8976 Wellington Road
Manassas, VA 20109

April 1, 2021

R. Scott Deyette
New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau C
625 Broadway, 11th Floor
Albany, New York 12233-7014

Re: Interim Groundwater Monitoring Report: 952-30R Shutdown Test
Former IBM 952/982 Site (Neptune Commerce Center)
Poughkeepsie, Dutchess County, New York
NYSDEC Site No. 314076

Dear Mr. Deyette:

The enclosed document presents the interim findings of the shutdown test of groundwater extraction well 952-30R at the IBM former leased Building 952/982 site located at the Neptune Commerce Center on Neptune Road, Poughkeepsie, New York. The work described herein was conducted in accordance with the shutdown test work plan dated July 26, 2019 and approved by the Department on October 11, 2019.

If you have any questions, please contact me at (703) 257-2580.

Sincerely,
International Business Machines Corporation

Stephen P Brown

Stephen Brown, P.E.
Program Manager, IBM Corporate Environmental Affairs

Enclosure: Letter Report

cc: T. Perretta (NYSDOH)
D. Kaminski (NCI)

FORMER IBM BUILDING 952 AND BUILDING 982 LEASED PROPERTY
DUTCHESS COUNTY
TOWN OF POUGHKEEPSIE, NEW YORK

INTERIM GROUNDWATER MONITORING REPORT
952-30R SHUTDOWN TEST

NYSDEC Site Number: 314076
Order on Consent, Index #A3-0655-12-10

April 1, 2021

Prepared by:
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Former Building 952/982 Site
Town of Poughkeepsie
Dutchess County, New York

Interim Groundwater Monitoring Report:
952-30R Shutdown Test

Site ID: 314076
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April 1, 2021

As the person with primary responsibility for the performance of the geological services and activities associated with the captioned Report, I certify that I have reviewed the document titled *"Former IBM Building 952 and Building 982 Leased Property, Interim Groundwater Monitoring Report: 952-30R Shutdown Test, Site ID: 314076, Order on Consent, Index #A3-0655-12-10"*. This report is dated April 1, 2021 and was prepared by Groundwater Sciences, P.C. (GSPC) and Groundwater Sciences Corporation (GSC) for IBM Corporation.

As a professional geologist licensed in the State of New York, I certify that the associated geological services and this report have been prepared under my direct supervision while working as agent for GSPC. To the best of my knowledge; all such information contained in this report is complete and accurate.

This report bears the seal of a professional geologist; no alterations may be made to the information contained in this report unless made in accordance with Title 8, Article 145, Section 7209 of New York State Education Law.

Signature: _____ Date: 4/1/2021

Name: Dorothy A. Bergmann

License No: 00477

State: New York

TABLE OF CONTENTS

LIST OF TABLES (see also, LIST OF APPENDICES)

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

IBM	International Business Machines Corporation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSGQS	New York State Groundwater Quality Standards as described in 6NYCRR Part 703, Division of Water Technical and Operational Guidance Series (1.1.1)
SVOC	Semi Volatile Organic Compound
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
111-TCA	1,1,1-Trichlorethane
11-DCA	1,1-Dichloroethane
11-DCE	1,1-Dichloroethene
12-DCBZ	1,2-Dichlorobenzene
12-DCA	1,2-Dichloroethane
12-DCE (tot)	sum of cis- and trans- isomers of 1,2-dichloroethene
124-TCBZ	1,2,4-Trichlorobenzene
13-DCBZ	1,3-Dichlorobenzene
14-DCBZ	1,4-Dichlorobenzene
BS-2EH-PTAL	Bis(2-Ethylhexyl)phthalate
CBZ	Chlorobenzene
TCM	Chloroform
D(N)BUT-PTAL	Di-n-butyl phthalate
DCM	Methylene Chloride
PCE	Tetrachloroethene
TCE	Trichloroethene

1.0 INTRODUCTION

This report presents the interim findings of the shutdown test of groundwater extraction well 952-30R located at the former International Business Machines Corporation (IBM) former leased Building 952/982 Site (Site), in Poughkeepsie, New York (**Figure 1-1**). This report has been prepared by Groundwater Sciences Corporation and Groundwater Sciences, P.C. at the request of IBM.

The Site is currently listed on the New York State Inactive Hazardous Waste Disposal Site Registry as a Class 4 Site, Site ID 314076. The Site is being remediated by IBM pursuant to Order on Consent Index A3-0655-12-10 executed on May 18, 2011 for Site #314076 between the New York State Department of Environmental Conservation (NYSDEC) and IBM.

Extraction well 952-30R operated for nearly twenty-six year, providing removal of dissolved volatile organic compounds (VOCs) within and near the source area of the Site, localized around the extraction well. The request to perform a shutdown test of groundwater extraction well 952-30R was based on a review and analysis of trends in volatile organic compound (VOC) concentrations and mass removals during groundwater extraction operations at the Site and included the results of the baseline sampling event which was completed during May 2019. The findings of this review indicate that although the groundwater extraction operations resulted in significant decreases in VOC concentrations in groundwater, with reductions of up to two orders of magnitude, concentrations in Site groundwater within the source area have reached asymptotic values and continued operations were unlikely to provide further meaningful reductions in concentrations in groundwater within the source area wells.

Based on these findings, IBM proposed to shutdown of extraction well 952-30R, combined with groundwater monitoring, to confirm that groundwater monitoring would serve as a more appropriate remedial alternative to address the remaining low concentrations of VOCs in the groundwater at the Site. The results of this test will be used to support modifications to the final remedy for the Site.

The shutdown test consists of a program of groundwater monitoring before and after shutdown of groundwater withdrawals at 952-30R. The three-phase approach for the shutdown test was

presented in the work plan dated July 26, 2019[1] (952-30R Shutdown Test Work Plan) submitted to the Department, and subsequently approved on October 11, 2019[2].

1.1 Purpose and Objectives

The purpose of the 952-30R shutdown test is to collect empirical data to confirm the results of an assessment and trend analysis that predicted termination of 952-30R withdrawal would not result in meaningful impacts to downgradient groundwater conditions. The shutdown test was designed to provide data of sufficient quantity and quality to support the termination of 952-30R.

This report presents interim results of the shutdown test after six quarters of monitoring post shutdown of 952-30R.

1.2 Organization of Report

The remainder of this report is organized in four additional sections with associated tables, figures, and appendices. Section 2 presents background information pertinent to the shutdown test. Section 3 describes the shutdown test scope of work. Section 4 presents the interim findings of the shutdown test and Section 5 provides summary conclusions.

[1] IBM Corporation,.July 26, 2019, Request for Extraction Well 952-30R Shutdown Test Former IBM Leased Building 982 (Neptune Commerce Center) Poughkeepsie, Dutchess County, New York NYSDEC, Order on Consent Index #A3-0655-12-10, Site No. 314076

[2] NYSDEC, October 11, 2019, Request for Extraction Well 952-30R Shutdown Test, Former IBM B952/982 Site (Neptune Commerce Center) Poughkeepsie, Dutchess County, New York, NYSDEC Site No. 314076

2.0 SITE BACKGROUND

This section provides an overview of pertinent background information concerning the location and hydrogeologic setting of the Site; a summary of previous investigations and remedial history; site-ownership and regulatory history and the rationale for the 952-30R shutdown.

2.1 Location and Hydrogeologic Setting

A portion of the Poughkeepsie, New York 7.5-minute USGS Quadrangle map showing the location of the Site is attached as **Figure 1-1**. The Site is located in the Town of Poughkeepsie, New York, with frontage on both South Road and Neptune Road. A map showing the extraction well 952-30R and Site groundwater monitoring wells is attached as **Figure 2-2**.

The Site lies topographically in a broad upland approximately 135 feet above mean sea level (amsl) between Casper Creek, 2,000 feet to the southeast, and a small unnamed stream, 3,500 feet to the northwest. The site is flanked on the northeast and southwest by two prominent hills with elevations greater than 200 feet above mean sea level (amsl). Surface water drainage from the site is primarily to the southeast toward Casper Creek.

The Site is underlain with dolostone, a calcium magnesium carbonate rock prone to solution weathering by groundwater, particularly in zones where the rock is highly fractured. Solution features were apparent in some of the borings, particularly 952-11R (**Figure 2-2**) which contained an open void from 79 feet to 105 feet below ground surface. Bedrock ranges from less than 20 feet to over 50 feet below the ground surface at the Site. Bedrock is overlain by a variable thickness of unconsolidated sediments, including primarily glacially derived tills, outwash materials consisting of gravels, sands, and silts, lake deposits consisting of alluvial silts and clays, and man-made fill material. The thickness of unconsolidated sediments ranges from more than 55 feet thick, southeast of Building 982, to less than ten feet thick along Route 9. The overlying contact with the unconsolidated sediments is an erosional surface. The primary unconsolidated sediments found under the Site are, from oldest to youngest:

- Glacial till, a poorly sorted mixture of boulders, gravel, sand, silt and clay deposited directly by contact with ice;

- Generally poorly sorted outwash material consisting of gravels, sands and silts which is the result of re-working of till and other materials by glacial meltwater;
- Alluvial silts and clays which are the result of deposition in a low-energy environment such as a glacial lake;
- Man-made fill materials which lack bedding or structure.

Beneath the Site, groundwater flow occurs primarily within the dolostone bedrock of the Wappinger Formation with the exception of a few isolated zones of perched water on top of silt and clay lenses within the unconsolidated sediments. Several nested bedrock piezometers have been constructed at this Site and water levels measured in these piezometers indicate a vertical gradient downward in the shallow bedrock and then horizontal flow within the deeper bedrock zone. As shown on **Figure 2-3**, the principal directions of groundwater flow are to the east, south and west from a location near the front of former B982 and pumping well, 952-30R.

2.2 Summary of Previous Investigations and Remedial History

In 1984, upon discovery that a central waste holding tank had leaked, the Site was remediated voluntarily by IBM, without a consent order but with NYSDEC oversight. At that time, IBM occupied the Site as a lessee when the Site was owned by South Road Associates. As such, IBM remains responsible for the current ongoing remedial activities conducted at the Site.

Site groundwater has been monitored periodically since 1982 for various constituents, including Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), Metals, Phenols (total); Pesticides, Poly-chlorinated Biphenyls and Oil and Grease. Beginning in 1993, Site groundwater has been monitored under a NYSDEC-approved Groundwater Monitoring Plan (GMP) that was originally submitted as part of the Site's *Operation and Maintenance Plan for the Groundwater Collection and Treatment System, IBM Building 952 and Building 982 Leased Property* (O&M Plan)[3]. Several minor modifications were made to the GMP and approved by the NYSDEC including decommissioning of several monitoring wells and a reduction in monitored constituents.

[3] Groundwater Sciences Corporation, February 24, 1994, Operation and Maintenance Plan for the Groundwater Collection and Treatment System, IBM Building 952 and Building 982 Leased Property.

Remedial investigations were performed to characterize the nature and extent of contamination at the Site beginning in 1982. Generally, the remedial investigations determined that the onsite groundwater and subsurface soils were contaminated by a former leaking underground waste chemical holding tank located in the courtyard between former Buildings 952 and Building 982 (**Figure 2-2**). The onsite soil chemical contamination was generally located in the vicinity of the underground waste chemical holding tank. Additionally, it was determined that soils under Building 952 and a portion of Building 982 were also impacted. According to previous analytical data, compounds with the highest concentrations in the soil include 1,2-dichlorobenzene (12-DCBZ), methylene chloride (DCM), chloroform (TCM), bis(2-ethylhexyl)phthalate (BS-2EH-PTAL), and di-n-butyl phthalate (D(N)BUT-PTAL). The results of the remedial investigations s are described in detail in the following reports:

- Lawler, Matusky, and Skelly, Engineers (LMS), August 1982. *Interim Report on Building 952/982.*
- LMS, March 1983. Final Report: Hydrogeology and Chemistry of Building 952 Area.
- Conestoga-Rovers & Associates Limited (CRA), April 1984. *Soil Sampling & Analysis Buildings 952 and 982.*
- CRA, May 1985. Remedial Action Project Soil and Sampling and Analysis Buildings 952 and 982 (Volume 1).
- CRA, September 1985. Remedial Action Plan Construction Implementation Buildings 952 and 982 (Volume 2).
- Milton Chazen Associates (MCA), May 1986. Groundwater Quality Data Report 1984-1985, Building 952 Site.
- Groundwater Sciences Corporation (GSC), March 1993. IBM B952/982 Site Reclassification Petition, Volumes 1 & 2.
- Henningson, Durham & Richardson Architecture & Engineering, P.C. (HDR), December 2011, Revised February 2012. *B952 Excavation Work Plan*.
- Sanborn, Head Engineering, P.C., September 2013. Subslab Depressurization System (SSDS) Design/Installation Work Plan.
- Sanborn, Head Engineering, P.C., February 2014. Subslab Depressurization System Start-Up and Performance Testing Report.
- HDR, January 2017. B952 Excavation Work Plan Summary Report.

Major milestones in the Site history, remedial investigations and operations following the discovery of VOCs in groundwater is provided below:

- October 1981 – A single monitoring well was installed near the abandoned storage tank. The well was screened in the dolostone bedrock since the overlying unconsolidated sediments appeared to be dry.
- 1982 - Removal of the chemical holding tank. Installation of 36 soil borings completed both interior to the buildings and exterior of the buildings to collect soil samples.
- 1984 – Removal of four tanks which included a fuel oil storage tank, a concrete tank, and two concrete vaults containing water main valves, fittings, and piping, removed as part of the remedial action approved by the NYSDEC[4].
- 1984 – Installation a series of nested piezometers and commencement of the voluntary groundwater monitoring program at the Site. The monitored well locations included a series of perimeter wells that covered all segments of the property line.
- 1990 – Reinstallation of a monitoring well that had been abandoned (952-10RA) as part of the excavation in the courtyard between former B952 and B982.
- 1992 – Seven soil samples were collected from five of the historical soil sampling locations beneath the concrete slab floor of B952. These samples were collected at locations and depths previously sampled in 1982 to determine what changes had occurred in the intervening ten-year period. This comparison indicated that volatile organic compounds (VOCs) in the soil had dissipated and that semivolatile organic compounds (SVOCs) and oil and grease concentrations in the soil were essentially unchanged after ten years.
- 1993 - IBM submits a Petition to Reclassify the Former Buildings 952 and 982 Site from a Class 2a to a Class 4 Site in the NYSDEC Inactive Hazardous Waste Disposal Registry[5].
- 1993 – Start-up of groundwater extraction well 952-30R and associated on-site treatment system (December 1, 1993).
- 1993 – NYSDEC reclassifies[6] the Site to a Class 4 Site on the Registry of Inactive Waste Disposal Sites.

[4] IBM identified the area of contaminated soil after purchasing the property from Endicott-Johnson, prior to IBM's redevelopment of the property as the "Clark Street Campus". VOCs detected in the soil included PCE, TCE, 111-TCA, methylene chloride, and toluene. The soil was disposed at the CECOS Landfill in Niagara Falls, New York.

[5] Groundwater Sciences Corporation, March 8, 1993. IBM B952/982 Site, Reclassification Petition, 2 Volumes.

[6] NYSDEC, December 2, 1993, Petition to Reclassify, IBM 952/982, Site ID. No.314076.

- 1994 – IBM transmits[7] the Operation and Maintenance Plan for the Groundwater Collection and Treatment System.
- 2005 to 2010 Former B952 and 982 remained vacant and the Site undeveloped.
- 2011 NCI received Site Plan and Subdivision approval from the Town of Poughkeepsie. NCI redevelopment activities included the demolition of former IBM leased Building 952 and the construction of two new commercial buildings in its place. Former IBM leased Building 982 would remain intact and be renovated.

  IBM prepared an Excavation Work Plan (EWP) as required by its approved SMP. The EWP was initiated in September 2012 and IBM completed field activities in June 2013. Soils that exhibited detections on the PID and/or an odor were excavated, stockpiled, and sampled for laboratory analyses of VOCs and BN-SVOCS via EPA Methods 8260B and 8270D, respectively, as required by the EWP. There were no detections of VOCs or BN-SVOCs above NYSDEC required site soil cleanup objectives (SCOs) of restricted residential use. Post-excavation samples were collected from each of the excavation areas in accordance with NYSDEC DER-10[8] for VOCs and BN-SVOCs by EPA Methods 8260B and 8270D, respectively. Post excavation sample results indicate that there were no detections of VOCs or BN-SVOCs above NYSDEC required site SCOs of restricted residential use.
- 2019 to present: Groundwater extraction well 952-30R is one of two remediation systems at installed and operated by IBM at the Site. In May 2019, IBM completed a baseline sampling event of all available groundwater monitoring wells and conducted a review of monitoring data that resulted in a request to shutdown extraction well 952-30R. The shutdown test consists of a program of groundwater monitoring before and after shutdown of groundwater withdrawals at 952-30R. The three-phase approach for the shutdown test was presented in the work plan dated July 26, 2019[9] (952-30R Shutdown Test Work Plan) submitted to the Department, and subsequently approved on October 11, 2019[10].

  The second remediation system is a sub-slab depressurization system associated with soil vapor intrusion mitigation at the former IBM leased Building 982. A work plan[11] to evaluate termination of operations of the sub-slab depressurization system was submitted

[7] Groundwater Sciences Corporation, February 24, 1994. Operation and Maintenance Plan for the Groundwater Collection and Treatment System. IBM Building 952 and Building /982 Leased Property,

[8] NYSDEC, May 2010, DER-10 Technical Guidance for Site Investigation and Remediation.

[9] IBM Corporation,. July 26, 2019, Request for Extraction Well 952-30R Shutdown Test Former IBM Leased Building 982 (Neptune Commerce Center) Poughkeepsie, Dutchess County, New York NYSDEC, Order on Consent Index #A3-0655-12-10, Site No. 314076

[10] NYSDEC, October 11, 2019, Request for Extraction Well 952-30R Shutdown Test, Former IBM B952/982 Site (Neptune Commerce Center) Poughkeepsie, Dutchess County, New York, NYSDEC Site No. 314076

[11] Sanborn Head and Associates,. February 15, 2019, Work Plan for Subslab Depressurization System Shutdown Testing Former IBM Leased Building 982 (Neptune Commerce Center) Poughkeepsie, Dutchess County, New York NYSDEC Site No. 314076

to the NYSDEC and subsequently approved[12]. On March 5, 2020, IBM submitted the Sub-slab Depressurization System (SSDS) Shutdown Testing Results Report[13], for the former IBM 952/982 Site. On June 9, 2020[14], NYSDEC recommended that the SSDS remain off with a request for additional sampling to further evaluate the system shutdown. The requested additional samples were recently collected and will be reported to the NYSDEC under separate cover.

2.3 Site Ownership and Regulatory History

As noted previously, the Site was leased by IBM and owned by South Road Associates. As of April 25, 2005, the site was transacted to Neptune Capital Investors, LLC.

IBM entered into an Order on Consent, Index #A3-0655-12-10[15] (Order) issued by the New York State Department of Environmental Conservation (NYSDEC) on May 18, 2011, which required the preparation of a Site Management Plan (SMP) as the final phase of the remediation, and for the continued operation and management of the Site. As detailed in the Paragraph 11 of the Order, the O&M Plan was superseded by the Order.

Following issuance of the Order, IBM prepared and submitted various documents to fulfill the need for a SMP and associated Environmental Easements. On December 2, 2011, IBM submitted a Final SMP[16] and NYSDEC in consultation with the New York State Department of Health (NYSDOH) approved the SMP in a letter dated December 29, 2011[17].

In 2011, the Site owner received Site Plan approval from the local municipality to redevelop the Site. During redevelopment, IBM requested and NYSDEC approved suspension[18] of the requirement to sample periphery wells at the Site as required under the GMP until such time as the

[12] NYSDEC, July 2, 2019, Former IBM B952/982, Subslab Depressurization System Shutdown Testing Results, Site No. 314076, Poughkeepsie, Dutchess County.

[13] Sanborn Head and Associates,. March 5, 2020, Sub-slab Depressurization System (SSDS) Shutdown Testing Results Report Former IBM Leased Building 982 (Neptune Commerce Center) Poughkeepsie, Dutchess County, New York NYSDEC Site No. 314076.

[14] NYSDEC, July 2, 2019, Former IBM B952/982, Sub-slab Depressurization System Shutdown Sampling – December 2019 Sampling, Site No. 314076, Poughkeepsie, Dutchess County.

[15] NYSDEC, Order on Consent Index #A3-0655-12-10, Site No. 314076

[16] Groundwater Sciences Corporation and Henningson, Durham and Richardson Architecture & Engineering, P.C, December 2, 2011, Former IBM B952/982 Site, Dutchess County, New York, NYSDEC Site No. 314076, Site Management Plan

[17] NYSDEC, Former IBM Building 952/982 Site, Poughkeepsie, Dutchess County, Site No. 314076, Final Site Management Plan

[18] IBM and NYSDEC correspondences, January 23, 2013, IBM request and NYSDEC approval to suspend sampling and gauging of peripheral wells at the Site until redevelopment of the Site is complete.

redevelopment of the Site was complete. During the hiatus in sampling of the well field, IBM continued to operate and complete monitoring the pumping well, 952-30R as per the approved GMP.

In addition, IBM submitted information pertaining to the metes and bounds written description for our Site Boundary Modification Request[19] based on remedial actions and sampling results conducted during redevelopment of the Site. Lastly, on October 23, 2018, IBM submitted an update to the SMP to reflect changes at the Site due to redevelopment and to account for changes to the GMP.

2.4 Rationale for 952-30R Shutdown

The request to perform a shutdown test of groundwater extraction well 952-30R was based on a review and analysis of trends in volatile organic compound (VOC) concentrations and mass removals during nearly twenty-six years of groundwater extraction operations at the Site and included the results of the baseline sampling event which was completed during May 2019. The baseline sampling event included all remaining Site groundwater wells for the parameters designated in the approved GMP.

Data review and trend analysis indicate that the groundwater extraction operations resulted in significant decreases in VOC concentrations in groundwater, with reductions of up to two orders of magnitude. Since startup VOC concentrations had shown significant reductions within the source area wells and were below the NYSGQS in perimeter wells. Despite continued groundwater extraction operations, concentrations in Site groundwater within the source area have reached asymptotic values and further meaningful reductions in concentrations in groundwater within the source area wells are not expected.

Based on these findings, it was proposed that the shutdown of extraction well 952-30R, combined with groundwater monitoring, is now a more appropriate remedial alternative to address the remaining low concentrations of VOCs in the groundwater at the Site. The results of this test will be used to support modifications to the final remedy for the Site.

[19] Site Boundary Modification Request, March 28, 208 with corrections dated August 14, 2018.

3.0 DESCRIPTION OF WORK PERFORMED

The scope of the 952-30R shutdown test consists of a program of groundwater monitoring pre- and post-shutdown of groundwater extraction well 952-30R.

The scope of the shutdown monitoring program consists of three phases as follows:

Phase 1 Pre-Shutdown Monitoring consisting of a baseline monitoring round performed prior to shutdown of 952-30R, including recording groundwater elevations for all Site monitoring wells and analysis of groundwater samples for the list of parameters consistent with the approved GMP.

Phase 2 Post-Shutdown Quarterly Monitoring performed for a period of six months. The monitoring includes recording groundwater elevations for the wells shown on **Figure 2-2** and VOC analysis of groundwater samples collected from inactive extraction well 952-30R and groundwater monitoring wells 952-10RA, and 952-31R. The water level data would be reviewed to assess apparent groundwater flow directions.

Phase 3 Quarterly monitoring for an additional 2 years following completion of Phase 2. The monitoring includes recording groundwater elevations and sampling of all accessible wells on-Site.

The scope of field activities associated with this interim report include:

- Performance of Phase 2 activities, including post-shutdown water level measurement rounds at all accessible wells on Site for two quarters and two post-shutdown groundwater sampling events at the three source area wells (952-10RA, 952-31R and the extraction well 952-30R).
- Performance of one year of Phase 3 activities, including post-shutdown water level measurement rounds at all accessible wells on-Site for four quarters and four post-shutdown groundwater sampling events at all accessible wells on-Site.

As noted previously, the Phase 1 pre-shutdown monitoring was completed in May 2019 and included sampling and analysis of all Site groundwater monitoring wells for the list of target analytes consistent with the approved GMP. In addition, groundwater elevations were determined

at each groundwater monitoring location. The data collected under Phase 1 serves as a baseline of pre-shutdown conditions.

3.1 Groundwater Elevation Measurements

The groundwater level elevation measurements for the shutdown test included recording of water levels at twelve well locations on-Site. The water level monitoring locations are shown on **Figure 2-2**.

Groundwater elevations were calculated by subtracting the measured depth to water from the surveyed elevation of the measuring point. The measuring point for most wells is the top of the inner well casing (i.e., "Surveyed Reference Point Elevation"). Pre- and post-shutdown depth-to-water measurements and their calculated groundwater elevations are provided in **Table A-1** of **Appendix A**.

3.2 Groundwater Sampling

The groundwater sampling program for the shutdown test consisted of collection of groundwater samples from the accessible on-Site monitoring wells shown on **Figure 2-2**. The twelve wells sampled include:

- Extraction well 952-30R.
- Source area monitoring wells: 952-10RA and 952-31R.
- Other Site monitoring wells: 952-6R; 952-9R; 952-11R; 952-12R; 952-13R; 952-14R; 952-14RA 952-16R and 952-29R.

Monitoring wells were purged using a dedicated pump system, small non-dedicated pump systems or dedicated bailers. After purging the samples were collected into laboratory-provided, properly preserved sample containers and placed in coolers with ice for transportation to EnviroTest Laboratories of Newburgh, New York (EnviroTest) using standard chain-of-custody protocols. The samples delivered to EnviroTest were analyzed for VOCs using SW-846 Method 8021B and if required, BN-SVOCs using SW-846 Method 8270D, Oil and Grease and turbidity by standard methods.

Field sampling data, including results of field screening of the groundwater samples for temperature, pH and specific conductance and the results of laboratory analyses are summarized by well in **Appendix B.**

4.0 FINDINGS

This section describes the findings of the 952-30R shutdown test, including a review of groundwater levels and flow conditions on Site; a summary of the principal constituents of concern; source area groundwater quality monitoring results and Site-wide groundwater quality monitoring results.

4.1 Groundwater Levels and Flow Directions

Beneath the site, groundwater flow occurs primarily within the dolostone bedrock of the Wappinger Formation with the exception of a few isolated zones of perched water on top of silt and clay lenses within the unconsolidated sediments.

Several nested bedrock piezometers have been constructed at this Site and water levels measured in these piezometers indicate a vertical gradient downward in the shallow bedrock and then horizontal flow within the deeper bedrock zone

Figure 4-1 and **Figure 4-2** depict groundwater elevation contours recorded during Phase 2 non-pumping conditions for the fourth quarter 2019 and first quarter 2020, respectively. **Figure 4-3**, **Figure 4-4**, **Figure 4-5** and **Figure 4-6** depict groundwater elevation contours recorded during the first year of Phase 3 non-pumping conditions for the second quarter 2020, third quarter 2020, fourth quarter 2020 and first quarter 2021, respectively.

As shown on these figures, the principal directions of groundwater flow are to the east and south from a location near the front of former B982 and near monitoring well 952-10RA and pumping well, 952-30R.

4.2 Principal Constituents of Concern

The principal constituents detected at the site are chlorinated benzenes, chlorinated ethanes and chlorinated ethenes. A brief description of each of these groupings of VOCs is provided below.

Chlorinated benzenes – The principal chlorinated benzenes detected in groundwater at the Site include the three isomers of dichlorobenzene (12-DCBZ; 1,3-dichlorobenzene (13-DCBZ) and 1,4-dichlorobenzene (14-DCBZ)); 1,2,4-trichlorobenzene (124-TCBZ) and chlorobenzene (CBZ).

Chlorinated ethanes – The principal chlorinated ethanes detected in groundwater at the Site include:

1,1,1-trichloroethane (111-TCA); 1,1-dichloroethane (11-DCA); 1,2-dichloroethane (12-DCA) and 1,1-dichloroethene (11-DCE). 111-TCA is a primary solvent used in many industrial applications and in printing operations. Its principal transformation products are 11-DCA by reductive dechlorination and 11-DCE by an abiotic elimination reaction.

Chlorinated ethenes – The principal chlorinated ethenes detected in groundwater at the Site include tetrachloroethene (PCE); trichloroethene (TCE) and 1,2-dichloroethene (12-DCE(tot)). TCE can be either a daughter product of PCE by reductive dechlorination or a primary solvent unrelated to PCE use. Dissolved TCE, whether derived from PCE or directly from the solvent TCE, degrades by reductive dechlorination to either cis-1,2-dichlorothene (preferentially) or trans-1,2-dichloroethene.

Other compounds detected in groundwater include the semi-volatile compound BS-2EH-PTAL and chloroform (TCM).

4.3 Source Area Groundwater Quality Monitoring Results

A comparison of source area groundwater quality sampling results is provided in **Table B-1** of **Appendix B** Groundwater quality monitoring results for each compound detected at each monitored location during the shutdown test is provided in **Table B-1**, therefore the list of compounds detected at locations may vary. Source area wells include 952-10RA, 952-31R and the pumping well 952-30R. Also, of note, **Table B-1** includes data from the last sampling event prior to Site redevelopment (2012), the historical maximum concentration detected for each compound detected during the shutdown test and the date the historical maximum concentration was detected.

Source area groundwater quality during the shutdown test, shows chlorinated benzene concentrations, including 12-DCBZ, 13-DCBZ and 14-DCBZ at monitoring well 952-10RA are consistently detected above the 3 ug/L New York State Groundwater Quality Standard (6NYCRR Part 703) (NYSGQS) for these compounds. Monitoring results for 952-31R show a similar pattern

of concentrations for chlorinated benzenes (12-DCBZ, 13-DCBZ and 14-DCBZ) detected above the NYSGQS of 3 ug/L although at much lower concentrations than found at 952-10RA. For the compounds detected at the extraction well 952-30R, during the shutdown test, none were detected above the NYSGQS.

It should be noted that although groundwater quality measurements for wells 952-10RA and 952-31R indicate the presence of chlorinated benzene compounds that exceed the NYSGQS, the detected concentrations during the shutdown text did not exceed the maximum historical detected concentrations for these compounds.

TCE was detected consistently in all samples collected under the shutdown test at 952-10RA. Of the six quarters of data collected post-shutdown of 952-30R, TCE data from three quarters exceeded the NYSGQS of 5 ug/L at source area monitoring well 952-10RA. TCE was also consistently detected in source area monitoring well 952-31R whereas of the six quarters of data collected post-shutdown of 952-30R, only one result exceeded the NYSGQS.

Other compounds detected in source area wells during the six quarters of post-shutdown of 952-30R include: CBZ; 124-TCBZ; 111-TCA; 11-DCE; 11-DCA; 12-DCA; 12-DCE (total); PCE; TCM; 1,2-dichloropropane; 2-chlorotoluene; 4-chlorotoluene vinyl chloride and BS-2EH-PTAL.

4.4 Site-wide Groundwater Quality Monitoring Results

A comparison of Site-wide groundwater quality sampling results is provided in **Table B-2** of **Appendix B**. Site-wide monitoring includes wells that are upgradient, side-gradient and downgradient of the source area.

Groundwater quality monitoring results for each compound detected at each monitored location during the shutdown test is provided in **Table B-2**, therefore the list of compounds detected at locations may vary. Nine site-wide wells were monitored during Phase 3 of the shutdown test and include: 952-6R; 952-9R; 952-11R; 952-12R; 953-13R; 952-14R; 952-14RA; 952-16R and 952-29R.

Also, of note, **Table B-2** includes data from the last sampling event prior to Site redevelopment (2012), the historical maximum concentration detected for each compound detected during the shutdown test and the date the historical maximum concentration was detected.

Of the samples collected from non-source area locations, only one compound, BS-2EH-PTAL was detected at concentrations that exceeded the NYSGQS of 5 ug/L. BS-2EH-PTAL was detected at the following three locations: 952-9R, 952-14-R and 952-14RA at 7.4 J ug/L; 6.7 J ug/L and 6.6 J ug/L, respectively.

A review **Table B-2** shows detections for other compounds at wells that are outside the source area are sporadic and not at concentrations that exceed the NYSGQS for these constituents. Other compounds detected at concentrations in non-source area wells during the six quarters of post-shutdown of 952-30R include: 12-DCBZ; 111-TCA; 11-DCA; 12-DCA; TCE; TCM; toluene; and benzo(b)fluorene. None of the other compounds detected, were detected at concentrations that exceed the NYSGQS for samples collected during the six quarters following shutdown of 952-30R.

5.0 SUMMARY CONCLUSIONS

Pre-shutdown groundwater quality results indicate the groundwater remedy implemented at the Site has been successful. Chlorinated benzene concentrations have been detected at perimeter monitoring wells only sporadically and have remained at levels below NYSGQS since early 1999. For the six quarters of post-shutdown monitoring, only one chlorinated benzene, 12DCBZ, was detected in a perimeter monitoring well, 952-11R, at a concentration of 0.27J ug/L which is below the NYSGQS of 3 ug/L for this compound.

One compound, BS-2EH-PTAL was detected in three perimeter wells at concentrations that exceed the NYSGQS of 5 ug/L. The detections of BS-2EH-PTAL were not confirmed with the subsequent sampling event.

Based on our understanding of conditions within and near the Site, the continued shutdown of extraction well 952-30R is expected to result in no meaningful impacts constituting a threat to public health and the environment.

Given the findings summarized in this report, IBM will continue to implement the approved shutdown work plan including the remaining quarterly monitoring under Phase 3 to include recording groundwater elevations and sampling of all accessible wells on-Site.

Following the conclusion of Phase 3 monitoring, the combined two and a half years of post-shutdown monitoring data will be compared to the pre-shutdown sampling results to confirm no meaningful impacts constituting a threat to public health and the environment have developed since 952-30R shutdown.

Throughout the remainder of the Phase 3 monitoring period, extraction well 952-30R and the associated GTF will remain inactive as long as the groundwater monitoring data for chlorinated benzenes and VOCs indicate no meaningful impacts to downgradient groundwater conditions. However, if a review of the pre- and post-shutdown concentrations indicates a meaningful impact to groundwater downgradient of 952-30R, then groundwater extraction operations at 952-30R would resume and the shutdown monitoring program would be reevaluated.

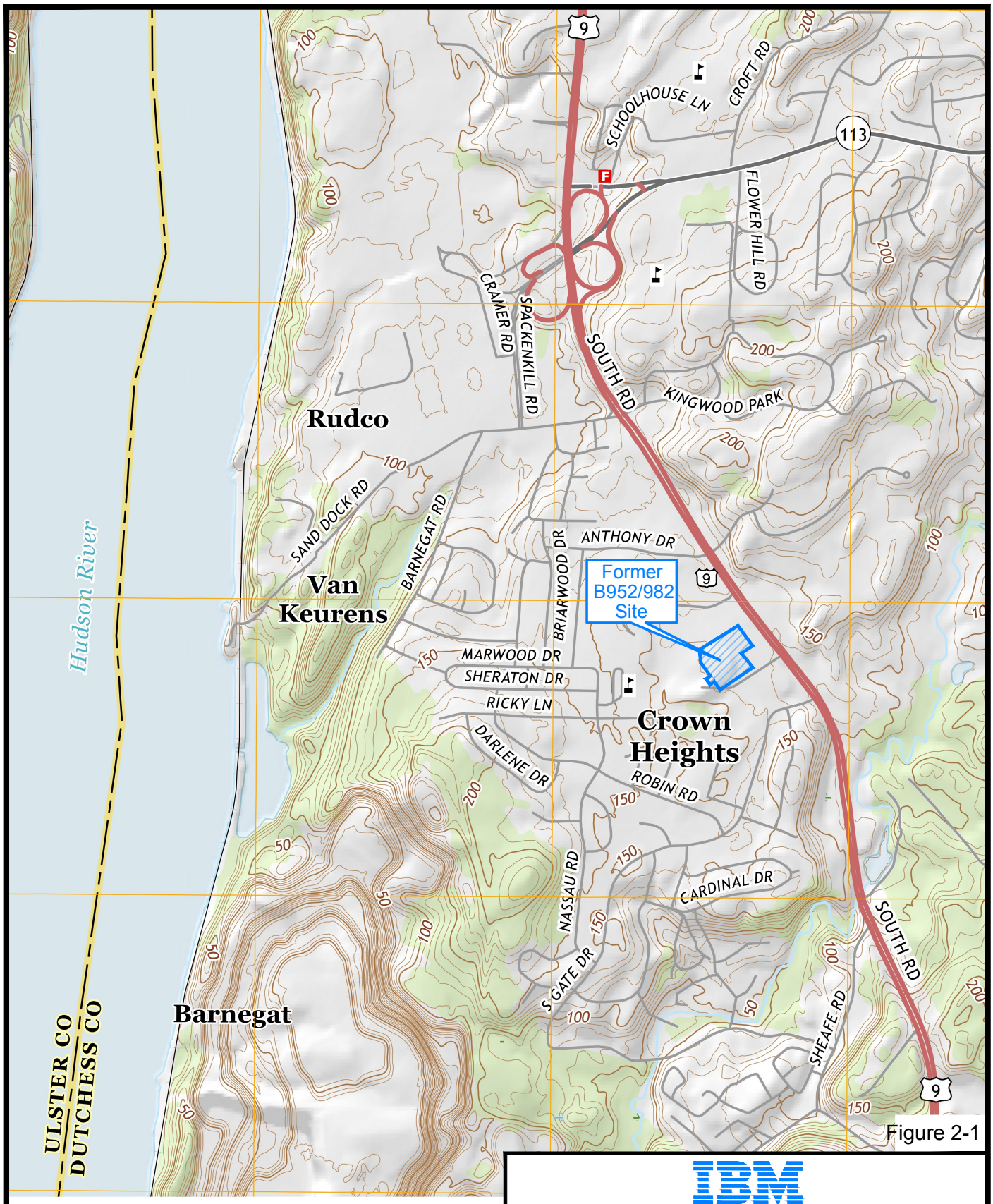

Figure 2-1

Portion of the Poughkeepsie, New York
7.5-minute USGS Quadrangle (2016)

Approximate

Scale
0 500' 1000' 1500'

Source: USGS National Map US Topo

IBM
Poughkeepsie, New York

Former B952/982
Site Location Map

DRAWN BY: JPB	DATE: 7/22/19	DRAWING NO.
CHECKED & APPROVED BY: DAB		92022-034-B1

GROUNDWATER SCIENCES CORPORATION

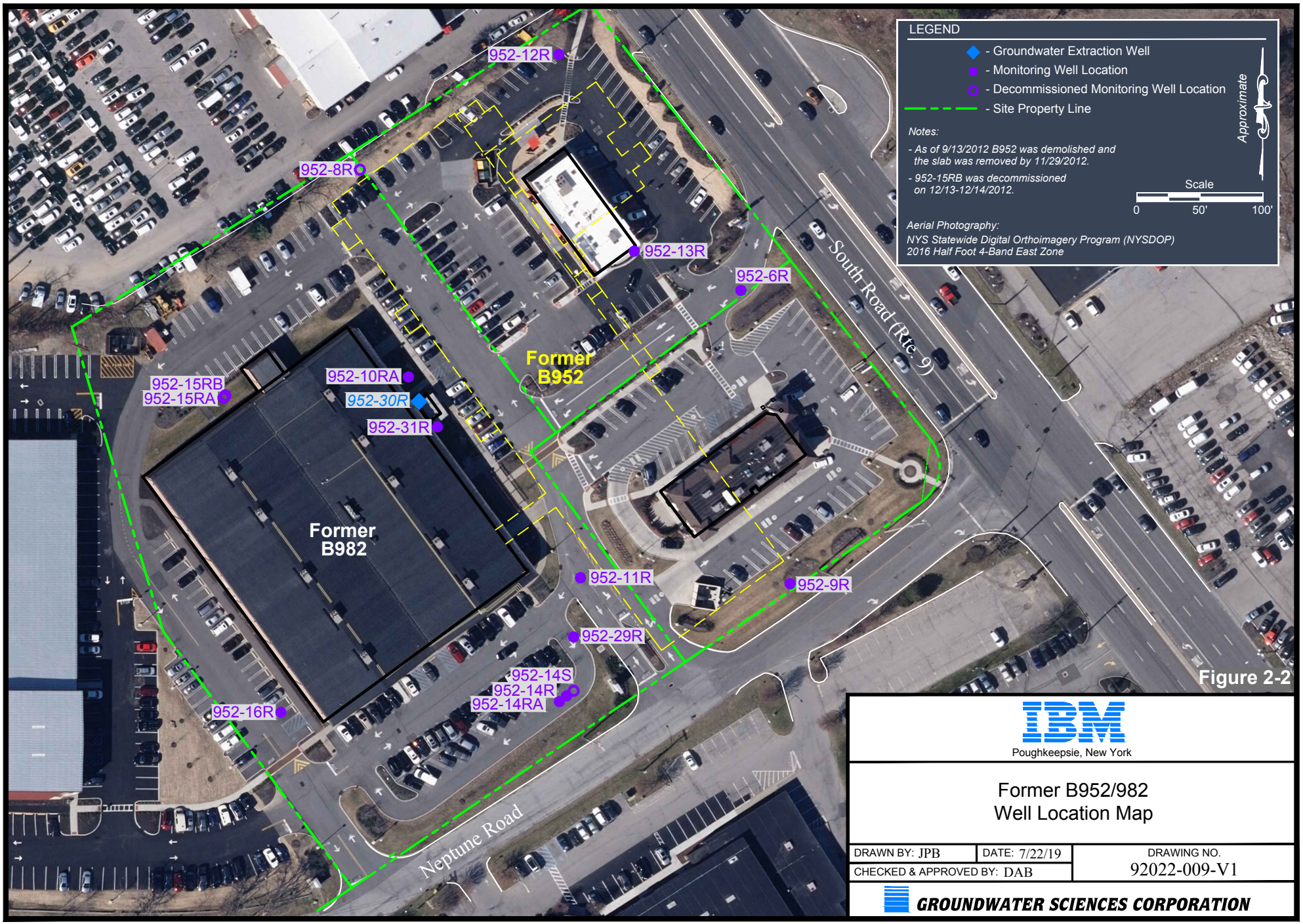

Figure 2-2

IBM
Poughkeepsie, New York

Former B952/982
Well Location Map

DRAWN BY: JPB	DATE: 7/22/19	DRAWING NO.
CHECKED & APPROVED BY: DAB		92022-009-V1

GROUNDWATER SCIENCES CORPORATION

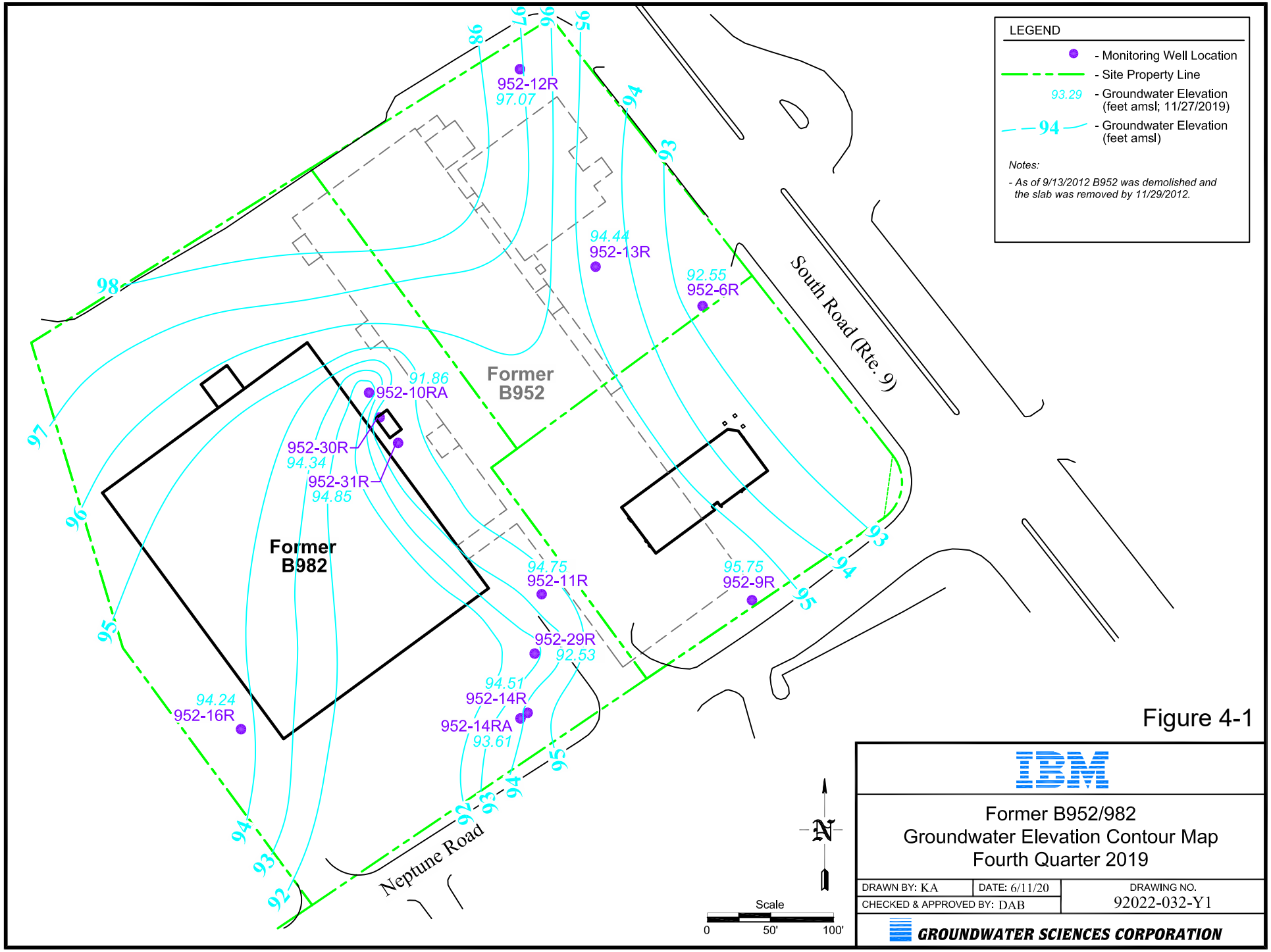

Figure 4-1

IBM

Former B952/982
Groundwater Elevation Contour Map
Fourth Quarter 2019

DRAWN BY: KA	DATE: 6/11/20	DRAWING NO.
CHECKED & APPROVED BY: DAB		92022-032-Y1

GROUNDWATER SCIENCES CORPORATION

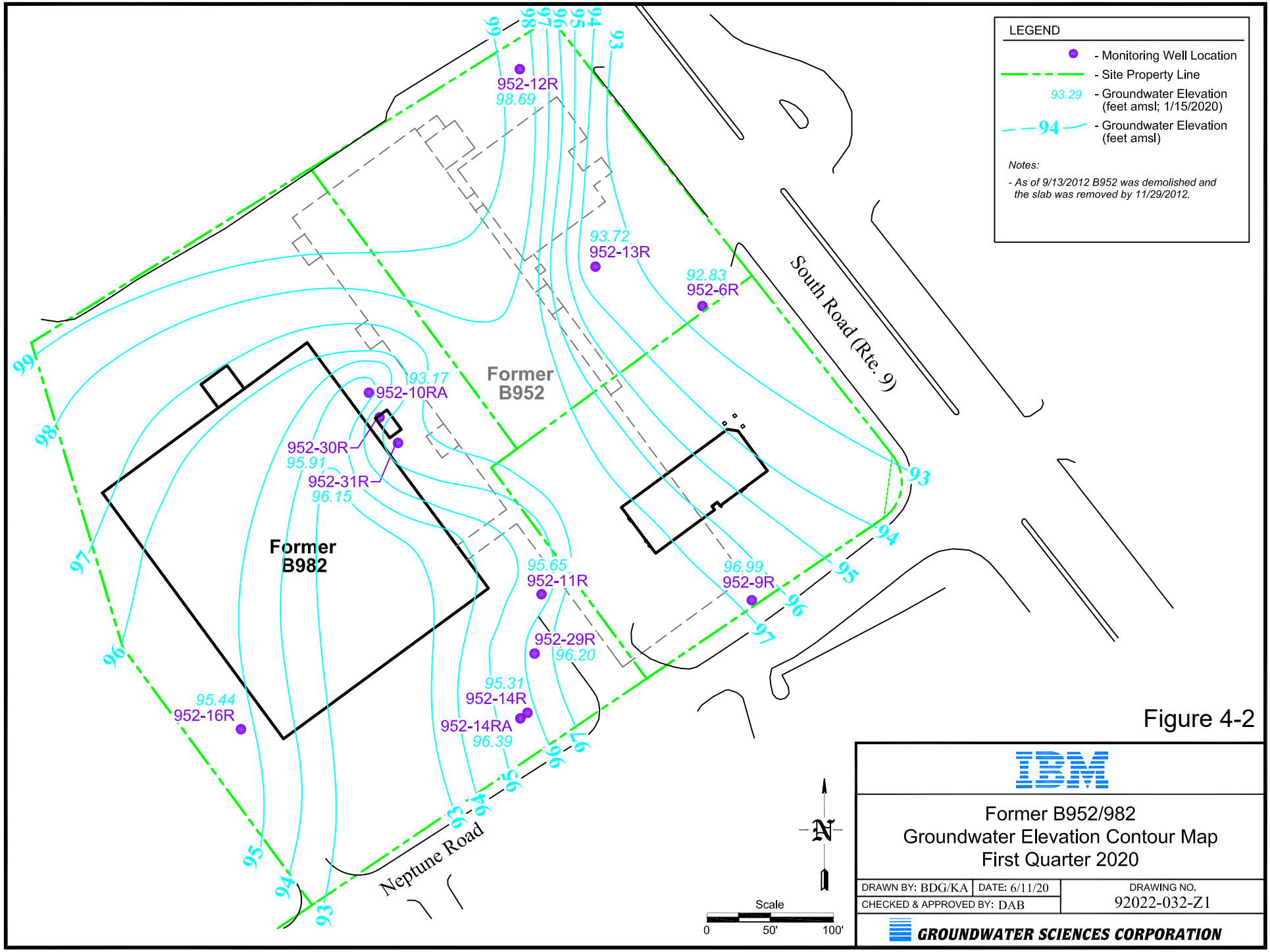

Figure 4-2

IBM

Former B952/982
Groundwater Elevation Contour Map
First Quarter 2020

DRAWN BY: BDG/KA	DATE: 6/11/20	DRAWING NO.
CHECKED & APPROVED BY: DAB		92022-032-Z1

GROUNDWATER SCIENCES CORPORATION

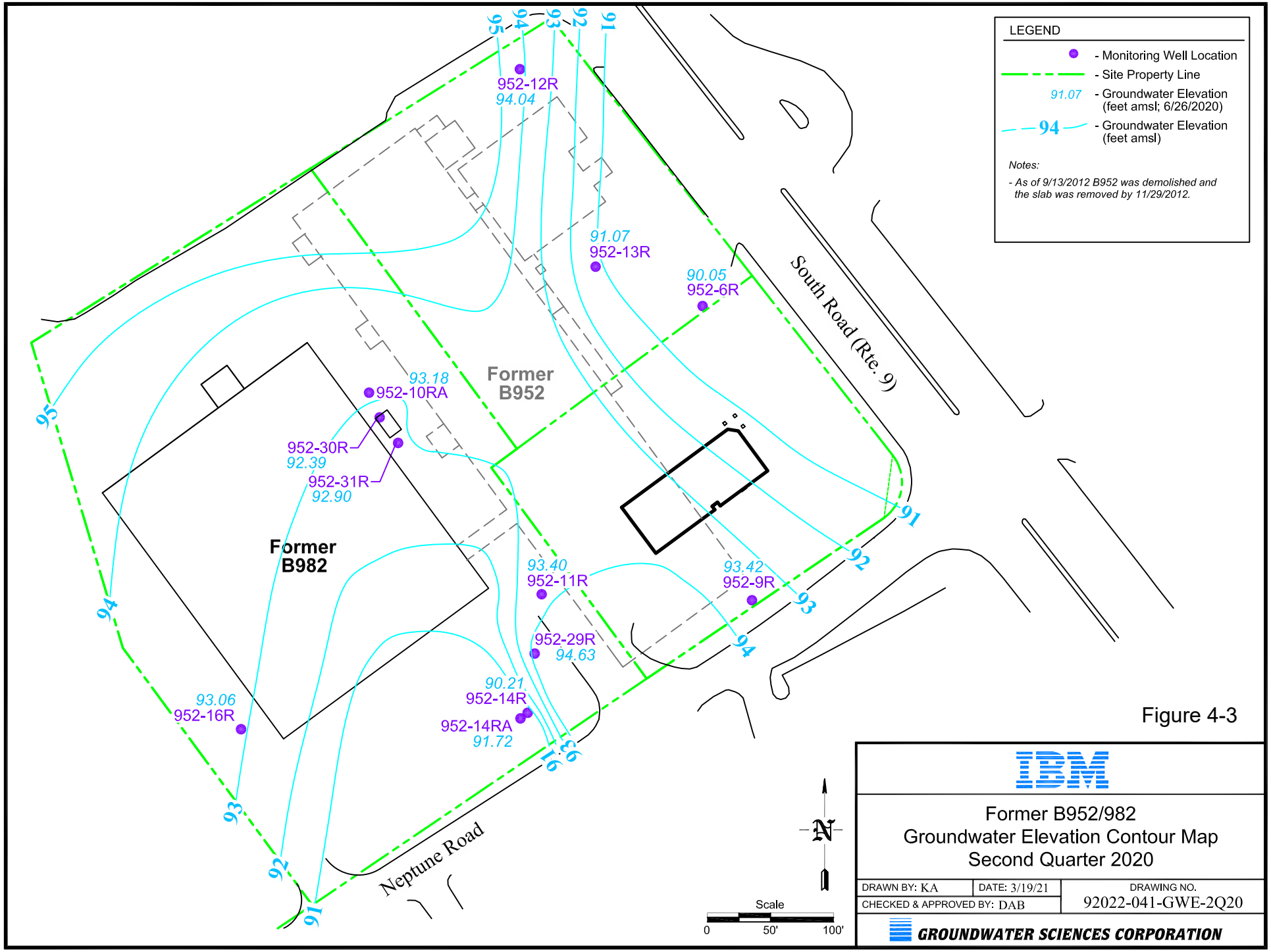

Figure 4-3

IBM

Former B952/982
Groundwater Elevation Contour Map
Second Quarter 2020

DRAWN BY: KA	DATE: 3/19/21	DRAWING NO.
CHECKED & APPROVED BY: DAB		92022-041-GWE-2Q20

GROUNDWATER SCIENCES CORPORATION

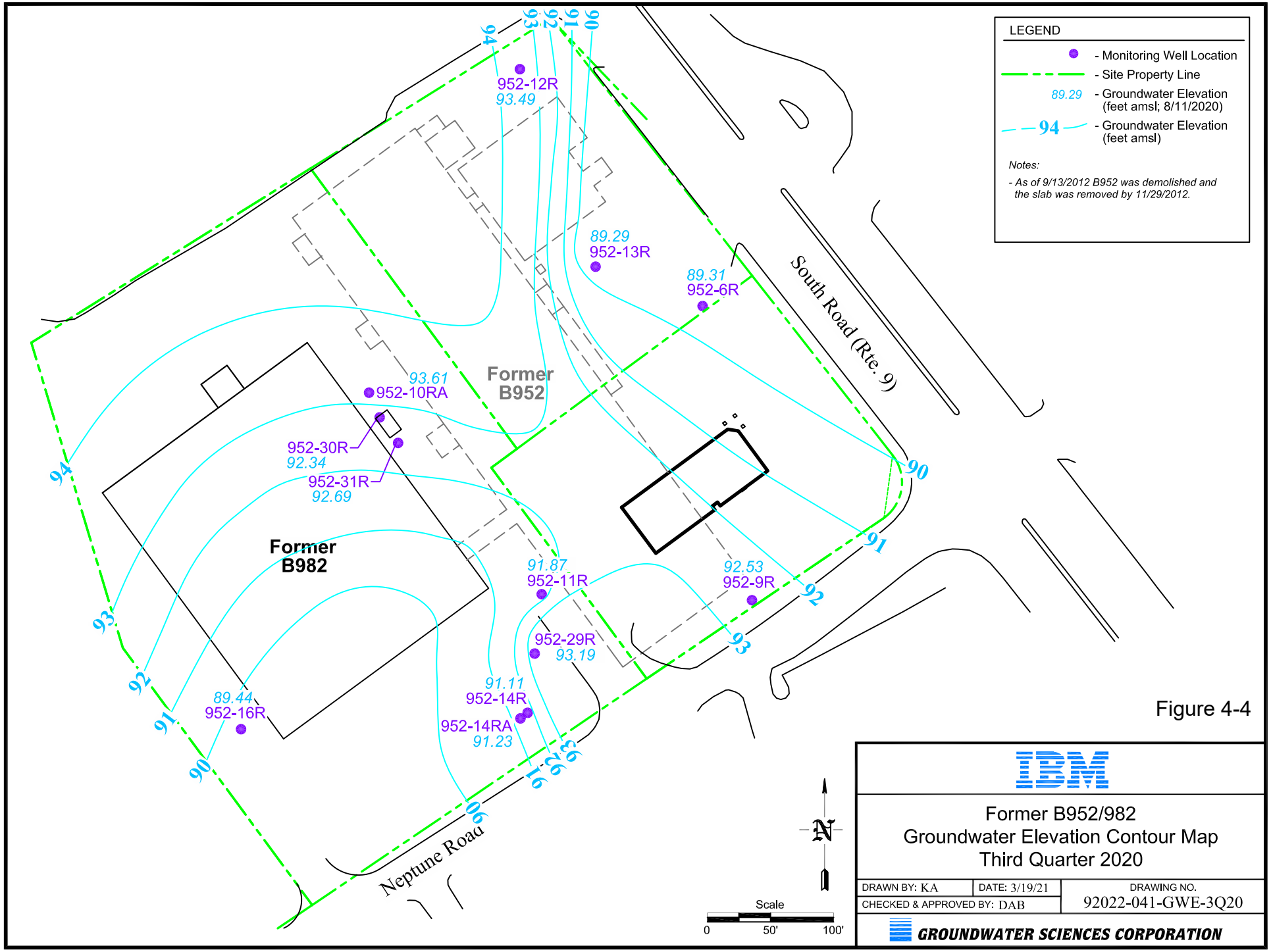

Figure 4-4

IBM

Former B952/982
Groundwater Elevation Contour Map
Third Quarter 2020

DRAWN BY: KA	DATE: 3/19/21	DRAWING NO.
CHECKED & APPROVED BY: DAB		92022-041-GWE-3Q20

GROUNDWATER SCIENCES CORPORATION

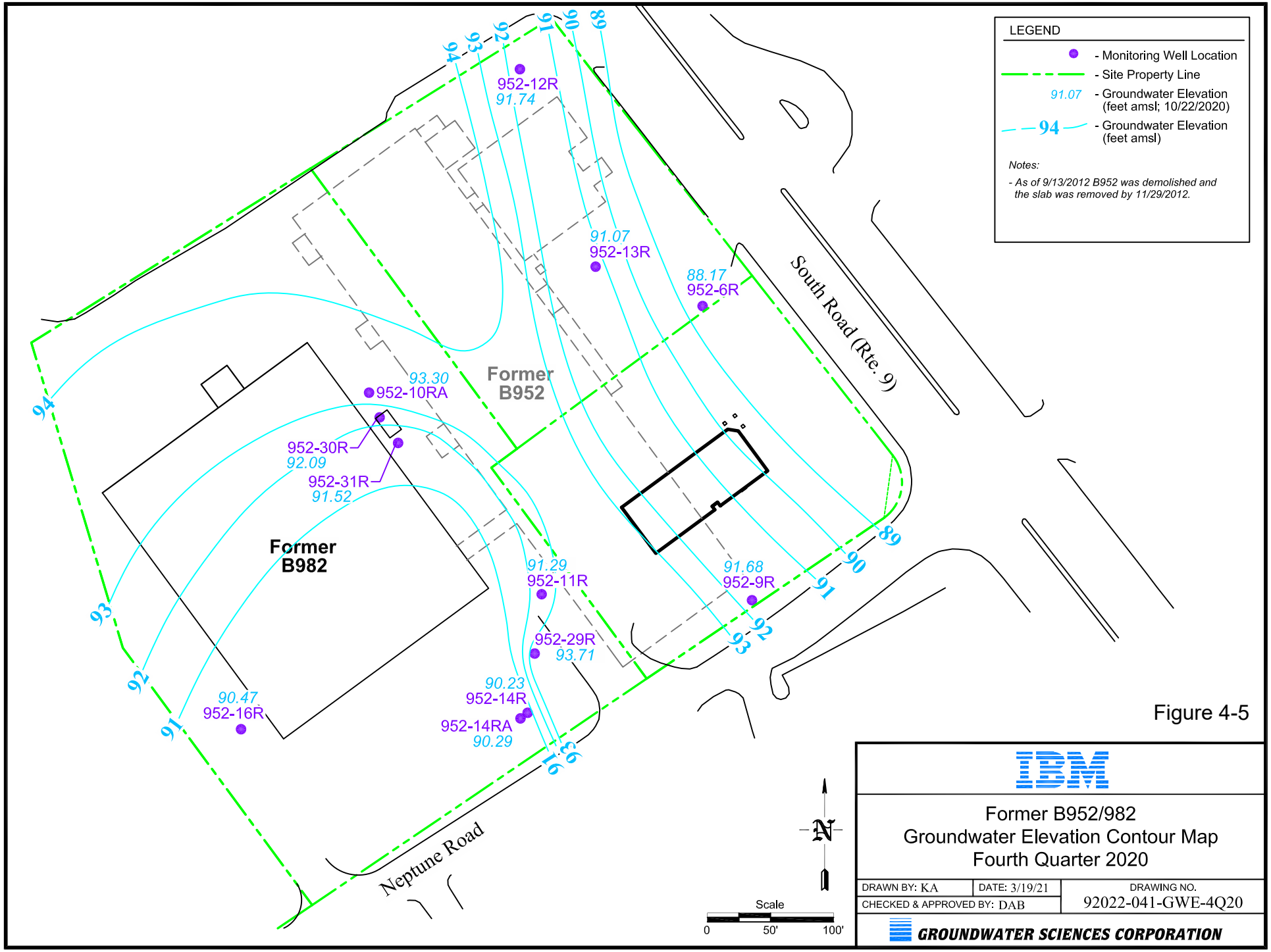

Figure 4-5

IBM

Former B952/982
Groundwater Elevation Contour Map
Fourth Quarter 2020

DRAWN BY: KA	DATE: 3/19/21	DRAWING NO.
CHECKED & APPROVED BY: DAB		92022-041-GWE-4Q20

GROUNDWATER SCIENCES CORPORATION

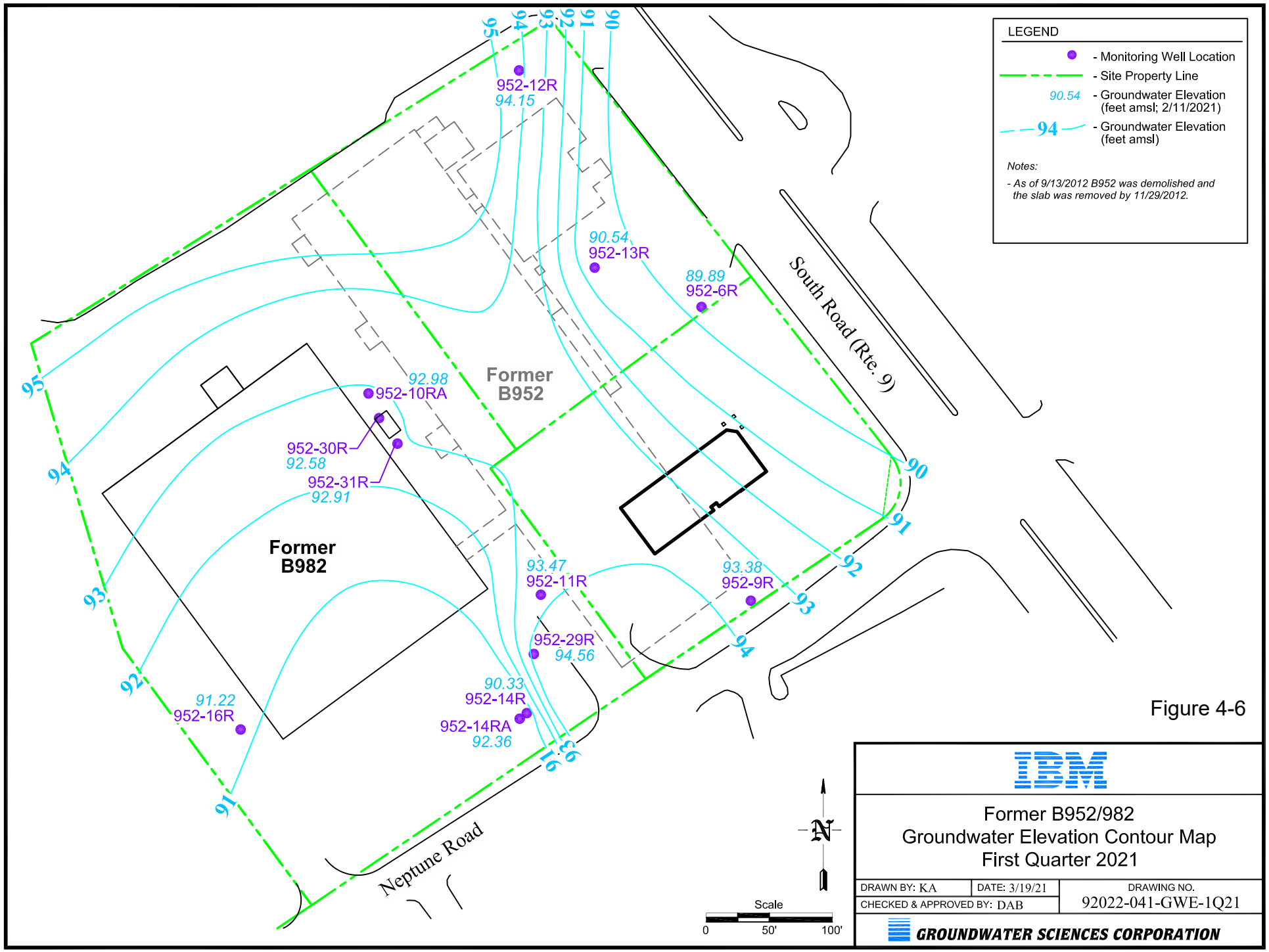

Figure 4-6

IBM

Former B952/982
Groundwater Elevation Contour Map
First Quarter 2021

DRAWN BY: KA	DATE: 3/19/21	DRAWING NO.
CHECKED & APPROVED BY: DAB		92022-041-GWE-1Q21

GROUNDWATER SCIENCES CORPORATION

Appendix A
Groundwater Elevation Determinations

Table A-1: Depth to Water Measurements and Calculated Groundwater Elevation Data

Table A-1

Former Leased Property - Buildings 952/982
Depth to Water Measurements and Calculated Groundwater Elevation Data

Well No.	Elevation TOC	1/15/2020 DTW	1/15/2020 GWE	6/26/2020 DTW	6/26/2020 GWE	8/11/2020 DTW	8/11/2020 GWE	10/22/2020 DTW	10/22/2020 GWE
952-6R	**130.68**	37.85	92.83	40.63	90.05	41.37	89.31	42.51	88.17
952-9R	**137.80**	40.81	96.99	44.38	93.42	45.27	92.53	46.12	91.68
952-10RA	**137.61**	41.19	96.42	44.43	93.18	44.00	93.61	44.31	93.30
952-11R	**135.57**	39.92	95.65	42.17	93.40	43.70	91.87	44.28	91.29
952-12R	**135.07**	36.38	98.69	41.03	94.04	41.58	93.49	43.33	91.74
952-13R	**131.07**	37.35	93.72	40.00	91.07	41.78	89.29	40.00	91.07
952-14R	**135.33**	40.02	95.31	45.12	90.21	44.22	91.11	45.10	90.23
952-14RA	**135.61**	39.22	96.39	43.89	91.72	44.38	91.23	45.32	90.29
952-16R	**135.44**	40.00	95.44	42.38	93.06	46.00	89.44	44.97	90.47
952-29R	**137.31**	41.11	96.20	42.68	94.63	44.12	93.19	43.60	93.71
952-30R	**136.69**	40.78	95.91	44.30	92.39	44.35	92.34	44.60	92.09
952-31R	**137.07**	40.92	96.15	44.17	92.90	44.38	92.69	45.55	91.52

Notes:

TOC Top of Casing (surveyed reference point)
DTW Measured Depth to Water from surveyed reference point (Elevation TOC) (feet)
GWE Calculated Groundwater Elevation (feet above mean sea level)

Table A-1 (continued)

Former Leased Property - Buildings 952/982
Depth to Water Measurements and Calculated Groundwater Elevation Data

Well No.	Elevation TOC	2/11/2021 DTW	GWE
952-6R	**130.68**	40.79	89.89
952-9R	**137.80**	44.42	93.38
952-10RA	**137.61**	44.63	92.98
952-11R	**135.57**	42.10	93.47
952-12R	**135.07**	40.92	94.15
952-13R	**131.07**	40.53	90.54
952-14R	**135.33**	45.00	90.33
952-14RA	**135.61**	43.25	92.36
952-16R	**135.44**	44.22	91.22
952-29R	**137.31**	42.75	94.56
952-30R	**136.69**	44.11	92.58
952-31R	**137.07**	44.16	92.91

Notes:

TOC	Top of Casing (surveyed reference point)
DTW	Measured Depth to Water from surveyed reference point (Elevation TOC) (feet)
GWE	Calculated Groundwater Elevation (feet above mean sea level)

Appendix B
Groundwater Monitoring Data Summary Tables

Table B-1: Source Area Monitoring Wells: Comparison of Historical, Phase 1 (Baseline), Phase 2 (Post-shutdown) and Phase 3 (Post-shutdown) Groundwater Monitoring Results

Table B-2: Site-wide Monitoring Wells: Comparison of Historical, Phase 1 (Baseline) and Phase 3 (Post-shutdown) Groundwater Monitoring Results

Table B-1: Comparison of Historical, Phase 1 (Baseline), Phase 2 (Post-shutdown) and Phase 3 (Post-shutdown) Groundwater Monitoring Results
Former Building 952/982 Site, NYSDEC Site #314076
Source Area Wells

952-10RA Source Area Well	Phase 1 Baseline Sampling May 2019	Phase 2 Quarter 1 of 2 post-shutdown (4Q 2019)	Phase 2 Quarter 2 of 2 post-shutdown (1Q 2020)	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment April 12, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,2-Dichlorobenzene	***94 D***	***80 D***	***74 D***	***19***	***300 D***	***690 D***	***47 D***	***430***	***24,000***	3/29/1994
1,3-Dichlorobenzene	***27 D***	***20***	***20***	***7.4***	***53 D***	***120 D***	***17***	***110***	***3,100***	11/13/1995
1,4-Dichlorobenzene	***26***	***22***	***20***	***7.8***	***73 D***	***150 D***	***11***	***150***	***4,900***	3/29/1994
Chlorobenzene	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.58 J	1.6	ND@1.0	3.1	***14***	12/2/1993
1,2,4-Trichlorobenzene	ND@1.0	ND@1.0	ND@1.0	ND@1.0	3.5 J	ND@1.0	ND@1.0	***28***	***330***	6/9/1998
1,1,1-Trichloroethane	0.6 J	0.68 J	0.55 J	0.76 J	1	1.1	0.84 J	0.95 J	***15***	12/2/1993
1,1-Dichloroethene	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.36 J	ND@1.0	ND@1.0	2.3	9/5/1995
1,1-Dichloroethane	ND@1.0	0.29 J	ND@1.0	ND@1.0	0.31 J	0.55 J	0.40 J	0.83 J	1.7	9/5/1995
1,2-Dichloroethane	ND@1.0	ND@1.0	ND@1.0	0.34 J	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.5 J	9/5/1995
1,2-Dichloroethene (total)	0.42 J	0.80 J	0.41 J	0.38 J	1.1	1.5	1.3	2.6	***6.1***	9/5/1995
1,2-Dichloropropane	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.28 J	0.30 J	ND@1.0	ND@1.0	ND@1.0	
2-Chlorotoluene	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.48 J	1.7	ND@1.0	1.1	***9.2***	6/12/2007
4-Chlorotoluene	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.51 J	ND@1.0	1.1	***9.2***	6/12/2007
Chloroform	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.21 J	ND@1.0	ND@1.0	0.21 J	0.6 J	9/5/1995
Tetrachloroethene	ND@1.0	ND@1.0	ND@1.0	0.31 J	0.39 J	0.72 J	ND@1.0	0.15 J	1.7	9/5/1995
Trichloroethene	4.5	***6.5***	3.2	2.9	***5.7***	***5.0***	4.8	3.4	***13***	9/5/1995
Vinyl Chloride	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.2 J	ND@1.0	0.96 J	1.0	6/23/2009
Bis(2-ethylhexyl phthalate)	ND@9.5	NS	NS	ND@9.5	ND@9.5	ND@9.5	2.7 J	ND@10	13	3/29/1994

952-31R Source Area Well	Phase 1 Baseline Sampling May 2019	Phase 2 Quarter 1 of 2 post-shutdown (4Q 2019)	Phase 2 Quarter 2 of 2 post-shutdown (1Q 2020)	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment April 12, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,2-Dichlorobenzene	***41 D***	***430 D***	***12***	***17***	***5.2***	0.75 J	ND@1.0	***110 /120***	***3700***	5/20/1996
1,3-Dichlorobenzene	***12***	***65 D***	2.7	***3.4 J***	***3.5***	0.22 J	ND@1.0	***13 / 16***	***460***	11/26/1996
1,4-Dichlorobenzene	***14***	***110 D***	***3.9***	***4.6 J***	***4.0***	ND@1.0	ND@1.0	***21 / 24***	***480***	6/9/1998
Chlorobenzene	0.75 J	1.8	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	4.0 / ND@12	***23***	6/1/2006
1,1,1-Trichloroethane	2.4	0.78 J	0.85 J	1.5	0.53 J	0.99 J	0.93 J	3.8 / ND@12	***41***	12/21/1994
1,1-Dichloroethene	***6.5***	1.3	2.1	2.5	0.32 J	0.29 J	ND@1.0	***8.7 / 6.4***	***30***	9/5/1995
1,1-Dichloroethane	3.6	2.0	1.2	2.0	0.34 J	ND@1.0	0.54 J	***5.9 / 4.4***	***16***	12/4/1998
1,2-Dichloroethane	***1.7***	0.69 J	0.69 J	1.4	ND@1.0	0.89 J	ND@1.0	***2.8 / 2.5***	***12***	12/4/1998
1,2-Dichloroethene (total)	4.6	1.7	1.6	3.3	0.46 J	ND@1.0	0.44 J	***6.2 / 5.7***	***40***	9/12/1996
1,2-Dichloropropane	0.78 J	0.26 J	0.59 J	0.52 J	ND@1.0	ND@1.0	ND@1.0	***1.1*** / ND@5	***2.2***	2/14/1995
2-Chlorotoluene	ND@1.0	0.68 J	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.52 J / ND@12	0.98 J	6/17/2011
4-Chlorotoluene	ND@1.0	0.23 J	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.23 J / ND@12	0.7 J	9/15/1998
Chloroform	0.35 J	ND@1.0	0.19 J	0.33 J	ND@1.0	ND@1.0	ND@1.0	0.75 J / ND@12	1.1	6/2/2010
Trichloroethene	***14***	2.4	4.2	***6.5***	1.4	1.2	1.1	***19 / 14***	***57***	2/14/1995
Vinyl Chloride	ND@1.0	0.23 J	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	1.3 / ND@5.0	***3.2***	6/17/2011

952-30R Extraction Well	Phase 1 Baseline Sampling May 2019	Phase 2 Quarter 1 of 2 post-shutdown (4Q 2019)	Phase 2 Quarter 2 of 2 post-shutdown (1Q 2020)	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment April 12, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,2-Dichlorobenzene	0.82 J	ND@1.0	0.55 J	0.34 J	ND@1.0	ND@1.0	0.65 J	***4.1***	***600***	12/3/1993
1,4-Dichlorobenzene	0.22 J	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	1.6	***160***	12/3/1993
1,1,1-Trichloroethane	ND@1.0	ND@1.0	0.43 J	0.69 J	0.46 J	0.51 J	0.69 J	1.2	***15***	12/21/1994
1,2-Dichloroethane	ND@1.0	ND@1.0	ND@1.0	0.39 J	0.3 J	ND@1.0	ND@1.0	0.21 J	1.2	9/5/1995
Trichloroethene	0.36 J	ND@1.0	ND@1.0	0.92 J	0.59 J	0.62 J	0.57 J	2.4	***12***	9/5/1995
Bis(2-ethylhexyl phthalate)	ND@9.5	NS	NS	ND@9.5	1.7 J	ND@9.8	ND@9.5	2.0 J	2.0 J	9/12/1996

Notes:

All results in ug/L

BOLD and Italicized results exceed applicable New York State Groundwater Standard (6NYCRR Part 703)

D	Indicates result reported from a secondary dilution factor
J	Estimated Value
ND@X	Not Detected at Laboratory Detection Limit "X"
NS	Not Sampled
VOCs	Volatile Organic Compounds
SVOCs	Semivolatile Organic Compounds
Value / Value	Analytical Result and Duplicate Result

Table B-2: Comparison of Historical, Phase 1 (Baseline) and Phase 3 (Post-shutdown) Groundwater Monitoring Results
Former Building 952/982 Site, NYSDEC Site #314076
Site-wide Monitoring Wells

952-6R *	Phase 1 Baseline Sampling May 2019	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment May 2, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,1,1-Trichloroethane	0.39 J	0.56 J	0.51 J	0.65 J	0.50 J	0.42 J	1.0	6/5/2011
1,1-Dichloroethane	ND@1.0	0.43 J	0.36 J	0.62 J	ND@1.0	0.55 J	1.0	9/13/1996
Trichloroethene	0.68 J	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	0.36 J	6/23/2009
Benzo(b)fluoroanthene	ND@1.0	ND@1.0	0.73 J	ND@9.5	ND@9.8	ND@1.0	2.0	3/29/1994
Bis(2-ethylhexyl phthalate)	ND@9.5	ND@9.5	ND@9.5	3.5 J	ND@9.8	ND@10	***7.0***	9/25/2003

952-9R *	Phase 1 Baseline Sampling May 2019	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment May 2, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,1,1-Trichloroethane	ND@1.0	ND@1.0	ND@1.0	0.84 J	ND@1.0	ND@1.0	ND@1.0	5/21/1996
Bis(2-ethylhexyl phthalate)	ND@9.5	ND@9.5	ND@9.8	***7.4 J***	ND@9.8	ND@10	***20***	5/21/1996

952-11R	Phase 1 Baseline Sampling May 2019	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment April 30, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,2-Dichlorobenzene	ND@1.0	ND@1.0	ND@1.0	0.27 J	ND@1.0	ND@1.0	***9***	12/2/1993
1,1,1-Trichloroethane	0.27 J	0.46 J	0.47 J	0.63 J	0.83 J	0.32 J	1.1	12/20/1994
1,1-Dichloroethane	ND@1.0	ND@1.0	ND@1.0	0.33 J	ND@1.0	ND@1.0	ND@1.0	
1,2-Dichloroethane	ND@1.0	ND@1.0	ND@1.0	0.46 J	ND@1.0	ND@1.0	1.2	6/13/1995
Trichloroethene	ND@1.0	ND@1.0	ND@1.0	0.54 J	ND@1.0	ND@1.0	2	12/9/1993
Chloroform	0.19 J	0.25 J	ND@1.0	0.26 J	ND@1.0	0.21 J	***17***	12/9/1998
Bis(2-ethylhexyl phthalate)	ND@9.5	ND@9.5	ND@9.5	3.5 J	2.6 J	ND@10	***21***	9/20/1994

952-12R	Phase 1 Baseline Sampling May 2019	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment May 2, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,1,1-Trichloroethane	ND@1.0	ND@1.0	ND@1.0	0.59 J	1.0	0.30 J	1.0	9/6/1995

952-13R *	Phase 1 Baseline Sampling May 2019	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment May 2, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,1,1-Trichloroethane	0.24 J	0.39 J	0.47 J	0.86 J	0.56 J	ND@1.0	4.1	6/21/2002

952-14R *	Phase 1 Baseline Sampling May 2019	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment April 30, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,1,1-Trichloroethane	1.1 / 1.1	1.3 / 1.3	1.0 / 1.2	1.5 / 1.5	0.78 J / 0.92 J	1.5	2.2	11/25/1996
1,1-Dichloroethane	ND@1.0 / 0.39 J	ND@1.0 / ND@1.0	ND@1.0 / ND@1.0	ND@1.0 / ND@1.0	ND@1.0 / ND@1.0	0.18 J / 0.17 J	0.24 J	12/12/2007
1,2-Dichloroethane	ND@1.0 / ND@1.0	0.4 J / 0.39 J	0.31 J / ND@1.0	0.53 J / 0.51 J	ND@1.0 / ND@1.0	ND@1.0 / ND@1.0	ND@1.0	
Bis(2-ethylhexyl phthalate)	ND@9.5/ND@9.5	ND@9.5/ND@9.5	ND@9.8/ND@9.8	***6.7 J /*** 3.5 J	ND@9.8 / ND@9.8	ND@10 / ND@10	***5***	11/16/1995

952-14RA *	Phase 1 Baseline Sampling May 2019	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment April 30, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
1,1,1-Trichloroethane	0.79 J	0.98 J	1.1	1.3	1.3	1.2	3.0	11/25/1996
Trichloroethene	0.83 J	0.95 J	0.78 J	0.89 J	ND@1.0	1.3	2.1	11/25/1996
Toluene	ND@1.0	ND@1.0	ND@1.0	ND@1.0	2.5	ND@1.0	ND@1.0	
Bis(2-ethylhexyl phthalate)	ND@9.5	ND@9.5	ND@9.5	***6.6 J***	ND@9.5	ND@10	***15***	11/15/1995

952-16R *	Phase 1 Baseline Sampling May 2019	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment April 30, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
VOCs	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0		
SVOCs	NS	NS	NS	NS	NS	NS		

952-29R	Phase 1 Baseline Sampling May 2019	Phase 3 Quarter 1 of 8 post-shutdown (2Q 2020)	Phase 3 Quarter 2 of 8 post-shutdown (3Q 2020)	Phase 3 Quarter 3 of 8 post-shutdown (4Q 2020)	Phase 3 Quarter 4 of 8 post-shutdown (1Q 2021)	Prior to Site redevelopment April 30, 2012	Historical Maximum Detected Concentration	Historical Maximum Detected (Date)
VOCs	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0	ND@1.0		
SVOCs	ND	ND	ND	ND	ND	ND		

Notes:

All results in ug/L

BOLD and Italicized results exceed applicable New York State Groundwater Standard (6NYCRR Part 703)

*	Downgradient Perimeter Monitoring Location
D	Indicates result reported from a secondary dilution factor
J	Estimated Value
ND@X	Not Detected at Laboratory Detection Limit "X"
NS	Not Sampled
VOCs	Volatile Organic Compounds
SVOCs	Semivolatile Organic Compounds
Value / Value	Analytical Result and Duplicate Result