Mr. Jason Pelton
Project Manager
New York State Department of Environmental Conservation
Remedial Bureau D
625 Broadway
Albany, New York 12233-7015

Arcadis of New York, Inc.
Two Huntington Quadrangle
Suite 1S10
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610
www.arcadis.com

Subject:
Fourth Quarter 2018 Progress Report
Northrop Grumman Systems Corporation
Operable Unit 2, NYSDEC Site ID # 1-30-003A,
Bethpage, New York

ENVIRONMENT

Date:
January 10, 2019

Contact:
David E. Stern

Phone:
631.391.5284

Email:
david.stern@arcadis.com

Our ref:
NYNG2019.22TM.LARA5

Dear Jason:

In accordance with Appendix "A", Section XIII of Administrative Order on Consent (AOC) Index # W1-118-14-12, this letter reports Operable Unit 2 (OU2) activities performed by Northrop Grumman Systems Corporation (Northrop Grumman) during the Fourth Quarter of 2018 (October through December 2018). Activities planned for First Quarter of 2019 (January through March 2019) are also described.

This progress report provides data that have been received as final and/or validated from the current period that are not included in other routine reporting for OU2 (e.g., quarterly reports as specified in the Groundwater Monitoring Plan).

As this is an ongoing remediation project, Northrop Grumman has transitioned the frequency of these progress reports from monthly to quarterly. Therefore, the next report will be submitted following the close of March 2019.

OU2 ACTIVITIES CONDUCTED DURING FOURTH QUARTER 2018

OU2 On-Site Containment (ONCT) System

- Continued Operation, Maintenance, and Monitoring (OM&M) of the OU2 ONCT system, including performance of maintenance of South Basins (centermost).
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
    - Tower 96, of the ONCT System, was shut down on November 21, 2018 for three hours (08:00-11:00) due to duct work repair.
    - Tower 96, of the ONCT System, was shut down from November 28, 2018 through December 4, 2018 due to premature failure and repair of supplemental blower bearings .
    - Tower 96, of the ONCT system, was shut down from December 17, 2018 through December 18, 2018 due to maintenance on the supplemental blower belts.
    - Tower 102, of the ONCT System, was shut down from November 17, 2018 through November 18, 2018 to accommodate planned repair of a sluice gate associated with the South Basins.
- Completed Fourth Quarter 2018 ONCT system sampling.
- Data not routinely reported are provided for the current period as follows:
    - Analytical data associated with Tower 96 Effluent and monthly sampling of ONCT Tower 96 system Remedial Wells 1 and 3R are provided in Table 1. Locations of wells are shown on Figure 1.

Regional Groundwater Monitoring & Outpost Well Monitoring

- Initiated and completed Fourth Quarter 2018 routine OU2 groundwater monitoring activities
- Completed supplemental (quarterly) VOC sampling at Monitoring Well GM-20D located just south of the ONCT remedial wells to monitor ONCT system hydraulic effectiveness following 2017 ONCT South Basins maintenance activities
- Data not routinely reported are provided for the current period as follows:
    - Analytical data associated with the sampling of Monitoring Wells GM-GM-20D and MW-2GF are in Table 1. Monitoring Well MW-2GF is routinely sampled for metals and 1,4-dioxane. During the current period, the laboratory inadvertently analyzed for VOCs; these VOC results are included in the attached table. Locations of wells are shown on Figure 1.

- Prepared and submitted Third Quarter 2018 and Fourth Quarter 2018 sampling event data (Form 1 packages) to NYSDEC

Northrop Grumman Cooperation with Navy

- Coordinated with Navy and completed Fourth Quarter 2018 sampling of additional outpost wells and plume monitoring wells.
- Prepared and submitted Third Quarter 2018 sampling event data for Navy owned wells, including Form 1 packages, to Navy for distribution

Other

- Prepared and submitted the Third Quarter 2018 AOC quarterly progress report
- Prepared and submitted the Third Quarter 2018 OU2 Operation, Maintenance, and Monitoring Report

OU2 ACTIVITIES SCHEDULED FOR FIRST QUARTER 2019

OU2 On-Site Containment (ONCT) System

- Continue OM&M of OU2 ONCT system, including preparation for and performance of maintenance of South Basins (easternmost) in First Quarter 2019, dependent on weather.
- Conduct First Quarter 2019 ONCT system sampling.

Regional Groundwater Monitoring & Outpost Well Monitoring

- Conduct First Quarter 2019 sampling from wells in Northrop Grumman's routine monitoring program (BPOW2 well cluster)
- Continue supplemental (quarterly) VOC sampling at Monitoring Wells GM-21D2, GM-33D2, GM-75D2 and GM-20D

Northrop Grumman Cooperation with Navy

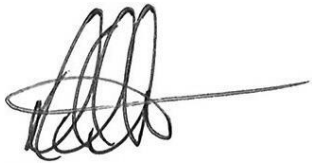
- Conduct First Quarter 2019 sampling from additional outpost wells

Other

- Prepare and submit the Fourth Quarter 2018 AOC quarterly progress report on January 10, 2019.
- Prepare and submit the 2018 Annual OU2 Operation, Maintenance and Monitoring Report.

Sincerely,

Arcadis of New York, Inc.



David E. Stern
Senior Hydrogeologist/Associate Project Manager

Enclosures

Copies:
Steven Karpinski, NYSDOH
Steven Scharf – NYSDEC
Donald Hesler, NYSDEC
Andrew Guglielmi, NYSDEC
Edward J. Hannon, Northrop Grumman
Jill Palmer, Esq., Northrop Grumman
Daniel Riesel, Esq., Sive, Paget & Riesel, P.C.
Mark A. Chertok, Esq., Sive, Paget & Riesel, P.C.
Brian S. Murray, NAVFAC Mid-Atlantic Environmental
Bethpage Public Library – Public Repository
Carlo San Giovanni, Arcadis
Mike Wolfert, Arcadis
File, Arcadis

TABLES

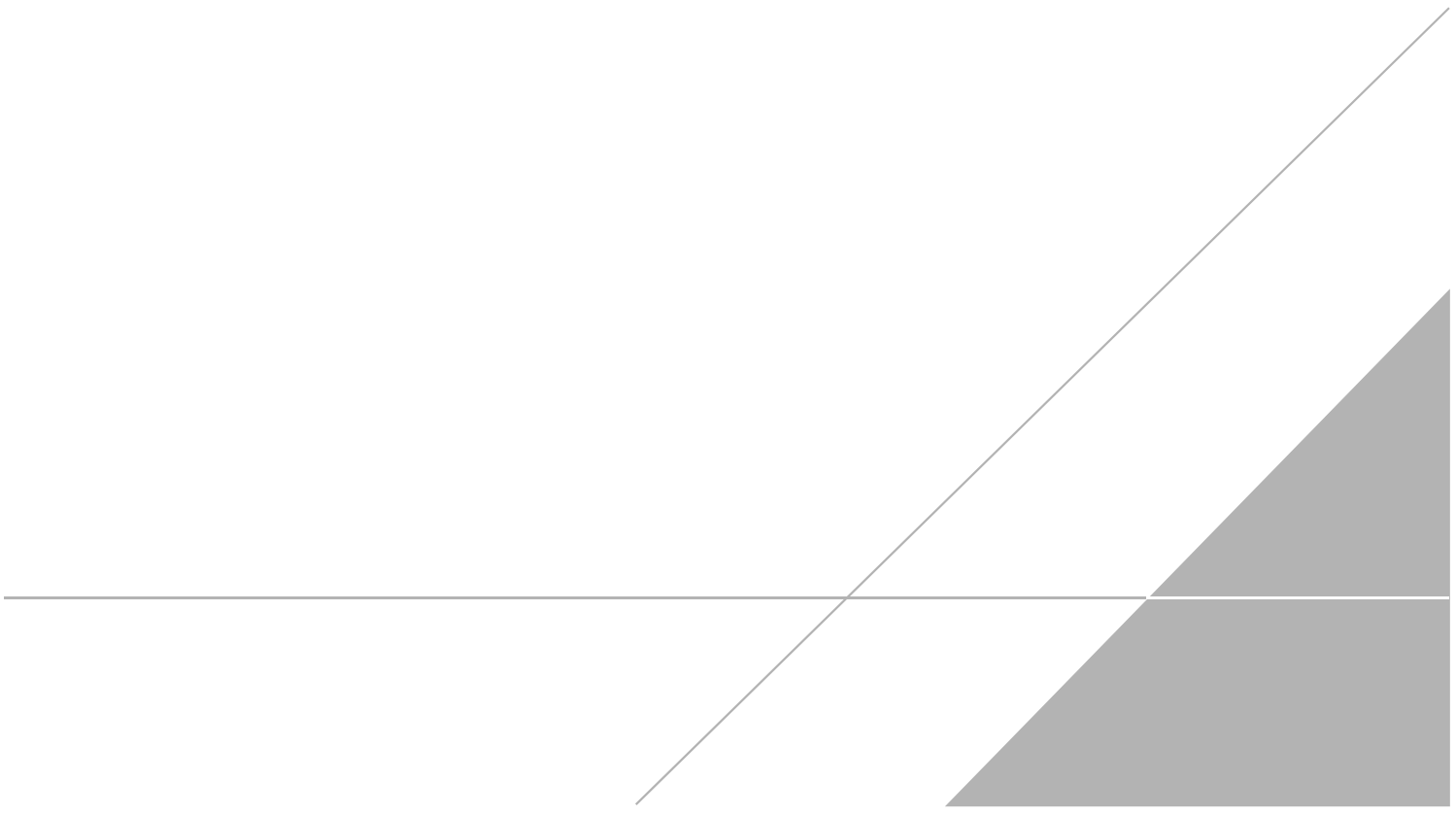


Table 1.
Concentrations of Volatile Organic Compounds
Operable Unit 2, Northrop Grumman Systems Corporation
Bethpage, New York

Constituents (units in µg/L)	Location ID: / Sample ID: / Date:	96 EFFLUENT T96 EFFLUENT (GW)_20180821 8/21/2018	WELL 1 WELL 1_20180821 8/21/2018	WELL 3R WELL 3R_20180821 8/21/2018	96 EFFLUENT T96 EFFLUENT (GW)_20181010 10/10/2018	WELL 1 WELL 1_20181010 10/10/2018	WELL 3R WELL 3R_20181010 10/10/2018	MW-02GF MW-2GF_20181026 10/26/2018	GM-20D GM-20D_20181107 11/7/2018	96 EFFLUENT T96 EFFLUENT (GW)_20181108 11/8/2018	WELL 1 WELL 1_20181108 11/8/2018	WELL 3R WELL 3R_20181108 11/8/2018	QAQC TB110718DC1 11/7/2018
Volatile Organic Compounds [1]													
1,1,1-Trichloroethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	**0.56**	**1.1**	< 1.0	< 0.50	< 0.50	< 0.50	< 1.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-trichloro-1,2,2-trifluoroethane		< 0.50	**2.5**	**2.0**	< 0.50	**4.0**	**3.0**	< 5.0	< 5.0	< 0.50	**3.1**	**2.3**	< 5.0
1,1,2-Trichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		< 1.0	**0.80 J**	**1.4**	< 1.0	**0.69 J**	**1.3**	**0.76 J**	< 1.0	< 1.0	**0.66 J**	**1.1**	< 1.0
1,1-Dichloroethene		< 0.50	2.4	**3.0**	< 0.50	**2.4**	**3.4**	< 1.0	< 1.0	< 0.50	**1.8**	**3.0**	< 1.0
1,2-Dichloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		< 1.0	**4.1**	< 1.0	< 1.0	**4.1**	< 1.0	< 1.0	< 1.0	< 1.0	**3.9**	< 1.0	< 1.0
2-Butanone (MEK)		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
4-Methyl-2-Pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromodichloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Disulfide		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Carbon Tetrachloride		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorodibromomethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform		< 0.50	**0.51**	< 0.50	< 0.50	**0.53**	< 0.50	< 1.0	< 1.0	< 0.50	< 0.50	< 0.50	< 1.0
Chloromethane		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene		< 0.50	**5.6**	**3.9**	< 0.50	**5.6**	**3.9**	< 1.0	< 1.0	< 0.50	**4.8**	**3.2**	< 1.0
cis-1,3-Dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichloromethane		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 2.0	< 2.0	< 0.50	< 0.50	< 0.50	< 2.0
Ethylbenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m&p-Xylenes		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl N-Butyl Ketone (2-Hexanone)		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene (Monomer)		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene		< 0.50	**16.5**	**24.2**	< 0.50	**19.2**	**27.5**	< 1.0	< 1.0	< 0.50	**19.1**	**27.3**	< 1.0
Toluene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 1.0	< 1.0	< 0.50	< 0.50	< 0.50	< 1.0
trans-1,3-Dichloropropene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene		< 0.50	**639**	**272**	**0.39**	**559**	**288**	**5.3**	**0.70 J**	< 0.50	**530**	**284**	< 1.0
Vinyl chloride		< 0.50	< 0.50	**2.0**	< 0.50	< 0.50	1.9	< 1.0	< 1.0	< 0.50	< 0.50	**1.6**	< 1.0
Total VOCs[2]		0	**670**	**310**	**0.39**	**600**	**330**	**7.2**	**0.70**	0	**560**	**320**	0

Notes and Abbreviations on last page.

Table 1.
Concentrations of Volatile Organic Compounds
Operable Unit 2, Northrop Grumman Systems Corporation
Bethpage, New York

Notes and Abbreviations:

(1) Sample analysis by VOC Method 8260C unless otherwise noted.

(2) Results rounded to two significant figures.

Results validated following protocols specified in OU2 Groundwater Monitoring Plan (ARCADIS 2016), or as received as final from the laboratory as of the end of the AOC reporting period.

4.1	Bold value indicates a detection
µg/L	Micrograms per liter
<1.0	Constituent not detected above its laboratory quantification limit.
OU2	Operable Unit 2
VOC	Volatile Organic Compound
QAQC	Quality Assurance/Quality Control sample
TB	Trip Blank
J	Value is estimated concentration

FIGURES

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\NY001496\1414\GWMI4\149614141414F01.dwg LAYOUT: 1 SAVED: 3/31/2016 10:05 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 3/31/2016 2:50 PM BY: SANCHEZ, ADRIAN
XREFS: IMAGES: PROJECTNAME: ----
Xr1496X01
XrBDR-CP

HWD 10208
HWD 8779
FORMER OXY/RUCO POLYMER SITE
(107)
PLANT 111
PLANT 110
PLANT 115
PLANT 21
PLANT 37
PLANT 35
PLANT 15
PLANT 14
PLANT 26
PLANT 30
BETHPAGE COMMUNITY PARK
NWIRP SITE (FORMER NAVY SITE)
PLANT 12
PLANT 12A
PLANT 3
HN-24I
HN-24S
FW-03
PLANT 10
WT
HN-42S
HN-42I
FARMERS AVENUE
BWD 8768
BWD 8767
HAYPATH ROAD
(PLAINVIEW ROAD)
BETHPAGE COMMUNITY PARK
BETHPAGE HIGH SCHOOL
BWD 9591
GM-13D
GM-16I
GM-16SR
HN-40S
HN-40I
BROADWAY
MW-3-1
WELL 3R
WELL 3
10597
GM-17SR
GM-17I
GM-17D
PLANT 5 BASINS
PLANT 5
OU2 MAIN FACILITY REMEDIAL SYSTEM (TOWER 96)
OU2 MAIN FACILITY REMEDIAL SYSTEM (TOWER 102)
EXISTING OU2 TREATMENT SYSTEMS
MW-1GF
GM-32S
PLANT 2
PLANT 1 FUEL DEPOT AREA
GRUMMAN ROAD
PLANT 1
OU-2 ON-SITE GROUNDWATER REMEDY TREATMENT SYSTEMS
WELL 1
GM-18S
GM-18I
GM-18D
MW-2GF
GM-39DA
GM-39DB
GM-19S
GM-19I
MW-5
MW-4
MW-6
GM-15SR
GM-15I
GM-15D
GM-15D2
GM-73D3
GM-73D2
GM-73D
GM-74I
GM-74D
GM-74D2
GM-74D3
WELL 19
GM-33D2
10631
WELL 18
SOUTH BASINS
WELL 17
10600
GM-78S
GM-78I
GM-78D
GM-78D2
GM-20I
GM-20D
GM-21D2
10633
BLOOMINGDALE ROAD
CENTRAL AVENUE
9921
GM-21S
GM-21I
GM-21D
GM-75D2
10624
10627
GM-79I
GM-79D
10628
LONG ISLAND RAILROAD
GM-37D
GM-37D2
10634
GM-71D2
GM-70D2
GM-35D2
GM-36D
GM-36D2
N-10821
BWD 6915
6916
NORTH WANTAGH AVE.
HICKSVILLE ROAD
STEWART AVENUE
BETHPAGE STATE PARKWAY
SEAFORD - OYSTER BAY EXPRESSWAY
MALLARD ROAD
(GARDINER'S AVENUE)
LOWLAND ROAD
GM-34D
GM-34D2
BWD 8941
3876
GM-38D
GM-38D2
BWD 8004
TOH(LWD) 7076
PIKE
BPOW 1-4
BPOW 1-5
BPOW 1-6
BPOW 1-3
BPOW 1-1
BPOW 1-2
SFWD 7377
SFWD 5148
SFWD 4043
BOUNDARY AVENUE
BPOW 4-2R
BPOW 4-1R
TOH(LWD) 5303
BPOW 2-2
BPOW 2-3
BPOW 2-1
SFWD 6150
BPOW 3-3
BPOW 3-4
BPOW 3-2
BPOW 3-1
NYAW 9338
NYAW 8480
HICKSVILLE

EXPLANATION

- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
- PROPERTY BOUNDARY OF THE FORMER NAVY SITE
- PROPERTY BOUNDARY OF THE FORMER OXY/RUCO SITE
- LONG ISLAND RAILROAD
- DENOTES NORTHROP GRUMMAN OWNED PROPERTY (AS OF 2009)
- DENOTES NAVY OWNED PROPERTY (AS OF 2014)
- DENOTES FORMER NAVY OWNED PROPERTY
- RECHARGE BASIN
- 10592 OBSERVATION/MONITORING/OUTPOST WELL (1)
- 9591 PUBLIC SUPPLY WELL (2)
- WELL-17 NORTHROP GRUMMAN REMEDIAL WELL
- PART OF ON-SITE REMEDY
- NWIRP NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
- TOH (LWD) TOWN OF HEMPSTEAD LEVITOWN WATER DISTRICT
- HWD HICKSVILLE WATER DISTRICT
- SFWD SOUTH FARMINGDALE WATER DISTRICT
- BWD BETHPAGE WATER DISTRICT
- NYAW NEW YORK AMERICAN WATER

NOTE:

(1) THIS FIGURE DEPICTS OBSERVATION/MONITORING/OUTPOST WELLS INCLUDED IN THE OU-2 GROUNDWATER MONITORING PROGRAM.

(2) PUBLIC SUPPLY WELLS ARE NOT SAMPLED AS A PART OF THE OU2 GROUNDWATER MONITORING PROGRAM AND ARE ONLY FOR REFERENCE.

0 1000' 2000'
APPROXIMATE SCALE IN FEET

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
OPERABLE UNIT 2

LOCATIONS OF WELLS AND ON-SITE GROUNDWATER REMEDY

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1