.65E-09		4.20E-06±1.88E-07	
1108A	06/03/14	4.77E-09±1.37E-09		3.08E-09±7.21E-10		4.96E-08±5.20E-08	U
1108A	12/08/14	4.39E-09±2.00E-09		5.73E-09±1.17E-09		7.68E-08±5.34E-08	U
1109A	06/05/14	1.78E-09±1.86E-09	U	2.55E-09±1.35E-09	J	1.25E-07±5.50E-08	
1109A	12/09/14	2.62E-09±1.97E-09	U	1.11E-09±1.13E-09	U	1.46E-07±6.14E-08	
1109B	06/06/14	-1.17E-09±1.14E-09	U	1.41E-09±1.07E-09	U	1.18E-07±6.08E-08	J
1109B	12/10/14	1.23E-09±1.69E-09	U	6.90E-12±1.14E-09	U	2.03E-07±6.50E-08	
1110A	06/02/14	9.10E-09±2.09E-09		2.45E-08±1.49E-09		2.75E-08±5.48E-08	U
1110A	12/08/14	1.31E-08±3.43E-09		5.98E-09±1.47E-09		1.34E-07±5.78E-08	
1111A	06/06/14	4.06E-09±2.51E-09	J	6.94E-09±1.93E-09		9.98E-08±5.93E-08	J
1111A	12/10/14	3.29E-09±2.10E-09	J	2.87E-09±1.38E-09		1.34E-07±6.08E-08	
1111A	12/10/14	5.72E-09±2.44E-09		2.92E-09±1.23E-09		1.18E-07±5.66E-08	

Table B-9 continued.

Sample Location	Sample Date	Actinium-228 (µCi/mL)	Q	Bismuth-214 (µCi/mL)	Q	Carbon-14 (µCi/mL)	Q
1101A	06/03/14	1.90E-08±1.86E-08	U	1.00E-08±1.88E-08	U	-2.21E-08±1.97E-08	U
1101B	06/03/14	4.19E-08±1.50E-08	UJ	2.02E-08±1.57E-08	UJ	-2.22E-08±1.97E-08	U
1101C	06/03/14	-6.98E-09±2.25E-08	U	1.32E-08±1.23E-08	U	4.16E-09±2.07E-08	U
1102A	06/03/14	-5.51E-09±2.81E-08	U	1.47E-08±1.92E-08	U	9.81E-09±2.10E-08	U
1102B	06/03/14	-1.18E-08±2.44E-08	U	-4.39E-09±1.71E-08	U	-6.55E-09±2.04E-08	U
1103A	06/04/14	-4.22E-09±2.11E-08	U	1.14E-08±1.30E-08	U	-1.86E-08±1.95E-08	U
1103A	06/04/14	2.67E-08±2.10E-08	U	1.25E-08±1.13E-08	U	1.39E-09±1.83E-08	U
1103B	06/04/14	1.05E-09±1.93E-08	U	1.80E-08±1.77E-08	U	-5.47E-09±2.04E-08	U
1103C	06/02/14						
1104A	06/04/14	-2.38E-09±2.40E-08	U	1.02E-08±1.46E-08	U	6.29E-09±2.11E-08	U
1104B	06/04/14	1.83E-08±3.22E-08	U	2.61E-08±1.76E-08	UJ	8.34E-10±1.85E-08	U
1104C	06/02/14	1.03E-08±2.45E-08	U	1.62E-08±1.54E-08	U		
1104C	12/08/14					-7.69E-09±1.89E-08	U
1105A	06/05/14	5.69E-10±1.98E-08	U	1.59E-08±2.03E-08	U	-2.38E-08±1.99E-08	U
1105B	06/05/14	5.77E-09±1.73E-08	U	2.09E-08±1.74E-08	UJ	-1.51E-08±2.00E-08	U
1106A	06/05/14	-8.04E-09±2.71E-08	U	1.22E-08±1.34E-08	U	8.68E-10±2.08E-08	U
1106B	06/05/14	-3.88E-09±2.22E-08	U	1.28E-08±1.20E-08	U	-1.88E-08±2.00E-08	U
1107A	06/04/14	1.46E-08±1.99E-08	U	1.29E-08±1.25E-08	U	1.15E-08±1.90E-08	U
1108A	06/03/14	-1.74E-08±2.52E-08	U	-6.02E-10±1.46E-08	U	-1.37E-08±2.03E-08	U
1109A	06/05/14	5.53E-08±2.44E-08	UJ	1.37E-08±1.34E-08	U	-1.66E-08±1.99E-08	U
1109B	06/06/14	-5.43E-09±2.32E-08	U	2.95E-08±1.47E-08	UJ	4.22E-09±1.85E-08	U
1110A	06/02/14	-1.34E-08±2.51E-08	U	2.02E-08±2.07E-08	U	2.38E-08±1.93E-08	U
1111A	06/06/14	7.88E-09±2.76E-08	U	-6.37E-09±1.48E-08	U	-1.25E-08±1.99E-08	U

Table B-9 continued.

Sample Location	Sample Date	Cesium-134 (µCi/mL)	Q	Cesium-137 (µCi/mL)	Q	Cobalt-57 (µCi/mL)	Q
1101A	06/03/14	1.70E-10±5.42E-09	U	1.99E-10±5.23E-09	U	-2.47E-09±3.71E-09	U
1101B	06/03/14	5.72E-12±4.84E-09	U	-1.19E-09±4.57E-09	U	7.97E-10±3.77E-09	U
1101C	06/03/14	-1.14E-09±5.17E-09	U	3.74E-09±1.03E-08	U	-1.29E-09±3.58E-09	U
1102A	06/03/14	-4.69E-09±8.02E-09	U	4.45E-09±7.03E-09	U	-1.65E-10±4.26E-09	U
1102B	06/03/14	5.08E-09±6.59E-09	U	7.00E-10±6.09E-09	U	8.12E-10±4.43E-09	U
1103A	06/04/14	1.23E-09±5.15E-09	U	1.95E-09±3.71E-09	U	-1.25E-09±3.15E-09	U
1103A	06/04/14	-1.59E-09±6.72E-09	U	-3.36E-09±5.67E-09	U	-3.46E-10±3.29E-09	U
1103B	06/04/14	9.99E-10±4.74E-09	U	1.87E-09±8.73E-09	U	2.94E-09±3.85E-09	U
1103C	06/02/14						
1104A	06/04/14	4.39E-09±6.66E-09	U	-4.43E-09±6.13E-09	U	2.04E-10±5.07E-09	U
1104B	06/04/14	2.73E-10±5.19E-09	U	-4.74E-09±5.04E-09	U	3.23E-09±3.97E-09	U
1104C	06/02/14	7.92E-09±5.37E-09	U	-2.48E-10±5.33E-09	U	3.83E-09±5.80E-09	U
1105A	06/05/14	2.63E-09±7.28E-09	U	1.92E-10±4.84E-09	U	-4.72E-10±3.52E-09	U
1105B	06/05/14	-8.88E-11±4.98E-09	U	-4.82E-11±5.36E-09	U	-1.24E-09±4.26E-09	U
1106A	06/05/14	-7.68E-09±6.90E-09	U	2.16E-09±5.58E-09	U	-4.35E-10±4.73E-09	U
1106B	06/05/14	3.15E-09±7.40E-09	U	-8.45E-10±5.48E-09	U	2.54E-10±4.73E-09	U
1107A	06/04/14	-4.81E-09±5.72E-09	U	-8.63E-10±5.85E-09	U	3.34E-09±4.29E-09	U
1108A	06/03/14	-6.46E-09±6.41E-09	U	-1.38E-09±6.35E-09	U	2.66E-09±3.99E-09	U
1109A	06/05/14	1.37E-09±4.87E-09	U	3.98E-09±5.11E-09	U	3.20E-10±4.32E-09	U
1109B	06/06/14	-1.99E-09±6.52E-09	U	2.75E-09±5.29E-09	U	-2.67E-09±4.61E-09	U
1110A	06/02/14	-1.40E-09±7.20E-09	U	-4.55E-09±6.65E-09	U	4.66E-09±4.19E-09	U
1111A	06/06/14	-3.89E-09±7.09E-09	U	-1.01E-09±6.81E-09	U	6.85E-10±3.31E-09	U

Table B-9 continued.

Sample Location	Sample Date	Cobalt-60 (µCi/mL)	Q	Iodine-129 (µCi/mL)	Q	Lead-212 (µCi/mL)	Q
1101A	06/03/14	-2.64E-10±4.75E-09	U	3.66E-10±3.69E-10	U	-8.73E-09±9.26E-09	U
1101B	06/03/14	1.87E-09±4.24E-09	U	1.45E-09±8.87E-10	UJ	1.04E-08±1.52E-08	U
1101C	06/03/14	2.85E-09±5.27E-09	U	-1.21E-10±2.06E-10	U	1.17E-08±1.04E-08	U
1102A	06/03/14	7.04E-09±7.73E-09	U	5.12E-10±6.03E-10	U	1.35E-08±2.07E-08	U
1102B	06/03/14	6.27E-10±6.71E-09	U	1.63E-11±3.22E-10	U	5.09E-09±1.52E-08	U
1103A	06/04/14	1.43E-09±5.20E-09	U	6.07E-10±3.56E-10	U	1.67E-12±9.25E-09	U
1103A	06/04/14	-1.92E-09±5.44E-09	U	3.66E-10±5.18E-10	U	4.45E-10±1.07E-08	U
1103B	06/04/14	1.52E-09±5.48E-09	U	2.55E-10±2.27E-10	U	2.04E-08±1.54E-08	UJ
1103C	06/02/14						
1104A	06/04/14	1.47E-09±4.92E-09	U	1.66E-10±4.34E-10	U	1.67E-08±1.76E-08	U
1104B	06/04/14	-1.63E-09±5.17E-09	U	-6.30E-11±4.27E-10	U	2.59E-09±1.45E-08	U
1104C	06/02/14	1.27E-09±6.39E-09	U			1.58E-08±1.65E-08	U
1105A	06/05/14	2.86E-09±4.94E-09	U	-8.40E-11±4.76E-10	U	-6.25E-09±1.01E-08	U
1105B	06/05/14	2.93E-10±4.89E-09	U	-1.96E-10±4.99E-10	U	2.95E-09±1.25E-08	U
1106A	06/05/14	-1.83E-09±5.97E-09	U	1.53E-11±4.98E-10	U	1.03E-08±1.33E-08	U
1106B	06/05/14	-1.27E-09±4.78E-09	U	2.81E-10±5.49E-10	U	1.47E-09±1.16E-08	U
1107A	06/04/14	4.13E-10±4.80E-09	U	1.23E-10±3.66E-10	U	7.59E-09±1.46E-08	U
1108A	06/03/14	6.82E-10±6.13E-09	U	8.64E-11±3.80E-10	U	6.07E-09±1.48E-08	U
1109A	06/05/14	5.63E-09±4.83E-09	U	-2.88E-10±5.38E-10	U	1.50E-08±1.11E-08	U
1109B	06/06/14	-7.48E-09±5.30E-09	U	1.31E-10±2.74E-10	U	5.57E-09±1.54E-08	U
1110A	06/02/14	-4.59E-10±5.12E-09	U	4.89E-10±7.15E-10	U	6.02E-09±1.08E-08	U
1111A	06/06/14	-4.10E-09±6.23E-09	U	-2.77E-11±1.62E-10	U	-8.21E-09±1.22E-08	U

Table B-9 continued.

Sample Location	Sample Date	Lead-214 (µCi/mL)	Q	Potassium-40 (µCi/mL)	Q	Radium-224 (µCi/mL)	Q
1101A	06/03/14	-3.27E-09±1.47E-08	U	2.25E-08±7.01E-08	U	9.02E-08±9.51E-08	U
1101B	06/03/14	5.63E-09±1.14E-08	U	-1.54E-08±5.85E-08	U	7.87E-08±1.21E-07	U
1101C	06/03/14	-1.80E-09±1.30E-08	U	7.89E-08±5.93E-08	U	7.33E-08±8.83E-08	U
1102A	06/03/14	1.08E-08±1.59E-08	U	2.96E-08±9.75E-08	U	2.33E-07±1.45E-07	U
1102B	06/03/14	9.48E-09±1.94E-08	U	8.73E-09±6.59E-08	U	7.61E-08±1.25E-07	U
1103A	06/04/14	4.86E-09±1.14E-08	U	-1.79E-08±6.44E-08	UJ	-3.59E-09±8.88E-08	U
1103A	06/04/14	-5.09E-09±1.33E-08	U	1.34E-07±7.35E-08	UJ	3.13E-08±9.72E-08	U
1103B	06/04/14	2.57E-08±1.27E-08	UJ	-2.06E-08±6.19E-08	U	1.11E-07±1.06E-07	U
1103C	06/02/14						
1104A	06/04/14	6.53E-09±1.32E-08	U	-1.28E-08±7.27E-08	U	5.80E-08±1.39E-07	U
1104B	06/04/14	-6.35E-09±1.14E-08	U	2.26E-08±7.17E-08	U	-2.69E-08±1.03E-07	U
1104C	06/02/14	2.33E-09±1.33E-08	U	-5.80E-08±6.33E-08	U	1.68E-07±1.75E-07	U
1105A	06/05/14	1.33E-08±1.59E-08	U	-4.19E-08±6.01E-08	U	-8.08E-09±9.45E-08	U
1105B	06/05/14	-5.51E-09±1.33E-08	U	-7.36E-08±4.72E-08	U	6.32E-08±9.50E-08	U
1106A	06/05/14	1.32E-08±1.20E-08	U	2.19E-08±7.26E-08	U	7.44E-08±1.07E-07	U
1106B	06/05/14	-2.65E-09±1.21E-08	U	5.51E-08±6.58E-08	U	6.72E-08±1.14E-07	U
1107A	06/04/14	7.11E-09±1.35E-08	U	5.06E-08±8.48E-08	U	1.19E-07±1.03E-07	U
1108A	06/03/14	-1.79E-09±1.30E-08	U	1.47E-08±8.28E-08	U	8.03E-08±1.00E-07	U
1109A	06/05/14	8.21E-10±1.06E-08	U	-4.17E-08±7.28E-08	U	1.29E-07±1.27E-07	U
1109B	06/06/14	-6.00E-09±1.40E-08	U	-2.14E-08±6.81E-08	U	2.17E-07±1.18E-07	UJ
1110A	06/02/14	1.10E-08±2.31E-08	U	-6.36E-08±8.11E-08	U	1.97E-10±1.08E-07	U
1111A	06/06/14	1.81E-08±1.59E-08	U	-4.63E-08±7.55E-08	U	7.55E-08±8.84E-08	U

Table B-9 continued.

Sample Location	Sample Date	Radium-226 (µCi/mL)	Q	Strontium-90 (µCi/mL)	Q	Technetium-99 (µCi/mL)	Q
1101A	06/03/14	-6.26E-08±1.08E-07	U	-3.23E-10±4.55E-10	U	-2.82E-10±1.32E-09	U
1101B	06/03/14	4.37E-08±1.30E-07	U	-1.40E-10±5.06E-10	U	-7.09E-10±1.29E-09	U
1101C	06/03/14	1.20E-07±1.40E-07	U	-2.18E-11±3.15E-10	U	-2.97E-10±1.36E-09	U
1102A	06/03/14	8.67E-08±2.10E-07	U	2.96E-10±5.25E-10	U	3.43E-12±1.36E-09	U
1102B	06/03/14	-1.30E-07±1.39E-07	U	-3.08E-10±4.64E-10	U	-5.33E-10±1.29E-09	U
1103A	06/04/14	-1.23E-07±1.05E-07	U	-2.15E-10±2.71E-10	U	1.31E-09±1.52E-09	U
1103A	06/04/14	2.68E-08±1.41E-07	U	-9.38E-11±2.45E-10	U	-3.90E-11±1.37E-09	U
1103B	06/04/14	7.24E-08±1.34E-07	U	5.54E-10±4.69E-10	U	-6.08E-10±1.32E-09	U
1103C	06/02/14						
1104A	06/04/14	1.17E-07±1.83E-07	U	8.25E-11±5.41E-10	U	-1.07E-09±1.28E-09	U
1104B	06/04/14	1.26E-07±1.55E-07	U	-1.14E-10±4.50E-10	U	4.80E-10±1.89E-09	U
1104C	06/02/14	3.83E-08±1.40E-07	U				
1104C	12/08/14					-1.02E-09±2.19E-09	U
1105A	06/05/14	1.09E-07±1.17E-07	U	-8.66E-11±2.84E-10	U	-3.15E-11±1.30E-09	U
1105B	06/05/14	6.58E-08±2.39E-07	U	2.68E-10±4.32E-10	U	-1.00E-09±1.29E-09	U
1106A	06/05/14	1.06E-07±1.93E-07	U	5.86E-10±5.68E-10	U	-4.98E-10±1.34E-09	U
1106B	06/05/14	-9.58E-08±1.26E-07	U	-4.44E-10±3.77E-10	U	-2.00E-10±1.59E-09	U
1107A	06/04/14	7.51E-08±1.82E-07	U	9.26E-09±9.92E-10		1.20E-09±1.46E-09	U
1108A	06/03/14	8.76E-08±1.71E-07	U	2.07E-11±4.93E-10	U	-6.44E-11±1.35E-09	U
1109A	06/05/14	9.05E-08±1.52E-07	U	1.45E-10±4.32E-10	U	-9.55E-10±1.27E-09	U
1109B	06/06/14	-1.03E-07±1.41E-07	U	1.76E-10±5.45E-10	U	-2.76E-10±1.31E-09	U
1110A	06/02/14	-2.80E-08±1.53E-07	U	-1.44E-10±4.78E-10	U	2.03E-09±1.74E-09	U
1111A	06/06/14	7.21E-08±1.48E-07	U	2.16E-10±5.23E-10	U	-1.41E-10±1.33E-09	U

Table B-9 continued.

Sample Location	Sample Date	Thallium-208 (µCi/mL)	Q	Thorium-234 (µCi/mL)	Q	Uranium-235 (µCi/mL)	Q
1101A	06/03/14	-8.45E-10±5.65E-09	U	-6.40E-08±1.46E-07	U	-1.31E-09±3.00E-08	U
1101B	06/03/14	1.72E-09±6.83E-09	U	-7.24E-08±2.22E-07	U	1.12E-08±3.11E-08	U
1101C	06/03/14	8.41E-09±7.46E-09	UJ	1.45E-07±2.24E-07	U	1.11E-08±2.92E-08	U
1102A	06/03/14	-3.51E-09±8.98E-09	U	-9.17E-08±1.34E-07	U	4.26E-08±5.02E-08	U
1102B	06/03/14	-7.18E-09±7.31E-09	U	-6.23E-08±3.13E-07	U	-7.39E-09±4.01E-08	U
1103A	06/04/14	-1.30E-09±5.27E-09	U	-1.48E-08±1.85E-07	U	1.31E-08±4.00E-08	U
1103A	06/04/14	1.08E-10±6.33E-09	U	9.34E-08±1.28E-07	U	2.46E-08±2.92E-08	U
1103B	06/04/14	8.46E-09±7.56E-09	UJ	-1.79E-07±2.78E-07	U	-1.84E-09±3.53E-08	U
1103C	06/02/14						
1104A	06/04/14	2.65E-09±6.93E-09	U	-1.11E-07±3.48E-07	U	-8.83E-09±3.96E-08	U
1104B	06/04/14	5.99E-09±1.01E-08	U	2.26E-07±4.59E-07	U	4.07E-08±3.65E-08	U
1104C	06/02/14	2.95E-09±6.09E-09	U	8.22E-08±4.04E-07	U	4.66E-09±4.12E-08	U
1105A	06/05/14	-1.30E-09±5.36E-09	U	2.91E-08±1.95E-07	U	-1.85E-08±3.44E-08	U
1105B	06/05/14	-2.14E-10±5.45E-09	U	1.51E-07±3.10E-07	U	-2.16E-08±3.60E-08	U
1106A	06/05/14	3.74E-10±6.33E-09	U	-4.44E-07±3.91E-07	U	2.75E-09±3.69E-08	U
1106B	06/05/14	-6.40E-11±5.37E-09	U	6.52E-08±3.22E-07	U	2.81E-08±3.44E-08	U
1107A	06/04/14	-5.99E-10±6.37E-09	U	9.56E-08±3.96E-07	U	-5.69E-09±3.78E-08	U
1108A	06/03/14	-6.10E-09±6.67E-09	U	1.57E-07±3.36E-07	U	-2.49E-08±3.15E-08	U
1109A	06/05/14	-4.21E-10±6.96E-09	U	1.85E-07±4.35E-07	U	-1.89E-08±3.49E-08	U
1109B	06/06/14	4.42E-09±8.29E-09	U	2.15E-07±3.04E-07	U	-4.81E-09±5.84E-08	U
1110A	06/02/14	-1.88E-09±7.11E-09	U	9.22E-08±4.78E-07	U	-4.01E-08±3.77E-08	U
1111A	06/06/14	1.04E-12±7.75E-09	U	-9.46E-08±1.05E-07	U	-3.38E-08±2.84E-08	U

Key for Qualifier Codes (Q):

J = Analyte identified. Associated result is considered estimated or uncertain.

U = Not detected above minimum detectable concentration (MDC) and/or 2-sigma uncertainty.

UJ = Not detected above MDC and/or 2-sigma uncertainty, which may be considered estimated or uncertain.

Table B-10. 2014 Groundwater Field Parameter Data - SDA 1100-Series Wells

Blank entries indicate a result was not obtained, typically due to insufficient sample volume. Duplicate samples on the same date indicate a field duplicate was collected and analyzed.

Source: NYSERDA

Sample Location	Sample Date	Conductivity (μmhos/cm)	Q	pH	Q	Temperature (Deg C)	Q	Turbidity (NTU)	Q
1101A	06/03/14	734	J	7.63	J	17.1	J	20.8	
1101A	12/10/14	684		7.47		8.22		0.00	J
1101B	06/03/14	593	J	8.11	J	17.3	J	10.2	J
1101B	12/10/14	571		7.55		9.27		0.36	
1101C	06/03/14	377	J	7.86	J	17.01	J	153	
1101C	12/08/14	343		7.76		9.43		545	
1102A	06/03/14	676	J	7.45		17.41		11.4	
1102A	12/08/14	714		7.40		11.94		7.50	
1102B	06/03/14	541	J	7.37		16.46		5.74	
1102B	12/08/14	563		7.62		9.80		6.98	
1103A	06/04/14	1206	J	7.27		13.49		30.7	
1103A	06/04/14	1206	J	7.27		13.49		30.7	
1103A	12/08/14	1169		7.19		9.63		50.7	
1103B	06/04/14	766	J	7.48		14.88		7.31	
1103B	12/08/14	632		7.40		9.64		250	
1103C	06/02/14								
1103C	12/08/14								
1104A	06/04/14	707	J	7.57		14.10		4.05	
1104A	12/09/14	673		7.51		12.14		2.26	
1104B	06/04/14	550	J	7.72		18.17		5.71	
1104B	12/09/14	527		7.66		10.82		2.16	
1104C	06/02/14								
1104C	12/08/14								
1105A	06/05/14	636		7.66		15.90		154	
1105A	12/09/14	629		7.73		10.02		92.3	

Table B-10 continued.

Sample Location	Sample Date	Conductivity (μmhos/cm)	Q	pH	Q	Temperature (Deg C)	Q	Turbidity (NTU)	Q
1105B	06/05/14	597		7.73		16.82		77.1	
1105B	12/09/14	580		7.62		9.39		179	
1106A	06/05/14	675		7.53		12.18		5.72	
1106A	12/09/14	663		7.62		11.16		1.53	
1106B	06/05/14	665		7.37		13.11		28.7	
1106B	12/09/14	655		7.64		11.32		31.2	
1107A	06/04/14	2014	J	6.83		14.08		2.11	
1107A	12/09/14	1900		6.82		10.26		7.19	
1108A	06/03/14	757	J	7.45	J	16.2	J	411	J
1108A	12/08/14	827		7.29		10.66		141	
1109A	06/05/14	562		7.58		13.90		5.37	
1109A	12/09/14	590		7.74		12.55		4.00	
1109B	06/06/14	458		7.75		12.52		18.7	
1109B	12/10/14	444		7.66		10.75		28.8	
1110A	06/02/14								
1110A	12/08/14	1329		5.50	J	6.64		5.45	
1111A	06/06/14	975		7.32		11.92		6.35	
1111A	12/10/14	912		7.25		8.48		1.74	
1111A	12/10/14	912		7.25		8.48		1.74	

Key:

Q Qualifier Code

Appendix C – Surface and Stormwater Data

Table C-1. 2014 SDA Surface Water Data - Lagoon Road Creek (WNNDADR)

Duplicate samples on the same date indicate a field duplicate was collected and analyzed.

Source: NYSERDA

Sample Date	Gross alpha (µCi/mL)	Q	Gross beta (µCi/mL)	Q	Tritium (µCi/mL)	Q
02/20/14	1.09E-09±7.23E-10	U	1.39E-08±1.29E-09		1.95E-07±6.25E-08	
05/15/14	2.15E-09±1.34E-09	J	4.41E-08±2.95E-09		3.36E-07±7.16E-08	
08/14/14	8.58E-10±1.16E-09	U	3.62E-08±1.89E-09		3.98E-07±6.76E-08	
08/14/14	-2.39E-10±6.15E-10	U	3.62E-08±1.42E-09		3.77E-07±6.65E-08	
11/25/14	4.51E-10±1.18E-09	U	3.60E-08±2.78E-09		3.71E-07±7.32E-08	

Table C-2. 2014 SDA Surface Water Data - Erdman Brook (WNERB53)

Source: NYSERDA

Sample Date	Gross alpha (µCi/mL)	Q	Gross beta (µCi/mL)	Q	Tritium (µCi/mL)	Q
02/20/14	2.31E-09±1.43E-09	J	3.51E-09±1.08E-09		5.59E-08±5.53E-08	U
05/15/14	1.90E-09±1.35E-09	U	6.02E-09±1.18E-09		6.82E-08±5.56E-08	U
08/14/14	-1.91E-10±8.27E-10	U	7.42E-09±7.22E-10		4.75E-08±4.99E-08	U
11/25/14	3.07E-09±1.65E-09	J	4.85E-09±1.38E-09		3.75E-08±5.66E-08	U

Table C-3. 2014 SDA Surface Water Data - Frank's Creek (WNFRC67)

Source: NYSERDA

Sample Date	Gross alpha (µCi/mL)	Q	Gross beta (µCi/mL)	Q	Tritium (µCi/mL)	Q
02/20/14	-2.61E-10±9.04E-10	U	4.17E-10±1.16E-09	U	6.82E-08±5.57E-08	U
05/15/14	-3.37E-10±8.65E-10	U	1.35E-09±9.42E-10	U	-1.16E-08±5.00E-08	U
08/14/14	-3.88E-10±8.49E-10	U	1.17E-09±9.09E-10	U	6.68E-08±4.91E-08	U
11/25/14	-6.26E-10±8.33E-10	U	1.46E-09±9.57E-10	U	5.19E-08±5.56E-08	U

Table C-4. 2014 SDA Surface Water Data - Frank's Creek (WNDCELD)

Source: NYSERDA

Sample Date	Gross alpha (µCi/mL)	Q	Gross beta (µCi/mL)	Q	Tritium (µCi/mL)	Q
02/20/14	-4.43E-12±8.02E-10	U	2.68E-09±1.19E-09		1.04E-08±5.18E-08	U
05/15/14	8.17E-09±2.33E-09		1.13E-08±1.55E-09		2.53E-08±4.95E-08	U
08/14/14	-5.37E-10±6.64E-10	U	1.62E-10±1.14E-09	U	7.23E-08±5.19E-08	U
11/25/14	-8.70E-11±9.24E-10	U	3.19E-10±1.05E-09	U	4.19E-08±5.37E-08	U

Table C-5. 2014 SDA Surface Water Data - Buttermilk Creek: Upgradient of the SDA (WFBCBKG)

Duplicate samples on the same date indicate a field duplicate was collected and analyzed.

Source: NYSERDA

Sample Date	Gross alpha (µCi/mL)	Q	Gross beta (µCi/mL)	Q	Tritium (µCi/mL)	Q
02/20/14	3.53E-10±9.35E-10	U	1.14E-09±1.00E-09	U	7.85E-09±4.93E-08	U
02/20/14	1.18E-09±1.23E-09	U	8.15E-10±9.04E-10	U	-9.29E-09±4.78E-08	U
05/15/14	8.74E-10±1.14E-09	U	1.45E-09±9.74E-10	U	3.16E-08±5.41E-08	U
08/14/14	-7.48E-10±6.91E-10	U	1.46E-09±1.02E-09	U	1.09E-08±4.76E-08	U
11/25/14	2.28E-10±9.66E-10	U	2.07E-09±1.05E-09	J	6.74E-08±5.64E-08	U

Key for Qualifier Codes (Q):

J = Analyte identified. Associated result is considered estimated or uncertain.

U = Not detected above minimum detectable concentration (MDC) and/or 2-sigma uncertainty.

UJ = Not detected above MDC and/or 2-sigma uncertainty, which may be considered estimated or uncertain.

Table C-6. 2014 SDA Surface Water Data - Buttermilk Creek: Downgradient of the SDA (WFBCANL)

Source: NYSERDA

Sample Date	Gross alpha (µCi/mL)	Q	Gross beta (µCi/mL)	Q	Tritium (µCi/mL)	Q
08/14/14	5.07E-10±8.38E-10	U	1.93E-09±9.48E-10		5.46E-08±5.13E-08	U

Table C-7. 2014 SDA Stormwater Radiological Data - Outfall Location W01

Duplicate samples on the same date indicate a field duplicate was collected and analyzed.

Source: NYSERDA

Sample Date	Gross alpha (µCi/mL)	Q	Gross beta (µCi/mL)	Q	Tritium (µCi/mL)	Q
04/22/14	1.97E-10±8.05E-10	U	6.78E-09±1.76E-09		2.12E-07±6.64E-08	
04/22/14	1.71E-09±1.23E-09	J	5.28E-09±1.63E-09		1.92E-07±6.35E-08	
07/07/14	-2.55E-10±6.95E-10	U	9.66E-09±1.74E-09		1.53E-07±5.70E-08	

Sample Date	Cesium-137 (µCi/mL)	Q	Cobalt-60 (µCi/mL)	Q	Potassium-40 (µCi/mL)	Q
04/22/14	-7.59E-10±2.67E-09	U	-1.01E-10±2.51E-09	U	-6.44E-09±3.60E-08	U
04/22/14	1.05E-09±2.75E-09	U	-5.03E-10±2.46E-09	U	-5.50E-09±3.45E-08	U
07/07/14	2.43E-09±3.05E-09	U	8.91E-10±2.42E-09	U	1.43E-08±3.12E-08	U

Key for Qualifier Codes (Q):

J = Analyte identified. Associated result is considered estimated or uncertain.
U = Not detected above minimum detectable concentration (MDC) and/or 2-sigma uncertainty.
UJ = Not detected above MDC and/or 2-sigma uncertainty, which may be considered estimated or uncertain.

Table C-8. 2014 SDA Stormwater Chemical Physical Data - Outfall Location W01

Blank entries indicate a result was not obtained, typically because it was not required. Duplicate samples on the same date indicate a field duplicate was collected and analyzed. Data are reported herein relative to the laboratory practical quantitation limit.

Source: NYSERDA

Sample Date	Sample Type	BOD (mg/L)	Q	COD (mg/L)	Q	Nitrogen, Total (mg/L)	Q	Oil & Grease (mg/L)	Q
04/22/14	Grab	27.6		48.8		6.40		4.9	U
04/22/14	Ambient Rain								
04/22/14	Composite	4.9		14.8	J	1.52			
04/22/14	Composite	4.9		7.5	J	1.57			
07/07/14	Grab	9.2		34.4		2.89		4.8	UJ
07/07/14	Grab	11.5		25.6		2.68		4.8	UJ
07/07/14	Ambient Rain								
07/07/14	Composite	4.1		5.8		0.88			

Sample Date	Sample Type	Total Phosphorus (mg/L)	Q	TSS (mg/L)	Q	pH (SU)	Q	Temp (deg C)	Q
04/22/14	Grab	0.202	J	6.8		6.72		13.1	
04/22/14	Ambient Rain					6.57		13.1	
04/22/14	Composite	0.100	UJ	4.0	U				
04/22/14	Composite	0.100	UJ	4.0	U				
07/07/14	Grab	0.052		10.8	J	3.99		20.8	
07/07/14	Grab	0.061		18.4	J	3.99		20.8	
07/07/14	Ambient Rain					3.56		20.9	
07/07/14	Composite	0.010	U	4.0	U				

Key for Qualifier Codes (Q):

J = Analyte identified. Associated result is considered estimated or uncertain.

U = Not detected above associated value.

UJ = Not detected above associated value, which may be considered estimated or uncertain.

Appendix D – Overland Gamma Radiation Survey & Thermoluminescent Dosimeter Data

Table D-1. 2014 Overland Gamma Radiation Survey Results

Source: NYSERDA

Location[a]	April 23 (μrem/hr) 1 m	April 23 (μrem/hr) 1 cm	Sept. 4 (μrem/hr) 1 m	Sept. 4 (μrem/hr) 1 cm
P-1	7	6	7	6
P-2	6	7	9	9
P-3	8	7	8	7
P-4	7	8	9	8
P-5	9	7	9	6
P-6	9	11	8	7
P-7	7	6	6	5
P-8	8	8	6	6
P-9	7	8	10	8
P-10	5	6	5	5
P-11	5	6	6	5
P-12	5	6	6	6
P-13	7	7	5	6
P-14	6	5	5	6
P-15	7	7	5	7
P-16	8	8	6	7
SDA2n	9	8	7	8
SDA2s	7	9	6	7
SDA3n	9	9	8	10
SDA3s	9	8	8	10
SDA4n	6	8	6	7
SDA4s	9	9	9	9
T1s	7	9	6	6
T2n	9	8	7	6
T3n	8	8	8	7
T3s	8	9	6	7
T4n	10	9	9	10

Table D-1 continued.

Location[a]	April 23 (µrem/hr) 1 m	1 cm	Sept. 4 (µrem/hr) 1 m	1 cm
T4s	10	10	6	7
T5n	10	10	9	8
T5s	10	10	8	10
T6n	7	8	8	8
T6s	9	8	7	7
T7n	8	10	7	8
T7s	7	7	8	8
T8n	8	9	9	8
T8s	6	7	10	7
T9n	9	10	9	8
T9s	8	7	8	9
T10n	9	8	7	7
T10s	7	8	6	7
T11n	7	8	6	6
T11s	8	10	6	7
T12n	7	8	7	9
T12s	7	7	6	7
T13n	8	8	8	8
T13s	8	8	5	6
T14n	8	8	8	9
T14s	9	8	6	6
DC-(G)[b]	7	6	6	7
DC-dr[b]	6	5	4	3

Key:

cm	centimeter
m	meter

a SDA perimeter locations (P-1 through P-16) are identified on Figure 2-6. Measurements were made at one meter (1 m) and one centimeter (1 cm) from the ground, tank or building surface.

b DC-(G) and DC-dr are located (at the Drum Cell) on the WVDP premises adjacent to the SDA. The Drum Cell was used to store low-level radioactive waste drums; however, the waste was removed and shipped for off-site disposal in 2007. The DC-(G) and DC-dr measurements were made at locations on the north side and west roll-up door, respectively.

Table D-2. 2014 Thermoluminescent Dosimeter Data

Source: NYSERDA

Location	1st Qtr (mR/Qtr)	Q	2nd Qtr (mR/Qtr)	Q	3rd Qtr (mR/Qtr)	Q	4th Qtr (mR/Qtr)	Q
DNTLD19 (SDA E. Fence)	16.9±3.1	J	15.9±2.9		17.5±3.1		17.7±3.2	
DNTLD33 (SDA SW Corner)	17.3±3.2	J	17.4±3.2		15.7±2.8		16.9±3.0	
DNTLD43 (SDA West Gate)	11.5±2.1	J	14.7±2.7		14.2±2.6		15.0±2.7	
DNTLD53 (SDA NW Corner)	19.5±3.6	J	17.7±3.2		20.2±3.6		22.7±4.1	
NYTLDBK (Background Location)	14.2±2.6	J	14.1±2.6		18.6±3.3		15.5±2.8	

Key for Qualifier Code (Q):

J = Analyte identified. Associated result is considered estimated or uncertain.

Appendix E – Precipitation

Table E-1. First Quarter 2014 SDA Precipitation Data (Liquid Rainfall Equivalent)

Source: NYSERDA

January 2014	Precipitation (inches)	February 2014	Precipitation (inches)	March 2014	Precipitation (inches)
1/1/2014	0.21	2/1/2014	0.48	3/1/2014	0
1/2/2014	0.26	2/2/2014	0.18	3/2/2014	0.18
1/3/2014	0	2/3/2014	0	3/3/2014	0
1/4/2014	0	2/4/2014	0.17	3/4/2014	0
1/5/2014	0.11	2/5/2014	0.62	3/5/2014	0
1/6/2014	0.32	2/6/2014	0.03	3/6/2014	0
1/7/2014	0.02	2/7/2014	0	3/7/2014	0
1/8/2014	0	2/8/2014	0	3/8/2014	0.01
1/9/2014	0	2/9/2014	0.21	3/9/2014	0
1/10/2014	0.02	2/10/2014	0.05	3/10/2014	0.01
1/11/2014	0.71	2/11/2014	0.01	3/11/2014	0.06
1/12/2014	0.01	2/12/2014	0	3/12/2014	0.69
1/13/2014	0.14	2/13/2014	0.07	3/13/2014	0.01
1/14/2014	0.15	2/14/2014	0.05	3/14/2014	0.07
1/15/2014	0.07	2/15/2014	0.05	3/15/2014	0.11
1/16/2014	0.01	2/16/2014	0.07	3/16/2014	0
1/17/2014	0.01	2/17/2014	0.02	3/17/2014	0
1/18/2014	0.13	2/18/2014	0.2	3/18/2014	0.01
1/19/2014	0.01	2/19/2014	0.05	3/19/2014	0.42
1/20/2014	0.07	2/20/2014	0.64	3/20/2014	0.14
1/21/2014	0	2/21/2014	0.59	3/21/2014	0
1/22/2014	0.01	2/22/2014	0.02	3/22/2014	0.05
1/23/2014	0.03	2/23/2014	0	3/23/2014	0.03
1/24/2014	0	2/24/2014	0.2	3/24/2014	0
1/25/2014	0.06	2/25/2014	0.06	3/25/2014	0.02
1/26/2014	0.03	2/26/2014	0.08	3/26/2014	0.01
1/27/2014	0.06	2/27/2014	0.08	3/27/2014	0.02

Table E-1 continued.

January 2014	Precipitation (inches)	February 2014	Precipitation (inches)	March 2014	Precipitation (inches)
1/28/2014	0.01	2/28/2014	0	3/28/2014	0.21
1/29/2014	0			3/29/2014	1.08
1/30/2014	0			3/30/2014	0.13
1/31/2014	0			3/31/2014	0
Total	**2.45**	**Total**	**3.93**	**Total**	**3.26**

Table E-2. Second Quarter 2014 SDA Precipitation Data (Liquid Rainfall Equivalent)

Source: NYSERDA

April 2014	Precipitation (inches)	May 2014	Precipitation (inches)	June 2014	Precipitation (inches)
4/1/2014	0	5/1/2014	0.04	6/1/2014	0
4/2/2014	0	5/2/2014	0.29	6/2/2014	0
4/3/2014	0	5/3/2014	0.09	6/3/2014	0.38
4/4/2014	0.39	5/4/2014	0.01	6/4/2014	0.01
4/5/2014	0.07	5/5/2014	0	6/5/2014	0.01
4/6/2014	0	5/6/2014	0	6/6/2014	0
4/7/2014	0.4	5/7/2014	0	6/7/2014	0
4/8/2014	0.4	5/8/2014	0.02	6/8/2014	0.76
4/9/2014	0	5/9/2014	0.08	6/9/2014	0
4/10/2014	0.03	5/10/2014	0.12	6/10/2014	0
4/11/2014	0.2	5/11/2014	0	6/11/2014	0.07
4/12/2014	0	5/12/2014	0	6/12/2014	0.48
4/13/2014	0	5/13/2014	0.65	6/13/2014	0.58
4/14/2014	0.53	5/14/2014	0.28	6/14/2014	0
4/15/2014	0.43	5/15/2014	0.3	6/15/2014	0
4/16/2014	0	5/16/2014	0.57	6/16/2014	0
4/17/2014	0	5/17/2014	0.04	6/17/2014	0.04
4/18/2014	0	5/18/2014	0	6/18/2014	0.25
4/19/2014	0	5/19/2014	0	6/19/2014	0.01
4/20/2014	0	5/20/2014	0.28	6/20/2014	0
4/21/2014	0	5/21/2014	0.14	6/21/2014	0
4/22/2014	0.27	5/22/2014	0.14	6/22/2014	0
4/23/2014	0.15	5/23/2014	0.03	6/23/2014	0
4/24/2014	0	5/24/2014	0	6/24/2014	0.58
4/25/2014	0.41	5/25/2014	0	6/25/2014	0.4
4/26/2014	0.07	5/26/2014	0	6/26/2014	0
4/27/2014	0	5/27/2014	0.16	6/27/2014	0
4/28/2014	0	5/28/2014	0	6/28/2014	0
4/29/2014	0.16	5/29/2014	0	6/29/2014	0.4
4/30/2014	0.67	5/30/2014	0	6/30/2014	0
		5/31/2014	0		
Total	**4.18**	**Total**	**3.24**	**Total**	**3.97**

Table E-3. Third Quarter 2014 SDA Precipitation Data (Liquid Rainfall Equivalent)

Source: NYSERDA

July 2014	Precipitation (inches)	August 2014	Precipitation (inches)	September 2014	Precipitation (inches)
7/1/2014	0	8/1/2014	0	9/1/2014	0
7/2/2014	0.41	8/2/2014	0.63	9/2/2014	0.59
7/3/2014	0.25	8/3/2014	0.12	9/3/2014	0
7/4/2014	0.01	8/4/2014	0	9/4/2014	0
7/5/2014	0	8/5/2014	0.82	9/5/2014	0
7/6/2014	0	8/6/2014	0	9/6/2014	0.26
7/7/2014	0.93	8/7/2014	0	9/7/2014	0
7/8/2014	0.47	8/8/2014	0	9/8/2014	0
7/9/2014	0	8/9/2014	0	9/9/2014	0
7/10/2014	0	8/10/2014	0	9/10/2014	0.04
7/11/2014	0	8/11/2014	0	9/11/2014	0.14
7/12/2014	0	8/12/2014	1.43	9/12/2014	0
7/13/2014	0.98	8/13/2014	0.26	9/13/2014	0.03
7/14/2014	0.02	8/14/2014	0	9/14/2014	0
7/15/2014	0.3	8/15/2014	0	9/15/2014	0.12
7/16/2014	0	8/16/2014	0.15	9/16/2014	0.17
7/17/2014	0.06	8/17/2014	0.03	9/17/2014	0
7/18/2014	0	8/18/2014	0	9/18/2014	0
7/19/2014	0.22	8/19/2014	0	9/19/2014	0
7/20/2014	0	8/20/2014	0	9/20/2014	0
7/21/2014	0	8/21/2014	0	9/21/2014	0.47
7/22/2014	0	8/22/2014	0	9/22/2014	0.11
7/23/2014	0.21	8/23/2014	0	9/23/2014	0
7/24/2014	0	8/24/2014	0	9/24/2014	0
7/25/2014	0	8/25/2014	0	9/25/2014	0
7/26/2014	0	8/26/2014	0	9/26/2014	0
7/27/2014	0.05	8/27/2014	0	9/27/2014	0
7/28/2014	0.46	8/28/2014	0	9/28/2014	0
7/29/2014	0	8/29/2014	0	9/29/2014	0
7/30/2014	0	8/30/2014	0	9/30/2014	0.33
7/31/2014	0.16	8/31/2014	1.34		
Total	**4.53**	**Total**	**4.78**	**Total**	**2.26**

Table E-4. Fourth Quarter 2014 SDA Precipitation Data (Liquid Rainfall Equivalent)

Source: NYSERDA

Date	Precipitation (inches)	Date	Precipitation (inches)	Date	Precipitation (inches)
10/1/2014	0	11/1/2014	0.04	12/1/2014	0.01
10/2/2014	0	11/2/2014	0	12/2/2014	0.04
10/3/2014	0.02	11/3/2014	0	12/3/2014	0.04
10/4/2014	0.16	11/4/2014	0.06	12/4/2014	0
10/5/2014	0.04	11/5/2014	0.06	12/5/2014	0.03
10/6/2014	0.35	11/6/2014	0.29	12/6/2014	0.61
10/7/2014	0.27	11/7/2014	0.15	12/7/2014	0
10/8/2014	0.17	11/8/2014	0.01	12/8/2014	0
10/9/2014	0.01	11/9/2014	0.07	12/9/2014	0
10/10/2014	0	11/10/2014	0	12/10/2014	0.1
10/11/2014	0	11/11/2014	0	12/11/2014	0.38
10/12/2014	0	11/12/2014	0.14	12/12/2014	0
10/13/2014	0.2	11/13/2014	0.26	12/13/2014	0
10/14/2014	0	11/14/2014	0.2	12/14/2014	0.07
10/15/2014	0.24	11/15/2014	0.02	12/15/2014	0.01
10/16/2014	0.36	11/16/2014	0.02	12/16/2014	0.24
10/17/2014	0.05	11/17/2014	0.42	12/17/2014	0.37
10/18/2014	0.72	11/18/2014	0.03	12/18/2014	0.01
10/19/2014	0	11/19/2014	0.01	12/19/2014	0
10/20/2014	0.15	11/20/2014	0.39	12/20/2014	0
10/21/2014	0.31	11/21/2014	0.23	12/21/2014	0
10/22/2014	0	11/22/2014	0.25	12/22/2014	0
10/23/2014	0	11/23/2014	0.03	12/23/2014	0.07
10/24/2014	0	11/24/2014	0.17	12/24/2014	0.2
10/25/2014	0	11/25/2014	0	12/25/2014	0.04
10/26/2014	0	11/26/2014	0	12/26/2014	0
10/27/2014	0	11/27/2014	0.2	12/27/2014	0.04
10/28/2014	0.16	11/28/2014	0.02	12/28/2014	0.32
10/29/2014	0.01	11/29/2014	0	12/29/2014	0
10/30/2014	0	11/30/2014	0.07	12/30/2014	0
10/31/2014	0.14			12/31/2014	0.01
Total	**3.36**	**Total**	**3.14**	**Total**	**2.59**

Appendix F – Ground Surface Elevation Data

Table F-1. 2014 SDA North Slope Ground Surface Elevation Data - (Feet Above Mean Sea Level)

Source: NYSERDA

Location[a]	Elevation[b]
1	1345.86
3	1343.99
4	1345.42
5	1349.87
6	1355.91
7	1348.37
8	1356.65
9	1363.12
10	1368.68
11	1375.66
12	1358.93
13	1367.69
14	1371.64
15	1373.54
16	1371.28
17	1370.64
18	1357.46
19	1349.44
20	1348.99
31	1363.92
32	1350.81
33	1351.95
34	1362.79
35	1350.86
36	1362.99
38	1364.53
39	1365.32
40	1361.40
45	1363.47
46	1364.83
47	1357.95
48	1355.38
50	1346.21
51	1344.30

Table F-1 continued.

Location[a]	Elevation[b]
52	1359.75
53	1373.67
CP53	1375.74

a Locations 1-20 and 30-40 were established in 1982 by the USGS and resurveyed in 1983. From 1983 to 1991, the North Slope was not surveyed. Locations 45-48 were established by NYSERDA in 1991 when the annual North Slope survey was reinstated. Locations 50-53 were added in December 2011. Gaps in location numbers are points that were discontinued or never used.

b Coordinate System: Horizontal datum is North American Datum of 1927 (NAD27), NY West Zone. Vertical datum is National Geodetic Vertical Datum of 1929 (NGVD29). Elevations were measured on November 13, 2014, by Clear Creek Land Surveying, LLC.

Table F-2. 2014 SDA Trench Cap Ground Surface Elevation Data - (Feet Above Mean Sea Level)

Source: NYSERDA

Trench	Location[a]	Elevation[b]	Trench	Location[a]	Elevation[b]	Trench	Location[a]	Elevation[b]
1&2	S-M	1393.59	6	S-M	1386.67	11	S-M	1386.17
1&2	1+0	1392.72	6	1+0	1389.09	11	1+0	1385.26
1&2	2+0	1391.75	6	N-M	1391.47	11	2+0	1386.39
1&2	3+0	1391.42				11	3+0	1387.32
1&2	4+0	1390.86	7	S-M	1386.73	11	4+0	1387.77
1&2	5+0	1389.76	7	0+42.25	1385.82	11	5+0	1388.02
1&2	6+0	1386.97	7	N-M	1385.60	11	N-M	1389.40
1&2	N-M	1384.62						
1&2	7+10	1380.48	8	S-M	1391.03	12	S-M	1386.14
1&2	7+20	1378.28	8	1+0	1388.12	12	1+0	1384.54
			8	2+0	1388.69	12	2+0	1385.74
3	S-M	1393.74	8	3+0	1388.44	12	3+0	1386.83
3	1+0	1393.26	8	4+0	1388.31	12	4+0	1387.52
3	2+0	1393.17	8	5+0	1388.37	12	5+0	1387.46
3	3+0	1391.92	8	N-M	1389.87	12	N-M	1390.32
3	4+0	1391.49						
3	5+0	1389.98	9	S-M	1389.26	13	S-M	1386.01
3	6+0	1387.26	9	1+0	1387.16	13	1+0	1383.19
3	N-M	1385.09	9	2+0	1387.90	13	2+0	1385.38
			9	3+0	1388.30	13	3+0	1386.29
4	S-M	1394.15	9	4+0	1388.93	13	4+0	1386.96
4	1+0	1392.27	9	5+0	1389.29	13	5+0	1387.25
4	2+0	1393.03	9	N-M	1390.64	13	6+0	1385.99
4	3+0	1392.42				13	N-M	1388.72
4	4+0	1392.26	10	S-M	1387.39			
4	5+0	1390.37	10	1+0	1386.16	14	S-M	1386.10
4	6+0	1388.13	10	2+0	1387.28	14	1+0	1383.91
4	N-M	1388.04	10	3+0	1387.83	14	2+0	1384.63
			10	4+0	1388.44	14	3+0	1385.71
5	S-M	1394.67	10	5+0	1388.58	14	4+0	1386.19
5	1+0	1392.51	10	N-M	1390.27	14	5+0	1385.70
5	2+0	1391.89				14	6+0	1385.14
5	3+0	1391.07				14	N-M	1385.40
5	4+0	1390.43						
5	5+0	1390.50						
5	6+0	1387.61						
5	N-M	1389.24						

Table F-2 continued.

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a Location is given as X+Y where X is trench length in 100-foot increments plus Y in feet (e.g., 7+10 = 710 feet). N-M is located on the centerline mark of the north monument plaque at each trench. S-M is located on the centerline mark of the south monument plaque at each trench.

b Coordinate System: Horizontal datum is North American Datum of 1927 (NAD27), NY West Zone. Vertical datum is National Geodetic Vertical Datum of 1929 (NGVD29). Elevations were measured on November 5, 2014, by Clear Creek Land Surveying, LLC.

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