NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 7
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May 28, 2015

John Mosack
Executive Director, General Manager
Bristol-Myers Squibb Company
Mail Stop A-1; Syracuse Operations
Global Manufacturing and Supply
6000 Thompson Road
East Syracuse, NY 13057

Re: Bristol-Myers Squibb Restoration Area
Site ID No. C734138
Village of East Syracuse, Town of DeWitt, Onondaga County
Phase 1A RIWP – Sediment Sampling Module

Dear Mr. Mosack:

The New York State Department of Environmental Conservation (Department) and the New York State Department of Health have reviewed the Phase 1A Remedial Investigation Work Plan – Sediment Sampling Module (work plan), for the Bristol-Myers Squibb Restoration Area (site), dated April 2015, which was prepared by ARCADIS of New York, Inc. (ARCADIS) on behalf of the Bristol-Myers Squibb Company (BMS). Based on the work plan, the Department understands each sample collected from Headson's Brook will be analyzed for all the parameters listed on the left-hand side of Table 1 of the work plan, and each sample collected from the South Branch of Ley Creek will be analyzed for all the parameters listed on the right-hand side of Table 1 of the work plan.

The Department also reviewed the Quality Assurance/Quality Control information regarding EPA Method 1694, which was submitted by BMS on May 8, 2015. Matrix spike/matrix spike duplicate pairs should be collected and analyzed using EPA Method 1694 at the rate of one pair per 20 normal samples in order to be consistent with other analytical methods. Duplicate samples must be collected and analyzed using EPA Method 1694 at the rate of one duplicate per 20 normal samples.

The Department also considered the following figures, which were submitted by BMS on March 23, 2014, in completing review of the work plan:

- Revision 14, dated 12-21-1987, to Plot Plan, General Sewer System, drawing number X-Y-243, original date 9-24-1969, and

- Revision 17, dated 7-19-1990, to Plot Plan, General Sewer System, drawing number X-Y-243, original date 9-24-1969.

The work plan is hereby approved with the clarifications noted above. Note, given the wet nature of the sediments and the distance of the sampling sites from any receptor populations, formal community air monitoring will not be required as long as monitoring of the immediate work area is completed for volatile organic compounds and the results are within acceptable limits. BMS must obtain and comply with any necessary State, local or federal permits. If you have any questions, please do not hesitate to contact me at 315-426-7411 or joshua.cook@dec.ny.gov.

Sincerely,

Joshua P. Cook, P.E.
Environmental Engineer 2

ec: Harry Warner (NYSDEC)
Joshua Cook (NYSDEC)
Maureen Schuck (NYSDOH)
Richard Jones (NYSDOH)
John Mosack (BMS)
J. Richard Pooler (BMS)
John Killiany (BMS)
Anne Locke (BMS)
Keith White (ARCADIS)
Andrew Korik (ARCADIS)

QA/QC information regarding EPA Method 1694

According to Lancaster Lab's Technical Director, the following laboratory QA/QC will be included for EPA Method 1694. I have included a definition for each.

- ***Method Blank**: A method blank is an "analyte-free" matrix that is treated exactly the same as sample including exposure to all glassware, equipment, solvents, reagents, internal standards, and surrogates that are used with samples. The method blank is useful in identifying possible sources of contamination within the analytical process.*
- ***Lab Control Sample (LCS)**: A LCS is a blank matrix, free from the analytes of interest, spiked with verified known amounts of target analytes created from a source other than that used to make up calibration standards. The intent of LCS analysis is to provide insight into the intra-laboratory or analyst specific precision and bias or to assess the performance the measurement system.*
- ***Surrogates**: The surrogate standard is composed of labeled analogs of the target compounds and is added to the sample in a known amount, prior to extraction. The surrogate concentration is measured using the same procedures used to measure other analytes in the sample. The surrogate spike is utilized to provide broader insight into the proficiency and efficiency of an analytical method on a sample-specific basis.*
- ***Internal Standard**: Internal standards are compounds that are added, immediately prior to analysis, at a known concentration to every standard, blank, sample, and quality control sample. Internal standards are used to calibrate the analytical system by plotting the response of the internal standards versus the compounds of interest. Internal standards closely match the chemical behavior of the compounds of interest and are known not to be present in the sample.*
- ***Matrix Spike/Matrix Spike Duplicate***: A matrix spike is an aliquot of an environmental sample to which known quantities of target analytes are added in the laboratory. A matrix spike duplicate is a second aliquot of the sample which is also spiked with identical concentrations of target analytes. The matrix spike and matrix spike duplicate are analyzed in an identical manner as the sample. The purpose of a matrix spike is to determine the accuracy of the overall analytical procedure for determining the analytes of concern in the sample. The matrix spike duplicate analysis is used to document both the precision and accuracy of the method in a given sample matrix.*

  ** Matrix Spike/Matrix Spike Duplicate analysis will be provided only upon client request as it is not a required by the method*

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C734138 Phase 1A Remedial Investigation Work Plan

Sediment Sampling Module

BMS Syracuse North Campus Restoration Area
East Syracuse, New York

April 2015

ARCADIS

Keith A. White

I, Keith A. White, certify that I am currently a Qualified Environmental Professional [as defined in 6 NYCRR Part 375] and that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

C734138 Phase 1A Remedial Investigation Work Plan

Sediment Sampling Module

BMS Syracuse North Campus Restoration Area
East Syracuse, New York

Prepared for:
Bristol-Myers Squibb Company

Prepared by:
ARCADIS of New York, Inc.
6723 Towpath Road
PO Box 66
Syracuse
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Tel 315 446 9120
Fax 315 446 8053

Our Ref.:
B0087363.0005

Date:
April 2015

Acronyms and Abbreviations

BCA	Brownfield Cleanup Agreement
BDA	Brownfield Development Area
BMS	Bristol-Myers Squibb Company
CSX	CSX Transportation, Inc.
COC	constituent of concern
DER-10	Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OBG	O'Brien & Gere Engineers
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
Phase 1A WP	Phase 1A Work Plan
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
SVOC	Semi-volatile organic compound
TAL	Target Analyte List
TIC	Tentatively Identified Compound
VOC	Volatile organic compound

1. Introduction

This Sediment Sampling Plan comprises the fifth module of the Phase 1A Remedial Investigation (RI) Work Plan (Phase 1A WP) for the Bristol-Myers Squibb Company (BMS) Syracuse North Campus Restoration Area (Site No. C734138; Brownfield Development Area [BDA]) located at 6000 Thompson Road in East Syracuse, New York. ARCADIS prepared this Phase 1A WP module on behalf of BMS. The activities described in the Phase 1A WP will be performed in accordance with the requirements of the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program. The Brownfield Cleanup Agreement (BCA) between BMS and NYSDEC was executed on October 18, 2011. A site location map showing the general location of the BMS facility is provided as Figure 1. Figure 2 shows the location and boundaries of the BDA at the BMS facility.

This Sediment Sampling Plan has been prepared in accordance with the requirements of the Remedial Investigation Work Plan (RIWP; O'Brien & Gere Engineers [OBG] 2013a), which was conditionally approved by NYSDEC/New York State Department of Health (NYSDOH) on April 3, 2013. As outlined in the RIWP, the RI in the BDA is being completed in multiple phases.

2. Outfall Sediment Sampling Plan

2.1 Sediment Sampling Locations and Methodology

The purpose of the sediment sampling is to assess the potential presence of site-related constituents near storm water conveyance outfalls from the BDA to Headson's Brook and Ley Creek. Samples will be collected at or near the BDA storm water outfalls and downstream of the outfall locations. Upstream/background sediment samples will also be collected to allow for comparison of the constituent presence and concentrations in these locations to those observed (if present) at or near the BDA storm water outfalls.

Sediment samples will be collected at 17 locations as described below, and as shown on Figure 2:

- Three BMS outfall locations in Headson's Brook (Outfalls 001, 002, and 003)
- Two BMS outfall locations in Ley Creek (Outfalls 007 and 009)
- One location each in Headson's Brook and Ley Creek upstream of their confluences
- Ten locations upstream of the BDA (five each in Headson's Brook and Ley Creek)

Storm water drainage basins and associated outfalls are shown on Figure 2. Exact sampling locations will be selected in the field after considering water depth, depositional patterns (i.e., sediment layer thickness), the presence of sediment in proximity to each outfall, and accessibility (in terms of safety and access to private property). Actual sediment sample locations will be surveyed after sampling is completed using conventional survey methods to horizontal and vertical accuracies of 0.1 foot.

Samples will be collected using a Lexan® tube or other hand-sampling tool (e.g., Ponar dredge sampler, stainless steel shovel) based on field conditions, and will be extended vertically until refusal is encountered. Sediment samples and associated quality assurance/quality control samples will be collected and analyzed in accordance with the approved Field Sampling and Analysis Plan (OBG 2013c), the Quality Assurance Project Plan (OBG 2013b), and NYSDEC Division of

Environmental Remediation's DER-10 Technical Guidance for Site Investigation and Remediation (DER-10; NYSDEC 2010).

As outlined in DER-10 (NYSDEC 2010), sediment samples will be collected from multiple depth intervals, including 0 to 6 inches, 6 to 12 inches, and subsequent 12-inch intervals for analysis thereafter to the bottom of the recovered core. Sample intervals may be modified after consultation with NYSDEC field representative based on the stratigraphy of recovered cores or recovered core lengths. If the sampling tool encounters refusal at less than 6 inches, a minimum of three attempts will be made to achieve the adequate depth within the vicinity of the sampling area (e.g., within 4 feet of the sampling area). If a 6-inch sediment thickness is not present within the vicinity of the sampling area, then a grab sample of the available sediment thickness that is present will be collected for analysis using a Ponar dredge sampler or stainless steel shovel (based on field conditions).

2.2 Sediment Sample Laboratory Analyses

The analytical parameter lists for sediment samples in Headson's Brook and Ley Creek include: (1) the constituents outlined in Section 3.3.11 of the RIWP and NYSDEC's guidance document Screening and Assessment of Contaminated Sediment (OBG 2013a and NYSDEC 2014, respectively), (2) constituents of concern (COCs) that were analyzed for within the drainage basins of the individual outfalls during the Phase 1 RI sampling activities, and (3) six penicillin-related compounds that were historically produced or handled on site. Table 1 shows a summary of the analytical parameter lists for each waterway.

Sediment samples analyzed for VOCs, PCBs, Pesticides, TAL inorganics (including mercury, cyanide, and molybdenum), alcohols, and glycols will be submitted to and analyzed by the TestAmerica laboratory in Buffalo, New York. Sediment samples analyzed for SVOCs, alkylated PAHs, and total organic carbon will be submitted to and analyzed by the TestAmerica laboratory in Burlington, Vermont. The six penicillin-related compounds will be analyzed for by Eurofins Lancaster Laboratories located in Lancaster, Pennsylvania.

3. Reporting

Results of the sediment analysis will be included in the Phase 1A Data Summary Report. The Phase 1A Data Summary Report will include identification of data gaps (if any) and a proposed scope (as needed) for Phase 2 investigations.

4. Schedule

BMS will provide a final schedule for sediment soil sampling following receipt of NYSDEC/NYSDOH approval of this Work Plan. The schedule will be dependent on weather conditions and property access to the adjacent CSX Transportation, Inc. (CSX) property. BMS initiated a request for access to collect sediment samples from CSX on November 13, 2014. As of the submittal date of this Work Plan, access negotiations with CSX continue.

5. References

New York State Department of Environmental Conservation (NYSDEC). 2010. DER-10 Technical Guidance for Site Investigation and Remediation. May 3. Available online at: http://www.dec.ny.gov/regulations/67386.html

NYSDEC. 2014. Screening and Assessment of Contaminated Sediment. June 24. Available online at: http://www.dec.ny.gov/docs/fish_marine_pdf/screenasssedfin.pdf

O'Brien & Gere (OBG). 2013a. *Remedial Investigation Work Plan: BMS Syracuse North Campus Restoration Area Site No. C734138*. March 2013.

OBG. 2013b. *Quality Assurance Project Plan: BMS Syracuse North Campus Restoration Area Site No. C734138*.

OBG. 2013c. *Field Sampling and Analysis Plan: BMS Syracuse North Campus Restoration Area Site No. C734138.*

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Table

Table 1
Summary of Analytical Parameter Lists for Sediment Samples in Headson's Brook and Ley Creek

Site #C734138: BMS Syracuse North Campus Restoration Area

Headson's Brook	Ley Creek
Constituents Presented in the RIWP	
Volatile Organic Compounds, plus top 10 TICs (Method: 8260C)	Volatile Organic Compounds, plus top 10 TICs (Method: 8260C)
Semi-Volatile Organic Compounds, plus top 20 TICs (Method: 8270D)	Semi-Volatile Organic Compounds, plus top 20 TICs (Method: 8270D)
Total Organic Carbon (Lloyd Kahn Method)	Total Organic Carbon (Lloyd Kahn Method)
Alcohols (Method: 8015D)	Alcohols (Method: 8015D)
Glycols (Method: 8015D)	Glycols (Method: 8015D)
Arsenic (Method: 6010C)	
Chromium (Method: 6010C)	
Polychlorinated Biphenyls (Method: 8082A)	
Constituents Presented in the NYSDEC *Screening and Assessment of Contaminated Sediment* Guidance Document	
34 USEPA Polycyclic Aromatic Hydrocarbons (Method: 8270 SIM)	34 USEPA Polycyclic Aromatic Hydrocarbons (Method: 8270 SIM)
Constituents Previously Analyzed for in Site Soil and Groundwater during Phase 1 Remedial Investigation Sampling Activities	
Pesticides (Method: 8081B)	Pesticides (Method: 8081B)
TAL Inorganics (other than arsenic and chromium) (Method: 6010C)	TAL Inorganics (Method: 6010C)
	Polychlorinated Biphenyls (Method: 8082A)
Molybdenum (Method: 6010B/C)	Molybdenum (Method: 6010B/C)
Cyanide (Method: 9012A/B)	Cyanide (Method: 9012A/B)
Penicillin-Related Compounds (Method: 1694)	
Ampicillin	Ampicillin
Cloxacillin	Cloxacillin
Oxacillin	Oxacillin
Penicillin V	Penicillin V
Penicillin G	Penicillin G
Tetracycline	Tetracycline

Notes:
BMS = Bristol-Myers Squibb Company
NYSDEC = New York State Department of Environmental Conservation
RIWP = Remedial Investigation Work Plan (O'Brien & Gere 2013a)
SIM = Selective Ion Monitoring
TAL Inorganics = USEPA Target Analyte List for inorganics
TICs = Tentatively Identified Compounds
USEPA = U.S. Environmental Protection Agency

1. Method numbers are analytical test methods from USEPA's Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods (SW846), 4th Edition, June 1997.
2. The analytical test method for penicillin-related compounds is USEPA's Method 1694 for pharmaceuticals and personal care products in water, soil, sediment, and biosolids, December 2007. Available online at:http://water.epa.gov/scitech/methods/cwa/bioindicators/upload/2008_01_03_methods_method_1694.pdf.

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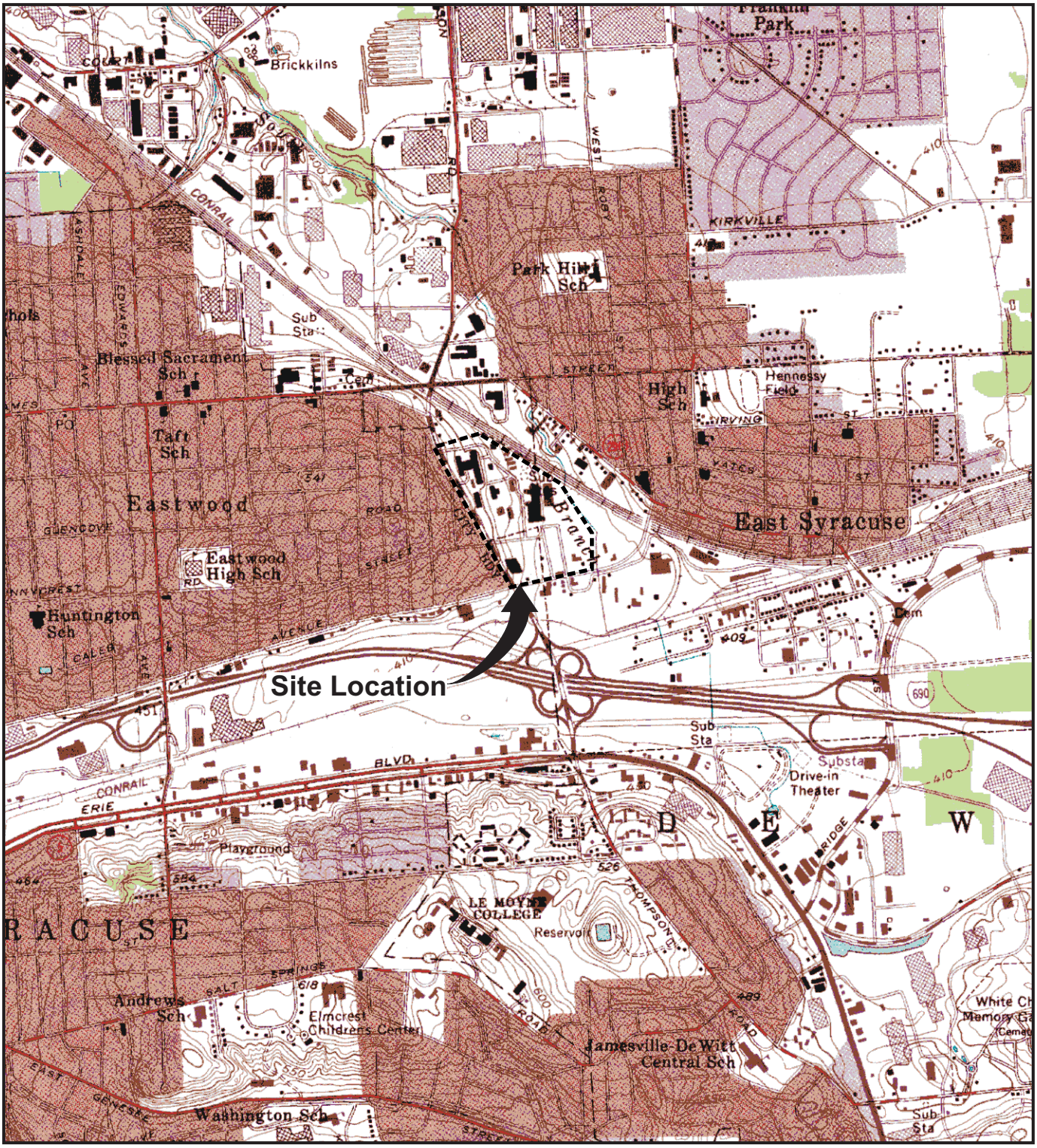
Figures



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., SYRACUSE EAST, N.Y., 1957. PHOTOREVISED 1978.

2000' 0 2000'

Approximate Scale: 1" = 2000'

SITE #C734138:BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY

SITE LOCATION MAP

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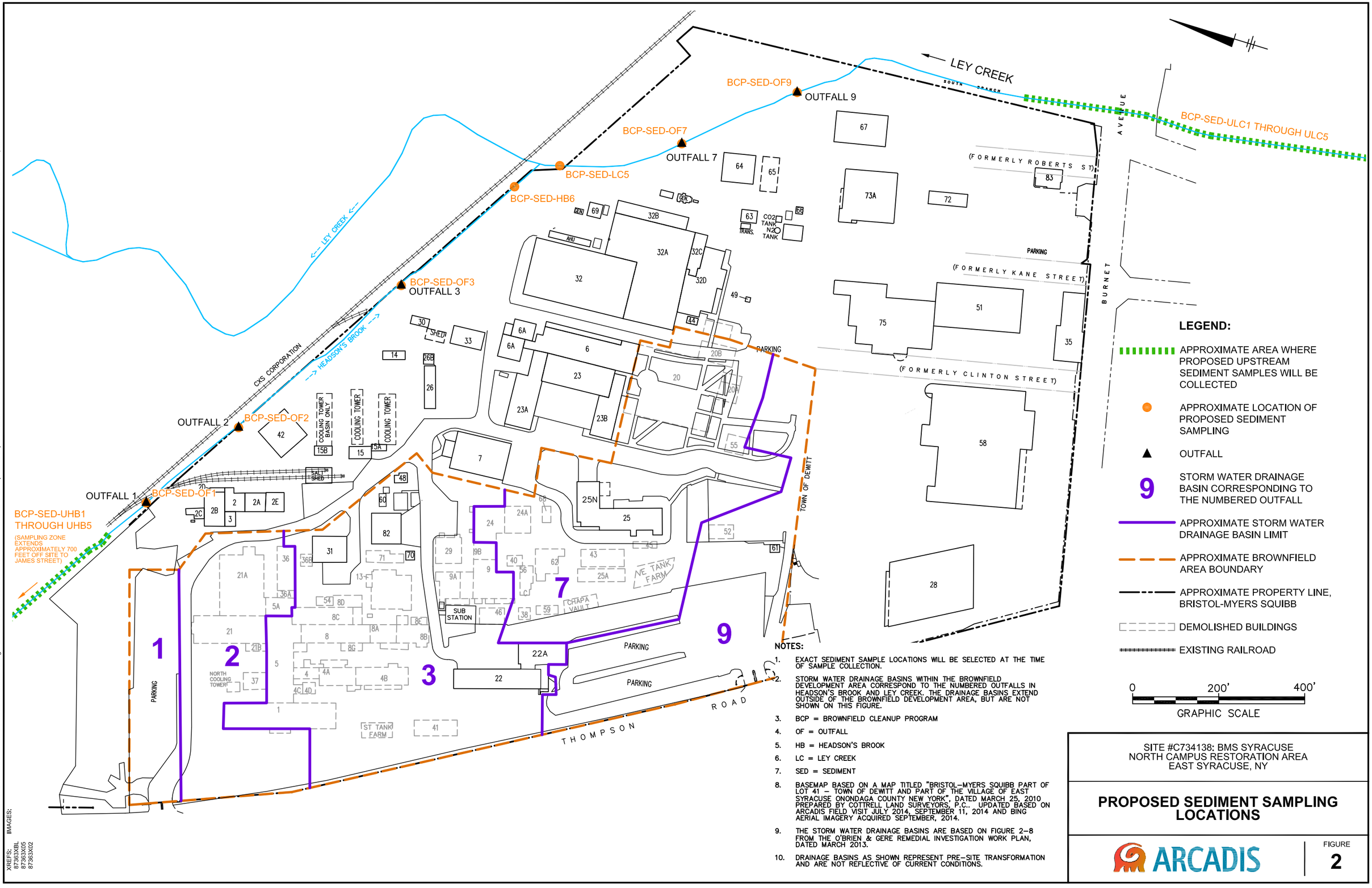
FIGURE
1

09/23/2014 SYRACUSE, NY-ENV/CAD-141 DJHOWES
B0087363/0005/00001/CDR/87363N01.CDR



NOTES:

1. EXACT SEDIMENT SAMPLE LOCATIONS WILL BE SELECTED AT THE TIME OF SAMPLE COLLECTION.
2. STORM WATER DRAINAGE BASINS WITHIN THE BROWNFIELD DEVELOPMENT AREA CORRESPOND TO THE NUMBERED OUTFALLS IN HEADSON'S BROOK AND LEY CREEK. THE DRAINAGE BASINS EXTEND OUTSIDE OF THE BROWNFIELD DEVELOPMENT AREA, BUT ARE NOT SHOWN ON THIS FIGURE.
3. BCP = BROWNFIELD CLEANUP PROGRAM
4. OF = OUTFALL
5. HB = HEADSON'S BROOK
6. LC = LEY CREEK
7. SED = SEDIMENT
8. BASEMAP BASED ON A MAP TITLED "BRISTOL-MYERS SQUIBB PART OF LOT 41 – TOWN OF DEWITT AND PART OF THE VILLAGE OF EAST SYRACUSE ONONDAGA COUNTY NEW YORK", DATED MARCH 25, 2010 PREPARED BY COTTRELL LAND SURVEYORS, P.C.. UPDATED BASED ON ARCADIS FIELD VISIT JULY 2014, SEPTEMBER 11, 2014 AND BING AERIAL IMAGERY ACQUIRED SEPTEMBER, 2014.
9. THE STORM WATER DRAINAGE BASINS ARE BASED ON FIGURE 2-8 FROM THE O'BRIEN & GERE REMEDIAL INVESTIGATION WORK PLAN, DATED MARCH 2013.
10. DRAINAGE BASINS AS SHOWN REPRESENT PRE-SITE TRANSFORMATION AND ARE NOT REFLECTIVE OF CURRENT CONDITIONS.

SITE #C734138: BMS SYRACUSE
NORTH CAMPUS RESTORATION AREA
EAST SYRACUSE, NY

PROPOSED SEDIMENT SAMPLING LOCATIONS

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FIGURE
2

CITY: SYRACUSE, NY DIV/GROUP: ENV/REM-WIM-DV DB: R PETRIE, R. BASSETT, P LISTER PM: G. THOMAS TM/TR: A. KORIK LYR: ON=*;OFF=*REF, (FRZ)
G:\ENV\CAD\SYRACUSE\ACTIVE\B0087363\0005\0002\DWG\SSWP\87363P002.dwg LAYOUT: 2 SAVED: 3/30/2015 1:10 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/30/2015 1:20 PM BY: POSENAUER, LISA
XREFS: IMAGES:
87363XBL
87363X05
87363X02