Mr. Jason Pelton
Division of Environmental Remediation
Remedial Bureau D, Section B
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233

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Subject:
Work Plan for Pre-Design Soil Sampling,
RW-21 Project Area Groundwater Remedy,
Operable Unit 3, Bethpage, New York.

Date:
June 4, 2019

Contact:
David Stern

Phone:
631-391-5284

Email:
David.stern@arcadis.com

Our ref:
NYNG2019.TS14

Dear Mr. Pelton:

Arcadis of New York Inc. (Arcadis) prepared this Pre-Design Work Plan on behalf of Northrop Grumman Systems Corporation (Northrop Grumman) to pre-characterize soil along Grumman Road and Hickey Boulevard, which is a portion of the proposed RW-21 Project Area Groundwater Remedy (RW-21 System) pipeline. The data produced from this effort will be evaluated to determine pre-construction soil quality conditions, for protection of construction worker health and safety, and for management of soils during construction. **Figure 1** provides an overview of the proposed RW-21 System.

SUMMARY OF RW-21 SYSTEM

In accordance with the Record of Decision (ROD) for Operable Unit 3 (OU3), Arcadis is designing a groundwater remedial system on behalf of Northrop Grumman to capture and treat volatile organic compounds (VOCs) from groundwater in a portion of the OU3 off-site plume referred to as the RW-21 Project Area. The RW-21 system remedial design includes three remedial wells, designated as RW-20, RW-21 and RW-22. Water pumped from these wells will be transmitted via underground pipes to a new RW-21 System treatment plant, which will be constructed on Northrop Grumman property. Existing on-site recharge basins will be used for the recharge of treated water.

SCOPE OF WORK

Soil sampling will be performed along the proposed pipeline route on the portion of Grumman Road/Hickey Boulevard between the new treatment plant and the

intersection with Central Avenue to the south, representing a distance of approximately 4,400 linear feet (**Figure 2**). Grumman Road is an active roadway that is owned and maintained by the Town of Oyster Bay (Town) with multiple commercial/industrial business abutting the work area.

A total of 44 soil borings are proposed to be drilled along the roadway on 100-ft centers, utilizing direct push drilling techniques (Geoprobe® rig). Continuous soil cores will be collected from grade to a maximum depth of 10 feet below land surface (ft bls), and screened using a photoionization detector (PID) for VOCs. The soil cores will also be geologically logged and visually examined for staining. Soil samples will be collected at the top, middle, and bottom of the borehole, corresponding to 0-2 ft bls; 4-6 ft bls; and 8-10 ft bls depth intervals. To acquire sufficient volume of soil with proposed analysis, more than one boring at each location may be needed. The maximum depth of 10 feet corresponds to the maximum anticipated depth of trench excavation for pipe installation. In addition to the planned sampling intervals, samples may also be collected to address elevated PID readings, staining, or odors encountered during drilling.

Soil samples will be submitted to a New York State Department of Health (NYSDOH) accredited laboratory for the analysis of Target Compound List (TCL) VOCs using United States Environmental Protection Agency (USEPA) Method 8260, SVOCs using USEPA Method 8270, TAL Metals using USEPA Method 6010C and PCBs using USEPA Method 8081. Sample analyses will follow the NYSDEC Analytical Services Protocol (ASP) and will be performed under standard laboratory turnaround time. Quality assurance/quality control (QA/QC) samples consisting of trip blanks, equipment blanks, and field duplicates will also be collected and analyzed in accordance with the NYSDEC-approved Quality Assurance Project Plan (QAPP). Analytical results will be reported using NYSDEC ASP Category B data deliverables. Data obtained from the analytical laboratory will be validated in accordance with the QAPP.

FIELD PROGRAM LOGISTICS

Sampling locations will be marked or staked in the field prior to commencing intrusive activities. Subsurface utilities will be cleared prior to drilling using a minimum of three lines of evidence (e.g., One Call, soft dig, review of utility maps and previous geophysical survey data, site inspection) in accordance with the existing site-specific health and safety plan (HASP). The boring locations will also be cleared of utilities to a depth of 5 ft bls using a hand auger or other soft dig technique. The locations of borings may be adjusted based on the presence of underground and overhead utilities. A site-specific traffic safety plan will be developed and implemented.

Field activities will be overseen continuously by an Arcadis field geologist. Community air monitoring will be conducted in accordance with the NYSDEC-approved Community Air Monitoring Plan.

Decontamination of re-usable downhole drilling/sampling tools (e.g., cutting shoe) will be performed at the work site. Decontamination of the drilling rig will be performed on Northrop Grumman property prior to and after completion of the work. Drill cuttings and other IDW (e.g., PPE, decontamination water, disposable liners, etc.) will be segregated by media and placed in Department of Transportation (DOT)-approved 55-gallon steel drums and removed from the work site on a daily basis. The drums of wastes generated during the activities will be temporarily stored on Northrop Grumman property pending disposal. Drill cuttings will be analyzed for total and toxicity characteristic leaching procedure (TCLP) VOCs, SVOCs, RCRA metals, pesticides, and RCRA characteristics, or as required by the disposal facility. Waste characterization results will be used to develop waste profiles for management of IDW.

Following completion of each boring location, the borehole(s) will be backfilled with clean soil, the work area will be broom swept, and the surface patched with cold patch asphalt.

REPORTING

The validated soil sampling results will be tabulated and provided to NYSDEC in a letter report, followed by applicable electronic data deliverables. This information will be used to support the RW-21 System planning and design.

PROJECT SCHEDULE

Arcadis currently anticipates mobilizing within 2 weeks upon receipt of notice of proceed from the Town of Oyster Bay. Soil sampling on Grumman Road/Hickey Boulevard will take approximately 3 weeks to complete, assuming two work crews, normal work hours (i.e. 7am - 5pm Monday through Friday) and no delays outside of Northrop Grumman's control.

Please contact me if you have any questions or need additional information

Sincerely,

Arcadis of New York, Inc.

David E. Stern
Project Manager

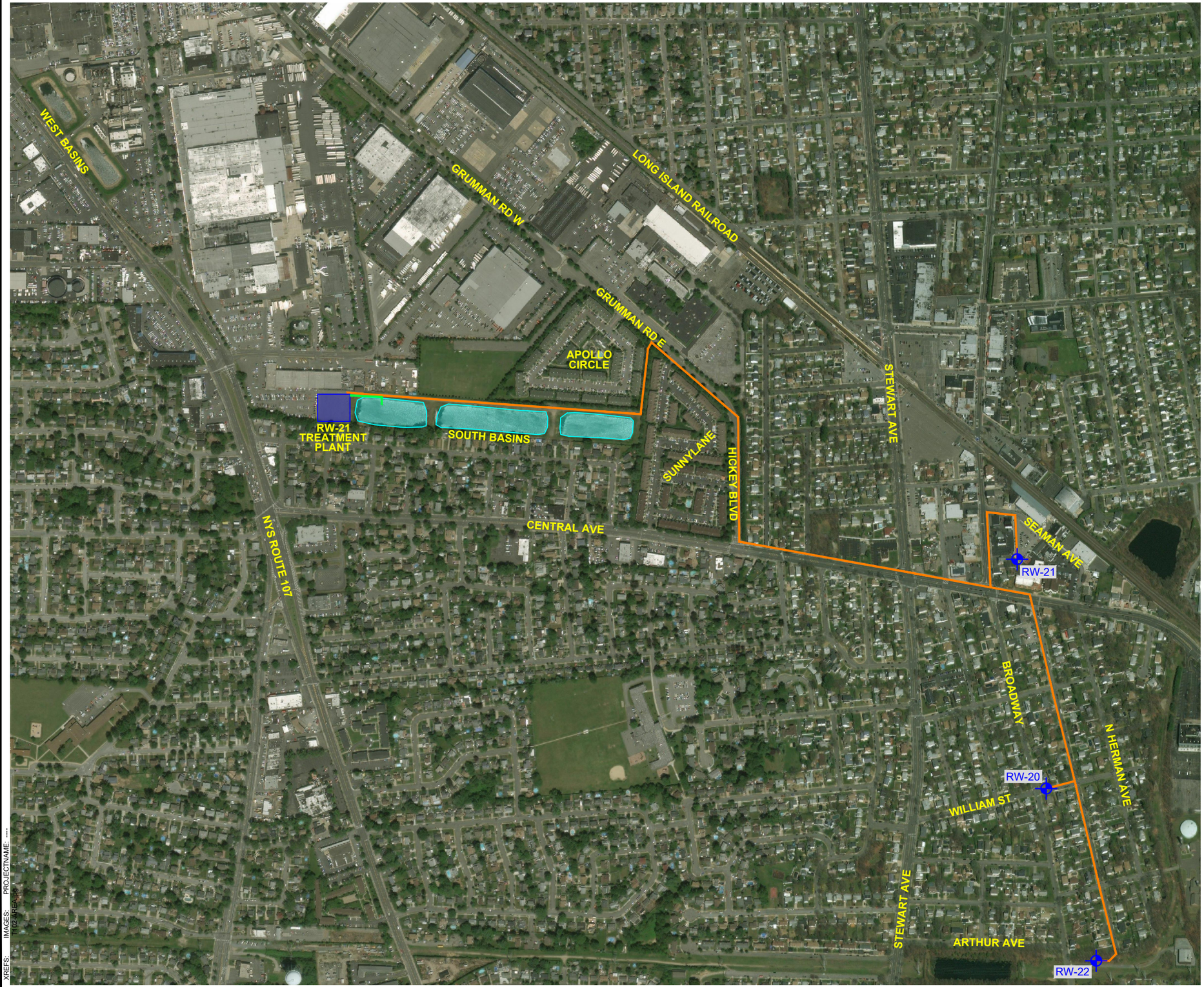
Copies:
Edward Hannon, Northrop Grumman
Don Hesler, NYSDEC
Steve Karpinski, NYSDOH

Enclosures:

Figures

1 Proposed RW-21 Project Area Groundwater Remedy

2 Proposed Area of Soil Sampling



LEGEND:

- COMPLETED REMEDIAL WELL
- TREATMENT PLANT ON NORTHROP GRUMMAN PROPERTY
- INFLUENT WATER
- EFFLUENT WATER
- BASIN

NOTE:

1. PIPELINE ROUTES AND TREATMENT BUILDING LOCATION ARE HIGHLY CONCEPTUAL, SUBJECT TO CHANGE DUE TO ACCESS, UTILITY LOCATIONS AND SITE CONDITIONS.

0 600' 1200'

APPROXIMATE SCALE IN FEET

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK

CONCEPTUAL DESIGN OF RW-21 PROJECT AREA TREATMENT SYSTEM

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY:SYRACUSE-NY DIV/GROUP:ENV DB:A.SANCHEZ LD:ALS PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(On)ON=*;OFF=*REF*
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XREFS: IMAGES: PROJECTNAME: ----
1102-AREA.jpg

LEGEND:

BASIN

SOIL BORING LOCATION

SOIL BORING AREA
NORTH PORTION OF GRUMMAN ROAD
AND EASTERN PORTION OF HICKEY BLVD

NOTE:

1. FIGURE SHOWS CONCEPTUAL PLAN. ACTUAL SOIL BORING AREAS AND SOIL BORING LOCATIONS MAY CHANGE DUE TO ACCESS, UTILITY LOCATIONS AND SITE CONDITIONS.
2. SOIL BORINGS WILL BE DRILLED EVERY 100FT IN THE SOIL BORING AREAS.
3. ACTUAL PIPE LOCATION IS CONTINGENT ON UTILITIES, ACCESS AND SITE CONDITIONS.

0 300' 600'

APPROXIMATE SCALE IN FEET

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK

SOIL BORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

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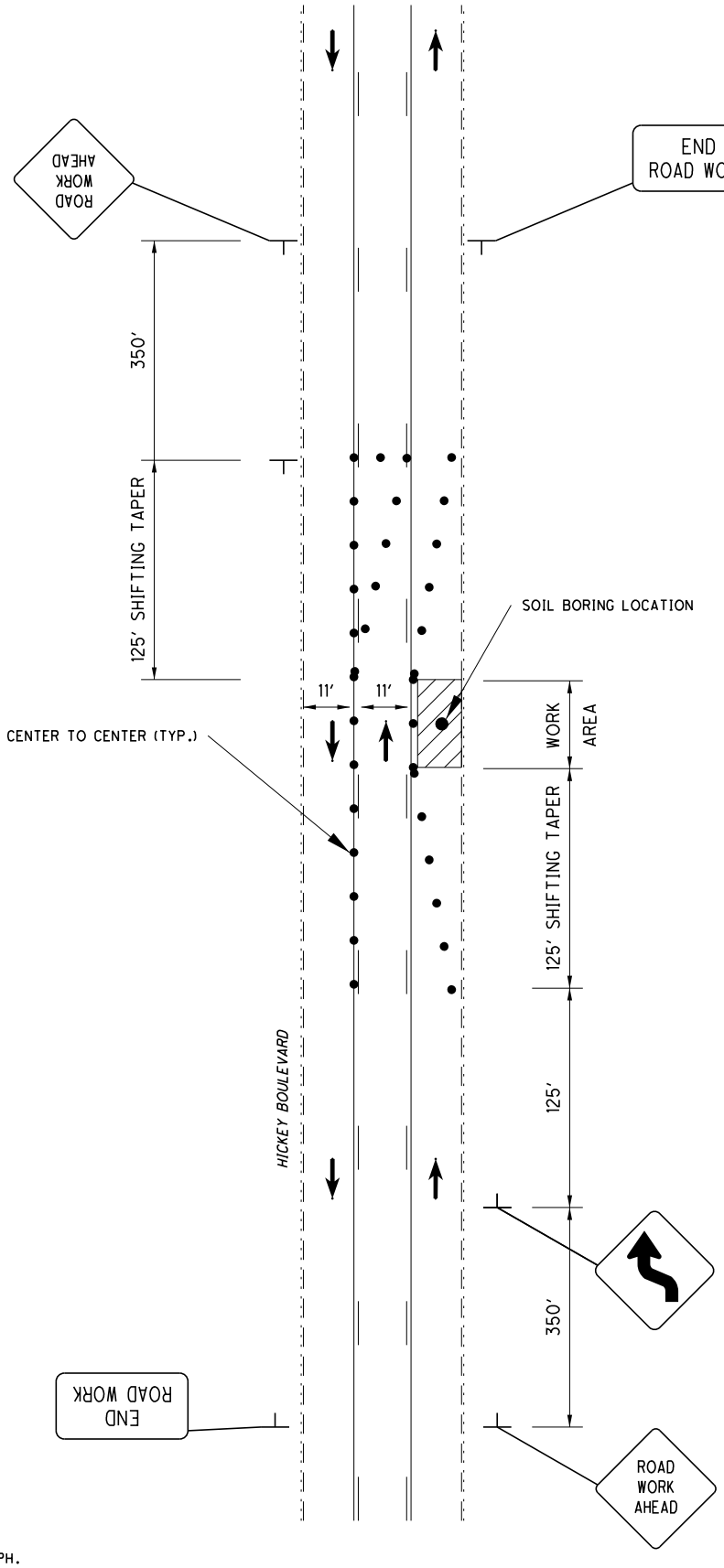
TRAFFIC CONTROL PLAN - OUTSIDE LANE CLOSURE ON HICKEY BOULEVARD

FIGURE IS NOT TO SCALE



LEGEND:

- PROPOSED SIGN POST
- PROPOSED DRUMS OR CONES
- PROPOSED WORK AREA
- TRAVEL DIRECTION ARROW
- EXISTING CURB
- EXISTING EDGE OF PAVEMENT

NOTES:

1. THE POSTED SPEED LIMIT ON HICKEY BOULEVARD IS 35 MPH.
2. EXISTING TOPOGRAPHIC FEATURES SHOWN ARE NOT FROM A FIELD SURVEY. THEY ARE APPROXIMATE AND ARE FOR ILLUSTRATION PURPOSES ONLY.
3. ALL PROPOSED TRAFFIC CONTROL DEVICES SHALL BE PER NEW YORK DOT AND MUTCD STANDARDS.
4. ACCESS TO ADJACENT PROPERTIES (DRIVEWAYS, ALLEYS, ETC.) SHALL BE MAINTAINED AT ALL TIMES.

Traffic Safety Plan (TSP)

Notes: ROW - Right of Way (Public) formerly known as "TCP"
Non-ROW - Not in the ROW (parking lots, etc.) formerly known as "STAR"

1.0 General

Plan type	Right of Way (ROW)
Project Name:	Northrop Grumman RW-21
Project Number:	NYNG2019.22LS PM0QC
Engineering Judgement Employee / Developer Name:	Justin Maderia
Duration of Project (in hours or days):	10 Hours
Time Restrictions (Y/N, if Y describe below):	Yes - 7a to 5p
Roadway Work Zone Start Point	125' Before Work Area
Roadway Work Zone End Point	125' After Work Area
Posted Speed Limit (roadway in mph)	35
Number of Lanes (each direction)	3 (1 in Each Direction with TWLTL)
Road Category Type (select)	Urban (≤40 mph)

[X] Working on multiple roads?

Projects with roadway work on multiple roadways must prepare a TSP for each roadway location. A map should be attached indicating which TSP applies to each roadway location.

Comments: This TSP covers work on in either the westbound curb lane on Grumman Road or the northbound curbland on Hickey Boulevard.
The Town of Oyster Bay may revoke approval of this TSP at any time, thereby stopping Work, if there is an unacceptable risk to the public or the public is unduly inconvenienced.

2.0 Work Description

Provide a brief description of scope of work:

Work performed in accordance with this traffic control plan is associated with the soil borings installed along Grumman Road and Hicky Blvd in the ROW. Soil borings will be drilled by Geoprobe rigs. Work zone at each boring location will be about 50ft or less by 12ft. Crew is expected to "mobile" and move between boring locations thru the day. Crew is expected to spend less than 4 hours at each boring location.

3.0 Type and Duration

Work locations on this project will be: Intermediate work (1-8 hours per location)

Roadway work will be performed: Travel lane

Special traffic conditions may include (select most prevalent): Not applicable

4.0 Traffic Control Layout, Number of Devices Required, and Phasing

Review by an EJE employee is mandatory

The following traffic control configuration in the Traffic Safety Handbook applies:

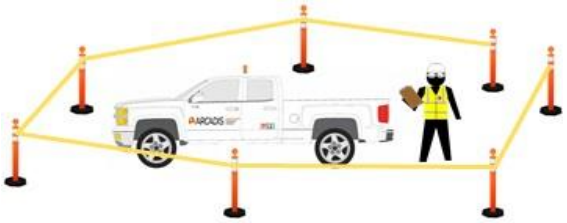
Section 6.13 Freeway Ramp or Lane Closure/Atypical Traffic Control (DOT Facts-301u)

The menu below will be blank and is not applicable.

The menu below will be blank and is not applicable.

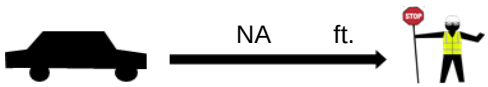
Review by an EJE employee is mandatory

All Arcadis vehicles in a ROW will, at a minimum, have a functioning high intensity strobe or rotating orange light. All Arcadis employees in the ROW will wear, at a minimum, a retroreflective high visibility outer clothing meeting ANSI Class II or III requirements and other PPE required by JSA or HASP. Don't leave vehicle doors open. Park vehicles in ROW with front wheels turned to the right. Avoid work configurations requiring standing to rear of vehicles. Stage equipment in vehicles where it can be accessed from the right side of the vehicle to the extent practical.



Intermediate Term (1-8 Hours)
Channelizing Cones with Caution Tape

ROW minimum sign spacing distances for "A", "B" and "C" (as applicable) in referenced DOT Facts.		ROW oncoming traffic minimum site distance required to see Flagger and properly decelerate and stop.
A	100 ft.	
B	100 ft.	
C	100 ft.	



ROW Cone Calculation (Values are default. Light grey fields may be modified based on actual road conditions)

	Active work area length (feet)	50
☐	Apply Optional Longitudinal Buffer (ft)?	0
	Lane width of offset (feet)	12
	Shoulder width of offset (feet)	10
	Posted speed limit	35

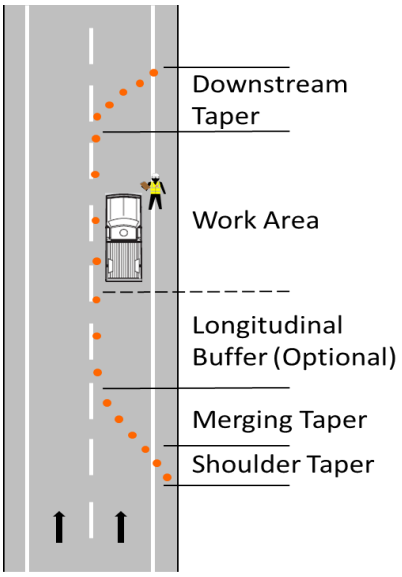
Contact EJE for assistance

☐ **Shoulder Taper**

Taper Length (feet)	NA
Cones Required	0
Cones Spacing (max., ft)	NA

☒ **Shifting/Merging Taper**

Taper Length (feet)	125
Cones Required	4
Cones Spacing (max., ft)	35



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Northrop Grumman Systems Corporation

APPENDIX D
COMMUNITY AIR MONITORING PLAN

Grumman Rd/Hickey Blvd, Bethpage New York

NYSDEC Site # 1-30-003A

Revised: August 13, 2019

APPENDIX D COMMUNITY AIR MONITORING PLAN

Grumman Rd/Hickey Blvd,

Bethpage New York

NYSDEC Site # 1-30-003A

Xuan Xu
Project Scientist

John D. Kirby, CIH, CSP
HASP Reviewer

Carlo San Giovanni
Program Manager

Prepared for:

Northrop Grumman Systems Corporation
Bethpage, New York

Prepared by:

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Tel 631 249 7600
Fax 631 249 7610

Our Ref.:

30018041

Date:

August 13, 2019

CONTENTS

1 INTRODUCTION

In accordance with New York State Department of Health (NYSDOH) requirements, this Community Air Monitoring Plan (CAMP) has been prepared for use during activities on Grumman Road/Hickey Blvd associated with the Northrop Grumman Corporation (NGC) RW-21 remediation pipeline construction. This CAMP serves to present the methods and procedures to conduct real-time monitoring for volatile organic compounds (VOC) and total particulates (i.e. nuisance dust) at each designated work area when certain activities are in progress.

This CAMP is not intended for use in establishing action levels for worker respiratory protection; action levels are described in the Site-Specific Health and Safety Plan (HASP) (Arcadis. 2019). The intent of this CAMP is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers that are not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities that are related to the Site. The response levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, this CAMP helps to confirm that work activities do not spread contamination off-site through the air.

Reliance on this CAMP does not preclude simple, common-sense measures to keep potential dust and odor emissions at a minimum around work areas. On the contrary, the air monitoring proposed is intended to enhance and record the effectiveness of good work practices in the control of potential emissions. The following sections of this CAMP present the monitoring instrumentation required to comply with NYSDOH policy, the frequency of monitoring, response levels, and response actions.

2 MONITORING INSTRUMENTATION

VOC monitoring will be performed using real-time monitoring instrumentation that is capable of measuring the types of VOCs known or suspected to be present at the work location (please refer to the HASP for details). The equipment will be calibrated daily and using the methods described in the HASP. Fifteen-minute running average concentrations will be recorded using PID MiniRAE 3000 or similar. The monitoring equipment will be have with an audible alarm to indicate exceedance of the action level.

The particulate monitoring will be performed using real-time instrumentation that is capable of measuring total particulate. Fifteen-minute running average concentrations will be recorded using a dust monitor (i.e. TSI Dust Track II, ThermoFisher Scientific PDR 1000, or similar). The particulate monitoring equipment will have an audible alarm to indicate exceedance of the action level.

3 MONITORING FREQUENCY

This section defines the typical activities that will occur in relation to the work area and correlates these activities to the frequency of monitoring required.

Continuous Monitoring for VOC and Particulates Will be Carried out for Intrusive Activities identified below:

1. Soil boring and sampling
2. Soil excavation and handling
3. Test pitting or trenching
4. Construction activities involving earthwork or disturbance of earthen surfaces
5. Other activities specified in this CAMP

Additionally, upwind particulate concentrations will be measured at the **start** of each workday and **periodically** (see below) thereafter to establish the background concentration.

Periodic monitoring for VOCs will be carried out during non-intrusive activities. For non-intrusive activities, the upwind concentrations will be measured at the **start and finish** of the work effort to establish the background concentration. Non-intrusive activities typically include the following:

1. Site Mobilization/Demobilization of equipment and machinery
2. Surveying (geophysical, coordinate/elevation)
3. Waste transportation
4. Site preparation and restoration that does not involve re-grading or other disturbances to surface materials

"Periodic" monitoring should be performed, at a minimum as follows:

1. Upon arrival at a work location to determine the ambient, or background concentrations
2. During each phase of work that potentially may generate VOC emissions to the air
3. Prior to leaving the work location

As an example, "Periodic" monitoring for VOCs during sample collection activities shall include monitoring as above and during the following times:

1. When opening drums or containers, or overturning soil
2. During collection of samples (soil/sediment)

For non-intrusive activities, particulate monitoring will not be performed.

3.1 VOC Monitoring Stations Locations, Response Levels, and Action

During each workday, the VOC monitoring station will be positioned at the downwind perimeter of the work area (i.e., the exclusion zone – see HASP for definition). As stated above, monitoring frequency (periodic or continuous) will be determined based on whether the activity is considered intrusive or non-intrusive. The direction of wind (if any) will be periodically recorded during each workday and re-positioning of upwind/downwind monitoring stations will be performed accordingly.

The VOC monitoring instrumentation output documenting 15-minute running average concentrations will be compared to the following response levels:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeds 5 parts per million (ppm) **above background** for the 15-minute average, work activities will be temporarily halted and monitoring continued.

  If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm **above background** but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the work area or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15- minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All readings will be recorded on the appropriate air monitoring log (please refer to the HASP for details) or the electronic log will be printed out. Air monitoring results will be appended to the appropriate report.

3.2 Particulate Monitoring Stations Locations, Response Levels, and Actions

For intrusive activities, the particulate (i.e., dust) monitoring station will be positioned at the downwind perimeter of the work zone (i.e. outside the work zone). In addition, fugitive dust migration will be visually assessed during all work activities. The direction of wind (if any) will be periodically recorded during each work day and re-positioning of the downwind monitoring station will be performed accordingly. The response levels and actions for fugitive dust are as follows:

- If the downwind PM-10 particulate level is 0.5 milligrams per cubic meter (mg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is visually observed leaving the work area, then dust suppression techniques will be employed. Dust suppression techniques will include (but not be limited to) misting of soil excavation activities, wet cutting of asphalt or concrete as necessary, wetting of roadways and work areas. Work will continue with dust suppression techniques provided that downwind particulate levels do not exceed 0.5 mg/m3 above the upwind level and provided that no visible dust is observed leaving the work area.
- If, after implementation of dust suppression techniques, downwind particulate levels are greater than 0.5 mg/m3 above the background concentration, then work will be stopped, and a re-evaluation of activities initiated. Work will resume if dust suppression measures and/or other controls are successful in reducing the downwind particulate concentration to less than 0.5 mg/m3 of the upwind level and in preventing visible dust from leaving the work area.

All readings will be recorded on the appropriate air monitoring log or the electronic log will be printed out. Air monitoring results will be appended to the appropriate report.

4 REPORTING

This section describes reporting requirements for work performed specifically on Town of Oyster Bay (TOB) property and rights-of-way under access agreement made between Northrop Grumman Systems Corporation (NG) and TOB. Special provisions may apply under specific access agreement.

- NG shall notify the TOB of any exceedance of criteria established under the CAMP within 24 hours after NG becomes aware of the exceedance and shall provide to the TOB on a weekly basis, copies of the daily data and reports of the air monitoring program;
- NG shall provide to the TOB a copy of any and all data and reports that NG submits to the NYSDEC, NYSDOH, or other regulatory agency regarding the Work covered by any access agreement made with TOB. NG's provision of such data and reports to the TOB shall be concurrent with NG's submission to said agency or agencies. All data and reports shall be provided to the TOB in an electronic format.

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X	**Work Area**		
	Cone Spacing (max., ft)	35	
	Cones Required	10	Note: Review taper configuration and cone spacing after ROW
X	**Downstream Taper**		implementation to ensure traffic is
	Taper Length (feet)	125	moving efficiently without motorist
	Cones Required	8	confusion in the RWZ.
	Cone Spacing (max., ft)	35	
	Cones Required (minimum)	22	

Select the traffic control devices to be used and enter number each required:

Check all that apply:		*Wording or Pictogram*	*Number:*
X	Warning signs	Road Work Ahead	2
X	Warning signs	Lane Shift Arrow	1
X	Warning signs	End Road Work	2
	Stop/Slow paddle		
	Red flag		
	Drums		
	Channelizer cone (42 inch height, 10 lb base)		
	Channelizer cone (42 inch height, 30 lb base)		
X	Traffic cones (≥ 18 inches tall)		22
	Barricade:		
	Flags for cones		
	Lights (for night work)		
	Plastic fencing (rolls)		
	Caution tape (rolls)		
	Other (specify):		

ROW Phasing:

1) Deploy warning signs at first approach, if required

2) Deploy subsequent approach warning signs, if required

3) Deploy channeling devices, if required, starting with first approach

4) Deploy "End Road Work" signs, if required

5) Position vehicle as shield to the extent practical

6) Commence work, SSO or designated contractor to maintain devices

7) Remove devices in reverse order

Reviewed By: Justin Maderia

HASP Reviewer: John Kirby

Engineering Judgment Review By: Justin Maderia