APPLICATION FOR REVIEW OF A PROJECT OF SIGNIFICANT IMPACT

WELLESLEY PLANNING BOARD

Applicant:

Babson College

Project:

Webster Athletic Center Renovation and Expansion

3 Babson College Drive, Wellesley, MA

October 13th, 2016

Submitted by

Babson College

Facilities Management and Planning

Babson Park, MA

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SECTION 3

APPLICATION FORMS AND SUBMISSION FEE

APPLICATION FOR REVIEW OF A PROJECT OF SIGNIFICANT IMPACT

Webster Athletic Center Renovation and Expansion

SECTION 3.0 APPLICATION FORMS AND SUBMISSION FEE

WEBSTER ATHLETIC CENTER

RENOVATION AND EXPANSION

PSI SUBMISSION

APPLICATION FORM

Attached in this section is a completed Wellesley Planning Board Application Form for Review of a Project of Significant Impact.

SUBMISSION FEE

The Traffic Impact and Assessment Study (TIAS) prepared by TEPP LLC indicates that the project will not result in 30+ new vehicles trips per hour during peak hours. Therefore, in accordance with the Planning Board Proposed Fee Schedule adopted September 18, 2012 (see Table 1 below), we have used $20,000 as the base fee.

TABLE 1: Excerpts from Planning Board Fee Schedule 2012

Planning Board Proposed Fee Schedule Adopted September 18, 2012	
PROJECT TYPE	**BASE FEE ($)***
Advertising Fee	**$50 Advertising Fee shall be added to all permits or modifications requiring a Public Hearing**
PSI	
PSI w/ 30+ new vehicle trips per hour	30,000**
PSI	20,000**

**Plus $0.60 per SF in excess of 10,000 SF up to 50,000 SF & plus $0.30 per SF for 50,000 + SF of new construction; plus $0.60 per SF in excess of 15,000 SF up to 50,000 SF & plus $0.30 per SF for renovation with change of use.

We have calculated the fee based on the information from Table 1 and show our calculations in Table 2 below. We have included a check in the amount of $49,900 for the PSI Submission Fee for the Webster Athletic Center Renovation and Expansion Project.

TABLE 2: Calculation of PSI Fee

		69,500	sq feet	new construction
		0	sq feet	renovations with change of use
		17,500	sq feet	renovations with no change of use
PSI Base fee			$20,000	Less than 30+ new vehicle trips per peak hr
Advertising Fee			$50	
	cost psf			
	$0.60	40,000	$24,000	In excess of 10K sq ft up to 50K sq ft
	$0.30	19,500	$5,850	For 50K+ sq ft of new construction
	$0.30	0	$0	Per sq ft for renovations with change of use.
		TOTAL	**$49,900**	

WELLESLEY PLANNING BOARD
APPLICATION FORM FOR REVIEW OF A
PROJECT OF SIGNIFICANT IMPACT

DATE: 13 October 2016
ADDRESS OF PROPERTY: 3 Babson College Drive PRECINCT F
NAME OF OWNER OF RECORD: Babson College, 231 Forest St., Wellesley MA

_____
signature

EXISTING USE OF
LAND/BUILDINGS: Education - Athletic Facility
PRESENT ZONING: Educational
PROPOSED USE OF
LAND/BUILDINGS: Education - Athletic Facility

FLOOR AREA OF BUILDING(S) NOW EXISTING ON THE
SITE: 105,500 SQUARE FEET.

TOTAL FLOOR AREA OF BUILDING(S) PROPOSED ON THE
SITE: 175,000 SQUARE FEET.

AGGREGATE TOTAL FLOOR AREA OF PROPOSED NEW CONSTRUCTION
ONLY 69,500 SQUARE FEET.

(IF RESIDENTIAL) NUMBER OF DWELLING UNITS NA

AREA OF LOT OR DEVELOPMENT SITE 174 acres +/- SQUARE FEET.

CONSULTANT(s) FOR IMPACT ANALYSIS Nitsch Engineering, Inc. 617 338-0063
McPhail Engineering, Inc. Phone 617 338-0063
VHB Engineering, Inc. 617 924-1770
WSP. 617-210-1723 TEPP LLC. 603 212-9133

****

This portion to be completed by Planning Department

APPLICATION FORM AND IMPACT ANALYSIS AS REQUIRED BY PLANNING BOARD
RECEIVED BY _____
signature date

REVIEW COMPONENTS WAIVED BY PLANNING BOARD
_____ date of vote _____
_____ date of vote _____
_____ date of vote _____
_____ date of vote _____

SUBMISSION FEE RECEIVED $_____ _____
date

IMPACT ANALYSIS TRANSMITTED TO REVIEW DEPARTMENTS _____
date

IMPACT ANALYSIS APPROVED BY:
Board of Selectmen _____
date
Board of Public Works _____
date
Fire Chief _____
date
Special Permit Approved by Planning Board _____ date.

WELLESLEY PLANNING BOARD

DEFINITIVE SUBMISSION - PROJECT PLAN SPECIFICATIONS

PROJECT OF SIGNIFICANT IMPACT

The Definitive Submission Project Plan shall be drawn to a scale of 1"=40' and shall show:

a. Title and North arrow;

b. Name of owner of record;

c. Name of applicant (if different than owner);

d. Names of all abutters as they appear on the most recent tax list;

e. The general topography including an indication of open and wooded areas, permanent monuments, natural objects such as waterways, drainage courses, large boulders or ledge outcroppings, stone walls and the like;

f. Proposed location of building(s) and structures, roads, drives, and parking areas, with the proposed rough layout of storm drains, water supply, sewage disposal system and necessary easements;

g. The general relation of the proposed driveway(s), water, sewer and drainage systems and easements to adjoining properties and ways.

Should the plan be submitted on more than one sheet, all sheets shall be of the same size.

SECTION 4

PROJECT OVERVIEW AND SUPPLEMENTAL INFORMATION

APPLICATION FOR REVIEW OF A PROJECT OF SIGNIFICANT IMPACT

Webster Athletic Center Renovation and Expansion

SECTION 4.0 PROJECT OVERVIEW AND SUPPLEMENTAL INFORMATION

WEBSTER ATHLETIC CENTER

RENOVATION AND EXPANSION

PSI SUBMISSION

INTRODUCTION

Babson College is pleased to submit to the Planning Board this application for a Project of Significant Impact (PSI) special permit under Article XVI-A of the Wellesley Zoning Bylaw. This section is intended to assist the Board members and the reviewing departments and committees in understanding the context in which the project is proposed and the details to be presented during public hearings. It provides not only this general overview and background, but also a brief summary of each of the component parts which follow in a series of technical appendices and reports.

PROJECT BACKGROUND AND OVERVIEW

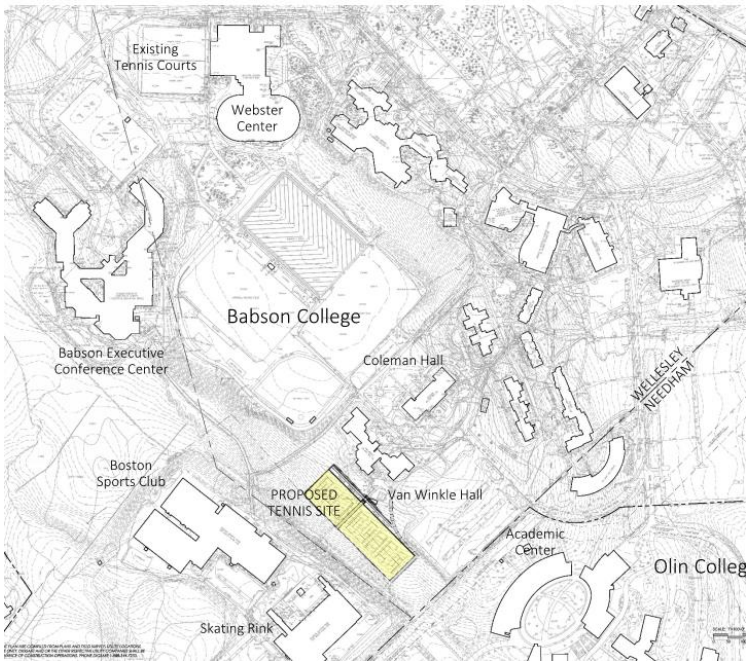
The Webster Athletic Center Renovation and Expansion (the "Project") includes the renovation of 17,500 square feet of existing interior space and a 69,500 square foot addition. The program for the Project, which includes the Staake Gymnasium and PepsiCo Pavilion, will include new recreation fitness rooms, multi-purpose rooms, new and renovated locker rooms, new and renovated athletic offices, a sports medicine center, and a new recreation space with three basketball courts. The site for the expansion is directly to the west of the current building where eight existing tennis courts are currently located.

Rendering of Proposed Project from Babson College Drive

View of Proposed Project from the South Lawn

The tennis courts will be relocated to a new site near the Babson Skating Rink and will be subject to a separate Town of Wellesley Site Plan Approval process. The permitting for these tennis courts will be under a separate submission. A plan indicating the proposed location of the new tennis courts is below:

Proposed tennis location



Presently, there are portions of the existing Webster Athletic Center (the "Center") which are over 90 years old and the last major upgrade to the building occurred in 1989. The facilities are in need of substantial updating and do not reflect the health and wellness needs of today's students.

Furthermore, with the existing Staake Gymnasium and PepsiCo Pavilion over-booked with student activity each day, the College is unable to accommodate all of the present varsity athletic and non-varsity recreational needs of the current Babson community. The Project will allow enough space to comfortably accommodate all of our varsity teams, club sports, intramural activities, pick-up games, and a wide range of fitness options, from yoga to dance to Zumba® to martial arts.

While the primary use of the facility will be for varsity sports and recreational use, the Project will also enhance campus-wide needs by providing a more appropriate space for many existing on-campus activities such as our first-year examinations, spring concert, social gatherings, or our undergraduate orientation each September. Many of these activities are currently housed in inadequately sized spaces without proper audio-visual capabilities or air-conditioning.

The design of the Project has also been considered very carefully with regard to the aesthetics and technical performance of both the renovations and expansion. The facades will reflect the traditional neo-Georgian architecture of some of our finest and oldest buildings and will present a welcoming face to the Babson and broader communities. The existing impervious tennis courts will be removed and replaced with the new construction and a series of landscaped open spaces which will make for a more welcoming arrival from the West Gate entrance and allow for more stormwater to be retained on-site.

During most of the year, the Project will operate much as the existing Webster Athletic Center does today, as a support facility for indoor and outdoor sports and for the Babson campus in general. The Center will be generally open between 6:00 A.M. and 11:00 P.M. Monday through Thursday with more limited hours on Fridays and the weekends. Of the various athletic facilities provided, the recreational spaces, fitness center, pool, and multi-purpose spaces will be used primarily by Babson faculty, staff, and students.

Municipal System Impact Analysis Summaries

Utility Capacity

a. Water System

The Project has sufficient water capacity to meet the flow demands of the proposed use without causing municipal water flow characteristics off site to fall below the standards adopted by the Board of Public Works. More information regarding the water system can be found in Section 6.1a of this submission in memoranda from Nitsch Engineering and WSP. For additional information regarding the water system, please refer to the following plans provided in Section 7.0:

Drawing Name and number		Prepared by	Date
C0.0	CIVIL NOTES AND LEGENDS	Nitsch Engineering	10/13/16
C1.0	SITE EROSION CONTROL PLAN	Nitsch Engineering	10/13/16
C1.1	SITE EROSION CONTROL DETAILS	Nitsch Engineering	10/13/16
C2.0	SITE UTILITY DEMOLITION PLAN	Nitsch Engineering	10/13/16
C3.0	SITE UTILITY PLAN	Nitsch Engineering	10/13/16
C4.0	SITE UTILITY DETAILS SHEET I	Nitsch Engineering	10/13/16
C4.1	SITE UTILITY DETAILS SHEET II	Nitsch Engineering	10/13/16
L1.0	LANDSCAPE MATERIALS PLAN	Stephen Stimson Associates	9/15/16
L1.1	LANDSCAPE PAVING DETAILS	Stephen Stimson Associates	9/15/16
L2.0	GRADING PLAN	Stephen Stimson Associates	9/15/16
L3.0	LANDSCAPE PLANTING PLAN	Stephen Stimson Associates	9/15/16
L3.1	LANDSCAPE PLANTING DETAILS	Stephen Stimson Associates	9/15/16
P1.1	PLUMBING PLAN LEVEL 1	WSP Parsons Brinkerhoff	10/13/16

b. Sewer System

The Project has sufficient sewer capacity to meet the flow demands of the proposed use without causing surcharge in those sewer lines which serve the Project and consistent with the standards adopted by the Board of Public Works. More information regarding the sewer system can be found in Section 6.1b of this report. Memoranda from Nitsch Engineering and WSP are included. Also see Civil, Plumbing, and Landscape plans included in Section 7.0 of this submission.

c. Storm Drainage

The Project has sufficient storm drainage capacity to meet the flow demands of the proposed development site without causing surcharge in those storm drainage lines which serve the Project and consistent with the standards adopted by the Board of Public Works. More detailed information regarding Storm Drainage can be found in Section 6.1b of this submission and in the Stormwater Management Report prepared by Nitsch Engineering included in Appendix I.

d. Electrical System

The Project will have sufficient electrical capacity to meet the peak service demands of the proposed use with causing the service in adjacent areas to fall below the standards adopted by the Municipal Light Board. More information on the Electrical System impacts can be found in Section 6.1d of this submission and in the plans listed below which are included in Section 7.0. An emergency generator will also be provided with this Project.

Drawing Name and number		Prepared by	Date
C0.0	CIVIL NOTES AND LEGENDS	Nitsch Engineering	10/13/16
C2.0	SITE UTILITY DEMOLITION PLAN	Nitsch Engineering	10/13/16
C3.0	SITE UTILITY PLAN	Nitsch Engineering	10/13/16
C4.0	SITE UTILITY DETAILS SHEET I	Nitsch Engineering	10/13/16
C4.1	SITE UTILITY DETAILS SHEET II	Nitsch Engineering	10/13/16
E1.0	ELECTRICAL SITE PLAN	WSP	10/13/16
E5.0	ELECTRICAL RISER DIAGRAM	WSP	10/13/16

Traffic

The Project will not create an increase in traffic trips to and from the campus during peak hours. Please refer to Section 6.2 and the Traffic Impact Assessment Study in Appendix II for more information.

Pedestrian and Bicycle Safety

Babson does not anticipate any increase in pedestrian or bicycle traffic on or off campus as a result of this Project. New sidewalks surrounding the Project on the campus will be provided. A safe pedestrian route with crosswalks and sidewalks is already in place from the campus to MBTA and MWRTA public transportation at Wellesley Hills. More information on Pedestrian and Bicycle Safety is provided in Section 6.3 of this submission.

Fire Protection and Life Safety

The College will work with the Fire Department to ensure that there is sufficient municipal fire alarm capacity as required to meet the operating requirements of the proposed use under applicable codes, regulations, and statutes, as enforced by the Fire Chief. We will continue to work closely with the Fire Prevention Division to ensure that the Project complies with fire flow requirements, location of and access to fire hydrants, and access for emergency vehicles. For more information, please see Section 6.4 and the Fire Protection and Occupancy Plans including in Section 7.0.

Refuse Disposal System

Please refer to Section 6.5 of this submission for information regarding waste and recycling during construction and post-construction.

ADDITIONAL INFORMATION

Building use

This section includes detailed information regarding the existing use of the existing Staake Gymnasium and PepsiCo Pavilion to provide insight about the range of different campus and community activities throughout the academic year. We expect that some of these activities will migrate from these existing spaces into the new recreation space within the expansion part of the Project, allowing for more consistent use of the existing court areas by all of our varsity teams. Some activities will remain in their current locations due to the fact that there is no seating or bleacher capacity for spectators in the new space.

The attached tables outline the types of activities that have occurred in the Webster Center during the 2015-2016 academic year (Table 4.1) and the types of activities which are anticipated to occur in the new recreation center portion of the building's expansion (Table 4.2). The central purpose of the new space will be to allow for an enhancement to the recreational opportunities for current students in state-of-the-art facilities. The three-court recreation area does not contain any seating for spectating and the floor will have striped markings for basketball, volleyball, tennis, and badminton.

During those limited times that the new space will not be used for athletic activities, it will allow for many events which currently occur in the Staake Gymnasium, PepsiCo Pavilion, or other locations on campus to move to a location with air-conditioning, better acoustic properties, and natural daylight. A limited number of new activities that might take place in the new recreation center are identified, including gathering the incoming Freshman class and their parents under one roof for welcoming programs, a Freshman Convocation, the College's Against Cancer Relay for Life, and student-organized academic conferences. (Table 4.2)

To the extent that the athletic and on-campus student life uses allow, the College will continue its tradition of opening its doors to community organizations, camps, and clinics, such as the summer camps, CAP Barton Road Program, and Wellesley Police 5K.

Construction Traffic Management

The College will produce and distribute a Construction Mitigation Plan before the Project commences. All construction traffic, except in emergency situations, will be routed from Route 9 to Cedar Street, Hunnewell Street and Wellesley Avenue to the main entrance off Forest Street. Traffic will then be routed on campus via College Drive to the site.

Construction traffic will vary based on the status of the Project at any given point. The peak staffing will likely be around 125 people and parking for these workers will be on campus. Truck traffic will also vary based on the phase of the Project. During the fall and winter of 2017, we anticipate that site-work, foundation work, and steel erection will be underway. We would expect maximum truck traffic during this phase.

On-campus parking should not be impacted since the College has sufficient parking spaces for the construction workers and all other campus needs. No off-campus parking will be permitted.

Workers vehicles will park in the Trim parking lot on campus. Our Construction Mitigation Plan will spell out construction hours and days, traffic access, staging locations, site maintenance requirements

including truck tire washing and spill prevention techniques, contact names and numbers and other pertinent information.

Community Outreach

In anticipation of this submission, representatives from the College have reached out to several Town departments to provide an overview of the Project and discuss specific Town requirements. In addition, the College is committed to strengthening the relationship with its neighbors and will be welcoming them to campus on the evening of October 26th to share the project plans in detail and discuss their questions and any concerns.

Please contact David Grissino, Director of Capital Projects, at DGrissino@Babson.edu with any additional questions.

Table 4.1: 2015-2016 Activity in the Webster Center

Webster Center

2015-16 Activity Report

USE LEGEND

Varisty Athletics

Intramurals

Academic/Student Org/Alumni/Conferences

Community Organizations/Clinics

Event	Location	Date	Time	Attendance
Varsity Volleyball Games	Staake Gymnasium	Game 1	1pm / 7pm	100
		Game 2	1pm / 7pm	100
		Game 3	1pm / 7pm	100
		Game 4	1pm / 7pm	100
		Game 5	1pm / 7pm	100
		Game 6	1pm / 7pm	100
		Game 7	1pm / 7pm	100
		Game 8	1pm / 7pm	100
		Game 9	1pm / 7pm	100
		Game 10	1pm / 7pm	100
		Game 11	1pm / 7pm	100
Varsity Men's	Staake Gymnasium	Game 1	1pm / 7pm	400
Basketball Games		Game 2	1pm / 7pm	400
		Game 3	1pm / 7pm	400
		Game 4	1pm / 7pm	400
		Game 5	1pm / 7pm	400
		Game 6	1pm / 7pm	400
		Game 7	1pm / 7pm	400
		Game 8	1pm / 7pm	400
		Game 9	1pm / 7pm	400
		Game 10	1pm / 7pm	400
		Game 11	1pm / 7pm	400
		Game 12	1pm / 7pm	400
		Game 13	1pm / 7pm	400
		Game 14	1pm / 7pm	400
		Game 15	1pm / 7pm	400
		Game 16	1pm / 7pm	400
Varsity Women's	Staake Gymnasium	Game 1	1pm / 7pm	250
Basketball Games		Game 2	1pm / 7pm	250
		Game 3	1pm / 7pm	250
		Game 4	1pm / 7pm	250
		Game 5	1pm / 7pm	250
		Game 6	1pm / 7pm	250
		Game 7	1pm / 7pm	250
		Game 8	1pm / 7pm	250

		Game 9	1pm / 7pm	250
		Game 10	1pm / 7pm	250
		Game 11	1pm / 7pm	250
		Game 12	1pm / 7pm	250
Event	**Location**	**Date**	**Time**	**Attendance**
Intramural 3v3	Staake Gymnasium	Date 1	9pm / 10pm	50
Basketball Games		Date 2	9pm / 10pm	50
		Date 3	9pm / 10pm	50
		Date 4	9pm / 10pm	50
		Date 5	9pm / 10pm	50
		Date 6	9pm / 10pm	50
		Date 7	9pm / 10pm	50
Intramural 5v5	Staake Gymnasium	Date 1	830pm / 930pm	60
Basketball Games		Date 2	830pm / 930pm	60
		Date 3	830pm / 930pm	60
		Date 4	830pm / 930pm	60
		Date 5	830pm / 930pm	60
		Date 6	830pm / 930pm	60
		Date 7	830pm / 930pm	60
		Date 8	830pm / 930pm	60
		Date 9	830pm / 930pm	60
		Date 10	830pm / 930pm	60
Intramural Co-Ed	PepsiCo Pavilion	Date 1	8pm / 9pm / 10pm	120
Dodgeball Games		Date 2	8pm / 9pm / 10pm	120
		Date 3	8pm / 9pm / 10pm	120
		Date 4	8pm / 9pm / 10pm	120
		Date 5	8pm / 9pm / 10pm	120
Intramural Indoor	PepsiCo Pavilion	Date 1	8pm / 9pm	80
Soccer Games		Date 2	8pm / 9pm	80
		Date 3	8pm / 9pm	80
		Date 4	8pm / 9pm	80
		Date 5	8pm / 9pm	80
		Date 6	8pm / 9pm	80
		Date 7	8pm / 9pm	80
		Date 8	8pm / 9pm	80
		Date 9	8pm / 9pm	80

		Date 10	8pm / 9pm	80
Intramural Co-Ed	Staake Gymnasium	Date 1	830pm / 930pm	80
Volleyball Games		Date 2	830pm / 930pm	80
		Date 3	830pm / 930pm	80
		Date 4	830pm / 930pm	80
		Date 5	830pm / 930pm	80
Event	**Location**	**Date**	**Time**	**Attendance**
Faculty Treat	PepsiCo Pavilion	27-Aug	10am-12pm	100
Undergraduate Orientation	PepsiCo & Staake	August 28-31	7am-10pm	1600 (400 per day x 4 days)
Faculty & Family BBQ	PepsiCo Pavilion	2-Sep	1pm-9pm	150
Sophomore Carnival	PepsiCo Pavilion	4-Sep	10am-2pm	400
MBA Creating Rehearsal	PepsiCo Pavilion	10-Sep	130pm-430pm	200
Scholars Retreat	PepsiCo Pavilion	11-Sep	10am-3pm	150
Investment Banking Conference	PepsiCo Pavilion	18-Sep	7am-3pm	300
AAU Basketball Tournament	PepsiCo & Staake	20-Sep	8am-5pm	400
Career Expo	PepsiCo Pavilion	24-Sep	7am-7pm	600
Homecoming Field Day	PepsiCo Pavilion	25-Sep	1230pm-330pm	100
AAU Basketball Tournament	PepsiCo & Staake	October 2-4	8am-10pm	1500 (500 per day x 3 days)
AKPSi Social	PepsiCo Pavilion	16-Oct	130pm-530pm	75
Wellness Expo	PepsiCo Pavilion	20-Oct	8am-3pm	300
Food Day	PepsiCo Pavilion	21-Oct	9am-3pm	400
SME Exam	PepsiCo Pavilion	23-Oct	9am-11am	300
Women's Lacrosse Clinic	PepsiCo Pavilion	25-Oct	230pm-7pm	50
Big Brother Big Sister	PepsiCo Pavilion	27-Oct	1pm-4pm	50
Japan International Circle	PepsiCo Pavilion	30-Oct	6pm-11pm	100
CAB Party	PepsiCo Pavilion	31-Oct	6pm-5am	800
Cradles 2 Crayons	PepsiCo Pavilion	7-Nov	730am-6pm	200
Noone Baseball Clinics	PepsiCo Pavilion	November 15,22,29,12/6	9am-12pm	100 (25 per day x 4 days)
Entrepreneurship Conference	PepsiCo Pavilion	13-Nov	11am-3pm	100
CAB Party	PepsiCo Pavilion	14-Nov	11am-11pm	200
AAU Basketball Tournament	PepsiCo & Staake	November 27-28	8am-10pm	800 (400 per day x 2 days)
CAP Barton Road Program	PepsiCo Pavilion	2-Dec	330pm-530pm	50
IFC Basketball Tournament	Staake Gymnasium	6-Dec	4pm-6pm	50
AAU Basketball Tournament	Staake Gymnasium	December 11-13	8am-10pm	900 (300 per day x 3 days)
Final Exams	PepsiCo Pavilion	December 14-18	8am-6pm	4500 (900 per day x 5 days)
Babson Indonesian Association	PepsiCo & Staake	January 30-31	430pm-830pm	150 (75 per day x 2 days)
USA Volleyball Games	Staake Gymnasium	31-Jan	7am-4pm	100

Noone Baseball Clinics	PepsiCo Pavilion	January 31, 2/7,14,21,28	9am-12pm	100 (25 per day x 4 days)
Special Olympics	Staake Gymnasium	14-Feb	7am-2pm	150
Prime Time Lacrosse	PepsiCo Pavilion	February 16-20	9am-12pm	250 (50 per day x 5 days)
FME Business Fair	PepsiCo Pavilion	24-Feb	8am-730pm	300
IT Midterm	PepsiCo Pavilion	4-Mar	7am-11am	300
NFTE Conference	PepsiCo Pavilion	16-Mar	7am-3pm	100
AAU Basketball Tournament	Staake Gymnasium	18-Mar	9am-10pm	300
AAU Basketball Tournament	PepsiCo & Staake	March 25-26	9am-10pm	800 (400 per day x 2 days)
FME One 4 Health	PepsiCo Pavilion	3-Apr	7am-3pm	150
CAB Spring Concert	PepsiCo Pavilion	9-Apr	7am-1am	2000
FME Organization Fair	PepsiCo Pavilion	15-Apr	8am-5pm	300
IFC Basketball Tournament	Staake Gymnasium	16-Apr	11am-2pm	50
Men’s Basketball Clinics	PepsiCo & Staake	April 16+23+30	630pm-930pm	150 (50 per day x 3 days)
BAA Boston Marathon	PepsiCo Pavilion	18-Apr	4am-8am	300
Prime Time Lacrosse	PepsiCo Pavilion	April 19-22	9am-12pm	200 (50 per day x 4 days)
HR Kids-On-Campus	PepsiCo Pavilion	21-Apr	1030am-2pm	50
USA Volleyball Games	PepsiCo & Staake	24-Apr	7am-4pm	100
Wellesley Police 5K	PepsiCo Pavilion	1-May	7am-4pm	300
Final Exams	PepsiCo Pavilion	May 2-6	8am-6pm	4500 (900 per day x 5 days)
Commencements	Staake Gymnasium	14-May	8am-6pm	1000
MBA One-Year Adventure	PepsiCo	26-May	1pm-4pm	50

Table 4.2: Proposed Activity in the new Recreation Center

Webster Center

Proposed Use for New Three Court Recreation Center

USE LEGEND

Varisty Athletics
Intramurals
Academic/Student Org/Alumni/Conferences
Community Organizations/Clinics

Existing Events relocated from other places on campus

Event	Current Location	Date	Time	Attendance
Intramural 3v3	Staake Gymnasium	Date 1	9pm / 10pm	50
Basketball Games		Date 2	9pm / 10pm	50
		Date 3	9pm / 10pm	50
		Date 4	9pm / 10pm	50
Intramural 5v5	Staake Gymnasium	Date 1	830pm / 930pm	60
Basketball Games		Date 2	830pm / 930pm	60
		Date 3	830pm / 930pm	60
		Date 4	830pm / 930pm	60
		Date 5	830pm / 930pm	60
Intramural Co-Ed	PepsiCo Pavilion	Date 1	8pm / 9pm / 10pm	120
Dodgeball Games		Date 2	8pm / 9pm / 10pm	120
		Date 3	8pm / 9pm / 10pm	120
Intramural Indoor	PepsiCo Pavilion	Date 1	8pm / 9pm	80
Soccer Games		Date 2	8pm / 9pm	80
		Date 3	8pm / 9pm	80
		Date 4	8pm / 9pm	80
		Date 5	8pm / 9pm	80
Intramural Co-Ed	Staake Gymnasium	Date 1	830pm / 930pm	80
Volleyball Games		Date 2	830pm / 930pm	80
		Date 3	830pm / 930pm	80

Event	Current Location	Date	Time	Attendance
Undergraduate Orientation	PepsiCo & Staake	TBD	7am-10pm	1600 (400 per day x 4 days)
Sophomore Carnival	PepsiCo Pavilion	TBD	10am-2pm	400
MBA Creating Rehearsal	PepsiCo Pavilion	TBD	130pm-430pm	200
Investment Banking Conference	PepsiCo Pavilion	TBD	7am-3pm	300
AAU Basketball Tournament	PepsiCo & Staake	TBD	8am-5pm	400
Career Expo	PepsiCo Pavilion	TBD	7am-7pm	600
Wellness Expo	PepsiCo Pavilion	TBD	8am-3pm	300
Food Day	PepsiCo Pavilion	TBD	9am-3pm	400
SME Exam	PepsiCo Pavilion	TBD	9am-11am	300
CAB Party	PepsiCo Pavilion	TBD	6pm-5am	800
Final Exams - Fall	PepsiCo Pavilion	TBD	8am-6pm	4500 (900 per day x 5 days)
Special Olympics	Staake Gymnasium	TBD	7am-2pm	150
FME Business Fair	PepsiCo Pavilion	TBD	8am-730pm	300
IT Midterm	PepsiCo Pavilion	TBD	7am-11am	300
CAB Spring Concert	PepsiCo Pavilion	TBD	7am-1am	2000
FME Organization Fair	PepsiCo Pavilion	TBD	8am-5pm	300
BAA Boston Marathon	PepsiCo Pavilion	TBD	4am-8am	300
Wellesley Police 5K	PepsiCo Pavilion	TBD	7am-4pm	300
Final Exams - Spring	PepsiCo Pavilion	TBD	8am-6pm	4500 (900 per day x 5 days)
Commencements	Staake Gymnasium	TBD	8am-6pm	1000
Student Organization Fair	Outdoors	TBD	8am-4pm	750
Best of Babson Awards	Sorenson	TBD	6pm-9pm	500
Babson Investment Assoc.	Various	TBD	TBD	500
Homecoming Comedian	Sorenson	TBD	TBD	500
Scholarship luncheon	Knight Auditorium	TBD	TBD	400
Academy of Distinguished Entrepreneurs	Knight Auditorium	TBD	TBD	400
Dance-a-thon	Reynolds	TBD	TBD	250

New Events

Event	Current Location	Date	Time	Attendance
Orientation (once/yr)	n/a	Once/year	TBD	2350
Convocation	n/a	Twice/year	TBD	2350
New Student Conferences	n/a	Two/year	TBD	300
Colleges against Cancer Relay for Life	n/a	Once/year	24-hour event	1000

SECTION 5

ABUTTER LIST

APPLICATION FOR REVIEW OF A PROJECT OF SIGNIFICANT IMPACT

Webster Athletic Center Renovation and Expansion

5.1 TOWN OF WELLESLEY ABUTTER LIST

5.2 TOWN OF NEEDHAM ABUTTER LIST

SECTION 5.0 ABUTTER LIST

WEBSTER ATHLETIC CENTER

RENOVATION AND EXPANSION

PSI SUBMISSION

WELLESLEY ABUTTERS

In accordance with requirements of the Town of Wellesley Planning Board public hearing notices, a signed list of abutters within 300' of the subject property is included herein.

See Attachment 5.1: Town of Wellesley Abutters List, 300 feet, dated 9/8/16, certified by Chief Assessor.

NEEDHAM ABUTTORS

The Webster Athletic Center is more than 300' from the Needham-Wellesley border on the campus so notices are not required. However, as a courtesy, included is a certified list of Needham abutters using Babson College's 3 Burrill Lane as the center with added abutters adjacent to the southern end of the campus.

See Attachment 5.2: Town of Needham Abutters List, dated 9/27/16, certified by Needham Board of Assessors.

Attachment 5.1: Town of Wellesley Abutters List

Town of Wellesley Abutters List

User Defined Distance

Date: **09/08/2016**
Address: **231 Forest St.**
Parcel ID: **67-22**
Distance: **300 feet**

Property Location	Owner of Record	Mailing Address
300 Wellesley Ave. 32-2-A	Wellesley Country Club	300 Wellesley Avenue Wellesley, MA 02481
228 Forest St. 40-1	Wellesley Country Club	300 Wellesley Avenue Wellesley, MA 02481
Wellesley Ave. 40-2	Commonwealth of Massachusetts DCR/MWRA	251 Causeway St. Boston, MA 02114
Forest St. 40-3	Commonwealth of Massachusetts DCR/MWRA	251 Causeway St. Boston, MA 02114
Forest St. 48-5	Town of Wellesley Natural Resources Department	525 Washington St. Wellesley, MA 02482
231 T Forest St. 48-7-T	Babson College Janet Fishstein	231 Forest Street Babson Park, MA 02457
152 Great Plain Ave. 49-1	Babson College Janet Fishstein	231 Forest Street Babson Park, MA 02457
17 Clark Rd 56-10	Wolpow, Robin Salter	17 Clark Road Wellesley, MA 02481
14 Ordway Rd 57-1	Tracy, Donald A & Kathan G	14 Ordway Road Wellesley, MA 02481
7 Hewins Farm Rd 57-10	Steiner, Mark E & McCann, Mary Ellen, Trustees	7 Hewins Farm Road Wellesley, MA 02481
5 Hewins Farm Rd 57-11	Barnes, Aaron & Lauren	5 Hewins Farm Road Wellesley, MA 02481
3 Hewins Farm Rd 57-12	Laxminarain, Prattipati & Narain, Charu	3 Hewins Farm Road Wellesley, MA 02481

Lorna Lee McCabe 9/8/2016
Chief Assessor
owners current thru July 31, 2016

Town of Wellesley
Abutters List

User Defined Distance

Date: **09/08/2016**
Address: **231 Forest St.**
Parcel ID: **67-22**
Distance: **300 feet**

Property Location	Owner of Record	Mailing Address
1 Hewins Farm Rd 57-13	Frechette, Eleanor F, Trustee Eleanor F Frechette Trust	1 Hewins Farm Road Wellesley, MA 02481
280 Wellesley Ave. 57-14	Collomb, James E & Petra Z	280 Wellesley Avenue Wellesley, MA 02481
173 Forest St. 57-15	Costa, Robert A & Anna Maria	173 Forest Street Wellesley, MA 02481
169 Forest St. 57-16	Aldrich, Hope	169 Forest Street Wellesley, MA 02481
Ordway Rd 57-17	Town of Wellesley	525 Washington St. Wellesley, MA 02482
18 Ordway Rd 57-2	Crowley, John D & Farrell G	18 Ordway Road Wellesley, MA 02481
22 Ordway Rd 57-3	George, Paul E & Helen D	22 Ordway Road Wellesley, MA 02481
260 Wellesley Ave. 57-4	Bornstein, Mitchell R & Piotroski, Susan A	260 Wellesley Avenue Wellesley, MA 02481
264 Wellesley Ave. 57-5	Rice, Kenneth L, Jr & Rice, Margaret J McDonough	264 Wellesley Avenue Wellesley, MA 02481
268 Wellesley Ave. 57-6	Curtin, Hugh D & Carole L	268 Wellesley Avenue Wellesley, MA 02481
2 Hewins Farm Rd 57-7	Ryan, Robert J & Mary Lou	2 Hewins Farm Road Wellesley, MA 02481
4 Hewins Farm Rd 57-8	Mallette, Francois	4 Hewins Farm Road Wellesley, MA 02481

Town of Wellesley
Abutters List

User Defined Distance

Date: **09/08/2016**
Address: **231 Forest St.**
Parcel ID: **67-22**
Distance: **300 feet**

Property Location	Owner of Record	Mailing Address
6 Hewins Farm Rd 57-9	Connolly, William T & Barbara E	6 Hewins Farm Road Wellesley, MA 02481
150 Great Plain Ave. 58-1	Babson College Janet Fishstein	231 Forest Street Babson Park, MA 02457
9 Ordway Rd 66-1	Walsh, David P & Nina	9 Ordway Road Wellesley, MA 02481
175 Wellesley Ave. 67-1	Babson College Janet Fishstein	231 Forest Street Babson Park, MA 02457
11 Alden Rd 67-10	Apostolica, William P, Trustee 11 Alden Realty Trust &	11 Alden Road Wellesley, MA 02481
9 Alden Rd 67-11	Keator, Matthew M & Virginia S	9 Alden Road Wellesley, MA 02481
5 Alden Rd 67-12	Refojo, Michael F & Christy A	5 Alden Road Wellesley, MA 02482
18 Sumner Rd 67-13	Moody, Curt & Rosemarie D	18 Sumner Road Wellesley, MA 02481
20 Sumner Rd 67-14	Harding, John C & Lynne D	20 Sumner Street Wellesley, MA 02481
24 Sumner Rd 67-15	Hansen, Steven W & Janeen	24 Sumner Road Wellesley, MA 02481
12 Alden Rd 67-16	Woodworth, Anthony J & Woodworth, Virginia W, Trustees	12 Alden Road Wellesley, MA 02481
16 Alden Rd 67-17	Hull, Robert S & Hull, Stephanie A, Trustees	16 Alden Road Wellesley, MA 02481

Town of Wellesley
Abutters List

User Defined Distance

Date: **09/08/2016**
Address: **231 Forest St.**
Parcel ID: **67-22**
Distance: **300 feet**

Property Location	Owner of Record	Mailing Address
20 Alden Rd 67-18	Hill, Mark R & Susan C	20 Alden Road Wellesley, MA 02481
24 Alden Rd 67-19	Griffin, Stephen H & Julie L	24 Alden Road Wellesley, MA 02481
57 Whiting Rd 67-2	Levin, Martin H & Terri	57 Whiting Road Wellesley, MA 02481
21 Ordway Rd 67-20	Finkelstein, Amy P, Trustee Amy P Finkelstein Rev Trust	21 Ordway Road Wellesley, MA 02481
15 Ordway Rd 67-21	McNamara, Michael J & Sarah B	15 Ordway Road Wellesley, MA 02481
9 R Alden Rd 67-23	Nicolai, Guyton, nf	Wellesley, MA 02482
56 Whiting Rd 67-3	Babson College Janet Fishstein	231 Forest Street Babson Park, MA 02457
180 Wellesley Ave. 67-5	Muderrisoglu, Aydin & Nese Koc Holding	180 Wellesley Avenue Wellesley, MA 02481
184 Wellesley Ave. 67-6	Germain, Joseph A	184 Wellesley Avenue Wellesley, MA 02481
188 Wellesley Ave. 67-7	Preston, Roger M & Sara	188 Wellesley Avenue Wellesley, MA 02481
21 Alden Rd 67-8	Sullivan, John D & Lisa	21 Alden Road Wellesley, MA 02481
15 Alden Rd 67-9	McCauley, Edward F & Mary E	15 Alden Road Wellesley, MA 02481

Town of Wellesley
Abutters List

User Defined Distance

Date: **09/08/2016**
Address: **231 Forest St.**
Parcel ID: **67-22**
Distance: **300 feet**

Property Location	Owner of Record	Mailing Address
135 Great Plain Ave. 68-1	Wellesley Residential, LLC	20 Mall Road Suite 220 Burlington, MA 01803
76 Great Plain Ave. 68-10	Khudairi, Maha	3 Maple Road Wellesley, MA 02481
80 Great Plain Ave. 68-11	Lavrentios, Charles & Tatyana	80 Great Plain Avenue Wellesley, MA 02482
8 Skyline Dr. 68-18	Miller, Walter E, III & Houshyar, Hani	8 Skyline Dr. Wellesley, MA 02482
18 Skyline Dr. 68-19	Perry, Duncan G & Heidi C	18 Skyline Drive Wellesley, MA 02482
22 Skyline Dr. 68-20	Aldridge, Kathleen T	22 Skyline Drive Wellesley, MA 02482
26 Skyline Dr. 68-21	Skyline Drive, LLC c/o Dr. John & Susan Eichhorn	2004 Laurel Ridge Cove Austin, TX 78732
32 Skyline Dr. 68-22	Fern, Irwin A & Doris L	32 Skyline Drive Wellesley, MA 02482
36 Skyline Dr. 68-23	Silver, Jeffrey E & Stacy Dean	36 Skyline Drive Wellesley, MA 02482
40 Skyline Dr. 68-24	Kwa, Eng-Hwi & Sew-Leong, Trustees	40 Skyline Drive Wellesley, MA 02482
44 Skyline Dr. 68-25	Mayer, Christine R	44 Skyline Drive Wellesley, MA 02482
47 Skyline Dr. 68-26	DeCaicedo, Hilda M Northern Trust Bank	One Northern Trust Way BOX 157260575 Sioux Falls, SD 57186

Town of Wellesley
Abutters List

User Defined Distance

Date: **09/08/2016**
Address: **231 Forest St.**
Parcel ID: **67-22**
Distance: **300 feet**

Property Location	Owner of Record	Mailing Address
43 Skyline Dr. 68-27	Hohenberg, Rudolph & Hanna K	43 Skyline Drive Wellesley, MA 02482
39 Skyline Dr. 68-28	Sullivan, Marilyn E	39 Skyline Drive Wellesley, MA 02482
35 Skyline Dr. 68-29	Assaad, Rami & Rania	35 Skyline Drive Wellesley, MA 02482
31 Skyline Dr. 68-30	Lockhart, John & Cecile A	31 Skyline Drive Wellesley, MA 02482
27 Skyline Dr. 68-31	Pagonis, Gina	27 Skyline Drive Wellesley, MA 02482
21 Skyline Dr. 68-32	Ferzoco, Victor A & Wirth, Fern A, Trustees Skyline 21 Realty Trust	21 Skyline Drive Wellesley, MA 02482
17 Skyline Dr. 68-33	Shamberger, Kathleen E & Robert E	17 Skyline Drive Wellesley, MA 02482
11 Skyline Dr. 68-34	Cotell, Richard W & Cotell, Catherine M, Trustees	3069 Enterprise Road Lexington, NC 27295
118 Great Plain Ave. 68-35	Smith, Heather & Burns, Holly, Trustees	118 Great Plain Avenue Wellesley, MA 02482
122 Great Plain Ave. 68-36	Steensma, David & Roede, Carol A	122 Great Plain Avenue Wellesley, MA 02482
126 Great Plain Ave. 68-37	Ireland, Charles F & Penelope C	126 Great Plain Avenue Wellesley, MA 02482
128 Great Plain Ave. 68-38	Dinsmoor, Theodore E & Sheila E	128 Great Plain Avenue Wellesley, MA 02482

Town of Wellesley
Abutters List

User Defined Distance

Date: **09/08/2016**
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Parcel ID: **67-22**
Distance: **300 feet**

Property Location	Owner of Record	Mailing Address
130 Great Plain Ave. 68-39	Oldcorn, Anthony J & Francoise D	130 Great Plain Avenue Wellesley, MA 02482
124 Great Plain Ave. 68-39-A	Dove, Mabel Tax Title	525 Washington St. Wellesley, MA 02482
72 Great Plain Ave. 68-9	72 Great Plain Avenue, LLC	14 Irving Park Watertown, MA 02472
149 Great Plain Ave. 69-4	Bartini, Michael & Grace, Trstees Michael Bartini 2010 Rev Trust	149 Great Plain Avenue Wellesley, MA 02482
145 Great Plain Ave. 69-5	Ahern, Thomas P & Bernier, Nichole	145 Great Plain Avenue Wellesley, MA 02482
141 Great Plain Ave. 69-6	Hanron, Nanci Cadario & Kevin	141 Great Plain Avenue Wellesley, MA 02482
48 Park Ave. 76-66-A	Axelrod, Lloyd, Trustee Lloyd Axelrod Family Trust	48 Park Avenue Wellesley, MA 02481
43 Whiting Rd 76-67	Cushman, Merritt R	43 Whiting Rd Wellesley, MA 02481
21 Great Plain Ave. 77-1	Miller, Thomas R & Stacy B	21 Great Plain Avenue Wellesley, MA 02482
8 Vista Rd 77-10	Helmer, Jason & Erica	8 Vista Road Wellesley, MA 02481
10 Vista Rd 77-11	Thompson, John E, Jr & Jane M	10 Vista Rd Wellesley, MA 02481
11 Vista Rd 77-12	Braslins, Maura A	11 Vista Road Wellesley, MA 02481

Town of Wellesley
Abutters List

User Defined Distance

Date: **09/08/2016**
Address: **231 Forest St.**
Parcel ID: **67-22**
Distance: **300 feet**

Property Location	Owner of Record	Mailing Address
7 Vista Rd 77-13	Reiszner, Laszlo & Judy	7 Vista Road Wellesley, MA 02481
3 Vista Rd 77-14	Fagan, William J	3 Vista Road Wellesley, MA 02481
1 Vista Rd 77-15	Ford, Joanne N & Ford, Robert	1 Vista Road Wellesley, MA 02481
86 Seaver St. 77-18	Cheung, Maggie S & Peter	86 Seaver Street Wellesley, MA 02481
88 Seaver St. 77-19	Divecchia, David M & Bethany S	88 Seaver Street Wellesley, MA 02481
11 Great Plain Ave. 77-2	Fontana, Gregory L & Susan L	11 Great Plain Avenue Wellesley, MA 02481
90 Seaver St. 77-20	Monahan, Gretchen H	94 Central Street Wellesley, MA 02482
84 Hopkinson St. 77-26	Cao, Wei Wei & Zhang, Fan	84 Hopkinson Street Wellesley, MA 02481
55 Park Ave. 77-27	Latypov, Ramil & Latypova, Ekaterina	55 Park Avenue Wellesley, MA 02481
128 Wellesley Ave. 77-28	Negro -Wilkins, Mary	128 Wellesley Avenue Wellesley, MA 02481
134 Wellesley Ave. 77-29	Spear, Linda B	134 Wellesley Avenue Wellesley, MA 02481
5 Great Plain Ave. 77-3	Nugent, Jane E	5 Great Plain Avenue Wellesley, MA 02482

Town of Wellesley
Abutters List

User Defined Distance

Date: **09/08/2016**
Address: **231 Forest St.**
Parcel ID: **67-22**
Distance: **300 feet**

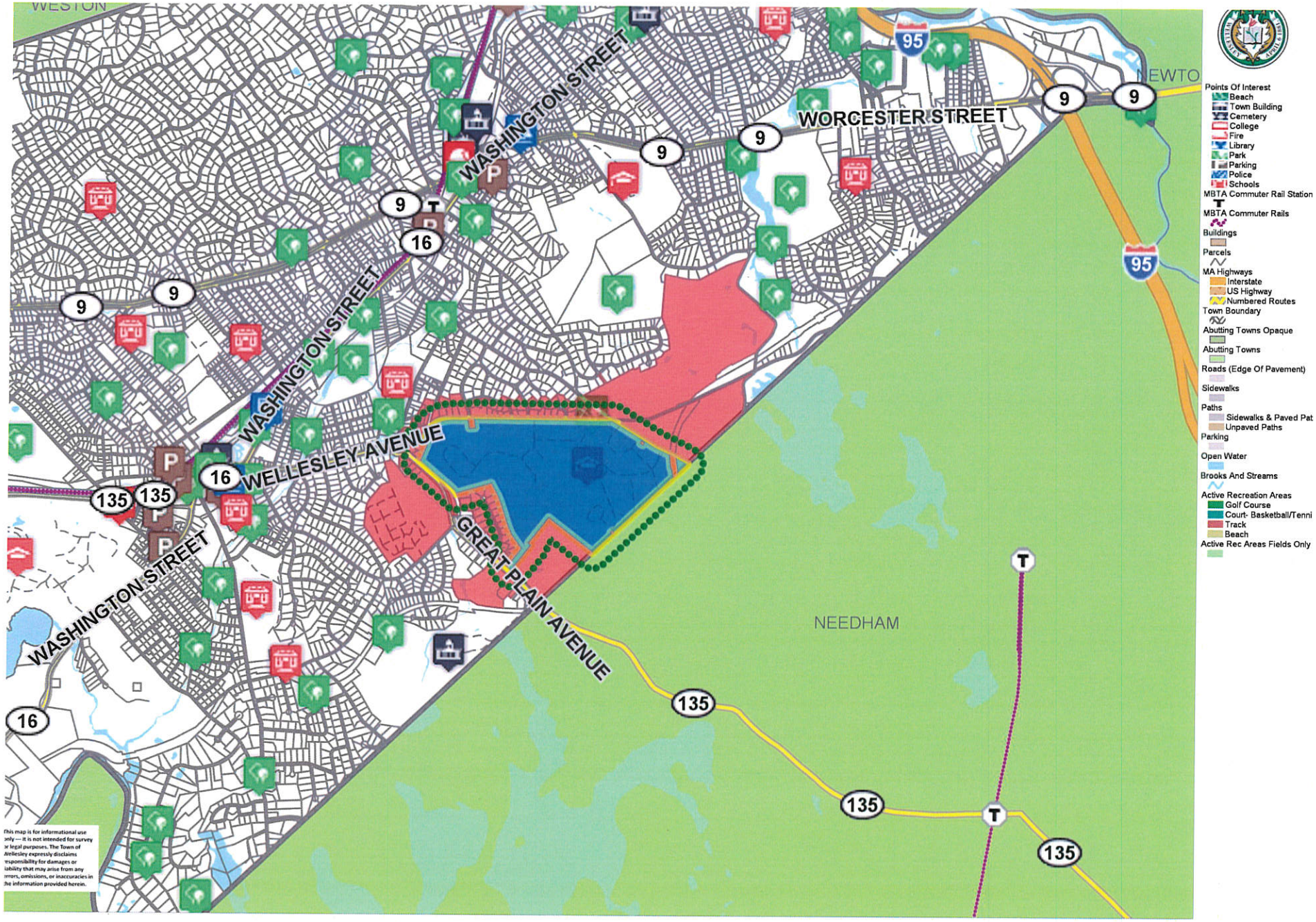
Property Location	Owner of Record	Mailing Address
140 Wellesley Ave. 77-30	Ainge, Daniel R & Michelle	140 Wellesley Avenue Wellesley, MA 02481
146 Wellesley Ave. 77-31	Levin, Martin	57 Whiting Road Wellesley, MA 02481
8 Great Plain Ave. 77-33	Kelley, Geoffrey G & Lamees A	8 Great Plain Avenue Wellesley, MA 02482
10 Great Plain Ave. 77-34	Zahka, Stephen A, Trustee Ten Great Plain Ave Nom Trust	38 Leo Way East Bridgewater, MA 02333
107 Wellesley Ave. 77-35	Valente, Andrea J	107 Wellesley Avenue Wellesley, MA 02481
52 Park Ave. 77-36	Frisoli, Leonard M Jr & Frisoli, Virginia M	52 Park Avenue Wellesley, MA 02481
15 Great Plain Ave. 77-37	Bello, Herbert L, Trustee 15 Great Plain Ave Nominee Trust	15 Great Plain Avenue Wellesley, MA 02482
Great Plain Ave. 77-39	Town of Wellesley	525 Washington St. Wellesley, MA 02482
Wellesley Ave. 77-40	Town of Wellesley	525 Washington St. Wellesley, MA 02482
88 Hopkinson St. 77-42	Popova, Maria	88 Hopkinson Street Wellesley, MA 02481
102 Wellesley Ave. 77-5	Wallis, Katie B & Nathaniel T	102 Wellesley Avenue Wellesley, MA 02481
106 Wellesley Ave. 77-6	Beyer, Eric & Julie	106 Wellesley Avenue Wellesley, MA 02481

Town of Wellesley
Abutters List

User Defined Distance

Date: **09/08/2016**
Address: **231 Forest St.**
Parcel ID: **67-22**
Distance: **300 feet**

Property Location	Owner of Record	Mailing Address
110 Wellesley Ave. 77-7	Ross, Robert C & Stracciolini, Andrea	110 Wellesley Avenue Wellesley, MA 02481
112 Wellesley Ave. 77-8	Flynn, Allison & Lawrence	112 Wellesley Avenue Wellesley, MA 02481
114 Wellesley Ave. 77-9	Smith, Catherine B & Gregory C	114 Wellesley Avenue Wellesley, MA 02481
148 Brook St. 78-16	Woodlawn Cemetery, Proprietors of	148 Brook Street Wellesley, MA 02482
Great Plain Ave. 78-26	Town of Wellesley	525 Washington St. Wellesley, MA 02482



3200 6400 ft

Printed on 09/08/2016 at 08:46 AM

Notified Abutters

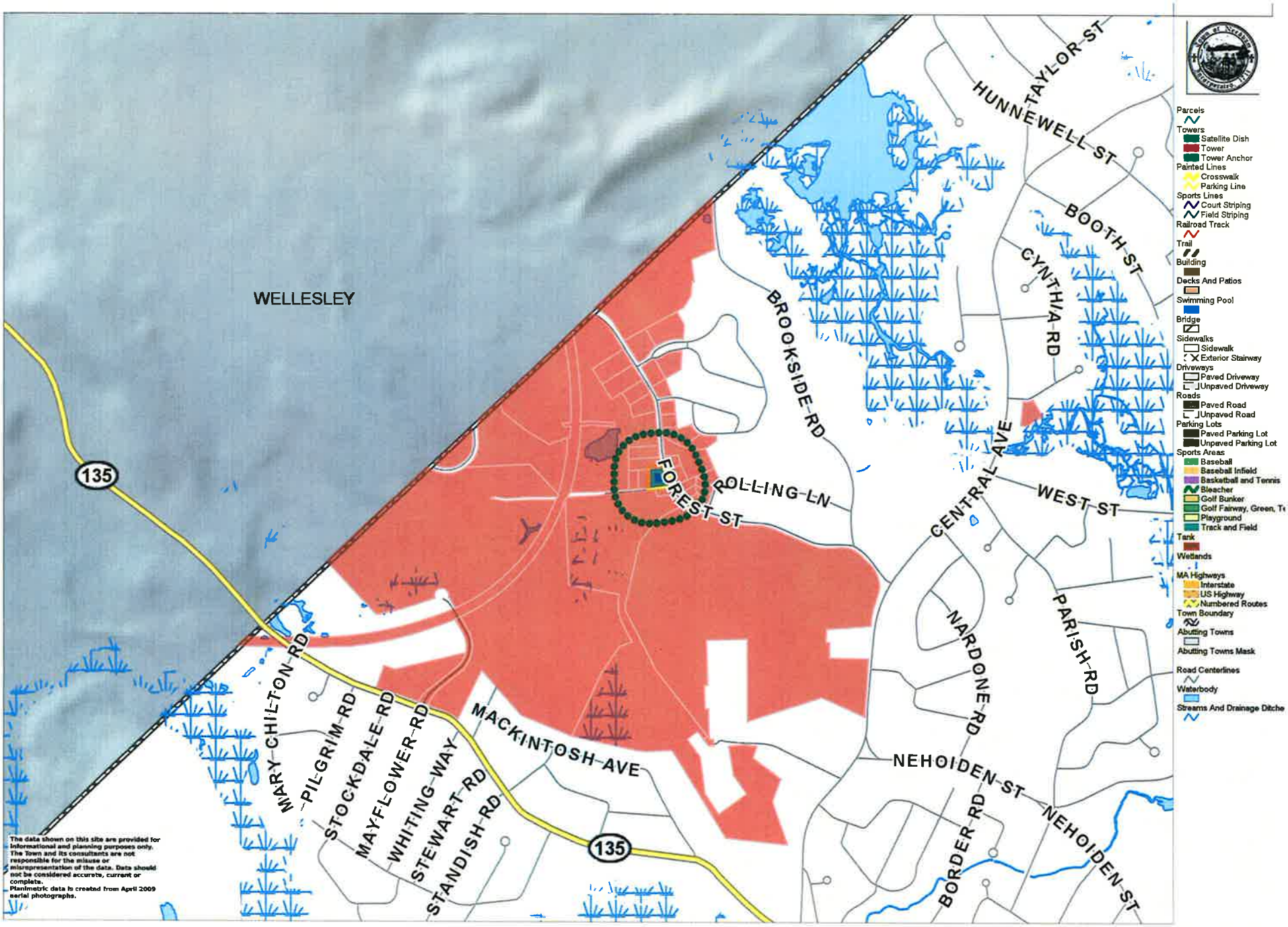
Attachment 5.2: Town of Needham Abutters List D BY HAND

PARCEL ID	St No.	Street	Owner Names	Owner Address	Mailing Address OWNER CITY	State	OWNER ZIP
199/081.0-0033-0000.0	0	RESERVOIR ST	MDC/WATER DIVISION C/O MA DEPT. OF CONSERVATION	251 CAUSEWAY ST SUITE 600	BOSTON	MA	02114
199/103.0-0032-0000.0	11	GLOVER RD	SCHAUMAN, TODD L. & GAMRATH-SCHAUMAN ROBIN C.	11 GLOVER RD	NEEDHAM	MA	02492
199/111.0-0035-0000.0	89	ROLLING LN	FIERIMONTE,MARYANN & DEMPSEY,LINDA C/O PFAFFMANN, KENDRIK A.	89 ROLLING LN	NEEDHAM	MA	02492
199/111.0-0036-0000.0	95	ROLLING LN	TANNER, SCOTT D. + TANNER, ROBIN L.	95 ROLLING LN	NEEDHAM	MA	02492
199/111.0-0037-0000.0	101	ROLLING LN	LAZAR, KENNETH H.	101 ROLLING LN	NEEDHAM	MA	02492
199/111.0-0038-0000.0	158	FOREST ST	CHANG, CHIA-RAY & DEPAULIS, ANDREA	158 FOREST ST	NEEDHAM	MA	02492
199/111.0-0039-0000.0	146	FOREST ST	OBEID, CHARLES	146 FOREST ST	NEEDHAM	MA	02492
199/111.0-0040-0000.0	138	FOREST ST	OLEARY, WILLIAM M. + OLEARY, LISA D.	138 FOREST STREET	NEEDHAM	MA	02492
199/111.0-0041-0000.0	132	FOREST ST	WASHEK, JOHN T.	946 GREAT PLAIN AVE	NEEDHAM	MA	02492
199/111.0-0042-0000.0	116	FOREST ST	RAMEIOR, JUDITH L.	116 FOREST ST	NEEDHAM	MA	02492
199/112.0-0041-0000.0	84	GLENDALE RD	CANTWELL, SEAN P. & CANTWELL, BRANDI L.	84 GLENDALE ROAD	NEEDHAM	MA	02492
199/112.0-0042-0000.0	106	FOREST ST	RIEDL, BRADLEY R & RIEDL, COLLEEN E	106 FOREST ST	NEEDHAM	MA	02492
199/112.0-0043-0000.0	90	GLENDALE RD	LEIBERMAN, AARON R. & LEIBERMAN, KERRY A.	90 GLENDALE RD	NEEDHAM	MA	02492
199/112.0-0044-0000.0	100	FOREST ST	CAGLIUSO, BRETT A & MARY ELIZABETH C/O KAMBOURAKIS, JOSEPH & BAUER, DEBO	100 FOREST ST	NEEDHAM	MA	02492
199/112.0-0046-0000.0	90	FOREST ST	DEVEREUX, E RICKERT & DEVEREUX, DANA P	90 FOREST ST	NEEDHAM	MA	02492
199/112.0-0048-0000.0	5	GLENDALE RD	POWERS, DANIEL & POWERS, NOEL ERICKSON	5 GLENDALE RD	NEEDHAM	MA	02492

PARCEL_ID	St No.	Street	Owner Names	Owner Address	Mailing Address OWNER_CITY	State	OWNER_ZIP
199/113.0-0009-0000.0	21	CLARKE RD	BARRETT, GORDON C. & BARRETT, PATRICIA D.	21 CLARKE RD	NEEDHAM	MA	02492
199/113.0-0011-0000.0	6	GLENDALE RD	HOLLAND, BRIAN G. ,TR GLENDALE REALTY TRUST	6 GLENDALE RD	NEEDHAM	MA	02492
199/113.0-0012-0000.0	5	CLARKE RD	FISCHER, HEIDI	5 CLARKE RD	NEEDHAM	MA	02492
199/113.0-0013-0000.0	12	CLARKE RD	GRIMES, KEVIN T. & GRIMES, ELIZABETH J	12 CLARKE RD	NEEDHAM	MA	02492
199/113.0-0015-0000.0	28	CLARKE RD	BURNS, MARK F. & CHRISTINE M. TRS. 28 CLARKE ROAD REALTY TRUST	28 CLARKE RD	NEEDHAM	MA	02492
199/113.0-0029-0000.0	0	FOREST ST	WELLESLEY COUNTRY CLUB	WELLESLEY AVE	WELLESLEY HLS	MA	02481
199/114.0-0001-0000.0	0	FOREST ST	BABSON INSTITUITE	BABSON PARK	BABSON PARK	MA	02457
199/114.0-0002-0000.0	37	FOREST ST	BABSON COLLEGE FACILITIES MANAGEMENT & PLANNING	COLLEGE DRIVE	BABSON PARK	MA	02457-03
199/114.0-0003-0000.0	51	FOREST ST	MULROY, JAMES T. & MULROY, ALICE E.	51 FOREST ST	NEEDHAM	MA	02492
199/114.0-0004-0000.0	61	FOREST ST	CIRINO, MARIA A. & BARBEAU, ELIZABETH M.	61 FOREST ST	NEEDHAM	MA	02492
199/114.0-0005-0000.0	75	FOREST ST	HOLLORAN, ELAINE K	75 FOREST ST	NEEDHAM	MA	02492
199/114.0-0007-0000.0	101	FOREST ST	VIRGILIO, MARIO, TR. VIRGILIO REALTY TRUST	101 FOREST ST	NEEDHAM	MA	02492
199/114.0-0008-0000.0	109	FOREST ST	VIRGILIO, FEDERICO M. & VIRGILIO, ANDREINA	109 FOREST ST	NEEDHAM	MA	02492
199/114.0-0009-0000.0	117	FOREST ST	FARIA, ANNE MARIE	117 FOREST ST	NEEDHAM	MA	02492
199/114.0-0010-0000.0	3	BURRILL LN	BABSON COLLEGE	231 FOREST ST OLIN 316	BABSON PARK	MA	02457
199/114.0-0011-0000.0	0	BURRILL LN	BABSON COLLEGE	231 FOREST ST OLIN 316	BABSON PARK	MA	02457
199/114.0-0012-0000.0	25	BURRILL LN	BABSON COLLEGE	231 FOREST AVE	BABSON PARK	MA	02457
199/309.0-0011-0000.0	46	BURRILL LN	BABSON COLLEGE	231 FOREST ST	BABSON PARK	MA	02457

PARCEL ID	St No.	Street	Owner Names	Mailing Address Owner Address	OWNER CITY	State	OWNER ZIP
199/309.0-0012-0000.0	1735	GREAT PLAIN AVE	FRANKLIN W. OLIN COLLEGE OF ENGINEERIN	1735 GREAT PLAIN AVE	NEEDHAM	MA	02492
199/309.0-0013-0000.0	0	OLIN WAY	FRANKLIN W. OLIN COLLEGE OF ENGINEERIN	1735 GREAT PLAIN AVE	NEEDHAM	MA	02494
199/309.0-0014-0000.0	1763	GREAT PLAIN AVE	FRANKLIN W. OLIN COLLEGE OF ENGINEERING, INC.	1735 GREAT PLAIN AVE	NEEDHAM	MA	02492
199/309.0-0020-0000.0	1000	OLIN WAY	FRANKLIN W. OLIN COLLEGE OF ENGINEERING, INC	1735 GREAT PLAIN AVE	NEEDHAM	MA	02492
199/309.0-0021-0000.0	137	FOREST ST	BABSON COLLEGE FACILITIES MANAGEMENT & PLANNING	BABSON COLLEGE	BABSON PARK	MA	02457
199/309.0-0022-0000.0	0	MAP HILL RD	BABSON INSTITUTE	WELLESLEY AVE	WELLESLEY	MA	02481
199/309.0-0023-0000.0	0	FOREST ST	BABSON COLLEGE	WELLESLEY AVE	WELLESLEY	MA	02481
199/309.0-0025-0000.0	865	CENTRAL AVE	BABSON COLLEGE C/O LIVING CARE VILLAGES -MASS	865 CENTRAL AVENUE	NEEDHAM	MA	02492
199/309.0-0026-0000.0	0	MAP HILL RD	BABSON INSTITUTE	WELLESLEY AVE	NEEDHAM	MA	02481

Certified as list of parties in interest under Mass. General Laws and Needham Zoning By-LAw, to the Best of our knowledge
For the Needham Board of Assessors.....



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SECTION 6

MUNICIPAL SYSTEM IMPACT ANALYSIS

APPLICATION FOR REVIEW OF A PROJECT OF SIGNIFICANT IMPACT

Webster Athletic Center Renovation and Expansion

6.1) Utility Capacity

a) Water System Impact Analysis
b) Sewer System Impact Analysis
c) Storm Drainage Impact Analysis
d) Electrical System Impact Analysis

6.2) Traffic Impact Study

6.3) Pedestrian and Bicycle Safety

6.4) Building Occupant Life Safety

6.5) Refuse Disposal System

6.1.a

WATER SYSTEM IMPACT ANALYSIS

Prepared by:

Nitsch Engineering Inc.	2016/10/13
WSP	2016/10/13

Nitsch Engineering

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www.nitscheng.com

MEMORANDUM

TO: Town of Wellesley Planning Board

FROM: Joshua Alston, PE, Senior Project Manager
Nitsch Engineering

DATE: October 13, 2016

RE: Webster Athletic Center Renovation and Expansion
Water System Impact Analysis

Nitsch Project #10070

This memorandum summarizes the analysis of the impacts on the municipal water system associated with the Webster Athletic Center Renovation and Expansion (the Project).

Existing Water System

The existing Webster Athletic Center is serviced by an existing domestic water service and fire protection service which connect to the campus water main located in Babson College Drive. The Project site is serviced by multiple fire hydrants that also connect to the campus water main located in Babson College Drive.

The campus water mains supply both domestic water and fire protection water, including the campus fire hydrants. The pressure in the campus water main is supplemented by booster pumps located in Park Manor Central, which connect to the campus water main in Park Manor Drive. The Babson College GIS mapping indicates that the campus water main in Babson College Drive and Park Manor Drive consists of 12-inch water pipe. The campus water main in Babson College Drive splits into two separate water mains at the intersection with Lunder Way. The Webster Athletic Center water services and fire hydrants connect to the most northerly water main in Babson College Drive.

Water System Impacts

The Project will maintain the existing domestic and fire protection water service connections, which will service both the renovated building and addition. Two fire hydrants will be relocated to accommodate the construction of the addition and the installation of new storm drainage piping and hydrant water service piping for the Project.

The Project will have no impact on the Town of Wellesley municipal water system. As noted in the Development Description, the Project will not increase the student, faculty or staff population, nor will the Project result in an in increase academic programs within the campus that would lead to increased daily water demands.

COMMONWEALTH OF MASSACHUSETTS
DAVID M. CONWAY
CIVIL
No. 40068
REGISTERED PROFESSIONAL ENGINEER

10/6/16

Q:\10070 Babson Webster Ctr\Civil\Project Data\Permitting\10070-MEMO-Sewer System Impacts.docx

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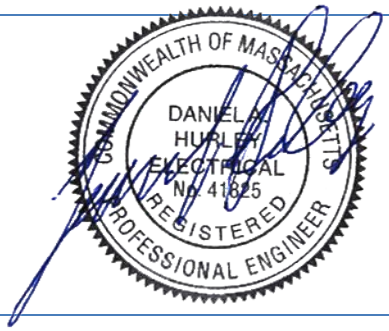
MEMORANDUM

To: Timothy Mansfield – C7A
From: Jimmie Ng
Date: October 13, 2016
Project Name: Webster Athletic Center Renovation and Expansion
Project Number: B1605030.000
Subject: Water and Sanitary Generation Rates



Estimated Water Use:

	Existing Building	Existing and New Addition
Plumbing Fixture Units	530 FU	900 FU
Peak Water Use	145 gpm	200 gpm

	Existing Building	Existing and New Addition
No. of Occupants	2,100	5,342*
Daily Water Use per Occupant	28 gpd	28 gpd
Daily Water Use Total	58,800 gpd	149,576 gpd

Estimated Sanitary Use:

	Existing Building	Existing and New Addition
No. of Occupants	2,100	5,342*
Daily Water Use per Occupant	25 gpd	25 gpd
Daily Water Use Total	52,500 gpd	133,550 gpd

* The occupancy is based on code and building square footage, and does not refer to an increase in the student population on campus.

6.1.b

SEWER SYSTEM IMPACT ANALYSIS

Prepared by:

Nitsch Engineering Inc.	2016/10/13
WSP	2016/10/13

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F: 617-338-6472
www.nitscheng.com

MEMORANDUM

TO: Town of Wellesley Planning Board

FROM: Joshua Alston, PE, Senior Project Manager
Nitsch Engineering

DATE: October 13, 2016

RE: Webster Athletic Center Renovation and Expansion
Sewer System Impact Analysis

Nitsch Project #10070

This memorandum summarizes the analysis of the impacts on the municipal sanitary sewer system associated with the Webster Athletic Center Renovation and Expansion (the Project).

Existing Sewer System

The Babson College Campus is serviced by two separate municipal sanitary sewer systems. The Fuller Brook system is located in Wellesley Avenue and receives sewer flows from the westerly and southerly portions of the Babson College campus, including the existing Webster Athletic Center. The Brookside system is located in Forest Street and receives sewer flows from the easterly portion of the campus.

The existing Webster Athletic Center building sanitary sewer services (4 separate services) are collected by a sewer collection system that runs along the easterly and northerly face of the building. This sewer collection system runs to the north, passing along the easterly side of Knight Auditorium and connects to the to the Fuller Brook municipal sanitary sewer system in Wellesley Avenue at a sewer manhole located between Hewins Farm Road and Sawyer Park Road.

Sewer System Impacts

The Project will maintain the existing building sanitary sewer services, which will continue to service the renovated building. The Project will include two new sanitary sewer services for the addition, which will connect into the sewer collection system at an existing sewer manhole located directly to the north of the existing Webster Athletic Center building.

The Project will have no impact on the Town of Wellesley municipal sanitary sewer system. As noted in the Development Description, the Project will not increase the student, faculty or staff population, nor will the Project result in an increase in academic programs within the campus that would lead to increased daily sewer flows.

COMMONWEALTH OF MASSACHUSETTS
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10/13/16

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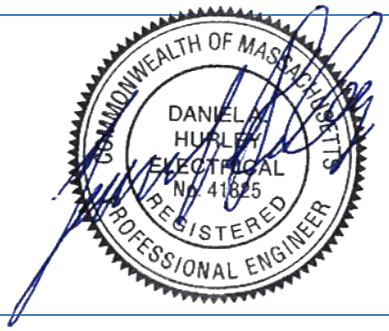
MEMORANDUM

To: Timothy Mansfield – C7A
From: Jimmie Ng
Date: October 13, 2016
Project Name: Webster Athletic Center Renovation and Expansion
Project Number: B1605030.000
Subject: Water and Sanitary Generation Rates



Estimated Water Use:

	Existing Building	Existing and New Addition
Plumbing Fixture Units	530 FU	900 FU
Peak Water Use	145 gpm	200 gpm

	Existing Building	Existing and New Addition
No. of Occupants	2,100	5,342*
Daily Water Use per Occupant	28 gpd	28 gpd
Daily Water Use Total	58,800 gpd	149,576 gpd

Estimated Sanitary Use:

	Existing Building	Existing and New Addition
No. of Occupants	2,100	5,342*
Daily Water Use per Occupant	25 gpd	25 gpd
Daily Water Use Total	52,500 gpd	133,550 gpd

* The occupancy is based on code and building square footage, and does not refer to an increase in the student population on campus.

6.1.c

STORM DRAINAGE IMPACT ANALYSIS

Prepared by:

Nitsch Engineering Inc.	2016/10/13
McPhail Associates	2016/10/05

SEE APPENDIX I

for Stormwater Report

6.1.d

ELECTRICAL SYSTEM IMPACT ANALYSIS

Prepared by

WSP 2016/10/13

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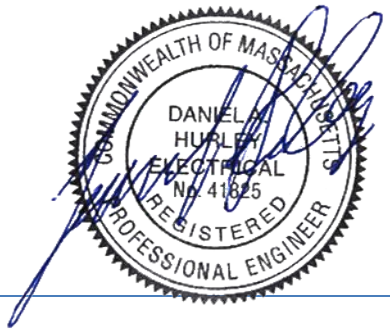
MEMORANDUM

To:	Timothy Mansfield – C7A
From:	Michael Foley
Date:	October 13, 2016
Project Name:	Webster Athletic Center Renovation and Expansion
Project Number:	B1605030.000
Subject:	Electrical Narrative



EXISTING ELECTRICAL SYSTEM

Babson College owns and maintains a medium voltage distribution system that serves all buildings on the campus.

The medium voltage distribution system consists of 13.8kV switchgear, 13.8kV feeders, 13.8kV to 480Y/277V or 208Y/120V oil-filled and dry-type transformers, 13.8kV load break switches, 13.8kV selector switches and 13.8kV load break elbows in manholes.

The outdoor 13.8kV switchgear serves as the main electrical service for the campus and is located off of Forest Street near Alumni Hall.

The switchgear consists of (2) incoming utility sections, (2) utility metering sections, (1) bus tie section, (1) control power section, and (4) feeder sections.

Wellesley Municipal Light Plant provides (2) 13.8kV lines to the switchgear. These lines provide power to the entire campus.

The (4) feeder sections distribute power throughout the campus through the (4) 13.8kV feeders. These feeders are label 1A, 1B, 2A, and 2B. Feeders 1A and 1B are routed together and serve the east side of the campus. Feeders 2A and 2B are routed together and serve the west side of the campus. Feeders 2A and 2B will be tapped to serve the new addition.

The existing switchgear was replaced in 2004 and is in good condition. The existing switchgear is operated and maintained by Wellesley Municipal Light Plant.

The 13.8kV feeders consist of #4/0 cables routed through underground ducts and manholes throughout campus.

Feeders are tapped in some manholes with load break elbows.

The existing Webster Athletic Center is served by a 1000 kVA 13.8kV – 460/277V transformer located off of Babson College Drive. This transformer and the existing electrical distribution system in the building will remain as is with no modifications.

NEW ELECTRICAL SERVICE

The new Webster Athletic Center addition will add approximately 968 kVA of connected load to the system. A new 1000 kVA 13.8kV – 460/277V transformer will be provided for the new addition. This transformer will be located in the rear of the building and connected to feeders 2A and 2B via a medium voltage load break selector switch.

A new 480/277V and 208/120V electrical distribution will be provided throughout the new addition to serve electrical loads associated with the building. A new 1000kW natural gas generator will be provided for emergency and standby power in the new addition.

LOAD ANALYSIS

Each MV feeder can handle up to 4655 kVA of load. Peak demand provided by Babson College Facilities for each feeder is as follows: Feeder 2A – 1960 kVA, Feeder 2B – 871 kVA. Adding 968 kVA of load to either of these feeders will not exceed their capacity.

6.2

TRAFFIC IMPACT AND ACCESS STUDY

Prepared by TEPP LLC 2016/10/13

SEE APPENDIX II

For Traffic Impact and Access Study (TIAS)

SECTION 6.2 TRAFFIC IMPACT AND ASSESSMENT STUDY

WEBSTER ATHLETIC CENTER

RENOVATION AND EXPANSION

PSI SUBMISSION

A traffic impact and assessment study (TIAS) was prepared by TEPP LLC on October 7, 2016 and is attached as Appendix II in Section 8 of this submission. The Project will not create an increase in traffic trips to and from the campus during peak hours.

6.3

PEDESTRIAN AND BICYCLE SAFETY

SECTION 6.3 PEDESTRIAN AND BICYCLE SAFETY

WEBSTER ATHLETIC CENTER

RENOVATION AND EXPANSION

PSI SUBMISSION

ON CAMPUS PEDESTRIAN AND BICYCLE SAFETY

The College does not anticipate any overall increase in the volume of on-campus pedestrian or bicycle traffic as a result of this project. However, certain pedestrian and bicycle improvements are planned in this project.

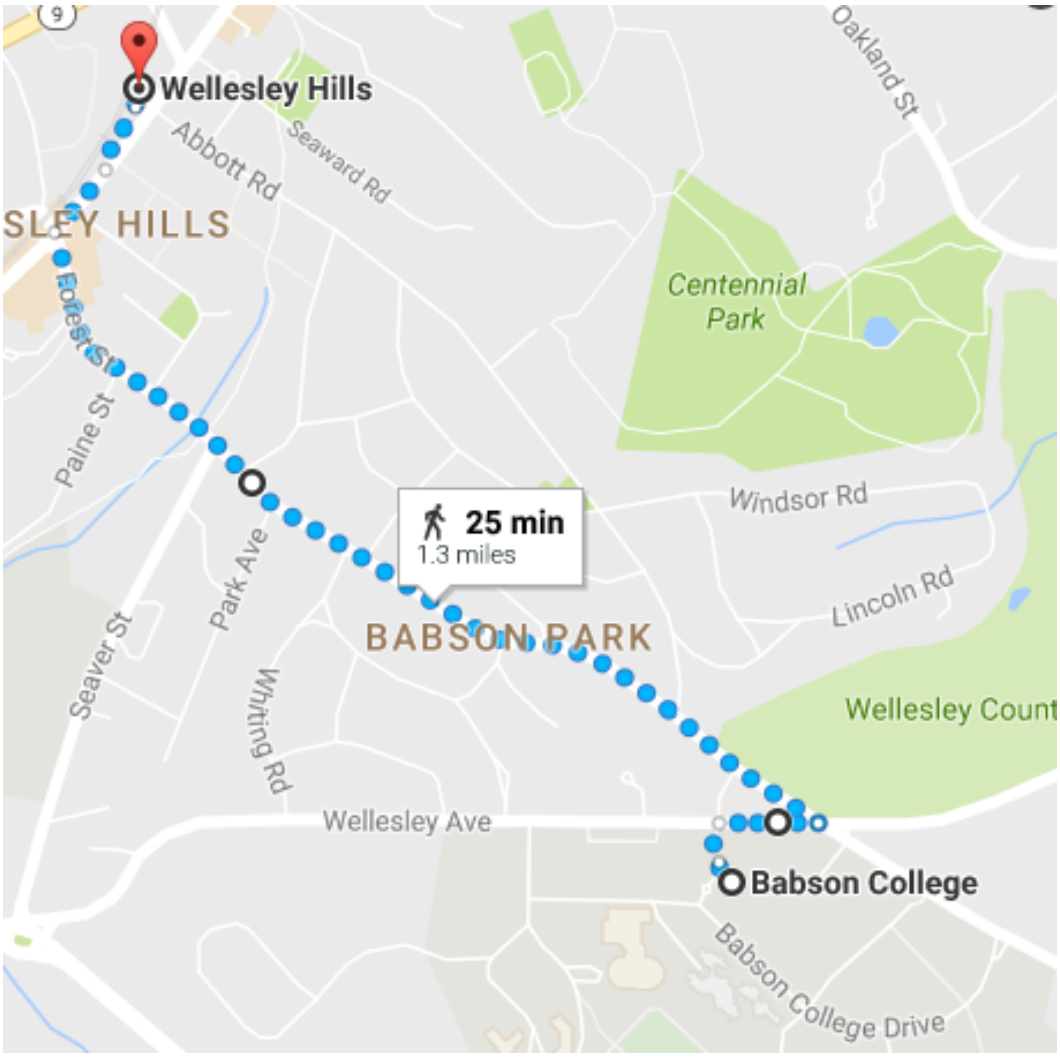
A new entrance to the Webster Athletic Center will be provided along College Drive. New six to eight-foot wide walkways will be provided along College Drive, Westgate Road, and Byrant way leading to the new entrances (entrances are located at #1 and #5 in the diagram below). There will also be new paths leading to the existing on-campus parking garage and to the existing surface parking lot for the Webster center. Paths are shown in L1.0 Materials Plan included in Section 7.0 of this report, and in the diagram below. The College also plans to install bicycle racks near the College Drive Entrance (#1) and the South Lawn entrance (#5) of the Center.

OFF CAMPUS PEDESTRIAN AND BICYCLE SAFETY

No increase to off-campus pedestrian or bicycle traffic is anticipated as a result of this project.

TRAVEL ROUTES TO PUBLIC TRANSPORTATION

There is a pedestrian-safe route from the campus along Forest Street to the Wellesley Hills MBTA Commuter Rail station (shown in the map below). The Route 8 MetroWest Regional Transit Authority (MWRTA) bus stop is also at this location. The travel distance from campus to the station is 1.3 miles. Leaving the campus, there is a painted pedestrian crossing at the intersection of Wellesley Avenue and Forest Street. Forest Street has sidewalks on one or both sides of the street from this intersection to Washington Street (Playhouse Square), and along Washington Street to the Commuter Rail station.



END

6.4

FIRE PROTECTION AND LIFE SAFETY ANALYSIS

Prepared by

WSP	2016/10/13
C7A	2016/10/13

SECTION 6.4 BUILDING OCCUPANT LIFE SAFETY

WEBSTER ATHLETIC CENTER

RENOVATION AND EXPANSION

PSI SUBMISSION

Summary
This section addresses the identification of the proposed use and occupancy and characteristics of the occupants, building contents, equipment and materials on site, identification of possible hazards and hazard scenarios and anticipated impact on municipal fire alarm systems. A comprehensive emergency plan with evacuation plan is not included in this submission but can be provided at a future date, upon request.

Proposed Use and Occupancy
Please refer to O1.1 and O1.2 Occupancy Plans included in Section 7.0 for proposed us and Occupancy information. Occupants are students and faculty.

Possible Hazards and Hazard Scenarios
Please refer to the attached memos for more information:

- Fire Alarm Narrative prepared by WSP Parsons Brinkerhoff dated 10/13/16 for an overview of the Fire Alarm System
- Fire Flow Demand prepared by WSP Parsons Brinkerhoff dated 10/13/16 for building description, water supply data, fire service entrance information, calculated fire flow demand, sprinkler type and quantity, and back flow preventer information.

Sprinkler Design Densities (Light Hazard and Ordinary Hazard, Group 1) are indicated on Plans FP1.1 and FP1.2 included in Section 7.0.

Anticipated Impact on Municipal Fire Alarm Systems
Babson College does not anticipate an Impact on the Municipal Fire Alarm System as a result of this project. The student body will not increase as a result of this Project.

Relocation of Emergency Panel
The building address is 3 Babson College Drive. A new entrance to the building on Babson College Drive is being provided as part of this project. The circuits for the existing Fire Alarm Panel will be rerouted to the location of the new Fire Alarm Panel at the new entrance area on Babson College Drive. The existing and new locations of the panel are shown on FP1.1.

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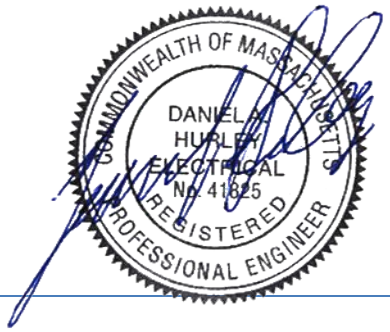
MEMORANDUM

To:	Timothy Mansfield – C7A
From:	Michael Foley
Date:	October 13, 2016
Project Name:	Webster Athletic Center Renovation and Expansion
Project Number:	B1605030.000
Subject:	Fire Alarm Narrative



CAMPUS FIRE ALARM REPORTING

Existing fire alarm systems on the campus report to the Campus Public Safety department via Radio type Master Boxes. The new Webster Athletic Center addition will be treated as a separate building and will be provided with its own Radio type Master Box.

EXISTING FIRE ALARM SYSTEM

A portion of the existing Webster Athletic Center will be demolished. The existing Fire Alarm Control Panel is located in it. A new FACP will be installed in an alternate location and all circuit will be re-routed to it prior to start of demolition.

NEW FIRE ALARM SYSTEM

A complete multiplex digital addressable fire alarm and mass notification system with audio/visual occupant notification will be provided throughout the new Webster Athletic Center addition.

The fire alarm work includes new ADA approved speaker/strobe light units, new ADA approved strobe light units, new manual pull station(s), new water flow switches, new tamper switches, new smoke detectors, new CO detectors, new heat detectors, new control and monitor modules and new power extenders.

The fire alarm system will be interfaced to either monitor or control the following equipment:

1. Emergency generator.
2. Fire pump.
3. Elevator.
4. HVAC equipment including fans, air handling units, fire/smoke dampers, smoke dampers and automatic control dampers.
5. Security system.
6. Existing fire alarm system in adjacent building.
7. Automatic transfer switches.
8. Fire suppression system.
9. Interface to building control system.
10. All other systems required by building code or any local code or local authorities.

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MEMORANDUM

To: Timothy Mansfield – C7A
From: Jimmie Ng
Date: October 13, 2016
Project Name: Webster Athletic Center Renovation and Expansion
Project Number: B1605030.000
Subject: Fire Flow Demand

COMMONWEALTH OF MASSACHUSETTS
DANIEL A. HURLEY
ELECTRICAL
No. 41825
REGISTERED PROFESSIONAL ENGINEER

The following outlines the anticipated building fire flows for this project.

Building Description: The referenced project is located at Babson College and is an addition to the existing Webster Center. The proposed building consists of the following:

1. Use Group: A-4, B and S-2.
2. Total square footage of building: 175,000 SF: 114,000 SF existing, 69,500 SF new
3. Building height: 28.5 feet, basement floor to second floor
4. Number of floors above grade: 2
5. Number of floors below grade: 1
6. Square footage per floor: varies
7. NFPA 13 occupancy hazards: Light and Ordinary Hazard
8. Type of construction: 1A
9. The building will have full sprinkler coverage.

Water Supply Data: Babson College provided the following fire pump test data for tests performed on July 22, 2016:

Fire Pump Test Data (with VFD on)			
Suction Pressure	Discharge Pressure	Net Pressure	Flow
64 psi	140 psi	76 psi	0 gpm
54 psi	138 psi	84 psi	1,000 gpm
42 psi	86 psi	44 psi	1,500 gpm

Fire Service Entrance: The existing 6-inch fire service in the existing Webster Athletic Center will remain and a new riser will be provided and a sprinkler main will be extended to the addition. No new fire service is anticipated.

Calculated Fire Flow Demand:

- The sprinkler system will be supplied by the campus water main through the existing fire service in the Webster Athletic Center. The design sprinkler demand based on NFPA 13 Ordinary Hazard protection will be 350 gpm (estimated). The total sprinkler design flow, including both interior and exterior hose streams, is 600 gpm.
- There will be no standpipes in the building.

Sprinkler Types: Quick Response spray sprinklers will be provided throughout the building as required by NFPA 13.

No. of Sprinklers: Estimated to be 600 new sprinklers for the building addition. The final sprinkler count will be determined as the design progresses.

Backflow Preventer: Existing Febco Double Check Valve Assembly.

Certification: The campus water supply on Babson College Drive is capable of providing in excess of 1,600 gpm at 20 psi which will provide the required fire flows during peak flow conditions for the proposed building.

6.5

REFUSE DISPOSAL SYSTEM

SECTION 6.5 REFUSE DISPOSAL AND RECYCLING IMPACT

WEBSTER ATHLETIC CENTER

RENOVATION AND EXPANSION

PSI SUBMISSION

Summary
Refuse and recycling systems for the proposed project are consistent with current Babson College standards and will have no negative impact on the Town's refuse disposal system. More details are provided below.

Solid waste
When the Project is completed, trash will be collected from the building by the Babson College Building Services staff and be transported to a compactor at the Facilities Services parking lot and yard. It will then be taken away under contract with Wellesley Trucking. Wellesley Trucking transports solid waste to a "trash to energy" plant. Any future construction waste generated by Babson's in-house staff for small projects in the building will be collected in two open top 30-yard roll offs that will be emptied by Wellesley Trucking. Wellesley Trucking reports that 75% of solid waste is recycled.

Recycling
Recycling for the completed project will also be collected from the project by the Building Services staff. It will be brought to a designated location outside the building and loaded into our recycling truck which transports it to a designated recycling compactor at the Facilities Services yard. This is transported to a recycling center under contract with Wellesley Trucking.

Construction
Construction waste for the project will be handled by the Construction Manager or General Constractor (Gilbane) who will make arrangements for roll offs to be on site during the construction process. More specifics on construction waste can be provided at a later date upon request.

SECTION 7

DEFINITIVE SUBMISSION PROJECT PLANS

APPLICATION FOR REVIEW OF A PROJECT OF SIGNIFICANT IMPACT

Webster Athletic Center Renovation and Expansion

G0.0 DRAWING LIST/ COVER SHEET
prepared by C7A, Timothy Mansfield 2016/10/13

G1.0 EXISTING SITE FEATURES PLAN
G2.0 CONTEXT PLAN
prepared by VHB, Russell Bousquet 2016/10/13

C0.0 CIVIL NOTES AND LEGENDS
C1.0 SITE EROSION CONTROL PLAN
C1.1 SITE EROSION CONTROL DETAILS
C2.0 SITE UTILITY DEMOLITION PLAN
C3.0 SITE UTILITY PLAN
C4.0 SITE UTILITY DETAILS SHEET I
C4.1 SITE UTILITY DETAILS SHEET II
prepared by Nitsch Engineering, David Conway 2016/10/13

L1.0 LANDSCAPE MATERIALS PLAN
L1.1 LANDSCAPE PAVING DETAILS
L2.0 GRADING PLAN
L3.0 LANDSCAPE PLANTING PLAN
L3.1 LANDSCAPE PLANTING DETAILS
prepared by Stephen Stimson Associates, Stephen Stimson 2016/09/15

E1.0 ELECTRICAL SITE PLAN
E5.0 ELECTRICAL RISER DIAGRAM
P1.1 PLUMBING PLAN LEVEL 1
FP1.1 FIRE PROTECTION PLAN LEVEL 1
FP1.2 FIRE PROTECTION PLAN LEVEL 2
prepared by WSP, Dan Hurley 2016/10/13

O1.1 OCCUPANCY PLAN LEVEL 1
O1.2 OCCUPANCY PLAN LEVEL 2
prepared by C7A, Timothy Mansfield 2016/10/13

SECTION 8

APPENDICES

APPLICATION FOR REVIEW OF A PROJECT OF SIGNIFICANT IMPACT

Webster Athletic Center Renovation and Expansion

APPENDIX I	STORMWATER REPORT prepared by Nitsch Engineering
APPENDIX II	TRAFFIC IMPACT AND ACCESS STUDY, prepared by TEPP LLC

APPENDIX I

APPLICATION FOR REVIEW OF A PROJECT OF SIGNIFICANT IMPACT

Webster Athletic Center Renovation and Expansion

STORMWATER REPORT, prepared by Nitsch Engineering

Appendix A	Stormwater Management Standards Documentation
Appendix B	Existing Conditions – HydroCAD Calculations
Appendix C	Proposed Conditions – HydroCAD Calculations
Appendix D	Closed Drainage System Design
Appendix E	Long-Term Pollution Prevention and Stormwater Operation and Maintenance Plan
Appendix F	Soil Investigations
Appendix G	Draft Stormwater Pollution Prevention Plan (SWPPP)

Nitsch Engineering

October 13, 2016

STORMWATER REPORT

For

WEBSTER ATHLETIC CENTER RENOVATION AND EXPANSION
Babson College
Wellesley, MA 02457

Applicant:
Babson College
231 Forest Street
Babson Park, MA 02457

Prepared by:

NITSCH ENGINEERING, INC.
2 Center Plaza, Suite 430
Boston, MA 02108

COMMONWEALTH OF MASSACHUSETTS
DAVID M. CONWAY
CIVIL
No. 40000
REGISTERED PROFESSIONAL ENGINEER
10/6/16

Nitsch Project #10070

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Figure 2 Proposed Watershed Areas

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Standard 4: Water Quality Volume Calculations
Bayfilter MASTEP Verification
Bioretention Basin Storage Table
Standard 4: TSS Removal Calculations
TP Removal Calculations
Standard 10: Illicit Discharge Compliance Statement

Appendix B Existing Conditions – HydroCAD Calculations

Appendix C Proposed Conditions – HydroCAD Calculations

Appendix D Closed Drainage System Design

Appendix E Long-Term Pollution Prevention and Stormwater Operation and Maintenance Plan

Appendix F Soil Investigations
NRCS Soil Maps and Descriptions
Foundation Engineering Report Prepared by McPhail Associates dated October 5, 2016

Appendix G Draft Stormwater Pollution Prevention Plan (SWPPP)

1.0 INTRODUCTION

Nitsch Engineering has prepared this Stormwater Report to support the permitting submissions for Webster Athletic Center Renovation and Expansion (the Project).

The Project stormwater management system has been designed to meet the applicable requirements of the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards and the Town of Wellesley (the Town) Department of Public Works Municipal Stormwater Drainage System Rules and Regulations to the maximum extent practicable.

Based on the site analysis, we conclude the Project results in an overall reduction in stormwater peak run-off rates to the Town of Wellesley drainage system and an overall improvement from the existing conditions. The supporting stormwater management calculations are included with this report.

The total site boundary analyzed throughout the stormwater design expands past the Project disturbance area (the Site) boundary in order to incorporate offsite drainage which may impact the existing and proposed stormwater management systems.

2.0 EXISTING CONDITIONS

The existing Webster Athletic Center building (the Building) is located at 3 Babson College Drive within the Babson College Campus in Wellesley, Massachusetts. The Site is bounded by Babson College Drive to the north and east, Bryant Way to the west, and a parking lot and athletic fields to the south. The project site currently contains the existing Webster Center, Pepsico Pavilion, outdoor tennis courts, and open landscaped space with plantings and some trees.

2.1 Existing Drainage System

The Site is currently serviced by a closed drainage system, which consists of roof drains, area drains, catch basins, and manholes connected by underground drain pipes. The closed drainage system flows north along the west face of the existing Building and discharges into the closed drainage system in Babson College Drive. There is no existing detention or infiltration system located within the Site.

2.2 Soils

NRSC Soil Designations

The Natural Resources Conservation Service (NRCS) Web Soil Survey for this area indicates that the soils underlying the Site are classified as Woodbridge fine sandy loam, 3 to 8 percent slopes and Paxton fine sandy loam, 3 to 8 percent slopes. These soils are classified as a Hydrologic Soil Group (HSG) C, or C/D. For the purpose of the analysis described in this Report, an HSG of C was used.

The Natural Resources Conservation Service (NRCS) soils maps are provided in Appendix F.

On-Site Soil Investigations

McPhail Associates, Inc. conducted subsurface explorations and geotechnical engineering studies for the Site. McPhail Associates prepared a geotechnical report titled ‘Foundation Engineering Report’ and dated October 5, 2016.

Groundwater was observed in the open boreholes at depth ranging from 5.9 to 9.6 feet below ground surface, or from about Elevation +222.4 to Elevation +211.2. It is anticipated that seasonal high

groundwater levels across the site will vary from those observed by McPhail during the subsurface explorations.

On June 21, 2016, McPhail performed three (3) constant head, in-situ permeability tests at the site. The tests were performed within groundwater observation wells that were installed within the Site. Each permeability test was performed within the glacial till deposit. The calculated permeability values ranged from 4.0 x 10^{-5} centimeters per second (cm/sec) to 3.0 x 10^{-6} cm/sec. These in-situ permeabilities are considered to be representative of the silt content and very dense nature of the relatively impervious glacial till deposit.

Massachusetts Stormwater Handbook indicates that the minimum infiltration rate for groundwater recharge facilities shall be no less than 0.17 inches/hour. The lower end of soils assigned to Hydrologic Soil Group C have an average infiltration rate of 0.17 inches/hour. No stormwater recharge system shall be sited in soils that infiltrate lower than 0.17 inches/hour due to the potential for failure. The permeability ranges of the soils within the project site based on both the McPhail permeability testing and the Natural Resources Conservation Service (NRCS) Web Soil Survey are indicative of a Hydrologic Soil Group C or D (0.003 inches/hour to 0.17 inches/hour), which is not suitable for stormwater infiltration Best Management Practices (BMPs). Since the underlying soils have a low to very low permeability rate, the site is limited in its ability to recharge stormwater run-off into the ground. Therefore, groundwater recharge is not feasible under the Massachusetts Stormwater Standards and Section XIVE of the Town of Wellesley Zoning Bylaws, Water Supply Protection Districts.

The report documenting these explorations is provided in Appendix F.

3.0 PROPOSED CONDITIONS

3.1 Project Overview

The Project includes the renovation and expansion (the Addition) of the existing Building, the removal of the existing tennis courts, and various site improvements. The site improvements will include the following:

1. Construction of new sidewalks, a new loading area, walkways, and plazas that provide for pedestrian connections between the Building and the adjacent campus areas;
2. Internal expansion of the existing domestic water and fire protection system to the Addition;
3. Installation of new gas, sewer, and drainage utilities to support the Project; and
4. Installation of a stormwater management system, which will include a closed drainage system comprised of area drains, catch basins and manholes, a Bioretention basin, and a proprietary water quality structure, which will provide water quality treatment.

The Project is a redevelopment and will only impact previously developed areas, will revegetate portions of the previously impervious tennis courts, and will result in an overall decrease in impervious area of 0.08 acres (approximately 3,500 square feet) within the Site. Refer to Table 1 for a comparison of the existing and proposed surface covers for the Site.

Table 1. Surface Cover Summary for Webster Athletic Center Renovation and Expansion

Surface Cover	Existing Site (acres)	Proposed Site (acres)	Change (acres)
Buildings	0.14	1.05	+0.91
Paved Roadway and Walkways	1.67	0.68	-0.99
Grass	1.34	1.42	+0.08
Woods/Brush	0.00	0.00	- -
Total	3.15	3.15	- -

3.2 Stormwater Management System

Stormwater run-off from the limits of the Site currently discharges to the closed drainage system in Babson College Drive. In addition, stormwater run-off from a small portion of area southwest of the Building discharges to this closed drainage system. This area includes an existing parking lot with a close drainage system, pedestrian walkways, which flow overland and are collected by the existing closed drainage system and landscape area. Stormwater run-off from the Site and the additional contributing area, which includes the existing parking lot, landscaped areas, and walkways highlighted in Figure 2, will continue to discharge to the closed drainage system in the built out condition.

The existing closed drainage system onsite will be improved in several respects. All existing drainage structures and pipes within the Site will be removed. The closed drainage system, which previously ran along the west face of the existing Building will be rerouted along the west face of the Addition. Existing catch basins, manholes, and conveyance pipes in Babson College Drive will be removed and replaced with new catch basins with sumps and hoods, and new manhole structures and conveyance pipes.

The Project results in an overall decrease in impervious area. As a result of the decrease in impervious area, peak run-off rates from the Site will decrease in the proposed conditions, and no stormwater mitigation is required for the Site.

A Bioretention basin will be installed along the northern edge of the existing parking lot. The Bioretention basin will collect stormwater run-off from the pedestrian/landscaped areas south of the Addition; the Bioretention basin will provide water quality pretreatment for the contributing stormwater prior to discharge to the downstream proprietary water quality structure, and also will provide some peak run-off rate mitigation to further decrease the peak run-off rates from the Site.

Groundwater recharge is not feasible within the proposed project limits because the soils associated with the project site have very low permeability rates and seasonal high groundwater is anticipated to be perched on the surface of or within the underlying dense glacial till deposits. Therefore, the stormwater management system does not include a component to infiltrate stormwater run-off to the groundwater.

All stormwater run-off collected by the enhanced stormwater management system will be treated prior to discharge to the design points in accordance with Mass DEP Stormwater Management Standards and the Town of Wellesley Department of Public Works Municipal Stormwater Drainage System Rules and Regulations. Water quality treatment will be achieved using deep-sump and hooded catch

basins, proprietary water quality structures, and the Bioretention basin. The proprietary water quality structures were selected for water quality treatment, Total Suspended Solids (TSS) and nutrient (phosphorous) removal, because of site constraints including topography and subsurface soil conditions.

A summary of each treatment train is provided below. All stormwater collected by the stormwater management system will be treated for a minimum 80% Total Suspended Solids (TSS) removal and 50% phosphorous removal. Total Suspended Solids (TSS) Removal spreadsheets and BMP sizing calculations are provided in Appendix A.

Treatment Train A
Bayfilter → Offsite

Treatment Train B
Bioretention Basin → Bayfilter → Offsite

Deep Sump and Hooded Catch Basins

Deep sump and hooded catch basins are proposed to provide pretreatment for the impervious areas of the roadway, parking aisles, and access driveway. Stormwater run-off collected by the catch basins will discharge to the proposed water quality structure; the deep sump and hooded catch basins will provide an additional 25% TSS removal.

BayFilter™

The BayFilter™ structures will treat stormwater run-off prior to discharging offsite. The structures have been sized to treat the water quality flow generated by 1-inch of rainfall over the contributing impervious area. The Bayfilter Unit (WQS1) was sized to treat the water quality volume from the contributing area from the Project site along with contributing impervious area from offsite areas.

The structures remove 80% Total Suspended Solids (TSS) and 50% Total Phosphorous (TP) from the stormwater. Sizing calculations are provided to document that the structures will remove a minimum of 80% of the anticipated TSS and 50% of the TP.

Bioretention Basin

A Bioretention basin is proposed to treat stormwater run-off generated from a portion of the Site. The Bioretention basin includes a minimum 24-inch media filter to provide TSS and nutrient pollutant removal. The Bioretention basin is not intended to provide stormwater recharge (See Section 2.2: On-Site Soil Investigations), and will include an underdrain along the bottom of the basin to collect and convey the treated stormwater to the closed drainage system. Overflow area drains will provide an overflow for large storm events to be conveyed to the closed drainage system.

The Bioretention basin is sized to treat 0.5-inches of rainfall over the contributing impervious area. See the Bioretention Basin Storage table in Appendix A. The primary purpose of the treatment is to provide pretreatment prior to discharging to the water quality structure, and to improve the performance and longevity of the water quality structure filter cartridges.

Contributing Impervious Area:	8,811 s.f.
Water Quality Volume (0.5-inches):	367 c.f.
Water Quality Volume Provided:	490 c.f.

3.3 Impact on Municipal Drainage System

Per the Town of Wellesley Municipal Stormwater Drainage System Rules and Regulations, the capacity of the stormwater system was studied. There is one design point for the analysis, the closed drainage system in Babson College Drive. The stormwater management system within the Site has been analyzed; there is an overall reduction in peak run-off rates and volumes in all major storm events from the Site, which will improve conditions downstream of the Site. Section 5.6 summarizes the peak flow rates in the existing and proposed conditions.

3.4 Stormwater Management During Construction

The Site Contractor will be responsible for stormwater management of the active construction site and is required to adhere to the conditions of the 2012 Construction General Permit (CGP) issued by the Environmental Protection Agency (EPA). The construction contract documents will require the contractor to obtain coverage under the EPA's National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Construction Activities and to prepare a Stormwater Pollution Prevention Plan (SWPPP) to comply with the Clean Water Act and its amendments. Operators of large and small construction activities must apply for coverage under the terms of the NPDES General Permit. The EPA has issued the CGP to authorize the discharge of stormwater associated with construction activities under the NPDES. The CGP authorizes the stormwater discharges from large and small construction activities that result in a total land disturbance of equal to or greater than 1 acre, where those discharges enter surface waters of the United States or a municipal storm system leading to surface waters of the United States. The discharges are subject to the conditions set forth in the CGP.

The goal of the CGP is to reduce or eliminate stormwater pollution from construction activities by requiring the planning and implementation of a SWPPP to protect the water quality of receiving surface water bodies. The SWPPP identifies potential sources of pollution from the construction site that may affect the quality of stormwater discharges, describes practices to be used to reduce such pollutants, and assures compliance with the terms and conditions of the CGP. The SWPPP is a comprehensive guide, which when followed, will result in the placement of erosion and pollution prevention measures, maintenance and monitoring of the in-place measures, and means to modify the plan.

In order to obtain coverage under the CGP for authorized stormwater discharges, the operator must prepare and submit a *Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under a NPDES General Permit*. A SWPPP must be prepared before the submission of a NOI and prior to the start of construction activities. A copy of the SWPPP must be kept at the Project site from project initiation to the date of final stabilization. Upon final stabilization of the site, a Notice of Termination must be submitted to the EPA. A notice of the permit and SWPPP must be posted conspicuously near the entrance to the site.

In Massachusetts, the EPA is the NPDES permitting authority.

Minimum erosion and sediment controls have been incorporated into the Project design to protect the resource areas during construction and are indicated on the Construction Plans within the accompanying Project Plan Set.

Prior to commencing any construction activities, the Contractor shall prepare a detailed SWPPP appropriate to the specific means and methods of construction of this Project. The Project's plans and specifications require the Contractor to implement erosion control measures prior to the start of any work. Control measures shall prevent erosion, siltation, and sedimentation of wetlands, construction areas, and adjacent areas. Erosion and sediment controls will be utilized adjacent to earthwork

stockpiles, onsite storage and staging areas, cut and fill slopes, stripped and graded areas, constructed swales and ditches, and the adjacent areas.

The erosion and sediment controls will include siltation fences, compost filter tube barriers, and temporary covers for drainage structures. Additionally, temporary soil protective coverings are required in all disturbed or graded areas subject to erosion to eliminate erosion and sediment transport. The temporary ground cover will be maintained until the area is stabilized. Construction equipment and activities will also be regulated in such a manner to minimize contamination and erosion.

4.0 LOCAL ZONING DESIGNATIONS: WATER SUPPLY PROTECTION DISTRICT

The Project is within the Water Supply Protection District, and is therefore subject to Section XIVE of the Town Zoning By-Law. The Water Supply Protection Districts are intended to preserve the quantity of ground and surface water which provides existing or potential water supply for the Town's residents, institutions, and businesses. The standards state that;

1. Provisions shall be made to protect against toxic or hazardous materials discharge or loss through corrosion, accidental damage, spillage, or vandalism through such measures as provision for spill control in the vicinity of chemical or fuel delivery points, secure storage areas for toxic or hazardous materials, and indoor storage provisions for corrodible or dissolvable materials;
2. No disposal of hazardous wastes shall occur within the District;
3. Fill material used in the District shall contain no solid waste, toxic or hazardous materials, or hazardous waste;
4. Stormwater run-off from impervious surfaces shall be recharged onsite unless recharge is not feasible because of site conditions or is undesirable because of risks. Subsurface systems shall be preceded by oil, grease and sediment traps. Drainage from loading areas for toxic or hazardous materials shall be separately collected for safe disposal;
5. Soil overburden shall not be lowered to finished exterior grades less than five feet above maximum groundwater elevation

The Project includes provisions to meet the Water Supply Protection District design and operation standards as summarized below:

1. Since the project will disturb more than one (1) acre of land, Babson College and the Project Contractor will need to obtain coverage under the Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Construction Activities. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the project to comply with the Construction General Permit (CGP). The SWPPP will include erosion and sediment controls (stabilization practices and structural practices), temporary and permanent stormwater management measures, provisions to protect against toxic and hazardous materials discharging to the groundwater during construction, Contractor inspection schedules and reporting of all SWPPP features, materials management, waste disposal, off-site vehicle tracking, spill prevention and response, sanitation, and non-stormwater discharges. These provisions will include the establishment of specific areas for handling of materials and operational standards in the event of a spill.
2. Fill material will contain no solid waste, toxic or hazardous materials, or hazardous waste.
3. Groundwater recharge is not feasible within the proposed Project limits because the soils

associated with the Site have very low permeability rates and seasonal high groundwater is anticipated to be perched on the surface of or within the underlying dense glacial till deposits. Therefore, the bioretention basin design is not dependent on the exfiltration of stormwater from the basin to the ground. An underdrain will be an installed at the bottom of the Bioretention basin to collect treated stormwater and discharge the treated stormwater into the closed drainage system.

4. The Site grading will include finish grade modifications to the landscape areas adjacent to the Building to provide accessible pedestrian connections throughout the site. Grade modifications of the adjacent landscape areas are designed to meet the intent of the Water Supply Protection District by maintaining a minimum five-foot cover over groundwater. Also the underlying soils within the project area consist of dense glacial till with low permeability, which acts as a near impervious barrier to the underlying groundwater.

5.0 2002 PROPOSED STORMWATER MANAGEMENT IMPROVEMENTS REPORT

In 2002, ENSR Corporation performed an analysis of the Babson College stormwater infrastructure within the Rosemary Brook watershed and prepared a report titled 'Proposed Stormwater Management Improvements, Rosemary Brook Watershed', dated January 2002. The analysis included existing and future conditions, and recommendations for the future improvements. The recommendations have been implemented as of the date hereof, as indicated by Babson College, (the Owner). The recommendations included:

1. Water quality enhancement capability of the stormwater management system;
2. Upgrades to the campus closed drainage system draining to Rosemary Brood to increase stormwater conveyance capacity. The drain line located in Babson College Drive was identified to be replaced under this recommendation. The line was a 15-inch Reinforced Concrete Pipe (RCP) that was proposed to be replaced with a 24-inch Corrugated Polyethylene Pipe (CPP).

The Project is located within the Rosemary Brook watershed. The Project follows the design criteria implemented in the 'Proposed Stormwater Management Improvements, Rosemary Brook Watershed' report. Below is a description of the improvements associated with the Project that incorporate the recommendations.

1. The stormwater management system meets or exceeds the required water quality treatment; see Section 7, Standard 4 for a detailed analysis.
2. The Project will result in an overall decrease in impervious area on the Site, which will result in a reduction in peak run-off rates to the closed drainage system in Babson College Drive. The closed drainage system is designed to convey the minimum required storm event, the 25-year storm. See Section 8 for a detailed analysis.
3. The drain main in Babson College Drive has been previously upgraded from a 15-inch RCP pipe to a 24-inch RCP pipe, which follows the design criteria presented in the 'Proposed Stormwater Management Improvements, Rosemary Brook Watershed' report.

6.0 STORMWATER MANAGEMENT ANALYSIS

6.1 Methodology

Nitsch Engineering completed a hydrologic analysis of the existing project site utilizing the Soil Conservation Service (SCS) Run-off Curve Number (CN) methodology. The SCS method calculates the rate at which the run-off reaches the design point considering several factors: the slope and flow lengths of the subcatchment area, the soil type of the subcatchment area, and the type of surface cover in the subcatchment area. HydroCAD Version 10.00 computer modeling software was used in conjunction with the SCS method to determine the peak run-off rates and run-off volumes for the 2-, 10-, 25-, and 100-year, 24-hour storm events. The proposed project site is being analyzed with the same methodology.

The site was divided into multiple drainage areas, or subcatchments, which drain to three design points. For each subcatchment area, SCS Run-off CNs were selected by using the cover type and hydrologic soil group of each area. The peak run-off rates and run-off volumes for the 2-, 10-, 25-, and 100-year, 24-hour storm events were then determined by inputting the drainage areas, CNs, and time of concentration (T_c) paths into the HydroCAD model.

6.2 HydroCAD Version 10.00

The HydroCAD computer program uses SCS and TR-20 methods to model drainage systems. TR-20 (Technical Release 20) was developed by the Soil Conservation Service to estimate run-off and peak discharges in small watersheds. TR-20 is generally accepted by engineers and reviewing authorities as the standard method for estimating run-off and peak discharges.

HydroCAD Version 10.00 uses up to four (4) types of components to analyze the hydrology of a given site: subcatchments, reaches, basins, and links. Subcatchments are areas of land that produce surface run-off. The area, weighted CN, and T_c characterize each individual subcatchment area. Reaches are generally uniform streams, channels, or pipes that convey water from one point to another. A basin is any impoundment that fills with water from one (1) or more sources and empties via an outlet structure. Links are used to introduce hydrographs into a project from another source or to provide a junction for more than one (1) hydrograph within a project. The time span for the model was set for 0-48 hours in order to prevent truncation of the hydrograph.

6.3 Precipitation Data

Nitsch Engineering used Technical Paper 40 by the National Weather Service to estimate the rainfall for the 2-, 10-, 25-, and 100-year, 24-hour storms. The rainfall values for Norfolk County that were used are as follows:

Storm Event	24-hour Rainfall
2-year	3.2 in.
10-year	4.7 in.
25-year	5.5 in.
100-year	6.7 in.

6.4 Existing Hydrologic Conditions

As summarized in Table 2, Nitsch Engineering delineated the project site into one (1) onsite subcatchment (watershed) areas discharging to one (1) design point utilizing an existing conditions survey and onsite observations. Table 2 summarizes the design point, location, and area of each watershed. The HydroCAD model for existing conditions is provided in Appendix B.

Table 2. Existing Drainage Area Summary

Design Point	Watershed	Area (acres)	Description
DP1	EX-1	3.15	Tennis Courts, landscape areas
Total Area		**3.15**	

6.5 Proposed Hydrologic Conditions

The Project has been designed to the applicable requirements of the MassDEP Stormwater Management Standards. The Project is a redevelopment; there is an overall decrease in impervious area of 0.8 acres. Therefore, the Project has been designed to meet Standard 2, Standard 3, and the pretreatment and structural stormwater BMPs requirements of Standards 4, 5, and 6 of the Stormwater Management Standards to the maximum extent practicable. The existing stormwater discharges comply with Standard 1 to the maximum extent practicable. The Project complies with all other requirements of the Stormwater Management Standards and will improve existing conditions. The Stormwater Management Standards are further discussed under Section 6.0, MassDEP Stormwater Management Standards.

The proposed stormwater management system was designed to collect and treat stormwater run-off from the Site prior to discharging to the Babson College Campus storm drain system. The Project was designed to maintain the general drainage patterns and direct stormwater run-off to the onsite design point in a similar manner as in the existing conditions. The existing watershed areas were modified to reflect the proposed topography, storm drainage structures and BMPs, and roadway and site areas (see Figure 2 and Table 3).

Table 3. Proposed Drainage Area Summary

Design Point	Watershed	Area (acres)	Description
DP1	PR-1	2.44	Building Roof, Landscape, walkways, loading dock
DP1	PR-2	0.71	Landscape, walkways, patio to Bioretention basin
Total Area		**3.15**	

6.6 Peak Flow Rates

The proposed site design and stormwater management system is expected to reduce the proposed peak run-off rates and volumes to at or below the existing rates from the Site. Tables 4 below summarizes the existing and proposed peak run-off rates based on the hydrologic analyses for the Site, discharging to storm drain main in Babson College Drive.

Table 4 – Peak Rates (cubic feet per second; cfs) and Volumes (acre-feet; af) of Run-off for Design Point, DP1 (Babson College Drive)

Storm Event	2-year Rate, Volume	10-year Rate, Volume	25-year Rate, Volume	100-year Rate, Volume
Existing	7.36 cfs, 0.53 af	12.27 cfs, 0.89 af	14.89 cfs, 1.09 af	18.81 cfs, 1.39 af
Proposed	6.81 cfs, 0.51 af	11.77 cfs, 0.87 af	14.29 cfs, 1.06 af	18.17 cfs, 1.37 af
% Reduction	(7.4%, 3.8%)	(4.1%, 2.2%)	(4.0%, 2.8%)	(3.4%, 1.4%)

Evaluation of Existing Municipal Systems
The Project reduces flow rates to the existing discharge points for each design storm. Therefore, further analysis of the existing systems is not required.

7.0 Stormwater Management Standards

7.1 MassDEP Stormwater Management Standards

The Project is considered a redevelopment under the MassDEP Stormwater Management Standards and has been designed to meet the Standards as summarized below:

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The stormwater management system has been designed to meet the MassDEP Stormwater Management Standards to the maximum extent practical using a combination of BMPs resulting in an overall improvement in the stormwater discharges to the Babson College Campus Storm Drain System. The stormwater treatment BMPs include deep sump and hooded catch basins, proprietary water quality structures (BayFilter™ water quality unit), and a Bioretention basin. The BMPs will be used to provide water quality treatment.

There are no new stormwater conveyances (outfalls) proposed for the Project. The existing outfall which currently discharges stormwater run-off from the Site will be maintained and utilized as the outfall for the proposed stormwater management system.

Standard 2: Peak Rate Attenuation

The proposed stormwater management system was designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates for the offsite design points. To prevent storm damage and downstream flooding, the proposed stormwater management practices will mitigate peak run-off rates for the 2-, 10-, 25- and 100-year, 24-hour storm events as noted in Section 6.5 and 6.6.

The existing conditions hydrologic calculations for the 2-, 10-, 25- and 100-year, 24-hour storm events are included with this report in Appendix B. The proposed conditions hydrologic calculations for the same storm events are included in Appendices C.

Standard 3: Groundwater Recharge

Groundwater recharge is not feasible within the proposed project limits because the soils associated with the Site have very low permeability rates and seasonal high groundwater is anticipated to be perched on the surface of or within the underlying dense glacial till deposits. Therefore, the stormwater management system does not include a component to infiltrate stormwater run-off to the groundwater.

Standard 4: Water Quality Treatment

The proposed stormwater management system has been designed to improve the water quality of the post-construction discharges from the Site. The stormwater management system was designed to meet the MassDEP Stormwater Management Standards to the maximum extent practical using deep sump and hooded catch basins and water quality structures. The system will remove at least 80% of the average annual post-construction load of Total Suspended Solids (TSS) and 50% of the Total Phosphorous (TP).

The Project is located within the Water Supply Protection District. Due to the sensitivity of the area, the Project was treated as a critical area. The required Water Quality Volume for sizing the stormwater management BMPs was calculated based on 1-inch times the total impervious area for TSS and Total Phosphorous (TP) removal.

Stormwater run-off from impervious area on Site will be collected by catch basins or area drains and directed to the BayFilter™ water quality structures prior to discharge. The BayFilter™ structure have been sized to treat the flow rate generated by 1-inch over the contributing impervious area. The BayFilter™ structure treat the flow to 80% TSS removal and 50% Total Phosphorous removal. The water quality volume generated from the Site's impervious area discharging to the Bioretention basin will be treated by the Bioretention filter media and collected by the basin underdrain. Stormwater will discharge from the Bioretention basin to the closed drainage system, and will further be treater by the BayFilter™ structure.

TSS and TP removal calculation spreadsheets and BMP sizing calculations are provided in Appendix A.

A post-construction Stormwater Management System Operations and Maintenance Plan has been prepared, which documents the long-term BMP operational requirements to maintain the functionality of the stormwater management system as designed. A Long-Term Pollution Prevention Plan has also been prepared that documents the source control and pollution prevention measures, including good housekeeping, storage of materials and waste products inside or under cover, spill prevention and response, maintenance of landscaped areas, and stabilization of eroded surfaces. The Operation and Maintenance Plan and Long-Term Pollution Prevention Plan are included in Appendix E.

Standard 5: Land Uses with Higher Potential Pollutant Loads

The Project does not contain Land Uses with Higher Potential Pollutant Loads (LUHPPLs) as defined by MassDEP.

Standard 6: Critical Areas

The Project is not located within any critical areas, as defined by MassDEP. However, the Site is located within the Town's Water Supply Protection District; therefore, the proposed stormwater

management system is designed to treat the stormwater run-off from 1-inch of rainfall over impervious area within the Site.

Standard 7: Redevelopment

The Project is considered a redevelopment as defined by MassDEP; the Project is a redevelopment of a previously developed site and will result in an overall decrease in impervious area. Therefore, the following Stormwater Management Standards will be met to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6 (see compliance narrative for Standards 2, 3, 4, 5, and 6). Existing stormwater discharges will comply with Standard 1 only to the maximum extent practicable (see compliance narrative for Standard 1). This Project will comply with all other requirements of the Stormwater Management Standards and improve existing conditions (see compliance narratives for Standards 8, 9, and 10).

Standard 8: Construction Period Pollution Prevention and Sedimentation Control

Sedimentation and erosion controls are included as part of the requirements of this Project and will be employed during site construction by the Contractor. Land disturbance will be kept to a minimum and the phasing of the work will be planned so that only the areas actively being developed are exposed. All other areas should have natural vegetation preserved, have good temporary cover, or permanent vegetation established. Permanent structures, temporary or permanent vegetation, and mulch/erosion netting will be required to be employed, as quickly as possible after land is disturbed. Disturbed areas will be protected from stormwater run-off by installing erosion control or stormwater management measures to prevent water from entering and running over disturbed areas, and to prevent erosion damage to downstream facilities. Perimeter control practices will be installed to isolate the construction site from surrounding areas. Siltation fence, temporary covers for drainage structures, and temporary settlement basins will be utilized where applicable.

Since the Project will disturb more than one (1) acre of land, a Notice of Intent will be submitted to the Environmental Protection Agency (EPA) for coverage under the National Pollution Discharge Elimination System (NPDES) Construction General Permit. As part of this application the Applicant is required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and implement the measures in the SWPPP. The SWPPP, which is to be kept on site, includes erosion and sediment controls (stabilization practices and structural practices), temporary and permanent stormwater management measures, Contractor inspection schedules and reporting of all SWPPP features, materials management, waste disposal, off-site vehicle tracking, spill prevention and response, sanitation, and non-stormwater discharges.

The Contractor will be required to implement the SWPPP for the duration of the Project. The Contractor will be required to inspect all controls regularly to ensure that the controls are working properly and shall clean and reinstall any control that needs to be cleaned or replaced. Additionally, the Contractor will be required to clean/flush the entire Project stormwater management system prior to final acceptance by the Owner.

The Contractor will obtain the appropriate permits for dewatering operations during construction and the Contractor will be required to adhere to the requirements and special conditions of these permits.

Standard 9: Operation and Maintenance Plan

A post-construction Operation and Maintenance Plan has been prepared and will be implemented to ensure that stormwater management systems function as designed. Source control and stormwater BMP operation requirements for the project site are summarized in the Long-Term Pollution Prevention Plan.

The Operation and Maintenance Plan and Long-Term Pollution Prevention Plan are included in Appendix E.

Standard 10: Prohibition of Illicit Discharges

There will be no illicit discharges to the stormwater management system associated with the Project. An Illicit Discharge Compliance Statement is provided in Appendix A.

8.0 CLOSED DRAINAGE SYSTEM DESIGN

The proposed closed drainage system consists of deep sump and hooded catch basins, drainage manholes, and proprietary water quality treatment units connected with corrugated polyethylene pipe. The closed drainage system was designed to convey the 25-year storm event using the Rational Method, as required by the Town. Refer to Appendix D for more information.

8.1 The Rational Method for Closed Drainage System Design

The Rational Method is a widely accepted rainfall-run-off model used for estimating peak design flows when modeling closed drainage system hydraulics. It is typically used when analyzing run-off rates from drainage areas to individual catch basins due to its simplicity and advantages on smaller scales over other models. Nitsch Engineering used the Rational Method to estimate the run-off into the closed drainage system.

The general formula for the rational method is:

$$Q = C\,i\,A$$

where

Q = *volumetric rate of run-off, in cubic feet per second*
C = *dimensionless run-off coefficient*
i = *rate of rainfall, in inches per hour*
A = *contributing drainage area (subcatchment), in acres*

The volumetric flow rate, *Q,* at which the run-off reaches a catch basin or other drainage inlet is determined by a number of factors: the slope and flow lengths of the subcatchment area, the soil type, the surface cover and size of the subcatchment area, and the chosen rainfall return period and associated intensity.

The primary difference between the Rational Method and the SCS method is the calculation of the run-off coefficient, *C.* The dimensionless run-off coefficient is determined from a number of factors, which are generally related to the surface cover of each individual subcatchment. A site covered with impermeable pavement typically has a run-off coefficient of 0.90. This value implies that almost all of the rain that falls on pavement or other impermeable covers will be converted to run-off. A site covered by grass or other landscaping will allow some of the water to be absorbed into the ground and can have coefficients which vary from 0.20 to 0.40, reflecting the associated reduction of run-off due to absorption. These different cover types within a drainage area are assigned a run-off coefficient and then weighted to determine an overall drainage area run-off coefficient, *C,* for each subcatchment. The proposed rain garden will further reduce peak run-off rates and volumes contributing to the closed drainage system. However, for the purpose of the analysis, the impact of the rain garden was not accounted for to allow for a more conservative analysis.

8.2 AutoDesk® Storm and Sanitary Analysis Software v. 6.4

Nitsch Engineering used AutoDesk® Storm and Sanitary Analysis Software (SSA) to estimate storm system inflows by the Rational Method and to size the proposed closed drainage system. SSA models hydraulic system capacities using Manning's Formula to properly size closed drainage system elements for the calculated run-off rates. Please refer to Appendix D of this report for the results of this analysis.

9.0 CONCLUSION

In conclusion, the Project will reduce overall site impervious area, and therefore reduce peak run-off rates and volumes being discharged from the Site. The Project's stormwater management system will improve the water quality of stormwater being discharged from the Site. The Project improvements are in line with the 2002 Proposed Stormwater Management Improvements Report recommendations; the Project will reduce stormwater discharge rates and volumes from the Site and will enhance water quality.

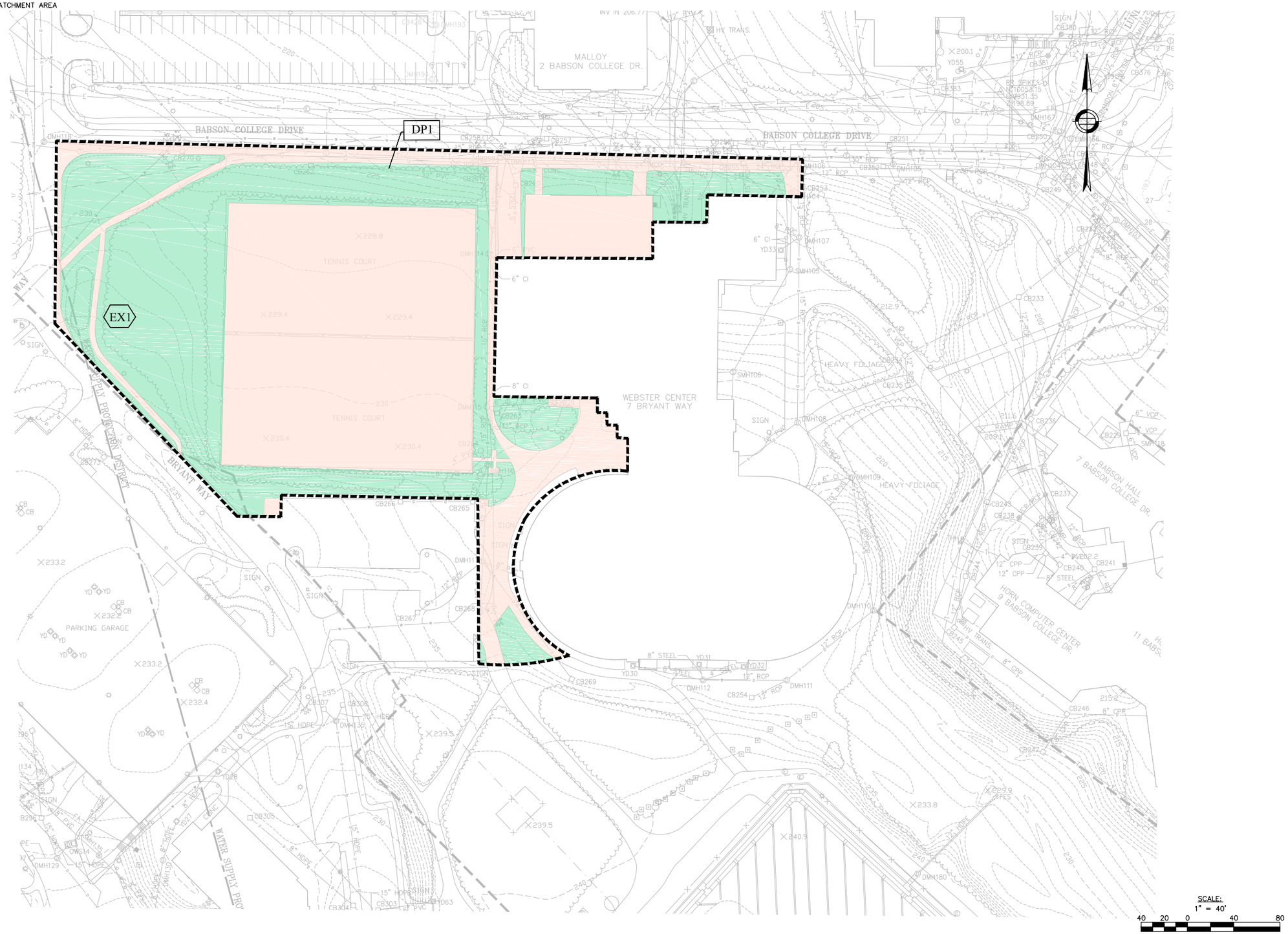
The Project is within the Water Supply Protection District and has been designed to comply with Section XIVE of the Town Zoning By-Law to the maximum extent practicable. The Project has been designed to meet the applicable requirements of the MassDEP Stormwater Management Standards to the maximum extent practicable and the Town of Wellesley Department of Public Works Municipal Stormwater Drainage System Rules and Regulations.

FIGURES

Figure 1 Existing Watershed Areas
Figure 2 Proposed Watershed Areas

LEGEND

DP2	DESIGN POINT
EX1	SUBCATCHMENT AREA
	SUBCATCHMENT AREA



Nitsch Engineering

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- Civil Engineering
- Land Surveying
- Transportation Engineering
- Sustainable Site Consulting
- Planning
- GIS

EXISTING WATERSHED AREAS
WEBSTER HALL RENOVATIONS
WELLESLEY, MA

PREPARED FOR:
BABSON COLLEGE
231 FOREST STREET, BABSON PARK, MA 02457

REV.	COMMENTS	DATE
	REVISIONS	

NITSCH PROJECT #	9896
FILE:	9896CDR.DWG
SCALE:	1"=40'
DATE:	9/7/2016
PROJECT MANAGER:	JA
SURVEYOR:	
DRAFTED BY:	
CHECKED BY:	

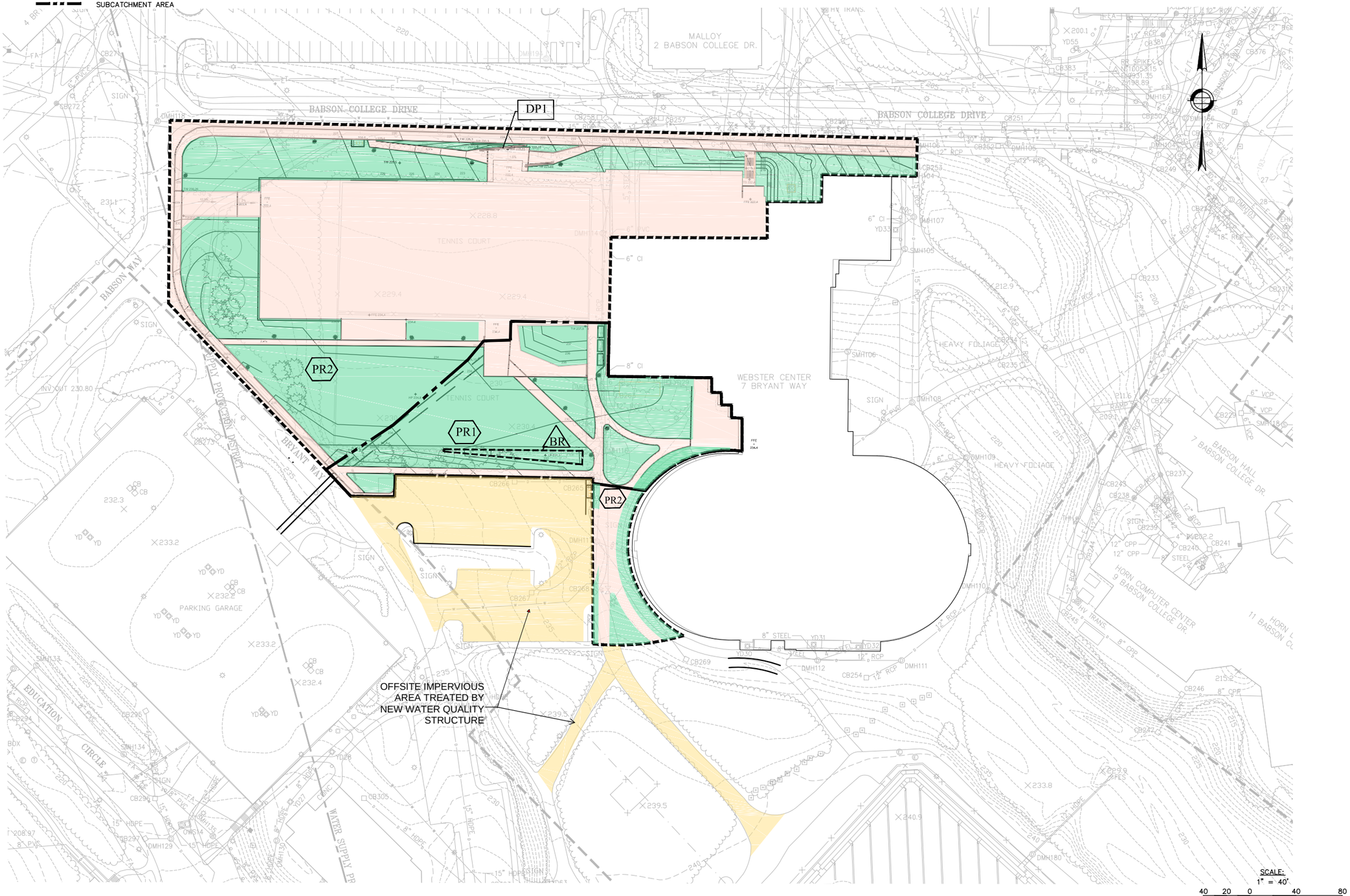
SHEET:1

FIG. 1

OF 1 REV.

LEGEND

DP2	DESIGN POINT
PR1	SUBCATCHMENT AREA
BR	STORMWATER BEST MANAGEMENT PRACTICE
	SUBCATCHMENT AREA



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PROPOSED WATERSHED AREAS
WEBSTER HALL CENTER RENOVATIONS AND EXPANSION
WELLESLEY, MA

PREPARED FOR:
BABSON COLLEGE
231 FOREST STREET, BABSON PARK, MA 02457

REV.	COMMENTS	DATE
1	TOWN OF WELLESLEY COMMENTS	9/16/14

REVISIONS

NITSCH PROJECT #	9896
FILE:	9896CDR.DWG
SCALE:	1"=40'
DATE:	9/7/16
PROJECT MANAGER:	JA
SURVEYOR:	
DRAFTED BY:	
CHECKED BY:	

SHEET:1

FIG. 2

OF 1 REV.

APPENDIX A

Stormwater Management Standards Documentation

Standard 4: Standard 4: Water Quality Volume Calculations
Bayfilter MASTEP Verification
Bioretention Basin Storage Table
Standard 4: TSS Removal Calculations
TP Removal Calculations
Standard 10: Illicit Discharge Compliance Statement

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1" Calculation Sheet

Nitsch Job # 10070
Calc: JLY
Date: 9/7/2016

This spreadsheet should be used to convert water quality volume to an equivilent water quality peak flow rate as outlined in the new MA DEP guidelines that take effect on October 15, 2013.

Glossary

Water Quality Flow Rate =	WQF
Water Quality Volume =	WQV*
unit peak discharge (csm/in) =	qu**
Impervious Area in watershed (square miles) =	Ai

*WQV is expressed in watershed inches (you must use 1.0-inches in all cases with this method and not 0.5-inches)
** calculate the qu based on the time of concentration (see 1" - qu Table)

Compute Water Quality Flow with the following Equation

WQF = (qu)(A)(WQV)

Input Information (in colored cells only)

Site Plan Callout		Enter qu (from 1" - qu Table)	Enter Impervious Area (SF) *	Ai (sq/mi)	WQV		WQF	
WQS1-BF	=	774	99609	0.003573	1	=	2.77	cfs
				0.000000	1	=	0.00	
				0.000000	1	=	0.00	

***Contributing Impervious area includes all contributing impervious area, including: Offsite walkways, offsite parking lot, site impervious area, building addition roof**

reduced on a site specific basis by BaySaver Technologies, Inc. in conjunction with an engineer.

The figure above shows the layout of a PVF-8-10-10, an 8' x 10' precast vault BayFilter™ system. The system comprises ten standard BFCs and 10 drain down modules. Unlike the manhole BayFilter™, the outlet manifold in the precast vault BayFilter™ does not connect directly to the outlet pipe. Instead, each of the under drain lines enters an outlet manifold which drains to the outlet pipe.

Box Culvert BayFilter™

Like the manhole BayFilter™, access to the box culvert BayFilter™ is provided through the hinged access hatch. The box culvert BayFilter™ is constructed in 10' x 6' sections. Each vault has at least one access hatch. The BFCs and outlet manifolds are arranged to allow maintenance personnel to stand on the concrete floor while working inside the structure. The BayFilter™ cartridges and under drain manifold components are supplied by BaySaver Technologies, Inc. together with the precast vaults. Please refer to Appendix C for a complete set of box culvert BayFilter™ configurations.

Available precast vault and box culvert filter systems include:

BayFilter™ Model	Vault Size (ft x ft)	Maximum Number of BFCs	Maximum Treatment Flow gpm (cfs)
PVF-8-10-10	8' x 10'	10	300 (0.67)
PVF-8-12-13	8' x 12'	13	390 (0.87)
PVF-8-14-15	8' x 14'	15	450 (1.00)
PVF-8-16-18	8' x 16'	18	540 (1.20)
PVF-10-16-21	10' x 16'	21	630 (1.40)
PVF-10-20-27	10 x 20'	27	810 (1.80)
PVF-10-26-33	10' x 26'	33	990 (2.21)
PVF-10-32-42	10' x 32'	42	1,260 (2.81)
PVF-10-38-51	10' x 38'	51	1,530 (3.41)
PVF-10-40-54	10' x 40'	54	1,620 (3.61)

BayFilter System :: A product from BAYSAVER ::

Performance information: (This product was evaluated in at least one third-party study. See MASTEP Evaluation Summary.)

The BayFilter performance data is from two studies, one field and one lab. The field study involved the BayFilter configured as part of a treatment train along with the BaySeparator (both products of BaySaver Technologies). In the field study evaluating the treatment train, the BaySeparator effectively served as a pretreatment device for the BayFilter, capturing larger particles before discharging to the BayFilter. The field study evaluated sediment, total phosphorus and turbidity removal; the lab study certified TSS removal rates, while also testing (but not verifying) turbidity and dissolved phosphorus removal. TSS removal rates by the BayFilter were similar for the field and lab study; between 81.5% and 86.1% for different data sets. The Maryland Department of the Environment issued a January 13, 2008 letter stating that The BaySaver Technologies system has been approved as a stormwater management BMP for water quality control. This approval specifies that "the system is comprised of three components that include the BaySeparator pretreatment chamber, underground storage pipes, and the BayFilter. When the BaySeparator is not used, an acceptable pretreatment measure in accordance with the 2000 Maryland Stormwater Design Manual will be required." In addition, the letter states "This approval is based on the field monitoring data provided by BayTechnologies that show that the BMP performance criteria of 80% TSS and 40% TP removal rates have been met."

Pollutants addressed	Manufacturer's Removal Efficiency claim	Minimum particle size	Tested removal efficiency (*)	Test Data Status (**)	Notes
Suspended sediment concentration	80-90%	-	85-86.9 %	2	Data from Liu field study
Total suspended solids	80-90%	-	83-86.1 %	2	Data from NJCAT lab study and Liu field study
Oil and grease	80-100%	-	-	0	-
Debris - floatables	80-100%	-	-	0	-
Debris- sinking	80-100%	-	-	0	-
Zinc	30-40%	-	-	0	-
Copper	40-50%	-	-	0	-
Total Phosphorus	50-65%	-	55-58.1 %	2	Data from Liu field study
Odor	55-65%	-	68-70.1 %	2	Turbidity (NTU) - data from Liu field study

* - Pollution removal efficiency evaluated by MASTEP staff based on review of available performance evaluation reports.

** - **1** = sufficient credible data to be able to evaluate pollution removal efficiency claims. **2** = promising studies are underway. **3** = insufficient credible data be able to evaluate claims. **0** = data review not yet conducted.

Test reports: **(click on link to view a summary of a test, click on disk icon to download the full report)**

Title	Author/ Agency	Date	TARP compliancy	Test protocol compliancy	Documents
NJCAT Technology Verification Bayfilter	-	06/01/2008	No	-	NJCAT_Technology_Verification_Bayfilter.pdf
Efficiency Assessment of the BaySeparator and BayFilter systems at Richard Montgomery High School.	Dr. Bo Liu and Ryan Janoch	01/06/2009	No	TARP and TAPE	BayFilter Field Test prelim report 9-18-08.pdf

Nitsch Engineering

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Form S4-C: Standard 4 – Water Quality
TSS Worksheet

Project Name: Webster Athletic Center Renovation and Expansion	Nitsch Project #: 10070
Location: Wellesley, MA	Checked by: **JA**
Prepared by: JLY	Sheet No.1 of **1**
Date: **10/13/16**	

DESCRIPTION OF DISCHARGE POINT

TIONS:
Column, click on Blue Cell to Activate Drop Down Menu
MP from Drop Down Menu
IP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Treatment Train A

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Bioretention Area	**0.80**	**1.00**	**0.80**	**0.20**
Proprietary Treatment Practice	**0.80**	**0.20**	**0.16**	**0.04**
	0.00	**0.04**	**0.00**	**0.04**
	0.00	**0.04**	**0.00**	**0.04**
	0.00	**0.04**	**0.00**	**0.04**

Total TSS Removal = **96%**

Project: Park Manor Renovations
Prepared By: JLY

*Equals remaining load from previous BMP (E)

TSS WORKSHEET from Volume 2, Chapter 3, Table 4, TSS Removal

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Form S4-C: Standard 4 – Water Quality
TSS Worksheet

Project Name: Webster Athletic Center Renovation and Expansion	Nitsch Project #: 10070
Location: Wellesley, MA	Checked by: **JA**
Prepared by: JLY	Sheet No.2 of **2**
Date: **10/13/16**	

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Treatment Train B

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Proprietary Treatment Practice	**0.80**	**1.00**	**0.80**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = **80%**

Project: Park Manor Renovations
Prepared By: JLY

*Equals remaining load from previous BMP (E)

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Total Phosphorous Worksheet

Project Name: Webster Athletic Center Renovation and Expansion	Nitsch Project #: 10070
Location: Wellesley, MA	Checked by: **JA**
Prepared by: JLY	Sheet No.1 of **1**
Date: **10/13/16**	

DESCRIPTION OF DISCHARGE POINT

TIONS:
Column, click on Blue Cell to Activate Drop Down Menu
MP from Drop Down Menu
IP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Treatment Train A

B BMP[1]	C TP Removal Rate[1]	D Starting TP Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Bioretention Area	**0.00**	**1.00**	**0.00**	**1.00**
Proprietary Treatment Practice	**0.50**	**1.00**	**0.50**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**

Total TP Removal = **50%**

Project: **Park Manor Renovations**
Prepared By: **JLY**

*Equals remaining load from previous BMP (E)

TP WORKSHEET

Nitsch Engineering

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Boston, MA 02111-2403
T: 617-338-0063
F: 617-338-6472

Water Quality
Total Phosphorous Worksheet

Project Name: Webster Athletic Center Renovation and Expansion	Nitsch Project #: 10070
Location: Wellesley, MA	Checked by: **JA**
Prepared by: JLY	Sheet No.2 of **2**
Date: **10/13/16**	

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Treatment Train B

TSS Removal Calculation Worksheet

B BMP[1]	C TP Removal Rate[1]	D Starting TP Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Proprietary Treatment Practice	**0.50**	**1.00**	**0.50**	**0.50**
	0.00	**0.00**	**0.00**	**0.00**
	0.00	**0.00**	**0.00**	**0.00**
	0.00	**0.00**	**0.00**	**0.00**
	0.00	**0.00**	**0.00**	**0.00**

Total TP Removal **50%**

Project: Park Manor Renovations
Prepared By: JLY

*Equals remaining load from previous BMP (E)

September 8, 2016

Webster Athletic Center Renovation and Expansion
Wellesley, Massachusetts

STANDARD 10: Illicit Discharge Compliance Statement

Standard 10 states: All illicit discharges to the stormwater management system are prohibited.

This is to verify:

1. Based on the information available there are no known or suspected illicit discharges to the stormwater management system at the Babson College site as defined in the DEP Stormwater Handbook.

2. The design of the stormwater system includes no existing illicit discharges and no illicit discharges are proposed.

Joshua J Alston

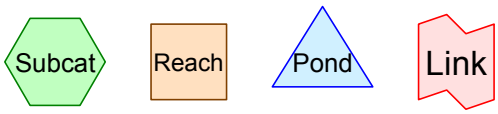
Joshua Alston, P.E. LEED AP BD+C

9/9/16

Date

APPENDIX B

Existing Conditions – HydroCAD Calculations



Routing Diagram for 10070-Proposed
Prepared by {enter your company name here}, Printed 9/9/2016
HydroCAD® 10.00-12 s/n 00546 © 2014 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.342	74	>75% Grass cover, Good, HSG C (EX1)
1.812	98	Paved parking, HSG C (EX1)
3.154	**88**	**TOTAL AREA**

Summary for Subcatchment EX1: EX1

Runoff = 7.36 cfs @ 12.09 hrs, Volume= 0.525 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (sf)	CN	Description
78,950	98	Paved parking, HSG C
31,355	74	>75% Grass cover, Good, HSG C
27,092	74	>75% Grass cover, Good, HSG C
137,397	88	Weighted Average
58,447		42.54% Pervious Area
78,950		57.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP-EX-1: DP-EX

Inflow Area = 3.154 ac, 57.46% Impervious, Inflow Depth = 2.00" for 2-Year event
Inflow = 7.36 cfs @ 12.09 hrs, Volume= 0.525 af
Outflow = 7.36 cfs @ 12.09 hrs, Volume= 0.525 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Subcatchment EX1: EX1

Runoff = 12.27 cfs @ 12.09 hrs, Volume= 0.890 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
78,950	98	Paved parking, HSG C
31,355	74	>75% Grass cover, Good, HSG C
27,092	74	>75% Grass cover, Good, HSG C
137,397	88	Weighted Average
58,447		42.54% Pervious Area
78,950		57.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP-EX-1: DP-EX

Inflow Area = 3.154 ac, 57.46% Impervious, Inflow Depth = 3.38" for 10-Year event
Inflow = 12.27 cfs @ 12.09 hrs, Volume= 0.890 af
Outflow = 12.27 cfs @ 12.09 hrs, Volume= 0.890 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Subcatchment EX1: EX1

Runoff = 14.89 cfs @ 12.09 hrs, Volume= 1.090 af, Depth= 4.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
78,950	98	Paved parking, HSG C
31,355	74	>75% Grass cover, Good, HSG C
27,092	74	>75% Grass cover, Good, HSG C
137,397	88	Weighted Average
58,447		42.54% Pervious Area
78,950		57.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP-EX-1: DP-EX

Inflow Area = 3.154 ac, 57.46% Impervious, Inflow Depth = 4.15" for 25-Year event
Inflow = 14.89 cfs @ 12.09 hrs, Volume= 1.090 af
Outflow = 14.89 cfs @ 12.09 hrs, Volume= 1.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Subcatchment EX1: EX1

Runoff = 16.85 cfs @ 12.09 hrs, Volume= 1.241 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=6.10"

Area (sf)	CN	Description
78,950	98	Paved parking, HSG C
31,355	74	>75% Grass cover, Good, HSG C
27,092	74	>75% Grass cover, Good, HSG C
137,397	88	Weighted Average
58,447		42.54% Pervious Area
78,950		57.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP-EX-1: DP-EX

Inflow Area = 3.154 ac, 57.46% Impervious, Inflow Depth = 4.72" for 50-Year event
Inflow = 16.85 cfs @ 12.09 hrs, Volume= 1.241 af
Outflow = 16.85 cfs @ 12.09 hrs, Volume= 1.241 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Subcatchment EX1: EX1

Runoff = 18.81 cfs @ 12.08 hrs, Volume= 1.394 af, Depth= 5.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (sf)	CN	Description
78,950	98	Paved parking, HSG C
31,355	74	>75% Grass cover, Good, HSG C
27,092	74	>75% Grass cover, Good, HSG C
137,397	88	Weighted Average
58,447		42.54% Pervious Area
78,950		57.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

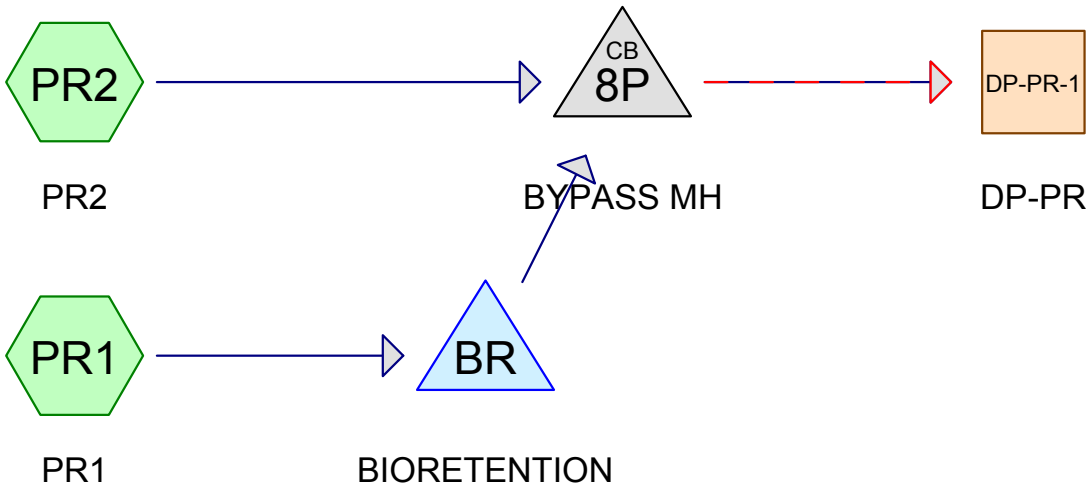
Summary for Reach DP-EX-1: DP-EX

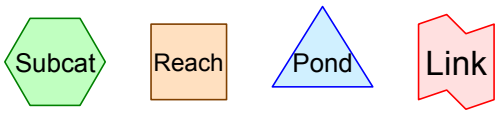
Inflow Area = 3.154 ac, 57.46% Impervious, Inflow Depth = 5.30" for 100-Year event
Inflow = 18.81 cfs @ 12.08 hrs, Volume= 1.394 af
Outflow = 18.81 cfs @ 12.08 hrs, Volume= 1.394 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

APPENDIX C

Proposed Conditions – HydroCAD Calculations





Routing Diagram for 10070-Proposed
Prepared by {enter your company name here}, Printed 9/9/2016
HydroCAD® 10.00-12 s/n 00546 © 2014 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.423	74	>75% Grass cover, Good, HSG C (PR1, PR2)
1.731	98	Paved parking, HSG C (PR1, PR2)
3.154	**87**	**TOTAL AREA**

Summary for Subcatchment PR1: PR1

Runoff = 1.22 cfs @ 12.09 hrs, Volume= 0.087 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (sf)	CN	Description
8,811	98	Paved parking, HSG C
22,205	74	>75% Grass cover, Good, HSG C
31,016	81	Weighted Average
22,205		71.59% Pervious Area
8,811		28.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PR2: PR2

Runoff = 5.92 cfs @ 12.09 hrs, Volume= 0.424 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.20"

Area (sf)	CN	Description
66,594	98	Paved parking, HSG C
39,787	74	>75% Grass cover, Good, HSG C
106,381	89	Weighted Average
39,787		37.40% Pervious Area
66,594		62.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP-PR-1: DP-PR

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 1.92" for 2-Year event
Inflow = 6.81 cfs @ 12.09 hrs, Volume= 0.505 af
Outflow = 6.81 cfs @ 12.09 hrs, Volume= 0.505 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 8P: BYPASS MH

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 1.92" for 2-Year event
Inflow = 6.81 cfs @ 12.09 hrs, Volume= 0.505 af
Outflow = 6.81 cfs @ 12.09 hrs, Volume= 0.505 af, Atten= 0%, Lag= 0.0 min
Primary = 3.33 cfs @ 12.09 hrs, Volume= 0.075 af
Secondary = 3.49 cfs @ 12.09 hrs, Volume= 0.430 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 218.65' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Secondary	217.20'	**12.0" Round Bayfilter** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.20' / 217.10' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Primary	217.70'	**18.0" Round Manhole** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.70' / 217.50' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=3.32 cfs @ 12.09 hrs HW=218.65' (Free Discharge)
└─**2=Manhole** (Barrel Controls 3.32 cfs @ 4.02 fps)

Secondary OutFlow Max=3.49 cfs @ 12.09 hrs HW=218.65' (Free Discharge)
└─**1=Bayfilter** (Barrel Controls 3.49 cfs @ 4.44 fps)

Summary for Pond BR: BIORETENTION

Inflow Area = 0.712 ac, 28.41% Impervious, Inflow Depth = 1.47" for 2-Year event
Inflow = 1.22 cfs @ 12.09 hrs, Volume= 0.087 af
Outflow = 1.06 cfs @ 12.14 hrs, Volume= 0.081 af, Atten= 13%, Lag= 2.8 min
Primary = 1.06 cfs @ 12.14 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 232.02' @ 12.14 hrs Surf.Area= 1,023 sf Storage= 784 cf

Plug-Flow detention time= 154.3 min calculated for 0.081 af (93% of inflow)
Center-of-Mass det. time= 118.4 min (958.0 - 839.5)

Volume	Invert	Avail.Storage	Storage Description
#1	230.50'	1,827 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
230.50	0	0	0
231.00	340	85	85
232.00	1,022	681	766
233.00	1,100	1,061	1,827

Device	Routing	Invert	Outlet Devices
#1	Device 2	231.70'	**18.0" Vert. Orifice/Grate X 2.00** C= 0.600
#2	Primary	228.00'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 228.00' / 227.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Device 2	230.50'	**0.170 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Primary OutFlow Max=1.05 cfs @ 12.14 hrs HW=232.02' (Free Discharge)
└─**2=Culvert** (Passes 1.05 cfs of 7.02 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 1.05 cfs @ 1.92 fps)
  └─**3=Exfiltration** (Controls 0.00 cfs)

Summary for Subcatchment PR1: PR1

Runoff = 2.27 cfs @ 12.09 hrs, Volume= 0.162 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
8,811	98	Paved parking, HSG C
22,205	74	>75% Grass cover, Good, HSG C
31,016	81	Weighted Average
22,205		71.59% Pervious Area
8,811		28.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PR2: PR2

Runoff = 9.73 cfs @ 12.09 hrs, Volume= 0.709 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
66,594	98	Paved parking, HSG C
39,787	74	>75% Grass cover, Good, HSG C
106,381	89	Weighted Average
39,787		37.40% Pervious Area
66,594		62.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP-PR-1: DP-PR

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 3.29" for 10-Year event
Inflow = 11.70 cfs @ 12.09 hrs, Volume= 0.865 af
Outflow = 11.70 cfs @ 12.09 hrs, Volume= 0.865 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 8P: BYPASS MH

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 3.29" for 10-Year event
Inflow = 11.70 cfs @ 12.09 hrs, Volume= 0.865 af
Outflow = 11.70 cfs @ 12.09 hrs, Volume= 0.865 af, Atten= 0%, Lag= 0.0 min
Primary = 6.99 cfs @ 12.09 hrs, Volume= 0.186 af
Secondary = 4.71 cfs @ 12.09 hrs, Volume= 0.679 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 219.25' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Secondary	217.20'	**12.0" Round Bayfilter** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.20' / 217.10' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Primary	217.70'	**18.0" Round Manhole** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.70' / 217.50' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=6.98 cfs @ 12.09 hrs HW=219.25' (Free Discharge)
└─**2=Manhole** (Barrel Controls 6.98 cfs @ 4.75 fps)

Secondary OutFlow Max=4.71 cfs @ 12.09 hrs HW=219.25' (Free Discharge)
└─**1=Bayfilter** (Inlet Controls 4.71 cfs @ 6.00 fps)

Summary for Pond BR: BIORETENTION

Inflow Area = 0.712 ac, 28.41% Impervious, Inflow Depth = 2.72" for 10-Year event
Inflow = 2.27 cfs @ 12.09 hrs, Volume= 0.162 af
Outflow = 2.12 cfs @ 12.12 hrs, Volume= 0.155 af, Atten= 7%, Lag= 1.9 min
Primary = 2.12 cfs @ 12.12 hrs, Volume= 0.155 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 232.16' @ 12.12 hrs Surf.Area= 1,034 sf Storage= 929 cf

Plug-Flow detention time= 89.6 min calculated for 0.155 af (96% of inflow)
Center-of-Mass det. time= 68.8 min (890.5 - 821.7)

Volume	Invert	Avail.Storage	Storage Description
#1	230.50'	1,827 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
230.50	0	0	0
231.00	340	85	85
232.00	1,022	681	766
233.00	1,100	1,061	1,827

Device	Routing	Invert	Outlet Devices
#1	Device 2	231.70'	**18.0" Vert. Orifice/Grate X 2.00** C= 0.600
#2	Primary	228.00'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 228.00' / 227.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Device 2	230.50'	**0.170 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Primary OutFlow Max=2.11 cfs @ 12.12 hrs HW=232.16' (Free Discharge)
└─**2=Culvert** (Passes 2.11 cfs of 7.16 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 2.11 cfs @ 2.31 fps)
  └─**3=Exfiltration** (Controls 0.00 cfs)

Summary for Subcatchment PR1: PR1

Runoff = 2.86 cfs @ 12.09 hrs, Volume= 0.204 af, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
8,811	98	Paved parking, HSG C
22,205	74	>75% Grass cover, Good, HSG C
31,016	81	Weighted Average
22,205		71.59% Pervious Area
8,811		28.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PR2: PR2

Runoff = 11.75 cfs @ 12.09 hrs, Volume= 0.865 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
66,594	98	Paved parking, HSG C
39,787	74	>75% Grass cover, Good, HSG C
106,381	89	Weighted Average
39,787		37.40% Pervious Area
66,594		62.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP-PR-1: DP-PR

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 4.04" for 25-Year event
Inflow = 14.29 cfs @ 12.09 hrs, Volume= 1.063 af
Outflow = 14.29 cfs @ 12.09 hrs, Volume= 1.063 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 8P: BYPASS MH

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 4.04" for 25-Year event
Inflow = 14.29 cfs @ 12.09 hrs, Volume= 1.063 af
Outflow = 14.29 cfs @ 12.09 hrs, Volume= 1.063 af, Atten= 0%, Lag= 0.0 min
Primary = 8.99 cfs @ 12.09 hrs, Volume= 0.255 af
Secondary = 5.30 cfs @ 12.09 hrs, Volume= 0.808 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 219.67' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Secondary	217.20'	**12.0" Round Bayfilter** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.20' / 217.10' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Primary	217.70'	**18.0" Round Manhole** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.70' / 217.50' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=8.99 cfs @ 12.09 hrs HW=219.67' (Free Discharge)
└─**2=Manhole** (Barrel Controls 8.99 cfs @ 5.10 fps)

Secondary OutFlow Max=5.30 cfs @ 12.09 hrs HW=219.67' (Free Discharge)
└─**1=Bayfilter** (Inlet Controls 5.30 cfs @ 6.75 fps)

Summary for Pond BR: BIORETENTION

Inflow Area = 0.712 ac, 28.41% Impervious, Inflow Depth = 3.43" for 25-Year event
Inflow = 2.86 cfs @ 12.09 hrs, Volume= 0.204 af
Outflow = 2.69 cfs @ 12.12 hrs, Volume= 0.198 af, Atten= 6%, Lag= 1.7 min
Primary = 2.69 cfs @ 12.12 hrs, Volume= 0.198 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 232.22' @ 12.12 hrs Surf.Area= 1,039 sf Storage= 994 cf

Plug-Flow detention time= 74.4 min calculated for 0.198 af (97% of inflow)
Center-of-Mass det. time= 57.1 min (872.2 - 815.1)

Volume	Invert	Avail.Storage	Storage Description
#1	230.50'	1,827 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
230.50	0	0	0
231.00	340	85	85
232.00	1,022	681	766
233.00	1,100	1,061	1,827

Device	Routing	Invert	Outlet Devices
#1	Device 2	231.70'	**18.0" Vert. Orifice/Grate X 2.00** C= 0.600
#2	Primary	228.00'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 228.00' / 227.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Device 2	230.50'	**0.170 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Primary OutFlow Max=2.68 cfs @ 12.12 hrs HW=232.22' (Free Discharge)
└─**2=Culvert** (Passes 2.68 cfs of 7.22 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 2.68 cfs @ 2.46 fps)
  └─**3=Exfiltration** (Controls 0.00 cfs)

Summary for Subcatchment PR1: PR1

Runoff = 3.30 cfs @ 12.09 hrs, Volume= 0.236 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=6.10"

Area (sf)	CN	Description
8,811	98	Paved parking, HSG C
22,205	74	>75% Grass cover, Good, HSG C
31,016	81	Weighted Average
22,205		71.59% Pervious Area
8,811		28.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PR2: PR2

Runoff = 13.27 cfs @ 12.08 hrs, Volume= 0.983 af, Depth= 4.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 50-Year Rainfall=6.10"

Area (sf)	CN	Description
66,594	98	Paved parking, HSG C
39,787	74	>75% Grass cover, Good, HSG C
106,381	89	Weighted Average
39,787		37.40% Pervious Area
66,594		62.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP-PR-1: DP-PR

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 4.62" for 50-Year event
Inflow = 16.23 cfs @ 12.09 hrs, Volume= 1.213 af
Outflow = 16.23 cfs @ 12.09 hrs, Volume= 1.213 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 8P: BYPASS MH

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 4.62" for 50-Year event
Inflow = 16.23 cfs @ 12.09 hrs, Volume= 1.213 af
Outflow = 16.23 cfs @ 12.09 hrs, Volume= 1.213 af, Atten= 0%, Lag= 0.0 min
Primary = 10.52 cfs @ 12.09 hrs, Volume= 0.311 af
Secondary = 5.71 cfs @ 12.09 hrs, Volume= 0.903 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 219.98' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Secondary	217.20'	**12.0" Round Bayfilter** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.20' / 217.10' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Primary	217.70'	**18.0" Round Manhole** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.70' / 217.50' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=10.52 cfs @ 12.09 hrs HW=219.98' (Free Discharge)
└─**2=Manhole** (Inlet Controls 10.52 cfs @ 5.95 fps)

Secondary OutFlow Max=5.71 cfs @ 12.09 hrs HW=219.98' (Free Discharge)
└─**1=Bayfilter** (Inlet Controls 5.71 cfs @ 7.27 fps)

Summary for Pond BR: BIORETENTION

Inflow Area = 0.712 ac, 28.41% Impervious, Inflow Depth = 3.97" for 50-Year event
Inflow = 3.30 cfs @ 12.09 hrs, Volume= 0.236 af
Outflow = 3.12 cfs @ 12.11 hrs, Volume= 0.230 af, Atten= 5%, Lag= 1.7 min
Primary = 3.12 cfs @ 12.11 hrs, Volume= 0.230 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 232.26' @ 12.11 hrs Surf.Area= 1,043 sf Storage= 1,039 cf

Plug-Flow detention time= 65.7 min calculated for 0.230 af (97% of inflow)
Center-of-Mass det. time= 50.9 min (861.8 - 810.9)

Volume	Invert	Avail.Storage	Storage Description
#1	230.50'	1,827 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
230.50	0	0	0
231.00	340	85	85
232.00	1,022	681	766
233.00	1,100	1,061	1,827

Device	Routing	Invert	Outlet Devices
#1	Device 2	231.70'	**18.0" Vert. Orifice/Grate X 2.00** C= 0.600
#2	Primary	228.00'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 228.00' / 227.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Device 2	230.50'	**0.170 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Primary OutFlow Max=3.11 cfs @ 12.11 hrs HW=232.26' (Free Discharge)
└─**2=Culvert** (Passes 3.11 cfs of 7.26 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 3.11 cfs @ 2.56 fps)
  └─**3=Exfiltration** (Controls 0.00 cfs)

Summary for Subcatchment PR1: PR1

Runoff = 3.74 cfs @ 12.09 hrs, Volume= 0.269 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (sf)	CN	Description
8,811	98	Paved parking, HSG C
22,205	74	>75% Grass cover, Good, HSG C
31,016	81	Weighted Average
22,205		71.59% Pervious Area
8,811		28.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PR2: PR2

Runoff = 14.78 cfs @ 12.08 hrs, Volume= 1.102 af, Depth= 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=6.70"

Area (sf)	CN	Description
66,594	98	Paved parking, HSG C
39,787	74	>75% Grass cover, Good, HSG C
106,381	89	Weighted Average
39,787		37.40% Pervious Area
66,594		62.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Reach DP-PR-1: DP-PR

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 5.19" for 100-Year event
Inflow = 18.17 cfs @ 12.09 hrs, Volume= 1.365 af
Outflow = 18.17 cfs @ 12.09 hrs, Volume= 1.365 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Summary for Pond 8P: BYPASS MH

Inflow Area = 3.154 ac, 54.88% Impervious, Inflow Depth > 5.19" for 100-Year event
Inflow = 18.17 cfs @ 12.09 hrs, Volume= 1.365 af
Outflow = 18.17 cfs @ 12.09 hrs, Volume= 1.365 af, Atten= 0%, Lag= 0.0 min
Primary = 11.94 cfs @ 12.09 hrs, Volume= 0.369 af
Secondary = 6.23 cfs @ 12.09 hrs, Volume= 0.996 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 220.42' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Secondary	217.20'	**12.0" Round Bayfilter** L= 11.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.20' / 217.10' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Primary	217.70'	**18.0" Round Manhole** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 217.70' / 217.50' S= 0.0133 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=11.93 cfs @ 12.09 hrs HW=220.42' (Free Discharge)
└─**2=Manhole** (Inlet Controls 11.93 cfs @ 6.75 fps)

Secondary OutFlow Max=6.23 cfs @ 12.09 hrs HW=220.42' (Free Discharge)
└─**1=Bayfilter** (Inlet Controls 6.23 cfs @ 7.94 fps)

Summary for Pond BR: BIORETENTION

Inflow Area = 0.712 ac, 28.41% Impervious, Inflow Depth = 4.53" for 100-Year event
Inflow = 3.74 cfs @ 12.09 hrs, Volume= 0.269 af
Outflow = 3.56 cfs @ 12.11 hrs, Volume= 0.263 af, Atten= 5%, Lag= 1.6 min
Primary = 3.56 cfs @ 12.11 hrs, Volume= 0.263 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 232.31' @ 12.11 hrs Surf.Area= 1,046 sf Storage= 1,083 cf

Plug-Flow detention time= 59.2 min calculated for 0.262 af (98% of inflow)
Center-of-Mass det. time= 46.1 min (853.3 - 807.2)

Volume	Invert	Avail.Storage	Storage Description
#1	230.50'	1,827 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
230.50	0	0	0
231.00	340	85	85
232.00	1,022	681	766
233.00	1,100	1,061	1,827

Device	Routing	Invert	Outlet Devices
#1	Device 2	231.70'	**18.0" Vert. Orifice/Grate X 2.00** C= 0.600
#2	Primary	228.00'	**12.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 228.00' / 227.50' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf
#3	Device 2	230.50'	**0.170 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Primary OutFlow Max=3.55 cfs @ 12.11 hrs HW=232.31' (Free Discharge)
└─**2=Culvert** (Passes 3.55 cfs of 7.30 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 3.55 cfs @ 2.65 fps)
  └─**3=Exfiltration** (Controls 0.00 cfs)

APPENDIX D

Closed Drainage System Design

Rainfall Details

Return Period..... 25 year(s)

Subbasin Summary

Subbasin Name	Area (ac)	Weighted Runoff Coefficient	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
SUB-AD3	0.01	0.90	0.06	0 00:06:00
SUB-AD4	0.02	0.90	0.12	0 00:06:00
SUB-AD6	0.18	0.51	0.59	0 00:06:00
SUB-CB100	0.23	0.77	1.13	0 00:06:00
SUB-CB265&266	0.25	0.90	1.44	0 00:06:00
SUB-CB267 & 268	0.19	0.90	1.09	0 00:06:00
SUB-RD1	0.20	0.90	1.15	0 00:06:00
SUB-RD2	0.14	0.90	0.81	0 00:06:00
SUB-RD3	0.14	0.90	0.81	0 00:06:00
SUB-RD4	0.14	0.90	0.81	0 00:06:00
SUB-RD5	0.14	0.90	0.81	0 00:06:00
SUB-RD6	0.20	0.90	1.15	0 00:06:00
SUB-RD7	0.18	0.90	1.04	0 00:06:00
SUB-TD	0.13	0.52	0.43	0 00:06:00

Link Summary

Pipe Name	From (Inlet) Node	Inlet Invert Elevation (ft)	To (Outlet) Node	Outlet Invert Elevation (ft)	Pipe Length (ft)	Pipe Slope (%)	Pipe Diameter (in)	Manning's Roughness	Peak Flow Q (cfs)	Peak Flow Velocity (ft/sec)	Pipe Design Capacity Qf (cfs)	Q/Qf Ratio
A1	CB100	230.01	DMH210	228.98	67	1.52	12	0.0120	1.12	5.36	4.76	0.24
A2	DMH210	228.00	EX-DMH	227.30	24	2.97	12	0.0120	1.12	5.74	9.99	0.11
A3	EX. CB 267&268	228.00	EX-DMH	227.30	68	1.03	12	0.0120	1.08	3.50	3.63	0.30
A4	EX-DMH	227.40	DMH209	225.50	78	2.44	15	0.0120	2.19	6.13	10.92	0.20
A5	EX CB265&266	224.00	DMH209	223.50	32	1.56	12	0.0120	1.44	2.13	7.78	0.18
A6	DMH209	225.30	DMH205	224.10	115	1.04	18	0.0140	3.51	3.38	9.97	0.35
A7	AD2	226.50	DMH205	225.00	62	2.43	12	0.0120	3.71	7.10	6.01	0.62
A8	AD3	231.20	DMH205	230.80	26	1.55	12	0.0130	0.06	1.89	4.44	0.01
A9	DMH205	224.00	DMH200	222.90	143	0.77	18	0.0140	7.06	4.64	8.56	0.83
B1	RD1	224.80	Wye1	224.35	58	0.78	12	0.0130	1.13	2.46	3.14	0.36
B2	RD3	224.80	Wye1	224.45	17	2.08	8	0.0130	0.79	3.32	1.74	0.46
B3	Wye1	224.35	DMH208	223.80	75	0.73	12	0.0150	1.88	3.10	2.64	0.71
B4	AD4	231.20	DMH208	230.50	39	1.78	12	0.0150	0.11	2.22	4.12	0.03
B5	RD2	224.80	DMH208	224.50	17	1.78	8	0.0130	0.80	3.96	1.61	0.49
B6	DMH208	223.70	DMH200	223.30	38	1.04	12	0.0120	2.68	3.93	3.94	0.68
C1	DMH200	222.80	DMH201	222.00	75	1.06	18	0.0130	9.42	6.05	10.83	0.87
C2	DMH201	221.90	DMH202	220.00	127	1.49	18	0.0120	9.43	7.40	13.89	0.68
C3	TD	220.20	DMH202	220.00	19	1.04	10	0.0150	0.38	1.67	1.93	0.20
C4	DMH202	219.50	DMH203	219.10	38	1.04	24	0.0120	9.61	4.06	25.03	0.38
C5	DMH203	219.00	WYE2	218.84	39	0.41	24	0.0120	9.56	4.02	15.68	0.61
C6	RD4	219.00	WYE2	218.84	25	0.63	8	0.0130	0.80	2.88	0.96	0.84
C7	WYE2	218.84	WYE3	218.49	84	0.42	24	0.0120	10.06	3.32	15.81	0.64
C8	RD5	219.00	WYE3	218.49	24	2.17	8	0.0130	0.80	3.26	1.78	0.45
C9	WYE3	218.49	WYE4	218.26	55	0.42	24	0.0120	10.53	3.35	15.80	0.67
D1	AD5/AD6	221.00	WYE4	220.00	4	26.77	8	0.0120	0.58	9.74	8.30	0.07
D2	WYE4	218.26	Out-1Pipe - (123)	218.14	29	0.41	24	0.0120	10.89	3.51	15.64	0.70
D3	Out-1Pipe - (123)	218.14	WYE5	218.04	25	0.40	24	0.0150	10.89	3.78	12.44	0.88
D4	RD6	230.31	WYE5	217.98	14	86.65	8	0.0130	1.15	5.17	11.25	0.10
D5	WYE5	218.04	OCS204	217.80	58	0.41	24	0.0120	11.61	4.89	15.77	0.74
D6	RD7	219.00	OCS204	218.50	14	3.63	10	0.0130	1.03	5.21	4.18	0.25
D7	OCS204	217.20	BAYFILTER	217.14	11	0.54	12	0.0120	4.84	7.54	8.68	0.56
D8	OCS204	217.70	DMH206	217.50	18	1.14	24	0.0120	7.44	5.62	26.16	0.28
E1	DMH206	214.90	DMH207	214.80	13	0.78	24	0.0120	7.43	2.50	21.65	0.34
E2	BAYFILTER	214.60	DMH207	214.50	11	0.88	12	0.0150	4.84	6.16	4.10	1.18
E3	DMH207	214.80	BCD-DMH	214.50	10	2.91	18	0.0150	12.26	7.78	15.54	0.79

Junction Input

Juntion Name	Invert Elevation (ft)	Rim Elevation (ft)
AD2	226.50	231.90
AD3	231.20	234.20
AD4	231.20	234.20
AD5/AD6	221.50	224.20
BAYFILTER	214.60	215.76
CB100	230.01	234.20
DMH200	221.00	233.00
DMH201	221.60	228.00
DMH202	219.50	234.00
DMH203	219.00	227.00
DMH205	223.50	233.00
DMH206	214.90	222.38
DMH207	214.80	220.80
DMH208	221.60	234.00
DMH209	225.30	231.30
DMH210	228.98	234.98
EX CB265&266	224.00	230.00
EX. CB 267&268	226.10	235.39
EX-DMH	227.40	234.00
OCS204	217.70	221.00
Out-1Pipe - (123)	218.00	227.20
RD1	224.80	230.00
RD2	224.80	225.55
RD3	224.45	230.45
RD4	219.00	232.00
RD5	219.00	232.00
RD6	219.00	232.00
RD7	219.00	232.00
TD	219.00	222.80
Wye1	223.70	234.00
WYE2	218.84	224.80
WYE3	218.40	224.80
WYE4	218.20	227.20
WYE5	217.98	236.19

APPENDIX E

Long-Term Pollution Prevention and Stormwater Operation and Maintenance Plan

Babson College
Webster Athletic Center Renovation and Expansion

Operation and Maintenance Plan (O&M) and Long Term Pollution Prevention Plan (LTPPP)

October 13, 2016

This Stormwater Management System Operation and Maintenance Plan provides for the inspection and maintenance of structural Best Management Practices (BMPs) and for measures to prevent pollution associated with the updated stormwater management system proposed for the Webster Hall renovation project at Babson College in the Town of Wellesley.

This document has been prepared in accordance with Standards 4 and 9 of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards.

Responsible Party

The Responsible Party indicated below shall implement the management practices outlined in this document and proactively conduct operations at the project site in an environmentally responsible manner. Compliance with this document does not in any way dismiss the responsible party, owner, property manager, or occupants from compliance with other applicable federal, state or local laws.

Inspection logs must be submitted to the Town of Wellesley Town Engineer.

David Grissino
Director of Capital Projects and Planning
Facilities Management and Planning
Babson College
231 Forest Street
Wellesley, MA 02481
Phone: (781) 235-1200

Maintenance Measures

The stormwater management system covered by this Operation and Maintenance Plan consists of the following components:

- Deep Sump Catch Basins
- Bioretention Basin
- Water Quality Structures
- Area Drains

Maintenance of these components will be conducted in accordance with maintenance practices, as noted in the attached Operation and Maintenance table summarizing the pertinent inspection and maintenance activities.

Practices for Long Term Pollution Prevention

Babson College shall implement the following good housekeeping procedures at the project site to reduce the possibility of accidental releases and to reduce safety hazards.

For the facilities covered by this Operation and Maintenance Plan, long term pollution prevention includes the following measures:

Storage of Hazardous Materials

To prevent leaks and spills, keep hazardous materials and waste products under cover or inside. Use drip pans or spill containment systems to prevent chemicals from entering the drainage system. Inspect storage areas for materials and waste products at least once per year to determine amount and type of the material on site, and if the material requires disposal.

Securely store liquid petroleum products and other liquid chemicals in federally- and state-approved containers. Restrict access to maintenance personnel and administrators.

Storage of Waste Products

Collect and store all waste materials in securely lidded dumpster(s) or other secure containers as applicable to the material. Keep dumpster lids closed and the areas around them clean. Do not fill the dumpsters with liquid waste or hose them out. Sweep areas around the dumpster regularly and put the debris in the garbage, instead of sweeping or hosing it into the campus roadway. Legally dispose of collected waste on a regular basis.

Segregate liquid wastes, including motor oil, antifreeze, solvents, and lubricants, from solid waste and recycle through hazardous waste disposal companies, whenever possible. Separate oil filters, batteries, tires, and metal filings from grinding and polishing metal parts from common trash items and recycle. These items are not trash and are illegal to dump. Contact a hazardous waste hauler for proper disposal to a hazardous waste collection center.

Spill Prevention and Response

Implement response procedures for releases of significant materials such as fuels, oils, or chemical materials onto the ground or other areas that could reasonably be expected to discharge to surface or groundwater.

- For minor spills, keep fifty (50) gallon spill control kits and Speedy Dry at all shop and work areas.

- Immediately contact applicable Federal, State, and local agencies for reportable quantities as required by law.

- Immediately perform applicable containment and cleanup procedures following a spill release.

- Promptly remove and dispose of all material collected during the response in accordance with Federal, State and local requirements. A licensed emergency response contractor may be required to assist in cleanup of releases depending on the amount of the release, and the ability of the Contractor to perform the required response.

- Reportable quantities of chemical, fuels, or oils are established under the Clean Water Act and enforced through DEP.

- Any petroleum based spill over 10 gallons requires immediate notification of the Wellesley Fire Department and Massachusetts Department of Environmental Protection.

Routine Inspection and Maintenance of Stormwater BMPs
Babson will conduct inspection and maintenance of the stormwater management practices in accordance with the guidelines discussed above.

Spill Prevention and Response

Babson College will implement response procedures for releases of significant materials such as fuels, oils, or chemical materials onto the ground or other areas that could reasonably be expected to discharge to surface or groundwater.

- Reportable quantities will immediately be reported to the applicable Federal, State, and local agencies as required by law.

- Applicable containment and cleanup procedures will be performed immediately. Impacted material collected during the response must be removed promptly and disposed of in accordance with Federal, State, and local requirements. A licensed emergency response contractor may be required to assist in cleanup of releases depending on the amount of the release and the ability of the responsible party to perform the required response.

- Reportable quantities of chemical, fuels, or oils are established under the Clean Water Act and enforced through DEP.

Minimize Soil Erosion

Soil erosion facilitates mechanical transport of nutrients, pathogens, and organic matter to surface water bodies. Repair all areas where erosion is occurring throughout the project site. Stabilize bare soil with riprap, seed, mulch, or vegetation.

Maintenance of Landscaped Areas

Babson College shall minimize the use of fertilizers, herbicides, and pesticides for the maintenance of facilities covered by this plan. Dumping of lawn wastes, brush or leaves or other materials or debris is not permitted in any Resource Area. Grass clippings, pruned branches and any other landscaped waste should be disposed of or composted in an appropriate location.

Snow and Ice Management

Snow and Ice Management shall be conducted consistent with Babson College's standard practices.

Prohibition of Illicit Discharges

The DEP Stormwater Management Standards prohibit illicit discharges to the storm water management system. Illicit discharges are discharges that do not entirely consist of stormwater, except for certain specified non-stormwater discharges.

Discharges from the following activities are not considered illicit discharges:

- firefighting
- water line flushing
- landscape irrigation
- uncontaminated groundwater
- potable water sources
- water used to clean residential buildings without detergents
- foundation drains
- footing drains
- individual resident car washing
- flows from riparian habitats and wetlands
- dechlorinated water from swimming pools
- water used for street washing
- air conditioning condensation

There are no known or proposed illicit connections associated with this project. If a potential illicit discharge to the facilities covered by this Plan is detected (e.g., dry weather flows at any pipe outlet, evidence of contamination of surface water discharge by non-stormwater sources), Babson College shall determine the nature and source of the discharge, and correct the illicit disharge.

Stormwater Operation and Maintenance Requirements

Inspect and maintain the stormwater management system as directed below. Repairs to any component of the system shall be made as soon as possible to prevent any potential pollutants (including silt) from entering the resource areas.

Deep Sump and Hooded Catch Basins

- Inspect catch basins biannually at the end of the foliage and snow removal seasons.
- Repair catch basin structures if damage is observed.
- Remove organic material, sediment and hydrocarbons annually or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin.
- Always clean out catch basins after street sweeping. If any evidence of hydrocarbons is found during inspection, the material shall be immediately removed using absorbent pads or other suitable measures and dispose of legally. Remove other accumulated debris as necessary.
- Transport and disposal of accumulated sediment offsite shall be in accordance with applicable local, state and federal guidelines and regulations.
- The inspection and maintenance of the deep sump catch basins may be located within a road with active traffic. The Babson College shall utilize appropriate temporary traffic control measures to safeguard workers.

Bioretention Basin

- Perform annual maintenance of all components of the bioretention area, including plants, soil, and mulch. Table 1, below, outlines recommended maintenance activities.

Table 1. Bioretention area maintenance recommendations

Location	Description	Frequency	Time of Year
Surface	Inspect and remove trash	Monthly	Year round
Soil	Inspect and repair erosion	Monthly	Year round
Organic Layer	Remulch void areas	Annually	Spring
	Remove previous mulch layer before applying new layer (optional)	Annually	Spring
Plants	Water vegetation at end of day for 14 consecutive days after planting	Immediately after planting	As needed
	Remove and replace all dead and diseased vegetation that cannot be treated	Annually	Spring
	Treat all diseased trees and shrubs	As needed	Variable

During and after storm events, record the length of time standing water remains in the bioretention areas. If the time is greater than 72 hours, thoroughly inspect the basins for signs of clogging and develop a corrective action plan. The corrective action plan, prepared by a qualified professional, will outline procedures to restore infiltrative function. The owner of the site shall take immediate action to implement these corrective measures.

Area Drains

- Inspect area drains biannually at the end of the foliage and snow removal seasons.
- Repair area drain structures if damage is observed.
- Remove debris from the grate. Clean out accumulated sediments at least once per year and more frequently as necessary.
- Transport and disposal of accumulated sediment off-site shall be in accordance with applicable local, state and federal guidelines and regulations.

Water Quality Units (Proprietary Separators)

Maintain water quality units according the recommendations set forth by the manufacturer. General inspection and maintenance procedures for proprietary devices are provided below:

- Inspect units following completion of construction, prior to being put into service.
- Repair Water Quality Units if damage is observed.
- Inspect units biannually at the end of the foliage and snow removal seasons.
- Inspect units immediately after any oil, fuel or chemical spill.
- All inspections shall include checking the oil level and sediment depth in the unit. Removal of sediments/oils shall occur per manufacturer recommendations.
- A licensed waste management company shall remove captured petroleum waste products from any oil, chemical or fuel spills and dispose.
- OSHA confined space entry protocols shall be followed if entry into the unit is required.

BayFilter Maintenance Requirements

The BayFilter™ system requires periodic maintenance to continue operating at the design efficiency. The maintenance process comprises the removal and replacement of each BayFilter™ cartridge and drain down module and the cleaning of the vault or manhole with a vacuum truck. BayFilter™ maintenance should be performed by a BaySaver Technologies, Inc. certified maintenance contractor, or approved equal.

The maintenance cycle of the BayFilter™ system will be driven mostly by the actual solids load on the filter. The system should be periodically monitored to be certain it is operating correctly. Since stormwater solids loads can be variable, it is possible that the maintenance cycle could be more or less than the projected duration.

The BayFilter™ systems for the project are designed to treat the WQv in 24 hours initially. Later in the cycle these cartridges will flow at a slower rate, and when the WQv does not drain down within 40± hours after the storm event, the system must be maintained. It is recommended that it be inspected every six (6) months. When the filter system exhibits flows below design levels the system should be maintained. Filter cartridge replacement should also be considered when the sediment levels are at or above the level of the 4 inch manifold system.

Sample BayFilter™ Maintenance Procedure

1. Remove the manhole cover.
2. Before entering the system make sure the air is safe per OSHA Standards or use breathing Apparatus. Use low O2, high CO, or other applicable warning devices per regulatory requirements.
3. Using a vacuum truck, remove any liquid and sediments that can be removed prior to entry.
4. Using a small lift or the boom of the vacuum truck, remove the used cartridges by lifting them out.
5. Any cartridges that cannot be readily lifted can be easily slid along the floor to a location that can be lifted via a boom lift.
6. When all the cartridges have been removed, it is now practical to remove the balance of the solids and water. Loosen the stainless clamps on the Fernco couplings for the manifold and remove the drainpipes as well. Carefully cap the manifold and the Fernco couplings and rinse the floor, washing away the balance of any remaining collected solids.
7. Clean the manifold pipes, inspect and reinstall.
8. Install the exchange cartridges and close all covers.
9. The used cartridges must be sent back to BaySaver Technologies for exchange/recycling and credit on undamaged units.

INSPECTION CHECKLIST (DEEP SUMP AND HOODED CATCH BASINS)		
Location: **Date:** **Time:** **Date Since Last Rain Event:**		**Inspector:** **Site Conditions:**
Inspection Items	**Satisfactory (S) or Unsatisfactory (U)**	**Comments/Corrective Action**
Inspections (2 times a year minimum, Spring & Fall)		
Visual evidence of trash, debris or dumping	S U	
Dead animals or vegetation that could generate odors or gases and could cause complaints	S U	
Evidence of oil, gasoline, contaminants, or other pollutants	S U	
Condition of basin. Is there a safety, function, or design problem (need for repair)	S U	
Vegetation blocking more than 10% of the basin opening (lawn areas)	S U	
Trash and debris blocking more than 20% of grate surface inlet capacity	S U	
Missing grate, missing or broken grate members	S U	
Grout fillet is separated or cracked wider than ½ inch and longer than 1 foot at the joint of outlet pipe; evidence of soil entering through cracks	S U	
Trash or debris in the basin exceeds 50% of the sump depth from the bottom of basin to invert of the outlet pipe; less than 6 inches clearance from the debris surface to the invert of the outlet pipe	S U	
Sediment in the basin exceeds 50% of the sump depth from the bottom of basin to invert of the outlet pipe; less than 6 inches clearance from the debris surface to the invert of the outlet pipe	S U	
Trash or debris blocking outlet pipe	S U	
Debris Cleanup (2 times a year minimum, Spring & Fall)		
Remove and legally dispose sediment, trash, and debris	S U	
Remove and legally dispose contaminants or pollutants	S U	
Repair catch basin (as necessary)	S U	
Replace catch basin castings (as necessary)		
Controlling Run-On (2-4 times a year)		
Adjacent vegetated areas show no signs of erosion and run-on to catch basin	S U	
Corrective Action Needed		**Due Date**
1.		
2.		
3.		
4.		

INSPECTION CHECKLIST (WATER QUALITY UNITS)		
Location: **Date:** **Time:** **Date Since Last Rain Event:**		**Inspector:** **Site Conditions:**
Inspection Items	**Satisfactory (S) or Unsatisfactory (U)**	**Comments/Corrective Action**
Inspections (2 times a year minimum, Spring & Fall)		
Visual evidence of trash, debris or dumping	S U	
Evidence of oil, gasoline, contaminants, or other pollutants	S U	
Condition of structure. Is there a safety, function, or design problem (need for repair)	S U	
Condition of frame and cover	S U	
Sediment in the basin exceeds manufacturer recommended levels	S U	
Trash or debris blocking inlet/outlet pipe	S U	
Debris Cleanup (2 times a year minimum, Spring & Fall)		
Remove and legally dispose sediment, trash, and debris	S U	
Remove and legally dispose contaminants or pollutants	S U	
Repair structure (as necessary)	S U	
Replace structure castings (as necessary)		
Corrective Action Needed		**Due Date**
1.		
2.		
3.		
4.		

INSPECTION CHECKLIST (BIORETENTION AREA)		
Location: **Date:** **Time:** **Date Since Last Rain Event:**		**Inspector:** **Site Conditions:**
Inspection Items	**Satisfactory (S) or Unsatisfactory (U)**	**Comments/Corrective Action**
Initial Inspection After Planting		
Plants are stable, roots not exposed	S U	
Surface is at design level	S U	
Overflow bypass/inlet is functional	S U	
Debris Cleanup (2 times a year minimum, Spring & Fall)		
Litter, leaves, and dead vegetation removed from the system	S U	
Prune perennial vegetation	S U	
Standing Water (1 time a year, After large storm events)		
No evidence of standing water after 72 hours	S U	
Short Circuiting & Erosion (1 time a year, After large storm events)		
No evidence of animal burrows or other holes	S U	
No evidence of erosion	S U	
Drought Conditions (As needed)		
Water plants as needed	S U	
Dead or dying plants	S U	
Overflow Bypass/Inlet Inspection (1 time a year, After large storm events)		
No evidence of blockage or accumulated leaves	S U	
Good condition, no need for repair	S U	
Vegetation Coverage (once a year)		
50% coverage established throughout system by first year	S U	
Substantial coverage by year 2 or later	S U	
Vegetation Health (once every 3 years)		
Dead or decaying plants removed from the system	S U	
Corrective Action Needed		**Due Date**
1.		
2.		
3.		
4.		

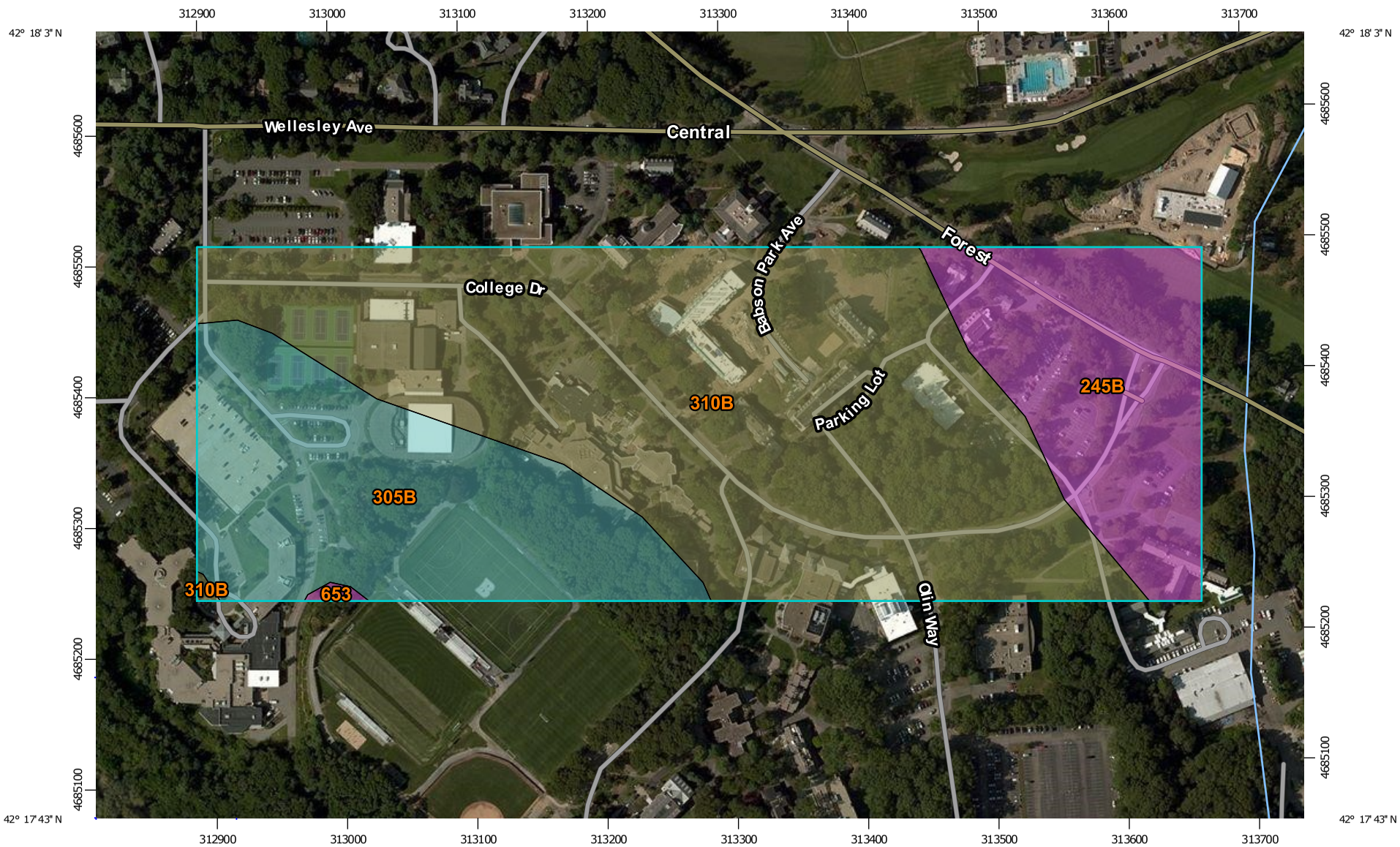
INSPECTION CHECKLIST (AREA DRAINS)		
Location: **Date:** **Time:** **Date Since Last Rain Event:**		**Inspector:** **Site Conditions:**
Inspection Items	**Satisfactory (S) or Unsatisfactory (U)**	**Comments/Corrective Action**
Inspections (2 times a year minimum, Spring & Fall)		
Visual evidence of trash, debris or dumping	S U	
Dead animals or vegetation that could generate odors or gases and could cause complaints	S U	
Evidence of oil, gasoline, contaminants, or other pollutants	S U	
Condition of basin. Is there a safety, function, or design problem (need for repair)	S U	
Vegetation blocking more than 10% of the basin opening (lawn areas)	S U	
Trash and debris blocking more than 20% of grate surface inlet capacity	S U	
Missing grate, missing or broken grate members	S U	
Trash or debris in the basin exceeds 50% of the sump depth from the bottom of basin to invert of the outlet pipe; less than 6 inches clearance from the debris surface to the invert of the outlet pipe	S U	
Sediment in the basin exceeds 50% of the sump depth from the bottom of basin to invert of the outlet pipe; less than 6 inches clearance from the debris surface to the invert of the outlet pipe	S U	
Trash or debris blocking outlet pipe	S U	
Debris Cleanup (2 times a year minimum, Spring & Fall)		
Remove and legally dispose sediment, trash, and debris	S U	
Remove and legally dispose contaminants or pollutants	S U	
Repair area drain (as necessary)	S U	
Replace area drain castings (as necessary)		
Controlling Run-On (2-4 times a year)		
Adjacent vegetated areas show no signs of erosion and run-on to area drain	S U	
Corrective Action Needed		**Due Date**
1.		
2.		
3.		
4.		

APPENDIX F

Soil Investigations

NRCS Soil Maps and Descriptions
Foundation Engineering Report Prepared by McPhail Associates dated October 5, 2016

Hydrologic Soil Group—Norfolk and Suffolk Counties, Massachusetts



Map Scale: 1:4,240 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 11, Sep 28, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 10, 2014—Sep 28, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

FOUNDATION ENGINEERING REPORT

WEBSTER ATHLETIC CENTER RENOVATION AND EXPANSION

BABSON PARK, MASSACHUSETTS

OCTOBER 5, 2016

Prepared For:

Babson College
Facilities Management and Planning
231 Forest Street
Babson Park, MA 02457

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PROJECT NO. 6173

October 5, 2016

Babson College
Facilities Management and Planning
231 Forest Street
Babson Park, MA 02457

Attention: Ms. Kerrie Dunn

Reference: Webster Athletic Center Renovation and Expansion; Babson Park, MA
Foundation Engineering Report

Ladies and Gentlemen:

This report documents the results of our subsurface exploration program and foundation design study for the proposed Webster Athletic Center renovation and expansion to be located at Babson College in Babson Park, Massachusetts.

This report was prepared in accordance with our proposal dated May 10, 2016 and the subsequent authorization of Babson College. These services are subject to the limitations contained in Appendix A.

Purpose and Scope

The purposes of the subsurface exploration program and foundation design study are to assess the subsurface soil, rock and groundwater conditions at the site as they relate to foundation design and construction, and based on this information to provide safe and economic foundation design recommendations for the proposed addition.

Foundation design includes foundation support of the proposed addition and its lowest level slab, treatment of the lowest level slab in consideration of groundwater, and seismic design considerations in accordance with the provisions of the Eighth Edition of the Massachusetts State Building Code (Code). Foundation construction considerations relating to geotechnical aspects of the proposed construction are also presented herein.

Existing Site Conditions

The site of the proposed Webster Center expansion is located south of Babson College Drive, east of West Gate Road and north of Bryant Way. The new structure will abut and connect into the existing Webster Center to the south and east. Currently, the majority of the site is occupied by tennis courts. Existing grades generally range from about Elevation +235 along the southern edge of the site to Elevation +220 along Babson College Drive to the north. Grades within the tennis courts are relatively level at approximately Elevation +230.

Proposed Development

The proposed two level addition is understood to be located to the west of the Webster Center and will occupy a footprint of approximately 46,000 square feet. The first level of the addition will match the first floor of the existing Webster Center at approximately Elevation +222 and the second floor will be located at approximately Elevation +234.

As part of the construction of the new addition, the northwest portion of the existing Webster Center will be demolished and replaced.

It is understood the proposed development will also include the installation of stormwater management systems outside the footprint of the proposed addition.

Recent Subsurface Exploration Procedures

During the period of June 2 through June 6, 2016, a subsurface exploration program consisting of eight borings (B-101 through B-108 (OW)) and three (3) test pits (TP-101 through TP-103) was completed at the project site by McPhail Associates, LLC (McPhail). The borings were performed by Geosearch, Inc. of Fitchburg, Massachusetts under contract to McPhail. The test pits were performed by F.E. French Construction, Inc. of Belmont, Massachusetts under contract to McPhail. The approximate plan locations of the recent explorations are included on the enclosed Subsurface Exploration Plan (Figure 2). Boring and test pit logs prepared by McPhail are included in Appendices B and C, respectively, following the text of this report.

The borings were performed using either a geoprobe rig and 3-1/2-inch casing or a track-mounted drill-rig and advanced utilizing 4-1/4-inch diameter hollow-stem augers. Standard 2-inch O.D. split-spoon samples and standard penetration tests were generally obtained at minimum 5-foot intervals of depth in accordance with the standard procedures described in ASTM D1586. The borings were drilled to depths ranging from 9 to 24 feet below the ground surface.

Groundwater observation wells were installed within completed boreholes B-101A(OW), B-104(OW) and B-108(OW). Groundwater Monitoring Reports are presented in Appendix D.

The test pits were excavated to depths ranging from 4.5 to 8.5 feet below existing grade using a CAT 340C excavator, and were terminated in the natural glacial till deposit.

The borings and test pits were observed by a McPhail field representative who performed field layout, prepared field logs, obtained and visually classified soil samples, monitored groundwater conditions in the open explorations, and determined the required exploration depths based upon the actual subsurface conditions encountered.

Field locations of the borings and test pits were determined by taping from features included on a 40-scale drawing entitled “Existing Conditions Plan” dated October 31, 2014 and

prepared by Andrews Survey & Engineering, Inc. The existing ground surface elevation at each exploration location was determined by a level survey performed by our field staff utilizing vertical control information on the above mentioned existing conditions plan.

Previous Subsurface Explorations

McPhail previously performed subsurface explorations in 1986 for an earlier phase of expansion to the Webster Center. The locations of the previous explorations are shown on the enclosed Figure 2 and relevant logs of the previous boring and test pits are included in Appendix E.

Laboratory Testing

At the completion of the field work, soil samples were returned to our laboratory for more detailed classification, analysis and testing. The laboratory testing consisted of sieve analyses to determine the gradations and confirm the visual classifications of the fill material and natural glacial till deposit. Laboratory test procedures were in general accordance with applicable ASTM Standards. Results of the sieve analyses for the fill material and natural glacial till deposit appear in Figures 3 and 4, respectively.

In-Situ Permeability Testing Procedures

On June 21, 2016, a total of three (3) rising head, in-situ permeability tests were performed within the groundwater observation wells which were installed at the site. The permeability tests were conducted at locations B-101A(OW), B-104(OW), and B-108(OW). Each permeability test was performed within the glacial till deposit. The calculated permeability values ranged from 4.0×10^{-5} centimeters per second (cm/sec) to 3.0×10^{-6} cm/sec. These in-situ permeabilities are considered to be representative of the silt content and compact to very dense nature of the relatively impervious glacial till deposit. The results of the individual in-situ permeability tests are presented in Appendix F.

Subsurface Conditions

A detailed description of the subsurface conditions encountered in the borings and test pits is documented on the logs contained in Appendices B, C, and E. Based on the explorations performed at the site, the following is a description of the generalized subsurface conditions across the site encountered from ground surface downward.

Surface treatments across the footprint of the proposed development typically consist of either topsoil or asphalt pavement. The topsoil typically consists of loose, black to dark brown, silt and sand, trace gravel, with organic material and roots. Where encountered, the

topsoil was typically observed to be 0.5 to 3 feet thick. Where asphalt was encountered it was typically observed to be 0.3 to 0.5 feet thick.

The previous borings encountered a layer of subsoil below the topsoil in areas which had not previously been developed. Where encountered, the subsoil typically consists of loose to compact, reddish-brown silt and sand with some gravel and roots. The subsoil was observed to range from 2 to 3.5 feet in thickness. Subsoil is anticipated to be encountered within the western edge of the proposed addition.

In the recent borings, with the exception of borings B-101 and B-101A, the topsoil was typically directly underlain by a layer of fill material consisting of very loose to compact, light brown to dark brown, silt and sand, with trace to some gravel, and trace organic material. At most locations the fill appeared to primarily be reworked natural glacial till. The fill material was observed to range from approximately 1.5 to 7 feet in thickness. Grain size distributions of typical samples of the fill material are presented on the enclosed Figure 3.

Underlying the fill material and/or subsoil material in most of the explorations and directly underlying the topsoil in borings B-101 and B-101A, a natural, inorganic glacial till deposit was encountered. The glacial till deposit typically consists of compact to very dense, grey-brown silt and sand with some gravel. The surface of the glacial till deposit was encountered within the footprint of the proposed addition at depths ranging from 0.5 to 8 feet below ground surface, or from approximately Elevation +227.8 to Elevation +217.8. The recent explorations were either terminated or encountered split-spoon refusal within the glacial till deposit at depths ranging from 5 to 24 feet below existing ground surface, corresponding to levels ranging from Elevation +217 to Elevation +207.2.

The groundwater level in the observation wells was typically observed to range from about Elevation +222.4 to Elevation +211.2 corresponding to depths of 5.9 feet and 9.6 feet below existing ground surface, respectively. Groundwater monitoring reports are contained in Appendix D following the text of this report. It is likely that groundwater is perched within the relatively impervious glacial till deposit and it is anticipated that future groundwater levels across the site may vary from those reported herein due to factors such as normal seasonal changes, runoff particularly during or following periods of heavy precipitation, and alterations of existing drainage patterns.

Existing Foundation Conditions

Test pit TP-101 was performed to document the foundation conditions of the existing Webster Center building. The test pit was performed adjacent to the perimeter foundation wall within the loading dock area on the north side of the structure. The test pit log for TP-101 can be found in Appendix C.

The reinforced concrete foundation wall included a continuous perimeter footing with its bottom observed at a depth of 3.9 feet below the existing ground surface or at

approximately Elevation +218.1. The footing was observed to be approximately 0.9-foot thick and extended approximately 0.5 feet horizontally from the exterior face of the existing foundation wall. The footing was observed to be bearing on a 6-inch thick layer of ¾-inch crushed stone which had been placed above the natural glacial till deposit. The footing appears to be have been backfilled primarily with reworked glacial till.

Foundation Design Recommendations

Based on the scope of the proposed construction and the subsurface conditions encountered at the site, it is recommended that the proposed structure be founded on conventional footing foundations bearing directly on the undisturbed, natural glacial till deposit or on compacted gravel fill placed over the surface of the glacial till deposit following the removal of all topsoil, subsoil, and/or fill material from below the proposed footing locations. The plan limits of the placement of gravel fill for support of the proposed structure should extend laterally beyond the edges of the footings for a horizontal distance equal to the depth measured from the design bottom of footing elevation to surface of the glacial till deposit, plus two feet.

Footings should be proportioned utilizing an allowable design bearing pressure of three (3) tons per square foot. The minimum footing width for perimeter footings and isolated footings should be 24 inches and 30 inches, respectively. All foundations should be designed in accordance with the Code.

Estimated long-term settlement for footings bearing on the glacial till deposit or compacted gravel fill is less than 1-inch and estimated long-term differential settlement of adjacent footings is less than 1/2-inch.

Perimeter foundations and interior foundations below unheated areas should be provided with a minimum 4-foot thickness of soil cover as frost protection. Interior foundations below heated areas should be located such that the top of foundation concrete is a minimum of six inches below the underside of the lowest level slab.

Proposed footings to be located directly adjacent to existing foundations should be founded at the same elevation as the existing foundations. All other foundations should be located such that they bear below a theoretical line drawn upward and outward at 2 to 1 (horizontal to vertical) from the bottom exterior edge of all adjacent existing or proposed footings, structures and/or utilities.

It is recommended that the lowest level slab be designed as a conventional soil-supported slab-on-grade. The slab-on-grade should be underlain by a polyethylene vapor barrier spread across the surface of a minimum 9-inch thickness of compacted 3/4-inch crushed stone placed over a layer of filter fabric that is spread across the subgrade consisting of the undisturbed glacial till deposit. If existing fill material is encountered at the slab subgrade elevation, it should be removed from within the footprint of the proposed addition and replaced with compacted gravel fill.

All gravel fill placed within the footprint of the proposed buildings should be placed in lifts having a compacted thickness of 6 inches and be compacted to a minimum of 95 percent of its maximum Modified Proctor dry density. The gravel fill should consist of a well-graded sand and gravel from a naturally-occurring source with less than eight percent passing the number 200 sieve.

In consideration of the lowest level slab being generally below the proposed exterior finished grades, it is recommended that perimeter and underslab drainage be provided wherever the proposed lowest level floor slab is more than 18 inches below the finished grade. Although groundwater was typically encountered slightly below the proposed lowest level slab during the subsurface exploration programs, the perimeter and underslab drains are intended to minimize groundwater intrusion into the below grade space due to conditions when groundwater may become temporarily elevated or "perched" on the glacial till deposit. The underslab and perimeter drainage systems are not intended to lower the existing groundwater level.

The perimeter drainage system should consist of a 4-inch diameter perforated PVC pipe having the highest invert a minimum of 12 inches below the underside of the lowest level slab. Where possible, the pipe should be pitched down at a minimum 0.5 percent slope in the direction of flow and be surrounded by a minimum 6-inch thickness of 3/4-inch crushed stone surrounded by a thickness of filter fabric such as Mirafi 140N, or equivalent.

The underslab drainage system should consist of a series of 4-inch diameter perforated PVC pipes located within the crushed stone drainage layer and should be surrounded by a minimum 6-inch thickness of 3/4-inch crushed stone. The drain pipes should have an invert at least 12 inches below the bottom of the lowest level slab, and where possible, should be pitched down at a minimum 0.5 percent slope.

The perimeter and underslab drain lines should be gravity drained to a storm drain line that is not subject to surcharge or terminated within a sump pit that discharges into the storm drain system. If required, the sump pit should be equipped with duplex pumps, each of which should be capable of pumping a minimum of 30 gallons per minute against a 20-foot head.

All below-grade walls should receive a troweled-on bitumastic damproofing. A prefabricated drainage product, such as Miradrain 6000, should be installed directly against the below-grade perimeter foundation walls and be tied into the perimeter drainage system. Backfill against the perimeter foundation walls may consist of ordinary fill. Additionally, the exterior site grades should be sloped away from the perimeter of the proposed building to minimize surface water infiltration.

All localized depressions in the lowest level slabs, such as elevator pits, should be provided with properly tied continuous waterstops in all construction joints and metallic waterproofing should be applied to properly prepared interior surfaces to protect against groundwater intrusion.

Below-grade foundation walls receiving lateral support at the top and bottom (i.e. restrained walls) should be designed for a lateral earth pressure corresponding to an equivalent fluid density of 60 pounds per cubic foot. To these values must be added the pressures attributable to earthquake forces per Section 1610.2 of the Code.

Lateral forces can be transmitted from the structure to the soil by passive pressure on the footings utilizing an equivalent fluid density of 120 pounds per cubic-foot providing that these structural elements are designed to resist these pressures. Lateral forces can also be considered to be transmitted from the structure to the soil by friction on the base of the footings using a frictional coefficient of 0.50 to which a factor of safety of 1.5 should be applied.

Seismic Design Considerations

For the purposes of determining parameters for structural seismic design, this site is considered to be a Site Class C as defined in Section 1613.5.5 of the Code. Further, the bearing strata on the proposed site are not considered to be subject to liquefaction during an earthquake based on the criterion of Section 1806.4 of the Code.

Foundation Construction Considerations

The primary construction considerations include preparation of the foundation bearing surfaces, subgrade protection, relocation of existing utilities, construction dewatering, and reuse of on-site soils.

The final excavation of the footing subgrade should be accomplished using an excavator that is equipped with smooth-edged bucket to avoid disturbance of the bearing surface. Further, it is recommended that as soon as the bearing surface is exposed, it be immediately covered with a minimum 3-inch thickness of compacted 3/4-inch crushed stone to prevent disturbance of the subgrade during subsequent forming operations.

Where existing utilities and structures are located within the footprint of the proposed addition, they should be relocated prior to construction. The resulting abandoned utility/structure and associated backfill should be removed and replaced with compacted gravel fill.

Due to the moderate to high silt content of the existing glacial till deposit, proper control of groundwater and surface water will be necessary to maintain a firm subgrade to support construction traffic. Based on the soil and groundwater conditions encountered in the subsurface explorations, it is anticipated that groundwater and surface water can be controlled using conventional sumping. Pumped groundwater should be recharged on site where possible. Otherwise, the appropriate dewatering discharge permits should be obtained prior to discharging water into nearby storm drains. Even with proper control of both surface water and groundwater, it is probable that during periods of wet weather off-

site gravel fill and/or crushed stone may be required to maintain trafficability for construction equipment.

Due to the moderate to high silt content of the existing fill material and glacial till, these soils are not anticipated to be suitable for reuse as structural fill. However, the existing fill material and the glacial till deposit are anticipated to be suitable for reuse as ordinary fill, provided that they are maintained in a relatively dry condition and can be properly compacted. The explorations indicate the presence of cobbles and boulders in the glacial till deposit. Thus, prior to reusing the glacial till as ordinary fill, it will be necessary to cull out all material in excess of 6 inches in largest dimension.

As indicated above, the existing fill material and the glacial till deposit contain a moderate to high silt content. Hence, it is emphasized that these excavated soils can become unsuitable for reuse as ordinary fill if they become too wet. It is recommended that stockpiles of excavated material intended for reuse be protected against increases in moisture content by securely covering the stockpiles prior to and during precipitation events. Therefore, the placement and compaction of the on-site soil should be completed during relatively dry and non-freezing conditions.

Chemical Testing Results

Current Department of Environmental Protection (DEP) policies and regulations for off-site disposal of excess excavated soil require environmental characterization of the excess excavated soil prior to its off-site disposal. In general, one full suite of chemical analyses per 500 cubic yards of topsoil and fill material and one full suite of chemical testing per 1,000 cubic yards of glacial till material is typically required by the receiving facilities. Therefore, based on the actual volume of topsoil, fill material, and glacial till that is required to be removed from the site, some chemical testing of soil samples may be required for the off-site disposal of excess excavated soil.

In consideration that some off-site disposal of soil will be required, McPhail performed preliminary soil pre-characterization for the site. A total of two (2) samples, one (1) fill material and one (1) glacial till, were submitted for chemical testing. Specifically, the samples were submitted for laboratory analysis for the presence of pH, reactivity, ignitability, specific conductance, total RCRA-8 metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons (TPH).

Preparation of samples for laboratory testing was conducted by compositing multiple discrete soil samples together to comprise one composite sample to be tested for the above referenced parameters. With respect to VOC testing representative of each composite, the discrete sample with the highest PID headspace screening level was preserved and submitted for VOC testing.

Chemical test data is included in Appendix G and is summarized in Table 1.

Reported levels of pH in the tested samples ranged from 6.3 Standard Units (S.U.) up to 7.1 S.U. No reactive cyanide or sulfide was detected in any of the samples. The results indicate that the samples tested are not considered to be ignitable. Results indicated levels of specific conductance ranging from 17 umhos/cm to 19 umhos/cm.

Analysis for RCRA-8 metals indicated the presence of arsenic, barium, and chromium at maximum concentrations of 3 milligrams per kilogram (mg/kg), 28 mg/kg, and 12 mg/kg, respectively. The detected concentrations of arsenic, barium, and chromium are all below the applicable RCS-1 Reportable Concentrations in soil as defined in the MCP, 310 CMR 40.0000.

Cadmium, lead, mercury, selenium, and silver were not detected at concentrations above the laboratory method detection limits, which are below the applicable RCS-1 reporting standards.

The presence of PCBs, SVOCs, VOCs, and TPH were also not detected at concentrations above the applicable laboratory method detection limits, which were generally below the applicable RCS-1 reporting standards.

Based on the results of the preliminary soil pre-characterization, it appears the fill material is suitable for re-use or disposal at a Less than RCS-1 facility and the natural glacial till deposit is considered Unregulated for off-site disposal. However, additional chemical testing will likely be required to fully characterize the soil for off-site disposal once the total volume of excess soil has been determined. McPhail Associates, LLC can provide these services should they be required for this project.

Final Comments

Under the terms of our contract, McPhail Associates, LLC will provide design assistance to the design team during the final design phase of this project. The purpose of this involvement will be to review the structural foundation drawings and foundation notes for conformance with the recommendations presented herein and to prepare the earthwork specification section for inclusion into the Contract Documents for construction.

McPhail Associates, LLC has also been retained during the construction period to observe final preparation of the foundation bearing surfaces and to monitor placement and compaction of fill materials in accordance with the provisions of the Code and the provisions of the Contract Documents. Our involvement during the construction phase of the work should minimize costly delays due to unanticipated field problems since our field engineer would be under the direct supervision of our project manager who was responsible for the subsurface exploration program and foundation design recommendations documented herein.

We trust that the above is sufficient for your present requirements. Should you have any questions concerning the recommendations presented herein, please do not hesitate to contact us.

Very truly yours,

McPHAIL ASSOCIATES, LLC

Benjamin E. Downing, P.E.

Chris M. Erikson, P.E.

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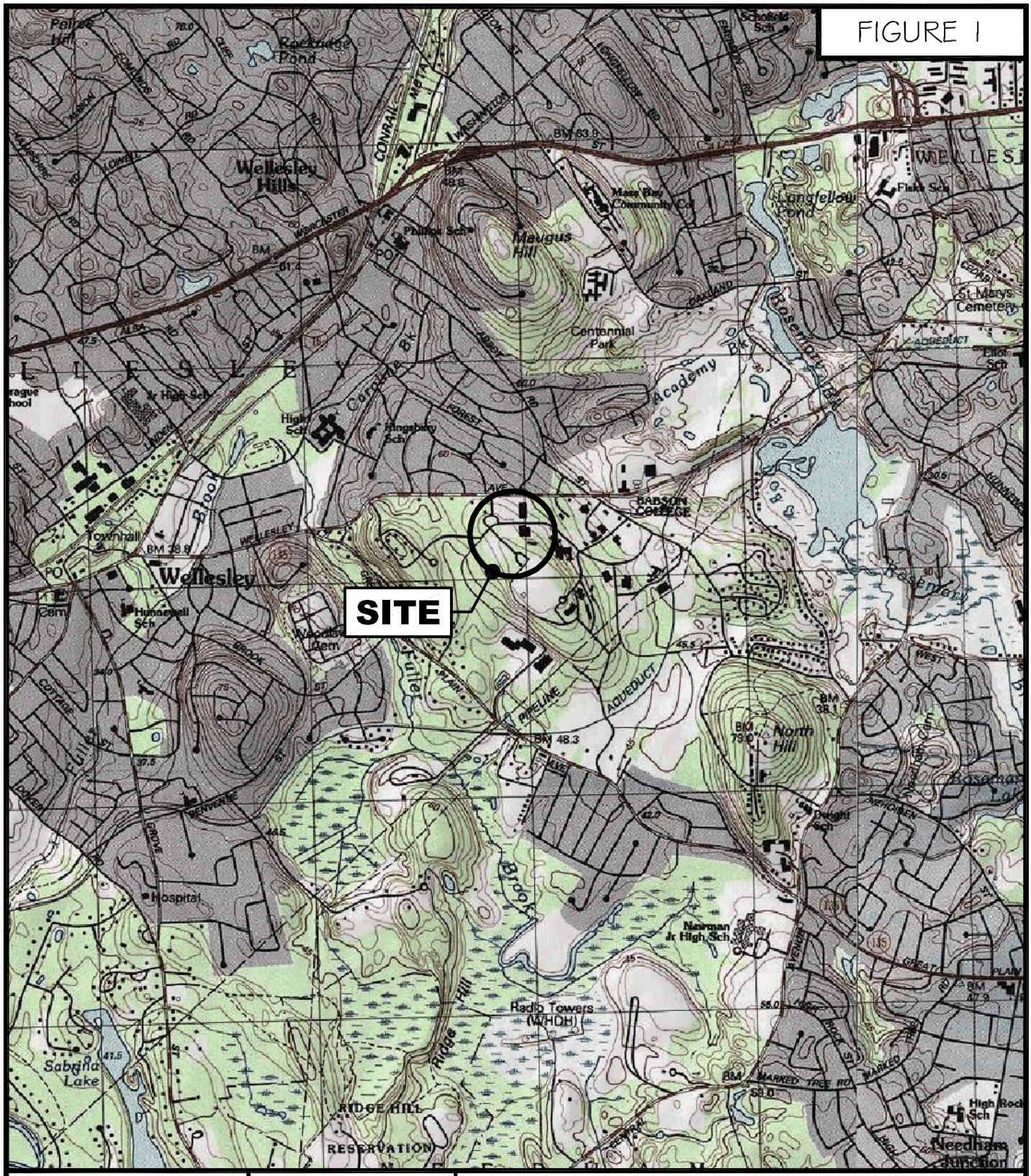
BED/cme

FIGURE 1



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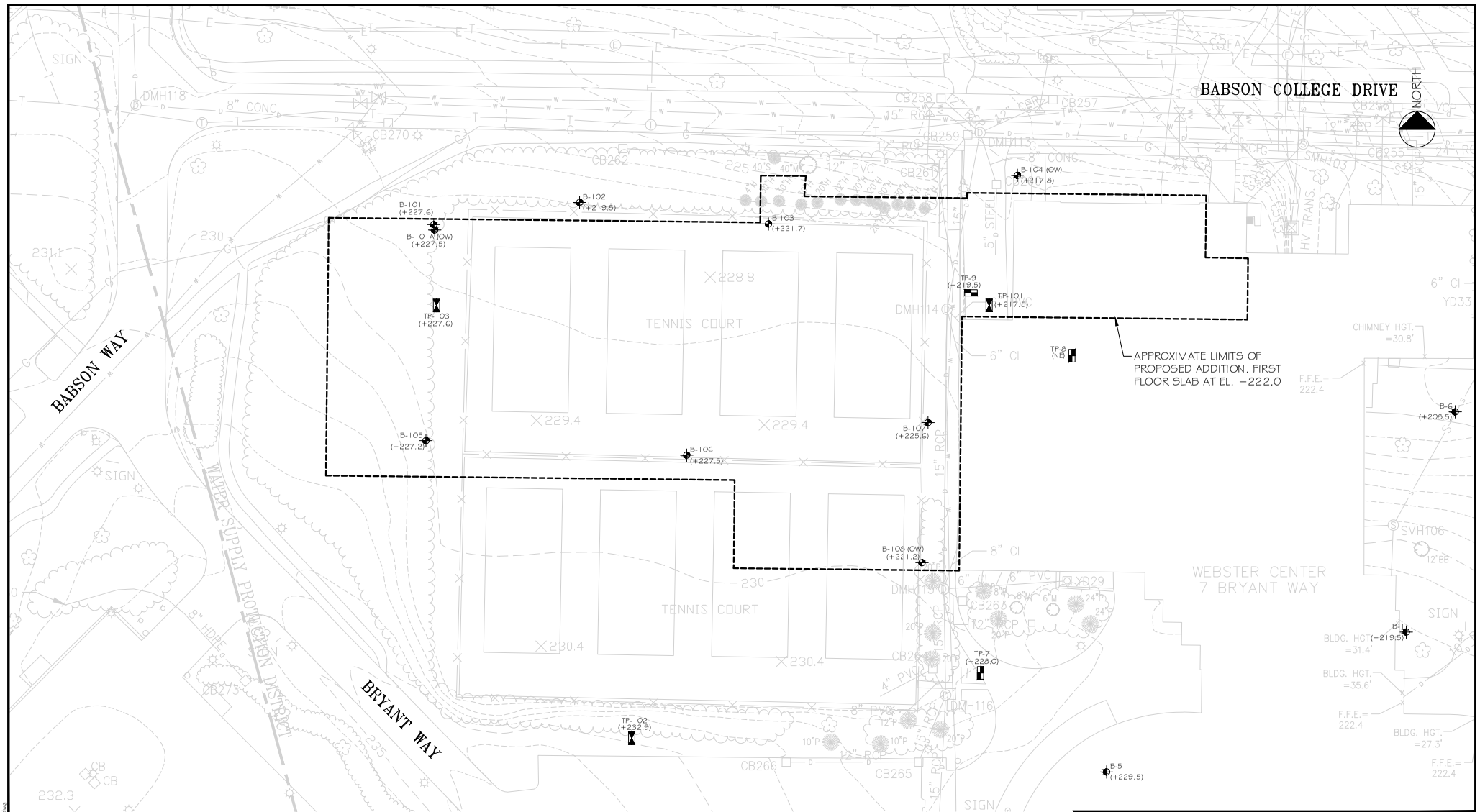
SCALE 1:25,000

PROJECT LOCATION PLAN

BABSON COLLEGE RECREATION AND ATHLETIC CENTER (BRAC) ADDITION

BABSON PARK MASSACHUSETTS



LEGEND

- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY F.E. FRENCH CONSTRUCTION, INC. ON JUNE 6, 2016 UNDER CONTRACT TO McPHAIL ASSOCIATES, LLC
- APPROXIMATE LOCATION OF BOREHOLE PERFORMED BY GEOSEARCH INC. DURING THE PERIOD OF JUNE 2 THROUGH JUNE 6, 2016 UNDER CONTRACT TO McPHAIL ASSOCIATES, LLC
- APPROXIMATE LOCATION OF TEST PIT PERFORMED BY G. GREENE CONSTRUCTION CO., INC. DURING JULY, 1986 FOR McPHAIL ASSOCIATES, INC.
- APPROXIMATE LOCATION OF BORING PERFORMED BY CARR-DEE CORP. DURING JULY, 1986 FOR McPHAIL ASSOCIATES, INC.

(+227.6)— INDICATES ELEVATION OF TOP OF GLACIAL TILL DEPOSIT ENCOUNTERED AT EXPLORATION

(NE)— INDICATES TOP OF GLACIAL TILL DEPOSIT NOT ENCOUNTERED AT EXPLORATION

(OW)— INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE

REFERENCE: THIS PLAN WAS PREPARED FROM A 40-SCALE DRAWING ENTITLED "EXISTING CONDITIONS PLAN" DATED OCTOBER 31, 2014 BY ANDREWS SURVEY & ENGINEERING, INC.

GRAPHIC SCALE

20 0 20 40 80

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BABSON COLLEGE RECREATION AND ATHLETIC CENTER (BRAC) ADDITION

BABSON PARK MASSACHUSETTS

SUBSURFACE EXPLORATION PLAN

FOR

BABSON COLLEGE

BY

McPHAIL ASSOCIATES, LLC

Date: JUNE 2016	Dwn: I.J.M.	Chkd: M.B.S.	Scale: 1" = 20'
Project No: 6173			FIGURE 2

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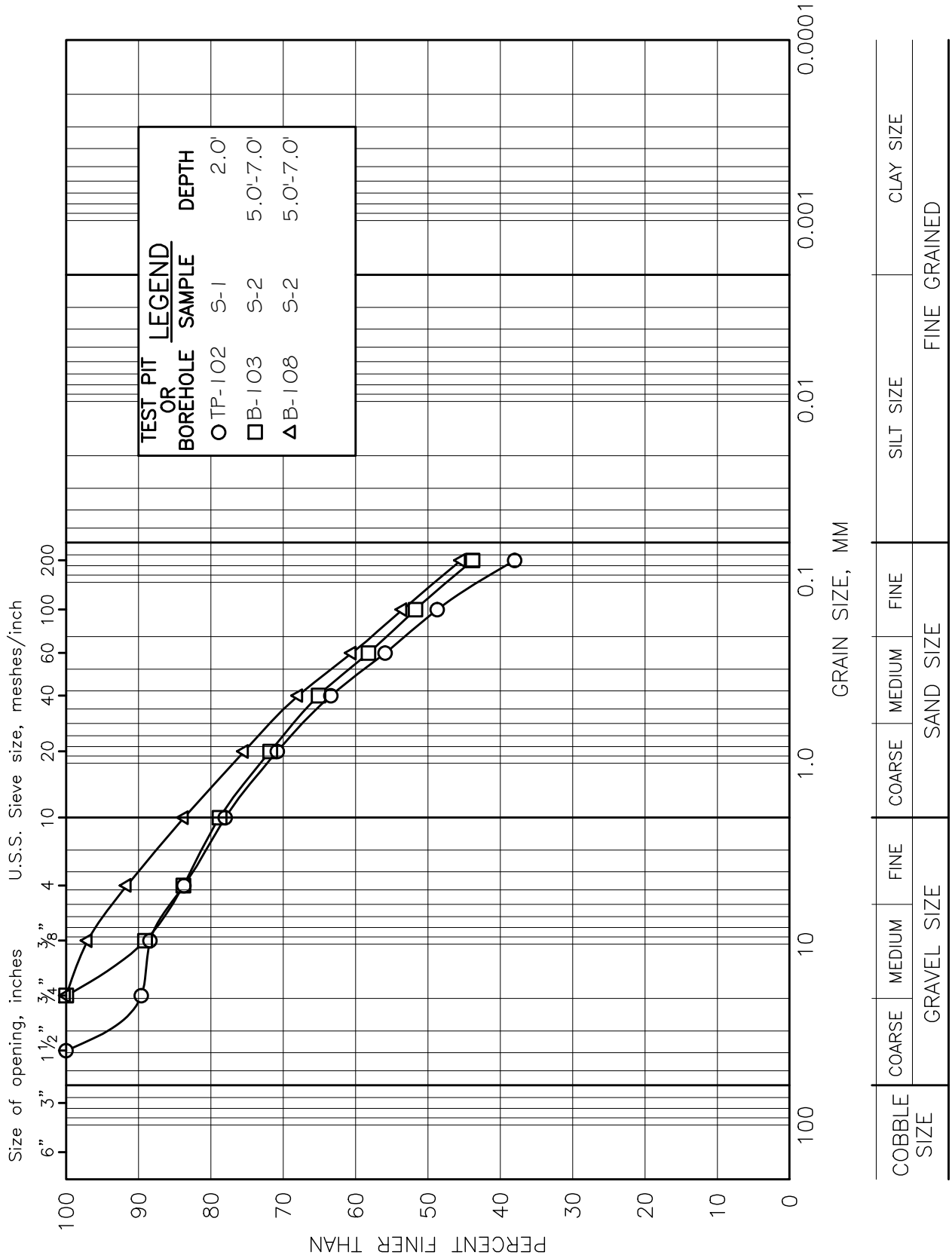
PROJECT No. 6173

GRAIN SIZE DISTRIBUTION

FILL

FIGURE 3



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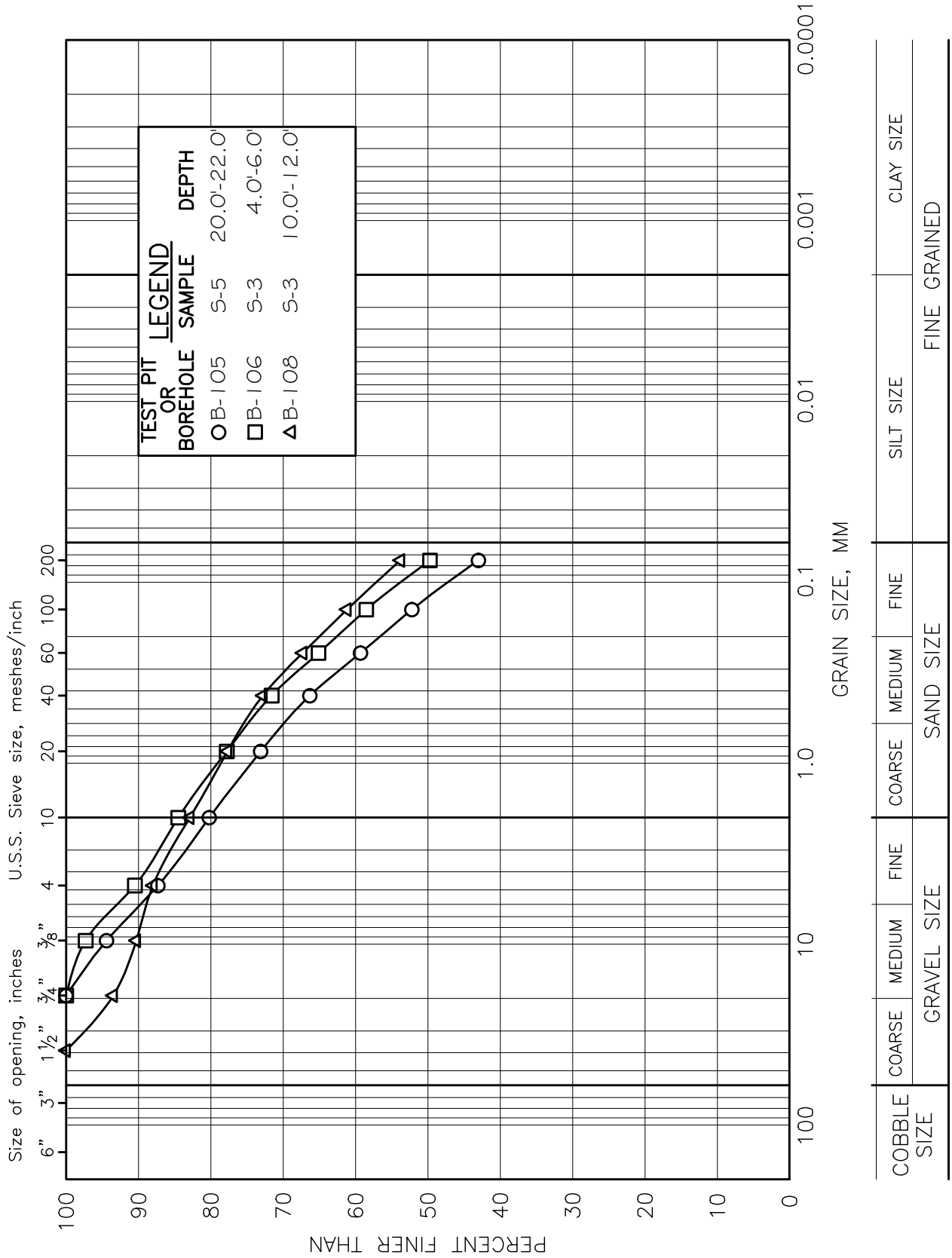
McPHAIL ASSOCIATES, LLC

PROJECT No. 6173

GRAIN SIZE DISTRIBUTION
GLACIAL TILL

FIGURE 4



McPHAIL ASSOCIATES, LLC

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TABLE 1

CHEMICAL TEST RESULTS
BRAC Addition; Babson Park, Massachusetts
McPhail Job No. 6173

LOCATION	In-State Lined Landfill Criteria	In-State Unlined Landfill Criteria	RCS-1 Reporting Standard	FILL COMPOSITE 2-7' B-102, B-107,TP-102	B-107 S-2 5-7' FILL	GLACIAL TILL B-107 10-14'
SAMPLING DATE				6/6/2016	6/6/2016	6/6/2016
LAB SAMPLE ID				L1617912-01	L1617912-02	L1617912-03
General Chemistry						
Specific Conductance				19	-	17
Solids, Total				91	91	92
pH (H)				6.3	-	7.1
Cyanide, Reactive				ND(10)	-	ND(10)
Sulfide, Reactive				ND(10)	-	ND(10)
Ignitability				NI	-	NI
MCP Total Metals (mg/kg)						
Arsenic, Total	40	40	20	3	-	3
Barium, Total			1000	23	-	28
Cadmium, Total	80	30	70	ND(0.43)	-	ND(0.43)
Chromium, Total	1000	1000	100	11	-	12
Lead, Total	2000	1000	200	ND(2.2)	-	ND(2.1)
Mercury, Total	10	10	20	ND(0.069)	-	ND(0.069)
Selenium, Total			400	ND(2.2)	-	ND(2.1)
Silver, Total			100	ND(0.43)	-	ND(0.43)
MCP Polychlorinated Biphenyls (mg/kg)						
Total PCB's			1	ND(0.0366)	-	ND(0.0346)
MCP Semivolatile Organics (mg/kg)						
Benzo(a)anthracene			7	ND(0.11)	-	ND(0.11)
Benzo(a)pyrene			2	ND(0.14)	-	ND(0.14)
Benzo(b)fluoranthene			7	ND(0.11)	-	ND(0.11)
Benzo(k)fluoranthene			70	ND(0.11)	-	ND(0.11)
Chrysene			70	ND(0.11)	-	ND(0.11)
Acenaphthylene			1	ND(0.14)	-	ND(0.14)
Anthracene			1000	ND(0.11)	-	ND(0.11)
Benzo(ghi)perylene			1000	ND(0.14)	-	ND(0.14)
Total SVOC's	100	100		ND	-	ND
MCP Volatile Organics by 5035 High (mg/kg)						
Benzene			2	-	ND(0.1)	ND(0.07)
Toluene			30	-	ND(0.15)	ND(0.1)
Ethylbenzene			40	-	ND(0.1)	ND(0.07)
Xylenes, Total			100	-	ND(0.2)	ND(0.14)
Naphthalene			4	-	ND(0.4)	ND(0.28)
Total VOC's	10	4		-	ND	ND
Petroleum Hydrocarbon Quantitation (mg/kg)						
TPH	5000	2500	1000	ND(35)	-	ND(34.2)
Recommend Disposal Category				**Less than RCS-1**		**Unregulated**

"-" - not tested
ND - Not detected above laboratory method detection limits in ()

APPENDIX A:

LIMITATIONS

LIMITATIONS

This report has been prepared on behalf of and for the exclusive use of Babson College for specific application to the proposed Webster Athletic Center renovation and expansion to be located at Babson College in Babson Park, Massachusetts in accordance with generally accepted soil and geotechnical engineering practices. No other warranty, expressed or implied, is made.

In the event that any changes in nature or design of the proposed construction are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by McPhail Associates.

The analyses and recommendations presented in this report are based upon the data obtained from the subsurface explorations performed at the approximate locations indicated on the enclosed plan. If variations in the nature and extent of subsurface conditions between the widely spaced explorations become evident during the course of construction, it will be necessary for a re-evaluation of the recommendations of this report to be made after performing on-site observations during the construction period and noting the characteristics of any variations.

McPhail Associates, LLC has been retained to provide design assistance to the Architect and Structural Engineer during the final design phase of this project. The purpose of this involvement is to review the structural foundation drawings and foundation notes for conformance with the recommendations herein, and to review the geotechnical and geoenvironmental-related specification sections for inclusion into the Contract Documents for construction

APPENDIX B:

RECENT BORING LOGS PREPARED BY MCPHAIL ASSOCIATES, LLC

Project:	Babson College	**Job #:**	6173.2.00
Location:	Babson College	**Date Started:**	6-2-16
City/State:	Wellesley. MA	**Date Finished:**	6-2-16

Boring No.

B-101

Contractor: Brian
Driller/Helper: Roger
Logged By/Reviewed By: A. Hathon
Surface Elevation (ft): 228.3

Casing Type/Depth (ft): 3.25" Casing
Casing Hammer (lbs)/Drop (in): Vibratory*
Sampler Size/Type: 1-3/8"/Split Spoon
Sampler Hammer (lbs)/Drop (in): 140/30"

Groundwater Observations

Date	Depth	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample N-Value	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows Per 6"	Sample Description and Boring Notes
	228		0.5 / 227.8	TOPSOIL	6	S1	6/6	0.0-0.5	3	S1 (0-0.5'): Loose, black, brown, SILT and SAND, trace gravel, trace organics. (TOPSOIL)
1	227			GLACIAL TILL	30	S1A	18/10	0.5-2.0	13 18 12	S1A (0.5'-2'): Dense, gray-brown, SILT and SAND, some gravel. (GLACIAL TILL)
2	226									
3	225									
4	224									
5	223				28	S2	24/16	5.0-7.0	16 14 14 15	S2 (5-7'): Compact, gray-brown, to yellow-brown, SILT and SAND, some gravel. (GLACIAL TILL)
6	222									
7	221									
8	220									
9	219									
10	218				70	S3	24/18	10.0-12.0	29 30 40 30	S3 (10-12'): Very dense, gray-brown, to yellow-brown, SAND and GRAVEL, in silt matrix. (GLACIAL TILL)
11	217		12.0 / 216.3							
12	216			Bottom of borehole at 12 feet below ground surface, casing refusal.						
13	215									
14	214									
15	213									
16	212									
17	211									
18	210									
19	209									
20	208									
21	207									
22	206									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
*No hammer drop to advance casing, used vibratory method similar to geoprobe. No groundwater observed

Weather: Cloudy 59

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Babson College	**Job #:**	6173.2.00
Location:	Babson College	**Date Started:**	6-3-16
City/State:	Wellesley. MA	**Date Finished:**	6-3-16

Boring No.

B-101A (OW)

Contractor: Kenny
Driller/Helper: Josh
Logged By/Reviewed By: A. Hathon
Surface Elevation (ft): 228.3

Casing Type/Depth (ft): 4.25" HSA
Casing Hammer (lbs)/Drop (in): NA
Sampler Size/Type: 1-3/8"/Split Spoon
Sampler Hammer (lbs)/Drop (in): 140/30"

Groundwater Observations

Date	Depth	Elev.	Notes
6-6-16	5.9	222.4	

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample N-Value	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows Per 6"	Sample Description and Boring Notes
	228		0.9 / 227.4	TOPSOIL						
1	227			GLACIAL TILL						
2	226									
3	225				32	S1	24/18	2.0-4.0	12 18 14 16	S1 (2-4'): Dense, grey-brown, to yellow-brown, SANDY SILT, some gravel. (Glacial Till)
4	224									
5	223									
6	222									
7	221									
8	220									
9	219									
10	218									
11	217									
12	216									
13	215									
14	214									
15	213									
16	212									
17	211									
18	210									
19	209									
20	208				113	S2	24/16	20.0-22.0	27 40 73 70	S2 (20-22'): Very Dense, grey-dark brown, SAND and GRAVEL, in silt matrix. (Glacial Till)
21	207		22.0 / 206.3							
22	206			End of boring						

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
Augers, 20 foot observation well, with 10 feet solid and 10 feet screened.

Weather: Cloudy 65

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Babson College	**Job #:**	6173.2.00
Location:	Babson College	**Date Started:**	6-6-16
City/State:	Wellesley. MA	**Date Finished:**	6-6-16

Boring No.

B-102

Contractor: Kenny
Driller/Helper: Josh
Logged By/Reviewed By: A. Hathon
Surface Elevation (ft): 226.5

Casing Type/Depth (ft): 4.25" HSA
Casing Hammer (lbs)/Drop (in): NA
Sampler Size/Type: 1-3/8"/Split Spoon
Sampler Hammer (lbs)/Drop (in): 140/30"

Groundwater Observations

Date	Depth	Elev.	Notes
6-6-16	13.75	212.8	

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample N-Value	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows Per 6"	Sample Description and Boring Notes
1	226		1.0 / 225.5	TOPSOIL	4	S1	12/10	0.0-1.0	2 2	S1 (0-1'): Very loose to loose, dark to red brown, SAND, w/ organics. (Topsoil)
2	225			FILL	7	S1A	12/10	1.0-2.0	3 4	S1A (1-2'): Loose, light brown to tan, SAND and GRAVEL, some silt. (Fill)
3	224									
4	223									
5	222									
6	221				26	S2	24/14	5.0-7.0	6 10 16 20	S2 (5-7'): Compact, tan to gray, SAND and GRAVEL, some silt. (Fill)
7	220		7.0 / 219.5							
8	219			GLACIAL TILL						
9	218									
10	217									
11	216				75	S3	24/20	10.0-12.0	16 32 43 35	S3 (10-12'): Very dense, gray, SAND and SILT, some gravel. (Glacial Till)
12	215									
13	214									
14	213									
15	212				152	S4	15/8	15.0-16.3	22 52 100	S4 (15-16.3'): Very dense, gray, SAND and SILT, some gravel. (Glacial Till)
16	211									
17	210									
18	209									
19	208									
20	207				140	S5	16/9	20.0-21.3	22 40 100	S5 (20-21.4'): Very dense, tan to light gray, SAND and SILT, some gravel. (Glacial Till)
21	206		21.4 / 205.1							
22	205			Split spoon refusal at 21.4 Feet below ground surface.						
	204									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:

Weather: Sunny 75

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Babson College	**Job #:**	6173.2.00
Location:	Babson College	**Date Started:**	6-2-16
City/State:	Wellesley. MA	**Date Finished:**	6-2-16

Boring No.

B-103

Contractor: Brian
Driller/Helper: Roger
Logged By/Reviewed By: A. Hathon
Surface Elevation (ft): 228.7

Casing Type/Depth (ft): 3.25" Casing
Casing Hammer (lbs)/Drop (in): Vibratory*
Sampler Size/Type: 1-3/8"/Split Spoon
Sampler Hammer (lbs)/Drop (in): 140/30"

Groundwater Observations

Date	Depth	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample N-Value	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows Per 6"	Sample Description and Boring Notes
			0.5 / 228.2	ASPHALT						
1	228			FILL	20	S1	24/14	0.0-2.0	55 12 8 6	S1 (0-2'): Compact, black-brown, SILTY SAND, some gravel, trace asphalt, trace organics. (Fill)
2	227									
3	226									
4	225									
5	224									
6	223				3	S2	24/16	5.0-7.0	1 1 2 10	S2 (5-7'): Very loose, dark gray-brown, SILT and SAND, trace to some gravel, trace wood, trace organics. (Fill)
7	222		7.0 / 221.7							
8	221			GLACIAL TILL	30	S3	24/18	7.0-9.0	12 13 17 16	S3 (7-9'): Dense, gray-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
9	220									
10	219									
11	218				38	S4	24/18	10.0-12.0	23 17 21 19	S4 (10-12'): Dense, gray-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
12	217									
13	216									
14	215									
15	214				73	S5	24/22	14.0-16.0	29 37 36 46	S5 (14-16'): Very dense, gray-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
16	213									
17	212				112	S6	24/22	16.0-18.0	25 39 73 98	S6 (16-18'): Very dense, gray-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
18	211		18.0 / 210.7							
19	210			Bottom of borehole at 18 feet below ground surface.						
20	209									
21	208									
22	207									
	206									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
*No hammer drop to advance casing, used vibratory method similar to geoprobe.

Weather: Sunny 63

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Babson College	**Job #:**	6173.2.00
Location:	Babson College	**Date Started:**	6-3-16
City/State:	Wellesley. MA	**Date Finished:**	6-3-16

Boring No.

B-104 (OW)

Contractor: Kenny
Driller/Helper: Josh
Logged By/Reviewed By: A. Hathon
Surface Elevation (ft): 220.8

Casing Type/Depth (ft): 4.25" HSA
Casing Hammer (lbs)/Drop (in): NA
Sampler Size/Type: 1-3/8"/Split Spoon
Sampler Hammer (lbs)/Drop (in): 140/30"

Groundwater Observations

Date	Depth	Elev.	Notes
6-3-16	9.61	211.2	

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample N-Value	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows Per 6"	Sample Description and Boring Notes
1	220		1.0 / 219.8	TOPSOIL	8	S1	12/10	0.0-1.0	5 3	S1 (0-1'): Very loose, dark brown, SILT and SAND, trace gravel, trace organics. (Topsoil)
2	219			FILL	4	S1A	12/4	1.0-2.0	2 2	S1A (1-2'): Very loose, yellow-brown, to gray-brown, SILT and SAND, some gravel, trace organics. (Fill)
3	218		3.0 / 217.8							
4	217			GLACIAL TILL						
5	216									
6	215				61	S2	24/14	5.0-7.0	26 32 29 20	S2 (5-7'): Very dense, gray-brown, SAND and SILT, some gravel. (Glacial Till)
7	214									
8	213									
9	212									
10	211									
11	210				78	S3	24/1	10.0-12.0	15 42 36 44	S3 (10-12'): Very dense, grey, cobble in nose of spoon. (Glacial Till)
12	209									
13	208									
14	207									
15	206									
16	205				19	S4	24/5	15.0-17.0	10 10 9 26	S4 (15-17'): Compact, yellow-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
17	204									
18	203									
19	202									
20	201									
21	200				54	S5	24/12	20.0-22.0	21 21 33 31	S5 (20-22'): Very dense, yellow-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
22	199		22.0 / 198.8							
	198			Bottom of borehole at 22 feet below ground surface.						

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
20 foot well installed with 10 feet screen and 10 feet solid.

Weather: Cloudy 67

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Babson College	**Job #:**	6173.2.00
Location:	Babson College	**Date Started:**	6-3-16
City/State:	Wellesley. MA	**Date Finished:**	6-3-16

Boring No.

B-105

Contractor: Kenny
Driller/Helper: Josh
Logged By/Reviewed By: A. Hathon
Surface Elevation (ft): 231.2

Casing Type/Depth (ft): 4.25" HSA
Casing Hammer (lbs)/Drop (in): NA
Sampler Size/Type: 1-3/8"/Split Spoon
Sampler Hammer (lbs)/Drop (in): 140/30"

Groundwater Observations

Date	Depth	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample N-Value	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows Per 6"	Sample Description and Boring Notes
	231		0.5 / 230.7	TOPSOIL	8	S1	6/6	0.0-0.5	4	S1 (0-0.5'): Very loose, loose, dark brown, SILT and SAND, trace gravel, trace organics. (Top Soil)
1	230			FILL	8	S1A	18/8	0.5-2.0	3 4 4	S1A (0.5-2'): Loose, dark brown, SILTY SAND, some gravel, trace organics. (Fill)
2	229									
3	228									
4	227		4.0 / 227.2							
5	226			GLACIAL TILL	53	S2	24/20	5.0-7.0	7 20 33 14	S2 (5-7): Very dense, gray-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
6	225									
7	224									
8	223									
9	222									
10	221				75	S3	24/18	10.0-12.0	17 34 41 54	S3 (10-12'): Very dense, gray-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
11	220									
12	219									
13	218									
14	217									
15	216				131	S4	9/8	15.0-15.8	31 100	S4 (15-15.8'): Very dense, gray-brown, SAND and GRAVEL, silt matrix. (Glacial Till) Augured through cobbles from 15.8 to 19 feet.
16	215									
17	214									
18	213									
19	212									
20	211				33	S5	24/22	20.0-22.0	14 17 16 19	S5 (20-22'): Dense, gray, SAND and GRAVEL, silt matrix. (Glacial Till)
21	210									
22	209				67	S6	24/24	22.0-24.0	65 32 35 49	S6 (22-24'): Very dense, gray, SAND and GRAVEL, silt matrix. (Glacial Till)
23	208									
24	207		24.0 / 207.2	Bottom of borehole at 24 feet below ground surface.						

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
No observed groundwater.

Weather: Cloudy 60

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Babson College	**Job #:**	6173.2.00
Location:	Babson College	**Date Started:**	6-2-16
City/State:	Wellesley. MA	**Date Finished:**	6-2-16

Boring No.

B-106

Contractor: Brian
Driller/Helper: Roger
Logged By/Reviewed By: A. Hathon
Surface Elevation (ft): 229.5

Casing Type/Depth (ft): 3.25" Casing
Casing Hammer (lbs)/Drop (in): Vibratory*
Sampler Size/Type: 1-3/8"/Split Spoon
Sampler Hammer (lbs)/Drop (in): 140/30"

Groundwater Observations

Date	Depth	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample N-Value	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows Per 6"	Sample Description and Boring Notes
	229		0.5 / 229.0	ASPHALT / TENNIS COURT						
1	228		2.0 / 227.5	FILL	12	S1	24/20	0.0-2.0	8 6 6 9	S1 (0-2'): Compact, black-brown, SILTY SAND, trace gravel, trace organics. (Fill)
2	227			GLACIAL TILL	24	S2	24/22	2.0-4.0	13 12 12 13	S2 (2-4'): Compact, gray-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
3	226									
4	225				32	S3	24/22	4.0-6.0	9 14 18 15	S3 (4-6'): Dense, gray-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
5	224									
6	223									
7	222									
8	221		9.0 / 220.5							
9	220			Bottom of borehole at 9 feet below ground surface, split spoon refusal.						
10	219									
11	218									
12	217									
13	216									
14	215									
15	214									
16	213									
17	212									
18	211									
19	210									
20	209									
21	208									
22	207									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
*No hammer drop to advance casing, used vibratory method similar to geoprobe.
No observed groundwater.

Weather: Sunny 65

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Babson College	**Job #:**	6173.2.00
Location:	Babson College	**Date Started:**	6-2-16
City/State:	Wellesley. MA	**Date Finished:**	6-2-16

Boring No.

B-107

Contractor: Brian
Driller/Helper: Roger
Logged By/Reviewed By: A. Hathon
Surface Elevation (ft): 228.6

Casing Type/Depth (ft): 3.25" Casing
Casing Hammer (lbs)/Drop (in): Vibratory*
Sampler Size/Type: 1-3/8"/Split Spoon
Sampler Hammer (lbs)/Drop (in): 140/30"

Groundwater Observations

Date	Depth	Elev.	Notes

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample N-Value	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows Per 6"	Sample Description and Boring Notes
1	228			TOPSOIL	14	S1	24/12	0.0-2.0	4 7 7 2	S1 (0-2'): Compact, brown, SILT and FINE SAND, trace gravel, trace organics. (Topsoil)
2	227									
3	226		3.0 / 225.6							
4	225			FILL						
5	224									
6	223				4	S2	24/14	5.0-7.0	2 2 2 2	S2 (5-7'): Loose, brown to yellow-brown, SILTY SAND, some coarse gravel. (Fill)
7	222									
8	221		8.0 / 220.6							
9	220			GLACIAL TILL						
10	219									
11	218				55	S3	24/16	10.0-12.0	18 30 25 39	S3 (10-12'): Very Dense, grey-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
12	217									
13	216				111	S4	24/22	12.0-14.0	36 39 72 79	S4 (12-14'): Very Dense, grey-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
14	215									
15	214				142	S5	23/20	14.0-15.9	40 65 77 100	S5 (14-15.9'): Very Dense, grey-brown, SAND and GRAVEL, silt matrix. (Glacial Till)
16	213		15.9 / 212.7							
17	212			Bottom of borehole at 15.9 feet below ground surface, split spoon refusal.						
18	211									
19	210									
20	209									
21	208									
22	207									
	206									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
*No hammer drop to advance casing, used vibratory method similar to geoprobe.
No observed groundwater.

Weather: Cloudy 60

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Babson College	**Job #:**	6173.2.00
Location:	Babson College	**Date Started:**	6-6-16
City/State:	Wellesley. MA	**Date Finished:**	6-6-16

Boring No.

B-108 (OW)

Contractor: Kenny
Driller/Helper: Josh
Logged By/Reviewed By: A. Hathon
Surface Elevation (ft): 229.2

Casing Type/Depth (ft): 4.25" HSA
Casing Hammer (lbs)/Drop (in): NA
Sampler Size/Type: 1-3/8"/Split Spoon
Sampler Hammer (lbs)/Drop (in): 140/30"

Groundwater Observations

Date	Depth	Elev.	Notes
6-6-16	14.1	215.1	

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample N-Value	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows Per 6"	Sample Description and Boring Notes
	229		1.0 / 228.2	TOPSOIL	20	S1	12/8	0.0-1.0	10 10	S1 (0-1'): Compact, dark-brown, SILT and SAND, trace gravel, trace organics. (Topsoil)
1	228			FILL	24	S1A	12/10	1.0-2.0	12 12	S1A (1-2'): Compact, yellow-brown, SAND, some silt, trace to some gravel. (Fill)
2	227									
3	226									
4	225									
5	224				10	S2	24/12	5.0-7.0	3 4 6 10	S2 (5-7'): Loose to compact, gray-brown, SANDY SILT, trace to some gravel. (Fill)
6	223									
7	222		8.0 / 221.2							
8	221			GLACIAL TILL						
9	220									
10	219				140	S3	17/14	10.0-11.4	15 40 100	S3 (10-11.4'): Very dense, gray-brown, SAND and GRAVEL, silt matrix, trace cobbles. (Glacial Till)
11	218									
12	217									
13	216									
14	215									
15	214				n/a	S4	3/0	15.0-15.3		S4 (15-15.25'): Very dense, NO RECOVERY
16	213									
17	212									
18	211									
19	210									
20	209		20.4 / 208.8		200	S5	5/2	20.0-20.4	100	S5 (20-20.4'): Very dense, gray- brown, SANDY SILT, some gravel. (Glacial Till)
21	208			Bottom of borehole at 20.4 feet below ground surface, split spoon refusal.						
22	207									

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
20 foot observation well with 10 feet solid and 10 feet screen.

Weather: Partly cloudy 68

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

APPENDIX C:

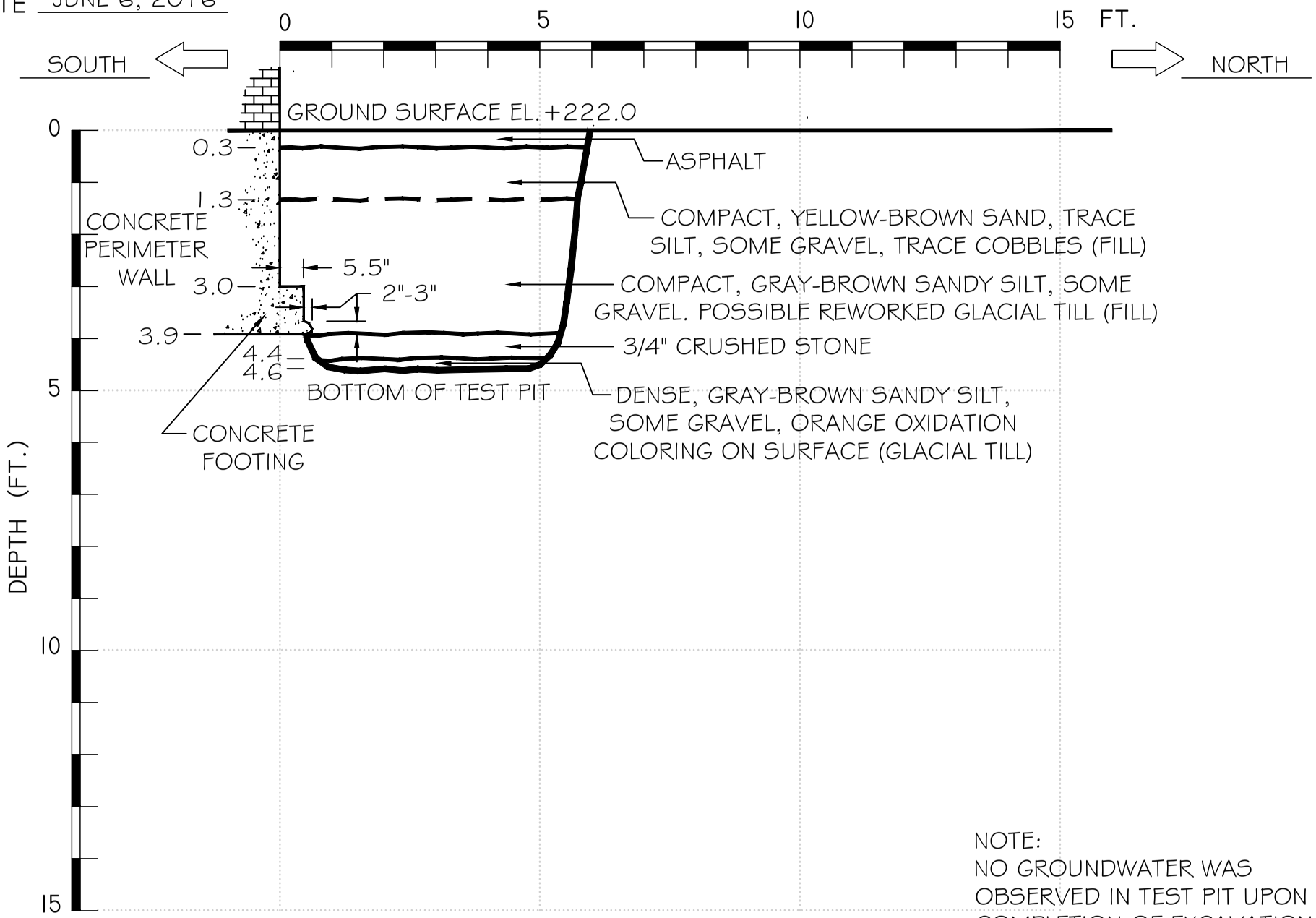
RECENT TEST PIT LOGS PREPARED BY MCPHAIL ASSOCIATES, LLC

JOB NO. 6173

DATE JUNE 6, 2016

TEST PIT LOG

TEST PIT NO. 101



NOTE:
NO GROUNDWATER WAS OBSERVED IN TEST PIT UPON COMPLETION OF EXCAVATION

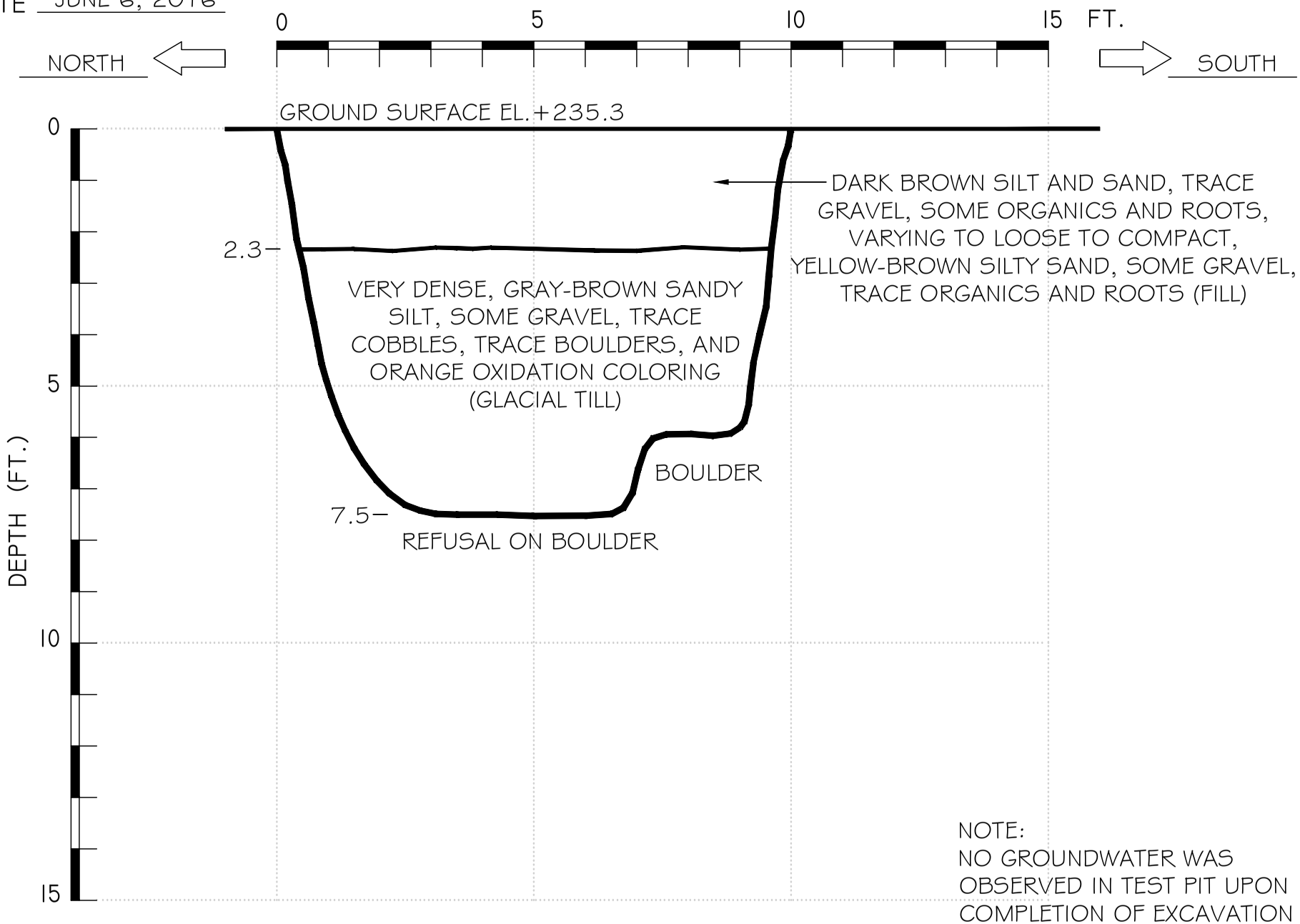
McPHAIL ASSOCIATES, LLC

TEST PIT LOG

JOB NO. 6173

DATE JUNE 6, 2016

TEST PIT NO. 102



NOTE:
NO GROUNDWATER WAS OBSERVED IN TEST PIT UPON COMPLETION OF EXCAVATION

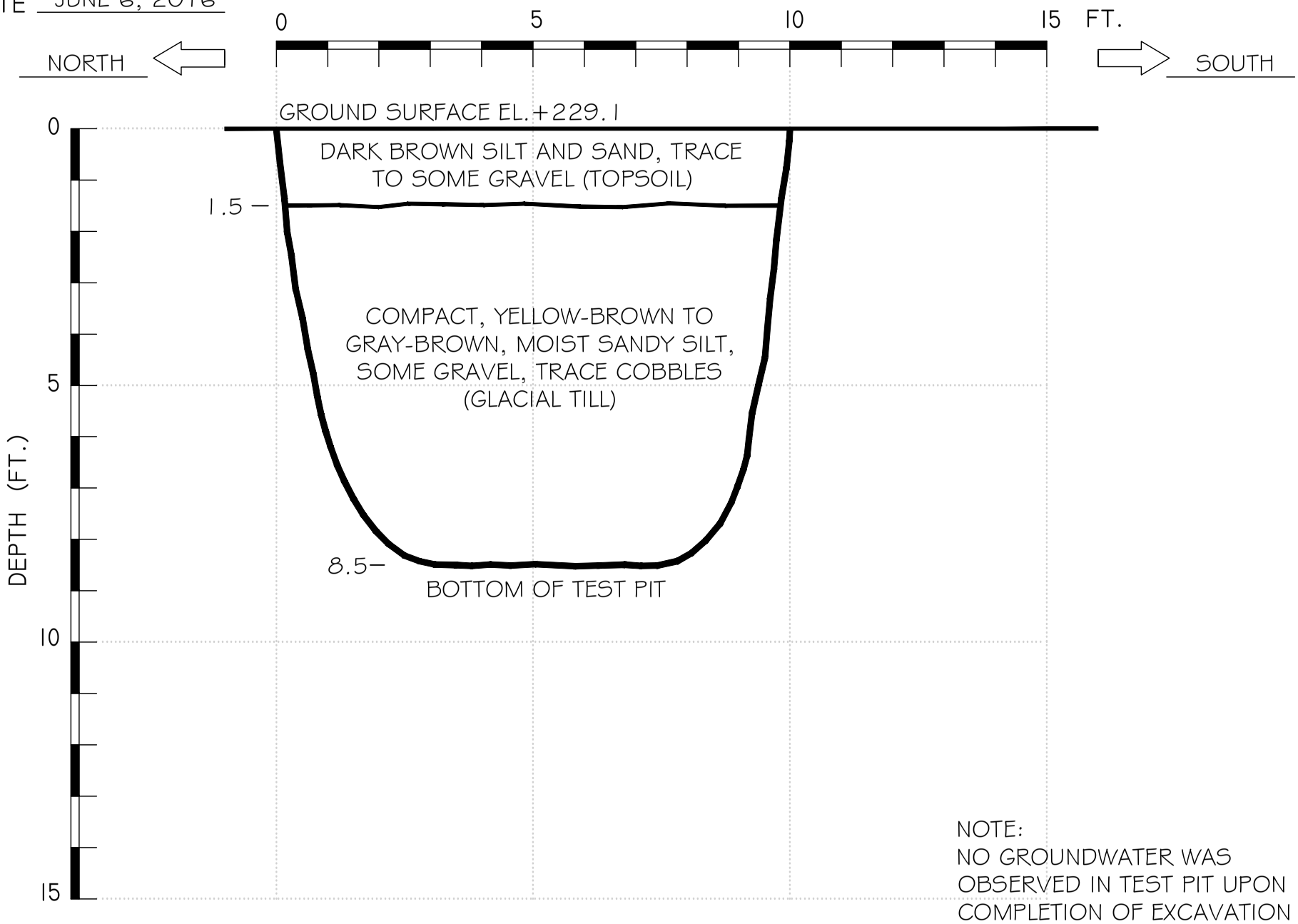
McPHAIL ASSOCIATES, LLC

TEST PIT LOG

JOB NO. 6173

DATE JUNE 6, 2016

TEST PIT NO. 103



NOTE:
NO GROUNDWATER WAS OBSERVED IN TEST PIT UPON COMPLETION OF EXCAVATION

McPHAIL ASSOCIATES, LLC

APPENDIX D:

GROUNDWATER MONITORING REPORTS

GROUNDWATER MONITORING REPORT						
Well I.D.	B-101A (OW)	**Elevation of Road Box**	+228.3	**Job. No.** **Job Name**	6173 BRAC Addition	
Date	**Time**	**Elapsed Time**	**Depth of Water from Road Box**	**Elevation of Water**	**Remarks**	**Read By**
		Days	**Feet**	**Feet**		
6/6/2016	14:00	Initial	5.9	+222.4	Installed	AKH
6/21/2016	13:00	15	7.0	+221.3		PWA

GROUNDWATER MONITORING REPORT

Well I.D.	B-104 (OW)	**Elevation of Road Box**	+220.8	**Job. No.** **Job Name**	6173 BRAC Addition	
Date	**Time**	**Elapsed Time**	**Depth of Water from Road Box**	**Elevation of Water**	**Remarks**	**Read By**
		Days	**Feet**	**Feet**		
6/6/2016	13:45	Initial	9.6	+211.2	Installed	AKH
6/21/2016	11:30	15	9.6	+211.2		PWA

GROUNDWATER MONITORING REPORT

Well I.D.	B-108 (OW)	**Elevation of Road Box**	+229.2	**Job. No.** **Job Name**	6173 BRAC Addition	
Date	**Time**	**Elapsed Time**	**Depth of Water from Road Box**	**Elevation of Water**	**Remarks**	**Read By**
		Days	**Feet**	**Feet**		
6/6/2016	14:10	Initial	14.1	+215.1	Installed	AKH
6/21/2016	11:30	15	10.1	+219.1		PWA

APPENDIX E:

LOGS OF PREVIOUS EXPLORATIONS

CARR-DEE CORP.

37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone 391-4500

To McPHAIL ASSOC., 30 NORFOLK ST., CAMBRIDGE, MA. Date JULY 18, 1986 Job No 86525

Location BABSON COLLEGE, MA. Scale 1" = 3 ft.

BORING 1

GROUND SURFACE El.+224

	LOAM	5 14	S#1, FROM G.S. TO 1'0", RECOVERED 5"
1'0"		13 21	S#1A, FROM 1'0" TO 2'0", RECOVERED 4"
	MEDIUM DENSE FINE TO MEDIUM SAND, GRAVEL, AND SILT (SUBSOIL)		
4'6"		16 25 36 48	S#2, FROM 5'0" TO 7'0" RECOVERED 18"
	VERY DENSE FINE TO MEDIUM SAND, GRAVEL, AND SILT (GLACIAL TILL)	20 28 29 38	S#3, FROM 10'0" TO 12'0" RECOVERED 8"
		25 28 33 39	S#4, FROM 15'0" TO 17'0" RECOVERED 11"
17'0"			

WATER LEVEL 6'0"
SIZE OF CASING NW, LENGH 10'0"
DRILLER: K, KNOX
DATE STARTED & COMPLETED: 7-9-86, 7-10-86

All samples have been visually classified by HJD Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in right hand column indicate number of blows required to drive TWO-INCH SPLIT SAMPLER 6 inches using 140 lb. weight falling 30 inches ±. Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches ±.

CARR-DEE CORP.

37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone 391-4500

To McPHAIL ASSOC., 30 NORFOLK ST., CAMBRIDGE, MA. Date JULY 18, 1986 Job No 86525

Location BABSON COLLEGE, MA. Scale 1" = 3 ft.

BORING 5

GROUND SURFACE EL.+232

	LOAM (SUBSOIL)	2, 1, 3, 5	S#1, FROM G.S. TO 2'0" RECOVERED 4"
2'6"			
	VERY DENSE SAND, GRAVEL, AND INORGANIC SILT (GLACIAL TILL)	12, 14, 106, 98	S#2, FROM 5'0" TO 7'0" RECOVERED 11"
		34, 49, 52, 87	S#3, FROM 10'0" TO 12'0" RECOVERED 8"
		32, 41, 42, 60	S#4, FROM 15'0" TO 17'0" RECOVERED 13"
		38, 41, 49, 54	S#5, FROM 20'0" TO 22'0" RECOVERED 7"
24'6"			

(CONTINUED ON SHEET NO. 2)

CARR-DEE CORP.

37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone 391-4500

To McPHAIL ASSOC., 30 NORFOLK ST., CAMBRIDGE, MA. Date JULY 18, 1986 Job No 86525

Location BABSON COLLEGE, MA. Scale 1" = 3 ft.

BORING 5 (CONTINUED)

24'6"

- R E F U S A L -
(100 BLOWS, NO PENETRATION, 2" S.S. 140-LB. WGT.)

WATER LEVEL 7'6"
SIZE OF CASING NW, LENGH 5'0"
DRILLER: K, KNOX , INSPECTOR: A. DONAVAN
DATE STARTED & COMPLETED: 7-16-86,7-16-86

All samples have been visually classified by HJD Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in right hand column indicate number of blows required to drive TWO-INCH SPLIT SAMPLER 6 inches using 140 lb. weight falling 30 inches ±. Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches ±.

CARR-DEE CORP.

37 LINDEN STREET P.O. BOX 67 MEDFORD, MA 02155-0001 Telephone 391-4500

To McPHAIL ASSOC., 30 NORFOLK ST., CAMBRIDGE, MA. Date JULY 18, 1986 Job No 86525

Location BABSON COLLEGE, MA. Scale 1" = 3 ft.

BORING 6

GROUND SURFACE +213

0'6"	ASPHALT		
	MEDIUM DENSE FINE SAND, TRACE OF GRAVEL (FILL)	6, 10, 11, 21	S#1, FROM 0'6" TO 2'6" RECOVERED 9"
2'6"	VERY DENSE, FINE TO COARSE SAND & GRAVEL (FILL)	28, 29, 30	S#2, FROM 2'6" TO 4'0" RECOVERED 7"
4'0"			
4'6"	FINE SILTY SAND, SOME GRAVEL	36	S#2A, FROM 4'0" TO 4'6", RECOVERED 4"
	VERY DENSE FINE SAND TO MEDIUM SAND, GRAVEL, AND INORGANIC SILT (GLACIAL TILL)	19, 50, 122	S#3, FROM 5'0" TO 6'6" RECOVERED 17"
		76, 69, 66, 91	s#4, FROM 7'0" TO 9'0" RECOVERED 6"
9'0"			

WATER LEVEL 4'6"
SIZE OF CASING NW, LENGH 5'0"
DRILLER: K, KNOX
DATE STARTED & COMPLETED: 7-10-86,7-10-86

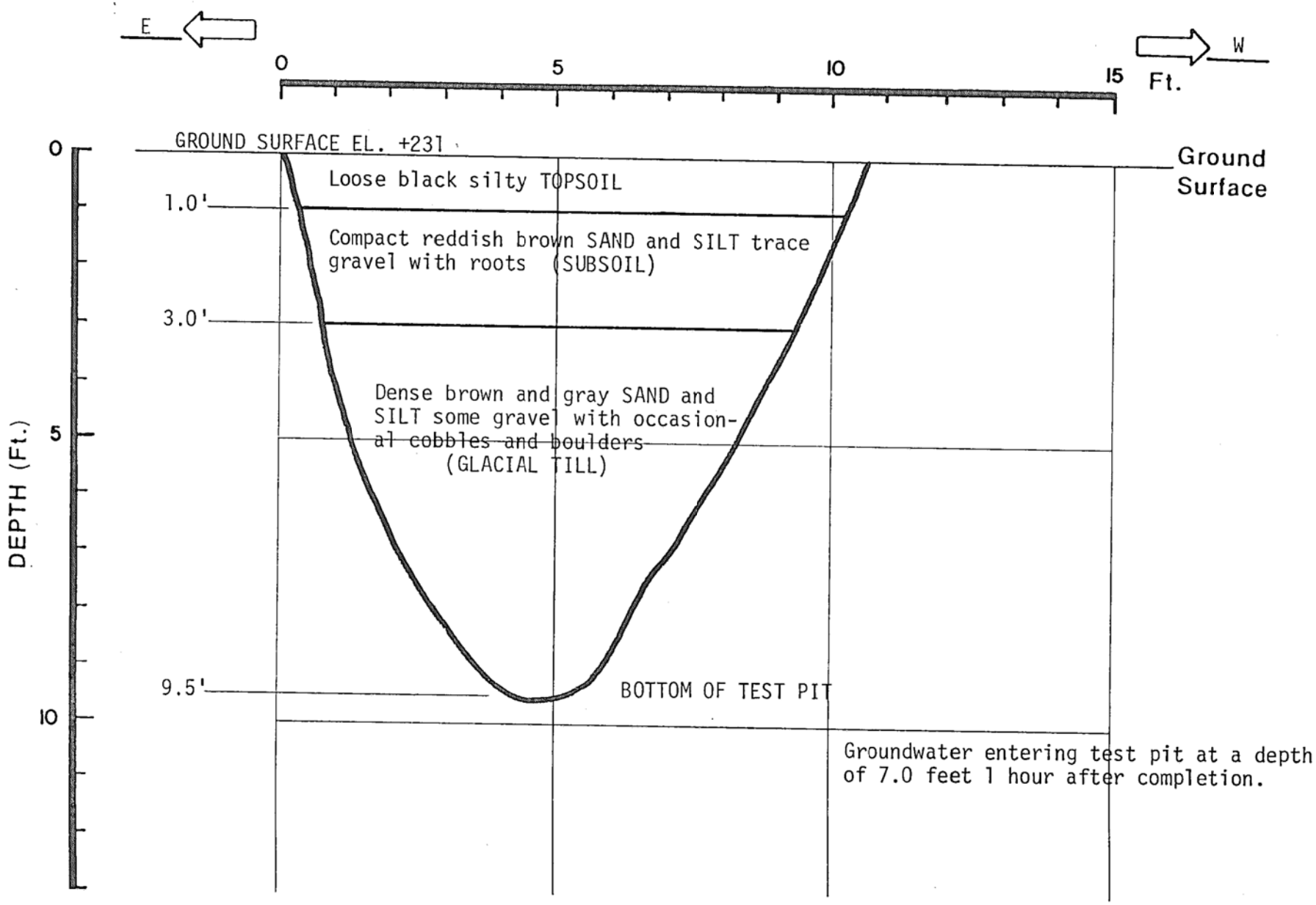
All samples have been visually classified by HJD Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in right hand column indicate number of blows required to drive TWO-INCH SPLIT SAMPLER 6 inches using 140 lb. weight falling 30 inches ±. Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches ±

JOB 1890

TEST PIT No. 7

TEST PIT LOG

DATE 7/11/86



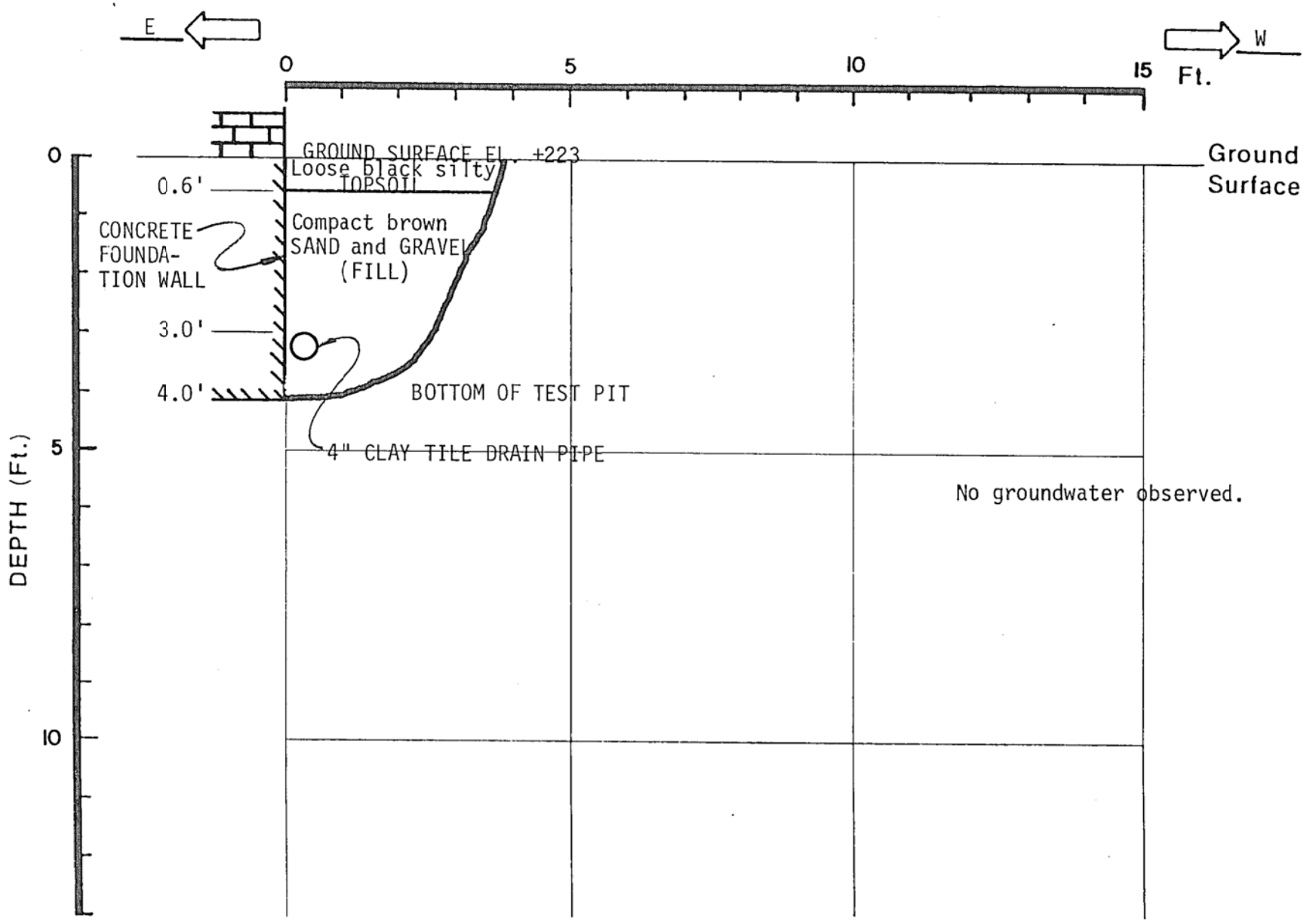
McPHAIL ASSOCIATES INC.

JOB 1890

TEST PIT No. 8

TEST PIT LOG

DATE 7/11/86



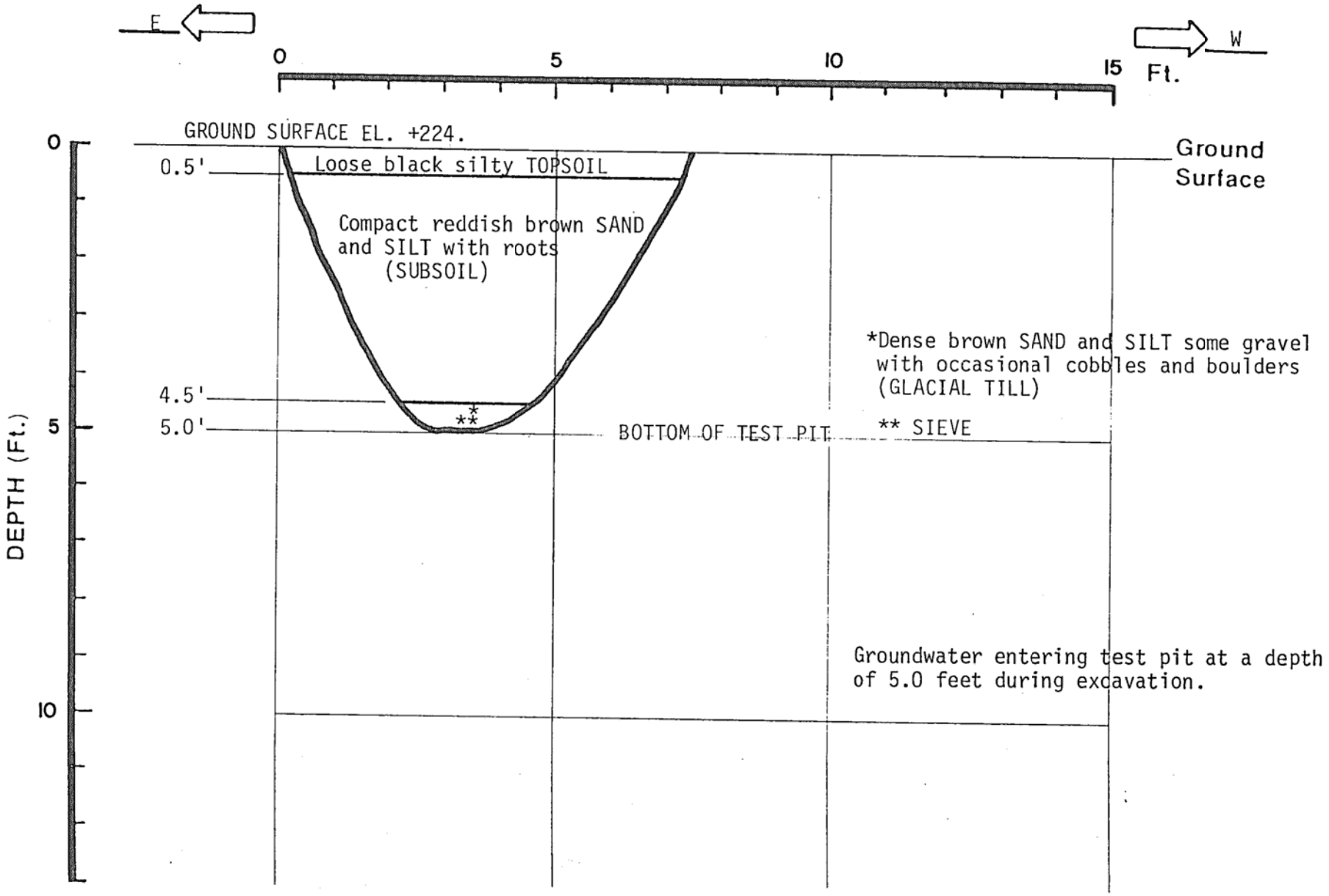
McPHAIL ASSOCIATES INC.

JOB 1890

TEST PIT No. 9

TEST PIT LOG

DATE 7/11/86



McPHAIL ASSOCIATES INC.

APPENDIX F:

IN-SITU PERMEABILITY TESTING

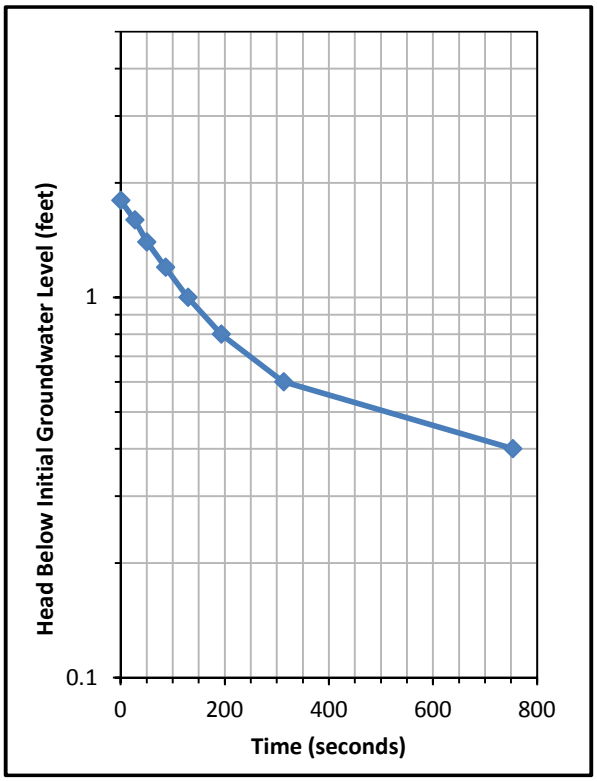
In-Situ Rising Head
Permeability Test Results

Project Name: BRAC
Project Number: 6173.2.00
Date: June 21, 2016
Observation Well No: B-101A(OW)

Ground Surface Elevation (ft): 228.3
Initial Depth to Groundwater (ft): 7
Test Performed By: PWA

Time	Elapsed Time (seconds)	Depth to Groundwater (feet)*	Head Below Initial Groundwater Level (feet)
13:11:36	0	8.8	1.8
13:12:03	27	8.6	1.6
13:12:26	50	8.4	1.4
13:13:02	86	8.2	1.2
13:13:45	129	8	1
13:14:49	193	7.8	0.8
13:16:49	313	7.6	0.6
13:24:09	753	7.4	0.4

* Depth to groundwater measured from ground surface



Estimated Permeability (cm/s): 4.0E-05
Solution Method: Bouwer and Rice

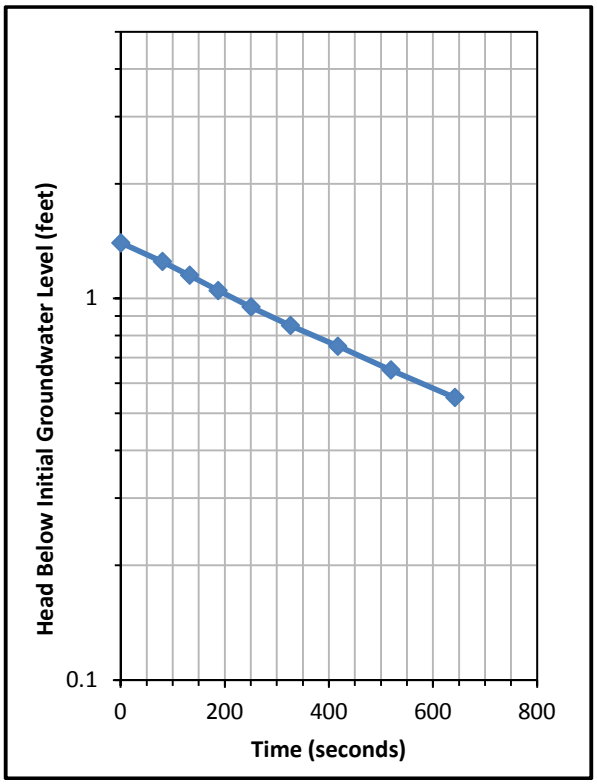
In-Situ Rising Head
Permeability Test Results

Project Name: BRAC
Project Number: 6173.2.00
Date: June 21, 2016
Observation Well No: B-104(OW)

Ground Surface Elevation (ft): 220.8
Initial Depth to Groundwater (ft): 9.55
Test Performed By: PWA

Time	Elapsed Time (seconds)	Depth to Groundwater (feet)*	Head Below Initial Groundwater Level (feet)
12:47:40	0	10.95	1.4
12:49:00	80	10.8	1.25
12:49:52	132	10.7	1.15
12:50:47	187	10.6	1.05
12:51:50	250	10.5	0.95
12:53:06	326	10.4	0.85
12:54:37	417	10.3	0.75
12:56:19	519	10.2	0.65
12:58:22	642	10.1	0.55

* Depth to groundwater measured from ground surface



Estimated Permeability (cm/s): 4.5E-05
Solution Method: Bouwer and Rice

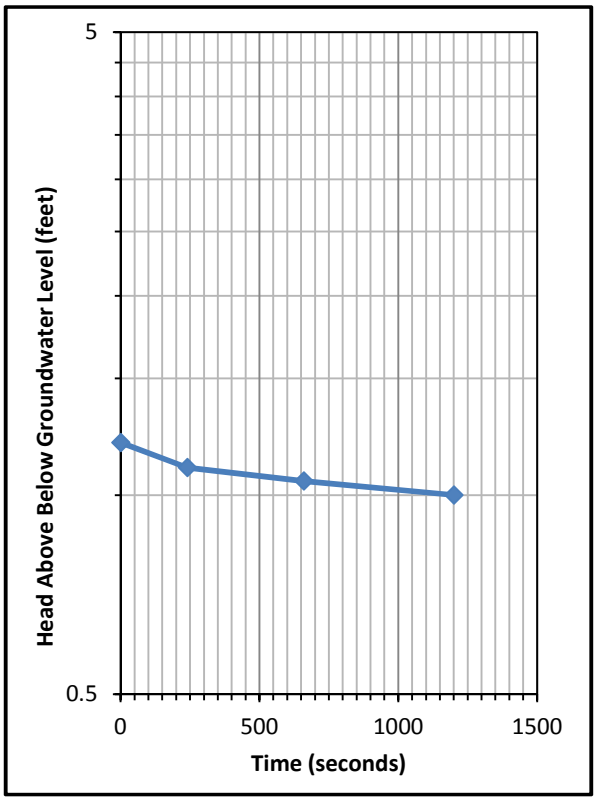
In-Situ Rising Head
Permeability Test Results

Project Name: BRAC
Project Number: 6173.2.00
Date: June 21, 2016
Observation Well No: B-108(OW)

Ground Surface Elevation (ft): 229.2
Initial Depth to Groundwater (ft): 10.1
Test Performed By: PWA

Time	Elapsed Time (seconds)	Depth to Groundwater (feet)*	Head Below Initial Groundwater Level (feet)
12:13:00	0	11.3	1.2
12:17:00	240	11.2	1.1
12:24:00	660	11.15	1.05
12:33:00	1200	11.1	1

* Depth to groundwater measured from ground surface



Estimated Permeability (cm/s): 3.0E-06
Solution Method: Bouwer and Rice

APPENDIX G:

LABORATORY CHEMICAL TESTING DATA

ANALYTICAL REPORT

Lab Number:	L1617912
Client:	McPhail Associates 2269 Massachusetts Avenue Cambridge, MA 02140
ATTN:	Ambrose Donovan
Phone:	(617) 868-1420
Project Name:	6173 BABSON COLLEGE BRAC
Project Number:	6173
Report Date:	06/22/16

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1617912-01	FILL COMPOSITE 2-7' B-102, B-107,TP-102	SOIL	WELLESLEY, MA	06/06/16 16:00	06/10/16
L1617912-02	B-107 S-2 5-7' FILL	SOIL	WELLESLEY, MA	06/06/16 16:00	06/10/16
L1617912-03	GLACIAL TILL B-107 10-14'	SOIL	WELLESLEY, MA	06/06/16 16:00	06/10/16

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912
Project Number: 6173 **Report Date:** 06/22/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912
Project Number: 6173 **Report Date:** 06/22/16

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

L1617912-02: The sample submitted for Volatile Organics was received without raw soil for the Total Solids analysis. The Total Solids result from the corresponding composite sample was utilized in the dry weight calculation of the Volatile Organics data.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Metals.

Volatile Organics

In reference to question G:

L1617912-02 and -03: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

The initial calibration, associated with L1617912-02 and -03, did not meet the method required minimum response factor on the lowest calibration standard for acetone (0.08357), 2-butanone (0.08894) and 4-methyl-2-pentanone (0.05061), as well as the average response factor for acetone, 2-butanone and 4-methyl-2-pentanone.

The continuing calibration standard, associated with L1617912-02 and -03, is outside the acceptance criteria for several compounds; however, it is within overall method allowances. A copy of the continuing calibration standard is included as an addendum to this report.

Semivolatile Organics

The initial calibration, associated with L1617912-01 and -03, utilized a quadratic fit for 2,4-Dinitrophenol.

Metals

In reference to question I:

All samples were analyzed for a subset of MCP analytes per the Chain of Custody.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 06/22/16

ORGANICS

VOLATILES

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-02	Date Collected:	06/06/16 16:00
Client ID:	B-107 S-2 5-7' FILL	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	06/15/16 16:39		
Analyst:	BN		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	1000	--	1
1,1-Dichloroethane	ND		ug/kg	150	--	1
Chloroform	ND		ug/kg	150	--	1
Carbon tetrachloride	ND		ug/kg	100	--	1
1,2-Dichloropropane	ND		ug/kg	350	--	1
Dibromochloromethane	ND		ug/kg	100	--	1
1,1,2-Trichloroethane	ND		ug/kg	150	--	1
Tetrachloroethene	ND		ug/kg	100	--	1
Chlorobenzene	ND		ug/kg	100	--	1
Trichlorofluoromethane	ND		ug/kg	400	--	1
1,2-Dichloroethane	ND		ug/kg	100	--	1
1,1,1-Trichloroethane	ND		ug/kg	100	--	1
Bromodichloromethane	ND		ug/kg	100	--	1
trans-1,3-Dichloropropene	ND		ug/kg	100	--	1
cis-1,3-Dichloropropene	ND		ug/kg	100	--	1
1,3-Dichloropropene, Total	ND		ug/kg	100	--	1
1,1-Dichloropropene	ND		ug/kg	400	--	1
Bromoform	ND		ug/kg	400	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	100	--	1
Benzene	ND		ug/kg	100	--	1
Toluene	ND		ug/kg	150	--	1
Ethylbenzene	ND		ug/kg	100	--	1
Chloromethane	ND		ug/kg	400	--	1
Bromomethane	ND		ug/kg	200	--	1
Vinyl chloride	ND		ug/kg	200	--	1
Chloroethane	ND		ug/kg	200	--	1
1,1-Dichloroethene	ND		ug/kg	100	--	1
trans-1,2-Dichloroethene	ND		ug/kg	150	--	1
Trichloroethene	ND		ug/kg	100	--	1
1,2-Dichlorobenzene	ND		ug/kg	400	--	1

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID: L1617912-02 Date Collected: 06/06/16 16:00

Client ID: B-107 S-2 5-7' FILL Date Received: 06/10/16

Sample Location: WELLESLEY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	400	--	1
1,4-Dichlorobenzene	ND		ug/kg	400	--	1
Methyl tert butyl ether	ND		ug/kg	200	--	1
p/m-Xylene	ND		ug/kg	200	--	1
o-Xylene	ND		ug/kg	200	--	1
Xylenes, Total	ND		ug/kg	200	--	1
cis-1,2-Dichloroethene	ND		ug/kg	100	--	1
1,2-Dichloroethene, Total	ND		ug/kg	100	--	1
Dibromomethane	ND		ug/kg	400	--	1
1,2,3-Trichloropropane	ND		ug/kg	400	--	1
Styrene	ND		ug/kg	200	--	1
Dichlorodifluoromethane	ND		ug/kg	1000	--	1
Acetone	ND		ug/kg	3600	--	1
Carbon disulfide	ND		ug/kg	400	--	1
Methyl ethyl ketone	ND		ug/kg	1000	--	1
Methyl isobutyl ketone	ND		ug/kg	1000	--	1
2-Hexanone	ND		ug/kg	1000	--	1
Bromochloromethane	ND		ug/kg	400	--	1
Tetrahydrofuran	ND		ug/kg	400	--	1
2,2-Dichloropropane	ND		ug/kg	500	--	1
1,2-Dibromoethane	ND		ug/kg	400	--	1
1,3-Dichloropropane	ND		ug/kg	400	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	100	--	1
Bromobenzene	ND		ug/kg	500	--	1
n-Butylbenzene	ND		ug/kg	100	--	1
sec-Butylbenzene	ND		ug/kg	100	--	1
tert-Butylbenzene	ND		ug/kg	400	--	1
o-Chlorotoluene	ND		ug/kg	400	--	1
p-Chlorotoluene	ND		ug/kg	400	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	400	--	1
Hexachlorobutadiene	ND		ug/kg	400	--	1
Isopropylbenzene	ND		ug/kg	100	--	1
p-Isopropyltoluene	ND		ug/kg	100	--	1
Naphthalene	ND		ug/kg	400	--	1
n-Propylbenzene	ND		ug/kg	100	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	400	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	400	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	400	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	400	--	1

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID: L1617912-02 Date Collected: 06/06/16 16:00

Client ID: B-107 S-2 5-7' FILL Date Received: 06/10/16

Sample Location: WELLESLEY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Diethyl ether	ND		ug/kg	500	--	1
Diisopropyl Ether	ND		ug/kg	400	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	400	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	400	--	1
1,4-Dioxane	ND		ug/kg	10000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	86		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	84		70-130
Dibromofluoromethane	95		70-130

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-03	Date Collected:	06/06/16 16:00
Client ID:	GLACIAL TILL B-107 10-14'	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	06/15/16 17:04		
Analyst:	BN		
Percent Solids:	92%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	700	--	1
1,1-Dichloroethane	ND		ug/kg	100	--	1
Chloroform	ND		ug/kg	100	--	1
Carbon tetrachloride	ND		ug/kg	70	--	1
1,2-Dichloropropane	ND		ug/kg	240	--	1
Dibromochloromethane	ND		ug/kg	70	--	1
1,1,2-Trichloroethane	ND		ug/kg	100	--	1
Tetrachloroethene	ND		ug/kg	70	--	1
Chlorobenzene	ND		ug/kg	70	--	1
Trichlorofluoromethane	ND		ug/kg	280	--	1
1,2-Dichloroethane	ND		ug/kg	70	--	1
1,1,1-Trichloroethane	ND		ug/kg	70	--	1
Bromodichloromethane	ND		ug/kg	70	--	1
trans-1,3-Dichloropropene	ND		ug/kg	70	--	1
cis-1,3-Dichloropropene	ND		ug/kg	70	--	1
1,3-Dichloropropene, Total	ND		ug/kg	70	--	1
1,1-Dichloropropene	ND		ug/kg	280	--	1
Bromoform	ND		ug/kg	280	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	70	--	1
Benzene	ND		ug/kg	70	--	1
Toluene	ND		ug/kg	100	--	1
Ethylbenzene	ND		ug/kg	70	--	1
Chloromethane	ND		ug/kg	280	--	1
Bromomethane	ND		ug/kg	140	--	1
Vinyl chloride	ND		ug/kg	140	--	1
Chloroethane	ND		ug/kg	140	--	1
1,1-Dichloroethene	ND		ug/kg	70	--	1
trans-1,2-Dichloroethene	ND		ug/kg	100	--	1
Trichloroethene	ND		ug/kg	70	--	1
1,2-Dichlorobenzene	ND		ug/kg	280	--	1

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID: L1617912-03 Date Collected: 06/06/16 16:00

Client ID: GLACIAL TILL B-107 10-14' Date Received: 06/10/16

Sample Location: WELLESLEY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	280	--	1
1,4-Dichlorobenzene	ND		ug/kg	280	--	1
Methyl tert butyl ether	ND		ug/kg	140	--	1
p/m-Xylene	ND		ug/kg	140	--	1
o-Xylene	ND		ug/kg	140	--	1
Xylenes, Total	ND		ug/kg	140	--	1
cis-1,2-Dichloroethene	ND		ug/kg	70	--	1
1,2-Dichloroethene, Total	ND		ug/kg	70	--	1
Dibromomethane	ND		ug/kg	280	--	1
1,2,3-Trichloropropane	ND		ug/kg	280	--	1
Styrene	ND		ug/kg	140	--	1
Dichlorodifluoromethane	ND		ug/kg	700	--	1
Acetone	ND		ug/kg	2500	--	1
Carbon disulfide	ND		ug/kg	280	--	1
Methyl ethyl ketone	ND		ug/kg	700	--	1
Methyl isobutyl ketone	ND		ug/kg	700	--	1
2-Hexanone	ND		ug/kg	700	--	1
Bromochloromethane	ND		ug/kg	280	--	1
Tetrahydrofuran	ND		ug/kg	280	--	1
2,2-Dichloropropane	ND		ug/kg	350	--	1
1,2-Dibromoethane	ND		ug/kg	280	--	1
1,3-Dichloropropane	ND		ug/kg	280	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	70	--	1
Bromobenzene	ND		ug/kg	350	--	1
n-Butylbenzene	ND		ug/kg	70	--	1
sec-Butylbenzene	ND		ug/kg	70	--	1
tert-Butylbenzene	ND		ug/kg	280	--	1
o-Chlorotoluene	ND		ug/kg	280	--	1
p-Chlorotoluene	ND		ug/kg	280	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	280	--	1
Hexachlorobutadiene	ND		ug/kg	280	--	1
Isopropylbenzene	ND		ug/kg	70	--	1
p-Isopropyltoluene	ND		ug/kg	70	--	1
Naphthalene	ND		ug/kg	280	--	1
n-Propylbenzene	ND		ug/kg	70	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	280	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	280	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	280	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	280	--	1

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID: L1617912-03 Date Collected: 06/06/16 16:00

Client ID: GLACIAL TILL B-107 10-14' Date Received: 06/10/16

Sample Location: WELLESLEY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Diethyl ether	ND		ug/kg	350	--	1
Diisopropyl Ether	ND		ug/kg	280	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	280	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	280	--	1
1,4-Dioxane	ND		ug/kg	7000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	85		70-130
Dibromofluoromethane	96		70-130

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 06/15/16 08:35
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 5035 High - Westborough Lab for sample(s): 02-03 Batch: WG904531-3					
Methylene chloride	ND		ug/kg	500	--
1,1-Dichloroethane	ND		ug/kg	75	--
Chloroform	ND		ug/kg	75	--
Carbon tetrachloride	ND		ug/kg	50	--
1,2-Dichloropropane	ND		ug/kg	180	--
Dibromochloromethane	ND		ug/kg	50	--
1,1,2-Trichloroethane	ND		ug/kg	75	--
Tetrachloroethene	ND		ug/kg	50	--
Chlorobenzene	ND		ug/kg	50	--
Trichlorofluoromethane	ND		ug/kg	200	--
1,2-Dichloroethane	ND		ug/kg	50	--
1,1,1-Trichloroethane	ND		ug/kg	50	--
Bromodichloromethane	ND		ug/kg	50	--
trans-1,3-Dichloropropene	ND		ug/kg	50	--
cis-1,3-Dichloropropene	ND		ug/kg	50	--
1,3-Dichloropropene, Total	ND		ug/kg	50	--
1,1-Dichloropropene	ND		ug/kg	200	--
Bromoform	ND		ug/kg	200	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	50	--
Benzene	ND		ug/kg	50	--
Toluene	ND		ug/kg	75	--
Ethylbenzene	ND		ug/kg	50	--
Chloromethane	ND		ug/kg	200	--
Bromomethane	ND		ug/kg	100	--
Vinyl chloride	ND		ug/kg	100	--
Chloroethane	ND		ug/kg	100	--
1,1-Dichloroethene	ND		ug/kg	50	--
trans-1,2-Dichloroethene	ND		ug/kg	75	--
Trichloroethene	ND		ug/kg	50	--

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 06/15/16 08:35
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 5035 High - Westborough Lab for sample(s): 02-03 Batch: WG904531-3					
1,2-Dichlorobenzene	ND		ug/kg	200	--
1,3-Dichlorobenzene	ND		ug/kg	200	--
1,4-Dichlorobenzene	ND		ug/kg	200	--
Methyl tert butyl ether	ND		ug/kg	100	--
p/m-Xylene	ND		ug/kg	100	--
o-Xylene	ND		ug/kg	100	--
Xylenes, Total	ND		ug/kg	100	--
cis-1,2-Dichloroethene	ND		ug/kg	50	--
1,2-Dichloroethene, Total	ND		ug/kg	50	--
Dibromomethane	ND		ug/kg	200	--
1,2,3-Trichloropropane	ND		ug/kg	200	--
Styrene	ND		ug/kg	100	--
Dichlorodifluoromethane	ND		ug/kg	500	--
Acetone	ND		ug/kg	1800	--
Carbon disulfide	ND		ug/kg	200	--
Methyl ethyl ketone	ND		ug/kg	500	--
Methyl isobutyl ketone	ND		ug/kg	500	--
2-Hexanone	ND		ug/kg	500	--
Bromochloromethane	ND		ug/kg	200	--
Tetrahydrofuran	ND		ug/kg	200	--
2,2-Dichloropropane	ND		ug/kg	250	--
1,2-Dibromoethane	ND		ug/kg	200	--
1,3-Dichloropropane	ND		ug/kg	200	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	50	--
Bromobenzene	ND		ug/kg	250	--
n-Butylbenzene	ND		ug/kg	50	--
sec-Butylbenzene	ND		ug/kg	50	--
tert-Butylbenzene	ND		ug/kg	200	--
o-Chlorotoluene	ND		ug/kg	200	--

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 06/15/16 08:35
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 5035 High - Westborough Lab for sample(s): 02-03 Batch: WG904531-3					
p-Chlorotoluene	ND		ug/kg	200	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	200	--
Hexachlorobutadiene	ND		ug/kg	200	--
Isopropylbenzene	ND		ug/kg	50	--
p-Isopropyltoluene	ND		ug/kg	50	--
Naphthalene	ND		ug/kg	200	--
n-Propylbenzene	ND		ug/kg	50	--
1,2,3-Trichlorobenzene	ND		ug/kg	200	--
1,2,4-Trichlorobenzene	ND		ug/kg	200	--
1,3,5-Trimethylbenzene	ND		ug/kg	200	--
1,2,4-Trimethylbenzene	ND		ug/kg	200	--
Diethyl ether	ND		ug/kg	250	--
Diisopropyl Ether	ND		ug/kg	200	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	200	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	200	--
1,4-Dioxane	ND		ug/kg	5000	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	85		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	91		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 02-03 Batch: WG904531-1 WG904531-2								
Methylene chloride	86		95		70-130	10		20
1,1-Dichloroethane	78		88		70-130	12		20
Chloroform	82		93		70-130	13		20
Carbon tetrachloride	84		98		70-130	15		20
1,2-Dichloropropane	79		89		70-130	12		20
Dibromochloromethane	97		105		70-130	8		20
1,1,2-Trichloroethane	98		103		70-130	5		20
Tetrachloroethene	108		126		70-130	15		20
Chlorobenzene	99		112		70-130	12		20
Trichlorofluoromethane	84		98		70-130	15		20
1,2-Dichloroethane	78		82		70-130	5		20
1,1,1-Trichloroethane	83		96		70-130	15		20
Bromodichloromethane	80		89		70-130	11		20
trans-1,3-Dichloropropene	90		98		70-130	9		20
cis-1,3-Dichloropropene	84		93		70-130	10		20
1,1-Dichloropropene	88		100		70-130	13		20
Bromoform	105		114		70-130	8		20
1,1,2,2-Tetrachloroethane	102		106		70-130	4		20
Benzene	86		97		70-130	12		20
Toluene	95		110		70-130	15		20
Ethylbenzene	94		108		70-130	14		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 02-03 Batch: WG904531-1 WG904531-2								
Chloromethane	73		86		70-130	16		20
Bromomethane	98		105		70-130	7		20
Vinyl chloride	84		97		70-130	14		20
Chloroethane	87		98		70-130	12		20
1,1-Dichloroethene	89		103		70-130	15		20
trans-1,2-Dichloroethene	87		102		70-130	16		20
Trichloroethene	87		100		70-130	14		20
1,2-Dichlorobenzene	103		114		70-130	10		20
1,3-Dichlorobenzene	102		117		70-130	14		20
1,4-Dichlorobenzene	101		116		70-130	14		20
Methyl tert butyl ether	84		85		70-130	1		20
p/m-Xylene	101		116		70-130	14		20
o-Xylene	100		115		70-130	14		20
cis-1,2-Dichloroethene	88		100		70-130	13		20
Dibromomethane	91		95		70-130	4		20
1,2,3-Trichloropropane	98		101		70-130	3		20
Styrene	103		116		70-130	12		20
Dichlorodifluoromethane	86		97		70-130	12		20
Acetone	88		87		70-130	1		20
Carbon disulfide	**66**	Q	83		70-130	**23**	Q	20
Methyl ethyl ketone	92		74		70-130	**22**	Q	20

Lab Control Sample Analysis
Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 02-03 Batch: WG904531-1 WG904531-2								
Methyl isobutyl ketone	86		85		70-130	1		20
2-Hexanone	80		78		70-130	3		20
Bromochloromethane	101		104		70-130	3		20
Tetrahydrofuran	80		75		70-130	6		20
2,2-Dichloropropane	82		94		70-130	14		20
1,2-Dibromoethane	104		107		70-130	3		20
1,3-Dichloropropane	95		99		70-130	4		20
1,1,1,2-Tetrachloroethane	97		111		70-130	13		20
Bromobenzene	100		114		70-130	13		20
n-Butylbenzene	94		111		70-130	17		20
sec-Butylbenzene	98		115		70-130	16		20
tert-Butylbenzene	98		115		70-130	16		20
o-Chlorotoluene	90		105		70-130	15		20
p-Chlorotoluene	90		105		70-130	15		20
1,2-Dibromo-3-chloropropane	111		113		70-130	2		20
Hexachlorobutadiene	108		128		70-130	17		20
Isopropylbenzene	96		112		70-130	15		20
p-Isopropyltoluene	99		118		70-130	18		20
Naphthalene	110		114		70-130	4		20
n-Propylbenzene	95		112		70-130	16		20
1,2,3-Trichlorobenzene	112		123		70-130	9		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173
Lab Number: L1617912
Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 02-03 Batch: WG904531-1 WG904531-2								
1,2,4-Trichlorobenzene	112		127		70-130	13		20
1,3,5-Trimethylbenzene	95		110		70-130	15		20
1,2,4-Trimethylbenzene	94		111		70-130	17		20
Diethyl ether	84		88		70-130	5		20
Diisopropyl Ether	**63**	Q	**68**	Q	70-130	8		20
Ethyl-Tert-Butyl-Ether	74		79		70-130	7		20
Tertiary-Amyl Methyl Ether	81		86		70-130	6		20
1,4-Dioxane	95		88		70-130	8		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	93		85		70-130
Toluene-d8	103		105		70-130
4-Bromofluorobenzene	87		91		70-130
Dibromofluoromethane	98		97		70-130

SEMIVOLATILES

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-01	Date Collected:	06/06/16 16:00
Client ID:	FILL COMPOSITE 2-7' B-102, B-107,TP-102	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	06/14/16 20:42
Analytical Date:	06/19/16 06:46		
Analyst:	HL		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID: L1617912-01 Date Collected: 06/06/16 16:00

Client ID: FILL COMPOSITE 2-7' B-102, B-107,TP-102 Date Received: 06/10/16

Sample Location: WELLESLEY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	220	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	390	--	1
4-Nitrophenol	ND		ug/kg	250	--	1
2,4-Dinitrophenol	ND		ug/kg	860	--	1
Pentachlorophenol	ND		ug/kg	360	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1
Pyridine	ND		ug/kg	720	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	72		30-130
Phenol-d6	73		30-130
Nitrobenzene-d5	84		30-130
2-Fluorobiphenyl	81		30-130
2,4,6-Tribromophenol	94		30-130
4-Terphenyl-d14	82		30-130

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-03	Date Collected:	06/06/16 16:00
Client ID:	GLACIAL TILL B-107 10-14'	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	06/14/16 20:42
Analytical Date:	06/19/16 07:11		
Analyst:	HL		
Percent Solids:	92%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID: L1617912-03 Date Collected: 06/06/16 16:00

Client ID: GLACIAL TILL B-107 10-14' Date Received: 06/10/16

Sample Location: WELLESLEY, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	220	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	390	--	1
4-Nitrophenol	ND		ug/kg	250	--	1
2,4-Dinitrophenol	ND		ug/kg	860	--	1
Pentachlorophenol	ND		ug/kg	360	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1
Pyridine	ND		ug/kg	720	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	69		30-130
Phenol-d6	70		30-130
Nitrobenzene-d5	81		30-130
2-Fluorobiphenyl	76		30-130
2,4,6-Tribromophenol	90		30-130
4-Terphenyl-d14	78		30-130

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 06/15/16 08:36
Analyst: PS

Extraction Method: EPA 3546
Extraction Date: 06/14/16 20:42

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01,03 Batch: WG903923-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	97	--
Bis(2-chloroethyl)ether	ND		ug/kg	140	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	97	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	190	--
Bis(2-chloroethoxy)methane	ND		ug/kg	170	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	140	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	140	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	97	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 06/15/16 08:36
Analyst: PS

Extraction Method: EPA 3546
Extraction Date: 06/14/16 20:42

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01,03 Batch: WG903923-1					
Benzo(b)fluoranthene	ND		ug/kg	97	--
Benzo(k)fluoranthene	ND		ug/kg	97	--
Chrysene	ND		ug/kg	97	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	97	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	97	--
Dibenzo(a,h)anthracene	ND		ug/kg	97	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	97	--
Aniline	ND		ug/kg	190	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	190	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	97	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	140	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	780	--
Pentachlorophenol	ND		ug/kg	320	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	230	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--
Pyridine	ND		ug/kg	650	--

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 06/15/16 08:36
Analyst: PS

Extraction Method: EPA 3546
Extraction Date: 06/14/16 20:42

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01,03 Batch: WG903923-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	64		30-130
Phenol-d6	66		30-130
Nitrobenzene-d5	65		30-130
2-Fluorobiphenyl	64		30-130
2,4,6-Tribromophenol	69		30-130
4-Terphenyl-d14	78		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01,03 Batch: WG903923-2 WG903923-3								
Acenaphthene	92		90		40-140	2		30
1,2,4-Trichlorobenzene	89		86		40-140	3		30
Hexachlorobenzene	100		96		40-140	4		30
Bis(2-chloroethyl)ether	87		85		40-140	2		30
2-Chloronaphthalene	97		91		40-140	6		30
1,2-Dichlorobenzene	82		81		40-140	1		30
1,3-Dichlorobenzene	80		79		40-140	1		30
1,4-Dichlorobenzene	80		79		40-140	1		30
3,3'-Dichlorobenzidine	80		60		40-140	29		30
2,4-Dinitrotoluene	111		106		40-140	5		30
2,6-Dinitrotoluene	112		104		40-140	7		30
Azobenzene	106		102		40-140	4		30
Fluoranthene	102		97		40-140	5		30
4-Bromophenyl phenyl ether	98		94		40-140	4		30
Bis(2-chloroisopropyl)ether	96		92		40-140	4		30
Bis(2-chloroethoxy)methane	96		92		40-140	4		30
Hexachlorobutadiene	86		82		40-140	5		30
Hexachloroethane	85		84		40-140	1		30
Isophorone	101		97		40-140	4		30
Naphthalene	89		84		40-140	6		30
Nitrobenzene	98		94		40-140	4		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01,03 Batch: WG903923-2 WG903923-3								
Bis(2-ethylhexyl)phthalate	110		106		40-140	4		30
Butyl benzyl phthalate	113		108		40-140	5		30
Di-n-butylphthalate	104		100		40-140	4		30
Di-n-octylphthalate	118		115		40-140	3		30
Diethyl phthalate	103		100		40-140	3		30
Dimethyl phthalate	107		98		40-140	9		30
Benzo(a)anthracene	99		95		40-140	4		30
Benzo(a)pyrene	110		107		40-140	3		30
Benzo(b)fluoranthene	106		103		40-140	3		30
Benzo(k)fluoranthene	101		96		40-140	5		30
Chrysene	96		92		40-140	4		30
Acenaphthylene	104		98		40-140	6		30
Anthracene	99		96		40-140	3		30
Benzo(ghi)perylene	99		94		40-140	5		30
Fluorene	98		95		40-140	3		30
Phenanthrene	94		89		40-140	5		30
Dibenzo(a,h)anthracene	103		96		40-140	7		30
Indeno(1,2,3-cd)pyrene	111		101		40-140	9		30
Pyrene	102		98		40-140	4		30
Aniline	67		59		40-140	13		30
4-Chloroaniline	66		52		40-140	24		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01,03 Batch: WG903923-2 WG903923-3								
1-Methylnaphthalene[1]	98		94		40-140	4		30
Dibenzofuran	95		91		40-140	4		30
2-Methylnaphthalene	95		88		40-140	8		30
Acetophenone	111		106		40-140	5		30
n-Nitrosodimethylamine	82		82		22-100	0		30
2,4,6-Trichlorophenol	102		96		30-130	6		30
2-Chlorophenol	94		91		30-130	3		30
2,4-Dichlorophenol	102		99		30-130	3		30
2,4-Dimethylphenol	107		102		30-130	5		30
2-Nitrophenol	98		94		30-130	4		30
4-Nitrophenol	117		94		30-130	22		30
2,4-Dinitrophenol	**19**	Q	**16**	Q	30-130	17		30
Pentachlorophenol	77		74		30-130	4		30
Phenol	93		90		30-130	3		30
2-Methylphenol	99		97		30-130	2		30
3-Methylphenol/4-Methylphenol	98		97		30-130	1		30
2,4,5-Trichlorophenol	106		99		30-130	7		30
Pyridine	36		35		30-130	3		30
4-Chlorophenyl phenyl ether	92		90		40-140	2		30
Hexachlorocyclopentadiene	83		80		40-140	4		30
NitrosoDiPhenylAmine(NDPA)/DPA	102		98		40-140	4		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01,03 Batch: WG903923-2 WG903923-3								
n-Nitrosodi-n-propylamine	101		95		40-140	6		30
2-Nitroaniline	114		107		40-140	6		30
3-Nitroaniline	87		83		40-140	5		30
4-Nitroaniline	100		97		40-140	3		30
P-Chloro-M-Cresol	113		106		30-130	6		30
4,6-Dinitro-o-cresol	71		71		30-130	0		30
Carbazole	101		97		40-140	4		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	79		76		30-130
Phenol-d6	89		84		30-130
Nitrobenzene-d5	88		83		30-130
2-Fluorobiphenyl	84		79		30-130
2,4,6-Tribromophenol	91		85		30-130
4-Terphenyl-d14	87		82		30-130

PETROLEUM HYDROCARBONS

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-01	Date Collected:	06/06/16 16:00
Client ID:	FILL COMPOSITE 2-7' B-102, B-107,TP-102	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015C(M)	Extraction Date:	06/15/16 23:22
Analytical Date:	06/16/16 12:22		
Analyst:	SR		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	35000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	90		40-140

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-03	Date Collected:	06/06/16 16:00
Client ID:	GLACIAL TILL B-107 10-14'	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	1,8015C(M)	Extraction Date:	06/15/16 23:22
Analytical Date:	06/16/16 12:59		
Analyst:	SR		
Percent Solids:	92%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	34200	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	90		40-140

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015C(M)
Analytical Date: 06/16/16 10:57
Analyst: SR

Extraction Method: EPA 3546
Extraction Date: 06/15/16 23:22

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01,03 Batch: WG904379-1					
TPH	ND		ug/kg	31600	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	86		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC

Project Number: 6173

Lab Number: L1617912

Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01,03 Batch: WG904379-2								
TPH	99		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	84				40-140

PCBS

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-01	Date Collected:	06/06/16 16:00
Client ID:	FILL COMPOSITE 2-7' B-102, B-107,TP-102	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	06/15/16 01:47
Analytical Date:	06/16/16 20:55	Cleanup Method:	EPA 3665A
Analyst:	KE	Cleanup Date:	06/15/16
Percent Solids:	91%	Cleanup Method:	EPA 3660B
		Cleanup Date:	06/15/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.6	--	1	A
Aroclor 1221	ND		ug/kg	36.6	--	1	A
Aroclor 1232	ND		ug/kg	36.6	--	1	A
Aroclor 1242	ND		ug/kg	36.6	--	1	A
Aroclor 1248	ND		ug/kg	36.6	--	1	A
Aroclor 1254	ND		ug/kg	36.6	--	1	A
Aroclor 1260	ND		ug/kg	36.6	--	1	A
Aroclor 1262	ND		ug/kg	36.6	--	1	A
Aroclor 1268	ND		ug/kg	36.6	--	1	A
PCBs, Total	ND		ug/kg	36.6	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		30-150	A
Decachlorobiphenyl	81		30-150	A
2,4,5,6-Tetrachloro-m-xylene	79		30-150	B
Decachlorobiphenyl	96		30-150	B

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173
Lab Number: L1617912
Report Date: 06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-03	Date Collected:	06/06/16 16:00
Client ID:	GLACIAL TILL B-107 10-14'	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082A	Extraction Date:	06/15/16 01:47
Analytical Date:	06/16/16 21:12	Cleanup Method:	EPA 3665A
Analyst:	KE	Cleanup Date:	06/15/16
Percent Solids:	92%	Cleanup Method:	EPA 3660B
		Cleanup Date:	06/15/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	34.6	--	1	A
Aroclor 1221	ND		ug/kg	34.6	--	1	A
Aroclor 1232	ND		ug/kg	34.6	--	1	A
Aroclor 1242	ND		ug/kg	34.6	--	1	A
Aroclor 1248	ND		ug/kg	34.6	--	1	A
Aroclor 1254	ND		ug/kg	34.6	--	1	A
Aroclor 1260	ND		ug/kg	34.6	--	1	B
Aroclor 1262	ND		ug/kg	34.6	--	1	A
Aroclor 1268	ND		ug/kg	34.6	--	1	A
PCBs, Total	ND		ug/kg	34.6	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	70		30-150	A
Decachlorobiphenyl	79		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		30-150	B
Decachlorobiphenyl	90		30-150	B

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 06/16/16 16:03
Analyst: KE

Extraction Method: EPA 3546
Extraction Date: 06/15/16 01:47
Cleanup Method: EPA 3665A
Cleanup Date: 06/15/16
Cleanup Method: EPA 3660B
Cleanup Date: 06/15/16

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01,03 Batch: WG903970-1						
Aroclor 1016	ND		ug/kg	31.6	--	A
Aroclor 1221	ND		ug/kg	31.6	--	A
Aroclor 1232	ND		ug/kg	31.6	--	A
Aroclor 1242	ND		ug/kg	31.6	--	A
Aroclor 1248	ND		ug/kg	31.6	--	A
Aroclor 1254	ND		ug/kg	31.6	--	A
Aroclor 1260	ND		ug/kg	31.6	--	A
Aroclor 1262	ND		ug/kg	31.6	--	A
Aroclor 1268	ND		ug/kg	31.6	--	A
PCBs, Total	ND		ug/kg	31.6	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		30-150	A
Decachlorobiphenyl	86		30-150	A
2,4,5,6-Tetrachloro-m-xylene	86		30-150	B
Decachlorobiphenyl	101		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC

Project Number: 6173

Lab Number: L1617912

Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01,03 Batch: WG903970-2 WG903970-3									
Aroclor 1016	77		80		40-140	4		30	A
Aroclor 1260	77		78		40-140	1		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	83		81		30-150	A
Decachlorobiphenyl	81		85		30-150	A
2,4,5,6-Tetrachloro-m-xylene	84		84		30-150	B
Decachlorobiphenyl	95		100		30-150	B

METALS

Project Name:	6173 BABSON COLLEGE BRAC	**Lab Number:**	L1617912
Project Number:	6173	**Report Date:**	06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-01	Date Collected:	06/06/16 16:00
Client ID:	FILL COMPOSITE 2-7' B-102, B-1	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	3.0		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:14	EPA 3050B	97,6010C	PS
Barium, Total	23		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:14	EPA 3050B	97,6010C	PS
Cadmium, Total	ND		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:14	EPA 3050B	97,6010C	PS
Chromium, Total	11		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:14	EPA 3050B	97,6010C	PS
Lead, Total	ND		mg/kg	2.2	--	1	06/11/16 11:11	06/13/16 13:14	EPA 3050B	97,6010C	PS
Mercury, Total	ND		mg/kg	0.069	--	1	06/11/16 11:10	06/15/16 12:40	EPA 7471B	97,7471B	BV
Selenium, Total	ND		mg/kg	2.2	--	1	06/11/16 11:11	06/13/16 13:14	EPA 3050B	97,6010C	PS
Silver, Total	ND		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:14	EPA 3050B	97,6010C	PS

Project Name:	6173 BABSON COLLEGE BRAC	**Lab Number:**	L1617912
Project Number:	6173	**Report Date:**	06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-03	Date Collected:	06/06/16 16:00
Client ID:	GLACIAL TILL B-107 10-14'	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	92%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	3.0		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:18	EPA 3050B	97,6010C	PS
Barium, Total	28		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:18	EPA 3050B	97,6010C	PS
Cadmium, Total	ND		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:18	EPA 3050B	97,6010C	PS
Chromium, Total	12		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:18	EPA 3050B	97,6010C	PS
Lead, Total	ND		mg/kg	2.1	--	1	06/11/16 11:11	06/13/16 13:18	EPA 3050B	97,6010C	PS
Mercury, Total	ND		mg/kg	0.069	--	1	06/11/16 11:10	06/15/16 12:42	EPA 7471B	97,7471B	BV
Selenium, Total	ND		mg/kg	2.1	--	1	06/11/16 11:11	06/13/16 13:18	EPA 3050B	97,6010C	PS
Silver, Total	ND		mg/kg	0.43	--	1	06/11/16 11:11	06/13/16 13:18	EPA 3050B	97,6010C	PS

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01,03 Batch: WG902969-1										
Arsenic, Total	ND		mg/kg	0.40	--	1	06/11/16 11:11	06/13/16 12:03	97,6010C	PS
Barium, Total	ND		mg/kg	0.40	--	1	06/11/16 11:11	06/13/16 12:03	97,6010C	PS
Cadmium, Total	ND		mg/kg	0.40	--	1	06/11/16 11:11	06/13/16 12:03	97,6010C	PS
Chromium, Total	ND		mg/kg	0.40	--	1	06/11/16 11:11	06/13/16 12:03	97,6010C	PS
Lead, Total	ND		mg/kg	2.0	--	1	06/11/16 11:11	06/13/16 12:03	97,6010C	PS
Selenium, Total	ND		mg/kg	2.0	--	1	06/11/16 11:11	06/13/16 12:03	97,6010C	PS
Silver, Total	ND		mg/kg	0.40	--	1	06/11/16 11:11	06/13/16 12:03	97,6010C	PS

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01,03 Batch: WG902981-1										
Mercury, Total	ND		mg/kg	0.083	--	1	06/11/16 11:10	06/15/16 12:27	97,7471B	BV

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC

Project Number: 6173

Lab Number: L1617912

Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01,03 Batch: WG902969-2 WG902969-3 SRM Lot Number: D088-540								
Arsenic, Total	114		105		79-121	8		30
Barium, Total	110		105		83-117	5		30
Cadmium, Total	107		107		83-117	0		30
Chromium, Total	110		110		80-120	0		30
Lead, Total	98		97		81-117	1		30
Selenium, Total	113		113		78-122	0		30
Silver, Total	112		112		75-124	0		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01,03 Batch: WG902981-2 WG902981-3 SRM Lot Number: D088-540								
Mercury, Total	112		101		72-128	10		30

INORGANICS
&
MISCELLANEOUS

Project Name:	6173 BABSON COLLEGE BRAC	**Lab Number:**	L1617912
Project Number:	6173	**Report Date:**	06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-01	Date Collected:	06/06/16 16:00
Client ID:	FILL COMPOSITE 2-7' B-102, B-1	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil		

Test Material Information

Source of Material:	Unknown
Description of Material:	Non-Metallic - Damp Clay
Particle Size:	Fine
Preliminary Burning Time (sec):	120

Parameter	Result	Date Analyzed	Analytical Method	Analyst
Ignitability of Solids - Westborough Lab				
Ignitability	NI	06/15/16 10:59	1,1030	AB

Project Name:	6173 BABSON COLLEGE BRAC	**Lab Number:**	L1617912
Project Number:	6173	**Report Date:**	06/22/16

SAMPLE RESULTS

Lab ID:	L1617912-03	Date Collected:	06/06/16 16:00
Client ID:	GLACIAL TILL B-107 10-14'	Date Received:	06/10/16
Sample Location:	WELLESLEY, MA	Field Prep:	Not Specified
Matrix:	Soil		

Test Material Information

Source of Material:	Unknown
Description of Material:	Non-Metallic - Damp Clay
Particle Size:	Fine
Preliminary Burning Time (sec):	120

Parameter	Result	Date Analyzed	Analytical Method	Analyst
Ignitability of Solids - Westborough Lab				
Ignitability	NI	06/15/16 10:59	1,1030	AB

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

SAMPLE RESULTS

Lab ID: L1617912-01
Client ID: FILL COMPOSITE 2-7' B-102, B-1
Sample Location: WELLESLEY, MA
Matrix: Soil

Date Collected: 06/06/16 16:00
Date Received: 06/10/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance	19		umhos/cm	10	--	1	-	06/12/16 16:31	1,9050A	JC
Solids, Total	91.0		%	0.100	NA	1	-	06/11/16 03:33	121,2540G	VB
pH (H)	6.3		SU	-	NA	1	-	06/11/16 08:30	1,9045D	KZ
Cyanide, Reactive	ND		mg/kg	10	--	1	06/13/16 21:45	06/14/16 00:06	1,7.3	ML
Sulfide, Reactive	ND		mg/kg	10	--	1	06/13/16 21:45	06/13/16 23:37	1,7.3	ML

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

SAMPLE RESULTS

Lab ID: L1617912-02
Client ID: B-107 S-2 5-7' FILL
Sample Location: WELLESLEY, MA
Matrix: Soil

Date Collected: 06/06/16 16:00
Date Received: 06/10/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	91.0		%	0.100	NA	1	-	06/11/16 03:33	121,2540G	VB

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

SAMPLE RESULTS

Lab ID: L1617912-03
Client ID: GLACIAL TILL B-107 10-14'
Sample Location: WELLESLEY, MA
Matrix: Soil

Date Collected: 06/06/16 16:00
Date Received: 06/10/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance	17		umhos/cm	10	--	1	-	06/12/16 16:31	1,9050A	JC
Solids, Total	92.0		%	0.100	NA	1	-	06/21/16 01:19	121,2540G	VB
pH (H)	7.1		SU	-	NA	1	-	06/11/16 08:30	1,9045D	KZ
Cyanide, Reactive	ND		mg/kg	10	--	1	06/13/16 21:45	06/14/16 00:06	1,7.3	ML
Sulfide, Reactive	ND		mg/kg	10	--	1	06/13/16 21:45	06/13/16 23:38	1,7.3	ML

Project Name: 6173 BABSON COLLEGE BRAC **Lab Number:** L1617912

Project Number: 6173 **Report Date:** 06/22/16

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01,03 Batch: WG903507-1										
Cyanide, Reactive	ND		mg/kg	10	--	1	06/13/16 21:45	06/14/16 00:03	1,7.3	ML
General Chemistry - Westborough Lab for sample(s): 01,03 Batch: WG903508-1										
Sulfide, Reactive	ND		mg/kg	10	--	1	06/13/16 21:45	06/13/16 23:31	1,7.3	ML

Lab Control Sample Analysis

Batch Quality Control

Project Name: 6173 BABSON COLLEGE BRAC

Project Number: 6173

Lab Number: L1617912

Report Date: 06/22/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01,03 Batch: WG902995-1								
pH	100		-		99-101	-		
General Chemistry - Westborough Lab Associated sample(s): 01,03 Batch: WG903169-1								
Specific Conductance	100		-		99-101	-		
General Chemistry - Westborough Lab Associated sample(s): 01,03 Batch: WG903507-2								
Cyanide, Reactive	71		-		30-125	-		40
General Chemistry - Westborough Lab Associated sample(s): 01,03 Batch: WG903508-2								
Sulfide, Reactive	92		-		60-125	-		40

Project Name: 6173 BABSON COLLEGE BRAC
Project Number: 6173

Lab Number: L1617912
Report Date: 06/22/16

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 06/10/2016 19:40

Cooler Information	Custody Seal
Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1617912-01A	Glass 500ml/16oz unpreserved	A	N/A	2.5	Y	Absent	IGNIT-1030(14),MCP-8082-10(365),REACTS(14),MCP-8270-10(14),TS(7),PH-9045(1),MCP(),REACTCN(14),TPH-DRO-D(14),COND-9050(28)
L1617912-01X	Glass 60ml unpreserved split	A	N/A	2.5	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1617912-02A	Vial MeOH preserved	A	N/A	2.5	Y	Absent	MCP-8260H-10(14)
L1617912-02B	Vial water preserved	A	N/A	2.5	Y	Absent	MCP-8260H-10(14)
L1617912-02C	Vial water preserved	A	N/A	2.5	Y	Absent	MCP-8260H-10(14)
L1617912-03A	Vial MeOH preserved	A	N/A	2.5	Y	Absent	MCP-8260H-10(14)
L1617912-03B	Vial water preserved	A	N/A	2.5	Y	Absent	MCP-8260H-10(14)
L1617912-03C	Vial water preserved	A	N/A	2.5	Y	Absent	MCP-8260H-10(14)
L1617912-03D	Glass 500ml/16oz unpreserved	A	N/A	2.5	Y	Absent	IGNIT-1030(14),MCP-8082-10(365),REACTS(14),MCP-8270-10(14),TS(7),PH-9045(1),MCP(),REACTCN(14),TPH-DRO-D(14),COND-9050(28)
L1617912-03X	Glass 60ml unpreserved split	A	N/A	2.5	Y	Absent	MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	6173 BABSON COLLEGE BRAC	**Lab Number:**	L1617912
Project Number:	6173	**Report Date:**	06/22/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Project Name:	6173 BABSON COLLEGE BRAC	**Lab Number:**	L1617912
Project Number:	6173	**Report Date:**	06/22/16

Data Qualifiers

reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	6173 BABSON COLLEGE BRAC	**Lab Number:**	L1617912
Project Number:	6173	**Report Date:**	06/22/16

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: 1,2-Dibromo-3-chloropropane, 1,2-Dibromoethane, m/p-xylene, o-xylene
EPA 624: 2-Butanone (MEK), 1,4-Dioxane, tert-Amylmethyl Ether, tert-Butyl Alcohol, m/p-xylene, o-xylene
EPA 625: Aniline, Benzoic Acid, Benzyl Alcohol, 4-Chloroaniline, 3-Methylphenol, 4-Methylphenol.
EPA 1010A: NPW: Ignitability
EPA 6010C: NPW: Strontium; SCM: Strontium
EPA 8151A: NPW: 2,4-DB, Dicamba, Dichloroprop, MCPA, MCPP; SCM: 2,4-DB, Dichloroprop, MCPA, MCPP
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene, Isopropanol; SCM: Iodomethane (methyl iodide), Methyl methacrylate (soil); 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Pentachloronitrobenzene, 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Pentachloronitrobenzene, 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 9010: NPW: Amenable Cyanide Distillation, Total Cyanide Distillation
EPA 9038: NPW: Sulfate
EPA 9050A: NPW: Specific Conductance
EPA 9056: NPW: Chloride, Nitrate, Sulfate
EPA 9065: NPW: Phenols
EPA 9251: NPW: Chloride
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
EPA 8270D: NPW: Biphenyl; SCM: Biphenyl, Caprolactam
EPA 8270D-SIM Isotope Dilution: SCM: 1,4-Dioxane
SM 2540D: TSS
SM2540G: SCM: Percent Solids
EPA 1631E: SCM: Mercury
EPA 7474: SCM: Mercury
EPA 8081B: NPW and SCM: Mirex, Hexachlorobenzene.
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA 8270-SIM: NPW and SCM: Alkylated PAHs.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene.
Biological Tissue Matrix: ***8270D-SIM; 3050B; 3051A; 7471B; 8081B; 8082A; 6020A:*** Lead***; 8270D:*** bis(2-ethylhexyl)phthalate, Butylbenzylphthalate, Diethyl phthalate, Dimethyl phthalate, Di-n-butyl phthalate, Di-n-octyl phthalate, Fluoranthene, Pentachlorophenol.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F,**
EPA 353.2: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 6/10/16

ALPHA Job #: L1617912

ALPHA ANALYTICAL
8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: McPhail Associates LLC
Address: 2269 Mass Ave
Cambridge, MA
Phone: 978-868-1420
Email: bdowning@mcphailgeo.com

Project Information

Project Name: 6173 Babson College BRAC
Project Location: wellesley, MA
Project #: 6173
Project Manager: Ben Downing
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☒ ADEx ☐ EMAIL

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☒ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Additional Project Information:

ANALYSIS: VOC: ☒ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☐ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint; SOIL DISPOSAL PACKAGE IV

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	SOIL DISPOSAL PACKAGE IV					Sample Comments	TOTAL # BOTTLES
1791201	FILL COMPOSITE 2-7' B-102, B-107, TP-102	06/16/16	16:00	SOIL	AKH									X						1
02	B-107 S-2 5-7' FILL	06/06/16	16:00	SOIL	AKH	X														3
03	GLACIAL TILL B-107 10-14'	06/06/16	16:00	SOIL	AKH	X								X						4
Container Type						V								A						
Preservative						0/F								A						

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Alex K Hart	06/10/16 14:00	Rob Maesto	6/10/16 16:05
Rob Maesto	6/10/16 19:10	[illegible]	6/10/16 19:10

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

4A

VOLATILE ORGANICS METHOD BLANK SUMMARY

SAMPLE NO.

WG904531-3BLANK

Lab Name: Alpha Analytical Labs

SDG No.: L1617912

Lab File ID: 0615A05 Lab Sample ID: WG904531-3

Date Analyzed: 06/15/16 Time Analyzed: 08:35

Instrument ID: VOA111.I

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	WG904531-1LCS	WG904531-1	0615A01	06/15/16 06:54
02	WG904531-2LCSD	WG904531-2	0615A02	06/15/16 07:20
03	B-107 S-2 5-7' FILL	L1617912-02	0615A24	06/15/16 16:39
04	GLACIAL TILL B-107 10-	L1617912-03	0615A25	06/15/16 17:04

COMMENTS: _____

page 1 of 1

FORM IV MCP-8260H-10 HIGH

7A
Volatile Organics CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1617912

Instrument ID: Voa111.i Calibration Date: 15-JUN-2016 Time: 06:54

Lab File ID: 0615A01 Init. Calib. Date(s): 04-APR-2 04-APR-2

Sample No: 8260 CCAL F Init. Calib. Times : 14:29 17:28

Compound	RRF	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.27564	.23824	.1	-14	20	
chloromethane	.37166	.27036	.1	-27	20	F
vinyl chloride	.33082	.27726	.1	-16	20	
bromomethane	.2064	.20116	.1	-3	20	
chloroethane	.20948	.18295	.1	-13	20	
trichlorofluoromethane	.35459	.29864	.1	-16	20	
ethyl ether	.16758	.13998	.05	-16	20	
1,1,-dichloroethene	.22717	.20263	.1	-11	20	
carbon disulfide	100	65.859	.1	-34	20	F
methylene chloride	.29752	.25594	.1	-14	20	
acetone	.06036	.0529	.1	-12	20	F
trans-1,2-dichloroethene	.26771	.23265	.1	-13	20	
methyl tert butyl ether	.74653	.62526	.1	-16	20	
Diisopropyl Ether	1.1046	.69106	.05	-37	20	F
1,1-dichloroethane	.53991	.41932	.2	-22	20	F
Ethyl-Tert-Butyl-Ether	.94251	.69268	.05	-27	20	F
cis-1,2-dichloroethene	.29461	.25885	.1	-12	20	
2,2-dichloropropane	.38923	.32016	.05	-18	20	
bromochloromethane	.12256	.12363	.05	1	20	
chloroform	.48228	.39763	.2	-18	20	
carbontetrachloride	.32407	.27293	.1	-16	20	
tetrahydrofuran	.08086	.06461	.05	-20	20	F
1,1,1-trichloroethane	.38311	.31878	.1	-17	20	
2-butanone	.09486	.08697	.1	-8	20	F
1,1-dichloropropene	.34678	.30449	.05	-12	20	
benzene	1.1239	.96887	.5	-14	20	
Tertiary-Amyl Methyl Ether	.7749	.62835	.05	-19	20	
1,2-dichloroethane	.3428	.26682	.1	-22	20	F
trichloroethene	.26775	.23317	.2	-13	20	
dibromomethane	.14605	.13277	.05	-9	20	
1,2-dichloropropane	.30322	.2384	.1	-21	20	F
bromodichloromethane	.36581	.29297	.2	-20	20	
1,4-dioxane	5000	4753	.05	-5	20	
cis-1,3-dichloropropene	.4483	.37831	.2	-16	20	
toluene	.84165	.79779	.4	-5	20	
4-methyl-2-pentanone	.08105	.07011	.1	-14	20	F
tetrachloroethene	.3065	.33093	.2	8	20	
trans-1,3-dichloropropene	.46531	.41959	.1	-10	20	

FORM VII MCP-8260H-10

7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1617912

Instrument ID: Voa111.i Calibration Date: 15-JUN-2016 Time: 06:54

Lab File ID: 0615A01 Init. Calib. Date(s): 04-APR-2 04-APR-2

Sample No: 8260 CCAL F Init. Calib. Times : 14:29 17:28

Compound	RRF	RRF	MIN RRF	%D	MAX %D	
1,1,2-trichloroethane	.22839	.22398	.1	-2	20	
chlorodibromomethane	.29961	.2902	.1	-3	20	
1,3-dichloropropane	.48365	.45964	.05	-5	20	
1,2-dibromoethane	.23798	.247	.1	4	20	
2-hexanone	.17636	.14073	.1	-20	20	F
chlorobenzene	.88451	.87181	.5	-1	20	
ethyl benzene	1.5426	1.4425	.1	-6	20	
1,1,1,2-tetrachloroethane	.29638	.28812	.05	-3	20	
p/m xylene	.56849	.5726	.1	1	20	
o xylene	.55016	.54875	.3	0	20	
styrene	.87815	.90511	.3	3	20	
bromoform	.34307	.36008	.1	5	20	
isopropylbenzene	2.9042	2.7724	.1	-5	20	
bromobenzene	.69941	.7036	.05	1	20	
n-propylbenzene	3.5199	3.3312	.05	-5	20	
1,1,2,2,-tetrachloroethane	.65127	.66119	.3	2	20	
2-chlorotoluene	2.4501	2.1935	.05	-10	20	
1,3,5-trimethybenzene	2.4155	2.3005	.05	-5	20	
1,2,3-trichloropropane	.49832	.48725	.05	-2	20	
4-chorotoluene	2.1948	1.9641	.05	-11	20	
tert-butylbenzene	1.9888	1.9427	.05	-2	20	
1,2,4-trimethylbenzene	2.4487	2.3074	.05	-6	20	
sec-butylbenzene	3.0736	2.9997	.05	-2	20	
p-isopropyltoluene	2.5114	2.4864	.05	-1	20	
1,3-dichlorobenzene	1.3331	1.3534	.6	2	20	
1,4-dichlorobenzene	1.3451	1.3565	.5	1	20	
n-butylbenzene	2.4986	2.3448	.05	-6	20	
1,2-dichlorobenzene	1.2272	1.2597	.4	3	20	
1,2-dibromo-3-chloropropane	.07792	.08647	.05	11	20	
hexachlorobutadiene	.46104	.49973	.05	8	20	
1,2,4-trichlorobenzene	.83781	.94152	.2	12	20	
naphthalene	1.7437	1.9265	.05	10	20	
1,2,3-trichlorobenzene	.77555	.86908	.05	12	20	
dibromofluoromethane	.24728	.24295	.05	-2	30	
1,2-dichloroethane-d4	.2503	.23192	.05	-7	30	
toluene-d8	1.3089	1.3474	.05	3	30	
4-bromofluorobenzene	1.0469	.91458	.05	-13	30	

FORM VII MCP-8260H-10

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Norfolk and Suffolk Counties, Massachusetts (MA616)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
245B	Hinckley loamy sand, 3 to 8 percent slopes	A	9.2	17.7%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	C	12.8	24.7%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	29.7	57.4%
653	Udorthents, sandy	A	0.1	0.2%
Totals for Area of Interest			**51.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

APPENDIX G

Draft Stormwater Pollution Prevention Plan (SWPPP)

Stormwater Pollution Prevention Plan (SWPPP)

For Construction Activities at:

WEBSTER ATHLETIC CENTER RENOVATION AND EXPANSION
3 Babson College Drive
Wellesley, Massachusetts 02457
(401) 255-8423

SWPPP Prepared for:

Cambridge 7 Associates
1050 Massachusetts Avenue
Cambridge, MA 02138
T: 617-492-7000
F: 617-492-7007

SWPPP Prepared by:

Nitsch Engineering
2 Center Plaza
Boston, MA 02143
T: 617-338-0063
F: 617-338-6472

SWPPP Preparation Date:

10/13/2016

Estimated Project Dates:

Project Start Date: 9/20/2017 (estimated)
Project Completion Date: 9/15/2019 (estimated)

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SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Operator(s) / Subcontractor(s)

Instructions (see definition of "operator" at CGP Part 1.1.a):

- Identify the operator(s) who will be engaged in construction activities at the site. Indicate respective responsibilities, where appropriate. Also include the 24-hour emergency contact.
- List subcontractors expected to work on-site. Notify subcontractors of stormwater requirements applicable to their work.
- Consider using Subcontractor Agreements such as the type included as a sample in Appendix G of the Template.

Operator(s):

Insert Company or Organization Name: Gilbane Co.
Insert Name: Stephen Duvel
Insert Address: 7 Jackson Walkway
Insert City, State, Zip Code: Providence RI 02903
Insert Telephone Number: 401-456-5869/ 401-255-8423
Insert Fax/Email: SDuvel@GilbaneCo.com
Insert area of control (if more than one operator at site): General Contractor/CM

[Repeat as necessary.]

Subcontractor(s): TBD

Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:
Insert area of control (if more than one operator at site):

[Repeat as necessary.]

Emergency 24-Hour Contact: TBD

Insert Company or Organization Name:
Insert Name:
Insert Telephone Number:

1.2 Stormwater Team

Instructions (see CGP Part 7.2.1):

- Identify the staff members (by name or position) that comprise the project's stormwater team as well as their individual responsibilities. At a minimum the stormwater team is comprised of individuals who are responsible for overseeing the development of the SWPPP, any later modifications to it, and for compliance with the requirements in this permit (i.e., installing and maintaining stormwater controls, conducting site inspections, and taking corrective actions where required).
- Each member of the stormwater team must have ready access to either an electronic or paper copy of applicable portions of the 2012 CGP and your SWPPP.

Insert Role or Responsibility: Owner
Insert Position: Director of Capital Projects
Insert Name: David Grissino
Insert Telephone Number: (781) 239-5987
Insert Email: dgrissino@babson.edu

Insert Role or Responsibility: Owner's Project Manager
Insert Position: Project Manager
Insert Name: Shara Lewis
Insert Telephone Number: 857 453 9310
Insert Email: slewis@pinck-co.com

Insert Role or Responsibility:
Insert Position:
Insert Name:
Insert Telephone Number:
Insert Email:

[Repeat as necessary.]

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Project/Site Information

Instructions (see "Project/Site Information" section of Appendix J – NOI form):

- In this section, you are asked to compile basic site information that will be helpful to you when you file your NOI.
- Detailed information on determining your site's latitude and longitude can be found at www.epa.gov/npdes/stormwater/latlong

Project Name and Address

Project/Site Name: Webster Athletic Center Renovation and Expansion - BRAC
Project Street/Location: 3 Babson College Drive
City: Babson Park
State: Massachusetts
ZIP Code: 02457
County or Similar Subdivision: Norfolk

Project Latitude/Longitude

(Use **one** of three possible formats, and specify method)

Latitude:
3. 42.2989 ° N (decimal)

Longitude:
3. -71.2690 ° W (decimal)

Method for determining latitude/longitude:
☐ USGS topographic map (specify scale: _____) ☐ EPA Web site ☐ GPS
☒ Other (please specify): Google Earth

Horizontal Reference Datum:
☐ NAD 27 ☒ NAD 83 or WGS 84 ☐ Unknown

If you used a U.S.G.S topographic map, what was the scale?
_____

Additional Project Information

Is the project/site located on Indian country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ Yes ☒ No

If yes, provide the name of the Indian tribe associated with the area of Indian country (including the name of Indian reservation if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property: NA

If you are conducting earth-disturbing activities in response to a public emergency, document the cause of the public emergency *(e.g., natural disaster, extreme flooding conditions)*, information substantiating its occurrence *(e.g., state disaster declaration)*, and a description of the construction necessary to reestablish effective public services: NA

Are you applying for permit coverage as a "federal operator" as defined in Appendix A of the 2012 CGP? ☐ Yes ☒ No

2.2 Discharge Information

Instructions (see "Discharge Information" section of Appendix J – NOI form):

- In this section, include information relating to your site's discharge. This information corresponds to the "Discharge Information" section of the NOI form. Because you may be using EPA's mapping tool to answer some of these questions, and the tool is accessed in the eNOI system, you may find it necessary to leave some questions unanswered until you have completed that portion of the NOI.
- For Table 1, list the name of the first surface water that receives discharges from your site. If your site has discharges to multiple surface waters, indicate the names of all such waters.
- For Table 2, if any of the surface waters you listed out in Table 1 are listed as impaired by the applicable State or Tribe, provide specified information about pollutants causing the impairment and whether or not a Total Maximum Daily Load (TMDL) has been completed for the surface water. For more information on TMDLs and impaired waters, including a list of TMDL contacts and links by state, visit www.epa.gov/npdes/stormwater/tmdl.
- For Table 3, indicate whether any of the surface waters you listed out in Table 1 are designated as Tier 2, 2.5, or 3 waters by your State or Tribe. See Appendix F for more information.

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☒ Yes ☐ No

Are there any surface waters that are located within 50 feet of your construction disturbances?
☐ Yes ☒ No

Table 1 – Names of Receiving Waters

Name(s) of the first surface water that receives stormwater directly from your site and/or from the MS4 (note: multiple rows provided where your site has more than one point of discharge that flows to different surface waters)
1. Rosemary Brook (Tributary to the Charles River)
2.
3.
4.
5.
6.

Table 2 – Impaired Waters / TMDLs (Answer the following for each surface water listed in Table 1 above)

	Is this surface water listed as "impaired"?	If you answered yes, then answer the following:			
		What pollutant(s) are causing the impairment?	Has a TMDL been completed?	Title of the TMDL document	Pollutant(s) for which there is a TMDL
1.	☒ YES ☐ NO	**Pesticides, Pathogens, Nuisance Exotic Species, Habitat Alterations, Nutrients, Flow Alterations, PCBs, Dissolved Oxygen, Total Phosphorous**	☒ YES ☐ NO	**Final Pathogen TMDL for the Charles River Watershed Total Maximum Daily Load for Nutrients in the Upper/Middle Charles River, Massachusetts**	**Pathogens; Phosphorous**
2.	☐ YES ☐ NO		☐ YES ☐ NO		
3.	☐ YES ☐ NO		☐ YES ☐ NO		
4.	☐ YES ☐ NO		☐ YES ☐ NO		
5.	☐ YES ☐ NO		☐ YES ☐ NO		
6.	☐ YES ☐ NO		☐ YES ☐ NO		

Describe the method(s) you used to determine whether or not your project/site discharges to an impaired water: U.S. EPA Watershed Assessment, Tracking, and Environmental Results, 2012 Waterbody Report for the Charles River

Table 3 – Tier 2, 2.5, or 3 Waters (Answer the following for each surface water listed in Table 1 above)

	Is this surface water designated as a Tier 2, Tier 2.5, or Tier 3 water? (see Appendix F)	If you answered yes, specify which Tier (2, 2.5, or 3) the surface water is designated as?
1.	☐ YES ☒ NO	
2.	☐ YES ☐ NO	
3.	☐ YES ☐ NO	

2.3 Nature of the Construction Activity

Instructions (see CGP Parts 1.3.c and 7.2.2):

- Provide a general description of the nature of the construction activities at your project.
- Describe the size of the property (in acres) and the total area expected to be disturbed by the construction activities (in acres), construction support activities covered by this permit (see Part 1.3.c of the permit), and the maximum area expected to be disturbed at any one time.

General Description of Project

Provide a general description of the construction project:

The existing site consists of an athletic center, tennis courts, and landscaped areas. The proposed project will consist of an addition to the athletic center, removal of the tennis courts, and construction of associated walkways, utilities, landscaped areas, and drainage systems.

Size of Construction Project

What is the size of the property (in acres), the total area expected to be disturbed by the construction activities (in acres), and the maximum area expected to be disturbed at any one time?

Size of Property: 3.21 acres

Area of Construction Disturbances: 3.21 acres

Maximum Area to be Disturbed at Any One Time: 3.21 acres

Construction Support Activities (only provide if applicable)

Describe any construction support activities for the project (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas)

The contractor will determine where construction support activities are to take place on site and will update the SWPPP as necessary.

2.4 Sequence and Estimated Dates of Construction Activities

Instructions (see CGP Part 7.2.5):

- Describe the intended construction sequence and timing of major activities.
- For each phase of construction, include the following information:
  - ✓ Installation of stormwater controls, and when they will be made operational;
  - ✓ Commencement and duration of earth-disturbing activities, including clearing and grubbing, mass grading, site preparation (i.e., excavating, cutting and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;
  - ✓ Cessation, temporarily or permanently, of construction activities on the site, or in designated portions of the site;
  - ✓ Final or temporary stabilization of areas of exposed soil. The dates for stabilization must reflect the applicable deadlines to which you are subject to in Part 2.2.1; and
  - ✓ Removal of temporary stormwater conveyances/channels and other stormwater control measures, removal of construction equipment and vehicles, and cessation of any pollutant-generating activities.
- The construction sequence must reflect the following requirements:
  - ✓ Part 2.1.1.1 (area of disturbance);
  - ✓ Part 2.1.1.3.a (installation of stormwater controls); and
  - ✓ Parts 2.2.1.1, 2.2.1.2, 2.2.1.3 (stabilization deadlines).
- Also, see EPA's *Construction Sequencing BMP Fact Sheet* at http://www.epa.gov/npdes/stormwater/menuofbmps/construction/cons_seq)

Phase I

INSERT GENERAL DESCRIPTION OF PHASE

- INSERT ESTIMATED START AND END DATES OF CONSTRUCTION DISTURBANCES ASSOCIATED WITH THIS PHASE
- FOR EACH STORMWATER CONTROL, INSERT ESTIMATED DATE(s) OF INSTALLATION OF EACH STORMWATER CONTROL
- FOR AREAS OF THE SITE REQUIRED TO BE STABILIZED, INSERT ESTIMATED DATE(s) OF APPLICATION OF STABILIZATION MEASURES
- INSERT ESTIMATED DATE(s) WHEN STORMWATER CONTROLS WILL BE REMOVED

Phase II

INSERT GENERAL DESCRIPTION OF PHASE

- INSERT ESTIMATED START AND END DATES OF CONSTRUCTION DISTURBANCES ASSOCIATED WITH THIS PHASE
- FOR EACH STORMWATER CONTROL, INSERT ESTIMATED DATE(s) OF INSTALLATION OF EACH STORMWATER CONTROL
- FOR AREAS OF THE SITE REQUIRED TO BE STABILIZED, INSERT ESTIMATED DATE(s) OF APPLICATION OF STABILIZATION MEASURES
- INSERT ESTIMATED DATE(s) WHEN STORMWATER CONTROLS WILL BE REMOVED

[Repeat as needed.]

2.5 Allowable Non-Stormwater Discharges

Instructions (see CGP Parts 1.3.d and 7.2.8):

- Identify all allowable sources of non-stormwater discharges. The allowable non-stormwater discharges identified in Part 1.3.d of the 2012 CGP include:
  - ✓ Discharges from emergency fire-fighting activities;
  - ✓ Fire hydrant flushings;
  - ✓ Landscape irrigation;
  - ✓ Waters used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;
  - ✓ Water used to control dust;
  - ✓ Potable water including uncontaminated water line flushings;
  - ✓ Routine external building wash down that does not use detergents;
  - ✓ Pavement wash waters provided spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and detergents are not used. You are prohibited from directing pavement was waters directly into any surface water, storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control;
  - ✓ Uncontaminated air conditioning or compressor condensate;
  - ✓ Uncontaminated, non-turbid discharges of ground water or spring water;
  - ✓ Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and
  - ✓ Construction dewatering water that has been treated by an appropriate control.

List of Allowable Non-Stormwater Discharges Present at the Site

Type of Allowable Non-Stormwater Discharge	Likely to be Present at Your Site?
Discharges from emergency fire-fighting activities	☐ YES ☒ NO
Fire hydrant flushings	☒ YES ☐ NO
Landscape irrigation	☒ YES ☐ NO
Waters used to wash vehicles and equipment	☒ YES ☐ NO
Water used to control dust	☒ YES ☐ NO
Potable water including uncontaminated water line flushings	☒ YES ☐ NO
Routine external building wash down	☒ YES ☐ NO
Pavement wash waters	☒ YES ☐ NO
Uncontaminated air conditioning or compressor condensate	☒ YES ☐ NO
Uncontaminated, non-turbid discharges of ground water or spring water	☐ YES ☒ NO
Foundation or footing drains	☒ YES ☐ NO
Construction dewatering water	☒ YES ☐ NO

(Note: You are reminded of the requirement to identify the likely locations of these allowable non-stormwater discharges on your site map. See Section 2.6, below, of the SWPPP Template.)

2.6 Site Maps

Instructions (see CGP Part 7.2.6):

- Attach site maps in Appendix A of the Template. For most projects, a series of site maps is necessary and recommended. The first should show the undeveloped site and its current features. An additional map or maps should be created to show the developed site or, for more complicated sites, show the major phases of development.

These maps must include the following features:

- Boundaries of the property and of the locations where construction will occur, including:
  - ✓ Locations where earth-disturbing activities will occur, noting any phasing of construction activities;
  - ✓ Approximate slopes before and after major grading activities. Note areas of steep slopes, as defined in Appendix A;
  - ✓ Locations where sediment, soil, or other construction materials will be stockpiled;
  - ✓ Locations of any crossings of surface waters;
  - ✓ Designated points on the site where vehicles will exit onto paved roads;
  - ✓ Locations of structures and other impervious surfaces upon completion of construction; and
  - ✓ Locations of construction support activity areas covered by this permit.
- Locations of all surface waters, including wetlands, that exists on or near your site. Indicate which waterbodies are listed as impaired, and which are identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 waters.
- The boundary lines of any natural buffer areas. See CGP Part 2.1.2.1.a.
- Areas of federally-listed critical habitat for endangered or threatened species.
- Topography of the site, existing vegetative cover (e.g., forest, pasture, pavement, structures), and drainage pattern(s) of stormwater and allowable non-stormwater flow onto, over, and from the site property before and after major grading activities.
- Stormwater and allowable non-stormwater discharge locations, including:
  - ✓ Locations of any storm drain inlets on the site and in the immediate vicinity of the site; and
  - ✓ Locations where stormwater or allowable non-stormwater will be discharged to surface waters (including wetlands).
- Locations of all potential pollutant-generating activities.
- Locations of stormwater control measures.
- Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

3.1 Endangered Species Protection

Instructions (see CGP Parts 1.1.e, 7.2.14.1, Appendix D, and the "Endangered Species Protection" section of the Appendix J – NOI form):

Follow the process in Appendix D of the permit for determining which eligibility criterion (A-E) you have met with respect to the protection of endangered species. You will

- Include documentation supporting your determination of eligibility.
- Additional information on Endangered Species Act (ESA) provisions for EPA's Construction General Permit is at www.epa.gov/npdes/stormwater/esa

Eligibility Criterion

Under which criterion listed in Appendix D are you eligible for coverage under this permit?

☒ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E**

For reference purposes, the eligibility criteria listed in Appendix D are as follows:

Criterion A. No federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's "action area" as defined in Appendix A of this permit.

Criterion B. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your action area under eligibility Criterion A, C, D, E, or F and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the "action area". To certify your eligibility under this Criterion, there must be no lapse of NPDES permit coverage in the other operator's certification. By certifying eligibility under this Criterion, you agree to comply with any effluent limitations or conditions upon which the other operator's certification was based. You must include in your NOI the tracking number from the other operator's notification of authorization under this permit. If your certification is based on another operator's certification under Criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C in your NOI form.

Criterion C. Federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in or near your site's "action area," and your site's discharges and discharge-related activities are not likely to adversely affect listed threatened or endangered species or critical habitat. This determination may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect listed species and critical habitat. To make this certification, you must include the following in your NOI: 1) any federally listed species and/or designated habitat located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also include a copy of your site map with your NOI.

Criterion D. Coordination between you and the Services has been concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion E. Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat. The result of this consultation must be either:

i. a biological opinion that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

ii. written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated habitat.

You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion F. Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Supporting Documentation

Provide documentation for the applicable eligibility criterion you select in Appendix D, as follows:

For criterion A, indicate the basis for your determination that no federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's action area (as defined in Appendix A of the permit). Check the applicable source of information you relied upon:

- ☐ Specific communication with staff of the U.S. Fish & Wildlife Service or National Marine Fisheries Service.
- ☒ Publicly available species list. NHESP Online Viewer and GIS layers (2008)
- ☐ Other source:

See NHESP Map included in this SWPPP as Appendix K.

3.2 Historic Preservation

Instructions (see CGP Part 1.1.f, 7.2.14.2, Appendix E, and the "Historic Preservation" section of the Appendix J – NOI form):

Follow the screening process in Appendix E of the permit for determining whether your installation of subsurface earth-disturbing stormwater controls will have an effect on historic properties.

- Include documentation supporting your determination of eligibility.
- To contact your applicable state or tribal historic preservation office, information is available at *www.achp.gov/programs/html*.

Appendix E, Step 1

Do you plan on installing any of the following stormwater controls at your site? Check all that apply below, and proceed to Appendix E, Step 2.

- ☐ Dike
- ☐ Berm
- ☒ Catch Basin
- ☐ Pond
- ☐ Stormwater Conveyance Channel (e.g., ditch, trench, perimeter drain, swale, etc.)
- ☐ Culvert
- ☒ Other type of ground-disturbing stormwater control: Bioretention Basin, Area Drain, Drain Manhole, and Water Quality Treatment Structure

(Note: If you will not be installing any ground-disturbing stormwater controls, no further documentation is required for Section 3.2 of the Template.)

Appendix E, Step 2

If you answered yes in Step 1, have prior surveys or evaluations conducted on the site already determined that historic properties do not exist, or that prior disturbances at the site have precluded the existence of historic properties? ☒ YES ☐ NO

- If yes, no further documentation is required for Section 3.2 of the Template.
- If no, proceed to Appendix E, Step 3.

3.3 Safe Drinking Water Act Underground Injection Control Requirements

Instructions (see CGP Part 7.2.14.3):

- If you will use any of the identified controls in this section, include documentation of contact between you and the applicable state agency or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR Parts 144-147.
- For state UIC program contacts, refer to the following EPA website: *http://water.epa.gov/type/groundwater/uic/whereyoulive.cfm*.

Do you plan to install any of the following controls? Check all that apply below.

☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

☐ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow

☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

If yes, INSERT COPIES OF LETTERS, EMAILS, OR OTHER COMMUNICATION BETWEEN YOU AND THE STATE AGENCY OR EPA REGIONAL OFFICE

SECTION 4: EROSION AND SEDIMENT CONTROLS

General Instructions (See CGP Parts 2.1 and 7.2.10):

- Describe the erosion and sediment controls that will be installed and maintained at your site.
- For more information or ideas on BMPs, see EPA's National Menu of BMPs http://www.epa.gov/npdes/stormwater/menuofbmps

4.1 Natural Buffers or Equivalent Sediment Controls

Instructions (see CGP Parts 2.1.2.1 and 7.2.9, and Appendix G):

This section only applies to you if a surface water is located within 50 feet your construction activities. If this is the case, consult CGP Part 2.1.2.1 and Appendix G for information on how to comply with the buffer requirements.

- Describe the compliance alternative (CGP Part 2.1.2.1.a.i, ii, or iii) that was chosen to meet the buffer requirements, and include any required documentation supporting the alternative selected. The compliance alternative selected must be maintained throughout the duration of permit coverage. However, if you select a different compliance alternative during your period of permit coverage, you must modify your SWPPP to reflect this change.
- If you qualify for one of the exceptions in CGP Part 2.1.2.1.e, include documentation related to your qualification for such exceptions.

Buffer Compliance Alternatives

Are there any surface waters within 50 feet of your project's earth disturbances? ☐ YES ☒ NO

(Note: If no, no further documentation is required for Part 4.1 in the SWPPP Template. Continue on to Part 4.2.)

4.2 Perimeter Controls

Instructions (see CGP Parts 2.1.2.2 and 7.2.10):

- Describe sediment controls that will be used (e.g., silt fences, filter berms, temporary diversion dikes, or fiber rolls) to meet the Part 2.1.2.2 requirement to "install sediment controls along those perimeter areas of your site that will receive stormwater from earth-disturbing activities."
- For linear projects, where you have determined that the use of perimeter controls in portions of the site is impracticable, document why you believe this is to be the case.
- Also see, EPA's *Silt Fence BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/silt_fences or *Fiber Rolls BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/fiber_rolls

General

The area of construction activity will be enclosed by a chain link fence and silt fence, silt fence with wattles, or super silt fence as specified on the Site Erosion and Sedimentation Control plan. Construction gates will be located at the entrance to the site as shown on the Site Erosion and Sedimentation Control Plan or as determined by the contractor. Sediment tracked offsite must be removed by the end of the same workday. All construction entrances should have be stabilized construction entrances.

Specific Perimeter Controls

Perimeter Control # 1

- BMP Description: Silt Fence
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Perimeter Control # 2

- BMP Description: Silt Fence with Wattles
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Perimeter Control # 3

- BMP Description: Super Silt Fence
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than ¼"
- Responsible Staff: Construction Manager and Site Contractor

Perimeter Control # 4

- BMP Description: Construction Fence
- Installation Schedule: Start of Construction
- Maintenance and Inspection: Weekly
- Responsible Staff: Construction Manager and Site Contractor

4.3 Sediment Track-Out

Instructions (see CGP Parts 2.1.2.3 and 7.2.10):

- Describe stormwater controls that will be used to "minimize the track-out of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting your construction site."
- Describe location(s) of vehicle exit(s), procedures to remove accumulated sediment off-site (e.g., vehicle tracking), and stabilization practices (e.g., stone pads or wash racks or both) to minimize off-site vehicle tracking of sediment. Also include the design, installation, and maintenance specifications for each control.
- Also, see EPA's *Construction Entrances BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/cons_entrance

General

Gates will be constructed as shown on the plans to allow for construction vehicle access. Construction access points will either have a stabilized construction entrance at the access location or a wheel wash station to minimize the track-out of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting the construction site. Sediment tracked offsite must be removed by the end of the same workday.

Specific Track-Out Controls

Track-Out Control # 1

- BMP Description: Designated truck washing area
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Track-Out Control # 2

- BMP Description: Wheel Wash station and Gravel
- Installation Schedule: Start of construction
- Maintenance and Inspection: Daily
- Responsible Staff: Construction Manager and Site Contractor

Track-Out Control # 3

- BMP Description: Street Sweeping
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly or as needed
- Responsible Staff Construction Manager and Site Contractor

Track-Out Control # 4

- BMP Description: Stabilized Construction Entrance
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly or as needed
- Responsible Staff Construction Manager and Site Contractor

4.4 Stockpiled Sediment or Soil

Instructions (see CGP Parts 2.1.2.4 and 7.2.10):

- Describe stormwater controls and other measures you will take to minimize the discharge of sediment or soil particles from stockpiled sediment or soil. Include a description of structural practices (e.g., diversions, berms, ditches, storage basins), including design, installation, and maintenance specifications, used to divert flows from stockpiled sediment or soil, retain or detain flows, or otherwise limit exposure and the discharge of pollutants from stockpiled sediment or soil.
- Also, describe any controls or procedures used to minimize exposure resulting from adding to or removing materials from the pile.

General
All soil stockpiles should be kept away from existing and proposed catch basins and area drains and outside of proposed bioretention footprints.

Stockpiles shall be protected from contact with onsite stormwater runoff using temporary perimeter sediment barriers. Soil stockpiles shall also be provided with cover (a tarp) or appropriate temporary stabilization to avoid direct contact with precipitation and to minimize sediment discharge

Soil stabilization measures shall be initiated immediately when earth-disturbing activities have permanently or temporarily ceased on any portion of the site. Earth-disturbing activities are considered temporarily ceased when work will not resume for a period of 14 or more calendar days. Stabilization activities shall be completed within 14 calendar days after the initiation of soil stabilization measures. Wattles or a silt fence may be placed around the perimeter of stockpiles to contain sediments. Stabilized portions of a site shall be inspected at least one per month.

Specific Stockpile Controls

Stockpile Control # 1

- BMP Description: Soil Stabilization Mats
- Installation Schedule: As/if required
- Maintenance and Inspection: Weekly & after storm events greater than 0.25"
- Responsible Staff: Construction Manager and Site Contractor

Stockpile Control # 2

- BMP Description: Silt Fence
- Installation Schedule: Immediately after stockpile is established
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Stockpile Control # 3

- BMP Description: Wattles
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than 0.25"
- Responsible Staff: Construction Manager and Site Contractor

4.5 Minimize Dust

Instructions (see CGP Parts 2.1.2.5 and 7.2.10):

Describe controls and procedures you will use at your project/site to minimize the generation of dust.

General

Disturbed land will be temporarily stabilized using measures including sprinkling/irrigation, vegetative cover, mulch, and/or stone. Wattles or a silt fence may be placed around the perimeter of stockpiles to contain sediments.

Specific Dust Controls

Dust Control # 1

- BMP Description: Sprinkling/Irrigation
- Installation Schedule: As needed throughout earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Dust Control # 2

- BMP Description: Contractor's seed mix
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Dust Control # 3

- BMP Description: Hydro Seeding
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Dust Control # 4

- BMP Description: Straw or Mulch
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

4.6 Minimize the Disturbance of Steep Slopes

Instructions (see CGP Parts 2.1.2.6 and 7.2.10):

- Describe how you will minimize the disturbance to steep slopes (as defined by CGP Appendix A).
- Describe controls (e.g., erosion control blankets, tackifiers), including design, installation and maintenance specifications, that will be implemented to minimize sediment discharges from slope disturbances.
- Also, see EPA's *Geotextiles BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/geotextiles

General
Steep slopes are defined as slopes of 15% or greater in grade. No steep slopes are proposed as part of this project. Should any temporary steep slopes be created during construction, the following BMP's should be used.

Specific Steep Slope Controls

Steep Slope Control # 1

- BMP Description: Straw or Mulch
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Steep Slope Control # 2

- BMP Description: Contractor's seed mix
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Steep Slope Control # 3

- BMP Description: Hydro Seeding
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Steep Slope Control # 4

- BMP Description: Soil Stabilization Mats
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Steep Slope Control # 5

- BMP Description: Rip-Rap
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

4.7 Topsoil

Instructions (see CGP Parts 2.1.2.7 and 7.2.10):

- Describe how topsoil will be preserved and identify these areas and associated control measures on your site map(s).
- If it is infeasible for you to preserve topsoil on your site, provide an explanation for why this is the case.

General
Onsite native topsoil shall be preserved, unless infeasible. Soil stabilization measure shall be initiated immediately when earth-disturbing activities have permanently or temporarily ceased on any portion of the sire. Earth-disturbing activities are considered temporarily ceased when work will not resume for a period of 14 or more calendar days. Stabilization activities shall be complete within 14 calendar days after the initiation of soil stabilization measures.

Specific Topsoil Controls

Topsoil Control # 1

- BMP Description: Straw or Mulch
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Topsoil Control # 2

- BMP Description: Hydro Seeding
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Topsoil Control # 3

- BMP Description: Contractor's seed mix
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Topsoil Control # 4

- BMP Description: Annual Rye Seed Mix
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

4.8 Soil Compaction

Instructions (see CGP Parts 2.1.2.8 and 7.2.10):

– In areas where final vegetative stabilization will occur or where infiltration practices will be installed, describe the controls, including design, installation, and maintenance specifications that will be used to restrict vehicle or equipment access or condition the soil for seeding or planting.

General
In landscaped areas or areas where bioretention will be installed, soil compaction shall be minimized. This includes restricting vehicle access and equipment use.

Specific Soil Compaction Controls

Soil Compaction Control # 1
Protect areas proposed for post-construction bioretention.

- Areas of post-construction bioretention shall be constructed after all ground surfaces are fully stabilized.
- All soil stockpiles and material storage areas shall be located outside of the areas proposed for post-construction detention.
- If proposed infiltration areas are constructed prior to the site being fully stabilized, additional erosion controls shall be installed.

Installation

- Measures will be implemented throughout construction

Maintenance Requirements

- The construction manager and site contractor are responsible for enforcing soil compactions controls.

4.9 Storm Drain Inlets

Instructions (see CGP Parts 2.1.2.9 and 7.2.10):

– Describe controls (e.g., inserts, rock-filled bags, or block and gravel) including design, installation, and maintenance specifications that will be implemented to protect all inlets that will receive stormwater from your construction activities, and that you have authority to access.

– Also, see EPA's *Storm Drain Inlet Protection BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/storm_drain

General
All existing and proposed storm drain inlets will be protected throughout the duration of construction. Inlet protection with siltation sacks and inlet protection with gravel will be the primary BMPs used during construction.

Storm Drain Inlet Control # 1

- BMP Description: Inlet Protection Catch Basin with Siltation Sacks

- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Storm Drain Inlet Control # 2

- BMP Description: Inlet Protection Catch Basin with Gravel
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

4.10 Constructed Stormwater Conveyance Channels

Instructions (see CGP Parts 2.1.3.1 and 7.2.10):

If you will be installing a stormwater conveyance channel, describe control practices (e.g., velocity dissipation devices), including design specifications and details (volume, dimensions, outlet structure), that will be implemented at the construction site.

General

Storm drain conveyance channels are not expected as part of this project. Should temporary channels be used during construction, the BMPs listed below should be used.

Specific Conveyance Channel Controls

Stormwater Conveyance Channel Control # 1

- BMP Description: Check Dams
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Stormwater Conveyance Channel Control # 2

- BMP Description: Rip-Rap
- Installation Schedule: Start of earthwork activities
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

4.11 Sediment Basins

Instructions (see CGP Parts 2.1.3.2 and 7.2.10):

If you will install a sediment basin, include design specifications and other details (volume, dimensions, outlet structure) that will be implemented at in conformance with CGP Part 2.1.3.2.

- At a minimum, sediment ponds must provide storage for either (1) the calculated volume of runoff from the 2-year, 24-hour storm (see CGP App. H), or (2) 3,600 cubic feet per acre drained
- Sediment ponds must also utilize outlet structures that withdraw water from the surface, , unless infeasible
- Also, see EPA's *Sediment Basin BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/sediment_basins

General
No temporary sediment basins are currently planned during the construction of this project. Should the contractor decide to use a temporary sediment basin, it should be sized using the criteria outlined in the Construction General Permit.

4.12 Chemical Treatment

Instructions (see CGP Parts 2.1.3.3 and 7.2.10.2):

If you are using treatment chemicals at your site, provide details for each of the items below. This information is required as part of the SWPPP requirements in CGP Part 7.2.10.2.

There are no proposed chemical treatments associated with this project, and therefore no proposed BMP's.

4.13 Dewatering Practices

Instructions (see CGP Parts 2.1.3.4 and 7.2.10):

If you will be discharging stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, include design specifications and details of all dewatering practices that are installed and maintained to comply with CGP Part 2.1.3.4.

General
If groundwater is encountered during construction, dewatering will occur using the following BMPs.

Specific Dewatering Practices

Dewatering Practice # 1

- BMP Description: Sediment Trap
- Installation Schedule: Start of de-watering activities

- Maintenance and Inspection: Weekly & after 1/4" storm events
- Responsible Staff: Construction Manager and Site Contractor

Dewatering Practice # 2

- BMP Description: Stone filter berm
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than 1/4"
- Responsible Staff: Construction Manager and Site Contractor

Dewatering Practice # 3

- BMP Description: Dumpster Lined with Plastic Sheeting
- Installation Schedule: Start of de-watering activities
- Maintenance and Inspection: Weekly & after 1/4" storm events
- Responsible Staff: Construction Manager and Site Contractor

4.14 Other Stormwater Controls

Instructions:

– Describe any other stormwater controls that do not fit into the above categories.

Any changes in construction activity that produce other allowable non-stormwater discharges will be identified, the SWPPP will be amended, and the appropriate erosion and sedimentation controls will be implemented.

4.15 Site Stabilization

Instructions (see CGP Parts 2.2 and 7.2.10):

The CGP requires you to immediately initiate stabilization when work in an area of your site has permanently or temporarily stopped, and to complete certain stabilization activities within prescribed deadlines. See CGP Part 2.2.1. The CGP also requires that stabilization measures meet certain minimum criteria. See CGP Part 2.2.2. For your SWPPP, you must include the following:

– Describe the specific vegetative and/or non-vegetative practices that will be used to stabilize exposed soils where construction activities have temporarily or permanently ceased. Avoid using impervious surfaces for stabilization whenever possible.
– Also, see EPA's *Seeding BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/seeding
– Once you begin construction, consider using the Grading/Stabilization Activities log in Appendix H of the Template to document your compliance with the stabilization requirements in CGP Part 2.2

All excavated soil will be stockpiled in the designated areas onsite. Soil stabilization measures shall be initiated immediately when earth-disturbing activities have permanently or temporarily ceased on any portion of the site. Earth-disturbing activities are considered temporarily ceased when work will not resume for a period of 14 or more calendar days. Stabilization activities shall be completed within 14 calendar days after the initiation of soil stabilization measures. It shall be stabilized with temporary soil stabilization mats or a tarp to prevent blowing dust and siltation into the storm drain system.
☐ *Vegetative* ☒ *Non-Vegetative*
☒ *Temporary* ☐ *Permanent*

- BMP Description: Soil Stabilization Mat
- Installation Schedule: As/if required
- Maintenance and Inspection: Weekly & after storm events greater than 0.25"
- Responsible Staff: Construction Manager and Site Contractor

SECTION 5: POLLUTION PREVENTION STANDARDS

5.1 Potential Sources of Pollution

Instructions (see CGP Part 7.2.7):

- Identify and describe all pollutant-generating activities at your site (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal).
- For each pollutant-generating activity, include an inventory of pollutants or pollutant constituents associated with that activity (e.g., sediment, fertilizers, and/or pesticides, paints, solvents, fuels), which could be exposed to rainfall or snowmelt, and could be discharged from your construction site. You must take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges.

Construction Site Pollutants

Potential sources of sediment to stormwater runoff:

- Stockpiles and construction staging
- Clearing and grubbing operations
- Grading and site excavation
- Topsoil stripping
- Landscape operations
- Soil tracking offsite from construction vehicles
- Runoff from unstabilized areas
- Construction debris

Potential pollutants and sources, other than sediment, to stormwater runoff:

- Combined Staging Area – fueling activities, equipment maintenance, sanitary facilities, and hazardous waste storage
- Materials Storage Area – building materials, solvents, adhesives, paving materials, paints, aggregates, trash, etc.
- Construction Activity-paving, curb installation, concrete pouring, and building construction

The Contractor shall coordinate staging areas with the Owner. The location of all staging areas will be determined for each phase of construction and shown on plans produced by The Contractor.

Construction Site Pollutants

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents** (that could be discharged if exposed to stormwater)	**Location on Site** (or reference SWPPP site map where this is shown)
Pesticides (insecticides, fungicides, herbicides, rodenticides)	Chlorinated hydrocarbons, organophosphates, carbonates, arsenic	Herbicides used for noxious weed control
Fertilizers	Nitrogen, phosphorous	Newly seeded areas

Plaster	Calcium sulphate, calcium carbonate, sulfuric acid	Building construction
Cleaning Solvents	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	No equipment cleaning allowed in project limits
Asphalt	Oil, petroleum distillates	Streets and parking lots
Concrete	Limestone, sand pH, chromium	Curb and gutter, sidewalk, building construction
Glue, Adhesives	Polymers, epoxies	Building construction
Paints	Metal oxides, Stoddard solvent, talc, calcium carbonate, arsenic	Building construction
Curing compounds	Naphtha	Curb and gutter, building construction
Wood preservatives	Stoddard solvent, petroleum distillates, arsenic, copper, chromium	Timber pads, bracing, building construction
Hydraulic Oils/fluids	Mineral oil	Leaks/broken hoses from equipment
Gasoline	Benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment/staging area
Diesel Fuel	Petroleum distillate, oil & grease, naphthalene, xylenes	Secondary containment/staging area
Kerosene	Coal oil, petroleum distillates	Secondary containment/staging area
Antifreeze/coolant	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	Leaks or broken hoses from equipment
Sanitary toilets	Bacteria, parasites, and viruses	Staging area

5.2 Spill Prevention and Response

Instructions (see CGP Parts 2.3 and 7.2.11):

- Describe procedures you will use to prevent and respond to leaks, spills, and other releases. You must implement the following at a minimum:
  - ✓ Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or title of the employee(s) responsible for detection and response of spills or leaks; and
  - ✓ Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.3.4c and established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period. Contact information must be in locations that are readily accessible and available.
- Some projects/site may be required to develop a Spill Prevention Control and Countermeasure (SPCC) plan under a separate regulatory program (40 CFR 112). If you are required to develop an SPCC plan, or you already have one, you should include references to the relevant requirements from your plan.

- BMP Description: Spill kit, vehicle washing, straw bale catch basin protection, silt fence
- Installation Schedule: Start of construction activity
- Maintenance and Inspection: Minimum weekly & as necessary
- Responsible Staff: Construction Manager and Site Contractor

- Hazardous material handling shall be provided to sub Construction Manager.
- Major vehicle maintenance on-site shall be prohibited
- Re-fueling of vehicles within 25 feet of a drainage structure shall be prohibited
- Spill kit shall be kept on-site consisting of:
  - Gloves
  - Absorbent mats
  - Drip pan

Spill Prevention and Control Plan

- Manufacturers' recommended spill control methods will be posted onsite and site personnel will be made aware of the requirements.
- Cleanup supplies will be kept onsite in a materials storage area. This equipment will include: goggles, brooms, dustpans, mops, rags, gloves, oil absorbent, sawdust, plastic and metal trash cans, and other materials and supplies specifically designated for cleanup.
- All spills will be immediately cleaned up after discovery.
- The spill area will be well ventilated.
- Cleanup personnel will wear suitable protective clothing.
- Spills of toxic and/or hazardous material will be reported to state, local, and Federal authorities, as required by law. Spills shall also be reported immediately to the owner.
- A spill incident report will be filed detailing the amount and extent of the spill, material(s) involved, and effectiveness of the cleanup. This report will be on file at the Construction

Manager/ Site Contractor office, as well as kept onsite in the field office. A copy shall also be filed with the Hazard Communication Coordinator (HCC).

The Construction Manager/ Site Contractor will designate someone onsite that will serve as the Spill Cleanup Coordinator. At least Two other personnel will be designated as alternate spill coordinators. All spill control personnel will be trained in spill prevention, control, and cleanup. The names of the responsible personnel will be posted at the jobsite office of the Construction Manager/ Site Contractor.

5.3 Fueling and Maintenance of Equipment or Vehicles

Instructions (see CGP Parts 2.3.3.1 and 7.2.11):

- Describe equipment/vehicle fueling and maintenance practices that will be implemented to eliminate the discharge of spilled or leaked chemicals (e.g., providing secondary containment *(examples: spill berms, decks, spill containment pallets)* and cover where appropriate, and/or having spill kits readily available.
- Also, see EPA's *Vehicle Maintenance and Washing Areas BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/vehicile_maintain

General

Minor vehicle and equipment emergency maintenance can be performed onsite. Major vehicle and equipment maintenance must be performed offsite. Equipment/vehicle storage areas and any onsite fuel tanks will be inspected weekly and after storm events. Equipment and vehicles will be inspected on each day of use. Any leaks will be repaired immediately or the equipment/vehicle will be removed from the site.

Minor vehicle and equipment emergency maintenance shall occur when a vehicle cannot be safely removed from the site. The vehicle should be repaired so it can be taken off-site so that the rest of the maintenance can occur.

Major vehicle maintenance on-site is prohibited. Re-fueling of vehicles within 25 feet of a drainage structure shall be prohibited.

Specific Pollution Prevention Practices

- BMP Description: Spill Kit
- Installation Schedule: Start of Construction/Onsite throughout construction
- Responsible Staff: Construction Manager and Site Contractor

5.4 Washing of Equipment and Vehicles

Instructions (see CGP Parts 2.3.3.2 and 7.2.11):

- Describe equipment/vehicle washing practices that will be used to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of washing (e.g., locating activities away from surface waters and stormwater inlets or conveyances and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls).
- Describe how you will prevent the discharge of soaps, detergents, or solvents by providing either (1) cover (*examples: plastic sheeting or temporary roofs*) to prevent these detergents from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas.
- Also, see EPA's *Vehicle Maintenance and Washing Areas BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/vehicile_maintain

General

Vehicle and equipment washout areas shall be constructed by the contractor so that no untreated water enters the storm drain system. Soaps, detergents, or solvents must be stored in a way to prevent these detergents from coming into contact with rainwater, or a similarly effective means designed to prevent the discharge of pollutants from these areas.

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1

- BMP Description: Designated vehicle/equipment washing areas
- Installation Schedule: Start of construction
- Maintenance and Inspection: Daily
- Responsible Staff: Construction Manager and Site Contractor

Pollution Prevention Practice # 2

- BMP Description: Spill kit, vehicle washing, straw bale catch basin protection, silt fence
- Installation Schedule: Start of construction activity
- Maintenance and Inspection: Minimum weekly & as necessary
- Responsible Staff: Construction Manager and Site Contractor

5.5 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

Instructions (see CGP Parts 2.3.3.3 and 7.2.11):

- For any of the types of construction products, materials, and wastes below in Sections 5.5.1-5.5.6 below that are expected to be used or stored at your site, provide the information on how you will comply with the corresponding CGP provision and the specific practices that will be employed.
- Also, see EPA's *General Construction Site Waste Management BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/cons_wasteman

5.5.1 Building Products

(Note: Examples include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures.)

Any building materials required to be stored onsite will be stored at a combined staging and materials storage area. Larger items, such as framing materials, will be elevated by appropriate methods to minimize contact with runoff. The storage area will be inspected weekly and after storm events. It will be kept clean, organized, and equipped with appropriate cleaning supplies. Perimeter controls (silt fence, straw bales, gravel bag berms, etc.), containment structures, covers, and liners will be repaired or replaced as needed to maintain proper function.

Building product usage shall follow the following good housekeeping BMPs:

- The Responsible Staff: Construction Manager or Site Contractor representative will inspect daily for proper use, storage, and cleanup of material used on the job site.
- Store only enough material onsite required for that job as to satisfy current construction needs.
- Store required materials in tightly lidded containers under cover.
- Store materials in original containers with clearly legible labels.
- Separate and store materials apart from each other.
- Do not mix materials unless specifically in accordance with manufacturers' recommendations.
- Use all products from a container before disposing of the container.
- Follow manufacturers' instructions for handling, storage, and disposing of all materials.
- All materials shall be stored in an area to prevent the discharge of pollutants from building products.

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1

- BMP Description: Stacked straw bales around soil stockpiles
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than 0.25"
- Responsible Staff: Construction Manager and Site Contractor

Pollution Prevention Practice # 2

- BMP Description: Silt Fence
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than 0.25"
- Responsible Staff: Construction Manager and Site Contractor

Pollution Prevention Practice # 3

- BMP Description: Plastic Cover
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly & after storm events greater than 0.25"
- Responsible Staff: Construction Manager and Site Contractor

5.5.2 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

- Fertilizers will be used at the application rates called for in the specifications for the project.
- Once applied, fertilizer will be worked into the soil to minimize wash off from irrigation and stormwater.
- Fertilizer will be stored under cover.
- The contents of partially used fertilizer bags will be transferred to re-sealable, watertight containers clearly labeled with their contents.

5.5.3 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

- Only skilled personnel in a designated area will perform fueling of vehicles onsite.
- Vehicles used onsite will be monitored for fuel and oil leaks.
- Vehicles used onsite will be maintained in good working order.
- Asphalt substances will be applied in accordance with manufacturers' recommendations.
- The use of petroleum products as a release agent for asphalt transport trucks is prohibited.
- Vehicle fueling will only be done in vehicle fueling areas located by the contractor.
- All vehicles parked overnight onsite shall have fuel absorbent pads placed beneath them to absorb any fuel leaks.
- The contractor shall be responsible for locating the fuel storage and re-fueling area onsite to minimize disturbance to construction activates and site area.

5.5.4 Hazardous or Toxic Waste

(Note: Examples include paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, acids.)

- Keep products in their original containers.
- Original container labels should be clearly visible.
- Material safety data sheets will be kept onsite and be available.
- Follow all state, local, and Federal regulations regarding the handling, use, storage, and disposal of hazardous material.

Paints:

- All paint containers will be tightly sealed when not in use.
- Remove excess paint in original labeled containers from the jobsite.
- Paint will not be disposed of onsite. Remove excess paint material from the site and legally dispose of.
- Paint shall not be disposed of in the storm drain system.

5.5.5 Construction and Domestic Waste

(Note: Examples include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, and other trash or building materials.)

Pollution Prevention Practice # 1

- BMP Description: Dumpster
- Installation Schedule: Start of construction
- Maintenance and Inspection: Weekly
- Responsible Staff: Construction Manager and Site Contractor

Pollution Prevention Practice # 2

- BMP Description: Litter/debris pick-up
- Installation Schedule: Start of construction
- Maintenance and Inspection: Daily
- Responsible Staff: Construction Manager and Site Contractor

5.5.6 Sanitary Waste

Pollution Prevention Practice # 1

- BMP Description: Porta John
- Installation Schedule: Start of construction
- Maintenance and Inspection: As manufacturer requires
- Responsible Staff: Construction Manager and Site Contractor

5.6 Washing of Applicators and Containers used for Paint, Concrete or Other Materials

Instructions (see CGP Parts 2.3.3.4 and 7.2.11):

- Describe how you will comply with the CGP Part 2.3.3.4 requirement to "provide an effective means of eliminating the discharge of water from the washout and cleanout of stucco, paint, concrete, form release oils, curing compounds, and other construction materials."
- Also, see EPA's *Concrete Washout BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/concrete_wash

General

Washing of applicators and containers used for paint, concrete or other materials shall follow the following good housekeeping BMPs:

- An effective means of eliminating the discharge of water from the washout and cleanout of stucco, pain, concrete, form release oils, curing compounds, and other construction materials.
- All washwater must be directed into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation.
- Washout and cleanout wastes should be handled as follows:
  - Do not dump liquid wastes into storm sewers.
  - Dispose of liquid wastes in accordance with applicable requirements.

  - Remove and dispose of hardened concrete waste consistent with the handling of other construction wastes.
- Locate any washout or cleanout activities as far away as possible from surface waters and stormwater inlets or conveyances, and to the extent practicable, designate areas to be used for these activities and conduct such activities only in these areas.

Specific Pollution Prevention Practices

- BMP Description: Designated applicator and container washing areas
- Installation Schedule: Start of construction
- Maintenance and Inspection: Daily
- Responsible Staff: Construction Manager and Site Contractor

5.7 Fertilizers

Instructions (CGP Parts 2.3.5 and 7.2.11):

Describe how you will comply with the CGP Part 2.3.5 requirement to "minimize discharges of fertilizers containing nitrogen or phosphorus"

General

Fertilizer usage shall follow the following good housekeeping BMPs to minimize discharges of nitrogen and phosphorous:

- Fertilizers will be used at the application rates called for in the specifications for the project and the manufacturer's specifications.
- Apply at the appropriate time of year for your location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth.
- Avoid applying before heavy rains that could cause excess nutrients to be discharged.
- Never apply to frozen ground.
- Never apply to stormwater conveyance channels with flowing water.
- Follow all other federal, state, tribal, and local requirements regarding fertilizer
- application.
- Once applied, Fertilizers will be worked into the soil to minimize wash off from irrigation and stormwater.
- Fertilizers will be stored under cover.
- The contents of partially used fertilizer bags will be transferred to re-sealable, watertight containers clearly labeled with their contents.

5.8 Other Pollution Prevention Practices

Instructions:

Describe any additional pollution prevention practices that do not fit into the above categories.

General

- INSERT GENERAL DESCRIPTION OF THE PROBLEM THIS CONTROL IS DESIGNED TO ADDRESS

Specific Pollution Prevention Practices

Pollution Prevention Practice # 1

Description

- INSERT DESCRIPTION OF PRACTICE TO BE INSTALLED
- IF APPLICABLE INCLUDE COPIES OF DESIGN SPECIFICATIONS HERE

Installation

- INSERT APPROXIMATE DATE OF INSTALLATION

Maintenance Requirements

- INSERT MAINTENANCE REQUIREMENTS FOR THE POLLUTION PREVENTION PRACTICE

[Repeat as needed.]

SECTION 6: INSPECTION AND CORRECTIVE ACTION

6.1 Inspection Personnel and Procedures

Instructions (see CGP Parts 2.1.1.4, 2.3.2, 3.3.2, 4, 5, and 7.2.12):

Describe the procedures you will follow for conducting inspections in accordance with CGP Parts 2.1.1.4, 2.3.2, 3.3.2, 4, 5, and 7.2.12.

Personnel Responsible for Inspections

INSERT NAMES OF PERSONNEL OR TYPES OF PERSONNEL WHO WILL BE CONDUCTING SITE INSPECTIONS HERE

Note: All personnel conducting inspections must be considered a "qualified person." CGP Part 4.1.1 clarifies that a "qualified person" is a person knowledgeable in the principles and practices of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

Inspection Schedule

Specific Inspection Frequency

INSERT INSPECTION SCHEDULE BASED ON CGP PARTS 4.1.2, 4.1.3, OR 4.1.4, WHICHEVER APPLIES

Rain Gauge Location (if applicable)

SPECIFY LOCATION(S) OF RAIN GAUGE TO BE USED FOR DETERMINING WHETHER A RAIN EVENT OF 0.25 INCHES OR GREATER HAS OCCURRED (only applies to inspections conducted for Part 4.1.2.2, 4.1.3, or 4.1.4.2)

Reductions in Inspection Frequency (if applicable)

- For the reduction in inspections resulting from stabilization: SPECIFY (1) LOCATIONS WHERE STABILIZATION STEPS HAVE BEEN COMPLETED AND (2) DATE THAT THEY WERE COMPLETED
  (Note: It is likely that you will not be able to include this in your initial SWPPP. If you qualify for this reduction (see CGP Part 4.1.4.1), you will need to modify your SWPPP to include this information.)

- For the reduction in inspections in arid, semi-arid, or drought-stricken areas: INSERT BEGINNING AND ENDING DATES OF THE SEASONALLY-DEFINED ARID PERIOD FOR YOUR AREA OR THE VALID PERIOD OF DROUGHT

- For reduction in inspections due to frozen conditions: INSERT BEGINNING AND ENDING DATES OF FROZEN CONDITIONS ON YOUR SITE

Inspection Report Forms

INSERT COPY OF ANY INSPECTION REPORT FORMS YOU WILL USE HERE OR IN APPENDIX D

6.2 Corrective Action

Instructions (CGP Parts 5 and 7.2.12):

- Describe the procedures for taking corrective action in compliance with CGP Part 5.

Personnel Responsible for Corrective Actions

INSERT NAMES OF PERSONNEL OR TYPES OF PERSONNEL RESPONSIBLE FOR CORRECTIVE ACTIONS

Corrective Action Forms

INSERT A COPY OF ANY CORRECTIVE ACTION FORMS YOU WILL USE HERE OR IN APPENDIX E

6.3 Delegation of Authority

Instructions:

- Identify the individual(s) or positions within the company who have been delegated authority to sign inspection reports.
- Attach a copy of the signed delegation of authority (see example in Appendix J of the Template.
- For more on this topic, see Appendix I, Subsection 11 of EPA's CGP.

Duly Authorized Representative(s) or Position(s):

Insert Company or Organization Name:
Insert Name:
Insert Position:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:

SECTION 7: TRAINING

Instructions (see CGP Part 6 and 7.2.13):

- Complete the table below to provide documentation that the personnel required to be trained in CGP Part 6 completed the appropriate training
- If personnel will be taking course training (which is not required as part of the CGP), consider using Appendix I to track completion of this training
- The following personnel, at a minimum, must be receive training, and therefore should be listed out individually in the table below:
  - ✓ Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention measures);
  - ✓ Personnel responsible for the application and storage of treatment chemicals (if applicable);
  - ✓ Personnel who are responsible for conducting inspections as required in Part 4.1.1; and
  - ✓ Personnel who are responsible for taking corrective actions as required in Part 5.
- CGP Part 6 requires that the required personnel must be trained to understand the following if related to the scope of their job duties:
  - ✓ The location of all stormwater controls on the site required by this permit, and how they are to be maintained;
  - ✓ The proper procedures to follow with respect to the permit's pollution prevention requirements; and
  - ✓ When and how to conduct inspections, record applicable findings, and take corrective actions.

Table 7-1: Documentation for Completion of Training

Name	Date Training Completed
INSERT NAME OF PERSONNEL HERE	INSERT COMPLETION DATE HERE

SECTION 8: CERTIFICATION AND NOTIFICATION

Instructions (CGP Appendix I, Part I.11.b):

- The following certification statement must be signed and dated by a person who meets the requirements of Appendix I, Part I.11.b.
- This certification must be re-signed in the event of a SWPPP Modification.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ Title: _____

Signature: _____ Date: _____

[Repeat as needed for multiple construction operators at the site.]

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A – Site Maps

Appendix B – Copy of 2012 CGP

Appendix C – NOI and EPA Authorization Email

Appendix D –Inspection Form

(Note: EPA is in the process of developing a sample inspection form for use by CGP permittees. The form will be made available at http://cfpub.epa.gov/npdes/stormwater/cgp.cfm.)

Appendix E – Corrective Action Form

(Note: EPA is in the process of developing a sample corrective action form for use by CGP permittees. The form will be made available at http://cfpub.epa.gov/npdes/stormwater/cgp.cfm.)

Appendix F – SWPPP Amendment Log

Appendix G – Subcontractor Certifications/Agreements

Appendix H – Grading and Stabilization Activities Log

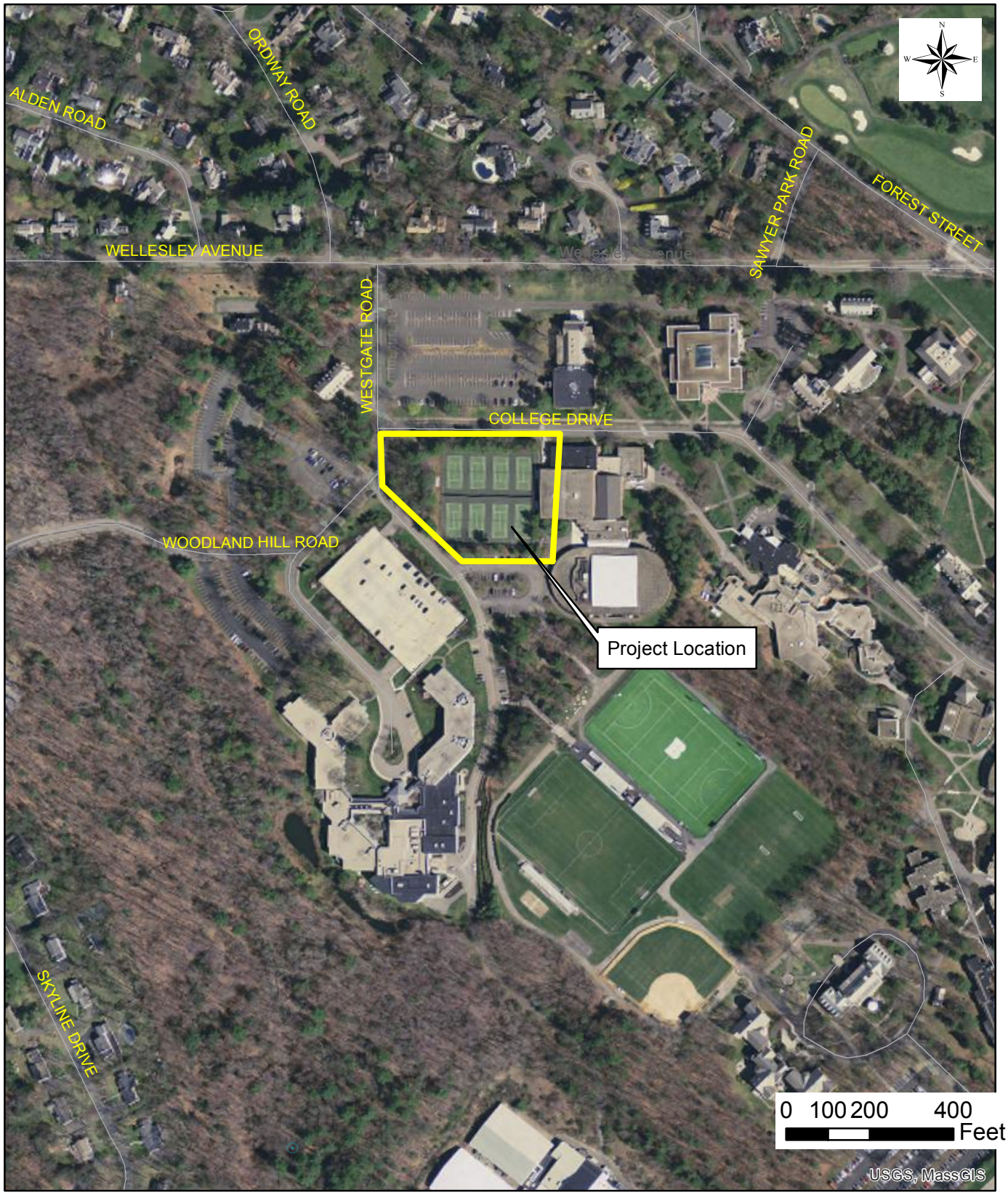
Appendix I – Training Log

Appendix J – Delegation of Authority

Appendix K – Endangered Species Documentation

Appendix L – Historic Preservation Documentation

Appendix A – Site Maps



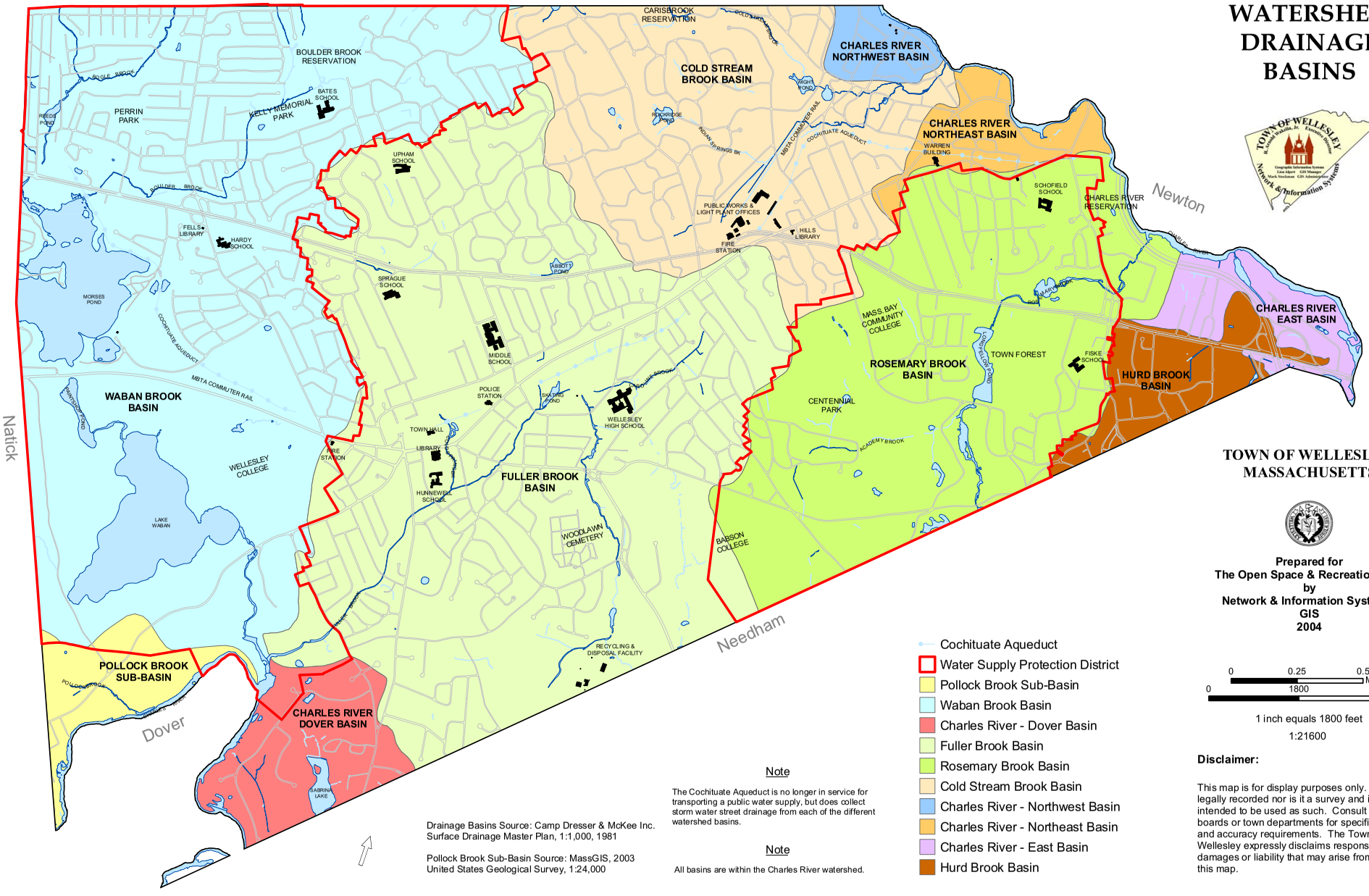
Appendix A: LOCUS

Webster Athletic Center
Renovation and Expansion

Data Source: MassGIS
Nitsch Project #10070

Nitsch Engineering

WATERSHED DRAINAGE BASINS



TOWN OF WELLESLEY, MASSACHUSETTS

Prepared for
The Open Space & Recreation Plan
by
Network & Information Systems
GIS
2004

0 0.25 0.5 Miles
0 1800 3600 Feet

1 inch equals 1800 feet

1:21600

- Cochituate Aqueduct
- Water Supply Protection District
- Pollock Brook Sub-Basin
- Waban Brook Basin
- Charles River - Dover Basin
- Fuller Brook Basin
- Rosemary Brook Basin
- Cold Stream Brook Basin
- Charles River - Northwest Basin
- Charles River - Northeast Basin
- Charles River - East Basin
- Hurd Brook Basin

Drainage Basins Source: Camp Dresser & McKee Inc.
Surface Drainage Master Plan, 1:1,000, 1981

Pollock Brook Sub-Basin Source: MassGIS, 2003
United States Geological Survey, 1:24,000

Note

The Cochituate Aqueduct is no longer in service for transporting a public water supply, but does collect storm water street drainage from each of the different watershed basins.

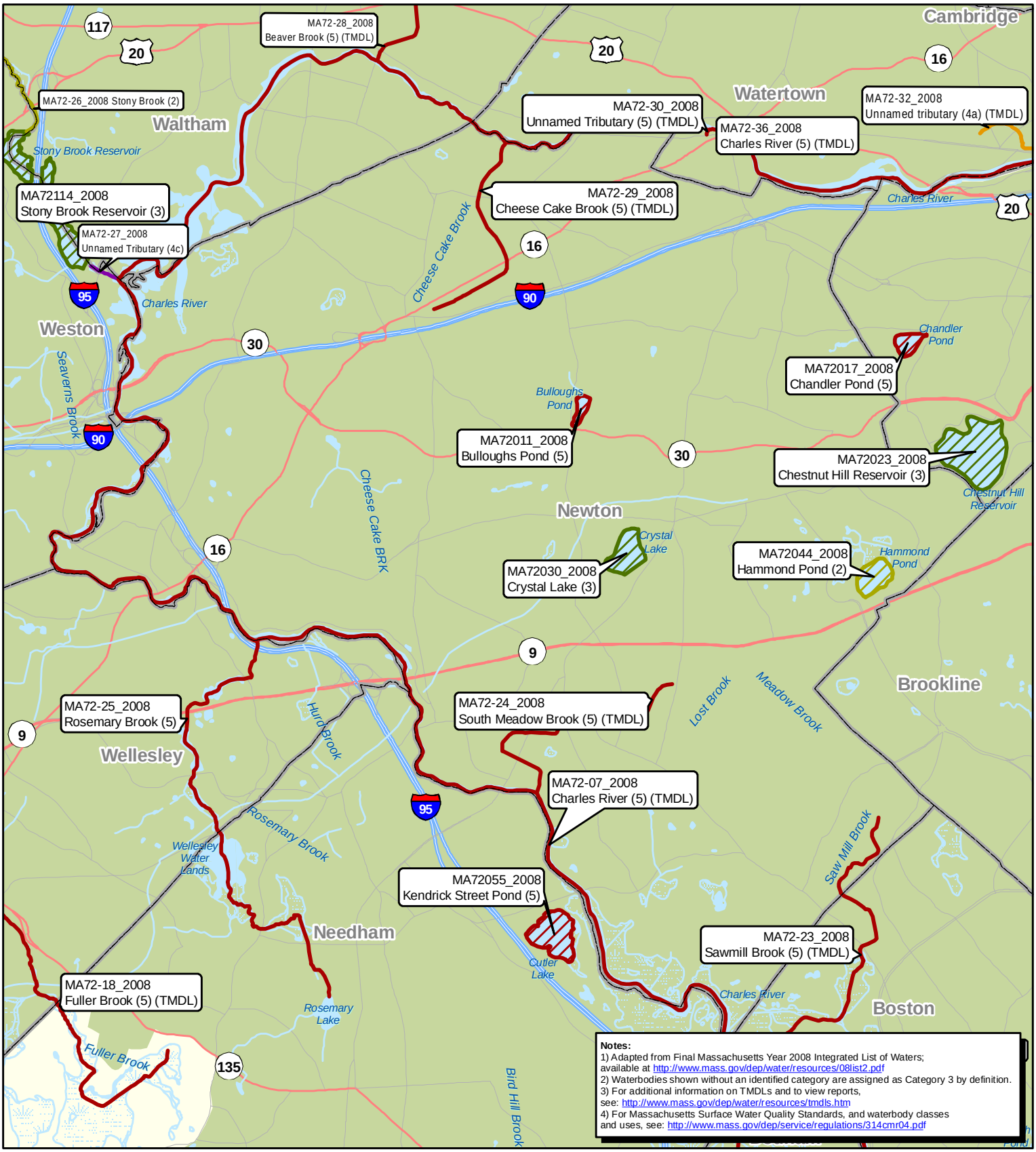
Note

All basins are within the Charles River watershed.

Disclaimer:

This map is for display purposes only. It is neither legally recorded nor is it a survey and it is not intended to be used as such. Consult appropriate boards or town departments for specific questions and accuracy requirements. The Town of Wellesley expressly disclaims responsibility for damages or liability that may arise from the use of this map.

Revised 9/24/04



Waterbody Assessment and TMDL Status
Newton, MA

N

0 0.5 Miles

EPA

Map produced by EPA Region I GIS Center
Map Tracker ID 6678, February 25, 2010
Data Sources: TeleAtlas, Census Bureau, USGS, MassDEP

Waterbody Label

State ID,
Waterbody Name (Category)
(TMDL(s) approved for this waterbody)

See companion table for a listing of pollutants, non-pollutants, and TMDLs for each waterbody

Assessment of Waterbody Segment

- Category 2: Attaining some uses; other uses not assessed
- Category 3: Insufficient information to make assessments for any use.
- Category 4a: TMDL is completed and approved for one or more pollutants
- Category 4c: Impairment not caused by a pollutant.
- Category 5: Impaired or threatened for one or more uses and requiring a TMDL.

- Waterbodies
- Swamp/Marsh
- MS4 Urbanized Areas (2000 Census)
- Municipal Boundaries

Appendix B – Copy of 2012 CGP

National Pollutant Discharge Elimination System
General Permit for Discharges from
Construction Activities

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA or the Act), as amended by the Water Quality Act of 1987, P.L. 100-4, "operators" of construction activities (defined in Part 1.1.a and Appendix A) that meet the requirements of Part 1.1 of this National Pollutant Discharge Elimination System (NPDES) general permit, are authorized to discharge pollutants in accordance with the effluent limitations and conditions set forth herein. Permit coverage is required from the "commencement of earth-disturbing activities" (see Appendix A) until "final stabilization" (see Part 2.2).

This permit becomes effective on **February 16, 2012**.

This permit and the authorization to discharge expire at midnight, **February 16, 2017**.

Signed and issued this 16th day of February, 2012

H. Curtis Spalding
Regional Administrator, Region 1

Signed and issued this 16th day of February, 2012

John Filippelli
Director, Division of Environmental Planning & Protection, Region 2

Signed and issued this 16th day of February, 2012

José C. Font
Acting Division Director, Carribbean Environmental Protection Division, Region 2, Caribbean Office

Signed and issued this 16th day of February, 2012

Catherine A. Libertz
Assistant Director, Water Protection Division, Region 3

Signed and issued this 16th day of February, 2012

James D. Giattina
Director, Water Protection Division, Region 4

Signed and issued this 16th day of February, 2012

Tinka G. Hyde
Director, Water Division, Region 5

Signed and issued this 16th day of February, 2012

William K. Honker, P.E.
Acting Director, Water Quality Protection Division, Region 6

Signed and issued this 16th day of February, 2012

Karen Flournoy
Director, Wetlands and Pesticides Division, Region 7

Signed and issued this 16th day of February, 2012

Melanie L. Pallman
Acting Assistant Regional Administrator, Office of Partneships and Regulatory Assistance, Region 8

Signed and issued this 16th day of February, 2012

Nancy Woo
Deputy Director, Water Division, Region 9

Signed and issued this 16th day of February, 2012

Michael J. Lidgard
Acting Director, Office of Water and Watersheds, Region 10

The signatures are for the permit conditions in Parts 1 through 9 and Appendices A through K.

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1. HOW TO OBTAIN PERMIT COVERAGE UNDER THE CGP.

To be covered under this permit, you must meet the eligibility conditions and follow the requirements for applying for permit coverage in this Part.

1.1. ELIGIBILITY CONDITIONS REQIRED OF ALL PROJECTS.

Only those projects that meet all of the following eligibility conditions may be covered under this permit:

a. You are an "operator" of the construction project for which discharges will be covered under this permit;

Note: For the purposes of this permit, an "operator" is any party associated with a construction project that meets either of the following two criteria:

1. *The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or*
2. *The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit).*

Subcontractors generally are not considered operators for the purposes of this permit.

Note: Where there are multiple operators associated with the same project, all operators are required to obtain permit coverage. The following applies in these situations:

1. *If one operator has control over plans and specifications and a different operator has control over activities at the project site, they may divide responsibility for compliance with the terms of this permit as long as they develop a group SWPPP (see Part 7.1.1), which documents which operator has responsibility for each requirement of the permit.*
2. *If an operator only has operational control over a portion of a larger project (e.g., one of four homebuilders in a subdivision), the operator is responsible for compliance with all applicable effluent limits, terms, and conditions of this permit as it relates to the activities on their portion of the construction site, including protection of endangered species, critical habitat, and historic properties, and implementation of control measures described in the SWPPP in the areas under their control.*
3. *You must ensure either directly or through coordination with other permittees, that your activities do not render another party's pollutant discharge controls ineffective.*
4. *If the operator of a "construction support activity" (see Part 1.3.c) is different than the operator of the main construction site, that operator is also required to obtain permit coverage.*

b. Your project:

i. Will disturb 1 or more acres of land, or will disturb less than 1 acre of land but is part of a common plan of development or sale that will ultimately disturb 1 or more acres of land; or

ii. Your project's discharges have been designated by EPA as needing a permit under § 122.26(a)(1)(v) or § 122.26(b)(15)(ii);

c. Your project is located in an area where EPA is the permitting authority (see Appendix B);

d. Discharges from your project are not:

   i. Already covered by a different NPDES permit for the same discharge; or

   ii. In the process of having coverage under a different NPDES permit for the same discharge denied, terminated, or revoked.[1, 2]

e. You are able to demonstrate that you meet one of the criteria listed in Appendix D with respect to the protection of species that are federally-listed as endangered or threatened under the Endangered Species Act (ESA) or federally-designated critical habitat;

f. You have completed the screening process in Appendix E relating to the protection of historic properties and places; and

g. You have complied with all requirements in Part 9 imposed by the applicable state, Indian tribe, or territory in which your construction activities will occur.

1.2. ELIGIBILITY CONDITIONS THAT APPLY DEPENDING ON TYPE OF PROJECT.

You must also satisfy, if applicable, the conditions in Parts 1.2.1 through 1.2.4 in order to obtain coverage under this permit.

1.2.1. Eligibility for Emergency-Related Construction Activities.

If you are conducting earth-disturbing activities in response to a public emergency *(e.g., natural disaster, widespread disruption in essential public services)*, and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services, you are authorized to discharge on the condition that a complete and accurate NOI is submitted within 30 calendar days after commencing earth-disturbing activities (see Table 1) establishing that you are eligible under this permit. You are also required to provide documentation in your SWPPP to substantiate the occurrence of the public emergency.

1.2.2. Water Quality Standards – Eligibility for New Sources.

If you are a "new source" (as defined in Appendix A), you are not eligible for coverage under this permit for discharges that EPA, prior to authorization under this permit, determines will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary in accordance with Part 1.4.5. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures designed to bring your discharge into compliance with water quality standards. In the absence of information demonstrating otherwise, EPA expects that compliance with the stormwater control requirements of this permit, including the requirements applicable to such discharges in Part 3.2, will result in discharges that will not cause, have the reasonable potential to cause, or contribute to an excursion above any applicable water quality standard.

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[1] Parts 1.1.d.i and 1.1.d.ii do not include sites currently covered under the 2003 or 2008 CGPs, which are in the process of obtaining coverage under this permit, and sites covered under this permit, which are transferring coverage to a different operator.

[2] Notwithstanding a project being made ineligible for coverage under this permit because it falls under the description of Parts 1.1.d.i or 1.1.d.ii, above, EPA may waive the applicable requirement after specific review if it determines that coverage under this permit is appropriate.

1.2.3. Discharging to Waters with High Water Quality – Eligibility for New Sources.

If you are a "new source" (as defined in Appendix A), you are eligible to discharge to a Tier 2, Tier 2.5, or Tier 3 water only if your discharge will not lower the water quality of the applicable water. In the absence of information demonstrating otherwise, EPA expects that compliance with the stormwater control requirements of this permit, including the requirements applicable to such discharges in Part 3.3.2, will result in discharges that will not lower the water quality of the applicable water. See list of Tier 2, Tier 2.5, and Tier 3 waters in Appendix F.

Note: Your project will be considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first surface water to which you discharge is identified by a state, tribe, or EPA as a Tier 2, Tier 2.5, or Tier 3 water. For discharges that enter a storm sewer system prior to discharge, the first surface water to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system.

1.2.4. Use of Cationic Treatment Chemicals.

If you plan to use cationic treatment chemicals (as defined in Appendix A), you are ineligible for coverage under this permit, unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

1.3. Types of Discharges Authorized Under the CGP.

The following is a list of discharges that are allowed under the permit provided that appropriate stormwater controls are designed, installed, and maintained:

a. Stormwater discharges, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with construction activity under 40 CFR § 122.26(b)(14) or § 122.26(b)(15)(i);

b. Stormwater discharges designated by EPA as needing a permit under 40 CFR § 122.26(a)(1)(v) or § 122.26(b)(15)(ii);

c. Stormwater discharges from construction support activities *(e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas)* provided:

   i. The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;

   ii. The support activity is not a commercial operation, nor does it serve multiple unrelated construction projects;

   iii. The support activity does not continue to operate beyond the completion of the construction activity at the project it supports; and

   iv. Stormwater controls are implemented in accordance with Part 2 and, if applicable, Part 3, for discharges from the support activity areas.

d. The following non-stormwater discharges from your construction activity, provided that, with the exception of water used to control dust and to irrigate areas to be vegetatively stabilized, these discharges are not routed to areas of exposed soil on your site and you comply with any applicable requirements for these discharges in Part 2:

   i. Discharges from emergency fire-fighting activities;

ii. Fire hydrant flushings;

iii. Landscape irrigation;

iv. Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;

v. Water used to control dust;

vi. Potable water including uncontaminated water line flushings;

vii. Routine external building washdown that does not use detergents;

viii. Pavement wash waters provided spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used. You are prohibited from directing pavement wash waters directly into any surface water, storm drain inlet, or stormwater conveyance, unless the conveyance is connected to a sediment basin, sediment trap, or similarly effective control;

ix. Uncontaminated air conditioning or compressor condensate;

x. Uncontaminated, non-turbid discharges of ground water or spring water;

xi. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and

xii. Construction dewatering water that has been treated by an appropriate control under Part 2.1.3.4; and

e. Discharges of stormwater listed above in Parts a, b, and c, or authorized non-stormwater discharges in Part d above, commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

1.4. SUBMITTING YOUR NOTICE OF INTENT (NOI).

To be covered under this permit, you must submit to EPA a complete and accurate NOI prior to commencing construction activities. The NOI certifies to EPA that you are eligible for coverage according to Part 1.1 and 1.2, and provides information on your construction operation and discharge.

Note: All "operators" (as defined in Appendix A) associated with your construction project, who meet the Part 1.1 eligibility requirements, and who elect to seek coverage under this permit, are required to submit an NOI.

Note: There are two exceptions to the requirement to submit the NOI prior to the commencement of construction activities: (1) for emergency-related projects, and (2) for new projects scheduled to commence construction activities on or after February 16, 2012, but no later than March 1, 2012. For these two types of projects, the NOI must be submitted within 30 calendar days after the commencement of earth-disturbing activities (see Part 1.4.2).

Note: You must complete the development of a Stormwater Pollution Prevention Plan (SWPPP) consistent with Part 7 prior to submitting your NOI for coverage under this permit.

1.4.1. How to Submit Your NOI.

You are required to use EPA's electronic NOI system, or "eNOI system", to prepare and submit your NOI. Go to www.epa.gov/npdes/stormwater/cgpenoi to access the eNOI system and file an NOI. If you have a problem with the use of the eNOI system, contact

the EPA Regional Office that corresponds to the location of your site. If you are given approval by the EPA Regional Office to use a paper NOI, and you elect to use it, you must complete the form in Appendix J.

1.4.2. Deadlines for Submitting Your NOI and Your Official Date of Permit Coverage.

Table 1 provides the deadlines for submitting your NOI and your official start date of permit coverage, which differ depending on when you commence construction activities. The following terms are used in Table 1 to establish NOI deadlines:

a. New project – a construction project that commences construction activities on or after February 16, 2012.

b. Existing project – a construction project that commenced construction activities prior to February 16, 2012.

c. New operator of a new or existing project – an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction project.

Table 1 NOI Submittal Deadlines and Official Start Date for Permit Coverage.

Type of Construction Project	Deadlines for Operators to Submit NOI	Official Start Date for Permit Coverage
New project	You must submit your NOI at least 14 calendar days prior to commencing earth-disturbing activities. *Exception:* If your project qualifies as an "emergency-related project" under Part 1.2.1, you must submit your NOI by no later than 30 calendar days after commencing earth-disturbing activities. *Exception:* If you are scheduled to commence construction activities on or after February 16, 2012, but no later than March 1, 2012, you must submit your NOI by no later than 30 calendar days after commencing earth-disturbing activities.	You are considered covered under this permit 14 calendar days after EPA has acknowledged receipt of your NOI on the Agency's website (www.epa.gov/npdes/stormwater/cgpnoisearch), unless EPA notifies you that your authorization has been delayed or denied. *Exception:* If your project qualifies as an "emergency-related project" under Part 1.2.1, you are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA has acknowledged receipt of your NOI, unless EPA notifies you that your authorization has been delayed or denied. *Exception:* If you are scheduled to commence construction activities on or after February 16, 2012, but no later than March 1, 2012, you are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA has acknowledged receipt of your NOI, unless EPA notifies you that your

Type of Construction Project	Deadlines for Operators to Submit NOI	Official Start Date for Permit Coverage
		authorization has been delayed or denied.
Existing project	You must submit your NOI by no later than May 16, 2012.[3] However, if you have not previously obtained coverage under an NPDES permit, you must submit your NOI immediately.	You are considered covered under this permit 14 calendar days after EPA has acknowledged receipt of your NOI on the Agency's website (www.epa.gov/npdes/stormwater/cgpnoisearch), unless EPA notifies you that your authorization has been delayed or denied.[4]
New operator of a new or existing project	You must submit your NOI at least 14 calendar days before the date the transfer to the new operator will take place.	You are considered covered under this permit 14 calendar days after EPA has acknowledged receipt of your NOI on the Agency's website (www.epa.gov/npdes/stormwater/cgpnoisearch), unless EPA notifies you that your authorization has been delayed or denied.

Note: If you have missed the deadline to submit your NOI, any and all discharges from your construction activities will continue to be unauthorized under the Clean Water Act until they are covered by this or a different NPDES permit. EPA may take enforcement action for any unpermitted discharges that occur between the commencement of earth-disturbing activities and discharge authorization.

Note: Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage.

1.4.3. Your Official End Date of Permit Coverage

Once covered under this permit, your coverage will last until the date that:

- You terminate permit coverage consistent with Part 8; or
- Your discharges are permitted under a different NPDES permit or a reissued or replacement version of this permit after expiring on February 16, 2017; or
- For existing projects that continue after this permit has expired, the deadline has passed for the submission of an NOI for coverage under a reissued or replacement version of this permit and you have failed to submit an NOI by the required deadline.

1.4.4. Continuation of Coverage for Existing Permittees After the Permit Expires.

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with the Administrative Procedure Act and

[3] For existing projects located in the following areas, NOIs must be submitted no later than 90 days after the date of permit issuance: the State of Idaho (except Indian country); and areas in the State of Washington, except Indian country, subject to construction by a Federal Operator.

[4] Note that if you are currently covered under the 2003 or 2008 CGP, this coverage continues until your coverage under this permit begins, provided you have submitted an NOI by the deadline.

remain in force and effect for discharges that were covered prior to expiration. If you were granted permit coverage prior to the expiration date, you will automatically remain covered by this permit until the earliest of:

- Your authorization for coverage under a reissued or replacement version of this permit following your timely submittal of a complete and accurate NOI requesting coverage under the new permit; or

  Note: If you fail to submit a timely NOI for coverage under the reissued or replacement permit, your coverage will terminate on the date that the NOI was due.

- Your submittal of a Notice of Termination; or
- Issuance or denial of an individual permit for the project's discharges; or
- A final permit decision by EPA not to reissue a general permit, at which time EPA will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will terminate at the end of this time period.

EPA reserves the right to modify or revoke and reissue this permit under 40 CFR 122.62 and 63, in which case you will be notified of any relevant changes or procedures to which you may be subject.

1.4.5. Procedures for Denial of Coverage.

Following your submittal of a complete and accurate NOI, you may be notified in writing by EPA that you are not covered, and that you must either apply for and/or obtain coverage under an individual NPDES permit or an alternate general NPDES permit. This notification will include a brief statement of the reasons for this decision and will provide application information. Any interested person may request that EPA consider requiring an individual permit under this paragraph.

If you are already a permittee with coverage under this permit, the notice will set a deadline to file the permit application, and will include a statement that on the effective date of the individual NPDES permit or alternate general NPDES permit, as it applies to you, coverage under this general permit will terminate. EPA may grant additional time to submit the application if you request it. If you are covered under this permit and fail to submit an individual NPDES permit application or an NOI for an alternate general NPDES permit as required by EPA, then the applicability of this permit to you is terminated at the end of the day specified by EPA as the deadline for application submittal. EPA may take appropriate enforcement action for any unpermitted discharge. If you submit a timely permit application, then when an individual NPDES permit is issued to you or you are provided with coverage under an alternate general NPDES permit, your coverage under this permit is terminated on the effective date of the individual permit or date of coverage under the alternate general permit.

1.5. REQUIREMENT TO POST A NOTICE OF YOUR PERMIT COVERAGE.

You must post a sign or other notice conspicuously at a safe, publicly accessible location in close proximity to the project site. At a minimum, the notice must include the NPDES Permit tracking number and a contact name and phone number for obtaining additional project information. The notice must be located so that it is visible from the public road that is nearest to the active part of the construction site, and it must use a font large enough to be readily viewed from a public right-of-way.

2. EFFLUENT LIMITATIONS APPLICABLE TO ALL DISCHARGES FROM CONSTRUCTION SITES

You are required to comply with the following effluent limitations in this Part for discharges from your site and/or from construction support activities (see Part 1.3.c).

Note: If your project is an "existing project" (see Part 1.4.2.b) or if you are a "new operator of an existing project" (see Part 1.4.2.c), and it is infeasible for you to comply with a specific requirement in this Part because (1) the requirement was not part of the permit you were previously covered under (i.e., the 2003 or 2008 CGP), and (2) because you are prevented from compliance due to the nature or location of earth disturbances that commenced prior to February 16, 2012, or because you are unable to comply with the requirement due to the manner in which stormwater controls have already been installed or were already designed prior to February 16, 2012, you are required to document this fact in your SWPPP and are waived from complying with that requirement. This flexibility applies only to the requirements in Parts 2.1, and 2.3.3 through 2.3.5 (except for Parts 2.3.3.1, 2.3.3.2b, 2.3.3.3c.i, and 2.3.3.4). This only applies to those portions of your site that have already commenced earth-disturbing activities or where stormwater controls implemented in compliance with the previous permit have already been installed.

Part 2 includes the following types of requirements:

- Erosion and Sediment Control Requirements (Part 2.1)
- Stabilization Requirements (Part 2.2)

  Pollution Prevention Requirements (Part 2.3)

2.1. EROSION AND SEDIMENT CONTROL REQUIREMENTS.

You must design, install, and maintain erosion and sediment controls that minimize the discharge of pollutants from earth-disturbing activities. To meet this requirement, you must comply with the following provisions.

2.1.1. General Requirements Applicable to All Construction Sites.

2.1.1.1 ***Area of Disturbance.*** You are required to minimize the amount of soil exposed during construction activities. You are also subject to the deadlines for temporarily and/or permanently stabilizing exposed portions of your site pursuant to Part 2.2.

2.1.1.2 ***Design Requirements.***

a. You must account for the following factors in designing your stormwater controls:

i. The expected amount, frequency, intensity, and duration of precipitation;

ii. The nature of stormwater runoff and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. If any stormwater flow will be channelized at your site, you must design stormwater controls to control both peak flowrates and total stormwater volume to minimize erosion at outlets and to minimize downstream channel and streambank erosion; and

iii. The range of soil particle sizes expected to be present on the site.

b. You must direct discharges from your stormwater controls to vegetated areas of your site to increase sediment removal and maximize stormwater

infiltration, including any natural buffers established under Part 2.1.2.1, unless infeasible. Use velocity dissipation devices if necessary to prevent erosion when directing stormwater to vegetated areas.

2.1.1.3 ***Installation Requirements.***

a. **Complete installation of stormwater controls by the time each phase of earth-disturbance has begun, unless infeasible.** By the time earth-disturbing activities in any given portion of your site have begun, unless infeasible, you must install and make operational any downgradient sediment controls (*e.g., buffers or equivalent sediment controls, perimeter controls, exit point controls, storm drain inlet protection)* that control discharges from the initial site clearing, grading, excavating, and other land-disturbing activities.

Note: Where it is infeasible to install stormwater controls prior to the initial earth disturbance, it is EPA's expectation that it will be a rare circumstance that will prevent the operator from installing such controls immediately following the initial earth disturbance.

Following the installation of these initial controls, all other stormwater controls planned for this portion of your site and described in your SWPPP must be installed and made operational as soon as conditions on the site allow.

Note: The requirement to install stormwater controls prior to earth-disturbance for each phase of the project does not apply to the earth disturbance associated with the actual installation of these controls.

b. **Use good engineering practices and follow manufacturer's specifications.** You must install all stormwater controls in accordance with good engineering practices, including applicable design specifications.

Note: Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practice and must be explained in your SWPPP.

2.1.1.4 ***Maintenance Requirements.***

a. You must ensure that all erosion and sediment controls required in this Part remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.

b. You must inspect all erosion and sediment controls in accordance with the applicable requirements in Part 4.1, and document your findings in accordance with Part 4.1.7. If you find a problem (*e.g., erosion and sediment controls need to be replaced, repaired, or maintained*), you must make the necessary repairs or modifications in accordance with the following schedule:

i. Initiate work to fix the problem immediately after discovering the problem, and complete such work by the close of the next work day, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

ii. When installation of a new erosion or sediment control or a significant repair is needed, you must install the new or modified control and make it operational, or complete the repair, by no later than 7 calendar days from the time of discovery where feasible. If it

is infeasible to complete the installation or repair within 7 calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7-day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as practicable after the 7-day timeframe. Where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within 7 calendar days of completing this work.

2.1.2. Erosion and Sediment Control Requirements Applicable to All Sites.

2.1.2.1 **Provide Natural Buffers or Equivalent Sediment Controls.** (These requirements only apply when a surface water is located within 50 feet of your project's earth disturbances).

Note: EPA does not consider stormwater control features (e.g., stormwater conveyance channels, storm drain inlets, sediment basins) to constitute "surface waters" for the purposes of triggering the requirement to comply with this Part.

Note: Areas that you do not own or that are otherwise outside your operational control may be considered areas of undisturbed natural buffer for purposes of compliance with this part.

You must ensure that any discharges to surface waters through the area between the disturbed portions of the property and any surface waters located within 50 feet of your site are treated by an area of undisturbed natural buffer and/or additional erosion and sediment controls in order to achieve a reduction in sediment load equivalent to that achieved by a 50-foot natural buffer. Refer to Appendix G (Buffer Guidance) for information to assist you in complying with this requirement, and to Part 2.1.2.1e for exceptions to this requirement.

a. **Compliance Alternatives.** You can comply with this requirement in one of the following ways:

i. Provide and maintain a 50-foot undisturbed natural buffer; or

Note: If your earth disturbances are located 50 feet or further from a surface water, then you have complied with this alternative.

ii. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or

iii. If it is infeasible to provide and maintain an undisturbed natural buffer of any size, you must implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

Note: For the compliance alternatives in Parts 2.1.2.1a.i and 2.1.2.1a.ii, you are not required to enhance the quality of the vegetation that already exists in the buffer, or provide vegetation if none exists (e.g., arid and semi-arid areas). You only need to retain and protect from disturbance the natural buffer that existed prior to the commencement of construction. Any preexisting structures or impervious surfaces are allowed in the natural buffer provided you retain and

protect from disturbance the natural buffer area outside the preexisting disturbance. Similarly, for alternatives 2.1.2.1a.ii and 2.1.2.1a.iii, you are required to implement and maintain sediment controls that achieve the sediment load reduction equivalent to the undisturbed natural buffer that existed on the site prior to the commencement of construction. In determining equivalent sediment load reductions, you may consider naturally non-vegetated areas and prior disturbances. See Appendix G for a discussion of how to determine equivalent reductions.

You must document the compliance alternative you have selected in your SWPPP, and comply with the applicable additional requirements described in Parts 2.1.2.1b and 2.1.2.1c below.

The compliance alternative selected above must be maintained throughout the duration of permit coverage, except that you may select a different compliance alternative during your period of permit coverage, in which case you must modify your SWPPP to reflect this change.

b. **Additional Requirements for the Compliance Alternatives in Parts 2.1.2.1a.i and 2.1.2.1a.ii.** If you choose either of the compliance alternatives in Parts 2.1.2.1a.i or 2.1.2.1a.ii above, throughout your period of coverage under this permit, you must comply with the following additional requirements:

   i. Ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;

   ii. Document in your SWPPP the natural buffer width retained on the property, and show the buffer boundary on your site plan; and

   iii. Delineate, and clearly mark off, with flags, tape, or other similar marking device all natural buffer areas.

c. **Additional Requirements for the Compliance Alternatives in Parts 2.1.2.1a.ii and 2.1.2.1a.iii.** If you choose either of the compliance alternatives in Parts 2.1.2.1a.ii and 2.1.2.1a.iii, you must document in your SWPPP the erosion and sediment control(s) you will use to achieve an equivalent sediment reduction, and any information you relied upon to demonstrate the equivalency.

d. **Additional Requirement for the Compliance Alternative in Part 2.1.2.1a.iii.** If you choose the compliance alternative in Part 2.1.2.1a.iii, you must also include in your SWPPP a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size.

e. **Exceptions.**

   i. If there is no discharge of stormwater to surface waters through the area between your site and any surface waters located within 50 feet of your site, you are not required to comply with the requirements in this Part. This includes situations where you have implemented control measures, such as a berm or other barrier, that will prevent such discharges.

ii. Where no natural buffer exists due to preexisting development disturbances *(e.g., structures, impervious surfaces)* that occurred prior to the initiation of planning for the current development of the site, you are not required to comply with the requirements in this Part, unless you will remove portions of the preexisting development.

Where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, you are required to comply with the requirements in this Part. For the purposes of calculating the sediment load reduction for either Part 2.1.2.1a.ii or 2.1.2.1a.iii above, you are not expected to compensate for the reduction in buffer function from the area covered by these preexisting disturbances. See Appendix G for further information on how to comply with the compliance alternatives in Part 2.1.2.1a.ii or 2.1.2.1a.iii above.

If during your project, you will disturb any portion of these preexisting disturbances, the area disturbed will be deducted from the area treated as natural buffer.For "linear construction projects" (see Appendix A), you are not required to comply with the requirements in this Part if site constraints (*e.g., limited right-of-way*) prevent you from meeting any of the compliance alternatives in Part 2.1.2.1a, provided that, to the extent practicable, you limit disturbances within 50 feet of the surface water and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the surface water. You must also document in your SWPPP your rationale as to why it is infeasible for you to comply with the requirements in Part 2.1.2.1a, and describe any buffer width retained and/or supplemental erosion and sediment controls installed.

iv. For "small residential lot" construction (*i.e., a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre*), you have the option of complying with the requirements in Appendix G (Part G.2.3).

v. The following disturbances within 50 feet of a surface water are exempt from the requirements in this Part:

- Construction approved under a CWA Section 404 permit; or
- Construction of a water-dependent structure or water access area *(e.g., pier, boat ramp, trail)*.

You must document in your SWPPP if any of the above disturbances will occur within the buffer area on your site.

2.1.2.2 ***Install Perimeter Controls.***

a. **Installation Requirements:** You must install sediment controls along those perimeter areas of your site that will receive stormwater from earth-disturbing activities.[5]

[5] Examples of perimeter controls include, but are not limited to, filter berms, silt fences, and temporary diversion dikes.

For linear projects with rights-of-way that restrict or prevent the use of such perimeter controls, you must maximize the use of these controls where practicable and document in your SWPPP why it is impracticable in other areas of the project.

b. **Maintenance Requirements:** You must remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control.

2.1.2.3 ***Minimize Sediment Track-Out.*** You must minimize the track-out of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting your construction site. To comply with this requirement, you must:

a. Restrict vehicle use to properly designated exit points;

b. Use appropriate stabilization techniques[6] at all points that exit onto paved roads so that sediment removal occurs prior to vehicle exit;

c. Where necessary, use additional controls[7] to remove sediment from vehicle tires prior to exit; and

d. Where sediment has been tracked-out from your site onto the surface of off-site streets, other paved areas, and sidewalks, you must remove the deposited sediment by the end of the same work day in which the track-out occurs or by the end of the next work day if track-out occurs on a non-work day. You must remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance (unless it is connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water.

Note: EPA recognizes that some fine grains may remain visible on the surfaces of off-site streets, other paved areas, and sidewalks even after you have implemented sediment removal practices. Such "staining" is not a violation of Part 2.1.2.3.

2.1.2.4 **Control Discharges from Stockpiled Sediment or Soil.** For any stockpiles or land clearing debris composed, in whole or in part, of sediment or soil, you must comply with the following requirements:

Note: For the purposes of this permit, sediment or soil stockpiles are defined as the storage for multiple days of soil or other sediment material to be used in the construction project.

a. Locate the piles outside of any natural buffers established under Part 2.1.2.1a and physically separated from other stormwater controls implemented in accordance with Part 2.1;

b. Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier;[8]

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[6] Examples of appropriate stabilization techniques include the use of aggregate stone with an underlying geotextile or non-woven filter fabric, or turf mats.

[7] Examples of additional controls to remove sediment from vehicle tires include, but are not limited to, wheel washing, rumble strips, and rattle plates.

[8] Examples include berms, dikes, fiber rolls, silt fences, sandbag, gravel bags, or straw bale.

c. Where practicable, provide cover or appropriate temporary stabilization to avoid direct contact with precipitation or to minimize sediment discharge;

d. Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water; and

e. Unless infeasible, contain and securely protect from wind.

2.1.2.5 ***Minimize Dust.*** In order to avoid pollutants from being discharged into surface waters, to the extent feasible, you must minimize the generation of dust through the appropriate application of water or other dust suppression techniques.

2.1.2.6 ***Minimize the Disturbance of Steep Slopes.*** You must minimize the disturbance of "steep slopes" (see definition in Appendix A).

Note: The permit does not prevent or prohibit disturbance on steep slopes. For some projects, disturbance on steep slopes may be necessary for construction (e.g., a road cut in mountainous terrain). If a disturbance to steep slopes is required for the project, EPA would recognize that it is not economically achievable to avoid the disturbance to steep slopes. However, in cases where steep slope disturbances are required, minimizing the disturbances to steep slopes consistent with this requirement can be accomplished through the implementation of a number of standard erosion and sediment control practices, such as by phasing disturbances to these areas and using stabilization practices designed to be used on steep grades.

2.1.2.7 ***Preserve Topsoil.*** You must preserve native topsoil on your site, unless infeasible.

Note: Some projects may be designed to be highly impervious after construction, and therefore little or no vegetation is intended to remain. In these cases, preserving topsoil at the site would not be feasible. Some sites may not have space to stockpile topsoil on site for later use, in which case, it may also not be feasible to preserve topsoil.

Note: Stockpiling of topsoil at off-site locations, or transfer of topsoil to other locations, is an example of a practice that is consistent with the requirements in this Part.

2.1.2.8 ***Minimize Soil Compaction***. In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed, you must either:

a. **Restrict vehicle / equipment use.** Restrict vehicle and equipment use in these locations to avoid soil compaction; or

b. **Use soil conditioning techniques.** Prior to seeding or planting areas of exposed soil that have been compacted, use techniques that condition the soils to support vegetative growth, if necessary and feasible.

2.1.2.9 ***Protect Storm Drain Inlets.*** If you discharge to any storm drain inlet that carries stormwater flow from your site directly to a surface water (and it is not first directed to a sediment basin, sediment trap, or similarly effective control), and you have authority to access the storm drain inlet, you must:

a. **Installation Requirements.** Install inlet protection measures[9] that remove sediment from your discharge prior to entry into the storm drain inlet.

Note: Inlet protection measures can be removed in the event of flood conditions or to prevent erosion.

b. **Maintenance Requirements.** Clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, you must remove the deposited sediment by the end of the same work day in which it is found or by the end of the following work day if removal by the same work day is not feasible.

2.1.3. Requirements Applicable Only to Sites Using These Specific Stormwater Controls.

You are required to comply with the following requirements if you will install any of the following stormwater controls at your site:

2.1.3.1 ***Constructed Stormwater Conveyance Channels.*** Design stormwater conveyance channels to avoid unstabilized areas on the site and to reduce erosion, unless infeasible. Minimize erosion of channels and their embankments, outlets, adjacent streambanks, slopes, and downstream waters during discharge conditions through the use of erosion controls and velocity dissipation devices[10] within and along the length of any constructed stormwater conveyance channel, and at any outlet to provide a non-erosive flow velocity.

2.1.3.2 ***Sediment Basins.*** If you install a sediment basin , you must comply with the following:

a. **Design requirements.**

i. Provide storage for either (1) the calculated volume of runoff from a 2-year, 24-hour storm (see Appendix H), or (2) 3,600 cubic feet per acre drained;

ii. When discharging from the sediment basin, utilize outlet structures that withdraw water from the surface in order to minimize the discharge of pollutants, unless infeasible;

Note: EPA believes that the circumstances in which it is infeasible to design outlet structures in this manner are rare. Exceptions may include areas with extended cold weather, where surface outlets may not be feasible during certain time periods (although it is expected that they would be used during other periods). If you have determined that it is infeasible to meet this requirement, you must provide documentation in your SWPPP to support your determination.

iii. Prevent erosion of (1) the sediment basin using stabilization controls *(e.g., erosion control blankets)*, and (2) the inlet and outlet using erosion controls and velocity dissipation devices; and

[9] Examples of inlet protection measures include fabric filters, sandbags, concrete blocks, and gravel barriers.

[10] Examples of velocity dissipation devices include check dams, sediment traps, riprap, or grouted riprap at outlets.

iv. Sediment basins must be situated outside of surface waters and any natural buffers established under Part 2.1.2.1a, and must be designed to avoid collecting water from wetlands.

b. **Maintenance requirements.** Keep in effective operating condition and remove accumulated sediment to maintain at least ½ of the design capacity of the sediment basin at all times.

2.1.3.3 ***Use of Treatment Chemicals.*** If you are using polymers, flocculants, or other treatment chemicals at your site, you must comply with the following minimum requirements:

a. **Use conventional erosion and sediment controls prior to and after the application of treatment chemicals.** Use conventional erosion and sediment controls prior to chemical addition to ensure effective treatment. Chemicals may only be applied where treated stormwater is directed to a sediment control *(e.g., sediment basin, perimeter control)* prior to discharge.

b. **Select appropriate treatment chemicals**. Chemicals must be selected that are appropriately suited to the types of soils likely to be exposed during construction and discharged to locations where chemicals will be applied, and to the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or area.

c. **Minimize discharge risk from stored chemicals.** Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures *(e.g., spill berms, decks, spill containment pallets),* or provide equivalent measures, designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means *(e.g., storing chemicals in covered area or having a spill kit available on site)*.

d. **Comply with state/local requirements.** Comply with relevant state and local requirements affecting the use of treatment chemicals.

e. **Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier.** You must also use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document specific departures from these practices or specifications and how they reflect good engineering practice.

f. **Ensure proper training.** Ensure that all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training. Among other things, the training must cover proper dosing requirements.

g. **Comply with additional requirements for the approved use of cationic chemicals.** If you have been authorized to use cationic chemicals at your site pursuant to Part 1.2.4, and the authorization is conditioned on your compliance with additional requirements necessary to ensure that the use of such chemicals will not cause an exceedance of water quality standards, you are required to comply with all such requirements.

h. **Provide proper SWPPP documentation.** You must include documentation in your SWPPP consistent with Parts 7.2.6.9 and 7.2.10.2 on the specific chemicals and chemical treatment systems you will use, and how you will comply with the requirements in this Part.

2.1.3.4 ***Dewatering Practices.*** You are prohibited from discharging ground water or accumulated stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, unless such waters are first effectively managed by appropriate controls.[11] Uncontaminated, non-turbid dewatering water can be discharged without being routed to a control.

You must also meet the following requirements for dewatering activities:

a. **Discharge requirements.**

i. Do not discharge visible floating solids or foam;

ii. Use an oil-water separator or suitable filtration device (such as a cartridge filter) that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials;

iii. To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area;

iv. At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.1.3.1;

v. With backwash water, either haul it away for disposal or return it to the beginning of the treatment process; and

vi. Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.

b. **Treatment chemical restrictions.** If you are using polymers, flocculants, or other treatment chemicals to treat dewatering water, you must comply with the requirements in Parts 2.1.3.3.

2.2. STABILIZATION REQUIREMENTS.

You are required to stabilize exposed portions of your site in accordance with the requirements of this Part.

Note: For the purposes of this permit, "exposed portions of your site" means areas of exposed soil that are required to be stabilized. Note that EPA does not expect that temporary or permanent stabilization measures to be applied to areas that are intended to be left unvegetated or unstabilized following construction (e.g., dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, or materials).

2.2.1. Deadlines for Initiating and Completing Stabilization.

2.2.1.1 ***Deadline to Initiate Stabilization.*** You must initiate soil stabilization measures immediately whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site.

[11] Examples of appropriate controls include, but are not limited to, sediment basins or sediment traps, sediment socks, dewatering tanks, tube settlers, weir tanks, or filtration systems (e.g., bag or sand filters) that are designed to remove sediment.

Note: Earth-disturbing activities have permanently ceased when clearing and excavation within any area of your construction site that will not include permanent structures has been completed.

Note: Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation within any area of the site that will not include permanent structures will not resume (i.e., the land will be idle) for a period of 14 or more calendar days, but such activities will resume in the future.

The 14 calendar day timeframe above begins counting as soon as you know that construction work on a portion of your site will be temporarily ceased. In circumstances where you experience unplanned or unanticipated delays in construction due to circumstances beyond your control (e.g., sudden work stoppage due to unanticipated problems associated with construction labor, funding, or other issues related to the ability to work on the site; weather conditions rendering the site unsuitable for the continuation of construction work) and you do not know at first how long the work stoppage will continue, your requirement to immediately initiate stabilization is triggered as soon as you know with reasonable certainty that work will be stopped for 14 or more additional calendar days. At that point, you must comply with Parts 2.2.1.1 and 2.2.1.2.

Note: For the purposes of this permit, EPA will consider any of the following types of activities to constitute the initiation of stabilization:

1. *prepping the soil for vegetative or non-vegetative stabilization;*
2. *applying mulch or other non-vegetative product to the exposed area;*
3. *seeding or planting the exposed area;*
4. *starting any of the activities in # 1 – 3 on a portion of the area to be stabilized, but not on the entire area; and*
5. *finalizing arrangements to have stabilization product fully installed in compliance with the applicable deadline for completing stabilization in Parts 2.2.1.2 and 2.2.1.3.*

This list of examples is not exhaustive.

Note: The term "immediately" is used to define the deadline for initiating stabilization measures. In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased.

2.2.1.2 ***Deadline to Complete Stabilization Activities.*** As soon as practicable, but no later than 14 calendar days after the initiation of soil stabilization measures consistent with Part 2.2.1.1[12], you are required to have completed:

a. For vegetative stabilization, all activities[13] necessary to initially seed or plant the area to be stabilized; and/or

b. For non-vegetative stabilization, the installation or application of all such non-vegetative measures.

[12] EPA may determine, based on an inspection carried out under Part 4.2 and corrective actions required under Part 5.3, that the level of sediment discharge on the site makes it necessary to require a faster schedule for completing stabilization. For instance, if sediment discharges from an area of exposed soil that is required to be stabilized are compromising the performance of existing stormwater controls, EPA may require stabilization to correct this problem.

[13] For example, such activities might include, but are not limited to, soil conditioning, application of seed or sod, planting of seedlings or other vegetation, application of fertilizer, and, as deemed appropriate, watering.

2.2.1.3 ***Exceptions to the Deadlines for Initiating and Completing Stabilization.***

a. *Deadlines for projects occurring in arid or semi-arid areas, or drought-stricken areas*. These requirements apply if (1) your site is located in an arid area, a semi-arid area, or a drought-stricken area, as these terms are defined in Appendix A, (2) construction will occur during the seasonally dry period or during a period in which drought is predicted to occur, and (3) you are using vegetative cover for temporary or permanent stabilization. You may also comply with the deadlines in Part 2.2.1.1 instead. The deadlines for these types of projects are as follows:

i. Immediately initiate, and within 14 calendar days of a temporary or permanent cessation of work in any portion of your site complete, the installation of temporary non-vegetative stabilization measures to the extent necessary to prevent erosion;

ii. As soon as practicable, given conditions or circumstances on your site, complete all activities necessary to initially seed or plant the area to be stabilized; and

iii. If construction is occurring during the seasonally dry period, indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions. You must also include the schedule you will follow for initiating and completing vegetative stabilization.

b. *Deadlines for projects that are affected by circumstances beyond the control of the permittee that delay the initiation and/or completion of vegetative stabilization as required in Parts 2.2.1.1 and/or 2.2.1.2*. If you are unable to meet the deadlines in Parts 2.2.1.1and/or 2.2.1.2 due to circumstances beyond your control[14], and you are using vegetative cover for temporary or permanent stabilization, you may comply with the following stabilization deadlines instead:

i. Immediately initiate, and within 14 calendar days complete, the installation of temporary non-vegetative stabilization measures to prevent erosion;

ii. Complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as conditions or circumstances allow it on your site; and

Note: You are required to have stabilized the exposed portions of your site consistent with Part 2.2.2 prior to terminating permit coverage under Part 8.2.

iii. Document the circumstances that prevent you from meeting the deadlines required in Parts 2.2.1.1and/or 2.2.1.2 and the schedule you will follow for initiating and completing stabilization.

c. *Deadlines for sites discharging to sensitive waters.* For any portion of the site that discharges to a sediment or nutrient-impaired water (see Part 3.2) or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.3), you are required

[14] Examples include problems with the supply of seed stock or with the availability of specialized equipment, unsuitability of soil conditions due to excessive precipitation and/or flooding.

to complete the stabilization activities specified in Parts 2.2.1.2a and/or 2.2.1.2b within 7 calendar days after the temporary or permanent cessation of earth-disturbing activities.

Note: If you qualify for the deadlines for initiating and completing stabilization in Part 2.2.1.3a or b*, you may comply with the stabilization deadlines in Part 2.2.1.3a or* b *for any portion of your site that discharges to a sensitive water.*

2.2.2. Criteria for Stabilization.

To be considered adequately stabilized, you must meet the criteria below depending on the type of cover you are using, either vegetative or non-vegetative.

2.2.2.1 ***Vegetative Stabilization.***

a. ***For all sites, except those located in arid or semi-arid areas or on agricultural lands.***

i. If you are vegetatively stabilizing any exposed portion of your site through the use of seed or planted vegetation, you must provide established uniform vegetation *(e.g., evenly distributed without large bare areas)*, which provides 70 percent or more of the density of coverage that was provided by vegetation prior to commencing earth-disturbing activities. You should avoid the use of invasive species;

ii. For final stabilization, vegetative cover must be perennial; and

iii. Immediately after seeding or planting the area to be vegetatively stabilized, to the extent necessary to prevent erosion on the seeded or planted area, you must select, design, and install non-vegetative erosion controls that provide cover *(e.g., mulch, rolled erosion control products)* to the area while vegetation is becoming established.

b. ***For sites located in arid or semi-arid areas, or drought-stricken areas.*** If you are located in an arid or semi-arid area, or a drought-stricken area, as these terms are defined in Appendix A, you are considered to have completed final stabilization if both of the following criteria are met:

i. The area you have seeded or planted must within 3 years provide established vegetation that covers 70 percent or more of the density of vegetation prior to commencing earth-disturbing activities; and

ii. In addition to seeding or planting the area to be vegetatively stabilized, to the extent necessary to prevent erosion on the seeded or planted area, you must select, design, and install non-vegetative erosion controls that provide cover for at least 3 years without active maintenance by you.

c. ***For sites located on land used for agriculture.*** Disturbed areas on land used for agricultural purposes *(e.g., pipelines across crop or range land, staging areas for highway construction*) that are restored to their pre-construction agricultural use are not subject to these final stabilization criteria. Areas disturbed that were not previously used for agricultural activities, and areas that are not being returned to preconstruction agricultural use, must meet the conditions for stabilization in this Part.

2.2.2.2 ***Non-Vegetative Stabilization.*** If you are using non-vegetative controls to stabilize exposed portions of your site, or if you are using such controls to temporarily protect areas that are being vegetatively stabilized, you must provide effective non-vegetative cover[15] to stabilize any such exposed portions of your site.

2.3. POLLUTION PREVENTION REQUIREMENTS.

You are required to design, install, and maintain effective pollution prevention measures in order to prevent the discharge of pollutants. Consistent with this requirement, you must:

- Eliminate certain pollutant discharges from your site (see Part 2.3.1);
- Properly maintain all pollution prevention controls (see Part 2.3.2); and
- Comply with pollution prevention standards for pollutant-generating activities that occur at your site (see Part 2.3.3).

These requirements apply to all areas of your construction site and any and all support activities covered by this permit consistent with Part 1.3.c.

2.3.1. Prohibited Discharges.

You are prohibited from discharging the following from your construction site:

2.3.1.1 Wastewater from washout of concrete, unless managed by an appropriate control as described in Part 2.3.3.4;

2.3.1.2 Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials, unless managed by an appropriate control as described in Part 2.3.3.4;

2.3.1.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

2.3.1.4 Soaps, solvents, or detergents used in vehicle and equipment washing; and

2.3.1.5 Toxic or hazardous substances from a spill or other release.

2.3.2. General Maintenance Requirements.

You must ensure that all pollution prevention controls installed in accordance with this Part remain in effective operating condition and are protected from activities that would reduce their effectiveness. You must inspect all pollutant-generating activities and pollution prevention controls in accordance with your inspection frequency requirements in Parts 4.1.2 or 3.2.2.1 to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater discharges to receiving waters, and must document your findings in accordance with Part 4.1.7. If you find that controls need to be replaced, repaired, or maintained, you must make the necessary repairs or modifications in accordance with the following:

2.3.2.1 Initiate work to fix the problem immediately after discovering the problem, and complete such work by the close of the next work day, if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance.

[15] For temporary stabilization, examples of temporary non-vegetative stabilization methods include, but are not limited to, hydromulch and erosion control blankets. For final stabilization, examples of permanent non-vegetative stabilization methods include, but are not limited to, riprap, gabions, and geotextiles.

2.3.2.2 When installation of a new pollution prevention control or a significant repair is needed, you must install the new or modified control and make it operational, or complete the repair, by no later than 7 calendar days from the time of discovery. If it is infeasible to complete the installation or repair within 7 calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7 calendar day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as practicable after the 7 calendar day timeframe. Where these actions result in changes to any of the pollution prevention controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within 7 calendar days of completing this work.

2.3.3. Pollution Prevention Standards.

You are required to comply with the pollution prevention standards in this Part if you conduct any of the following activities at your site or at any construction support activity areas covered by this permit (see Part 1.3.c):

- Fueling and maintenance of equipment or vehicles;
- Washing of equipment and vehicles;
- Storage, handling, and disposal of construction materials, products, and wastes; and
- Washing of applicators and containers used for paint, concrete, or other materials.

The pollution prevention standards are as follows:

2.3.3.1 ***Fueling and Maintenance of Equipment or Vehicles***. If you conduct fueling and/or maintenance of equipment or vehicles at your site, you must provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuel, from the area where these activities will take place.[16]

To comply with the prohibition in Part 2.3.1.3, you must:

a. If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR 112 and Section 311 of the CWA;

b. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;

c. Use drip pans and absorbents under or around leaky vehicles;

d. Dispose of or recycle oil and oily wastes in accordance with other federal, state, tribal, or local requirements;

e. Clean up spills or contaminated surfaces immediately, using dry clean up measures where possible, and eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge; and

f. Do not clean surfaces by hosing the area down.

[16] Examples of effective controls include, but are not limited to, locating activities away from surface waters and stormwater inlets or conveyances, providing secondary containment *(e.g., spill berms, decks, spill containment pallets)*and cover where appropriate, and/or having spill kits readily available.

2.3.3.2 ***Washing of Equipment and Vehicles.***

a. You must provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of washing;[17] and

b. To comply with the prohibition in Part 2.3.1.4, for storage of soaps, detergents, or solvents, you must provide either (1) cover (*e.g., plastic sheeting or temporary roofs*) to prevent these detergents from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas.

2.3.3.3 ***Storage, Handling, and Disposal of Construction Products, Materials, and Wastes.*** You must minimize the exposure to stormwater of any of the products, materials, or wastes specified below that are present at your site by complying with the requirements in this Part.

Note: These requirements do not apply to those products, materials, or wastes that are not a source of stormwater contamination or that are designed to be exposed to stormwater.

To ensure you meet this requirement, you must:

a. *For building products*[18]*:* In storage areas, provide either (1) cover (*e.g., plastic sheeting or temporary roofs*) to prevent these products from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas.

b. *For pesticides, herbicides, insecticides, fertilizers, and landscape materials:*

i. In storage areas, provide either (1) cover (e.g., *plastic sheeting or temporary roofs*) to prevent these chemicals from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas; and

ii. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label.

c. *For diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals:*

i. To comply with the prohibition in Part 2.3.1.3, store chemicals in water-tight containers, and provide either (1) cover *(e.g., plastic sheeting or temporary roofs)* to prevent these containers from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas *(e.g., spill kits)*, or provide secondary containment *(e.g., spill berms, decks, spill containment pallets)*; and

ii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. Do not clean

[17] Examples of effective controls include, but are not limited to, locating activities away from surface waters and stormwater inlets or conveyances and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls.

[18] Some examples of building products that are typically stored at construction sites include, but are not limited to, asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures.

surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

d. *For hazardous or toxic waste*[19]*:*

i. Separate hazardous or toxic waste from construction and domestic waste;

ii. Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, tribal, or local requirements;

iii. Store all containers that will be stored outside within appropriately-sized secondary containment *(e.g., spill berms, decks, spill containment pallets)* to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas *(e.g., storing chemicals in covered area or having a spill kit available on site)*;

iv. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, tribal, and local requirements; and

v. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.

e. *For construction and domestic waste*[20]: Provide waste containers *(e.g., dumpster or trash receptacle)* of sufficient size and number to contain construction and domestic wastes. In addition, you must:

(1) On work days, clean up and dispose of waste in designated waste containers; and

(2) Clean up immediately if containers overflow.

f. *For sanitary waste:* Position portable toilets so that they are secure and will not be tipped or knocked over.

2.3.3.4 **Washing of Applicators and Containers used for Paint, Concrete, or Other Materials.** To comply with the prohibition in Parts 2.3.1.1 and 2.3.1.2, you must provide an effective means of eliminating the discharge of water from the washout and cleanout of stucco, paint, concrete, form release oils, curing compounds, and other construction materials. To comply with this requirement, you must:

[19] Examples of hazardous or toxic waste that may be present at construction sites include, but are not limited to, paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, acids.

[20] Examples of construction and domestic waste include, but are not limited to, packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, and other trash or building materials.

a. Direct all washwater into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation;

b. Handle washout or cleanout wastes as follows:

   i. Do not dump liquid wastes in storm sewers;

   ii. Dispose of liquid wastes in accordance with applicable requirements in Part 2.3.3.3; and

   iii. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Part 2.3.3.3; and

c. Locate any washout or cleanout activities as far away as possible from surface waters and stormwater inlets or conveyances, and, to the extent practicable, designate areas to be used for these activities and conduct such activities only in these areas.

2.3.4. Emergency Spill Notification.

You are prohibited from discharging toxic or hazardous substances from a spill or other release, consistent with Part 2.3.1.5. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs during a 24-hour period, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR Part 110, 40 CFR Part 117, and 40 CFR Part 302 as soon as you have knowledge of the discharge. You must also, within 7 calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release. State, tribal, or local requirements may necessitate additional reporting of spills or discharges to local emergency response, public health, or drinking water supply agencies.

2.3.5. Fertilizer Discharge Restrictions.

You are required to minimize discharges of fertilizers containing nitrogen or phosphorus. To meet this requirement, you must comply with the following requirements:

2.3.5.1 Apply at a rate and in amounts consistent with manufacturer's specifications, or document departures from the manufacturer specifications where appropriate in Part 7.2.7.3 of the SWPPP;

2.3.5.2 Apply at the appropriate time of year for your location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth;

2.3.5.3 Avoid applying before heavy rains that could cause excess nutrients to be discharged;

2.3.5.4 Never apply to frozen ground;

2.3.5.5 Never apply to stormwater conveyance channels with flowing water; and

2.3.5.6 Follow all other federal, state, tribal, and local requirements regarding fertilizer application.

3. WATER QUALITY-BASED EFFLUENT LIMITATIONS.

3.1. GENERAL EFFLUENT LIMITATION TO MEET APPLICABLE WATER QUALITY STANDARDS

Your discharge must be controlled as necessary to meet applicable water quality standards. You must also comply with any additional requirements that your state or tribe requires you to meet in Part 9.

In the absence of information demonstrating otherwise, EPA expects that compliance with the conditions in this permit will result in stormwater discharges being controlled as necessary to meet applicable water quality standards. If at any time you become aware, or EPA determines, that your discharge is not being controlled as necessary to meet applicable water quality standards, you must take corrective action as required in Part 5.2.1, and document the corrective actions as required in Part 5.2.2 and Part 5.4.

EPA will also impose additional water quality-based limitations on a site-specific basis, or require you to obtain coverage under an individual permit, if information in your NOI, or from other sources indicates that your discharges are not controlled as necessary to meet applicable water quality standards. This includes situations where additional controls are necessary to comply with a wasteload allocation in an EPA established or approved TMDL.

3.2. DISCHARGE LIMITATIONS FOR IMPAIRED WATERS

If you discharge to a surface water that is impaired for (1) sediment or a sediment-related parameter, such as total suspended solids (TSS) or turbidity, and/or (2) nutrients, including impairments for nitrogen and/or phosphorus, you are required to comply with the requirements in Part 3.2.2.

Note: For the purposes of this Part, "impaired waters" are waters identified as impaired on the appropriate CWA Section 303(d) list, or waters with an EPA-approved or established TMDL. Your construction site will be considered to discharge to an impaired water if the first surface water to which you discharge is identified by a state, tribe, or EPA pursuant to Section 303(d) of the CWA as not meeting an applicable water quality standard, or is included in an EPA-approved or established total maximum daily load (TMDL). For discharges that enter a storm sewer system prior to discharge, the first surface water to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system.

If you discharge to an impaired water that is impaired for a parameter other than a sediment-related parameter or nutrients, EPA will inform you if any additional limits or controls are necessary for your discharge to be controlled as necessary to meet water quality standards, including for it to be consistent with the assumptions of any available wasteload allocation in any applicable TMDL, or if coverage under an individual permit is necessary in accordance with Part 1.4.5.

If during your coverage under a previous permit, you were required to install and maintain stormwater controls specifically to meet the assumptions and requirements of an EPA-approved or established TMDL (for any parameter) or to otherwise control your discharge to meet water quality standards, you must continue to implement such controls as part of this permit.

3.2.1. Identify If You Discharge To An Impaired Water.

If you discharge to an impaired water, you must provide the following information in your NOI:

- A list of all impaired waters to which you discharge;
- The pollutant(s) for which the surface water is impaired; and

- Whether a TMDL has been approved or established for the waters to which you discharge.

3.2.2. Requirements for Discharges to Sediment or Nutrient-Impaired Waters.

If you discharge to a surface water that is impaired for (1) sediment or a sediment-related parameter *(e.g., total suspended solids (TSS) or turbidity)* and/or (2) nutrients *(e.g., nitrogen and/or phosphorus)*, including impaired waters for which a TMDL has been approved or established for the impairment, you are required to comply with the following stormwater control requirements, which supplement the requirements applicable to your site in other corresponding parts of the permit

3.2.2.1 ***Frequency of Site Inspection.*** You must conduct inspections at the frequency specified in Part 4.1.3.

3.2.2.2 ***Deadline to Complete Stabilization.*** You must comply with the deadlines for completing site stabilization as specified in Part 2.2.1.3c.

3.2.2.3 ***State and Tribal Requirements.*** You must comply with any additional state or tribal impairment-related requirements included in Part 9.

EPA will also impose additional water quality-based limitations on a site-specific basis, or require you to obtain coverage under an individual permit, if it is determined that the controls in the Part will not be sufficient to control discharges consistent with the assumptions and requirements of an applicable wasteload allocation of an approved or established TMDL or to prevent the site from contributing to the impairment.

3.3. DISCHARGES TO WATERS IDENTIFIED AS TIER 2, TIER 2.5, OR TIER 3.

3.3.1. Identify if You Discharge to a Tier 2, Tier 2.5, or Tier 3 Water.

If you discharge to a water identified by a state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 water, you must provide on your NOI a list of waters identified as Tier 2, Tier 2.5, or Tier 3 to which you discharge. See Appendix F for a list of Tier 2 and 3 waters in Idaho, Massachusetts, New Hampshire, and New Mexico.

Note: For the purposes of this permit, you are considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first surface water to which you discharge is identified by a state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3. Tiers 2, 2.5 and 3 refer to waters either identified by the state as high quality waters or Outstanding National Resource Waters under 40 CFR §131.12(a)(2) and (3). For discharges that enter a storm sewer system prior to discharge, the surface water to which you discharge is the first surface water that receives the stormwater discharge from the storm sewer system.

3.3.2. Requirements for New Projects Discharging to Tier 2, Tier 2.5, or Tier 3 Waters.

For new projects, if you will discharge to a Tier 2, Tier 2.5, or Tier 3 water, you are required to comply with the requirements in Parts 4.1.3 (inspection frequencies) and 2.2.1.3c (stabilization deadlines), and, if applicable, Part 9 (relevant state or tribal requirements). In addition, on a case-by-case basis, EPA may notify operators of such new projects or operators of existing projects with increased discharges that additional analyses, stormwater controls, or other permit conditions are necessary to comply with the applicable antidegradation requirements, or notify you that an individual permit application is necessary in accordance with Part 1.4.5.

4. INSPECTIONS.

4.1. SITE INSPECTIONS.

4.1.1. Person(s) Responsible for Inspecting Site.

The person(s) inspecting your site may be a person on your staff or a third party you hire to conduct such inspections. You are responsible for ensuring that the person who conducts inspections is a "qualified person."

Note: A "qualified person" is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact stormwater quality, and the skills to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

4.1.2. Frequency of Inspections.

At a minimum, you must conduct a site inspection in accordance with one of the two schedules listed below, unless you are subject to Part 4.1.3 or Part 4.1.4:

4.1.2.1 At least once every 7 calendar days; or

4.1.2.2 Once every 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches or greater. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.1.7.1d.

Note: Inspections are only required during the project's normal working hours.

Note: You are required to specify in your SWPPP which schedule you will be following.

Note: "Within 24 hours of the occurrence of a storm event" means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. Thus, if you have elected to inspect bi-weekly in accordance with Part 4.1.2.2 and there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

4.1.3. Increase in Inspection Frequency for Sites Discharging to Sensitive Waters.

For any portion of the site that discharges to a sediment or nutrient-impaired water (see Part 3.2) or to a water that is identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.3), instead of the inspection frequency specified in Part 4.1.2, you must conduct inspections in accordance with the following inspection frequencies:

4.1.3.1 Once every 7 calendar days; and

4.1.3.2 Within 24 hours of the occurrence of a storm event of 0.25 inches or greater. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that

measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.1.7.1d.

Note: Inspections are only required during the project's normal working hours.

Note: "Within 24 hours of the occurrence of a storm event" means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. Thus, if there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

Note: If you qualify for any of the reduced inspection frequencies in Part 4.1.4, you may conduct inspections in accordance with Part 4.1.4 for any portion of your site that discharges to a sensitive water.

4.1.4. Reductions in Inspection Frequency.

Your inspection frequency may be reduced as follows:

4.1.4.1 ***For Stabilized Areas.*** You may reduce the frequency of inspections to once per month in any area of your site where the stabilization steps in Parts 2.2.1.2a and 2.2.1.2b have been completed. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.1.2 or 4.1.3, if applicable. You must document the beginning and ending dates of this period in your records.

4.1.4.2 ***For Arid, Semi-Arid, or Drought-Stricken Areas.*** You may reduce the frequency of inspections to once per month and within 24 hours of the occurrence of a storm event of 0.25 inches or greater if your site is located in an arid, semi-arid, or drought-stricken area, as these terms are defined in Appendix A, and construction is occurring during the seasonally dry period or during a period in which drought is predicted to occur. You must document that you are using this reduced schedule and the beginning and ending dates of the seasonally dry period in your SWPPP. To determine if a storm event of 0.25 inches or greater has occurred on your site, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, you must record the total rainfall measured for that day in accordance with Part 4.1.7.1d.

Note: Inspections are only required during the project's normal working hours.

Note: "Within 24 hours of the occurrence of a storm event" means that you are required to conduct an inspection within 24 hours once a storm event has produced 0.25 inches, even if the storm event is still continuing. Thus, if there is a storm event at your site that continues for multiple days, and each day of the storm produces 0.25 inches or more of rain, you are required to conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

4.1.4.3 ***For Frozen Conditions.***

a. If you are suspending earth-disturbing activities due to frozen conditions, you may temporarily suspend inspections on your site until thawing conditions (see Appendix A) begin to occur if:

i. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least 3 months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain on snow events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.1.2 or 4.1.3, if applicable;

ii. Land disturbances have been suspended; and

iii. All disturbed areas of the site have been temporarily or permanently stabilized in accordance with Part 2.2.

b. If you are still conducting earth-disturbing activities during frozen conditions, you may reduce your inspection frequency to once per month if:

i. Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least 3 months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain on snow events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.1.2 or 4.1.3 if applicable; and

ii. Except for areas in which you are actively conducting earth-disturbing activities, disturbed areas of the site have been temporarily or permanently stabilized in accordance with Part 2.2.

You must document the beginning and ending dates of this period in your SWPPP.

4.1.5. Areas that Need to Be Inspected. During your site inspection, you must at a minimum inspect the following areas of your site:

4.1.5.1 All areas that have been cleared, graded, or excavated and that have not yet completed stabilization consistent with Part 2.2;

4.1.5.2 All stormwater controls (including pollution prevention measures) installed at the site to comply with this permit;

4.1.5.3 Material, waste, borrow, or equipment storage and maintenance areas that are covered by this permit;

4.1.5.4 All areas where stormwater typically flows within the site, including drainageways designed to divert, convey, and/or treat stormwater;

4.1.5.5 All points of discharge from the site; and

4.1.5.6 All locations where stabilization measures have been implemented.

You are not required to inspect areas that, at the time of the inspection, are considered unsafe to your inspection personnel.

4.1.6. Requirements for Inspections. During your site inspection, you must at a minimum:

4.1.6.1 Check whether all erosion and sediment controls and pollution prevention controls are installed, appear to be operational, and are working as intended to minimize pollutant discharges. Determine if any controls need to be replaced, repaired, or maintained in accordance with Parts 2.1.1.4 and 2.3.2;

4.1.6.2 Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site;

4.1.6.3 Identify any locations where new or modified stormwater controls are necessary to meet the requirements of Parts 2 and/or 3;

4.1.6.4 At points of discharge and, if applicable, the banks of any surface waters flowing within your property boundaries or immediately adjacent to your property, check for signs of visible erosion and sedimentation *(i.e., sediment deposits)* that have occurred and are attributable to your discharge; and

4.1.6.5 Identify any and all incidents of noncompliance observed.

4.1.6.6 If a discharge is occurring during your inspection, you are required to:

a. Identify all points of the property from which there is a discharge;

b. Observe and document the visual quality of the discharge, and take note of the characteristics of the stormwater discharge, including color, odor, floating, settled, or suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollutants; and

c. Document whether your stormwater controls are operating effectively, and describe any such controls that are clearly not operating as intended or are in need of maintenance.

4.1.6.7 Based on the results of your inspection, initiate corrective action under Part 5.

4.1.7. Inspection Report.

4.1.7.1 ***Requirement to Complete Inspection Report.*** You must complete an inspection report within 24 hours of completing any site inspection. Each inspection report must include the following:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. A summary of your inspection findings, covering at a minimum the observations you made in accordance with Part 4.1.6;

d. If you are inspecting your site at the frequency specified in Part 4.1.2.2, Part 4.1.3, or Part 4.1.4.2, and you conducted an inspection because of rainfall measuring 0.25 inches or greater, you must include the applicable rain gauge or weather station readings that triggered the inspection; and

e. If you have determined that it is unsafe to inspect a portion of your site, you must describe the reason you found it to be unsafe and specify the locations that this condition applied to.

4.1.7.2 ***Signature Requirements.*** Each inspection report must be signed in accordance with Appendix I, Part I.11 of this permit.

4.1.7.3 ***Recordkeeping Requirements.*** You are required to keep a current, copy of all inspection reports at the site or at an easily accessible location, so that it can be made available at the time of an onsite inspection or upon request by EPA. For purposes of this permit, your inspection reports may be kept electronically if the records are:

a. In a format that can be read in a similar manner as a paper record;

b. Legally dependable with no less evidentiary value than their paper equivalent; and

c. Accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form.

Note: See Section IX.1.7 of the Fact Sheet for a discussion on ways to ensure that electronic records satisfy this requirement. See Appendix I, Part I.11.5 for requirements relating to electronic signature of these documents.

All inspection reports completed for this Part must be retained for at least 3 years from the date that your permit coverage expires or is terminated.

4.2. INSPECTIONS BY EPA.

You must allow EPA, or an authorized representative of the EPA, to conduct the following activities at reasonable times:

4.2.1. Enter onto areas of your site, including any construction support activity areas covered by this permit (see Part 1.3.c), and onto locations where records are kept under the conditions of this permit;

4.2.2. Access and copy any records that must be kept under the conditions of this permit;

4.2.3. Inspect your construction site, including any construction support activity areas covered by this permit (see Part 1.3.c) and any stormwater controls installed and maintained at the site; and

4.2.4. Sample or monitor for the purpose of ensuring compliance.

5. CORRECTIVE ACTIONS.

5.1. "CORRECTIVE ACTIONS" DEFINED.

Corrective actions are actions you take in compliance with this Part to:

- Repair, modify, or replace any stormwater control used at the site;
- Clean up and properly dispose of spills, releases, or other deposits; or
- Remedy a permit violation.

5.2. REQUIREMENTS FOR TAKING CORRECTIVE ACTION.

You must complete the following corrective actions in accordance with the deadlines specified in this Part. In all circumstances, you must immediately take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational, including cleaning up any contaminated surfaces so that the material will not discharge in subsequent storm events.

Note: In this context, the term "immediately" requires construction operators to, on the same day a condition requiring corrective action is found, take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational. However, if the problem is identified at a time in the work day when it is too late to initiative corrective action, the initiation of corrective action must begin on the following work day.

5.2.1. For any of the following conditions on your site, you must install a new or modified control and make it operational, or complete the repair, by no later than 7 calendar days from the time of discovery. If it is infeasible to complete the installation or repair within 7 calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7 calendar day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as practicable after the 7-day timeframe.

5.2.1.1 A required stormwater control was never installed, was installed incorrectly, or not in accordance with the requirements in Parts 2 and/or 3; or

5.2.1.2 You become aware that the stormwater controls you have installed and are maintaining are not effective enough for the discharge to meet applicable water quality standards or applicable requirements in Part 3.1. In this case, you must notify your EPA Regional Office by the end of the next work day. You are required to submit your notification through EPA's electronic NOI system, or "eNOI", at www.epa.gov/npdes/cgpenoi; or

5.2.1.3 One of the prohibited discharges in Part 2.3.1 is occurring or has occurred.

5.2.2. Where your corrective actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within 7 calendar days of completing corrective action work.

5.3. CORRECTIVE ACTION REQUIRED BY EPA.

You must comply with any corrective actions required by EPA as a result of permit violations found during an inspection carried out under Part 4.2.

5.4. CORRECTIVE ACTION REPORT.

For each corrective action taken in accordance with this Part, you must complete a corrective action report, which includes the applicable information in Parts 5.4.1 and 5.4.2. Note that these reports must be maintained in your records but do not need to be provided to EPA except upon request.

5.4.1. Within 24 hours of discovering the occurrence of one of the triggering conditions in Part 5.2.1 at your site, you must complete a report of the following:

5.4.1.1 Which condition was identified at your site;

5.4.1.2 The nature of the condition identified; and

5.4.1.3 The date and time of the condition identified and how it was identified.

5.4.2. Within 7 calendar days of discovering the occurrence of one of the triggering conditions in Part 5.2.1 at your site, you must complete a report of the following:

5.4.2.1 Any follow-up actions taken to review the design, installation, and maintenance of stormwater controls, including the dates such actions occurred;

5.4.2.2 A summary of stormwater control modifications taken or to be taken, including a schedule of activities necessary to implement changes, and the date the modifications are completed or expected to be completed; and

5.4.2.3 Notice of whether SWPPP modifications are required as a result of the condition identified or corrective action.

5.4.3. **Signature Requirements.** Each corrective action report must be signed and certified in accordance with Appendix I, Part I.11 of this permit.

5.4.4. **Recordkeeping Requirements.** You are required to keep a current copy of all corrective action reports at the site or at an easily accessible location, so that it can be made available at the time of an onsite inspection or upon request by EPA. For purposes of this permit, your corrective action reports may be kept electronically if the records are:

5.4.4.1 In a format that can be read in a similar manner as a paper record;

5.4.4.2 Legally dependable with no less evidentiary value than their paper equivalent; and

5.4.4.3 Accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form.

Note: See Section IX.1.7 of the Fact Sheet for a discussion on ways to ensure that electronic records satisfy this requirement. See Appendix I, Part I.11.5 for requirements relating to electronic signature of these documents.

All corrective action reports completed for this Part must be retained for at least 3 years from the date that your permit coverage expires or is terminated.

6. STAFF TRAINING REQUIREMENTS.

Prior to the commencement of earth-disturbing activities or pollutant-generating activities, whichever occurs first, you must ensure that the following personnel understand the requirements of this permit and their specific responsibilities with respect to those requirements:

- Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention measures);
- Personnel responsible for the application and storage of treatment chemicals (if applicable);
- Personnel who are responsible for conducting inspections as required in Part 4.1.1; and
- Personnel who are responsible for taking corrective actions as required in Part 5.

Notes: (1) If the person requiring training is a new employee, who starts after you commence earth-disturbing or pollutant-generating activities, you must ensure that this person has the proper understanding as required above prior to assuming particular responsibilities related to compliance with this permit.

(2) For emergency-related construction activities, the requirement to train personnel prior to commencement of earth-disturbing activities does not apply, however, such personnel must have the required training prior to NOI submission.

You are responsible for ensuring that all activities on the site comply with the requirements of this permit. You are not required to provide or document formal training for subcontractors or other outside service providers, but you must ensure that such personnel understand any requirements of the permit that may be affected by the work they are subcontracted to perform.

At a minimum, personnel must be trained to understand the following if related to the scope of their job duties (e.g., only personnel responsible for conducting inspections need to understand how to conduct inspections):

- The location of all stormwater controls on the site required by this permit, and how they are to be maintained;
- The proper procedures to follow with respect to the permit's pollution prevention requirements; and
- When and how to conduct inspections, record applicable findings, and take corrective actions.

7. STORMWATER POLLUTION PREVENTION PLAN (SWPPP).

7.1. GENERAL REQUIREMENTS.

7.1.1. Requirement to Develop a SWPPP Prior to Submitting Your NOI.

All operators associated with a construction project to be covered under this permit must develop a SWPPP.

Note: You have the option of developing a group SWPPP where you are one of several operators who will be engaged in construction activities at your site. For instance, if both the owner and the general contractor of the construction site are permitted, the owner may be the party responsible for SWPPP development, and the general contractor can choose to use this same SWPPP, as long as the SWPPP addresses the general contractor's scope of construction work and obligations under this permit.

You are required to develop your site's SWPPP prior to submitting your NOI. At a minimum, your SWPPP must include the information required in Part 7.2 and as specified in other parts of the permit. [21] You must also update the SWPPP as required in Part 7.4.

Note: If your project is an "existing project" (see Part 1.4.2.b) or if you are a new operator of an existing project" (see Part 1.4.2.c), and it is infeasible for you to comply with a specific requirement in this Part or in Parts 2.1, and 2.3.3 through 2.3.5 (except for Parts 2.3.3.1, 2.3.3.2b, 2.3.3.3c.i, and 2.3.3.4) because (1) the provision was not part of the permit you were previously covered under (i.e., the 2003 or 2008 CGP), and (2) because you are prevented from compliance due to the nature or location of earth disturbances that commenced prior to February 16, 2012, or because you are unable to comply with the requirement due to the manner in which stormwater controls have already been installed or were already designed prior to February 16, 2012, you are required to include documentation of the reasons why it is infeasible for you to meet the specific requirement, and then you may be waived from complying with this requirement. You must include a separate justification why it is infeasible for you to meet each of the applicable requirements.

If you prepared a SWPPP for coverage under a previous version of this NPDES permit, you must review and update your SWPPP to ensure that this permit's requirements are addressed prior to submitting your NOI.

7.2. SWPPP CONTENTS.

Your SWPPP must include the following information, at a minimum.

7.2.1. Stormwater Team.

Each operator, or group of multiple operators, must assemble a "stormwater team," which is responsible for overseeing the development of the SWPPP, any later modifications to it, and for compliance with the requirements in this permit.

The SWPPP must identify the personnel (by name or position) that are part of the stormwater team, as well as their individual responsibilities. Each member of the stormwater team must have ready access to an electronic or paper copy of applicable portions of this permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

7.2.2. Nature of Construction Activities.

The SWPPP must describe the nature of your construction activities, including the size of the property (in acres) and the total area expected to be disturbed by the construction

[21] The SWPPP does not establish the effluent limits that apply to your site's discharges; these limits are established in this permit in Parts 2 and 3.

activities (in acres), construction support activity areas covered by this permit (see Part 1.3.c), and the maximum area expected to be disturbed at any one time.

7.2.3. Emergency-Related Projects.

If you are conducting earth-disturbing activities in response to a public emergency (see Part 1.2), you must document the cause of the public emergency *(e.g., natural disaster, extreme flooding conditions, etc.)*, information substantiating its occurrence *(e.g., state disaster declaration or similar state or local declaration)*, and a description of the construction necessary to reestablish effected public services.

7.2.4. Identification of Other Site Operators.

The SWPPP must include a list of all other operators who will be engaged in construction activities at your site, and the areas of the site over which each operator has control.

7.2.5. Sequence and Estimated Dates of Construction Activities.

The SWPPP must include a description of the intended sequence of construction activities, including a schedule of the estimated start dates and the duration of the activity, for the following activities:

7.2.5.1 Installation of stormwater control measures, and when they will be made operational, including an explanation of how the sequence and schedule for installation of stormwater control measures complies with Part 2.1.1.3a and of any departures from manufacturer specifications pursuant to Part 2.1.1.3b;

7.2.5.2 Commencement and duration of earth-disturbing activities, including clearing and grubbing, mass grading, site preparation (i.e., excavating, cutting and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;

7.2.5.3 Cessation, temporarily or permanently, of construction activities on the site, or in designated portions of the site;

7.2.5.4 Final or temporary stabilization of areas of exposed soil. The dates for stabilization must reflect the applicable deadlines to which you are subject in Part 2.2.1; and

7.2.5.5 Removal of temporary stormwater conveyances/channels and other stormwater control measures, removal of construction equipment and vehicles, and cessation of any pollutant-generating activities.

Note: If plans change due to unforeseen circumstances or for other reasons, the requirement to describe the sequence and estimated dates of construction activities is not meant to "lock in" the operator to meeting these projections. When departures from initial projections are necessary, this should be documented in the SWPPP itself or in associated records, as appropriate.

7.2.6. Site Map.

The SWPPP must include a legible site map, or series of maps, showing the following features of your project:

Note: Included in the project site are any construction support activities covered by this permit (see Part 1.3.c).

7.2.6.1 Boundaries of the property and of the locations where construction activities will occur, including:

a. Locations where earth-disturbing activities will occur, noting any phasing of construction activities;

b. Approximate slopes before and after major grading activities. Note areas of steep slopes, as defined in Appendix A;

c. Locations where sediment, soil, or other construction materials will be stockpiled;

d. Locations of any crossings of surface waters;

e. Designated points on the site where vehicles will exit onto paved roads;

f. Locations of structures and other impervious surfaces upon completion of construction; and

g. Locations of construction support activity areas covered by this permit (see Part 1.3.c).

7.2.6.2 Locations of all surface waters, including wetlands, that exist within or in the immediate vicinity of the site. Indicate which waterbodies are listed as impaired, and which are identified by your state, tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 waters;

7.2.6.3 The boundary lines of any natural buffers provided consistent with Part 2.1.2.1a;

7.2.6.4 Areas of federally-listed critical habitat for endangered or threatened species;

7.2.6.5 Topography of the site, existing vegetative cover (*e.g., forest, pasture, pavement, structures*), and drainage pattern(s) of stormwater and authorized non-stormwater flow onto, over, and from the site property before and after major grading activities;

7.2.6.6 Stormwater and allowable non-stormwater discharge locations, including:

a. Locations of any storm drain inlets on the site and in the immediate vicinity of the site; and

Note: The requirement to show storm drain inlets in the immediate vicinity of the site on your site map only applies to those inlets that are easily identifiable from your site or from a publicly accessible area immediately adjacent to your site.

b. Locations where stormwater or allowable non-stormwater will be discharged to surface waters (including wetlands) on or near the site.

7.2.6.7 Locations of all potential pollutant-generating activities identified in Part 7.2.7;

7.2.6.8 Locations of stormwater control measures; and

7.2.6.9 Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

7.2.7. Construction Site Pollutants.

The SWPPP must include the following:

7.2.7.1 A list and description of all the pollutant-generating activities[22] on your site.

[22] Examples of pollutant-generating activities include, but are not limited to: paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations.

7.2.7.2 For each pollutant-generating activity, an inventory of pollutants or pollutant constituents *(e.g., sediment, fertilizers and/or pesticides, paints, solvents, fuels)* associated with that activity, which could be exposed to rainfall, or snowmelt, and could be discharged from your construction site. You must take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges. You must also document any departures from the manufacturer's specifications for applying fertilizers containing nitrogen and phosphorus, as required in Part 2.3.5.1.

7.2.8. Non-Stormwater Discharges.

The SWPPP must also identify all sources of allowable non-stormwater discharges listed in Part 1.3.d.

7.2.9. Buffer Documentation.

If you are required to comply with Part 2.1.2.1 because a surface water is located within 50 feet of your project's earth disturbances, you must describe which compliance alternative you have selected for your site, and comply with any additional requirements to provide documentation in Part 2.1.2.1.

7.2.10. Description of Stormwater Control Measures.

7.2.10.1 ***Stormwater Control Measures to be Used During Construction Activity.*** The SWPPP must describe all stormwater control measures that are or will be installed and maintained at your site to meet the requirements of Part 2. For each stormwater control measure, you must document:

a. Information on the type of stormwater control measure to be installed and maintained, including design information;

b. What specific sediment controls will be installed and made operational prior to conducting earth-disturbing activities in any given portion of your site to meet the requirement of Part 2.1.2.2a;

c. For exit points on your site, document stabilization techniques you will use and any additional controls that are planned to remove sediment prior to vehicle exit consistent with Part 2.1.2.3; and

d. For linear projects, where you have determined that the use of perimeter controls in portions of the site is impracticable, document why you believe this to be the case (see Part 2.1.2.2a).

7.2.10.2 ***Use of Treatment Chemicals.*** If you will use polymers, flocculants, or other treatment chemicals at your site, the SWPPP must include:

a. A listing of all soil types[23] that are expected to be exposed during construction and that will be discharged to locations where chemicals will be applied. Also include a listing of soil types expected to be found in fill material to be used in these same areas, to the extent you have this information prior to construction.

b. A listing of all treatment chemicals to be used at the site, and why the selection of these chemicals is suited to the soil characteristics of your site;

[23] Information on soils may be obtained at http://websoilsurvey.nrcs.usda.gov/app/.

c. If you have been authorized by your applicable EPA Regional Office to use cationic treatment chemicals, include the specific controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards;

d. The dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage;

e. Information from any applicable Material Safety Data Sheets (MSDS);

f. Schematic drawings of any chemically-enhanced stormwater controls or chemical treatment systems to be used for application of the treatment chemicals;

g. A description of how chemicals will be stored consistent with Part 2.1.3.3b;

h. References to applicable state or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems; and

i. A description of the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to use of the treatment chemicals at your site.

7.2.10.3 ***Stabilization Practices.*** The SWPPP must describe the specific vegetative and/or non-vegetative practices that will be used to comply with the requirements in Part 2.2, including:

a. If you will be complying with the stabilization deadlines specified in Part 2.2.1.3a, you must indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions; and

b. If you will be complying with the stabilization deadlines specified in Part 2.2.1.3b, you must document the circumstances that prevent you from meeting the deadlines specified in Parts 2.2.1.1 and/or 2.2.1.2.

7.2.11. Pollution Prevention Procedures.

7.2.11.1 ***Spill Prevention and Response Procedures.*** The SWPPP must describe procedures that you will follow to prevent and respond to spills and leaks consistent with Part 2.3, including:

a. Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and

b. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.4 and established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302, occurs during a 24-hour period. Contact information must be in locations that are readily accessible and available.

You may also reference the existence of Spill Prevention Control and Countermeasure (SPCC) plans developed for the construction activity under Part 311 of the CWA, or spill control programs otherwise required

by an NPDES permit for the construction activity, provided that you keep a copy of that other plan onsite.

Note: Even if you already have an SPCC or other spill prevention plan in existence, your plans will only be considered adequate if they meet all of the requirements of this Part, either as part of your existing plan or supplemented as part of the SWPPP.

7.2.11.2 ***Waste Management Procedures.*** The SWPPP must describe procedures for how you will handle and dispose of all wastes generated at your site, including, but not limited to, clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste.

7.2.12. Procedures for Inspection, Maintenance, and Corrective Action.

The SWPPP must describe the procedures you will follow for maintaining your stormwater control measures, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Part 2.1.1.4, Part 2.3.2, Part 4, and Part 5 of the permit. The following information must also be included in your SWPPP:

7.2.12.1 Personnel responsible for conducting inspections;

7.2.12.2 The inspection schedule you will be following, which is based on whether your site is subject to Part 4.1.2 or Part 4.1.3, and whether your site qualifies for any of the allowances for reduced inspection frequencies in Part 4.1.4. If you will be conducting inspections in accordance with the inspection schedule in Part 4.1.2.2 or Part 4.1.3, the location of the rain gauge on your site or the address of the weather station you will be using to obtain rainfall data;

7.2.12.3 If you will be reducing your inspection frequency in accordance with Part 4.1.4.2, the beginning and ending dates of the seasonally-defined arid period for your area or the valid period of drought. If you will be reducing your inspection frequency in accordance with Part 4.1.4.3, the beginning and ending dates of frozen conditions on your site; and

7.2.12.4 Any inspection or maintenance checklists or other forms that will be used.

7.2.13. Staff Training.

The SWPPP must include documentation that the required personnel were trained in accordance with Part 6.

7.2.14. Documentation of Compliance with Other Federal Requirements.

7.2.14.1 *Endangered Species Act*. The SWPPP must include documentation supporting your determination with respect to Part 1.1.e and Appendix D.

7.2.14.2 *Historic Properties*. The SWPPP must include documentation required by Appendix E in relation to potential impacts to historic properties.

7.2.14.3 *Safe Drinking Water Act Underground Injection Control (UIC) Requirements for Certain Subsurface Stormwater Controls.* If you are using any of the following stormwater controls at your site, as they are described below, you must document any contact you have had with the applicable state agency or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR Parts 144 -147. Such controls would generally be considered Class V UIC wells:

a. Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

b. Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and

c. Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system).

Note: For state UIC program contacts, refer to the following EPA website: http://water.epa.gov/type/groundwater/uic/whereyoulive.cfm.

7.2.15. SWPPP Certification.

You must sign and date your SWPPP in accordance with Appendix I, Part I.11.

7.2.16. Post-Authorization Additions to the SWPPP.

Once you are notified of your coverage under this permit, you must include the following documents as part of your SWPPP:

7.2.16.1 A copy of your NOI submitted to EPA along with any correspondence exchanged between you and EPA related to coverage under this permit;

7.2.16.2 A copy of the acknowledgment letter you receive from the NOI Processing Center or eNOI system assigning your permit tracking number;

7.2.16.3 A copy of this permit (an electronic copy easily available to the stormwater team is also acceptable).

7.3. ON-SITE AVAILABILITY OF YOUR SWPPP.

You are required to keep a current copy of your SWPPP at the site or at an easily accessible location so that it can be made available at the time of an on-site inspection or upon request by EPA; a state, tribal, or local agency approving stormwater management plans; the operator of a storm sewer system receiving discharges from the site; or representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS).

EPA may provide access to portions of your SWPPP to a member of the public upon request. Confidential Business Information (CBI) will be withheld from the public, but may not be withheld from EPA, USFWS, or NMFS.

Note: Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR Part 2, Subpart B. In general, submitted information protected by a business confidentiality claim may be disclosed to other employees, officers, or authorized representatives of the United States concerned with implementing the CWA. The authorized representatives, including employees of other executive branch agencies, may review CBI during the course of reviewing draft regulations.

If an onsite location is unavailable to keep the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance of your construction site.

7.4. REQUIRED SWPPP MODIFICATIONS.

7.4.1. List of Conditions Requiring SWPPP Modification.

You must modify your SWPPP, including the site map(s), in response to any of the following conditions:

7.4.1.1 Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater control measures, pollution prevention measures, or other activities at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered under Part 5. You do not need to modify your SWPPP if the estimated dates in Part 7.2.5 change during the course of construction;

7.4.1.2 To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;

7.4.1.3 If inspections or investigations by site staff, or by local, state, tribal, or federal officials determine that SWPPP modifications are necessary for compliance with this permit;

7.4.1.4 Where EPA determines it is necessary to impose additional requirements on your discharge, the following must be included in your SWPPP:

a. A copy of any correspondence describing such requirements; and

b. A description of the stormwater control measures that will be used to meet such requirements.

7.4.1.5 To reflect any revisions to applicable federal, state, tribal, or local requirements that affect the stormwater control measures implemented at the site; and

7.4.1.6 If applicable, if a change in chemical treatment systems or chemically-enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

7.4.2. Deadlines for SWPPP Modifications.

You must complete required revisions to the SWPPP within 7 calendar days following the occurrence of any of the conditions listed in Part 7.4.1.

7.4.3. SWPPP Modification Records.

You are required to maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change (see Part 7.2.15 above) and a brief summary of all changes.

7.4.4. Certification Requirements.

All modifications made to the SWPPP consistent with Part 7.4 must be authorized by a person identified in Appendix I, Part I.11.b.

7.4.5. Required Notice to Other Operators.

Upon determining that a modification to your SWPPP is required, if there are multiple operators covered under this permit, you must immediately notify any operators who may be impacted by the change to the SWPPP.

8. HOW TO TERMINATE COVERAGE.

Until you terminate coverage under this permit, you are required to comply with all conditions and effluent limitations in the permit. To terminate permit coverage, you must submit to EPA a complete and accurate Notice of Termination (NOT), which certifies that you have met the requirements for terminating in Part 8.

8.1. MINIMUM INFORMATION REQUIRED IN NOT.

You will be required to provide the following in your NOT:

8.1.1. NPDES permit tracking number provided by EPA when you received coverage under this permit;

8.1.2. Basis for submission of the NOT (see Part 8.2);

8.1.3. Operator contact information;

8.1.4. Name of project and address (or a description of location if no street address is available); and

8.1.5. NOT certification.

8.2. CONDITIONS FOR TERMINATING PERMIT COVERAGE.

You may terminate permit coverage only if one of the following conditions occurs at your site:

8.2.1. You have completed all earth-disturbing activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.3.c), and you have met the following requirements:

8.2.1.1 For any areas that (1) were disturbed during construction, (2) are not covered over by permanent structures, and (3) over which you had control during the construction activities, you have met the requirements for final vegetative or non-vegetative stabilization in Part 2.2.2;

8.2.1.2 You have removed and properly disposed of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use following your termination of permit coverage;

8.2.1.3 You have removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following your termination of permit coverage or those that are biodegradable; and

8.2.1.4 You have removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following your termination of permit coverage; or

8.2.2. You have transferred control of all areas of the site for which you are responsible under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit; or

8.2.3. Coverage under an individual or alternative general NPDES permit has been obtained.

8.3. HOW TO SUBMIT YOUR NOT.

You are required to use EPA's electronic NOI system, or "eNOI system", to prepare and submit your NOT. The electronic NOT form you are required to complete is found at www.epa.gov/npdes/stormwater/cgpenoi. You will use your NOI tracking number *(i.e., the EPA number you were assigned upon authorization under the permit)* to upload the

fillable NOT form, which will ensure that EPA properly records your termination of coverage. If you have a problem with the use of the eNOI system, contact the EPA Regional Office that corresponds to the location of your site. If you are given approval by the EPA Regional Office to use a paper NOT, you must complete the form in Appendix K.

8.4. DEADLINE FOR SUBMITTING NOTS.

You must submit your NOT within 30 calendar days after any one of the triggering conditions in Part 8.2 occur.

8.5. EFFECTIVE DATE OF TERMINATION OF COVERAGE.

Your authorization to discharge under this permit terminates at midnight of the calendar day that a complete NOT is processed and posted on EPA's website (www.epa.gov/npdes/stormwater/cgpnoisearch).

9. PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY LANDS, OR TERRITORIES

The provisions in this Part provide modifications or additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the state or tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific states, Indian country, and areas in certain states subject to construction projects by Federal Operators. States, Indian country, and areas subject to construction by Federal Operators not included in this Part do not have any modifications or additions to the applicable conditions of this permit

9.1. Region 1

9.1.1. MAR120000: Commonwealth of Massachusetts (except Indian country).

9.1.1.1 You must comply with the Massachusetts Clean Waters Act (Ch. 21, ss. 26-53).

9.1.1.2 You must comply with the conditions in 314 CMR 4.00- Massachusetts Surface Water Quality Standards.

9.1.1.3 You must comply with the conditions in 314 CMR 3.00- Massachusetts Surface Water Discharge Permit Program.

9.1.1.4 You must comply with the Wetlands Protection Act (Ch. 131 s. 40) and its regulations, 310 CMR 10.00 and any Order of Conditions issued by a Conservation Commission or a Superseding Order of Conditions issued by the Massachusetts Department of Environmental Protection.

9.1.1.5 You must comply with the Massachusetts Storm Water Performance Standards, as prescribed by state regulations promulgated under the authority of the Massachusetts Clean Waters Act, MGL Ch. 21, ss 26-53 and the Wetlands Protection Act, Ch. 131, s. 40.

9.1.1.6 You must comply with the conditions in 314 CMR 9.00 – Water Quality Certification for Discharges of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters of the United States within the Commonwealth.

9.1.1.7 You must comply with the Massachusetts Endangered Species Act (MESA), MGL Ch. 313A and regulations at 321 CMR 10.00 and any actions undertaken to comply with this stormwater general permit shall not result in non-compliance with the MESA.

9.1.1.8 Activities covered under this general permit shall not interfere with the implementation of mosquito control work conducted in accordance with Chapter 252 including s. 5A thereunder and MassDEP Guideline Number BRP G01-02, West Nile Virus Application of Pesticides to Wetland Resource Areas and Buffer Zones, and Public Water Supplies.

9.1.1.9 The Department may request a copy of the Stormwater Pollution Prevention Plan (SWPPP) and the permittee is required to submit the SWPPP to the Department within 14 days of such request. The Department may conduct an inspection of any facility covered by this permit to ensure compliance with state law requirements, including state water quality standards. The Department may enforce its certification conditions.

9.1.1.10 The Department may require the permit holder to perform water quality monitoring during the permit term if monitoring is necessary for the protection of public health or the environment as designated under the authority at 314 CMR 3.00.

9.1.1.11 The Department may require the permit holder to provide measurable verification of the effectiveness of Best Management Practices (BMPs) and other control measures used in the stormwater management program, including water quality monitoring.

9.1.1.12 The Department has determined that compliance with this permit does not protect the permit holder from enforcement actions deemed necessary by the Department under its associated regulations to address an imminent threat to public health or a significant adverse environmental impact which results in a violation of the Massachusetts Clean Waters Act, Ch. 21, ss. 26-53.

9.1.1.13 The Department reserves the right to modify this 401 Water Quality Certification if any changes, modifications, or deletions are made to this general permit. In addition, the Department reserves the right to add and/or alter the terms and conditions of this 401 Water Quality Certification to carry out its responsibilities during the term of this general permit with respect to water quality, including any revisions to 314 CMR 4.00, Massachusetts Surface Water Quality Standards.

9.1.1.14 Should any violation of the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, or the conditions of this 401 Water Quality Certification occur, the Department will direct the permit holder to correct the violation(s). The Department has the right to take any action as authorized by the General Laws of the Commonwealth to address the violation(s) of this permit or the Massachusetts Clean Waters Act and the regulations promulgated thereunder. Substantial civil and criminal penalties are authorized under MGL Ch. 21, s. 42 for discharging into Masachusetts' waters in violation of an order or permit issued by this Department. This 401 Water Quality Certification does not relieve the permit holder of the duty to comply with other applicable Massachusetts statutes and regulations.

9.1.2. NHR120000: State of New Hampshire.

9.1.2.1 If you disturb 100,000 square feet or more of contiguous area, you must also apply for an Alteration of Terrain (AoT) permit from DES pursuant to RSA 485-A:17 and Env-Ws 1500. This requirement also applies to a lower disturbance threshold of 50,000 square feet or more when construction occurs within the protected shoreline under the Shoreland Water Quality Protection Act (see RSA 483-B and Env-Ws 1400). A permit application must also be filed if your project disturbs an area of greater than 2,500 square feet, is within 50 feet of <u>any</u> surface water, and has a flow path of 50 feet or longer disturbing a grade of 25 percent or greater. Project sites with disturbances smaller than those discussed above, that have the potential to adversely affect state surface waters, are subject to the conditions of an AoT General Permit by Rule.

9.1.2.2 You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-stormwater discharge under this permit (see Part 1.3.d). The water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the source of the groundwater to be treated and discharged.

Information on groundwater contamination can be generated over the Internet via the NHDES web site http://des.nh.gov/ at the OneStop Web Geographic Information System at http://www2.des.state.nh.us/gis/onestop. If it is determined that the groundwater to be dewatered is near a remediation or other waste site you must apply for the Remediation General Permit (see http://www.epa.gov/region1/npdes/rgp.html.)

9.1.2.3 You must treat any uncontaminated excavation dewatering discharges as necessary to remove suspended solids and turbidity. The discharges must be sampled at a location prior to mixing with stormwater at least once per week during weeks when discharges occur. Samples must be analyzed for total suspended solids (TSS) and must meet monthly average and daily maximum TSS limits of 50 milligrams per liter (mg/L) and 100 mg/L, respectively. TSS (a.k.a. Residue, Nonfilterable) sampling and analysis must be performed in accordance with Tables IB and II in 40 CFR 136.3 (see: http://www.access.gpo.gov/nara/cfr/waisidx_02/40cfr136_02.html). Records of any sampling and analysis must be maintained and kept with the SWPPP for at least three years after final site stabilization.

9.1.2.4 Construction site owners and operators must consider opportunities for post-construction groundwater recharge using infiltration best management practices (BMPs) during site design and preparation of the stormwater pollution prevention plan (SWPPP). If your construction site is in a town that is required to obtain coverage under the NPDES General Permit for discharges from Municipal Separate Storm Sewer Systems (MS4) you may be required to use such practices. The SWPPP must include a description of any on-site infiltration that will be installed as a post-construction stormwater management measure or reasons for not employing such measures such as 1) The facility is located in a wellhead protection area as defined in RSA 485-C:2; or 2) The facility is located in an area where groundwater has been reclassified to GAA, GAI or GA2 pursuant to RSA 485-C and Env-Ws 420; or 3) Any areas that would be exempt from the groundwater recharge requirements contained in Env-Ws 1507.04(e), including all land uses or activities considered to be a "High-load Area" (see Env-Wq 1502.26). For design considerations for infiltration measures see Volume II of the NH Stormwater Manual.

9.1.2.5 Appendix F contains a list of Tier 2, or high quality waters. Although there is no official list of tier 2 waters, it can be assumed that all NH surface waters are tier 2 for turbidity unless 1) the surface water that you are proposing to discharge into is listed as impaired for turbidity in the states listing of impaired waters (see Surface Water Quality Watershed Report Cards at http://des.nh.gov/organization/divisions/water/wmb/swqa/report_cards.htm or 2) sampling upstream of the proposed discharge location shows turbidity values greater than 10 NTU. A single grab sample collected during dry weather (no precipitation within 48 hours) is acceptable.

9.1.2.6 To ensure compliance with RSA 485-C, RSA 485-A, RSA 485-A:13, I(a), Env-Wq 1700 and Env-Wq 302, the following information may be requested by NHDES. This information must be kept on site unless you receive a written request from NHDES that it be sent to the address shown in Part 9.1.2.7.

a. A site map required in Part 7.2.6, showing the type and location of all post-construction infiltration BMPs utilized at the facility or the reason(s) why none were installed;

b. A list of all non-stormwater discharges that occur at the facility, including their source locations and the control measures being used (see Part 1.3.d).

c. Records of sampling and analysis of TSS required for construction dewatering discharges (see Part 9.1.2.3).

9.1.2.7 All required or requested documents must be sent to:

NH Department of Environmental Services, Wastewater Engineering Bureau, Permits & Compliance Section
P.O. Box 95
Concord, NH 03302-0095

9.1.2.8 When NHDES determines that additional water quality certification requirements are necessary to protect water quality, it may require individual discharges to meet additional conditions to obtain or continue coverage under the CGP. Any such conditions must be supplied to the permittee in writing. Any required pollutant loading analyses and any designs for structural best management practices necessary to protect water quality must be prepared by a civil or sanitary engineer registered in New Hampshire.

9.2. Region 4

9.2.1. FLR12000I: Indian country within the State of Florida.

9.2.1.1 **Seminole Tribe of Florida**. The following conditions apply only for discharges on federal trust lands of the Seminole Tribe of Florida (Big Cypress, Brighton, Hollywood, Immokalee, and Tampa Reservations):

a. Any discharges into waters of the Seminole Tribe of Florida shall not cause an exceedance in Turbidity of 29 NTU above natural background conditions.

b. Unless otherwise specified by previous permits or criteria, a storm event of three (3) day duration and twenty five (25) year return frequency shall be used in computing off-site discharge on Seminole Lands as agreed upon in the Water Rights Compact agreement attached to Public Law 100-228 (December 31, 1987), Seminole Indian Land Claims Settlement Act of 1987.

c. The Seminole Tribe of Florida accepts a 20' X 20' stabilization at entry/exit points.

9.3. Region 5

9.3.1. MIR12000I: Indian country within the State of Michigan. Projects on Indian country within the State of Michigan are not eligible for coverage under this permit. Contact EPA Region 5 for an individual permit application.

9.3.2. MNR12000I: Indian country within the State of Minnesota. Projects on Indian country within the State of Minnesota are not eligible for coverage under this permit. Contact EPA Region 5 for an individual permit application.

9.3.3. WIR12000I: Indian country within the State of Wisconsin, except the Sokaogon Chippewa (Mole Lake) Community. Projects in Indian country within the State of Wisconsin, are not eligible for coverage under this permit. Contact EPA Region 5 for an individual permit application.

9.4. Region 6

9.4.1. NMR120000: State of New Mexico, except Indian country.

9.4.1.1 In addition to all other provisions of this permit, operators who intend to obtain authorization under this permit for all new and existing stormwater discharges must satisfy the following condition:

The SWPPP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion, and sediment control best management practices (BMPs) and/or other controls that are designed to prevent to the maximum extent practicable an increase in the sediment yield and flow velocity from pre-construction, pre-development conditions to assure that applicable standards in 20.6.4 NMAC, including the antidegradation policy, or waste load allocations (WLAs) are met. This requirement applies to discharges both during construction and after construction operations have been completed. The SWPPP must identify, and document the rationale for selecting these BMPs and/or other controls. The SWPPP must also describe design specifications, construction specifications, maintenance schedules (including a long term maintenance plan), criteria for inspections, and expected performance and longevity of these BMPs. BMP selection must be made based on the use of appropriate soil loss prediction models (e.g., SEDCAD 4.0, RUSLE, SEDIMOT II, MULTISED, etc.), or equivalent, generally accepted (by professional erosion control specialists), soil loss prediction tools. The operator(s) must demonstrate, and include documentation in the SWPPP, that implementation of the site-specific practices will assure that the applicable standards or WLAs are met, and will result in sediment yields and flow velocities that, to the maximum extent practicable, will not be greater than the sediment yield levels and flow velocities from pre-construction, pre-development conditions. The SWPPP must be prepared in accordance with good engineering practices by qualified (e.g., CPESC certified, engineers with appropriate training, etc.) erosion control specialists familiar with the use of soil loss prediction models and design of erosion and sediment control systems based on these models (or equivalent soil loss prediction tools). Qualifications of the preparer (e.g., professional certifications, description of appropriate training) must be documented in the SWPPP. The operator(s) must design, implement, and maintain BMPs in the manner specified in the SWPPP.

9.4.1.2 Operators are not eligible to obtain authorization under this permit for all new and existing stormwater discharges to outstanding national resource waters (ONRWs) (also referred to as "Tier 3" waters).

9.4.1.3 The criteria for final stabilization in Part 2.2.2.1a is a "uniform vegetation (e.g., evenly distributed without large bare areas), which provides 70 percent or more of the density of coverage that was provided by vegetation prior to commencing earth-disturbing activities." The adjustment to allow for less than 100 % native vegetative cover (e.g., 50 % native vegetative cover x 70 % = 35 %) is acceptable.

9.4.1.4 Permittees can only use the criteria for final stabilization in Part 2.2.2.1b ("The area you have seeded or planted must within 3 years provide established vegetation that covers 70 percent or more of the density of vegetation prior to commencing earth-disturbing activities; and in addition to seeding or planting the area to be vegetatively stabilized, to the extent necessary to

prevent erosion on the seeded or planted area, you must select, design, and install non-vegetative erosion controls that provide cover for at least 3 years without active maintenance by you") as a method for final vegetative stabilization for purposes of filing a Notice of Termination (NOT) under the following conditions:

If this option is selected, you must notify NMED at the address listed in Part 9.4.1.5 at the time the NOT is submitted to EPA. The information to be submitted includes:

- A copy of the NOT;
- Contact information, including individual name or title, address, and phone number for the party responsible for implementing the final stabilization measures; and
- The date that the permanent vegetative stabilization practice was implemented and the projected timeframe that the 70 % native vegetative cover requirements are expected to be met. (Note that if more than three years is required to establish 70 percent of the natural vegetative cover, this technique cannot be used or cited for fulfillment of the final stabilization requirement – you remain responsible for establishment of final stabilization).

NMED also requires that operators periodically (minimum once/year) inspect and properly maintain the area until the criteria for final stabilization, as specified in Part 2.2 of the CGP, have been met. Operators must prepare an inspection report documenting the findings of these inspections and signed in accordance with Appendix I, Part I.11. This inspection record must be retained along with the SWPPP for three years after the NOT is submitted for the site and additionally submitted to NMED at the address listed in Part 9.4.1.5. The inspections at a minimum must include the following:

- Observations of all areas of the site disturbed by construction activity;
- Best Management Practices (BMPs)/post-construction stormwater controls must be observed to ensure they are effective;
- An assessment of the status of vegetative re-establishment; and
- Corrective actions required to ensure vegetative success within three years, and control of pollutants in stormwater runoff from the site, including implementation dates.

9.4.1.5 Copies of all documents submitted to EPA in non-electronic format must be sent to the following address:

Program Manager
Point Source Regulation Section
Surface Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, New Mexico 87502

9.4.2. NMR12000I: Indian country within the State of New Mexico.

9.4.2.1 **Pueblo of Sandia**. The following conditions apply only to discharges on the Pueblo of Sandia Reservation:

a. Copies of all Notices of Intent submitted to the EPA must also be sent concurrently to the Pueblo of Sandia at the following address. Discharges are not authorized by this permit unless an accurate and complete NOI has been submitted to the Pueblo of Sandia.

Regular U.S. Delivery Mail:
Pueblo of Sandia Environment Department
Attention: Water Quality Manager
481 Sandia Loop
Bernalillo, New Mexico 87004

b. The Pueblo of Sandia will not allow the Rainfall Erosivity Waivers (see Appendix C) to be granted for any small construction activities.

c. The Stormwater Pollution Prevention Plan (SWPPP) must be available to the Pueblo of Sandia Environment either electronically or hard copy upon request for review. The SWPPP must be made available at least fourteen (14) days before construction begins. The fourteen (14) day period will give Tribal staff time to become familiar with the project site, prepare for construction inspections, and determine compliance with the Pueblo of Sandia Water Quality Standards. Failure to provide a SWPPP to the Pueblo of Sandia may result in denial of the discharge or construction delay.

d. An "Authorization to Proceed Letter" with site specific mitigation, site and project requirements will be sent out to the permittee when a review of the NOI and SWPPP is completed by the Pueblo of Sandia Environment Department. This approval will allow the construction to proceed if all applicable requirements are met.

e. Before submitting a Notice of Termination (NOT), permittees must clearly demonstrate to the Pueblo of Sandia Environment Department though a site visit or documentation that requirements for site stabilization have been met and any temporary erosion control structures have been removed. A short letter stating the stabilization requirements have been met will be sent to the permittee to add to the permittees NOT submission to EPA.

f. Copies of all NOT submitted to the EPA must also be sent concurrently to the Pueblo of Sandia at the following address:

Regular U.S. Delivery Mail:
Pueblo of Sandia Environment Department
Attention: Water Quality Manager
481 Sandia Loop
Bernalillo, New Mexico 87004

9.4.3. OKR12000F: Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46,

and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

In accordance with Section 303 of the Clean Water Act and Oklahoma's Water Quality Standards (OAC 785: 45):

9.4.3.1 For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or any water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Certification is denied for any on-going activities such as sand and gravel mining or any mineral mining.

9.4.3.2 For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Big Lee Creek or any water or watershed designated "ORW" (Outstanding Resource Water) in Oklahoma's Water Quality Standards, certification is denied for any discharges originating from support activities, including concrete and asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas.

9.5. Region 8

9.5.1. MTR12000I: Indian country within the State of Montana

9.5.1.1 **The Confederated Salish and Kootenai Tribes of the Flathead Nation**. The following conditions apply only to discharges on the Confederated Salish and Kootenai Tribes of the Flathead Nation Reservation:

a. Permittees must send the Stormwater Pollution Prevention Plan (SWPPP) to the Tribes at least 30 days before construction starts.

b. Before submitting the Notice of Termination (NOT), permittees must clearly demonstrate to an appointed tribal staff person during an on-site inspection that requirements for site stabilization have been met.

c. The permittee must send a copy of the Notice of Intent (NOI) and the Notice of Termination (NOT) to the tribes.

d. Permittees may submit their SWPPPs and NOTs electronically to clintf@cskt.org.

Written NOI's, SWPPPs and NOT's may be mailed to:
Clint Folden, Water Quality Regulatory Specialist
Confederated Salish and Kootenai Tribes
Natural Resources Department
P.O. Box 278
Pablo, MT 59855

9.5.1.2 Fort Peck Tribes. The following conditions apply only to discharges on the Fort Peck Reservation:

Permittees must notify the Fort Peck Office of Environmental Protection (OEP) two weeks prior to commencing construction.

9.6. Region 9

9.6.1. AZR12000I: Indian country within the State of Arizona.

9.6.1.1 **Hualapai Tribal Lands**. The following condition applies only for discharges on the Hualapai Reservation:

All notices of intent for proposed stormwater discharges under the CGP and all pollution prevention plans for stormwater discharges on Hualapai Tribal lands shall be submitted to Water Resources Program through the Tribal Chairman for review and approval, P.O. Box 179, Peach Springs, AZ 86434.

9.6.2. CAR12000I: Indian country within the State of California.

9.6.2.1 **Big Pine Paiute Tribe of the Owens Valley**. Big Pine Tribal Water Quality Standards Section VII(e): If a proposed action has the possibility to adversely affect the water quality of Big Pine Creek, an application must be filed with the Tribal Environmental Office. The application must describe the action proposed and its effects on the creek, how this information was derived, and a justification for the action. Upon satisfying these requirements, the Tribal Environmental Office will recommend or not recommend this proposal to be considered by the Tribal Council. Tribal Council will make a determination whether to consider the proposal further. If the Tribal Council wishes to consider the application further, the public participation process will take place (see paragraph VII(d)). The Tribal Council has the sole authority in permitting degradation to Big Pine Creek. If the Tribal Council makes the decision to allow degradation, they will submit their decision to the USEPA for review and approval.

9.6.3. GUR120000: The Island of Guam. Permittees must adhere with imposed conditions for the project, in accordance with section 307(c)(1), of the Coastal Zone Management Act, 15 CFR part 930.

9.6.4. MPR120000: Commonwealth of the Northern Mariana Islands (CNMI).

9.6.4.1 An Earthmoving and Erosion Control Permit must be obtained from DEQ prior to any construction activity covered under the NPDES General Permit.

9.6.4.2 All conditions and requirements set forth in the United States Environmental Protection Agency (USEPA), National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Construction Activities must be complied with.

9.6.4.3 A stormwater pollution prevention plan (SWPPP) for stormwater discharges from construction activities must be approved by the Director of DEQ prior to submission of the Notice of Intent (NOI).

9.6.4.4 A NOI to be covered by the General Permit for Discharges from Construction Activities must be submitted to DEQ and USEPA, Region IX, in the form prescribed by USEPA, accompanied by a SWPPP approval letter from DEQ.

9.6.4.5 The NOI must be postmarked fourteen (14) calendar days prior to any stormwater discharges and a copy is submitted to the Director of DEQ no later than seven (7) calendar days prior to any stormwater discharges.

9.6.4.6 Copies of all monitoring reports required by the NPDES General Permit are submitted to DEQ.

9.6.4.7 In accordance with Section 10.3(h) and (i) of the CNMI Water Quality Standards, DEQ reserves the right to deny coverage under this permit and

require submittal of an application for an individual NPDES permit based on review of the NOI or other information made available to the Director.

9.6.5. NVR12000I: Indian country within the State of Nevada.

9.6.5.1 **Pyramid Lake Paiute Tribe**. The following conditions apply only for discharges on the Pyramid Lake Paiute Reservation:

a. A SWPPP for stormwater discharges from project construction activities must be submitted to, and approved by, the PLPT Environmental Department director, prior to the submission of a Notice of Intent (NOI or eNOI) to EPA.

b. The applicant is to submit a hard copy of the Notice of Intent (NOI or eNOI) and a draft or final copy of the Stormwater Pollution Prevention Plan (SWPPP) by U.S. Mail to the Pyramid Lake Environmental Department at the address below:

Pyramid Lake Tribe Environmental Department
P.O. Box 256
Nixon, NV 89424

c. The applicant is to concurrently submit to the PLPT Environmental Department, hard copies of any other forms submitted to the EPA, including waivers, reporting, and Notice of Termination (NOT).

9.7. Region 10

9.7.1. IDR120000: The State of Idaho, except those located on Indian country. Projects in the State of Idaho, except those located on Indian country, are not eligible for coverage under this permit. Contact EPA Region 10 for an individual permit application.

9.7.2. ORR12000I: Indian country within the State of Oregon.

9.7.2.1 **Confederated Tribes of the Umatilla Indian Reservation**. The following conditions apply only to discharges on the Umatilla Indian Reservation:

a. The operator shall be responsible for achieving compliance with the Confederated Tribes of the Umatilla Indian Reservations (CTUIR) Water Quality Standards.

b. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTUIR Water Resources Program at the address below, at the same time it is submitted to EPA.

c. The operator shall be responsible for submitting all Stormwater Pollution Prevention Plans (SWPPP) required under this permit to the CTUIR Water Resources Program for review and determination that the SWPPP is sufficient to meet Tribal Water Quality Standards, prior to the beginning of any discharge activities taking place.

d. The operator shall be responsible for reporting an exceedance to Tribal Water Quality Standards to the CTUIR Water Resources Program at the same time it is reported to EPA.

Confederated Tribes of the Umatilla Indian Reservation
Water Resources Program
46411 Timine Way
Pendleton, OR 97801

e. The CTUIR Tribal Historic Preservation Office (THPO) requests copies of each NOI which will define whether or not the undertaking has the potential to affect historic properties, and if so, define the undertaking's area of potential effect (APE).

f. The THPO must be provided 30 days to comment on the APE as defined in the permit application.

g. If the project is an undertaking, a cultural resource investigation must occur. All fieldwork must be conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_0.htm) and documented using Oregon Reporting Standards (http://egov.oregon.gov/OPRD/HCD/ARCH/arch_pubsandlinks.shtml). The resulting report must be submitted to the THPO and the THOP must concur with the findings and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

h. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties.

i. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800.

Confederated Tribes of the Umatilla Indian Reservation
Cultural Resources Protection Program
Tribal Historic Preservation Office
46411 Timine Way
Pendleton, OR 97801

9.7.2.2 Confederated Tribes of the Warm Springs Reservation of Oregon. The following conditions apply only for discharges on the Warm Springs Reservation:

a. All activities covered by this NPDES general permit occurring within a designated riparian buffer zone as established in Ordinance 74 (Integrated Resource Management Plan or IRMP) must be reviewed, approved and permitted through the Tribe's Hydraulic Permit Application process, including payment of any applicable fees.

b. All activities covered by this NPDES permit must follow all applicable land management and resource conservation requirements specified in the IRMP.

c. Operators of activities covered by this NPDES general permit must submit a Storm Water Pollution Prevention Plan to the Tribe's Water Control Board at the following address for approval at least 30 days prior to beginning construction activity:

Chair, Warm Springs Water Control Board
P.O. Box C
Warm Springs, Oregon 97761

d. The operator shall be responsible for achieving compliance with the Water Quality Standards of the Confederated Tribes of the Warm Springs Reservation of Oregon. The operator shall be responsible for

reporting an exceedance to Tribal Water Quality Standards to the Water Control Board at the address above.

e. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTWS, Branch of Natural Resources, Tribal Environmental Office at the address above, at the same time it is submitted to EPA.

f. The CTWS Tribal Historic Preservation Officer (THPO) requests copies of each NOI which will define whether or not the undertaking has the potential to affect historic properties, and if so, define the undertaking's area of potential effect (APE).

g. The THPO must be provided 30 days to comment on the APE as defined in the permit application.

h. If the project is an undertaking, a cultural resource investigation must occur. All fieldwork must be conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_0.htm) and documented using Oregon Reporting Standards (http://egov.oregon.gov/OPRD/HCD/ARCH/arch_pubsandlinks.shtml). The resulting report must be submitted to the THPO and the THOP must concur with the findings and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

i. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate effects to historic properties.

j. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800.

9.7.3. WAR12000F: Areas in the State of Washington, except those located on Indian country, subject to construction by Federal Operators. Areas in the State of Washington, except those located on Indian country, subject to construction by Federal Operators are not eligible for coverage under this permit. Contact EPA Region 10 for an individual permit application.

9.7.4. WAR12000I: Indian country within the State of Washington

9.7.4.1 **Kalispel Tribe**. The following conditions apply only for discharges on the Kalispel Reservation:

a. The operator shall be responsible for achieving compliance with the Kalispel Tribe's Water Quality Standards, and;

b. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the Kalispel Tribe Natural Resources Department (KNRD) at the same time as it is submitted to the EPA, and;

c. The operator shall submit all Storm Water Pollution Prevention Plans (SWPPP) to KNRD thirty (30) days prior to beginning any discharge activities for review, and;

d. The operator shall be responsible for reporting any exceedance of Tribal Water Quality Standards to KNRD at the same time it is reported to EPA, and;

e. Prior to any land disturbing activities on the Kalispel Indian Reservation and its dependent communities, the operator shall attain a cultural resource clearance letter from KNRD.

f. All tribal correspondence pertaining to the General Permit for Discharges from Construction Activities shall be sent to:

Kalispel Tribe Natural Resources Department
Water Resources Program
PO Box 39
Usk, WA 99180

9.7.4.2 **Lummi Nation**. The following conditions apply only for discharges on the Lummi Reservation:

a. Pursuant to Lummi Code of Laws (LCL) 17.05.020(a), the operator must also obtain a land use permit from the Lummi Planning Department as provided in Title 15 of the Lummi Code of Laws and regulations adopted thereunder.

b. Pursuant to LCL 17.05.020(a), each operator shall develop and submit a Stormwater Pollution Prevention Plan to the Lummi Water Resources Division for review and approval by the Water Resources Manager prior to beginning any discharge activities.

c. Pursuant to LCL Title 17, each operator shall be responsible for achieving compliance with the Water Quality Standards for Surface Waters of the Lummi Indian Reservation (Lummi Administrative Regulations [LAR] 17 LAR 07.010 together with supplements and amendments thereto).

d. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the Lummi Water Resources Division at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Lummi Water Resources Division the acknowledgement of receipt of the NOI from the EPA and the associated NPDES tracking number provided by the EPA within 7 calendar days of receipt by EPA.

e. Each operator shall submit a signed hard copy of the Notice of Termination (NOT) to the Lummi Water Resources Division at the same time it is submitted electronically to the EPA and shall provide the Lummi Water Resources Division the EPA acknowledgement of receipt of the NOT.

f. Stormwater Pollution Prevention Plans, Notice of intent, Notice of Termination and associated correspondence with the EPA shall be submitted to:

Lummi Natural Resources Department
ATTN: Water Resources Manager
2616 Kwina Road
Bellingham, WA 98226-9298

g. Please see the Lummi Nation website (www.lummi-nsn.gov) and/or the Lummi Natural Resources Department website (http://lnnr.lummi-nsn.gov/LummiWebsite/Website.php?PageID=53) to review a copy of Title 17 of the Lummi Code of Laws, associated regulations, and the references upon which the conditions identified above are based.

9.7.4.3 **Makah Tribe**. The following conditions apply only for discharges on the Makah Reservation:

a. The operator shall be responsible for achieving compliance with the Makah Tribe's Water Quality Standards.

b. The operator shall submit a Storm Water Pollution Prevention Plan to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division for review and approval at least thirty (30) days prior to beginning any discharge activities.

c. The operator shall submit a copy of the Notice of Intent to the Makah Tribe Water Quality Program and Makah Fisheries Habitat Division at the same time it is submitted to EPA.

d. Storm Water Pollution Prevention Plans and Notices of Intent shall be submitted to:

Ray Colby
Makah Tribal Water Quality
Water Quality Specialist
(360) 645-3162
colby.ray@centurytel.net
PO Box 115
Neah Bay, WA 98357

9.7.4.4 **Puyallup Tribe of Indians**. The following conditions apply only for discharges on the Puyallup Reservation:

a. Each permittee shall be responsible for achieving compliance with the Puyallup Tribe's Water Quality Standards, including antidegradation provisions. The Puyallup Natural Resources Department will conduct an antidegradation review for permitted activities that have the potential to lower water quality. The antidegradation review will be consistent with the Tribe's Antidegradation Implementation Procedures.

b. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Puyallup Tribe's antidegradation policies if the discharge point is located within 1 linear mile upstream of waters designated by the Tribe.

c. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the Puyallup tribal Natural Resources Department at the address listed below at the same time it is submitted to EPA.

Puyallup Tribe of Indians
3009 E. Portland Avenue
Tacoma, WA 98404
ATTN: Natural Resources Department – Bill Sullivan and Char Naylor

d. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to Bill Sullivan and Char Naylor in the Puyallup Tribal Natural Resources Department for review.

e. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Bill Sullivan and Char

Naylor in the Puyallup Tribal Natural Resources Department at the address listed above.

f. The permittee shall submit all stormwater pollution prevention plans to Bill Sullivan and Char Naylor in the Puyallup Tribal Natural Resources Department for review and approval prior to beginning any activities resulting in a discharge to tribal waters.

g. The permittee shall conduct benchmark monitoring for turbidity and nutrients, complying with Section 3 monitoring requirements.

h. The permittee shall notify Bill Sullivan and Char Naylor prior to conducting inspections at construction sites generating stormwater discharged to tribal waters.

Appendix A - Definitions and Acronyms

Definitions

"Action Area" – all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. See 50 CFR 402. For the purposes of this permit and for application of the Endangered Species Act requirements, the following areas are included in the definition of action area:

- The areas on the construction site where stormwater discharges originate and flow toward the point of discharge into the receiving waters (including areas where excavation, site development, or other ground disturbance activities occur) and the immediate vicinity. (Example: Where bald eagles nest in a tree that is on or bordering a construction site and could be disturbed by the construction activity or where grading causes stormwater to flow into a small wetland or other habitat that is on the site that contains listed species.)
- The areas where stormwater discharges flow from the construction site to the point of discharge into receiving waters. (Example: Where stormwater flows into a ditch, swale, or gully that leads to receiving waters and where listed species (such as listed amphibians) are found in the ditch, swale, or gully.)
- The areas where stormwater from construction activities discharge into receiving waters and the areas in the immediate vicinity of the point of discharge. (Example: Where stormwater from construction activities discharges into a stream segment that is known to harbor listed aquatic species.)
- The areas where stormwater controls will be constructed and operated, including any areas where stormwater flows to and from the stormwater controls. (Example: Where a stormwater retention pond would be built.)
- The areas upstream and/or downstream from the stormwater discharge into a stream segment that may be affected by these discharges. (Example: Where sediment discharged to a receiving stream settles downstream and impacts a breeding area of a listed aquatic species.)

"Agricultural Land" - cropland, grassland, rangeland, pasture, and other agricultural land, on which agricultural and forest-related products or livestock are produced and resource concerns may be addressed. Agricultural lands include cropped woodland, marshes, incidental areas included in the agricultural operation, and other types of agricultural land used for the production of livestock.

"Antidegradation Policy" or "Antidegradation Requirements" - the water quality standards regulation that requires States and Tribes to establish a three-tiered antidegradation program:

1. Tier 1 maintains and protects existing uses and water quality conditions necessary to support such uses. An existing use can be established by demonstrating that fishing, swimming, or other uses have actually occurred since November 28, 1975, or that the water quality is suitable to allow such uses to occur. Where an existing use is established, it must be protected even if it is not listed in the water quality standards as a designated use. Tier 1 requirements are applicable to all surface waters.
2. Tier 2 maintains and protects "high quality" waters -- water bodies where existing conditions are better than necessary to support CWA § 101(a)(2) "fishable/swimmable"

uses. Water quality can be lowered in such waters. However, State and Tribal Tier 2 programs identify procedures that must be followed and questions that must be answered before a reduction in water quality can be allowed. In no case may water quality be lowered to a level which would interfere with existing or designated uses.

3. Tier 3 maintains and protects water quality in outstanding national resource waters (ONRWs). Except for certain temporary changes, water quality cannot be lowered in such waters. ONRWs generally include the highest quality waters of the United States. However, the ONRW classification also offers special protection for waters of exceptional ecological significance, i.e., those which are important, unique, or sensitive ecologically. Decisions regarding which water bodies qualify to be ONRWs are made by States and authorized Indian Tribes.

"Arid Areas" – areas with an average annual rainfall of 0 to 10 inches.

"Bank" (e.g., stream bank or river bank) – the rising ground bordering the channel of a water of the U.S.

"Bluff" – a steep headland, promontory, riverbank, or cliff.

"Borrow Areas" – the areas where materials are dug for use as fill, either onsite or off-site.

"Bypass" – the intentional diversion of waste streams from any portion of a treatment facility. See 40 CFR 122.41(m)(1)(i).

"Cationic Treatment Chemical" – polymers, flocculants, or other chemicals that contain an overall positive charge. Among other things, they are used to reduce turbidity in stormwater discharges by chemically bonding to the overall negative charge of suspended silts and other soil materials and causing them to bind together and settle out. Common examples of cationic treatment chemicals are chitosan and cationic PAM.

"Commencement of Earth-Disturbing Activities" - the initial disturbance of soils (or 'breaking ground') associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material).

"Commencement of Pollutant-Generating Activities" – at construction sites (for the purposes of this permit) occurs in any of the following circumstances:

- Clearing, grubbing, grading, and excavation has begun;
- Raw materials related to your construction activity, such as building materials or products, landscape materials, fertilizers, pesticides, herbicides, detergents, fuels, oils, or other chemicals have been placed at your site;
- Use of authorized non-stormwater for washout activities, or dewatering activities, have begun; or
- Any other activity has begun that causes the generation of or the potential generation of pollutants.

"Construction Activities" – earth-disturbing activities, such as the clearing, grading, and excavation of land.

"Construction and Development Effluent Limitations and New Source Performance Standards" (C&D Rule) – as published in 40 CFR § 450 is the regulation requiring effluent limitations guidelines

(ELG's) and new source performance standards (NSPS) for controlling the discharge of pollutants from construction sites.

"Construction Site" – the land or water area where construction activities will occur and where stormwater controls will be installed and maintained. The construction site includes construction support activities, which may be located at a different part of the property from where the primary construction activity will take place, or on a different piece of property altogether. The construction site is often a smaller subset of the lot or parcel within which the project is taking place.

"Construction Support Activities" – a construction-related activity that specifically supports the construction activity and involves earth disturbance or pollutant-generating activities of its own, and can include activities associated with concrete or asphalt batch plants, equipment staging yards, materials storage areas, excavated material disposal areas, and borrow areas.

"Construction Waste" – discarded material (such as packaging materials, scrap construction materials, masonry products, timber, steel, pipe, and electrical cuttings, plastics, and styrofoam).

"Conveyance Channel" – a temporary or permanent waterway designed and installed to safely convey stormwater flow within and out of a construction site.

"Corrective Action" – for the purposes of the permit, any action taken to (1) repair, modify, or replace any stormwater control used at the site; (2) clean up and dispose of spills, releases, or other deposits found on the site; and (3) remedy a permit violation.

"Critical Habitat" – as defined in the Endangered Species Act at 16 U.S.C. 1531 for a threatened or endangered species, (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.

"CWA" – the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. section 1251 et seq.

"Dewatering" – the act of draining rainwater and/or groundwater from building foundations, vaults, and trenches.

"Discharge" – when used without qualification, means the "discharge of a pollutant."

"Discharge of a Pollutant" – any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. See 40 CFR 122.2.

"Discharge Point" – for the purposes of this permit, the location where collected and concentrated stormwater flows are discharged from the construction site.

"Discharge-Related Activity" – activities that cause, contribute to, or result in stormwater and allowable non-stormwater point source discharges, and measures such as the siting, construction, and operation of stormwater controls to control, reduce, or prevent pollutants from being discharged.

"Discharge to an Impaired Water" – for the purposes of this permit, a discharge to an impaired water occurs if the first water of the U.S. to which you discharge is identified by a State, Tribe, or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting an applicable water quality standard, or is included in an EPA-approved or established total maximum daily load (TMDL). For discharges that enter a storm sewer system prior to discharge, the water of the U.S. to which you discharge is the first water of the U.S. that receives the stormwater discharge from the storm sewer system.

"Domestic Waste" – for the purposes of this permit, typical household trash, garbage or rubbish items generated by construction activities.

"Drainageway" – an open linear depression, whether constructed or natural, that functions for the collection and drainage of surface water.

"Drought-Stricken Area" – for the purposes of this permit, an area in which the National Oceanic and Atomospheric Administration's U.S. Seasonal Drought Outlook indicates for the period during which the construction will occur that any of the following conditions are likely: (1) "Drought to persist or intensify", (2) "Drought ongoing, some improvement", (3) "Drought likely to improve, impacts ease", or (4) "Drought development likely". See http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.gif.

"Earth-Disturbing Activity" or "Land-Disturbing Activity" – actions taken to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, and movement and stockpiling of top soils.

"Effective Operating Condition" – for the purposes of this permit, a stormwater control is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

"Effluent Limitations" – for the purposes of this permit, any of the Part 2 or Part 3 requirements.

"Effluent Limitations Guideline" (ELG) – defined in 40 CFR § 122.2 as a regulation published by the Administrator under section 304(b) of CWA to adopt or revise effluent limitations.

"Electronic Notice of Intent" (eNOI) – EPA's online system for submitting electronic Construction General Permit forms.

"Eligible" – for the purposes of this permit, refers to stormwater and allowable non-stormwater discharges that are authorized for coverage under this general permit.

"Emergency-Related Project" – a project initiated in response to a public emergency (e.g., natural disaster, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services.

"Endangered Species" – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose

protection under the provisions of this Act would present an overwhelming and overriding risk to man.

"Excursion" – a measured value that exceeds a specified limit.

"Existing Project" – a construction project that commenced construction activities prior to February 15, 2012.

"Exit Points" – any points of egress from the construction site to be used by vehicles and equipment during construction activities.

"Exposed Soils" – for the purposes of this permit, soils that as a result of earth-disturbing activities are left open to the elements.

"Federal Operator" – an entity that meets the definition of "Operator" in this permit and is either any department, agency or instrumentality of the executive, legislative, and judicial branches of the Federal government of the United States, or another entity, such as a private contractor, performing construction activity for any such department, agency, or instrumentality.

"Final Stabilization" – on areas not covered by permanent structures, either (1) vegetation has been established, or for arid or semi-arid areas, will be established that provides a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the natural background vegetative cover, or (2) non-vegetative stabilization methods have been implemented to provide effective cover for exposed portions of the site.

"Hazardous Materials" or "Hazardous Substances" or "Hazardous or Toxic Waste" – for the purposes of this permit, any liquid, solid, or contained gas that contain properties that are dangerous or potentially harmful to human health or the environment. See also 40 CFR §261.2.

"Historic Property" – as defined in the National Historic Preservation Act regulations means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

"Impaired Water" or "Water Quality Impaired Water" or "Water Quality Limited Segment" – for the purposes of this permit, waters identified as impaired on the CWA Section 303(d) list, or waters with an EPA-approved or established TMDL. Your construction site will be considered to discharge to an impaired water if the first water of the U.S. to which you discharge is identified by a state, tribe, or EPA pursuant to Section 303(d) of the CWA as not meeting an applicable water quality standard, or is included in an EPA-approved or established total maximum daily load (TMDL). For discharges that enter a storm sewer system prior to discharge, the first water of the U.S. to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system.

"Impervious Surface" – for the purpose of this permit, any land surface with a low or no capacity for soil infiltration including, but not limited to, pavement, sidewalks, parking areas and driveways, packed gravel or soil, or rooftops.

"Indian Country" or "Indian Country Lands" – defined at 40 CFR §122.2 as:

1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
2. All dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and
3. All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-ways running through the same.

"Infeasible" – for the purpose of this permit, infeasible means not technologically possible or not economically practicable and achievable in light of best industry practices. EPA notes that it does not intend for any permit requirement to conflict with state water rights law.

"Install" or "Installation" – when used in connection with stormwater controls, to connect or set in position stormwater controls to make them operational.

"Intermittent (or Seasonal) Stream" – one which flows at certain times of the year when groundwater provides water for stream flow, as well as during and immediately after some precipitation events or snowmelt.

"Jar test" – a test designed to simulate full-scale coagulation/flocculation/sedimentation water treatment processes by taking into account the possible conditions.

"Landward" – positioned or located away from a waterbody, and towards the land.

"Level Spreader" – a temporary stormwater control used to spread stormwater flow uniformly over the ground surface as sheet flow to prevent concentrated, erosive flows from occurring.

"Linear Project" – includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

"Minimize" – to reduce and/or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

"Municipal Separate Storm Sewer System" or "MS4" – defined at 40 CFR §122.26(b)(8) as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned and operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
2. Designed or used for collecting or conveying stormwater;
3. Which is not a combined sewer; and
4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

"National Pollutant Discharge Elimination System" (NPDES) – defined at 40 CFR §122.2 as the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA. The term includes an 'approved program.'

"Native Topsoil" – the uppermost layer of naturally occurring soil for a particular area, and is often rich in organic matter, biological activity, and nutrients.

"Native Vegetation" – the species of plants that have developed for a particular region or ecosystem and are considered endemic to that region or ecosystem.

"Natural Buffer" – for the purposes of this permit, an area of undisturbed natural cover surrounding surface waters within which construction activities are restricted. Natural cover includes the vegetation, exposed rock, or barren ground that exists prior to commencement of earth-disturbing activities.

"Natural Vegetation" – vegetation that occurs spontaneously without regular management, maintenance or species introductions, removals, and that generally has a strong component of native species.

"New Operator of a New or Existing Project" – an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction project.

"New Project" – a construction project that commences construction activities on or after February 15.

"New Source" – for the purpose of this permit, a construction project that commenced construction activities after February 1, 2010.

"New Source Performance Standards (NSPS)" – for the purposes of this permit, NSPS are technology-based standards that apply to construction sites that are new sources under 40 CFR 450.24.

"Non-Stormwater Discharges" – discharges that do not originate from storm events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

"Non-Turbid" – a discharge that does not cause or contribute to an exceedence of turbidity-related water quality standards.

"Notice of Intent" (NOI) – the form (electronic or paper) required for authorization of coverage under the Construction General Permit.

"Notice of Termination" (NOT) – the form (electronic or paper) required for terminating coverage under the Construction General Permit.

"Operational" – for the purpose of this permit, stormwater controls are made "operational" when they have been installed and implemented, are functioning as designed, and are properly maintained.

"Operator" – for the purpose of this permit and in the context of stormwater discharges associated with construction activity, any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit).

This definition is provided to inform permittees of EPA's interpretation of how the regulatory definitions of "owner or operator" and "facility or activity" are applied to discharges of stormwater associated with construction activity.

"Ordinary High Water Mark" – the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris.

"Outfall" – see "Discharge Point."

"Permitting Authority" – for the purposes of this permit, EPA, a Regional Administrator of EPA, or an authorized representative.

"Point(s) of Discharge" – see "Discharge Point."

"Point Source" – any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

"Pollutant" – defined at 40 CFR §122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

"Pollutant-Generating Activities" – at construction sites (for the purposes of this permit), those activities that lead to or could lead to the generation of pollutants, either as a result of earth-disturbance or a related support activity. Some of the types of pollutants that are typically found at construction sites are:

- sediment;
- nutrients;
- heavy metals;
- pesticides and herbicides;
- oil and grease;
- bacteria and viruses;
- trash, debris, and solids;
- treatment polymers; and
- any other toxic chemicals.

"Pollution Prevention Measures" – stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

"Polymers" – for the purposes of this permit, coagulants and flocculants used to control erosion on soil or to enhance the sediment removal capabilities of sediment traps or basins. Common construction site polymers include polyacrylamide (PAM), chitosan, alum, polyaluminum chloride, and gypsum.

"Prohibited Discharges" – discharges that are not allowed under this permit, including:

1. Wastewater from washout of concrete;
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
4. Soaps or solvents used in vehicle and equipment washing;
5. Toxic or hazardous substances from a spill or other release; and
6. Waste, garbage, floatable debris, construction debris, and sanitary waste from pollutant-generating activities.

"Provisionally Covered Under this Permit" – for the purposes of this permit, EPA provides temporary coverage under this permit for emergency-related projects prior to receipt of a complete and accurate NOI. Discharges from earth-disturbing activities associated with the emergency-related projects are subject to the terms and conditions of the permit during the period of temporary coverage.

"Receiving Water" – a "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

"Run-On" – sources of stormwater that drain from land located upslope or upstream from the regulated site in question.

"Semi-Arid Areas" – areas with an average annual rainfall of 10 to 20 inches.

"Site" – for construction activities, the land or water area where earth-disturbing activities take place, including construction support activities.

"Small Construction Activity" – defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A small construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

"Small Residential Lot" – for the purpose of this permit, a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

"Snowmelt" – the conversion of snow into overland stormwater and groundwater flow as a result of warmer temperatures.

"Spill" – for the purpose of this permit, the release of a hazardous or toxic substance from its container or containment.

"Stabilization" – the use of vegetative and/or non-vegetative cover to prevent erosion and sediment loss in areas exposed through the construction process.

"Steep Slopes" – where a state, Tribe, local government, or industry technical manual (e.g., stormwater BMP manual) has defined what is to be considered a "steep slope", this permit's definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

"Storm Sewer System" – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) designed or used for collecting or conveying stormwater.

"Stormwater" – stormwater runoff, snow melt runoff, and surface runoff and drainage.

"Stormwater Control Measure" - refers to any stormwater control, BMP, or other method (including narrative effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

"Stormwater Controls" – see "Stormwater Control measure."

"Stormwater Discharge Associated with Construction Activity" – as used in this permit, a discharge of pollutants in stormwater to waters of the United States from areas where land-disturbing activities (e.g., clearing, grading, or excavation) occur, or where construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck chute washdown, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants), are located.

"Stormwater Inlet" – a structure placed below grade to conduct water used to collect stormwater runoff for conveyance purposes.

"Stormwater Team" – the group of individuals responsible for oversight of the development and modifications of the SWPPP, and oversight of compliance with the permit requirements. The individuals on the "Stormwater Team" must be identified in the SWPPP.

"Storm Event" – a precipitation event that results in a measurable amount of precipitation.

"Storm Sewer" – a system of pipes (separate from sanitary sewers) that carries stormwater runoff from buildings and land surfaces.

"Subcontractor" – for the purposes of this permit, an individual or company that takes a portion of a contract from the general contractor or from another subcontractor.

"Surface Water" – a "Water of the United States" as defined in 40 CFR §122.2.

"SWPPP" (Stormwater Pollution Prevention Plan) – a site-specific, written document that, among other things: (1) identifies potential sources of stormwater pollution at the construction site; (2) describes stormwater control measures to reduce or eliminate pollutants in stormwater

discharges from the construction site; and (3) identifies procedures the operator will implement to comply with the terms and conditions of this general permit.

"Temporary Stabilization" – a condition where exposed soils or disturbed areas are provided a temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

"Thawing Conditions" – for the purposes of this permit, thawing conditions are expected based on the historical likelihood of two or more days with daytime temperatures greater than 32˚F. This date can be determined by looking at historical weather data. Note: the estimation of thawing conditions is for planning purposes only. During construction the permittee will be required to conduct site inspections based upon actual conditions (i.e., if thawing conditions occur sooner than expected, the permittee will be required to conduct inspections at the regular frequency).

"Threatened Species" – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

"Tier 2 Waters" – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(2), those waters thatare characterized as having water quality that exceeds the levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

"Tier 2.5 Waters" – for antidegradation purposes, those waters designated by States or Tribes as requiring a level of protection equal to and above that given to Tier 2 waters, but less than that given Tier 3 waters. Some States have special requirements for these waters.

"Tier 3 Waters" – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(3), Tier 3 waters are identified by states as having high quality waters constituting an Outstanding Natural Resource Water (ONRW), such as waters of National Parks and State Parks, wildlife refuges, and waters of exceptional recreational or ecological significance.

"Total Maximum Daily Load" or "TMDL" – the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.

"Toxic Waste" – see "Hazardous Materials."

"Turbidity" – a condition of water quality characterized by the presence of suspended solids and/or organic material.

"Uncontaminated Discharge" – a discharge that does not cause or contribute to an exceedence of applicable water quality standards.

"Upland" - the dry land area above and 'landward' of the ordinary high water mark.

"Upset" – Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by

operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

"Water-Dependent Structures" – structures or facilities that are required to be located directly adjacent to a waterbody or wetland, such as a marina, pier, boat ramp, etc.

"Water Quality Standards" – defined in 40 CFR § 131.3, and are provisions of State or Federal law which consist of a designated use or uses for the waters of the United States, water quality criteria for such waters based upon such uses, and an antidegradation policy to protect high-quality waters. Water quality standards protect the public health or welfare, enhance the quality of water and serve the purposes of the Act.

"Waters of the United States" – defined at 40 CFR §122.2 as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters, including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
    a. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
    b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    c. Which are used or could be used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (1) through (4) of this definition;
6. The territorial sea; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

In applying this definition, EPA will consider applicable Court cases and current guidance.

"Wetland" – those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support,

a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. On-site evaluations are typically required to confirm the presence and boundaries of wetlands.

"Work day" – for the purposes of this permit, a work day is a calendar day on which construction activities will take place.

Acronyms

C&D – Construction & Development

CGP – Construction General Permit

CFR – Code of Federal Regulations

CWA – Clean Water Act

eNOI – Electronic Notice of Intent

EPA – United States Environmental Protection Agency

ESA – Endangered Species Act

FWS – United States Fish and Wildlife Service

MS4 – Municipal Separate Storm Sewer System

MSGP – Multi-Sector General Permit

NMFS – United States National Marine Fisheries Service

NOI – Notice of Intent

NOT – Notice of Termination

NPDES – National Pollutant Discharge Elimination System

NRC – National Response Center

NRCS – National Resources Conservation Service

POTW – Publicly Owned Treatment Works

SPCC – Spill Prevention Control and Countermeasure

SWPPP – Stormwater Pollution Prevention Plan

TMDL – Total Maximum Daily Load

USGS – United States Geological Survey

WQS – Water Quality Standard

Appendix B - Permit Areas Eligible for Coverage

Permit coverage for stormwater discharges from construction activity occurring within the following areas is provided by legally separate and distinctly numbered permits:

B.1 EPA Region 1: CT, MA, ME, NH, RI, VT

US EPA, Region 01
Office of Ecosystem Protection
NPDES Stormwater Program
5 Post Office Square
Boston, MA 02109-3912

The States of Connecticut, Maine, Rhode Island, and Vermont are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
CTR12000I	Indian country within the State of Connecticut
MAR120000	Commonwealth of Massachusetts (except Indian country)
MAR12000I	Indian country within the State of Massachusetts
NHR120000	State of New Hampshire
RIR12000I	Indian country within the State of Rhode Island
VTR12000F	Areas in the State of Vermont subject to construction by a Federal Operator

B.2 EPA Region 2: NJ, NY, PR, VI

For NJ, NY, and VI:
US EPA, Region 02
NPDES Stormwater Program
290 Broadway, 24th Floor
New York, NY 10007-1866

For PR:
US EPA, Region 02
Caribbean Environmental Protection Division
NPDES Stormwater Program
1492 Ponce de Leon Ave
Central Europa Building, Suite 417
San Juan, PR 00907-4127

The State of New York is the NPDES Permitting Authority for the majority of discharges within its state. The State of New Jersey and the Virgin Islands are the NPDES Permitting Authority for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
NYR12000I	Indian country within the State of New York
PRR120000	Commonwealth of Puerto Rico

B.3 EPA Region 3: DE, DC, MD, PA, VA, WV

US EPA, Region 03
NPDES Stormwater Program
1650 Arch St
Philadelphia, PA 19103

The State of Delaware is the NPDES Permitting Authority for the majority of discharges within its state. Maryland, Pennsylvania, Virginia, and West Virginia are the NPDES Permitting Authority for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
DCR120000	District of Columbia
DER12000F	Areas in the State of Delaware subject to construction by a Federal Operator

B.4 EPA Region 4: AL, FL, GA, KY, MS, NC, SC, TN

US EPA, Region 04
Water Protection Division
NPDES Stormwater Program
61 Forsyth St SW
Atlanta, GA 30303-3104

The States of Alabama, Florida, Mississippi, and North Carolina are the NPDES Permitting Authority for the majority of discharges within their respective States. EPA Region 4 is the NPDES Permitting Authority for all Indian country lands within any other Region 4 State except Catawba lands in South Carolina.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
ALR12000I	Indian country within the State of Alabama
FLR12000I	Indian country within the State of Florida
MSR12000I	Indian country within the State of Mississippi
NCR12000I	Indian country within the State of North Carolina
RE412000I	Indian country within any other Region 4 State (except Catawba lands in South Carolina)

B.5 EPA Region 5: IL, IN, MI, MN, OH, WI

US EPA, Region 05
NPDES & Technical Support
NPDES Stormwater Program
77 W Jackson Blvd
(WN-16J)
Chicago, IL 60604-3507

The States of Michigan, Minnesota, and Wisconsin are the NPDES Permitting Authority for the majority of discharges within their respective states. The States of Illinois, Indiana, and Ohio are the NPDES Permitting Authorities for all discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
MIR12000I	Indian country within the State of Michigan
MNR12000I	Indian country within the State of Minnesota, except the Fond Du Lac Band and Grand Portage Band of Lake Superior Chippewa
WIR12000I	Indian country within the State of Wisconsin, except the Bad River , Lac Du Flambeau and Sokaogon Chippewa (Mole Lake) Community

B.6 EPA Region 6: AR, LA, OK, TX, NM (except see Region 9 for Navajo lands, and see Region 8 for Ute Mountain Reservation lands)

US EPA, Region 06
NPDES Stormwater Program
1445 Ross Ave, Suite 1200
Dallas, TX 75202-2733

The States of Louisiana, Oklahoma, and Texas are the NPDES Permitting Authority for the majority of discharges within their respective state. The State of Arkansas is the NPDES Permitting Authority for all discharges within its respective state.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
LAR12000I	Indian country within the State of Louisiana
NMR120000	State of New Mexico, except Indian country
NMR12000I	Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.
OKR12000I	Indian country within the State of Oklahoma
OKR12000F	Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).
TXR12000F	Discharges in the State of Texas that are not under the authority of the Texas Commission on Environmental Quality (formerly TNRCC), including activities associated with the exploration, development, or production of oil or gas or geothermal resources, including transportation of crude oil or natural gas by pipeline.
TXR12000I	Indian country within the State of Texas

B.7 EPA Region 7: IA, KS, MO, NE (except see Region 8 for Pine Ridge Reservation Lands)

US EPA, Region 07
NPDES Stormwater Program
901 N 5th St
Kansas City, KS 66101

The States of Iowa, Kansas, and Nebraska are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Missouri is the NPDES Permitting Authority for all discharges within its state.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
IAR12000I	Indian country within the State of Iowa
KSR12000I	Indian country within the State of Kansas
NER12000I	Indian country within the State of Nebraska, except Pine Ridge Reservation lands (see Region 8)

B.8 EPA Region 8: CO, MT, ND, SD, WY, UT (except see Region 9 for Goshute Reservation and Navajo Reservation Lands), the Ute Mountain Reservation in NM, and the Pine Ridge Reservation in NE.

US EPA, Region 08
NPDES Stormwater Program
999 18th St, Suite 300
(EPR-EP)
Denver, CO 80202-2466

The States of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
COR12000F	Areas in the State of Colorado, except those located on Indian country, subject to construction activity by a Federal Operator
COR12000I	Indian country within the State of Colorado, as well as the portion of the Ute Mountain Reservation located in New Mexico
MTR12000I	Indian country within the State of Montana
NDR12000I	Indian country within the State of North Dakota, as well as that portion of the Standing Rock Reservation located in South Dakota (except for the portion of the lands within the former boundaries of the Lake Traverse Reservation which is covered under South Dakota permit SDR10000I listed below)
SDR12000I	Indian country within the State of South Dakota, as well as the portion of the Pine Ridge Reservation located in Nebraska and the portion of the lands within the former boundaries of the Lake Traverse Reservation located in North Dakota (except for the Standing Rock Reservation which is covered under North Dakota permit NDR10000I listed above)
UTR12000I	Indian country within the State of Utah, except Goshute and Navajo Reservation lands (see Region 9)
WYR12000I	Indian country within the State of Wyoming

B.9 EPA Region 9: CA, HI, NV, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Goshute Reservation in UT and NV, the Navajo Reservation in UT, NM, and AZ, the Duck Valley Reservation in ID, and the Fort McDermitt Reservation in OR.

US EPA, Region 09
NPDES Stormwater Program
75 Hawthorne St
San Francisco, CA 94105-3901

The States of Arizona, California and Nevada are the NPDES Permitting Authority for the majority of discharges within their respective states. The State of Hawaii is the NPDES Permitting Authority for all discharges within its state.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
ASR120000	Island of American Samoa
AZR12000I	Indian country within the State of Arizona, as well as Navajo Reservation lands in New Mexico and Utah
CAR12000I	Indian country within the State of California
GUR120000	Island of Guam
JAR120000	Johnston Atoll
MPR120000	Commonwealth of the Northern Mariana Islands
MWR120000	Midway Island and Wake Island
NVR12000I	Indian country within the State of Nevada, as well as the Duck Valley Reservation in Idaho, the Fort McDermitt Reservation in Oregon and the Goshute Reservation in Utah

B.10 EPA Region 10: AK, WA, ID (except see Region 9 for Duck Valley Reservation Lands), and OR (except see Region 9 for Fort McDermitt Reservation).

US EPA, Region 10
NPDES Stormwater Program
1200 6th Ave (OW-130)
Seattle, WA 98101-1128
Phone: (206) 553-6650

The States of Oregon and Washington are the NPDES Permitting Authority for the majority of discharges within their respective states.

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
AKR12000I	Indian country within the State of Alaska
AKR12-000F	Areas in the the Denali National Park and Preserve subject to construction by a Federal Operator
IDR120000	State of Idaho, except Indian country **[COVERAGE NOT YET AVAILABLE]**
IDR12000I	Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)
ORR12000I	Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)
WAR12000F	Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator **[COVERAGE NOT YET AVAILABLE]**
WAR12000I	Indian country within the State of Washington

Appendix C - Small Construction Waivers and Instructions

These waivers are only available to stormwater discharges associated with small construction activities (i.e., 1-5 acres). As the operator of a small construction activity, you may be able to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on: (A) a low rainfall erosivity factor, (B) a TMDL analysis, or (C) an equivalent analysis that determines allocations for small construction sites are not needed. Each operator, otherwise needing permit coverage, must notify EPA of its intention for a waiver. It is the responsibility of those individuals wishing to obtain a waiver from coverage under this general permit to submit a complete and accurate waiver certification as described below. Where the operator changes or another is added during the construction project, the new operator must also submit a waiver certification to be waived.

C.1 Rainfall Erosivity Waiver

Under this scenario the small construction project's rainfall erosivity factor calculation ("R" in the Revised Universal Soil Loss Equation) is less than 5 during the period of construction activity. The operator must certify to EPA that construction activity will occur only when the rainfall erosivity factor is less than 5. The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a stabilization practice that will provide interim non-vegetative stabilization can be used for the end of the construction period, provided the operator commits (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the construction general permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with its certification statement constitutes acceptance of and commitment to complete the final stabilization process. The operator must submit a waiver certification to EPA prior to commencing construction activities.

> *Note: The rainfall erosivity factor "R" is determined in accordance with Chapter 2 of Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), pages 21–64, dated January 1997; United States Department of Agriculture (USDA), Agricultural Research Service.*

EPA has developed an online rainfall erosivity calculator to help small construction sites determine potential eligibility for the rainfall erosivity waiver. You can access the calculator from EPA's website at:www.epa.gov/npdes/stormwater/lew. The R factor can easily be calculated by using the construction site latitude/longitude or address and estimated start and end dates of construction. This calculator may also be useful in determining the time periods during which construction activity could be waived from permit coverage. You may find that moving your construction activity by a few weeks or expediting site stabilization will allow you to qualify for the waiver. Use this online calculator or the Construction Rainfall Erosivity Waiver Fact Sheet (www.epa.gov/npdes/pubs/fact3-1.pdf) to assist in determining the R Factor for your small construction site.

If you are the operator of the construction activity and eligible for a waiver based on low erosivity potential, you can submit a rainfall erosivity waiver electronically via EPA's eNOI system (www.epa.gov/npdes/cgpenoi) or provide the following information on the waiver certification form in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The rainfall erosivity factor calculation that applies to the active construction phase at your project site; and
5. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, which certifies that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five.

You can access the waiver certification form from EPA's website at: (http://www.epa.gov/npdes/pubs/construction_waiver_form.pdf). Paper copies of the form must be sent to one of the addresses listed in Part C.4 of this section.

Note: If the R factor is 5 or greater, you cannot apply for the rainfall erosivity waiver, and must apply for NPDES permit coverage, unless you qualify for the Water Quality Waiver as described in section B below.

If your small construction project continues beyond the projected completion date given on the waiver certification, you must recalculate the rainfall erosivity factor for the new project duration. If the R factor is below five (5), you must update all applicable information on the waiver certification and retain a copy of the revised waiver as part of your records. The new waiver certification must be submitted prior to the projected completion date listed on the original waiver form to assure your exemption from permitting requirements is uninterrupted. If the new R factor is 5 or above, you must obtain NPDES permit coverage.

C.2 TMDL Waiver

This waiver is available if EPA has established or approved a TMDL that addresses the pollutant(s) of concern for the impaired water and has determined that controls on stormwater discharges from small construction activity are not needed to protect water quality. The pollutant(s) of concern include sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. Information on TMDLs that have been established or approved by EPA is available from EPA online at http://www.epa.gov/owow/tmdl/ and from state and tribal water quality agencies.

If you are the operator of the construction activity and eligible for a waiver based on compliance with an EPA-established or approved TMDL, you must provide the following information on the Waiver Certification form in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;

3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. The name and approval date of the TMDL;
6. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the TMDL.

C.3 Equivalent Analysis Waiver

This waiver is available for non-impaired waters only. The operator can develop an equivalent analysis that determines allocations for his/her small construction site for the pollutant(s) of concern or determines that such allocations are not needed to protect water quality. This waiver requires a small construction operator to develop an equivalent analysis based on existing in-stream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

If you are a construction operator who wants to use this waiver, you must develop your equivalent analysis and provide the following information to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. Your equivalent analysis;
6. A statement, signed and dated by an authorized representative as provided in Appendix I, Subsection I.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the equivalent analysis.

C.4 Waiver Deadlines and Submissions

1. Waiver certifications must be submitted prior to commencement of construction activities.
2. If you submit a TMDL or equivalent analysis waiver request, you are not waived until EPA approves your request. As such, you may not commence construction activities until receipt of approval from EPA.
3. Late Notifications: Operators are not prohibited from submitting waiver certifications after initiating clearing, grading, excavation activities, or other construction activities. The Agency reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and waiver authorization is granted.

Submittal of a waiver certification is an optional alternative to obtaining permit coverage for discharges of stormwater associated with small construction activity, provided you qualify for the waiver. Any discharge of stormwater associated with small construction activity not covered by either a permit or a waiver may be considered an unpermitted discharge under the Clean Water Act. As mentioned above, EPA reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and either discharge authorization is granted or a complete and accurate waiver certification is submitted. EPA may notify any operator covered by a waiver that they must apply for a permit. EPA may notify any operator who has been in non-compliance with a waiver that they may no longer use the waiver for future projects. Any member of the public may petition EPA to take action under this provision by submitting written notice along with supporting justification.

Complete and accurate Rainfall Erosivity waiver certifications not otherwise submitted electronically via EPA's eNOI system (www.epa.gov/npdes/cgpenoi) must be sent to one of the following addresses:

Regular U.S. Mail Delivery
EPA Stormwater Notice Processing Center
Mail Code 4203M
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Overnight/Express Mail Delivery
EPA Stormwater Notice Processing Center
Room 7420
U.S. EPA
1201Constitution Avenue, NW
Washington, DC 20004

Complete and accurate TMDL or equivalent analysis waiver requests must be sent to the applicable EPA Region office specified in Appendix B.

Appendix D - Endangered Species Act Requirements

The purpose of this guidance is to assist you in complying with the requirements in Part 1.1.e of the permit requiring you to demonstrate that you meet one of the criteria listed in this appendix with respect to the protection of any and all species that are federally-listed as endangered or threatened under the Endangered Species Act (ESA) or of habitat that is federally-designated as "critical habitat" under the ESA in order to be eligible for coverage under this permit.

This guidance provides you information on the following:

- **Section D.1:** ESA Eligibility Criteria
- **Section D.2:** Guidance for Determining Which ESA Criteria Applies

D.1 ESA Eligibility Criteria

You must certify in your NOI that you meet one of the eligibility criteria listed below in order to be eligible for coverage under this permit. You must also specify in the NOI the basis for your selection of the applicable eligibility criterion.

> Note: (1) Regardless of the criterion selected, you must provide documentation in your SWPPP that is sufficient to support your determination that you satisfy the requirements of the particular criterion. (2) While coordination between you and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service (together, the "Services") is not necessarily required in all cases, EPA encourages you to coordinate with the Services and to do so early in the planning process prior to submitting your NOI.

Criterion A. No federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in your site's "action area" as defined in Appendix A of this permit.

Criterion B. The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your action area under eligibility Criterion A, C, D, E, or F and there is no reason to believe that federally-listed species or federally-designated critical habitat not considered in the prior certification may be present or located in the "action area". To certify your eligibility under this Criterion, there must be no lapse of NPDES permit coverage in the other operator's certification. By certifying eligibility under this Criterion, you agree to comply with any effluent limitations or conditions upon which the other operator's certification was based. You must include in your NOI the tracking number from the other operator's notification of authorization under this permit. If your certification is based on another operator's certification under Criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C in your NOI form.

Criterion C. Federally-listed threatened or endangered species or their designated critical habitat(s) are likely to occur in or near your site's "action area," and your site's discharges and discharge-related activities are not likely to adversely affect listed threatened or endangered species or critical habitat. This determination may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to adversely affect listed species and critical habitat. To make this certification, you must include the following in your NOI: 1) any federally listed species and/or designated habitat located in your "action area"; and 2) the distance between your site and the listed species or designated critical habitat (in miles). You must also include a copy of your site map with your NOI.

Criterion D. Coordination between you and the Services has been concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in a written concurrence from the relevant Service(s) that your site's discharges and discharge-related activities are not likely to adversely affect listed species or critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion E. Consultation between a Federal Agency and the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service under section 7 of the ESA has been concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat. The result of this consultation must be either:

i. a biological opinion that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of listed species, nor the destruction or adverse modification of critical habitat; or

ii. written concurrence from the applicable Service(s) with a finding that the site's discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated habitat.

You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

Criterion F. Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and this authorization addresses the effects of the site's discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. You must include copies of the correspondence between yourself and the Services in your SWPPP and your NOI.

You must comply with any applicable terms, conditions, or other requirements developed in the process of meeting the eligibility criteria in this section to remain eligible for coverage under this permit. Documentation of these requirements must be kept as part of your SWPPP (see Part 7.2.14.1).

D.2 Guidance for Determining Which Criterion Applies

Part 1.1.5 of the permit requires that you meet one of the six criteria listed above in order to be eligible for coverage under the permit.

You must follow the procedures in Steps 1through 6 to determine the ESA criterion under which your site is eligible for permit coverage.

D.2.1 Step 1 - Determine if Your Discharges and Discharge-Related Activities Were Already Addressed in Another Operator's Valid Certification that Included Your Action Area.

- **If your discharges and discharge-related activities <u>were</u> already addressed in another operator's valid certification that included your action area** (e.g., a general contractor or developer may have completed and filed an NOI for the entire action area with the necessary ESA certifications (Criterion A, C, D, E, or F)), *you may select eligibility Criterion B on your Notice of Intent form*.

  By certifying eligibility under Criterion B, you must comply with any terms and conditions imposed under the eligibility requirements of Criterion A, C, D, E, or F to ensure that your discharges and discharge-related activities are protective of listed species and/or critical habitat.

  > Note: If you are unable to meet these eligibility requirements, then you may either establish eligibility under one of the other criterion, or you may consider applying to EPA for an individual permit.

  Under Criterion B, you must provide documentation in your SWPPP of any of these terms and conditions, as well as the other operator's basis for establishing eligibility. You must also provide a description of the basis for your selection of Criterion B on your NOI form, including the eligibility criterion (A, C, D, E, or F) that was certified to by the previous operator, and must provide the Tracking Number from the other operator's notification of authorization under this permit.

  If your certification is based on another operator's certification under criterion C, you must provide the documentation required in the NOI for criterion C, namely: 1) what federally listed species and/or designated habitat are located in your "action area"; and 2) what is the distance between your site and the listed species or designated critical habitat (in miles).

- **If discharges and discharge-related activities from your site <u>were not</u> addressed in another operator's valid certification that included your action area,** you must follow the applicable procedures in Steps 2 through 5 below.

D.2.2 Step 2 - Determine if Listed Threatened or Endangered Species or their Designated Critical Habitat(s) are Likely to Occur in your Site's Action Area

You must determine, to the best of your knowledge, whether species listed as either threatened or endangered, or their critical habitat(s) (see definitions of these terms in Appendix A), are located in your site's action area. To make this determination, you should first determine if listed species and/or critical habitat are expected to exist in your county or township. The local offices of the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and State or Tribal Heritage Centers often maintain lists of federally listed endangered or threatened species on their internet sites. For FWS

terrestrial and aquatic species information, you can use FWS' on-line mapping tool, the Information, Planning, and Consultation (IPAC) System, located at http://www.fws.gov/ipac/.

Note: To determine the field office that corresponds to your project site, visit http://www.fws.gov/endangered/regions/index.html and http://www.nmfs.noaa.gov/ (under the left tabe for "Regions").

In most cases, species and/or critical habitat lists allow you to determine if any such species or habitat exists in your county or township. You can also find critical habitat designations and associated requirements at 50 CFR Parts 17 and 226. http://www.access.gpo.gov.

- ***If there <u>are</u> listed species and/or critical habitat in your county or township***, you should contact your local FWS, NMFS, or State or Tribal Heritage Center to determine if the listed species are known to exist in your action area and if any critical habitat areas have been designated that overlap your action area.
    - If your local FWS, NMFS, or State or Tribal Heritage Center indicates that these species and/or critical habitat could exist in your action area, you must:
        - Do **one or more** of the following:
            - Conduct visual inspections. This method may be particularly suitable for construction sites that are smaller in size or located in non-natural settings such as highly urbanized areas or industrial parks where there is little or no natural habitat, or for construction activities that discharge directly into municipal stormwater collection systems.
            - Conduct a formal biological survey. In some cases, particularly for larger construction sites with extensive stormwater discharges, biological surveys may be an appropriate way to assess whether species are located in the action area and whether there are likely to be adverse effects to such species. Biological surveys are frequently performed by environmental consulting firms. A biological survey may in some cases be useful to conduct in conjunction with Steps Two, Three, or Four of these instructions.
            - If required, conduct an environmental assessment under the National Environmental Policy Act (NEPA). Some construction activities might require review under NEPA for specific reasons, such as federal funding or other federal involvement in the project. Note: Coverage under the CGP does not trigger such a review for individual projects/sites. EPA has complied with NEPA in the issuance of the CGP.

and

- Follow the instructions in Steps 3 – 5 below, as applicable. Note that many but not all measures imposed to protect listed species under these steps will also protect critical habitat. Thus, meeting the eligibility requirements of this CGP may require measures to protect critical habitat that are separate from those to protect listed species.

- ***If there are <u>no</u> listed species in your county or township and <u>no</u> critical habitat areas in your action area,*** *you may check eligibility criterion A on your NOI form*. You must also provide a description of the basis for the criterion selected on your NOI form and provide documentation supporting the criterion selected in your SWPPP.

D.2.3 Step 3 - Determine if the Construction Activity's Discharges or Discharge-Related Activities Are Likely to Adversely Affect Listed Threatened or Endangered Species or Designated Critical Habitat

If in Step 2 you determine based on communication with your local FWS, NMFS, or State or Tribal Heritage Center, or other determination, that listed species and/or critical habitat could exist in your action area, you must next assess whether your discharges or discharge-related activities are likely to adversely affect listed threatened or endangered species or designated critical habitat.

Potential adverse effects from discharges and discharge-related activities include:

- *Hydrological*. Stormwater discharges may cause siltation, sedimentation or induce other changes in receiving waters such as temperature, salinity or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a stormwater discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely. Construction activity itself may also alter drainage patterns on a site where construction occurs that can impact listed species or critical habitat.

- *Habitat*. Excavation, site development, grading, and other surface disturbance activities from construction activities, including the installation or placement of stormwater controls, may adversely affect listed species or their habitat. Stormwater may drain or inundate listed species habitat.

- *Toxicity*. In some cases, pollutants in stormwater may have toxic effects on listed species.

The scope of effects to consider will vary with each site. If you are having difficulty determining whether your project is likely to adversely affect listed species or critical habitat, or one of the Services has already raised concerns to you, you should contact the appropriate office of the FWS, NMFS or Natural Heritage Center for assistance.

- ***If adverse effects to listed threatened or endangered species or their critical habitat <u>are not</u> likely***, *then you may select eligibility criterion C on the NOI form*. You must provide the following specific information on your NOI form: 1) what federally listed species and/or designated habitat are located in your "action area"; and 2) what is the distance between your site and the listed species or

designated critical habitat (in miles). You must also provide a copy of your site map with your NOI.

- ***If adverse effects to listed threatened or endangered species or their critical habitat <u>are</u> likely***, you must follow Step 4 below.

D.2.4 Step 4 - Determine if Measures Can Be Implemented to Avoid Adverse Effects

If you make a preliminary determination in Step 3 that adverse effects from your construction activity's discharges or discharge-related activities are likely to occur, you can still receive coverage under eligibility criterion C of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of adverse effects prior to applying for CGP coverage.

These measures may involve relatively simple changes to construction activities such as re-routing a stormwater discharge to bypass an area where species are located, relocating stormwater controls, or by modifying the "footprint" of the construction activity. If you are unable to ascertain which measures to implement to avoid the likelihood of adverse effects, you must coordinate or enter into consultation with the FWS and/or NMFS, in which case you would not be eligible for coverage under eligibility criterion C, but may instead be eligible for coverage under eligibility criterion D, E, or F (described in more detail in Step 5).

- **If you are able to install and implement appropriate measures to avoid the likelihood of adverse effects,** *then you may check eligibility criterion C on the NOI form*. The measures you adopt to avoid or eliminate adverse affects must be implemented for the duration of the construction project and your coverage under the CGP. You must also provide a description of the basis for the criterion selected , and the following specific information on your NOI form: 1) what federally listed species and/or designated habitat are located in your "action area"; and 2) what is the distance between your site and the listed species or designated critical habitat (in miles).

- **If you cannot ascertain which measures to implement to avoid the likelihood of adverse effects,** you must follow the procedures in Step 5**.**

D.2.5 Step 5 - Determine if the Eligibility Requirements of Criterion D, E, or F Can Be Met

If in Step 4 you cannot ascertain which measures to implement to avoid the likelihood of adverse effects, you must contact the FWS and/or NMFS. You may still be eligible for CGP coverage if any likely adverse effects can be addressed through meeting criterion D, E, or F.

- **Criterion D:** You have coordinated with the Services and have addressed the effects of your site's discharges on federally-listed threatened or endangered species and federally-designated critical habitat, which resulted in a written concurrence from the relevant Service(s) that your site's discharges are not likely to adversely affect listed species or critical habitat.

  If you have met the requirements of criterion D, *you may select eligibility criterion D on the NOI form*. You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between you and the applicable Service in your SWPPP.

- **Criterion E:** Formal or informal ESA section 7 consultation is performed with the FWS and/or NMFS and that consultation addresses the effects of your discharges and discharge-related activities on federally-listed and threatened species and designated critical habitat. In order to be eligible for coverage under this permit, consultation must result in a "no jeopardy opinion" or a written concurrence by the Service(s) on a finding that your stormwater discharge(s) and stormwater discharge-related activities are not likely to adversely affect listed species or critical habitat (For more information on consultation, see 50 CFR §402). If you receive a "jeopardy opinion," you may continue to work with the FWS and/or NMFS and your permitting authority to modify your project so that it will not jeopardize listed species or designated critical habitat.

  Note that most consultations are accomplished through informal consultation. When conducting informal ESA section 7 consultation as a non-federal representative, you must follow the procedures found in 50 CFR Part 402 of the ESA regulations. You must notify FWS and/or NMFS of your intention and agreement to conduct consultation as a non-federal representative.

  Consultation may occur in the context of another federal action at the construction site (e.g., where ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project or where a NEPA review is performed for the project that incorporates a section 7 consultation). Any terms and conditions developed through consultations to protect listed species and critical habitat must be incorporated into the SWPPP. As noted above, operators may, if they wish, initiate consultation with the Services at Step Four.

  Whether ESA section 7 consultation must be performed with either the FWS, NMFS or both Services depends on the listed species that may be affected by the operator's activity. In general, NMFS has jurisdiction over marine, estuarine, and anadromous species. Operators should also be aware that while formal section 7 consultation provides protection from incidental takings liability, informal consultation does not.

  If you have met the requirements of criterion E, *you may select eligibility criterion E on the NOI form.* You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between yourself and the Services in your SWPPP.

- **Criterion F:** Your construction activities are authorized through the issuance of a permit under section 10 of the ESA, and that authorization addresses the effects of your discharge(s) and discharge-related activities on federally-listed species and designated critical habitat. You must follow FWS and/or NMFS procedures when applying for an ESA Section 10 permit (see 50 CFR §17.22(b)(1) for FWS and §222.22 for NMFS). Application instructions for section 10 permits for FWS and NMFS can be obtained by accessing the FWS and NMFS websites (http://www.fws.gov and http://www.nmfs.noaa.gov) or by contacting the appropriate FWS and NMFS regional office.

  If you have met the requirements of criterion F, *you may select eligibility criterion F on the NOI form.* You must provide a description of the basis for the criterion selected on your NOI form and must include copies of the correspondence between yourself and the Services in your SWPPP.

Appendix E – Historic Property Screening Process

Background

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of Federal "undertakings", such as the issuance of this permit, on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. To address any issues relating to historic properties in connection with the issuance of this permit, EPA has developed the screening process in this appendix that enables construction operators to appropriately consider the potential impacts, if any, of their installation of stormwater controls on historic properties and to determine whether actions can be taken, if applicable, to mitigate any such impacts. Although the coverages of individual construction sites under this permit do not constitute separate Federal undertakings, the screening process in this appendix provides an appropriate site-specific means of addressing historic property issues in connection with EPA's issuance of the permit.

Key Terms

Historic property- prehistoric or historic districts, sites, buildings, structures, or objects that are included in or eligible for inclusion in the National Register of Historic Places, including artifacts, records, and remains that are related to and located within such properties

SHPO – The State Historic Preservation Officer for a particular state

THPO or Tribal representative – The Tribal Historic Preservation Officer for a particular Tribe or, if there is no THPO, the representative designated by such Tribe for NHPA purposes

Instructions for All Construction Operators

You are required to follow the screening process in this appendix to determine if your installation of stormwater controls on your site has the potential to cause effects to historic properties, and whether or not you need to contact your SHPO, THPO, or other tribal representative for further information. You may not submit your NOI until you have completed this screening process. The following four steps describe how applicants can meet the historic property requirements under this permit:

Step 1 *Are you installing any stormwater controls that require subsurface earth disturbance?*

The first step of the screening process is to determine if you will install stormwater controls that cause subsurface earth disturbance. The installation of the following types of stormwater controls require subsurface earth disturbance:

- Dikes
- Berms
- Catch Basins
- Ponds
- Ditches
- Trenches
- Culverts
- Channels
- Perimeter Drains

- Swales

Note: This list is not intended to be exhaustive. Other stormwater controls that are not on this list may involve earth-disturbing activities and must also be examined for the potential to affect historic properties.

Note: You are only required to consider earth-disturbing activities related to the installation of stormwater controls in the NHPA screening process. You are not reqired to conside other earth-disturbing activities a the site. If you are installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, your project has the potential to have an effect on historic properties. If this is the case, then you must proceed to Step 2.

If you are not installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, then you may indicate this on your NOI, and no further screening is necessary. During the 14-day waiting period after submitting your NOI, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse impacts to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse impacts to historic properties are necessary.

<u>Step 2</u> *Have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances precluded the existence of historic properties?*

If you are installing a stormwater control that requires subsurface earth disturbance, you must next determine if it has already been determined that no historic properties exist on your site based on prior professional cultural resource surveys or other evaluations, or that the existence of historic properties has been precluded because of prior earth disturbances.

If prior to your project it has already been determined that no historic properties exist at your site based on available information, including information that may be provided by your applicable SHPO, THPO, or other tribal representative, then you may indicate this on your NOI, and no further screening steps are necessary. Similarly, if earth disturbances that have occurred prior to your project have eliminated the possibility that historic properties exist on your site, you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse impacts to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse impacts to historic properties are necessary.

If neither of these circumstances exists for your project, you must proceed to Step 3.

<u>Step 3</u> *If you are installing any stormwater controls that require subsurface earth disturbance, you must determine if these activities will have an effect on historic properties.*

If your answer to the questions in Steps 1 and 2 is "no", *then you must assess whether your earth-disturbing activities related to the installation of stormwater controls will have an effect on historic properties. This assessment may be based on historical sources, knowledge of the area, an assessment of the types of earth-disturbing activities you are engaging in, considerations of*

any controls and/or management practices you will adopt to ensure that your stormwater control-related earth-disturbing activities will not have an effect on historic properties, and any other relevant factors. If you determine based on this assessment that earth disturbances related to the installation of yous stormwater controls will not cause effects to historic properties, you may indicate this on your NOI, and document the basis for your determinatioin in your SWPPP and no further screening steps are necessary. In this case you must also attach a copy of your site map to your NOI. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse impacts to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse impacts to historic properties are necessary.

If none of the circumstances in Steps 1-3 exist for your project, you must proceed to Step 4.

<u>Step 4:</u> *If you are installing any stormwater controls that require subsurface earth disturbance and you have not satisfied the conditions in Steps 1-3, you must contact and consult with the appropriate historic preservation authorities.*

Where you are installing stormwater controls that require subsurface earth disturbance, and you cannot determine in Step 3 that these activities will not have effects on historic properties, then you must contact the relevant SHPO, THPO, or other tribal representative to request their views as to the likelihood that historic properties are potentially present on your site and may be impacted by the installation of these controls.

> *Note: Addresses for SHPOs and THPOs may be found on the Advisory Council on Historic Preservation's website (www.achp.gov/programs.html). In instances where a Tribe does not have a THPO you should contact the appropriate Tribal government office designated by the Tribe for this purpose when responding to this permit eligibility condition.*

You must submit the following minimum information in order to properly initiate your request for information:

1. Project name (*i.e.*, the name or title most commonly associated with your project);
2. A narrative description of the project;
3. Name, address, phone and fax number, and email address (if available) of the operator;
4. Most recent U.S. Geological Survey (USGS) map section (7.5 minute quadrangle) showing actual project location and boundaries clearly indicated; and
5. Sections of SWPPP site map (see Part 7.2.6) that show locations where stormwater controls that will cause subsurface earth disturbance will be installed (see Step 1).

Without submitting this minimum information, you will not have been considered to have properly initiated your request. You will need to provide the SHPO, THPO, or other tribal representative a minimum of15 calendar days after they receive these materials to respond to your request for information about your project. You are advised to get a receipt from the post office or other carrier confirming the date on which your letter was received.

If you do not receive a response within15 calendar days after receipt by the SHPO, THPO, or other tribal representative of your request, then you may indicate this on your NOI, and no further screening steps are necessary. Or, if the applicable SHPO, THPO, or other tribal representative responds to your request with an indication that no historic properties will be affected by the installation of stormwater controls at your site, then you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other tribal representative may request that EPA hold up authorization based on concerns about potential adverse impacts to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse impacts to historic properties are necessary.

If within 15 calendar days of receipt of your request the applicable SHPO, THPO, or other tribal representative responds with a request for additional information or for further consultation regarding appropriate measures for treatment or mitigation of effects on historic properties caused by the installation of stormwater controls on your site, you must comply with this request and proceed to Step 5.

Step 5: *Consultation with your applicable SHPO, THPO, or other tribal representative*.

If, following your discussions with the appropriate historic preservation authorities in Step 4, the applicable SHPO, THPO, or other tribal represenative requests additional information or further consultation, you must respond with such information or to consult to determine impacts to historic properties that may be caused by the installation of stormwater controls on your site and appropriate measures for treatment or mitigation of such impacts. If as a result of your discussions with the applicable SHPO, THPO, or tribal representative, you enter into, and comply with, a written agreement regarding treatment and/or mitigation of impacts on your site, then you may indicate this on your NOI, and no further screening steps are necessary.

If, however, agreement on an appropriate treatment or mitigation plan cannot be reached between you and the SHPO, THPO, or other tribal representative within 30 days of your response to the SHPO, THPO, or other tribal representative's request for additional information or further consultation, you may submit your NOI, but you must indicate that you have not negotiated measures to avoid or mitigate such effects. You must also include in your SWPPP the following documentation:

1. Copies of any written correspondence between you and the SHPO, THPO, or other tribal representative; and
2. A description of any significant remaining disagreements as to mitigation measures between you and the SHPO, THPO, or other tribal representative.

After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, ACHP or other tribal representative may request that EPA place a hold on authorization based upon concerns regarding potential adverse effects to historic properties. EPA, in coordination with the ACHP, will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

Appendix F - List of Tier 3, Tier 2, and Tier 2.5 Waters

EPA's CGP has special requirements for discharges to waters designated by a state or tribe as Tier 2/2.5 or Tier 3 for antidegradation purposes under 40 CFR 131.12(a). See Parts 1.2.3 and 3.3.

The list below is provided as a resource for operators who must determine whether they discharge to a Tier 2/2.5 or Tier 3 water. Only Tier 2/2.5 or Tier 3 waters specifically identified by a water quality standard authority (e.g., a state, territory, or tribe) are identified in the table below. Many authorities evaluate the existing and protected quality of the receiving water on a pollutant-by-pollutant basis and determine whether water quality is better than the applicable criteria that would be affected by a new discharge or an increase in an existing discharge of the pollutant. In instances where water quality is better, the authority may choose to allow lower water quality, where lower water quality is determined to be necessary to support important social and economic development. Permittees are not required to identify those waters which are evaluated on an individual basis.

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
MAR100000	**Commonwealth of Massachusetts, except Indian Country lands**	
	Tier 2 and Tier 2.5 waters are identified and listed in 314 CMR 4.06 Basin Classification. (314 CMR 4 can be found at DEP's web page at http://www.mass.gov/dep/service/regulations/314cmr04.pdf)	
	Tier 2	Tier 2 waters are listed on a parameter-by-parameter basis.
	Tier 2.5	Tier 2.5 waters are listed as "outstanding resource waters" on the website: http://www.mass.gov/dep/water/laws/tblfig.pdf
NHR100000	**State of New Hampshire**	
	Tier 2/2.5	There is no list of Tier 2/Tier 2.5 waters. New dischargers should contact Ken Edwardson at Kenneth.Edwardson@des.nh.gov.
	Tier 3	Env-Ws 1708.05(a) Surface waters of national forests and surface waters designated as "natural" under RSA 483:7-a, I shall be considered outstanding resource waters (ORW). "Natural waters" are listed at http://www.gencourt.state.nh.us/rsa/html/L/483/483-15.htm. Surface waters of national forests are not included in an official list. For further questions, new dischargers should contact Thelma Murphy (EPA Region 1's stormwater coordinator) at murphy.thelma@epa.gov.
PRR100000	**Commonwealth of Puerto Rico**	
	Tier 3	Tier III waters are those which are classified as either Class SA or Class SE. Class SA waters are defined as "Coastal waters and estuarine waters of high quality and/or exceptional ecological or recreational value whose existing characteristics shall not be altered, except by natural causes, in order to preserve the existing natural phenomena." Class SA waters include bioluminiscent lagoons and bays such as La Parguera and Monsio José on the Southern Coast, Bahía de Mosquito in Vieques, and any other coastal or estuarine waters of exceptional quality of high ecological value or recreational which may be designated by Puerto Rico, through Resolution, as requiring this classification for protection of the waters. Class SE waters are defined

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
		as "Surface waters and wetlands of exceptional ecological value, whose existing characteristics should not be altered in order to preserve the existing natural phenomena." Class SE waters include Laguna Tortuguero, Laguna Cartagena and any other surface water bodies of exceptional ecological value as may be designated by Puerto Rico through Resolution.
DCR100000	**District of Columbia**	
	Tier 2/2.5	Rock Creek and its tributaries and Battery Kemble Creek and its tributaries are considered Special Waters of the District of Columbia (SWDC) under its antidegradation program.
MNR10000I	**Fond du Lac Band of MN Chippewa**	
	Tier 3	Six lakes are presently identified as Tier 3: (1) Dead Fish, (2) Jaskari, (3) Miller (Mud), (4) Perch, (5) Rice Portage, (6) Wild Rice.
	Grand Portage Band of MN Chippewa	
	Tier 2/2.5	All waters, not already classified as Tier 3, are high quality Tier 2 waters. (see Grand Portage Reservation Water Quality Standards, Section VI & VII, Pages 14-16).
	Tier 3	"The portion of Lake Superior north of latitude 47 degrees, 57 minutes, 13 seconds, east of Hat Point, south of the Minnesota-Ontario boundary, and west of the Minnesota-Michigan boundary." (see Section VII, Page 16).
WIR10000I	**Lac du Flambeau Band of the Lake Superior Chippewa**	
	Tier 2	All named waters, including wetlands, not specified under an antidegradation classification.
	Tier 2.5	Bills Lake, Birch Lake, Bobidosh Lake, Bog Lake (SE SE Sec. 31, T40NR6E), Bolton Lake, Broken Bow Lake, Chewalah Lake, Clear Lake (Sec. 2, T39NR4E), Corn Great, Great, Corn Lake, Little "Least/Lesser", Crawling Stone Lake, Big, Crawling Stone Lake, Little, Crescent Lake, Crooked Lake, Big, David Lake, Ellerson Lake, Middle, Ellerson Lake, West, Elsie Lake "Boundary Lake", Fat Lake, Fence Lake, Gresham Creek, Green Lake (NW NW Sec. 19, T41R6E), Grey Lake, Gunlock Lake, Haskell Lake, Headflyer Lake (Sec. 19, T41NR5E), Highway Lake (NW NW Sec. 19, T41NR5E), Horsehead Lake (SE SW Sec. 9, T40NR5E), Hutton's Creek, Ike Walton Lake, Lily Lake (SE SW Sec. 35, T40NR5E), Little Ten Lake, Lodge Lake "L. Rice" (NW NW Sec. 8, T41NR6E), Lucy Lake, Mindys Lake (Sec. 8, T40NR5E), Minette Lake, Mitten Lake, Monk's Lake (Sec. 13, T40NR5E), Moving Cloud Lake, Mud Creek, Muskesin Lake, Patterson Lake, Placid Twin Lake (North), Placid Twin Lake (South), Plummer Lake, Poupart Lake, Prairie Lake (NE SW Sec. 13, T40NR4E), Raven Lake, Ross Allen Lake, Sand Lake, Little, Scott Lake (Sec. 22, T40N, R4E), Shishebogama Lake, Signal Lake, Snort Lake (Sec. 5, T41N, R6E), Spring Lake "Jerms", Squirrel Lake, Statenaker Lake "Hollow", Stearns Lake "Hourglass", Sugarbush "Hidden Lake" (NW NW Sec. 17, T41NR5E), Sugarbush Creek, Sugarbush Lake, Little, Sugarbush Lake, Lower, Sugarbush Lake, Middle, Sugarbush Lake, Upper, Sunfish Lake, Tippecanoe Lake, Tomahawk River, To-To Tom Lake, Toulish Lake, Trout River, Warrior Lake, White Sand Lake, Whitefish Lake

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
		"Cattail Lake" (Sec. 34, T40N5R), Wishow Lake, Wyandock Lake
	Tier 3	Bear River (1st bridge to Reservation boundary), Big Springs (Sec. 25, T40NR4E), Black Lake, Cranberry Lake, Doud Lake, Eagle Lake, Gene Lake, Johnson Springs, Little Trout Lake, Lost Lake (Sect. 1, T41NR4E), Mishonagon Creek, Munnomin (Jesse, Duck) Lake, Negani (Hegani) Lake, Reservation Line Lake, Spring Creek, Tank Lake, Thomas Lake, Wild Rice Lake, Zee Lake
NMR100000	**State of New Mexico**	
	Tier 3	(1) Rio Santa Barbara, including the west, middle and east forks from their headwaters downstream to the boundary of the Pecos Wilderness; and (2) the waters within the United States forest service Valle Vidal special management unit including: (a) Rio Costilla, including Comanche, La Cueva, Fernandez, Chuckwagon, Little Costilla, Holman, Gold, Grassy, LaBelle and Vidal creeks, from their headwaters downstream to the boundary of the United States forest service Valle Vidal special management unit; (b) Middle Ponil creek, including the waters of Greenwood Canyon, from their headwaters downstream to the boundary of the Elliott S. Barker wildlife management area; (c) Shuree lakes; (d) North Ponil creek, including McCrystal and Seally Canyon creeks, from their headwaters downstream to the boundary of the United States forest service Valle Vidal special management unit; and (e) Leandro creek from its headwaters downstream to the boundary of the United States forest service Valle Vidal special management unit. (3) the named perennial surface waters of the state, identified in Subparagraph (a) below, located within United States department of agriculture forest service wilderness. Wilderness are those lands designated by the United States congress as wilderness pursuant to the Wilderness Act. Wilderness areas included in this designation are the Aldo Leopold wilderness, Apache Kid wilderness, Blue Range wilderness, Chama River Canyon wilderness, Cruces Basin wilderness, Dome wilderness, Gila wilderness, Latir Peak wilderness, Pecos wilderness, San Pedro Parks wilderness, Wheeler Peak wilderness, and White Mountain wilderness. (a) The following waters are designated in the Rio Grande basin: (i) in the Aldo Leopold wilderness: Byers Run, Circle Seven creek, Flower canyon, Holden Prong, Indian canyon, Las Animas creek, Mud Spring canyon, North Fork Palomas creek, North Seco creek, Pretty canyon, Sids Prong, South Animas canyon, Victorio Park canyon, Water canyon; (ii) in the Apache Kid wilderness Indian creek and Smith canyon; (iii) in the Chama River Canyon wilderness: Chavez canyon, Ojitos canyon, Rio Chama; (iv) in the Cruces Basin wilderness: Beaver creek, Cruces creek, Diablo creek, Escondido creek, Lobo creek, Osha creek; (v) in the Dome wilderness: Capulin creek, Medio creek, Sanchez

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
		canyon/creek; (vi) in the Latir Peak wilderness: Bull creek, Bull Creek lake, Heart lake, Lagunitas Fork, Lake Fork creek, Rito del Medio, Rito Primero, West Latir creek; (vii) in the Pecos wilderness: Agua Sarca, Hidden lake, Horseshoe lake (Alamitos), Jose Vigil lake, Nambe lake, Nat lake IV, No Fish lake, North Fork Rio Quemado, Rinconada, Rio Capulin, Rio de las Trampas (Trampas creek), Rio de Truchas, Rio Frijoles, Rio Medio, Rio Molino, Rio Nambe, Rio San Leonardo, Rito con Agua, Rito Gallina, Rito Jaroso, Rito Quemado, San Leonardo lake, Santa Fe lake, Santa Fe river, Serpent lake, South Fork Rio Quemado, Trampas lake (East), Trampas lake (West); (viii) in the San Pedro Parks wilderness: Agua Sarca, Cañon Madera, Cave creek, Cecilia Canyon creek, Clear creek (North SPP), Clear creek (South SPP), Corralitos creek, Dove creek, Jose Miguel creek, La Jara creek, Oso creek, Rio Capulin, Rio de las Vacas, Rio Gallina, Rio Puerco de Chama, Rito Anastacio East, Rito Anastacio West, Rito de las Palomas, Rito de las Perchas, Rito de los Pinos, Rito de los Utes, Rito Leche, Rito Redondo, Rito Resumidero, San Gregorio lake; (ix) in the Wheeler Peak wilderness: Black Copper canyon, East Fork Red river, Elk lake, Horseshoe lake, Lost lake, Sawmill creek, South Fork lake, South Fork Rio Hondo, Williams lake. (b) The following waters are designated in the Pecos River basin: (i) in the Pecos wilderness: Albright creek, Bear creek, Beatty creek, Beaver creek, Carpenter creek, Cascade canyon, Cave creek, El Porvenir creek, Hollinger creek, Holy Ghost creek, Horsethief creek, Jack's creek, Jarosa canyon/creek, Johnson lake, Lake Katherine, Lost Bear lake, Noisy brook, Panchuela creek, Pecos Baldy lake, Pecos river, Rio Mora, Rio Valdez, Rito Azul, Rito de los Chimayosos, Rito de los Esteros, Rito del Oso, Rito del Padre, Rito las Trampas, Rito Maestas, Rito Oscuro, Rito Perro, Rito Sebadilloses, South Fork Bear creek, South Fork Rito Azul, Spirit lake, Stewart lake, Truchas lake (North), Truchas lake (South), Winsor creek; (ii) in the White Mountain wilderness: Argentina creek, Aspen creek, Bonito creek, Little Bonito creek, Mills canyon/creek, Rodamaker creek, South Fork Rio Bonito, Turkey canyon/creek. (c) The following waters are designated in the Gila River basin: (i) in the Aldo Leopold wilderness: Aspen canyon, Black Canyon creek, Bonner canyon, Burnt canyon, Diamond creek, Falls canyon, Fisherman canyon, Running Water canyon, South Diamond creek; (ii) in the Gila wilderness: Apache creek, Black Canyon creek, Brush canyon, Canyon creek, Chicken Coop canyon, Clear creek, Cooper canyon, Cow creek, Cub creek, Diamond creek, East Fork Gila river, Gila river, Gilita creek, Indian creek, Iron creek, Langstroth canyon, Lilley canyon, Little creek, Little Turkey creek, Lookout canyon, McKenna creek, Middle Fork Gila river, Miller Spring canyon, Mogollon creek, Panther canyon, Prior creek, Rain creek, Raw Meat creek, Rocky canyon, Sacaton creek, Sapillo creek, Sheep Corral canyon, Skeleton canyon, Squaw creek, Sycamore canyon, Trail canyon, Trail creek, Trout creek, Turkey creek, Turkey Feather creek, Turnbo canyon,

Permit Number	Areas of Coverage/Where EPA Is Permitting Authority	
		West Fork Gila river, West Fork Mogollon creek, White creek, Willow creek, Woodrow canyon. (d) The following waters are designated in the Canadian River basin: in the Pecos wilderness Daily creek, Johns canyon, Middle Fork Lake of Rio de la Casa, Middle Fork Rio de la Casa, North Fork Lake of Rio de la Casa, Rito de Gascon, Rito San Jose, Sapello river, South Fork Rio de la Casa, Sparks creek (Manuelitas creek). (e) The following waters are designated in the San Francisco River basin: (i) in the Blue Range wilderness: Pueblo creek; (ii) in the Gila wilderness: Big Dry creek, Lipsey canyon, Little Dry creek, Little Whitewater creek, South Fork Whitewater creek, Spider creek, Spruce creek, Whitewater creek. (f) The following waters are designated in the Mimbres Closed basin: in the Aldo Leopold wilderness Corral canyon, Mimbres river, North Fork Mimbres river, South Fork Mimbres river. (g) The following waters are designated in the Tularosa Closed basin: in the White Mountain wilderness Indian creek, Nogal Arroyo, Three Rivers. (h) The wetlands designated are identified on the maps and list of wetlands within United States forest service wilderness areas designated as outstanding national resource waters published at the New Mexico state library and available on the department's website.

Appendix G – Buffer Guidance.

The purpose of this guidance is to assist you in complying with the requirements in Part 2.1.2.1 of the permit regarding the establishment of natural buffers or equivalent sediment controls. This guidance is organized as follows:

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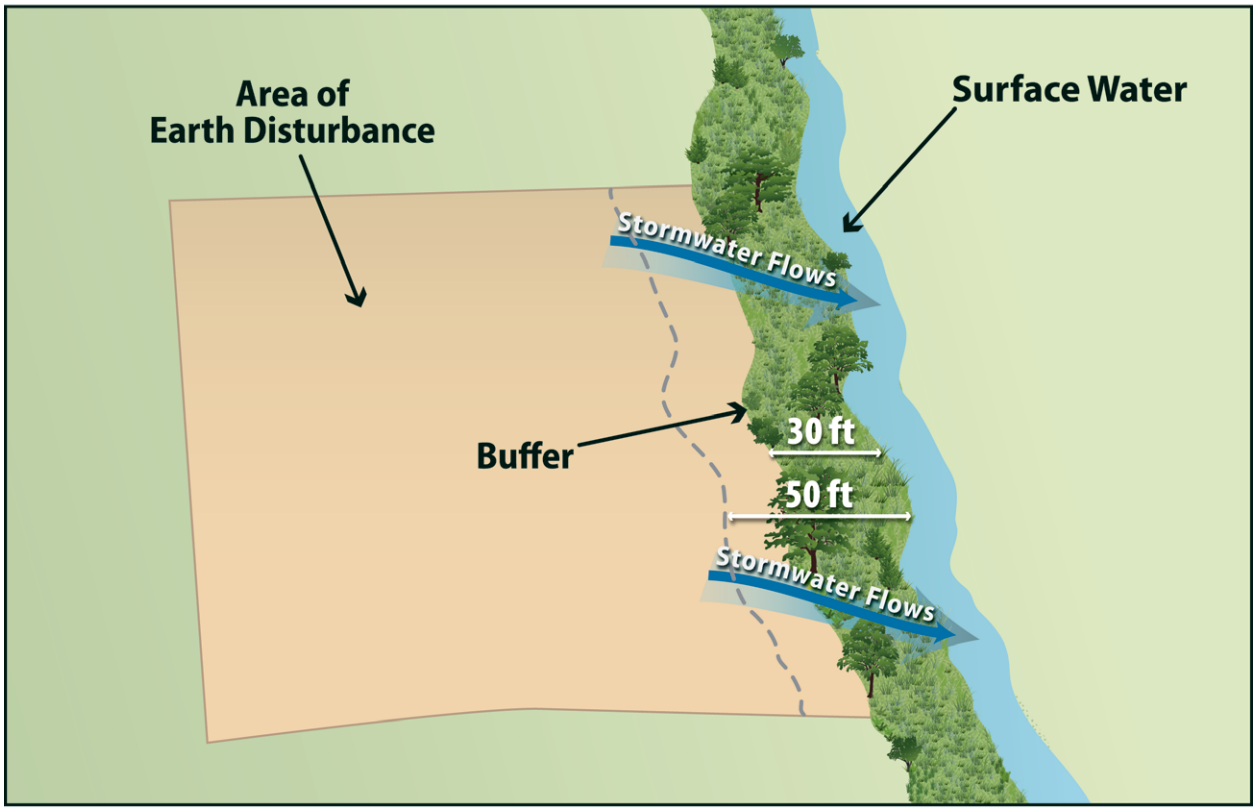
G.1 Sites That Are Required to Comply with Part 2.1.2.1

The purpose of this part is to help you determine if the requirements in Part 2.1.2.1 apply to your site.

G.1.1 Step 1 - Determine if Your Site is Within 50 Feet of a Surface Water

Part 2.1.2.1 applies to you only if your earth-disturbing activities will occur within 50 feet of a surface water that receives stormwater discharges from your site. Figure G – 1 illustrates when a site would be required to comply with the requirements in Part 2.1.2.1 due to their proximity to a surface water. If the surface water is not located within 50 feet of the earth-disturbing activities, Part 2.1.2.1 does not apply.

Figure G - 1. Example of earth-disturbing activities within 50 feet of a surface water.



If you determine that your earth-disturbing activities will occur within 50 feet of a surface water that receives stormwater discharges from your site, the requirements in Part 2.1.2.1 apply, except for certain circumstances that are described in Step 2.

Note that where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, or if a portion of area within 50 feet of the surface water is owned by another party and is not under your control, the buffer requirements in Part 2.1.2.1 still apply, but with some allowances.

Clarity about how to implement the compliance alternatives for these situations is provided in G.2.1.2 and G.2.2.2 below.

Note that EPA does not consider designed stormwater control features *(e.g., stormwater conveyance channels, storm drain inlets, stormwater basins)* that direct storm water to surface waters more than 50 feet from the disturbance to constitute surface waters for the purposes of determining if the buffer requirements apply.

G.1.2 Step 2 - Determine if Any Exceptions to the Requirements in Part 2.1.2.1 Apply

The following exceptions apply to the requirements in Part 2.1.2.1:

- If there is no discharge of stormwater to surface waters through the area between the disturbed portions of the site and any surface waters located within 50 feet of your site, you are not required to comply with the requirements in this Part. This includes situations where you have implemented controls measures, such as a berm or other barrier, that will prevent such discharges.
- Where no natural buffer exists due to preexisting development disturbances *(e.g., structures, impervious surfaces)* that occurred prior to the initiation of planning for the current development of the site, you are not required to comply with the requirements in this Part.

  Where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, you <u>are</u> required to comply with the requirements in this Part. For the purposes of calculating the sediment load reduction for either compliance alternative 2 or 3 below, you are not expected to compensate for the reduction in buffer function that would have resulted from the area covered by these preexisting disturbances. Clarity about how to implement the compliance alternatives for these situations is provided in G.2.1.2 and G.2.2.2 below.

  If during your project, you will disturb any portion of these preexisting disturbances, the area removed will be deducted from the area treated as natural buffer.
- For "linear construction projects" (see Appendix A), you are not required to comply with this requirement if site constraints *(e.g., limited right-of-way)* prevent you from complying with the requirements of the alternatives in Part 2.1.2.1a, provided that, to the extent practicable, you limit disturbances within 50 feet of the surface water and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the surface water. You must also document in your SWPPP your rationale for why it is infeasible for you to comply with the requirements in Part 2.1.2.1a, and describe any buffer width retained and/or supplemental erosion and sediment controls installed.
- For "small residential lot" construction *(i.e., a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre),* you have the option of complying with the requirements in Part G.2.3 of this appendix.
- The following disturbances within 50 feet of a surface water are exempt from the requirements in this Part:

  - Construction approved under a CWA Section 404 permit; or

- Construction of a water-dependent structure or water access areas *(e.g., pier, boat ramp, trail)*.

Note that you must document in your SWPPP if any disturbances related to any of the above exceptions occurs within the buffer area on your site.

G.2 COMPLIANCE ALTERNATIVES GUIDANCE

If in Part G.1 of this guidance you determine that the buffer requirements apply to your site, you have three compliance alternatives from which you can choose:

1. Provide and maintain a 50-foot buffer undisturbed natural buffer (Part 2.1.2.1a.i);[1] or
2. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer (Part 2.1.2.1a.ii);[1] or
3. If it is infeasible to provide and maintain an undisturbed natural buffer of any size, you must implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer (Part 2.1.2.1a.iii).[1]

The compliance alternative selected above must be maintained throughout the duration of permit coverage.

The following provides detailed guidance for how you can comply with each of the compliance alternatives. Part G.2.1 below provides guidance on how to provide and maintain natural buffers consistent with the alternatives 1 and 2, above. Part G.2.2 below provides guidance on how to comply with the requirement to provide a 50-foot buffer equivalent through erosion and sediment controls consistent with alternatives 2 and 3, above.

G.2.1 Guidance for Providing and Maintaining Natural Buffers

The following guidance is intended to assist you in complying with the requirements to provide and maintain a natural buffer during construction. This part of the guidance applies to you if you choose either alternative 1 (50-foot buffer) or alternative 2 (a buffer of < 50 feet supplemented by additional erosion and sediment controls that achieve the equivalent sediment load reduction as the 50-foot buffer), or if you are providing a buffer in compliance with one of the small residential lot compliance alternatives in Part G.2.3 below.

[1] *For the compliance alternatives in 1 and 2, you are not required to enhance the quality of the vegetation that already exists in the buffer, or provide vegetation if none exists (e.g., arid and semi-arid areas). You only need to retain and protect from disturbance the natural buffer that existed prior to the commencement of construction. Any preexisting structures or impervious surfaces are allowed in the natural buffer provided you retain and protect from disturbance the natural buffer area outside the preexisting disturbance. Similarly, for alternatives 2 and 3, you are required to implement and maintain sediment controls that achieve the sediment load reduction equivalent to the undisturbed natural buffer that existed on the site prior to the commencement of construction. In determining equivalent sediment load reductions, you may consider naturally non-vegetated areas and prior disturbances. See Part G.2.2 of this Appendix for a discussion of how to determine equivalent reductions.*

G.2.1.1 *Buffer Width Measurement*

Where you are retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:

1. The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
2. The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

Refer to Figure G – 2 and Figure G - 3. You may find that specifically measuring these points is challenging if the flow path of the surface water changes frequently, thereby causing the measurement line for the buffer to fluctuate continuously along the path of the waterbody. Where this is the case, EPA suggests that rather than measuring each change or deviation along the water's edge, it may be easier to select regular intervals from which to conduct your measurement. For instance, you may elect to conduct your buffer measurement every 5 to 10 feet along the length of the water.

Additionally, note that if earth-disturbing activities will take place on both sides of a surface water that flows through your site, to the extent that you are establishing a buffer around this water, it must be established on both sides. For example, if you choose alternative 1 above, and your project calls for disturbances on both sides of a small stream, you would need to retain the full 50 feet of buffer on both sides of the water. However, if your construction activities will only occur on one side of the stream, you would only need to retain the 50-foot buffer on the side of the stream where the earth-disturbance will occur.

Figure G - 2. This image shows buffer measurement from the ordinary high water mark of the water body, as indicated by a clear natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, and/or the presence of litter/debris.

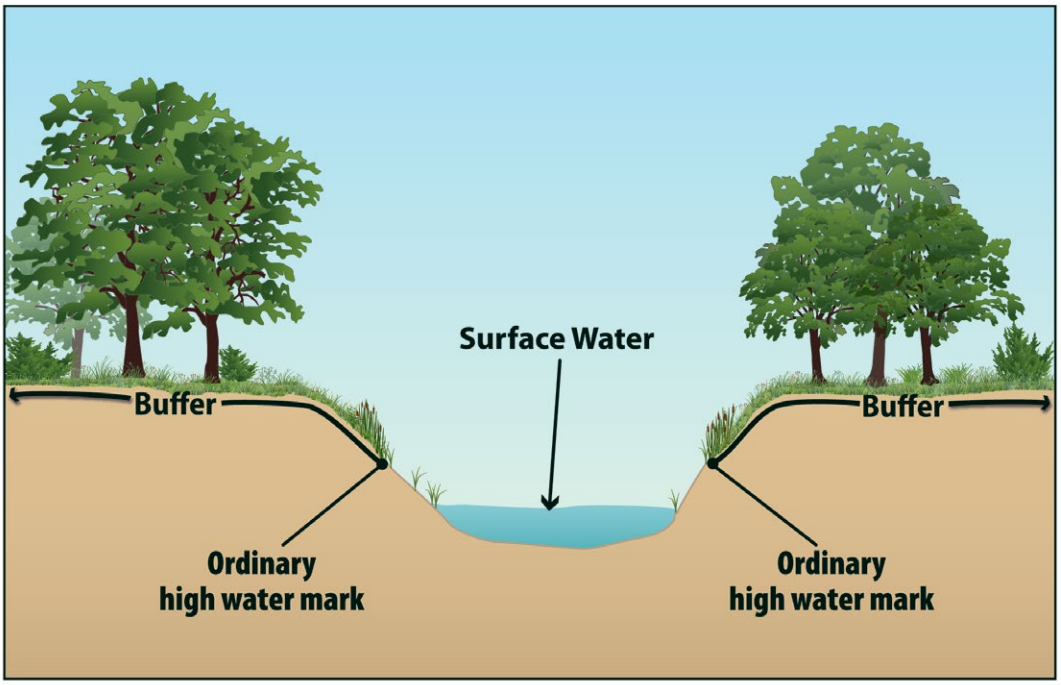
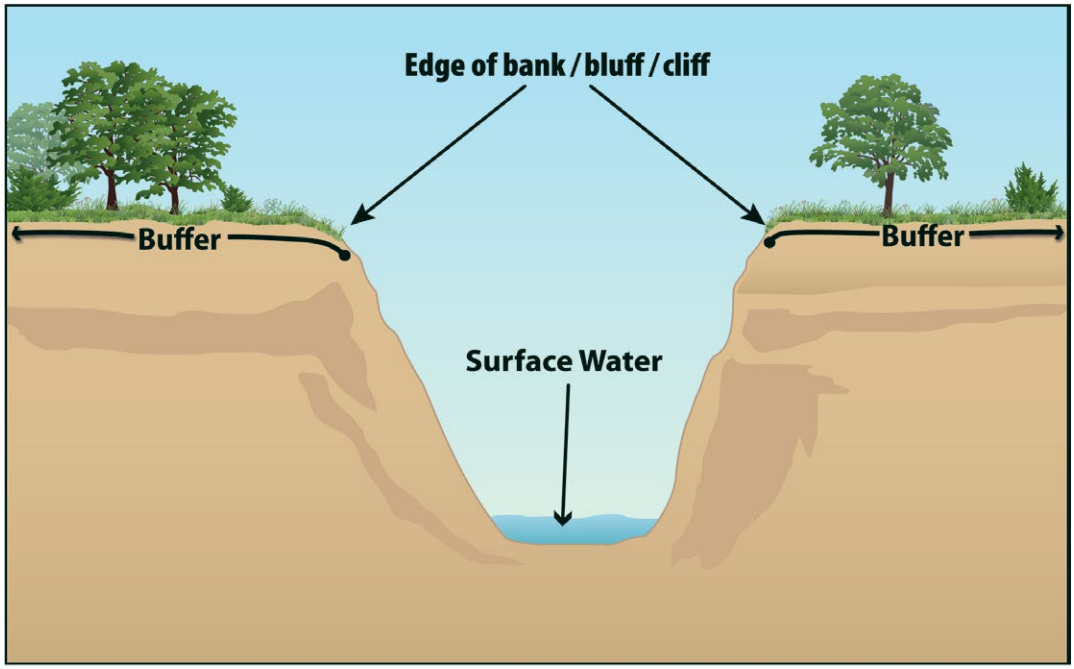


Figure G - 3. This image shows buffer measurement from the edge of the bank, bluff, or cliff, whichever is applicable.



G.2.1.2 *Limits to Disturbance Within the Buffer*

You are considered to be in compliance with this requirement if you retain and protect from construction activities the natural buffer that existed prior to the commencement of construction. If the buffer area contains no vegetation prior to the commencement of construction (e.g., sand or rocky surface), you are not required to plant any additional vegetation. As noted above, any preexisting structures or impervious surfaces are allowed in the buffer provided you retain and protect from disturbance the vegetation in the buffer outside the preexisting disturbance.

To ensure that the water quality protection benefits of the buffer are retained during construction, you are prohibited from conducting any earth-disturbing activities within the buffer during permit coverage. In furtherance of this requirement, prior to commencing earth-disturbing activities on your site, you must delineate, and clearly mark off, with flags, tape, or a similar marking device, the buffer area on your site. The purpose of this requirement is to make the buffer area clearly visible to the people working on your site so that unintended disturbances are avoided.

While you are not required to enhance the quality of the vegetation that already exists within the buffer, you are encouraged to do so where such improvements will enhance the water quality protection benefits of the buffer. (Note that any disturbances within the buffer related to buffer enhancement are permitted and do not constitute construction disturbances.) For instance, you may want to consider targeted plantings where limited vegetation exists, or replacement of existing vegetation where invasive or noxious plant species (see http://plants.usda.gov/java/noxiousDriver) have taken over. In the case of invasive or noxious species, you may want to remove and replace them with a diversity of native trees, shrubs, and herbaceous plants that are well-adapted to the climatic, soil, and hydrologic conditions on the site. You are also encouraged to limit the removal of naturally deposited leaf litter, woody debris, and other biomass, as this material contributes to the ability of the buffer to retain water and filter pollutants.

If a portion of the buffer area adjacent to the surface water is owned by another party and is not under your control, you are only required to retain and protect from construction activities the portion of the buffer area that is under your control. For example, if you elect alternative 1 above (provide and maintain a 50-foot buffer), but 10 feet of land immediately adjacent to the surface water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you must only retain and protect from construction activities the 40-foot buffer area that occurs on the property on which your construction activities are taking place. EPA would consider you to be in compliance with this requirement regardless of the activities that are taking place in the 10-foot area that is owned by a different party than the land on which your construction activities are taking place that you have no control over.

G.2.1.3 *Discharges to the Buffer*

You must ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls (*for example, you must comply with the Part 2.1.2.2 requirement to establish sediment controls around the downslope perimeter of your site disturbances*), and if necessary to prevent erosion caused by stormwater flows within the buffer, you must use velocity dissipation devices. The purpose of this requirement is to decrease the rate of stormwater flow and

encourage infiltration so that the pollutant filtering functions of the buffer will be achieved. To comply with this requirement, construction operators typically will use devices that physically dissipate stormwater flows so that the discharge entering the buffer is spread out and slowed down.

G.2.1.4 *SWPPP Documentation*

You are required to document in your SWPPP the natural buffer width that is retained. For example, if you are complying with alternative 1, you must specify in your SWPPP that you are providing a 50-foot buffer. Or, if you will be complying with alternative 2, you must document the reduced width of the buffer you will be retaining (and you must also comply with the requirements in Part 2.1.2.1c to describe the erosion and sediment controls you will use to achieve an equivalent sediment reduction, as described in Part G.2.2 below). Note that you must also show any buffers on your site plan in your SWPPP consistent with Part 7.2.6.3. Additionally, if any disturbances related to the exceptions in Part 2.1.2.1e occur within the buffer area, you must document this in the SWPPP.

G.2.2 Guidance for Providing the Equivalent Sediment Reduction as the 50-foot Buffer

If you are selecting Alternative 2 (provide and maintain a buffer that is less than 50 feet that is supplemented by additional erosion and sediment controls that, together, achieve the equivalent sediment load reduction as the 50-foot buffer) or Alternative 3 (implement erosion and sediment controls that achieve the equivalent sediment load reduction as the 50-foot buffer), the following guidance is intended to assist you in demonstrating that you will achieve the equivalent sediment reduction as the 50-foot buffer.

G.2.2.1 *Determine Whether it is Feasible to Provide a Reduced Buffer*

EPA recognizes that there will be a number of situations in which it will be infeasible to provide and maintain a buffer of any width. While some of these situations may exempt you from the buffer requirement entirely (see G.1.2), if you do not qualify for one of these exemptions, there still may be conditions or circumstances at your site that make it infeasible to provide a natural buffer. For example, there may be sites where a significant portion of the property on which the earth-disturbing activities will occur is located within the buffer area, thereby precluding the retention of natural buffer areas. EPA believes there are likely to be other examples of situations that make it infeasible to provide any buffer area.

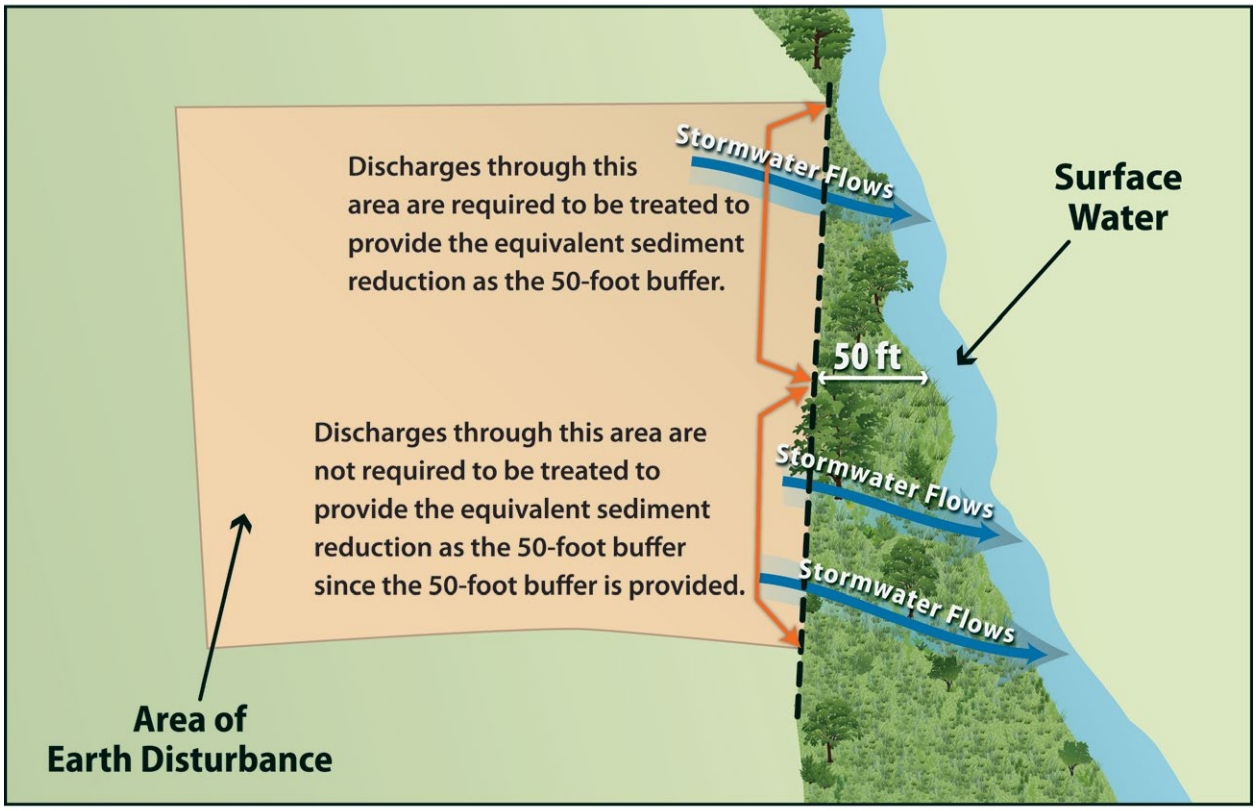
Therefore, in choosing between the 2 different compliance alternatives (Alternative 2 or 3), you should only elect to comply with Alternative 2 if it is feasible for you to retain any natural buffer on your site. (Note: For any buffer width retained, you are required to comply with the requirements in Part G.2.1, above, concerning the retention of vegetation and restricting earth disturbances.) Similarly, if you determine that it is infeasible to provide a natural buffer of any size during construction, you should elect to comply with Alternative 3. After making this determination, you should proceed to Part G.2.2.2 to determine how to provide controls that, together with any buffer areas that is being retained, if applicable, will achieve an equivalent sediment load reduction as the 50-foot buffer.

G.2.2.2 *Design Controls That Provide Equivalent Sediment Reduction as 50-foot Buffer*

You must next determine what additional controls must be implemented on your site that, alone or in combination with any retained natural buffer, achieve a reduction in sediment equivalent to that achieved by a 50-foot buffer.

Note that if only a portion of the natural buffer is less than 50 feet, you are only required to implement erosion and sediment controls that achieve the sediment load reduction equivalent to the 50-foot buffer for discharges through that area. You would not be required to provide treatment of stormwater discharges that flow through 50 feet or more of natural buffer. See Figure G - 4.

Figure G - 4 Example of how to comply with the requirement to provide the equivalent sediment reduction when only a portion of your earth-disturbances discharge to a buffer of less than 50-feet.



To comply with this requirement, you are required to do the following:

Step1 - Estimate the sediment reduction expected from your site if you had retained a 50-foot natural buffer;

Step 2 - Design controls that alone or in combination with any width of buffer retained achieve the equivalent sediment removal efficiency as that expected from the 50-foot buffer; and

Step 3 - Document in your SWPPP how your controls will achieve the equivalent sediment removal efficiency of the 50-foot buffer.

Guidelines to help you work through these requirements are provided below.

a. Step 1 - Estimate the Sediment Reduction from the 50-foot Buffer

In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of sediment controls used to reduce the discharge of sediment prior to the buffer. EPA has simplified this calculation by developing buffer performance tables covering a range of vegetation and soil types for the areas covered by the CGP. See Attachment 1, Tables G - 8 through G - 15. Note: buffer performance values in Tables G - 8 through G - 15 represent the percent of sediment captured through the use of perimeter controls (e.g., silt fences) and 50-foot buffers at disturbed sites of fixed proportions and slopes.[2]

Using Tables G - 8 through G - 15 (see Attachment 1), you can determine the sediment removal efficiency of a 50-foot buffer for your geographic area by matching the vegetative cover type that best describes your buffer area and the type of soils that predominate at your site. For example, if your site is located in Massachusetts (Table G - 9), and your buffer vegetation corresponds most closely with that of tall fescue grass, and the soil type at your site is best typified as sand, your site's sediment removal efficiency would be 81 percent.

In this step, you should choose the vegetation type in the tables that most closely matches the vegetation that would exist naturally in the buffer area on your site regardless of the condition of the buffer. However, because you are not required to plant any additional vegetation in the buffer area, in determining what controls are necessary to meet this sediment removal equivalency in Step 2 below, you will be able to take credit for this area as a fully vegetated "natural buffer."

Similarly, if a portion of the buffer area adjacent to the surface water is owned by another party and is not under your control, you can treat the area of land not

[2] EPA used the following when developing the buffer performance tables:

- The sediment removal efficiencies are based on the U.S. Department of Agriculture's RUSLE2 ("Revised Universal Soil Loss Equation 2") model for slope profiles using a 100-foot long denuded slopes.
- Sediment removal was defined as the annual sediment delivered at the downstream end of the 50-foot natural buffer (tons/yr/acre) divided by the annual yield from denuded area (tons/yr/acre).
- As perimeter controls are also required by the CGP, sediment removal is in part a function of the reduction due to a perimeter control (i.e., silt fence) located between the disturbed portion of the site and the upstream edge of the natural buffer and flow traveling through a 50-foot buffer of undisturbed natural vegetation.
- It was assumed that construction sites have a relatively uniform slope without topographic features that accelerate the concentration for erosive flows.
- It was assumed that vegetation has been removed from the disturbed portion of the site and a combination of cuts and fills have resulted in a smooth soil surface with limited retention of near-surface root mass

To represent the influence of soil, EPA analyzed 11 general soil texture classifications in its evaluation of buffer performance. To represent different types of buffer vegetation, EPA evaluated 4 or more common vegetative types for each state/territory covered under the permit. For each vegetation type evaluated, EPA considered only permanent, non-grazed and non-harvested vegetation, on the assumption that a natural buffer adjacent to the surface water will typically be undisturbed. EPA also evaluated slope steepness and found that sediment removal efficiencies present in Tables G -8 through G - 15 are achievable for slopes that are less than nine percent.

under control as having the equivalent vegetative cover and soil type that predominates on the portion of the property on which your construction activities are occurring.

> *For example, if your earth-disturbances occur within 50 feet of a surface water, but the 10 feet of land immediately adjacent to the surface water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10 foot area adjacent to the stream as having the equivalent soil and vegetation type as predominates in the 40 foot area under your control. You would then make the same assumption in Step 2 for purposes of determining the equivalent sediment removal.*

Alternatively, you may do your own calculation of the effectiveness of the 50-foot buffer based upon your site-specific conditions, and may use this number as your sediment removal equivalency standard to meet instead of using Tables G - 8 through G - 15. This calculation must be documented in your SWPPP.

b. <u>Step 2 - Design Controls That Match the Sediment Removal Efficiency of the 50-foot Buffer</u>

Once you have determined the estimated sediment removal efficiency of a 50-foot buffer for your site in Step 1, you will be required to select stormwater controls that will provide an equivalent sediment load reductions. These controls can include the installation of a single designed control, such as a sediment pond, additional perimeter controls, or other type of device. Alternatively, you may elect to install a combination of stormwater controls and to retain some amount of a buffer. Whichever control(s) you select, you must demonstrate in your SWPPP that the controls will provide at a minimum the same sediment removal capabilities as the 50-foot buffer (Step 1). You are allowed to take credit for the removal efficiencies of your required perimeter controls in your calculation of equivalency, because these were included in calculating the buffer removal efficiencies in tables G - 8 through G - 15. (Note: You are reminded that the controls must be kept in effective operating condition until you have completed final stabilization on the disturbed portions of the site discharging to the surface water.)

To make the determination that your controls and/or buffer area achieve an equivalent sediment load reduction as the 50-foot buffer, you will need to use a model or other type of calculator. As mentioned above, there are a variety of models available that can be used to support your calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other models. A couple of examples are provided in Attachment 3 to help illustrate how this determination could be made.

If you are retaining a buffer of less than 50 feet, you may take credit for the removal that will occur from the reduced buffer and only need to provide additional controls to make up the difference between the removal efficiency of a 50 foot buffer and the removal efficiency of the narrower buffer. For example, if you are retaining a 30 foot buffer, you can account for the sediment removal provided by the 30-foot buffer retained, and you will only need to design controls to make up for the additional removal provided by the 20-foot of buffer that is not being provided. To do this, you would plug the width of the buffer that is

retained into RUSLE or another model, along with other stormwater controls that will together achieve a sediment reduction equivalent to a natural 50-foot buffer.

As described in Step 1 above, you can take credit for the area you have retained as a "natural buffer" as being fully vegetated, regardless of the condition of the buffer area.

> *For example, if your earth-disturbances occur 30 feet from a surface water, but the 10 feet of land immediately adjacent to the surface water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10-foot area as a natural buffer, regardless of the activities that are taking place in the area. Therefore, you can assume (for purposes of your equivalency calculation) that your site is providing the sediment removal equivalent of a 30-foot buffer, and you will only need to design controls to make up for the additional removal provided by the 20-foot of buffer that is not being provided.*

c. <u>Step 3 - Document How Site-Specific Controls Will Achieve the Sediment Removal Efficiency of the 50-foot Buffer</u>

In Steps 1 and 2, you determined both the expected sediment removal efficiency of a 50-foot buffer at your site, and you used this number as a performance standard to design controls to be installed at your site, which alone or in combination with any retained natural buffer, achieves the expected sediment removal efficiency of a 50-foot buffer at your site. The final step is to document in your SWPPP the information you relied on to calculate the equivalent sediment reduction as an undisturbed natural buffer.

EPA will consider your documentation to be sufficient if it generally meets the following:

- For Step 1, refer to the table in Attachment 1 that you used to derive your estimated 50-foot buffer sediment removal efficiency performance. Include information about the buffer vegetation and soil type that predominate at your site, which you used to select the sediment load reduction value in Tables G - 8 through G - 15. Or, if you conducted a site-specific calculation for sediment removal efficiency, provide the specific removal efficiency, and the information you relied on to make your site-specific calculation.
- For Step 2: (1) Specify the model you used to estimate sediment load reductions from your site; and (2) the results of calculations showing how your controls will meet or exceed the sediment removal efficiency from Step 1.

If you choose Alternative 3, you must also include in your SWPPP a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size.

G.2.3 Small Residential Lot Compliance Alternatives

In this part of Appendix G, EPA provides additional compliance alternatives for operators of small residential lots. In accordance with Part 2.1.2.1e.iv, operators of small residential lots who do not provide a 50-foot buffer are not required to make the demonstration outlined in Part G.2.2.2. Instead, qualifying operators can comply with the buffer requirement by choosing to implement a set of traditional sediment and erosion controls from the menu of practices provided in Part G.2.3.2.

> A **small residential lot** is a lot or grouping of lots being developed for residential purposes that will disturb less than 1 acre of land, but that is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

EPA has developed two different alternatives for compliance. The following steps describe how a small residential lot operator would achieve compliance with these 2 alternatives.

G.2.3.1 *Step 1 – Determine if You are Eligible for the Small Residential Lot Compliance Alternatives*

In order to be eligible for the small residential lot compliance alternatives, the following conditions must be met:

a. The lot or grouping of lots meets the definition of "small residential lot"; and

b. The operator must comply with all other requirements in Part 2.1.2.1, including:

- **i.** Ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;
- **ii.** Document in the SWPPP the natural buffer width retained on the property, and show the buffer boundary on your site plan; and
- **iii.** Delineate, and clearly mark off, with flags, tape, or other similar marking device, all natural buffer areas.

G.2.3.2 *Step 2 – Implement the Requirements of the Small Residential Lot Compliance Alternative Selected*

You must next choose from one of two small residential lot compliance alternatives and implement the stormwater control practices associated with that alternative.

Note: The compliance alternatives provided below are not mandatory. Operators of small residential lots can alternatively choose to comply with the any of the options that are available to other sites in Part 2.1.2.1a, described in Parts G.2.1 and G.2.2 in this appendix.

a. <u>**Small Residential Lot Compliance Alternative 1**</u>

Alternative 1 is a straightforward tiered- technology approach that specifies the controls that a small residential lot must implement based on the buffer width retained. To achieve compliance with Alternative 1, you must implement the

controls specified in Table G – 1 based on the buffer width to be retained. See footnote 3, below, for a description of the controls you must implement.

For example, if you are an operator of a small residential lot that will be retaining a 35-foot buffer and you choose Small Residential Lot Compliance Alternative 1, you must implement double perimeter controls between earth disturbances and the surface water.

In addition to implementing the applicable control, you must also document in your SWPPP how you will comply with Alternative 1.

Table G - 1. Alternative 1 Requirements[3]

Retain 50-foot Buffer	Retain <50 and >30 foot Buffer	Retain ≤ 30 foot Buffer
No Additional Requirements	Double Perimeter Controls	Double Perimeter Controls and 7-Day Site Stabilization

b. <u>Small Residential Lot Compliance Alternative 2</u>

Alternative 2 specifies the controls that a builder of a small lot must implement based on both the buffer width retained and their risk of sediment discharge. By incorporating the sediment risk, this approach may result in the implementation of controls that are more appropriate for the site's specific conditions.

Step 1 – Determine Your Site's Sediment Risk Level

To meet the requirements of Alternative 2, you must first determine your site's sediment discharge "risk level" based on the site's slope, location, and soil type. To help you to determine your site's sediment risk level, EPA has developed five different tables for different slope conditions. You must select the table that most closely corresponds to your site's average slope.

For example, if your site's average slope is 7 percent, you would use Table G – 4 to determine your site's sediment risk.

After you determine which table applies to your site, you must then use the table to determine the "risk level" (e.g., "low", "moderate", or "high") that corresponds to your site's location and predominant soil type.[4]

For example, based on Table G - 3, a site located in New Hampshire with a 4 percent average slope and with predominately sandy clay loam soils would fall into the "moderate" risk level.

[3] **Description of Additional Controls Applicable to Small Residential Lot Compliance Alternatives 1 and 2:**

- **No Additional Requirements:** If you implement a buffer of 50 feet or greater, then you are not subject to any additional requirements. Note that you are required to install perimeter controls between the disturbed portions of your site and the buffer in accordance with Part 2.1.2.2.
- **Double Perimeter Control:** In addition to the reduced buffer width retained on your site, you must provide a double row of perimeter controls between the disturbed portion of your site and the surface water spaced a minimum of 5 feet apart.
- **Double Perimeter Control and 7-Day Site Stabilization:** In addition to the reduced buffer width retained on your site and the perimeter control implemented in accordance with Part 2.1.2.2, you must provide a double row of perimeter controls between the disturbed portion of your site and the surface water spaced a minimum of 5 feet apart, and you are required to complete the stabilization activities specified in Parts 2.2.1.2a and/or 2.2.1.2b within 7 calendar days of the temporary or permanent cessation of earth-disturbing activities.

[4] One source for determining your site's predominant soil type is the USDA's Web Soil Survey located at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

Table G - 2. Risk Levels for Sites with Average Slopes of ≤ 3 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Low	Moderate	Low	Moderate	Moderate
American Samoa	Moderate	Moderate	Moderate	Moderate	High
Massachusetts and New Hampshire	Low	Moderate	Low	Low	Moderate
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Low
Washington D.C.	Low	Moderate	Low	Low	Moderate

Table G - 3. Risk Levels for Sites with Average Slopes of > 3 Percent and ≤ 6 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	Moderate	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Low	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G - 4. Risk Levels for Sites with Average Slopes of > 6 Percent and ≤ 9 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	Moderate	High	Moderate	High	High
Puerto Rico	Moderate	High	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table G - 5. Risk Levels for Sites with Average Slopes of > 9 Percent and ≤ 15 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	Moderate	High	Moderate	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Moderate	Low	Moderate	Moderate
Washington D.C.	Moderate	High	Moderate	Moderate	High

Table G - 6. Risk Levels for Sites with Average Slopes of > 15 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	High	High	High	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	High	High	Moderate	High	High
Idaho	Low	Low	Low	Low	Moderate
New Mexico	Moderate	Moderate	Moderate	Moderate	High
Washington D.C.	High	High	Moderate	High	High

Step 2 – Determine Which Additional Controls Apply

Once you determine your site's "risk level", you must next determine the additional controls you need to implement on your site, based on the width of buffer you plan to retain. Table G - 7 specifies the requirements that apply based on the "risk level" and buffer width retained. See footnote 3, above, for a description of the additional controls that are required.

> *For example, if you are the operator of a small residential lot that falls into the "moderate" risk level, and you decide to retain a 20-foot buffer, using Table G-7 you would determine that you need to implement double perimeter controls to achieve compliance with Part 2.1.2.1.*

You must also document in your SWPPP your compliance with Alternative 2.

Table G - 7. Alternative 2 Requirements[2]

Risk Level Based on Estimated Soil Erosion	Retain ≥ 50' Buffer	Retain <50' and >30' Buffer	Retain ≤30' and >10' Buffer	Retain ≤ 10' Buffer
Low Risk	No Additional Requirements	No Additional Requirements	Double Perimeter Control	Double Perimeter Control
Moderate Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization
High Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization	Double Perimeter Control and 7-Day Site Stabilization

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ATTACHMENT 1

Sediment Removal Efficiency Tables[5]

EPA recognizes that very high removal efficiencies, even where theoretically achievable by a 50-foot buffer, may be very difficult to achieve in practice using alternative controls. Therefore in the tables below, EPA has limited the removal efficiencies to a maximum of 90%. Efficiencies that were calculated at greater than 90% are shown as 90%, and this is the minimum percent removal that must be achieved by alternative controls.

Table G - 8. Estimated 50-foot Buffer Performance in Idaho*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Tall Fescue Grass	42	52	44	48	85
Medium-density Weeds	28	30	28	26	60
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	25	26	24	24	55
Northern Mixed Prairie Grass	28	30	28	26	50
Northern Range Cold Desert Shrubs	28	28	24	26	50

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 9. Estimated 50-foot Buffer Performance in Massachusetts and New Hampshire*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Warm-season Grass (i.e., Switchgrass, Lemongrass)	79	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	78	90	90	90	90
Tall Fescue Grass	76	90	81	89	90
Medium-density Weeds	66	76	60	72	66

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

[5] The buffer performances were calculated based on a denuded slope upgradient of a 50-foot buffer and a perimeter controls, as perimeter controls are a standard requirement (see Part 2.1.2.2).

Table G - 10. Estimated 50-foot Buffer Performance in New Mexico*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Tall Fescue grass	71	85	80	86	90
Medium-density Weeds	56	73	55	66	78
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	53	70	51	62	67
Southern Mixed Prairie Grass	53	71	52	63	50
Southern Range Cold Desert Shrubs	56	73	55	65	53

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 11. Estimated 50-foot Buffer Performance in Washington, DC*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	81	90	90	90	90
Tall Fescue Grass	79	90	83	89	90
Medium-density Weeds	71	79	66	75	74

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 12. Estimated 50-foot Buffer Performance in American Samoa*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	82	90	90	90	83
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	85
Dense Grass	82	90	90	90	83
Tall Fescue Grass	82	89	82	89	79
Medium-density Weeds	70	73	62	75	59

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 13. Estimated 50-foot Buffer Performance in Guam*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	80	90	90	90	89
Warm-season Grass (i.e., Switchgrass, Lemongrass)	80	90	90	90	90
Dense Grass	79	90	90	90	89
Tall Fescue Grass	76	90	80	88	87
Medium-density Weeds	63	73	53	68	61

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 14. Estimated 50-foot Buffer Performance in Puerto Rico*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	83	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	83	90	90	90	90
Dense Grass	83	90	90	90	90
Tall Fescue Grass	82	90	84	90	89
Medium-density Weeds	72	78	65	76	64

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table G - 15. Estimated 50-foot Buffer Performance in Virgin Islands*

Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	85	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	86	90	90	90	90
Dense Grass	85	90	90	90	90
Tall Fescue Grass	85	90	88	90	89
Medium-density Weeds	75	77	71	78	63

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

ATTACHMENT 2

Using the Sediment Removal Efficiency Tables – Questions and Answers

- *What if my specific buffer vegetation is not represented in Tables G - 8 through G - 15?* Tables G - 8 through G - 15 provide a wide range of factors affecting buffer performance; however, there may be instances where the specific buffer vegetation type on your site is not listed. If you do not see a description of the type of vegetation present at your site, you should choose the vegetation type that most closely matches the vegetation type on your site. You can contact your local Cooperative Extension Service Office (www.csrees.usda.gov/Extension) for assistance in determining the vegetation type in Tables G - 8 through G - 15 that most closely matches your site-specific vegetation.
- *What if there is high variability in local soils?* EPA recognizes that there may be a number of different soil type(s) on any given construction site. General soil information can be obtained from USDA soil survey reports (http://websoilsurvey.nrcs.usda.gov) or from individual site assessments performed by a certified soil expert. Tables G - 8 through G - 15 present eleven generic soil texture classes, grouping individual textures where EPA has determined that performance is similar. If your site contains different soil texture classes, you should use the soil type that best approximates the predominant soil type at your site.
- *What if my site slope is greater than 9 percent after final grade is reached?* As indicated in the buffer performance tables, the estimated sediment removal efficiencies are associated with disturbed slopes of up to 9 percent grade. Where your graded site has an average slope of greater than 9 percent, you should calculate a site-specific buffer performance.
- *How do I calculate my own estimates for sediment reduction at my specific site?* If you determine that it is necessary to calculate your own sediment removal efficiency using site-specific conditions (e.g., slopes at your site are greater than 9 percent), you can do so by choosing from a range of available mathematical models that are available to facilitate this calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other equivalent models.
- *What is my estimated buffer performance if my site location is not represented by Tables G - 8 through G - 15?* If your site is located in an area not represented by Tables G - 8 through G - 15, you should use the table that most closely approximates conditions at your site. You may also choose to conduct a site-specific calculation of the buffer performance.
- *What if only a portion of my site drains to the buffer area?* If only a portion of your site drains to a surface water, where that water is within 50 feet of your construction activities, you are only required to meet the equivalency requirement for the stormwater flows corresponding to those portions of the site. See Example 2 below for an example of how this is expected to work.

ATTACHMENT 3

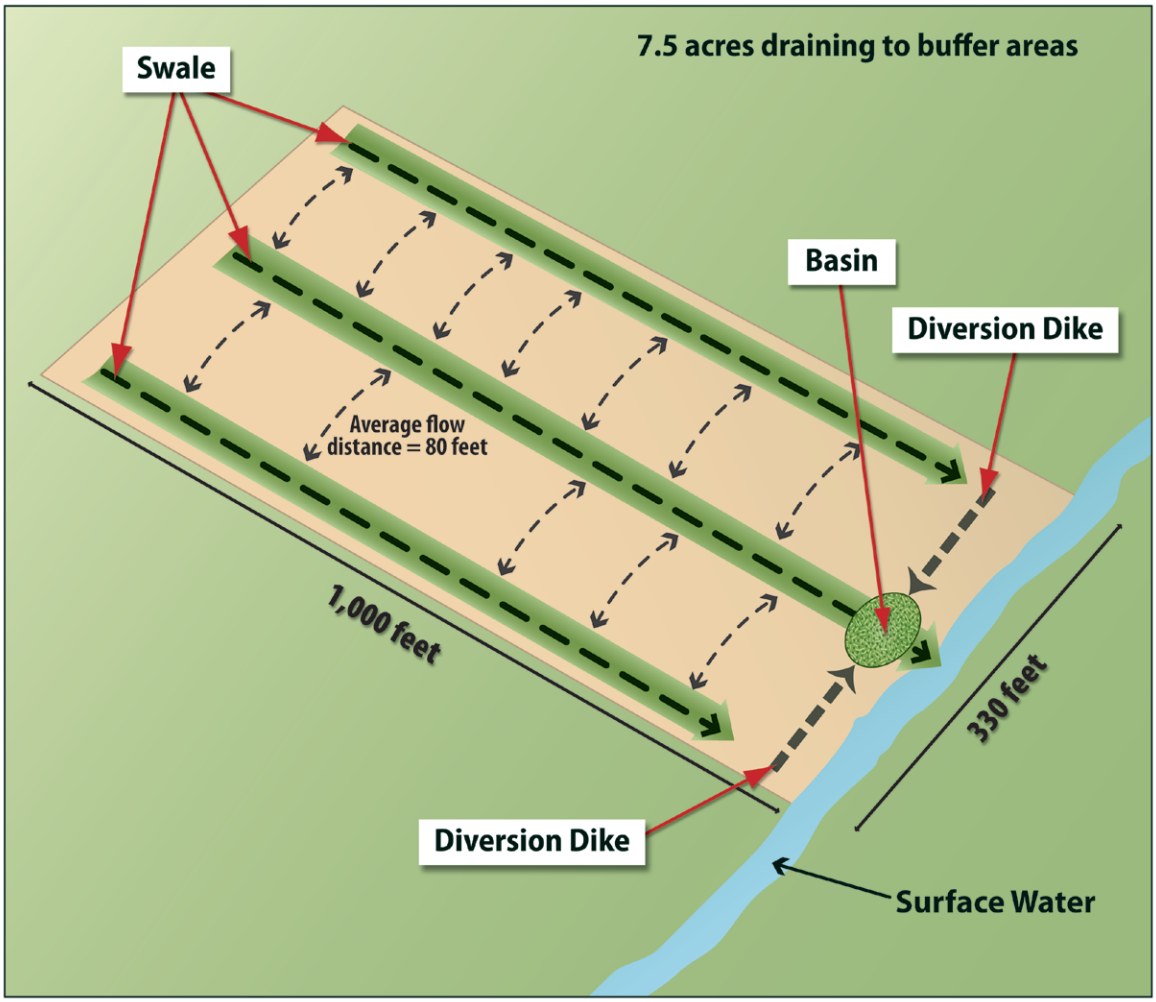
Examples of How to Use the Sediment Removal Efficiency Tables

Example 1. Comparatively Wet Location (7.5 acre site located in Massachusetts)

The operator of a 7.5-acre construction site in Massachusetts has determined that it is infeasible to establish a buffer of any size on their site, and is now required to select and install controls that will achieve an equivalent sediment load reduction as that estimated in G - 9 for their site conditions. The first step is to identify what percentage of eroded sediment is estimated to be retained from a 50-foot buffer. For this example, it is assumed that the site has a relatively uniform gentle slope (3 percent), so Table G - 9 can be used to estimate the 50-foot buffer sediment load reduction. If the site's buffer vegetation is best typified by cool-season dense grass and the underlying soil is of a type best described as loamy sand, the 50-foot buffer is projected to capture 90 percent of eroded sediment from the construction site.

The second step is to determine what sediment controls can be selected and installed in combination with the perimeter controls already required to be implemented at the site (see Part 2.1.2.2), which will achieve the 90 percent sediment removal efficiency from Table G - 9. For this example, using the RUSLE2 profile model, it was determined that installing a pair of shallow-sloped diversion ditches to convey runoff to a well-designed and maintained sediment basin provides 99 percent sediment removal. Because the estimated sediment reduction is greater than the required 90 percent that a 50-foot buffer provides, the operator will have met the buffer requirements. See Figure G - 5. The operator could also choose a different set of controls, as long as they achieve at least a 90 percent sediment removal efficiency.

Figure G - 5. Example 1 – Equivalent Sediment Load Reductions at a 7.5 ac Site in MA.



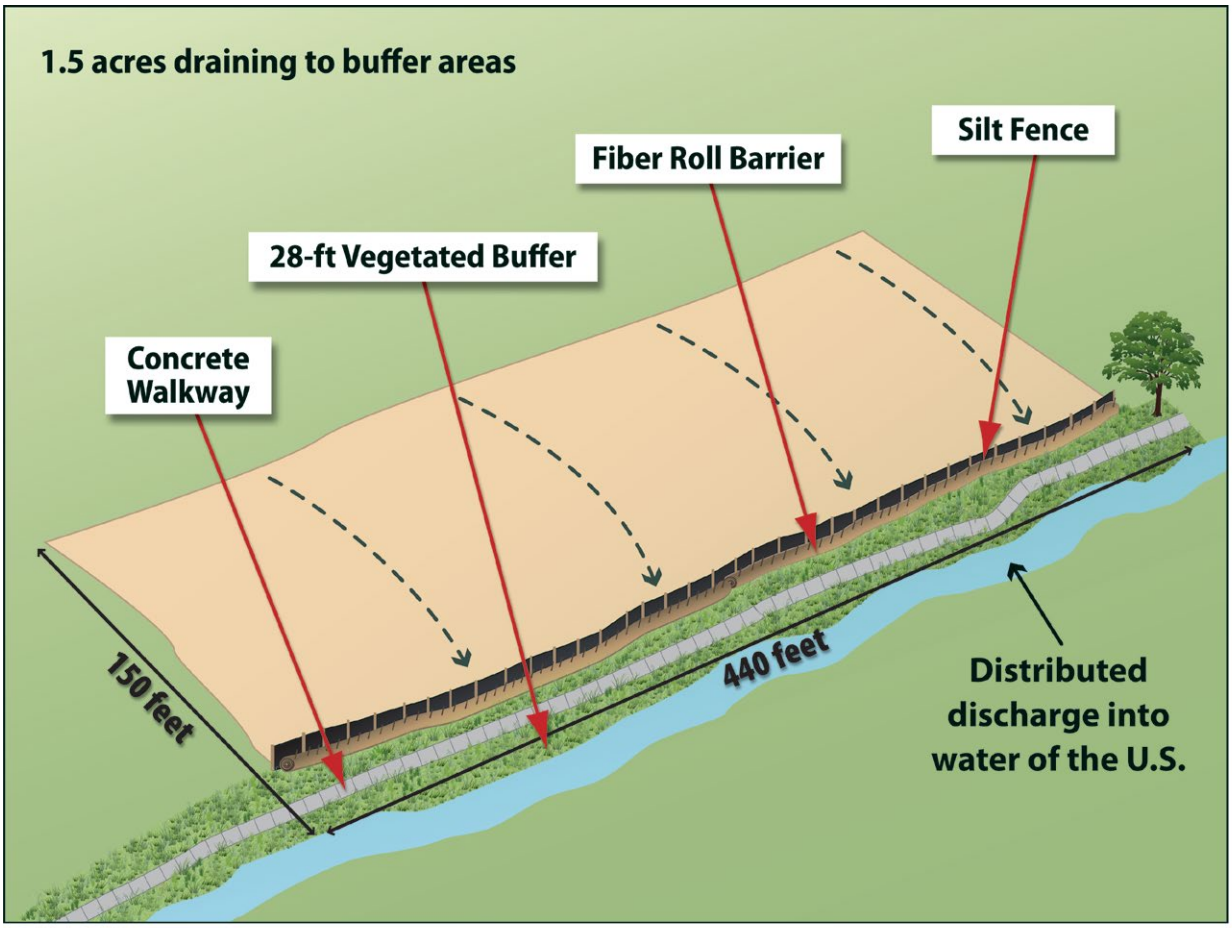
Example 2. Arid Location With Pre-existing Disturbances in the Natural Buffer (6.5 acre site located in New Mexico)

An operator of a site in New Mexico determines that it is not practicable to provide a 50-foot buffer, but a 28-foot buffer can be provided. Because the operator will provide a buffer that is less than 50 feet, the operator must determine which controls, in combination with the 28-foot buffer, achieve a sediment load reduction equivalent to the 50-foot buffer. In this example, the project will disturb 6.5 acres of land, but only 1.5 acres of the total disturbed area drains to the buffer area. Within the 28-foot buffer area is a preexisting concrete walkway. Similar to Example 1, the equivalence analysis starts with Step 1 (Part G.2.2.2) with a review of the New Mexico buffer performance (Table G - 10). The operator determines that the predominate vegetation type in the buffer area is prairie grass and the soil type is similar to silt, and that the site is of a uniform, shallow slope (e.g., 3 percent grade). Although the operator will take credit for the disturbance caused by the concrete walkway as a natural buffer in Step 2, here the operator can treat the entire buffer area as being naturally vegetated with prairie grass. Based on this information, the operator refers to Table G - 10 to estimate that the 50-foot buffer would retain 50 percent of eroded soil.

The second step is to determine, based on the 50 percent sediment removal efficiency found in Table G - 10, what sediment controls in combination with the 28-foot buffer area, can be

implemented to reduce sediment loads by 50 percent or more. The operator does not have to account the reduction in buffer function caused by the preexisting walkway, and can take credit for the entire 28-foot buffer being fully vegetated in the analysis. For this example, using the RUSLE2 profile model, the operator determined that installing a fiber roll barrier between the silt fence (already required by Part 2.1.2.2) and the 28-foot buffer will achieve an estimated 84 percent sediment removal efficiency. See Figure G - 6. Note that this operator is subject to the requirement in Part 2.1.2.1b.i to ensure that discharges through the silt fence, fiber roll barrier, and 28-foot buffer do not cause erosion within the buffer. The estimated sediment reduction is greater than the required 50 percent; therefore the operator will have met the buffer alternative requirement.

Figure G - 6. Example 2 – Equivalent Sediment Load Reductions at a 6.5 ac Site in NM.



Appendix H – 2-Year, 24-Hour Storm Frequencies

Part 2.1.3.2 of the permit indicates that if you install a sediment basin, one of the design requirements is to provide storage for either (1) the calculated volume of runoff from a 2-year, 24-hour storm, or (2) 3,600 cubic feet per acre drained. This appendix is intended to provide a guide to permittees to determine the volume of precipitation associated with their local 2-year, 24-hour storm event.

The permittee should start out by determining their local 2-year, 24-hour storm volume. The rainfall frequency atlases, technical papers, and the Precipitation Frequency Data Server (PFDS) developed by the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) serve as national standards for rainfall intensity at specified frequencies and durations in the United States. Operators of construction projects subject to the numeric effluent limits can use these standards to determine their local 2-year, 24-hour storm. Table H-1 identifies methods for determining precipitation frequency based on permit area. EPA notes that permittees may also use alternative peer-reviewed data sources not listed in Table H - 1 to determine the 2-year, 24-hour storm for their site.

Table H -1 – Method to Determine Precipitation Frequency Based on Permit Area

PERMIT AREA	METHOD TO DETERMINE PRECIPITATION FREQUENCY
District of Columbia	PFDS; NOAA Atlas 14, Vol. 2
Idaho	NOAA Atlas 2, Vol. 5; Technical Paper 40
Massachusetts	Technical Paper 40
New Hampshire	Technical Paper 40
New Mexico	PFDS; Technical Paper 40
Selected Pacific Islands	PFDS; Technical Paper 40
Puerto Rico and the U.S Virgin Islands	PFDS; Technical Paper 40
Other	PFDS; Technical Paper 40; NOAA Atlas 2 or 14

How to Determine Your Local 2-year, 24-hour Storm Size

Projects located in the **District of Columbia, New Mexico, Puerto Rico, U.S. Virgin Islands, or Pacific Island**s can use the PFDS at http://hdsc.nws.noaa.gov/hdsc/pfds/index.html or use NOAA's Atlas 14 Volumes 2, 3, and 5, respectively at http://www.nws.noaa.gov/oh/hdsc/currentpf.htm to determine their precipitation frequency.

The PFDS is an easy to use, point-and-click interface to official U.S. precipitation frequency estimates and intensities. The opening PFDS screen is a clickable map of the United States. Upon clicking on a state, a state-specific interface appears. From this page the user selects the following:

- A location: Either via clicking on the map or manually entering a longitude/latitude coordinate;
- Type of output: Depth-Duration Frequency (DDF) or Intensity-Duration-Frequency (IDF)
- Units: millimeters or inches; and
- Type of estimate: Point or areal.

Additionally, PFDS also serves as a tool for providing references and other information for other current precipitation frequency standards that are not yet updated.

Projects located in the **District of Columbia, Puerto Rico, U.S. Virgin Islands, or Pacific Islands** can use NOAA's Atlas 14 Volumes 2, 3, and 5, respectively at http://www.nws.noaa.gov/oh/hdsc/currentpf.htm or access the PFDS at http://hdsc.nws.noaa.gov/hdsc/pfds/index.html to determine their precipitation frequency.

Projects located in **Massachusetts and New Hampshire**, or other areas not covered by the PFDS or NOAA Atlases will need to use TP-40 to identify the precipitation frequency. TP-40 provides a map of the continental U.S. for the 2-year, 24-hour rainfall. TP40 can be accessed at http://www.nws.noaa.gov/oh/hdsc/PF_documents/TechnicalPaper_No40.pdf. (See also attached map of TP-40)

Projects located in **Idaho** can use the NOAA Atlas 2, Vol. 5 to determine their precipitation frequency. NOTE: Precipitation Frequencies on the NOAA Atlas 2, Vol. 5 are in tenths of an inch and will have to be converted to inches to determine precipitation frequency. NOAA Atlas 2, Vol. 5 can be accessed at http://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas2_Volume5.pdf. (See also attached map of NOAA Atlas 2, Vol. 5)

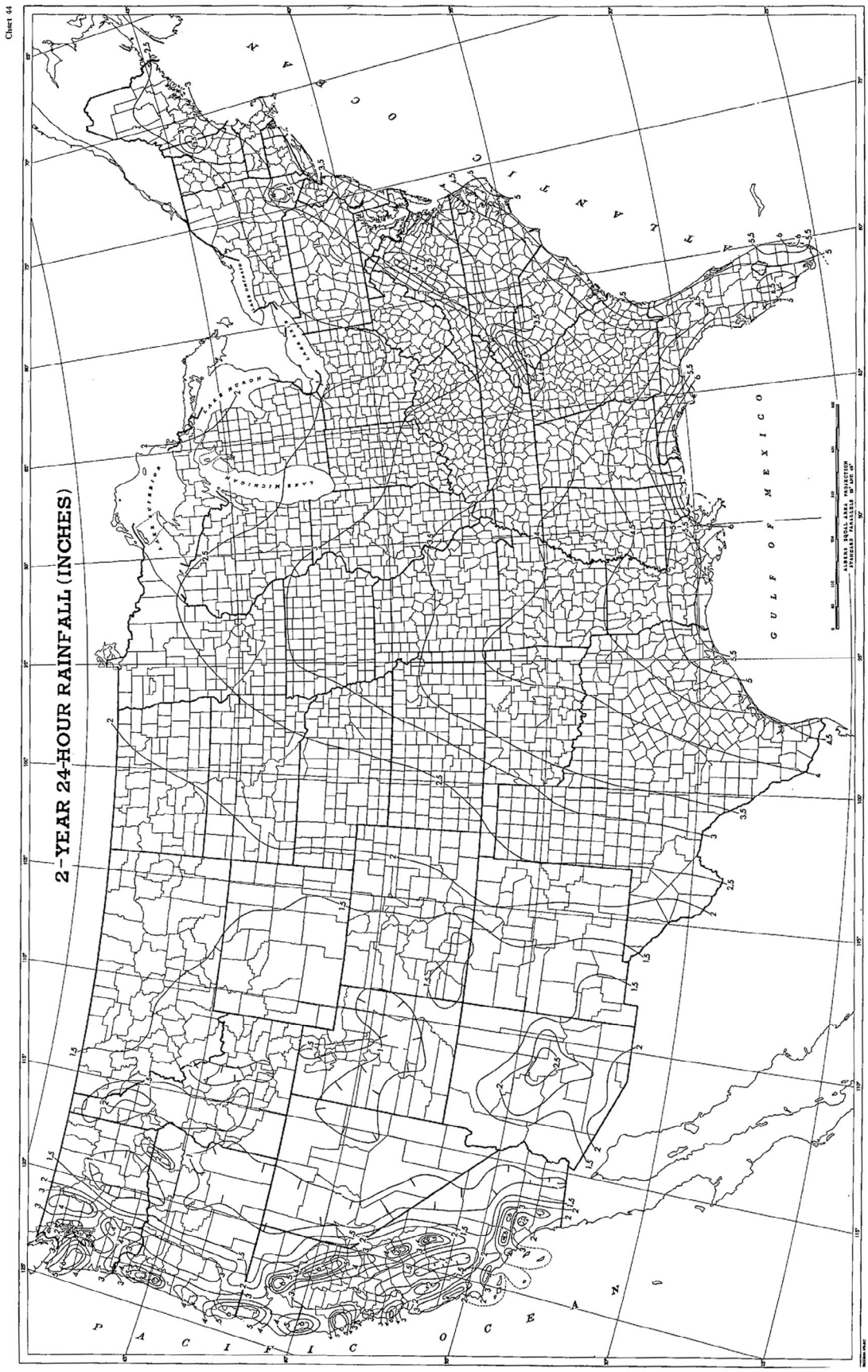
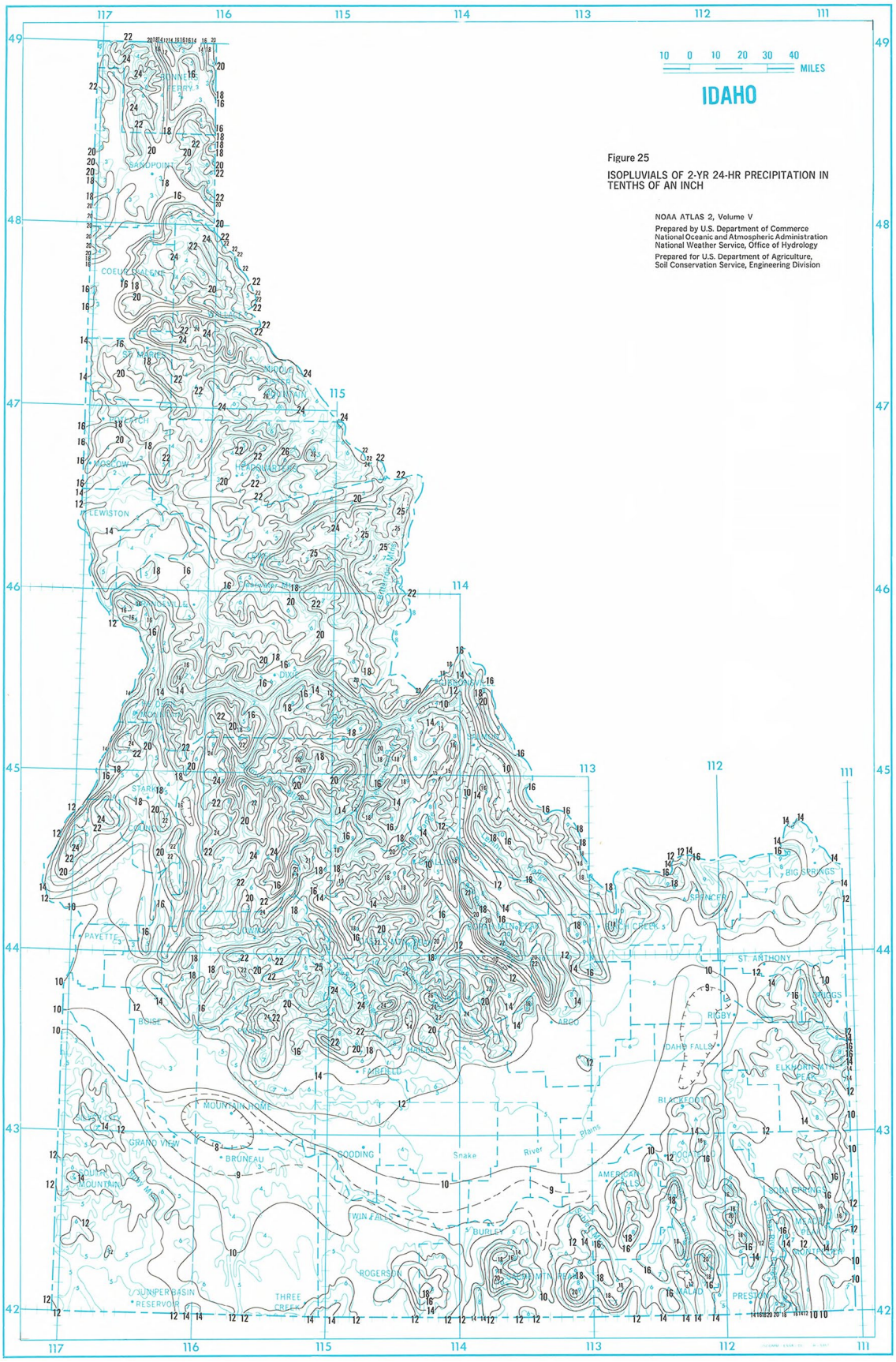


Chart 44
2-YEAR 24-HOUR RAINFALL (INCHES)
GULF OF MEXICO
PACIFIC OCEAN


10 0 10 20 30 40
MILES
IDAHO
Figure 25
ISOPLUVIALS OF 2-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH
NOAA ATLAS 2, Volume V
Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology
Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division
SANDPOINT
COEUR D'ALENE
MOSCOW
LEWISTON
PAYETTE
BOISE
MOUNTAIN HOME
GRAND VIEW
BRUNEAU
GOODING
TWIN FALLS
BURLEY
ROGERSON
JUNIPER BASIN RESERVOIR
THREE CREEK
ARCO
RIGBY
IDAHO FALLS
ST ANTHONY
BIG SPRINGS
SPENCER
AMERICAN FALLS
SODA SPRINGS
PRESTON
Snake
River
Plains

Appendix I - Standard Permit Conditions

Standard permit conditions in Appendix I are consistent with the general permit provisions required under 40 CFR 122.41.

I.1 Duty To Comply.

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

I.1.1 You must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards, even if the permit has not yet been modified to incorporate the requirement.

I.1.2 Penalties for Violations of Permit Conditions: The Director will adjust the civil and administrative penalties listed below in accordance with the Civil Monetary Penalty Inflation Adjustment Rule (61 FR 252, December 31, 1996, pp. 69359-69366, as corrected in 62 FR 54, March 20, 1997, pp.13514-13517) as mandated by the Debt Collection Improvement Act of 1996 for inflation on a periodic basis. This rule allows EPA's penalties to keep pace with inflation. The Agency is required to review its penalties at least once every 4 years thereafter and to adjust them as necessary for inflation according to a specified formula. The civil and administrative penalties following were adjusted for inflation starting in 1996.

I.1.2.1 *Criminal Penalties.*

a. *Negligent Violations*. The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than one year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than two years, or both.

b. *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

c. *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the Act, shall, upon

conviction of violating the imminent danger provision be subject to a fine of not more than $1,000,000 and can fined up to $2,000,000 for second or subsequent convictions.

d. *False Statement*. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

I.1.2.2 *Civil Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $37,500 per day for each violation).

I.1.2.3 *Administrative Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows

a. *Class I Penalty*. Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $16,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $37,500).

b. *Class II Penalty*. Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $11,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $177,500).

I.2 Duty to Reapply.

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain authorization as required by the new permit once EPA issues it.

I.3 Need to Halt or Reduce Activity Not a Defense.

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

I.4 Duty to Mitigate.

You must take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

I.5 Proper Operation and Maintenance.

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by you to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

I.6 Permit Actions.

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

I.7 Property Rights.

This permit does not convey any property rights of any sort, or any exclusive privileges.

I.8 Duty to Provide Information.

You must furnish to EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), within a reasonable time, any information that EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA or an authorized representative upon request, copies of records required to be kept by this permit.

I.9 Inspection and Entry.

You must allow EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), upon presentation of credentials and other documents as may be required by law, to:

I.9.1 Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

I.9.2 Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

I.9.3 Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

I.9.4 Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

I.10 Monitoring and Records.

I.10.1 Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.

I.10.2 You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date the permit expires or the date the permittee's authorization is terminated. This period may be extended by request of EPA at any time.

I.10.3 Records of monitoring information must include:

I.10.3.1 The date, exact place, and time of sampling or measurements;

I.10.3.2 The individual(s) who performed the sampling or measurements;

I.10.3.3 The date(s) analyses were performed

I.10.3.4 The individual(s) who performed the analyses;

I.10.3.5 The analytical techniques or methods used; and

I.10.3.6 The results of such analyses.

I.10.4 Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in the permit.

I.10.5 The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

I.11 Signatory Requirements.

I.11.1 All applications, including NOIs, must be signed as follows:

I.11.1.1 For a corporation: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

I.11.1.2 For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

I.11.1.3 For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive

officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

I.11.2 Your SWPPP, including changes to your SWPPP, inspection reports, and any other compliance documentation required under this permit, must be signed by a person described in Appendix I, Subsection I.11.1 above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

I.11.2.1 The authorization is made in writing by a person described in Appendix I, Subsection I.11.1;

I.11.2.2 The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

I.11.2.3 The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

I.11.3 Changes to Authorization. If an authorization under Part 1.7 is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new NOI satisfying the requirements of Part 1.7 must be submitted to EPA. See Table 1 in Part 1.7.2 of the permit. However, if the only change that is occurring is a change in contact information or a change in the facility's address, the operator need only make a modification to the existing NOI submitted for authorization.

I.11.4 Any person signing documents in accordance with Appendix I, Subsections I.11.1 or I.11.2 above must include the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

I.11.5 For persons signing documents electronically, in addition to meeting other applicable requirements in Appenidx I, Subsection I.11, such signatures must meet the same signature, authentication, and identity-proofing standards set forth at 40 CFR § 3.2000(b) for electronic reports (including robust second-factor authentication).

I.11.6 The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

I.12 Reporting Requirements.

I.12.1 Planned changes. You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

I.12.1.1 The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

I.12.1.2 The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).

I.12.2 Anticipated noncompliance. You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

I.12.3 Transfers. This permit is not transferable to any person except after notice to EPA. Where a facility wants to change the name of the permittee, the original permittee (the first owner or operators) must submit a Notice of Termination pursuant to Part 8. The new owner or operator must submit a Notice of Intent in accordance with Part 1.7 and Table 1. See also requirements in Appendix I, Subsections I.11.1 and I.11.2.

I.12.4 Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.

I.12.4.1 Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.

I.12.4.2 If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.

I.12.5 Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

I.12.6 Twenty-four hour reporting. In addition to reports required elsewhere in this permit:

I.12.6.1 You must report any noncompliance which may endanger health or the environment. Any information must be provided orally within 24 hours from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

I.12.6.2 The following shall be included as information which must be reported within 24 hours under this paragraph.

a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR 122.41(m)(3)(ii))

b. Any upset which exceeds any effluent limitation in the permit

c. Violation of a maximum daily discharge limit for any numeric effluent limitation. (See 40 CFR 122.44(g).)

I.12.6.3 EPA may waive the written report on a case-by-case basis for reports under Appendix I, Subsection I.12.6.2 if the oral report has been received within 24 hours.

I.12.7 Other noncompliance. You must report all instances of noncompliance not reported under Appendix I, Subsections I.12.4, I.12.5, and I.12.6, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix I, Subsection I.12.6.

I.12.8 Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Permitting Authority, you must promptly submit such facts or information.

I.13 Bypass.

I.13.1 Definitions.

I.13.1.1 Bypass means the intentional diversion of waste streams from any portion of a treatment facility See 40 CFR 122.41(m)(1)(i).

I.13.1.2 Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. See 40 CFR 122.41(m)(1)(ii).

I.13.2 Bypass not exceeding limitations. You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix I, Subsections I.13.3 and I.13.4. See 40 CFR 122.41(m)(2).

I.13.3 Notice.

I.13.3.1 Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass. See 40 CFR 122.41(m)(3)(i).

I.13.3.2 Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix I, Subsection I.12.6 (24-hour notice). See 40 CFR 122.41(m)(3)(ii).

I.13.4 Prohibition of bypass. See 40 CFR 122.41(m)(4).

I.13.4.1 Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. You submitted notices as required under Appendix I, Subsection I.13.3.

I.13.4.2 EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix I, Subsection I.13.4.1.

I.14 Upset.

I.14.1 Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

I.14.2 Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix I, Subsection I.14.3 are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. See 40 CFR 122.41(n)(2).

I.14.3 Conditions necessary for a demonstration of upset. See 40 CFR 122.41(n)(3). A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

I.14.3.1 An upset occurred and that you can identify the cause(s) of the upset;

I.14.3.2 The permitted facility was at the time being properly operated; and

I.14.3.3 You submitted notice of the upset as required in Appendix I, Subsection I.12.6.2.b (24 hour notice).

I.14.3.4 You complied with any remedial measures required under Appendix I, Subsection I.4.

I.14.4 Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, have the burden of proof. See 40 CFR 122.41(n)(4).

I.15 Retention of Records.

Copies of the SWPPP and all documentation required by this permit, including records of all data used to complete the NOI to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

I.16 Reopener Clause.

I.16.1 Procedures for modification or revocation. Permit modification or revocation will be conducted according to 40 CFR §122.62, §122.63, §122.64 and §124.5.

I.16.2 Water quality protection. If there is evidence indicating that the stormwater discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, you may be required to obtain an individual permit in accordance with Part 1.7.5 of this permit, or the permit may be modified to include different limitations and/or requirements.

I.16.3 Timing of permit modification. EPA may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines that may be promulgated in the course of the current permit cycle.

I.17 Severability.

Invalidation of a portion of this permit does not necessarily render the whole permit invalid. EPA's intent is that the permit is to remain in effect to the extent possible; in the event that any part of this permit is invalidated, EPA will advise the regulated community as to the effect of such invalidation.

Appendix J - Notice of Intent (NOI) Form and Instructions

Part 1.7.1 requires you to use the electronic NOI system, or "eNOI" system, to prepare and submit your NOI. However, if you are given approval by the EPA Regional Office to use a paper NOI form, and you elect to use it, you must complete and submit the following form.

NPDES FORM 3510-9	EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460 NOTICE OF INTENT (NOI) FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER AN NPDES GENERAL PERMIT	Form Approved. OMB No. 2040-0004

Submission of this Notice of Intent (NOI) constitutes notice that the operator identified in Section II of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section I of this form. Submission of this NOI also constitutes notice that the operator identified in Section II of this form meets the eligibility requirements of Parts 1.1 and 1.2 of the CGP for the project identified in Section III of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in Part 8 of the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage. Refer to the instructions at the end of this form.

I. Approval to Use Paper NOI Form

Have you been given approval from the Regional Office to use this paper NOI form*? ☐ YES ☐ NO

If yes, provide the reason you need to use this paper form, the name of the EPA Regional Office staff person who approved your use of this form, and the date of approval:

Reason for using paper form: _____

Name of EPA staff person: _____

Date approval obtained: _____

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper NOI form.**

II. Permit Information

Tracking Number (EPA Use Only):

Permit Number: (see Appendix B of the CGP for the list of eligible permit numbers)

III. Operator Information

Name:

Phone: - - Ext. Fax (optional): - -

E-mail:

IRS Employer Identification Number (EIN): –

Point of Contact:

First Name, Middle Initial, Last Name:

Mailing Address:

Street:

City: State: Zip Code: -

NOI Preparer (Complete if NOI was prepared by someone other than the certifier):

Prepared by:

First Name, Middle Initial, Last Name:

Organization:

Phone: - - Ext. Fax (optional): - -

E-mail:

IV. Project/Site Information

Project/Site Name:

Project/Site Address:

Street/Location: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

City: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ State: ☐☐ Zip Code: ☐☐☐☐☐ - ☐☐☐☐

County or similar government subdivision: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

For the project/site for you are seeking permit coverage, provide the following information:

Latitude/Longitude (Use one of three possible formats, and specify method):

Latitude 1. ___ ___° ___ ___' ___ ___" N (degrees, minutes, seconds)
2. ___ ___° ___ ___. ___ ___' N (degrees, minutes, decimal)
3. ___ ___. ___ ___ ___ ___° N (degrees decimal)

Longitude 1. ___ ___ ___° ___ ___' ___ ___" W (degrees, minutes, seconds)
2. ___ ___ ___° ___ ___. ___ ___' W (degrees, minutes, decimal)
3. ___ ___ ___. ___ ___ ___ ___° W (degrees decimal)

Latitude/Longitude Data Source: ☐ U.S.G.S. topographic map ☐ EPA web site ☐ GPS ☐ Other: _____

If you used a U.S.G.S. topographic map, what was the scale? _____

Horizontal Reference Datum: ☐ NAD 27 ☐ NAD 83 or WGS 84 ☐ Unknown

Is your project/site located in Indian Country lands, or located on a property of religious or cultural significance to an Indian tribe? ☐ YES ☐ NO

If yes, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property: _____

Are you requesting coverage under this NOI as a "federal operator" as defined in Appendix A? ☐ YES ☐ NO

Estimated Project Start Date: ☐☐ / ☐☐ / ☐☐☐☐ Estimated Project Completion Date: ☐☐ / ☐☐ / ☐☐☐☐

Estimated Area to be Disturbed (to the nearest quarter acre): ☐☐☐☐ . ☐☐

Have earth-disturbing activities commenced on your project/site? ☐ YES ☐ NO

If yes, is your project an "emergency-related project? ☐ YES ☐ NO

Have stormwater discharges from your project/site been covered previously under an NPDES permit? ☐ YES ☐ NO

If yes, provide the Tracking Number if you had coverage under EPA's CGP or the NPDES permit number if you had coverage under an EPA individual permit: ☐☐☐☐☐☐☐☐☐

V. Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ YES ☐ NO

Are there any surface waters within 50 feet of your project's earth disturbances? ☐ YES ☐ NO

Receiving Waters and Wetlands Information: (Attach a separate list if necessary)

Provide the name(s) of the first surface water that received stormwater directly from your site and/or from the MS4:	Provide the names of any impaired waters to which you discharge and the pollutant(s) for which they are impaired		Provide the names of any waters to which you discharge for which there is an EPA approved or established TMDL, the name of the TMDL, and the pollutant(s) for which there is a TMDL		
	Surface water name:	Pollutant(s) causing the impairment:	Surface water name:	TMDL name:	Pollutant(s) for which there is a TMDL:

Impaired Waters

Describe the methods you used to complete the above table:

_____

_____

Are any of the surface waters to which you discharge designated by the state or tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water) or as a Tier 3 water (Outstanding Natural Resource Water)? (See Appendix F).

☐ YES ☐ NO

If yes, name(s) of receiving water(s) and its designation (Tier 2, Tier 2.5 or Tier 3): _____

VI. Chemical Treatment Information

Will you use polymers, flocculants, or other treatment chemicals at your construction site? ☐ YES ☐ NO

If yes, will you use cationic treatment chemicals at your construction site*? ☐ YES ☐ NO

If yes, have you been authorized to use cationic treatment chemicals by your applicable EPA Regional Office in advance of filing your NOI*?
☐ YES ☐ NO

If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

Please indicate the treatment chemicals that you will use: _____

_____

* Note: You are ineligible for coverage under this permit unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

VII. Stormwater Pollution Prevention Plan (SWPPP) Information

Has the SWPPP been prepared in advance of filing this NOI? ☐ YES ☐ NO

SWPPP Contact Information:

First Name, Middle Initial Last Name: _____ _____ _____

Organization Name: _____

Phone: ___ - ___ - ____ Ext. ____ Fax (optional): ___ - ___ - ____

E-mail: _____

VIII. Endangered Species Protection

Using the instructions in Appendix D of the CGP, under which criterion listed in Appendix D are you eligible for coverage under this permit (only check 1 box)?

☐ A ☐ B ☐ C ☐ D ☐ E ☐ F

Provide a brief summary of the basis for criterion selection listed in Appendix D (e.g., communication with U.S. Fish and Wildlife Service or National Marine Fisheries Service, specific study): _____

_____

If you select criterion B, provide the Tracking Number from the other operator's notification of authorization under this permit: _____

If you select criterion C, you must attach a copy of your site map (see Part 7.2.6 of the permit), and you must answer the following questions:

What federally-listed species or federally-designated critical habitat are located in your "action area": _____

_____

What is the distance between your site and the listed species or critical habitat (miles): _____

_____

If you select criterion D, E, or F, attach copies of any letters or other communications between you and the U.S. Fish and Wildlife Service or National Marine Fisheries Service.

IX. Historic Preservation

Are you installing any stormwater controls as described in Appendix E that require subsurface earth disturbance? (Appendix E, Step 1) ☐ YES ☐ NO

If yes, have prior surveys or evaluations conducted on the site have already determined historic properties do not exist, or that prior disturbances have precluded the existence of historic properties? (Appendix E, Step 2) ☐ YES ☐ NO

If no, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? (Appendix E, Step 3) ☐ YES ☐ NO

If no, did the SHPO, THPO, or other tribal representative (whichever applies) respond to you within the 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties? (Appendix E, Step 4) ☐ YES ☐ NO

If yes, describe the nature of their response:

☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions

☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls

☐ Other: _____

_____

X. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

First Name, Middle Initial, Last Name: _____ ___ _____

Title: _____

Signature: _____ Date: __ / __ / ____

Email: _____

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form Date (2/16) This Form Replaces Form 3510-9 (11/08) Form Approved OMB No. 2040-0004

Who Must File an NOI Form

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.; the Act), federal law prohibits stormwater discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) permit. Operator of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must submit an NOI to obtain coverage under an NPDES general permit. Each person, firm, public organization, or any other entity that meets either of the following criteria must file this form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with the permit conditions. If you have questions about whether you need a NPDES stormwater permit, or if you need information to determine whether EPA or your state agency is the permitting authority, refer to www.epa.gov/npdes/stormwater/cgp or telephone EPA's NOI Processing Center at (866) 352-7755.

Where to File NOI Form

Completed NOI forms must be sent to the Regional EPA Office corresponding to the area where your construction site is located. The following is a list of Regional Office addresses:

Region 1: Connecticut, Massachusetts, New Hampshire, Rhode Island, and Vermont.

U.S. EPA Region 1
Office of Ecosystem Protection
5 Post Office Square – CIP
Boston, MA 02114

Region 2: New Jersey, New York, Puerto Rico, and Virgin Islands.

For Puerto Rico and the Virgin Islands:
U.S. EPA Region 2
Caribbean Environmental Protection Division
Environmental Management Branch
Centro Europa Building
1492 Ponce de Leon Avenue, Suite 417
San Juan, PR 00907-4127

For New Jersey and New York:
U.S. EPA Region 2
Division of Environmental Planning and Protection
290 Broadway
New York, NY 10007-1866

Region 3: Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia.

U.S. EPA Region 3
Water Protection Division (3WP40)
Stormwater Coordinator
1650 Arch Street
Philadelphia, PA 19103

Region 4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee.

U.S. EPA Region 4
Clean Water Act Enforcement Section
Water Programs Enforcement Branch
Water Management Division
Atlanta Federal Center
61 Forsyth Street SW
Atlanta, GA 30303

Region 5: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

U.S. EPA Region 5
Water Division
NPDES Programs Branch
77 W. Jackson Blvd.
Mail Code WN16J
Chicago, IL 60604

Region 6: Arkansas, Louisiana, Oklahoma, Texas, and New Mexico (except see Region 9 for Navajo lands, and see Region 8 for Ute Mountain Reservation lands).

U.S. EPA Region 6
Stormwater Coordinator
Compliance Assurance and Enforcement Division (6EN-WC)
EPA SW MSGP
P.O. Box 50625
Dallas, TX 75205

Region 7: Iowa, Kansas, Missouri, Nebraska.

U.S. EPA - Region 7
901 N. 5th Street
Kansas City, KS 66101

Region 8: Colorado, Montana, North Dakota, South Dakota, Wyoming, Utah (except see Region 9 for Goshute Reservation and Navajo Reservation lands), the Ute Mountain Reservation in New Mexico, and the Pine Ridge Reservation in Nebraska.

U.S. EPA Region 8
Stormwater Coordinator (8P-W-P)
999 18th Street, Suite 300
Denver, CO 80202-2466

Region 9: Arizona, California, Hawaii, Nevada, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, the Goshute Reservation in Utah and Nevada, the Navajo Reservation in Utah, New Mexico, and Arizona, the Duck Valley Reservation in Idaho, Fort McDermitt Reservation in Oregon.

U.S. EPA Region 9
Water Management Division, WTR-5
Stormwater Coordinator
75 Hawthorne Street
San Francisco, CA 94105

Region 10: Alaska, Idaho, Oregon (except see Region 9 for Fort McDermitt Reservation), Washington.

U.S. EPA Region 10
Office of Water and Watersheds OWW-130
Stormwater Coordinator
1200 6th Avenue
Seattle, WA 98101

Instructions for Completing EPA Form 3510-9

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form Date (2/16) This Form Replaces Form 3510-9 (11/08) Form Approved OMB No. 2040-0004

Completing the Form

Obtain and read a copy of the 2012 Construction General Permit, viewable at www.epa.gov/npdes/stormwater/cgp. To complete this form, type or print uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, refer to www.epa.gov/npdes/stormwater/cgp or telephone EPA's NOI Processing Center at (866) 352-7755. Please submit the original document with signature in ink - do not send a photocopied signature.

Section I. Approval to Use Paper NOI Form

You must indicate whether you have been given approval by the EPA Regional Office to use a paper NOI. Note that you are not authorized to use this paper NOI form unless the Regional Office has approved its use. Verbal approval from the Regional Office is sufficient. Where you have obtained approval to use this form, indicate the reason you need to use this form, the name of the EPA Regional Office staff person who provided approval for use of this form, and the date that approval was provided. See www.epa.gov/npdes/stormwater/contacts for a list of EPA Regional Office contacts.

Section II. Permit Number

Provide the number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible permit numbers).

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application. Refer to Appendix A of the permit for the definition of "operator". Provide the employer identification number (EIN from the Internal Revenue Service; IRS), also commonly referred to as your taxpayer ID. If the applicant does not have an EIN enter "NA" in the space provided. Also provide a point of contact, the operator's mailing address, telephone number, fax number (optional) and e-mail address (to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the facility SWPPP contact or a consultant for the certifier's signature), include the full name, organization, phone number and email address of the NOI preparer.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

Provide the latitude and longitude of your facility either in degrees, minutes, seconds; degrees, minutes, decimal; or degrees decimal format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and EPA's web-based siting tools, among others. Refer to www.epa.gov/npdes/stormwater/cgp for further guidance on the use of these methodologies. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. Applicants must specify which method they used to determine latitude and longitude. If a U.S.G.S. topographic map is used, applicants are required to specify the scale of the map used. If known, enter the horizontal reference datum for your latitude and longitude. The horizontal reference datum used on USGS topographic maps is shown on the bottom left corner of USGS topographic maps; it is also available for GPS receivers. If you use EPA's web siting tool, or if you are unsure of the horizontal reference datum for your site, please check the "unknown" box.

Indicate whether the project is in Indian country lands or located on a property of religious or cultural significance to an Indian tribe, and if so, provide the name of the Indian tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property.

Indicate whether you are seeking coverage under this permit as a "federal operator" as defined in Appendix A.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 10/06/2012). Indicate to the nearest quarter acre the estimated area to be disturbed.

Indicate whether earth-disturbing activities have already commenced on your project/site. If earth-disturbing activities have commenced on your site because stormwater discharges from the site have been previously covered under a NPDES permit, you must provide the CGP Tracking Number or the NPDES permit number if coverage was under an individual permit.

Section V. Discharge Information

Indicate whether discharges from the site will enter into a municipal separate storm sewer system (MS4), as defined in Appendix A.

Also, indicate whether any surface waters (as defined in Appendix A) exist either on or within 50 feet from your site. Note that if "yes", you are required to comply with the requirement in Part 2.1.2.1 of the permit to provide natural buffers or equivalent sediment controls.

You must specify the names of any surface waters that receive stormwater directly from your site and/or from the MS4 to which you discharge. You must also specify the names of any surface waters that you discharge to that are listed as "impaired" as defined in Appendix A, including any waters for which there is an approved or established TMDL, and the pollutants for which the water is impaired or for which there is a TMDL. This information will be used to determine if the site discharges to an impaired waterbody, which triggers additional requirements in Part 3.2.2 of the permit. Applicants must specify which method they used to determine whether or not their site discharges to impaired waters. Also, if a TMDL has been approved or established, identify the title or reference of the TMDL document.

Indicate whether discharges from the site will enter into a surface water that is designated as a Tier 2, Tier 2.5, or Tier 3 water. A list of Tier 2, 2.5, and 3 waters is provided as Appendix F. If the answer is "yes", name all waters designated as Tier 2, Tier 2.5, or Tier 3 to which the site will discharge.

Section VI. Chemical Treatment Information

Indicate whether the site will use polymers, flocculants, or other treatment chemicals. Indicate whether the site will employ cationic treatment chemicals. If the answer is "yes" to either question, indicate which chemical(s) you will use. Note that you are not eligible for coverage under this permit to use cationic treatment chemicals unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. Examples of cationic treatment chemicals include, but are not limited to, cationic polyacrylamide (C-PAM), PolyDADMAC (POLYDIALLYLDIMETHYLAMMONIUM CHLORIDE), and chitosan.

Section VII. Stormwater Pollution Prevention Plan (SWPPP) Information

All sites eligible for coverage under this permit are required to prepare a SWPPP in advance of filing the NOI, in accordance with Part 7. Indicate whether the SWPPP has been prepared in advance of filing the NOI.

Indicate the street, city, state, and zip code where the SWPPP can be found. Indicate the contact information (name, organization, phone, fax (optional), and email) for the person who developed the SWPPP for this project.

Section VIII. Endangered Species Information

Using the instructions in Appendix D, indicate under which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of federally listed endangered and threatened species and designated critical habitat. A description of the basis for the criterion selected must also be provided.

If criterion B is selected, provide the Tracking Number for the other operator who had previously certified their eligibility under criterion A, C, D, E, or F. The Tracking Number was assigned when the operator received coverage under this permit, and is included in the notice of authorization.

If criterion C is selected, you must attach copies of your site map. See Part 7.2.6 of the permit for information about what is required to be in your site map. You must also specify the federally-listed species or federally-designated critical habitat that are located in the "action area" of the project, and provide the distance between the construction site and any listed endangered species or their critical habitat.

If criterion D, E, or F is selected, attach copies of any communications between you and the U.S. Fish and Wildlife Service and National Marine Fisheries Service.

Section IX. Historic Preservation

Use the instructions in Appendix E to complete the questions on the NOI form regarding historic preservation.

Section X. Certification Information

All applications, including NOIs, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA). Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

Modifying Your NOI

If after submitting your NOI you need to correct or update any fields on this NOI form, you may do so by submitting a paper modification form, which you can obtain at the following link: http://www.epa.gov/npdes/pubs/cgp_modify.pdf

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form Date (2/16) This Form Replaces Form 3510-9 (11/08) Form Approved OMB No. 2040-0004

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

Visit this website for mailing instruction:
www.epa.gov/npdes/stormwater/application_coverage

Visit this website for instructions on how to submit electronically:
www.epa.gov/npdes/stormwater/cgpenoi

Appendix K - Notice of Termination (NOT) Form and Instructions

Part 8.3 requires you to use the electronic NOI system, or "eNOI" system, to prepare and submit your NOT. However, where your EPA Regional Office specifically authorizes you to use a paper NOT form, you are required to complete and submit the following form.

NPDES FORM 3510-13	EPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, DC 20460 NOTICE OF TERMINATION (NOT) FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER AN NPDES GENERAL PERMIT	Form Approved. OMB No. 2040-0004

Submission of this Notice of Termination constitutes notice that the operator identified in Section II of this form is no longer authorized discharge pursuant to the NPDES Construction General Permit (CGP) from the site identified in Section III of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

I. Approval to Use Paper NOT Form

Have you been given approval from the Regional Office to use this paper NOT form*? ☐ YES ☐ NO

*** Note: You must have been given approval by the Regional Office prior to using this paper NOT form.**

II. Permit Information

NPDES Stormwater General Permit Tracking Number: ☐☐☐☐☐☐☐☐☐

Reason for Termination (Check only one):

- ☐ You have completed earth-disturbing activities at your site, and you have met all other requirements in Part 8.2.1.
- ☐ Another operator has assumed control over all areas of the site and that operator has submitted an NOI and obtained coverage under the CGP.
- ☐ You have obtained coverage under an individual permit or another general NPDES permit addressing stormwater discharges from the construction site.

III. Operator Information

Name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

IRS Employer Identification Number (EIN): ☐☐ – ☐☐☐☐☐☐☐

Mailing Address:

Street: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

City: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ State: ☐☐ Zip Code: ☐☐☐☐☐ - ☐☐☐☐

Phone: ☐☐☐ - ☐☐☐ - ☐☐☐☐ Ext. ☐☐☐☐ Fax (optional): ☐☐☐ - ☐☐☐ - ☐☐☐☐

E-mail: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

IV. Project/Site Information

Project/Site Name: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Project/Site Address:

Street/Location: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

City: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ State: ☐☐ Zip Code: ☐☐☐☐☐ - ☐☐☐☐

County or similar government subdivision: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

V. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

First Name, Middle Initial, Last Name: ☐☐☐☐☐☐☐☐☐☐☐☐ ☐ ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Title: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Signature: _____ Date: ☐☐ / ☐☐ / ☐☐☐☐

Email: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Notice of Termination (NOT) of Coverage Under an NPDES General Permit for Stormwater Discharges Associated with Construction Activity

NPDES Form Date (2/16) This Form Replaces Form 3510-13 (12/08) Form Approved OMB No. 2040-0004

Who May File an NOT Form

Permittees who are presently covered under the EPA-issued 2012 Construction General Permit (CGP) for Stormwater Discharges Associated with Construction Activity may submit an NOT form when: (1) earth-disturbing activities at the site are completed and the conditions in Parts 8.2.1.1 thru 8.2.1.5 are met; or (2) the permittee has transferred all areas under its control to another operator, and that operator has submitted and obtained coverage under this permit; or (3) the permittee has obtained coverage under a different NPDES permit for the same discharges.

Completing the Form

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to www.epa.gov/npdes/stormwater/cgp or telephone EPA's NOI Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Approval to Use Paper NOT Form

You must indicate whether you have been given approval by the EPA Regional Office to use a paper NOT. Note that you are not authorized to use this paper NOT form unless the Regional Office has approved its use.

Section II. Permit Number

Enter the existing NPDES Stormwater General Permit Tracking Number assigned to the project by EPA's Stormwater Notice Processing Center. If you do not know the permit tracking number, refer to http://www.epa.gov/npdes/stormwater/cgp or contact EPA's NOI Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one:

You have completed earth-disturbing activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.6.3) and you have met all other requirements in Part 8.2.1.

Another operator has assumed control over all areas of the site and that operator has submitted an NOI and obtained coverage under the CGP.

You have obtained coverage under an individual permit or another general NPDES permit addressing stormwater discharges from the construction site.

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application and is covered by the permit tracking number identified in Section I. Refer to Appendix A of the permit for the definition of "operator". Provide the employer identification number (EIN from the Internal Revenue Service; IRS). If the applicant does not have an EIN enter "NA" in the space provided. Enter the complete mailing address, telephone number, and email address of the operator. Optional: enter the fax number of the operator.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section V. Certification Information

All applications, including NOIs, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 0.5 hours per notice, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460. Include the OMB number on any correspondence. Do not send the completed form to this address.

Visit this website for mailing instruction:
www.epa.gov/npdes/stormwater/application_coverage

Visit this website for instructions on how to submit electronically:
www.epa.gov/npdes/stormwater/cgpenoi

Appendix C – Copy of NOI and EPA Authorization email

Appendix D – Copy of Inspection Form

Appendix E – Copy of Corrective Action Form

Appendix F – *Sample* SWPPP Amendment Log

Instructions (see CGP Part 7.4):

- Create a log here of changes and updates to the SWPPP. You may use the table below to track these modifications.
- SWPPP modifications are required pursuant to CGP Part 7.4.1 in the following circumstances:
  - ✓ Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater control measures, pollution prevention measures, or other activities at your site that are no longer accurately reflected in your SWPPP;
  - ✓ To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;
  - ✓ If inspections or investigations determine that SWPPP modifications are necessary for compliance with this permit;
  - ✓ Where EPA determines it is necessary to impose additional requirements on your discharge; and
  - ✓ To reflect any revisions to applicable federal, state, tribal, or local requirements that affect the stormwater control measures implemented at the site.
- If applicable, if a change in chemical treatment systems or chemically-enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

Appendix G – *Sample* Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____

Date: _____

Appendix H – *Sample* Grading and Stabilization Activities Log

Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** (Indicate Temporary or Permanent)	**Date When Stabilization Measures Initiated**

Appendix I – *Sample* SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name:

Project Location:

Instructor's Name(s):

Instructor's Title(s):

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

- ❑ **Sediment and Erosion Controls**
- ❑ **Emergency Procedures**
- ❑ **Stabilization Controls**
- ❑ **Inspections/Corrective Actions**
- ❑ **Pollution Prevention Measures**

Specific Training Objective:_____

_____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		

Appendix J – *Sample* Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix I of EPA's Construction General Permit (CGP), and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix I.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

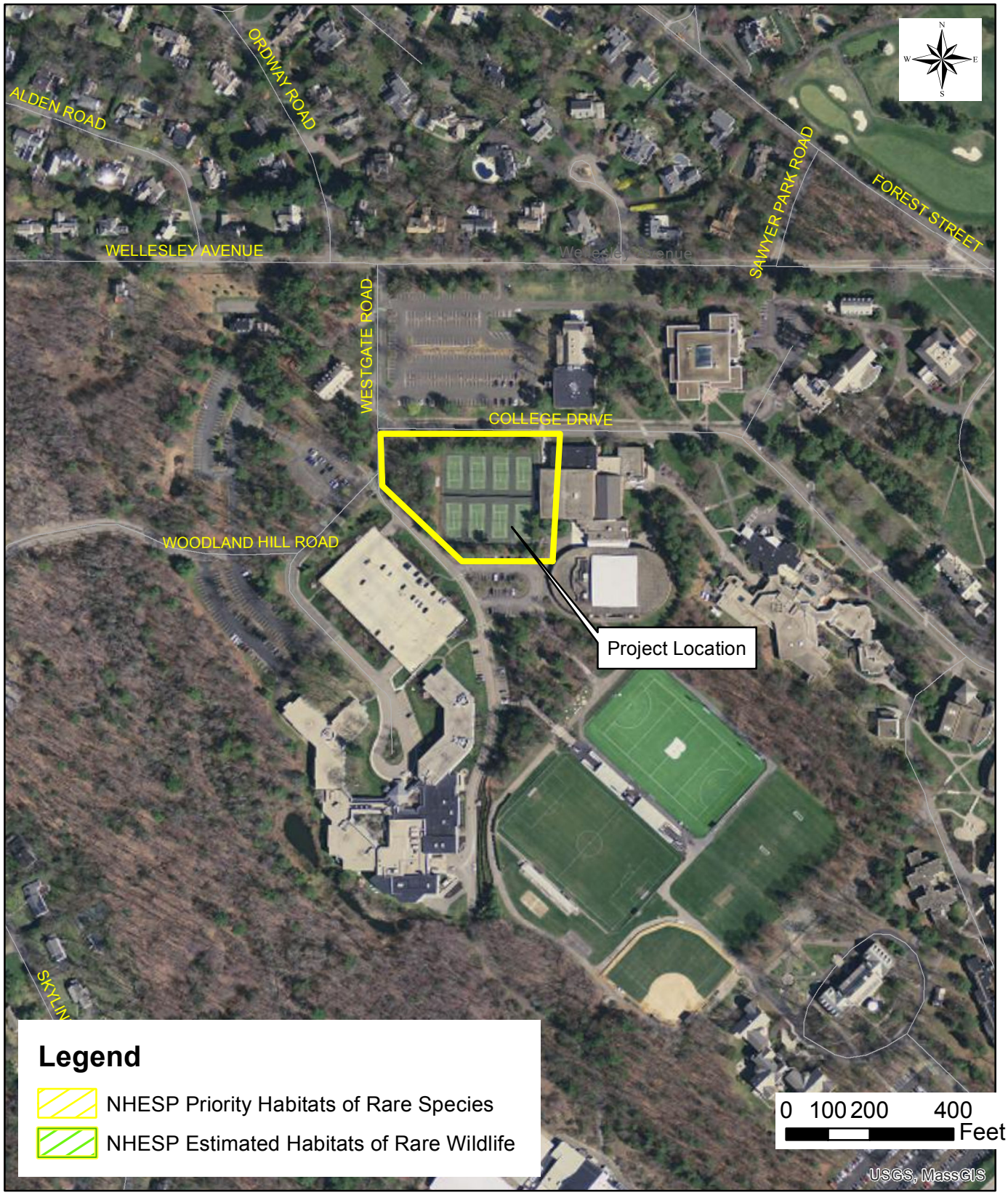
Company: _____

Title: _____

Signature: _____

Date: _____

Appendix K – Endangered Species Documentation



Appendix K: NHESP

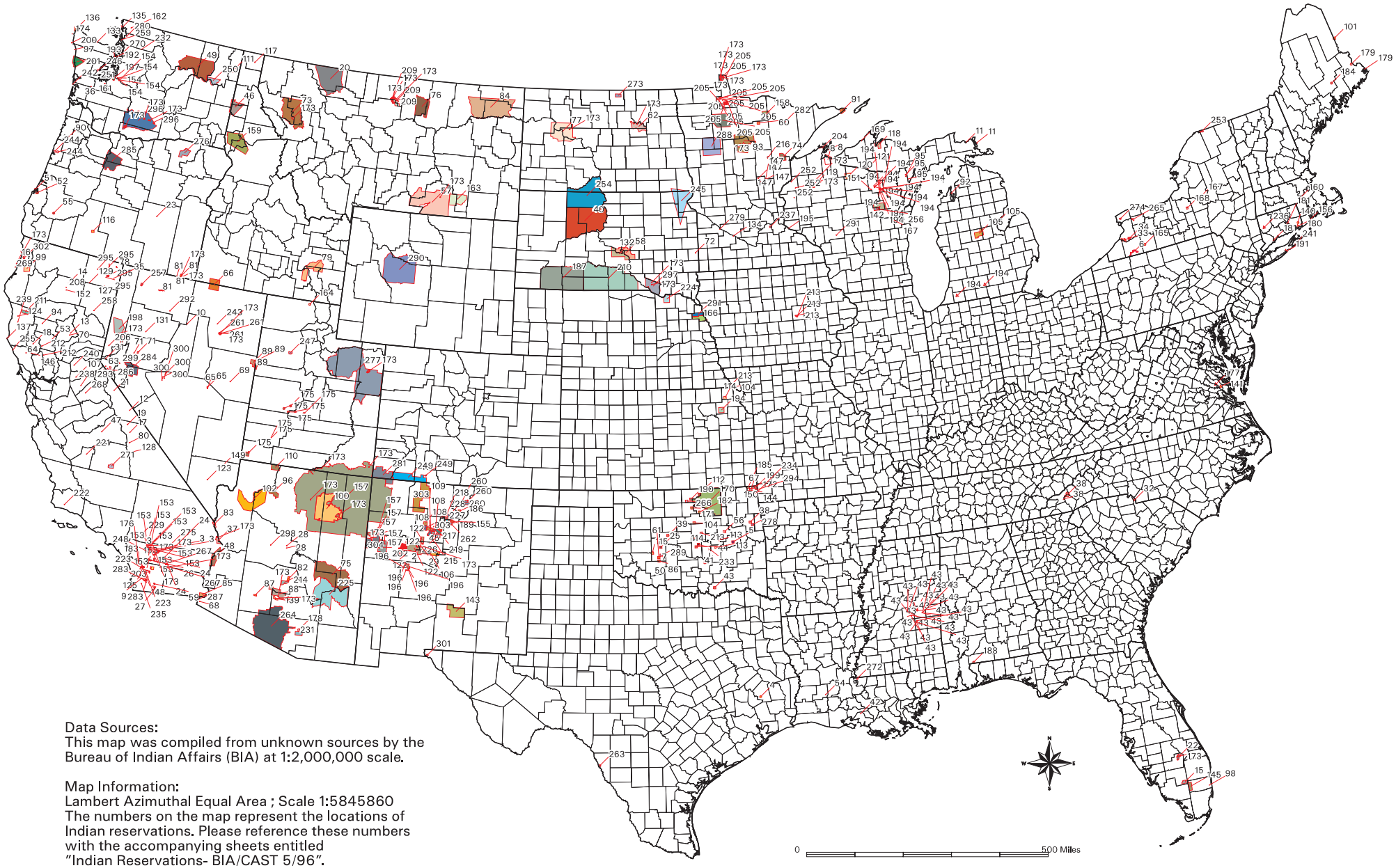
Webster Athletic Center
Renovation and Expansion

Data Source: MassGIS
Nitsch Project #10070

Nitsch Engineering

Appendix L – Historic Properties Documentation

Indian Reservations in the Continental United States



Data Sources:
This map was compiled from unknown sources by the Bureau of Indian Affairs (BIA) at 1:2,000,000 scale.

Map Information:
Lambert Azimuthal Equal Area ; Scale 1:5845860
The numbers on the map represent the locations of Indian reservations. Please reference these numbers with the accompanying sheets entitled "Indian Reservations- BIA/CAST 5/96".

Community Preservation Act (CPA) Points
- Mixed Types
- OpenSpace
- Housing
- Recreation
- Historic

Appendix L: Historic Site

Webster Athletic Center
Renovation and Expansion

Data Source: MassGIS
Nitsch Project #10070

Nitsch Engineering

APPENDIX II

APPLICATION FOR REVIEW OF A PROJECT OF SIGNIFICANT IMPACT

Webster Athletic Center Renovation and Expansion

TRAFFIC IMPACT AND ACCESS STUDY, prepared by TEPP LLC

TRAFFIC IMPACT AND ACCESS STUDY

WEBSTER ATHLETIC CENTER RENOVATION AND EXPANSION
Babson College, Wellesley, Massachusetts

October 7, 2016

Prepared For
Babson College

TEPP LLC TRANSPORTATION ENGINEERING, PLANNING AND POLICY

TRAFFIC IMPACT AND ACCESS STUDY

WEBSTER ATHLETIC CENTER RENOVATION AND EXPANSION
Babson College, Wellesley, Massachusetts

October 7, 2016

Prepared For
Babson College

TEPP LLC **TRANSPORTATION ENGINEERING, PLANNING AND POLICY**

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SUMMARY

PROJECT DESCRIPTION

Babson College (Babson) has retained TEPP LLC to prepare this traffic impact and access study (TIAS) conforming to the Town of Wellesley's Project of Significant Impact (PSI) regulations for Webster Athletic Center Renovation and Expansion Project (Proposed Project) on the Babson campus in Wellesley, Massachusetts.

- The Proposed Project will not result in increased student enrollment.
- The Proposed Project is not anticipated to materially increase area traffic, particularly during the AM and PM peak hours.
- This study will evaluate the impact of the Proposed Project in accordance with the Municipal System Impact Analysis Regulations and other applicable requirements that are contained in the Zoning Bylaw.

The Proposed Project location (Project Site) in relation to the surrounding roadway network is shown in **Figure 1**. The Proposed Project is an expansion and renovation of the existing Webster Athletic Center located at 3 Babson College Drive. The adjacent tennis courts will be removed (and relocated elsewhere on the campus) and an addition housing recreational athletic activities will be built in the location of the existing tennis courts. This facility will not result in an increase to the student body or the faculty. In addition, new pathways will be provided to link the athletic center to existing parking lots.

Figure 1. Site location.

STUDY SCOPE

This TIAS reflects and conforms to the requirements of Section XVI-A of the Wellesley Zoning Bylaw for Projects of Significant Impact.

The TIAS study area consists of the following intersections:

- Wellesley Avenue/Forest Street unsignalized intersection
- Wellesley Avenue/Babson West Gate unsignalized intersection
- Forest Street/Babson Main Gate unsignalized intersection

This TIAS analyzes traffic operations for the weekday AM and PM peak hours under the following conditions:

- 2016 existing
- 2017 no-build (with background traffic growth)
- 2023 build (with background traffic growth and the Proposed Project)

SIGHT DISTANCES

TEPP LLC measured/observed relevant available sight distances and roadway vehicle speeds for the following unsignalized intersections:

- Wellesley Avenue/Forest Street unsignalized intersection.
- Babson West Gate driveway on Wellesley Avenue.
- Babson Main Gate driveway on Forest Street.

The available sight distances will be adequate. Sight lines should be maintained to prevent inappropriate roadside obstructions or vegetation.

ACCIDENTS

Accident data for the study area intersections were obtained from the Massachusetts Department of Transportation (MassDOT) for the period from 2012 to 2014, the latest three years of available data. The crash rates were below state-wide and District 6 averages.

TRIP GENERATION

The existing Babson driveways are not expected to see an increase in traffic as a result of the Proposed Project.

The current campus generates the following vehicle-trips:

- West Gate Driveway along Wellesley Avenue
  - Weekday daily, 2,843 (total of in and out)
  - Weekday AM peak hour, 260 (237 in and 23 out)
  - Weekday PM peak hour, 333 (103 in and 230 out)
- Main Gate Driveway along Forest Street
  - Weekday daily, 4,084 (total of in and out)
  - Weekday AM peak hour, 223 (194 in and 29 out)
  - Weekday PM peak hour, 343 (115 in and 228 out)

- Total of both driveways
  - Weekday daily, 6,927 (total of in and out)
  - Weekday AM peak hour, 483 (431 in and 52 out)
  - Weekday PM peak hour, 676 (218 in and 458 out)

This TIAS includes historic and campus traffic generation from 1993 to 2016, based on traffic counts at Babson Main Gate driveway and Babson West Gate driveway. Weekday AM peak hour and weekday PM peak hour trip generation have been relatively constant. This is despite the addition of several hundred thousand square feet of campus floor area since 1993. Over the past decade, overall total enrollment has been relatively stable. Classes being offered at the Babson's Boston campus may decrease graduate school traffic generation.

AREA TRAFFIC VOLUMES

TEPP LLC obtained the existing daily and peak-hour traffic-volumes along the study area roadway and intersections. Future volume increases are only expected as a result of background area growth. The current area traffic volumes on the area roadways include:

- Wellesley Avenue west of Babson West Gate driveway
  - Weekday daily, 7,878 (total both directions)
  - Weekday AM peak hour, 766 (575 eastbound and 191 westbound)
  - Weekday PM peak hour, 761 (254 eastbound and 565 westbound)
- Forest Street (east of Babson Main Gate driveway)
  - Weekday daily, 6,109 (total both directions)
  - Weekday AM peak hour, 571 (194 eastbound and 377 westbound)
  - Weekday PM peak hour, 554 (301 eastbound and 253 westbound)

CAPACITY ANALYSIS

TEPP LLC conducted capacity analysis for the weekday AM and PM peak hours under the existing and future conditions as described above for all relevant study-area intersections to calculate levels of service, delays and queues.

Capacity analysis findings are:

- The Wellesley Avenue/Forest Street intersection shows delayed operations during the weekday AM and PM peak hours. However, the Proposed Project is not expected to impact these operations.
- The channelized movements related to the Wellesley Avenue/Forest Street intersection show low-to-moderate delays during the weekday AM and PM peak hours. The Proposed Project is not expected to impact these operations.
- The West Gate driveway approach to Wellesley Avenue shows moderate delays during the weekday AM peak hour and delayed operations during the weekday PM peak hour. The delays are on the Babson campus. Left turns from Wellesley Avenue show low delays for the weekday AM and PM peak hours. The Proposed Project is not expected to impact these operations.
- The Main Gate driveway approach to Forest Street shows low-to-moderate delays for the weekday AM and PM peak hour. Left turns from Forest Street show low delays. The Proposed Project is not expected to impact these operations.

IMPROVEMENT MEASURES

- Babson will continue implementation of transportation-demand management, consisting of: Weekday shuttle bus service between the Olin College, in the Town of Needham, Massachusetts, Wellesley College, and Babson campuses.
- Weekend shuttle bus service to and from Copley Square, in the City of Boston, Massachusetts, and to and from Woodland Massachusetts Bay Transportation Authority station, in the City of Newton, Massachusetts.
- Sunday shuttles between the Babson campus and the Woodland MBTA, Natick Mall, and Roche Bros. supermarket in the Town of Needham, Massachusetts.
- Carpooling support via designated carpooling spaces.
- Expanded-bicycle-use support with indoor bicycle storage, added bicycle racks, and shower facilities for cyclists.
- Flex-time schedule and summer four-day work week program.

EXISTING CONDITIONS

INTRODUCTION

Existing conditions include:

- physical conditions of the transportation network, roads and intersections
- traffic volumes
- sight distances
- accident history
- other relevant information

PHYSICAL CONDITIONS

TRANSPORTATION NETWORK

Figure 1 shows the transportation network, which includes the following existing streets:

- Wellesley Avenue
- Forest Street

The TIAS study area includes the following existing intersections:

- Wellesley Avenue/Forest Street unsignalized intersection
- Wellesley Avenue/Babson West Gate unsignalized intersection
- Forest Street/Babson Main Gate unsignalized intersection

WELLESLEY AVENUE

Wellesley Avenue:

- Is generally oriented in an east-west direction.
- Connects Washington Street (Massachusetts Route 16) to the west with Hunnewell Street to the east.

Near the study area, Wellesley Avenue:

- Is a two-lane roadway (one lane in each direction) under local jurisdiction with a well-defined double yellow center and white edge lines providing 12-foot wide travel lanes and 1-foot wide shoulders.
- The land use along Wellesley Avenue in the vicinity of the site includes the Wellesley Country Club, Babson, and residential dwellings.
- The pavement is generally in good condition.
- Has a 5-foot wide bituminous concrete sidewalk located near the Forest Street intersection and extends into the Babson campus.
- The sidewalk is part of the sidewalk network adjacent to Babson extending along Forest Street as well as part of the Charles River Link Trail.
- The sidewalk appears to be in fair to good condition with no significant signs of cracking, deterioration, heaving, sinking, shifting, patching, missing sections, encroaching vegetation, or obstacles. There is one section of the sidewalk on the southerly side of the roadway approaching Forest Street where it appears tree roots are beginning to heave the sidewalk.
- The posted speed limit is 30 miles per hour (mph) in proximity to the site. The 85th percentile observed speeds were recorded to be 38 mph eastbound and 38 mph westbound.

FOREST STREET

Forest Street:

- Is generally oriented in an east-west direction.
- Connects Washington Street (Route 16) in the west with Central Avenue in the east.

Near the study area, Forest Street:

- Is a two-lane roadway (one lane in each direction) under local jurisdiction with a well-defined double yellow center and white edge lines providing 12-foot wide travel lanes and 1-foot wide shoulders.
- Land use along Forest Street in the vicinity of the site includes the Wellesley Country Club, Babson, and residential dwellings.
- The pavement along Forest Street is generally in fair to good condition.
- There is a 6-foot wide bituminous sidewalk on the westerly side of Forest Street extending from the Babson driveway northerly through the intersection with Wellesley Avenue.

- An 8-foot wide painted crosswalk is provided across the Wellesley Avenue eastbound intersection approach connecting the area sidewalk network.
- The sidewalk appears in good condition with no significant signs of cracking, deterioration, heaving, sinking, shifting, patching, missing sections, encroaching vegetation, or obstacles.
- There were no observed speed limit signs within proximity to the site. However, the 85th percentile observed speeds were recorded to be 38 mph eastbound and 37 mph westbound.

WELLESLEY AVENUE/FOREST STREET INTERSECTION

The intersection has:

- Wellesley Avenue and Forest Street intersect to form a skewed four-legged unsignalized intersection under all-way STOP-sign control.
- The left-turns from the Wellesley Avenue westbound approach to Forest Street and right-turns from Forest Street northbound onto Wellesley Avenue are channelized by a raised delta island and are also under STOP-sign control.
- Both the Wellesley Avenue eastbound and westbound approaches provide a 12-foot wide single lane approach with a 2-foot wide shoulder under STOP control and have visible STOP lines.
- An 8-foot wide painted crosswalk is provided across the eastbound approach.
- The Forest Street northbound approach provides a 12-foot wide single lane with a 2-foot wide shoulder under STOP-sign control and has a visible STOP line.
- The Forest Street southbound approach provide an 11-foot wide single lane with a 1-foot wide shoulder under STOP-sign control and has a visible STOP line.
- Sight lines are provided on each of the four intersection approaches that allow each vehicle at the STOP line to see vehicles at each of the other three STOP lines.

WELLESLEY AVENUE/BABSON WEST GATE DRIVEWAY INTERSECTION

The intersection has:

- The existing Babson West Gate driveway meeting Wellesley Avenue to form a three-legged unsignalized intersection with the northbound site driveway approach under STOP-sign control.
- The Wellesley Avenue approaches each provide a 12-foot wide single general purpose lane with 1-foot wide shoulders.

- The site driveway approach provides a 12-foot wide single general-purpose lane under.
- The driveway gate is closed on the weekends as well as from 8 PM to 7 AM on the weekdays.

FOREST STREET/BABSON MAIN GATE DRIVEWAY INTERSECTION

The intersection has:

- The existing Babson Main Gate driveway meeting Forest Street to form a three-legged unsignalized intersection with the northbound site driveway approach under STOP-sign control.
- The Forest Street eastbound approach provides a 10-foot wide through lane and a 10-foot wide right-turn lane. The Forest Street westbound approach provides a 12-foot wide single general purpose lane with a 1-foot wide shoulder.
- The site driveway approach provides a 20-foot wide general-purpose lane that is used for two exiting lanes from the site driveway. Directional travel on this approach is separated by a 30-foot wide landscaped center island.

TRAFFIC VOLUMES

TRAFFIC COUNTS

TEPP LLC obtained turning movement counts:

- at the existing study-area intersections
- on Tuesday, September 27, 2016
- from 7:00 to 9:00 AM and from 4:00 to 6:00 PM

TEPP LLC also obtained automatic traffic volume counts to obtain daily traffic volumes:

- on the study-area roadways and site driveways
- between Tuesday and Wednesday, September 27 and 28, 2016
- included directional traffic as well as vehicle travel speeds

The traffic count data are in **Appendix B**.

MONTHLY ADJUSTMENT

The traffic volumes were balanced and historical traffic volume data were reviewed to determine if seasonal adjustments were required to reflect an average month condition:

- Consistent with state and local guidelines for traffic impact assessment, historical traffic volume data were obtained from the Massachusetts Department of Transportation (MassDOT).
- MassDOT weekday monthly factors include group 6, encompassing urban arterials, collectors and rural arterials.
- The nearest MassDOT permanent count station was located on I-95 in Newton, south of Route I-90 (Station No. 415).
- Based on this information, traffic during the month of September is above annual average month traffic conditions and therefore, the traffic count data was used to reflect above annual average traffic volume conditions.

The relevant MassDOT traffic-volume information is in **Appendix C**.

EXISTING TRAFFIC VOLUMES

Table 1 and **Figures 2 and 3** show the 2016 existing weekday volumes.

Table 1. 2016 existing weekday traffic volumes.

Location	Daily Vehicles[a]	Peak-Hour Information			
		Peak Hour	Vehicles[a]	K-factor[b]	Percent Direction
Wellesley Avenue west of West Gate driveway	7,878	AM	766	9.7	75 Eastbound
		PM	761	9.7	64 Westbound
Forest Street east of the Main Gate driveway	6,109	AM	571	9.3	66 Westbound
		PM	554	9.1	54 Eastbound
West Gate driveway south of Wellesley Avenue	2,843	AM	260	9.1	91 Southbound
		PM	333	11.7	69 Northbound
Main Gate driveway south of Forest Street	4,084	AM	223	5.5	87 Southbound
		PM	343	8.4	66 Northbound

[a]Total of both directions.
[b]K = the percent of daily volume that occurs during the peak hour.

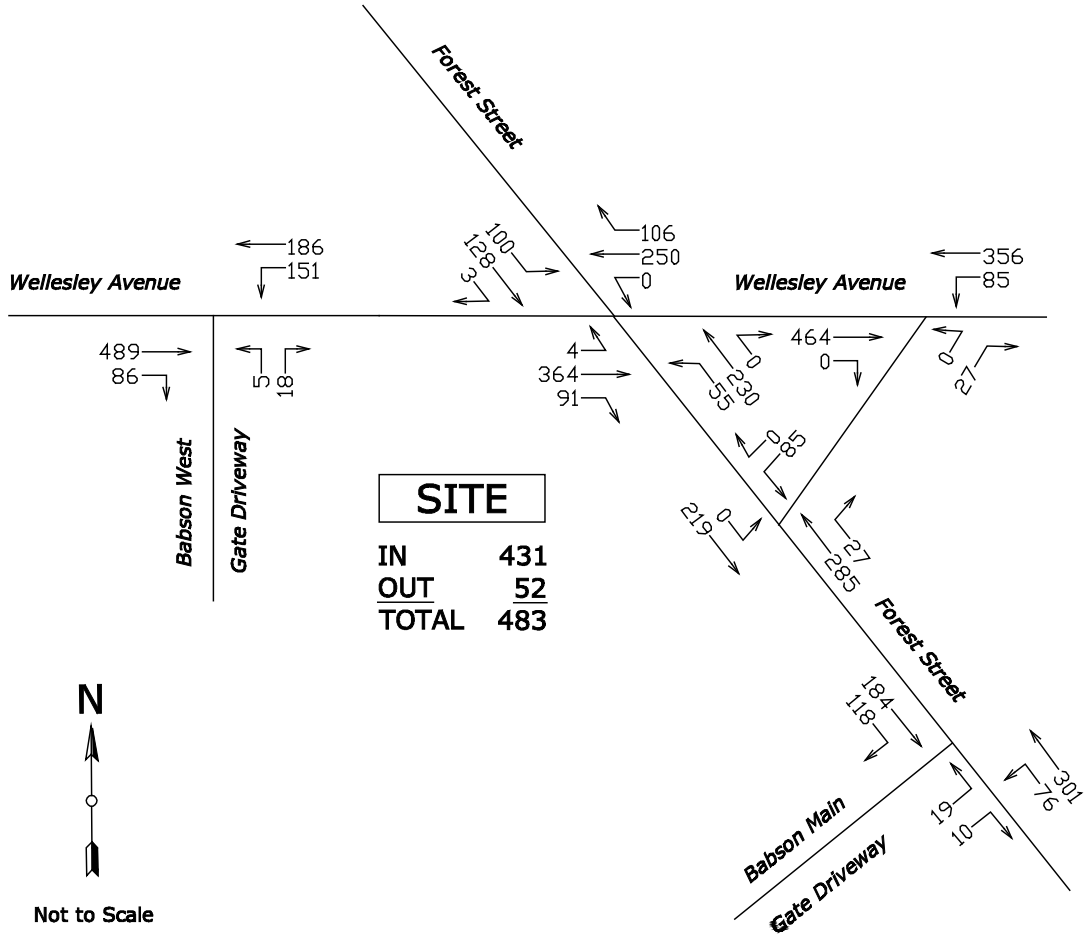


Figure 2. 2016 existing AM peak-hour volumes.

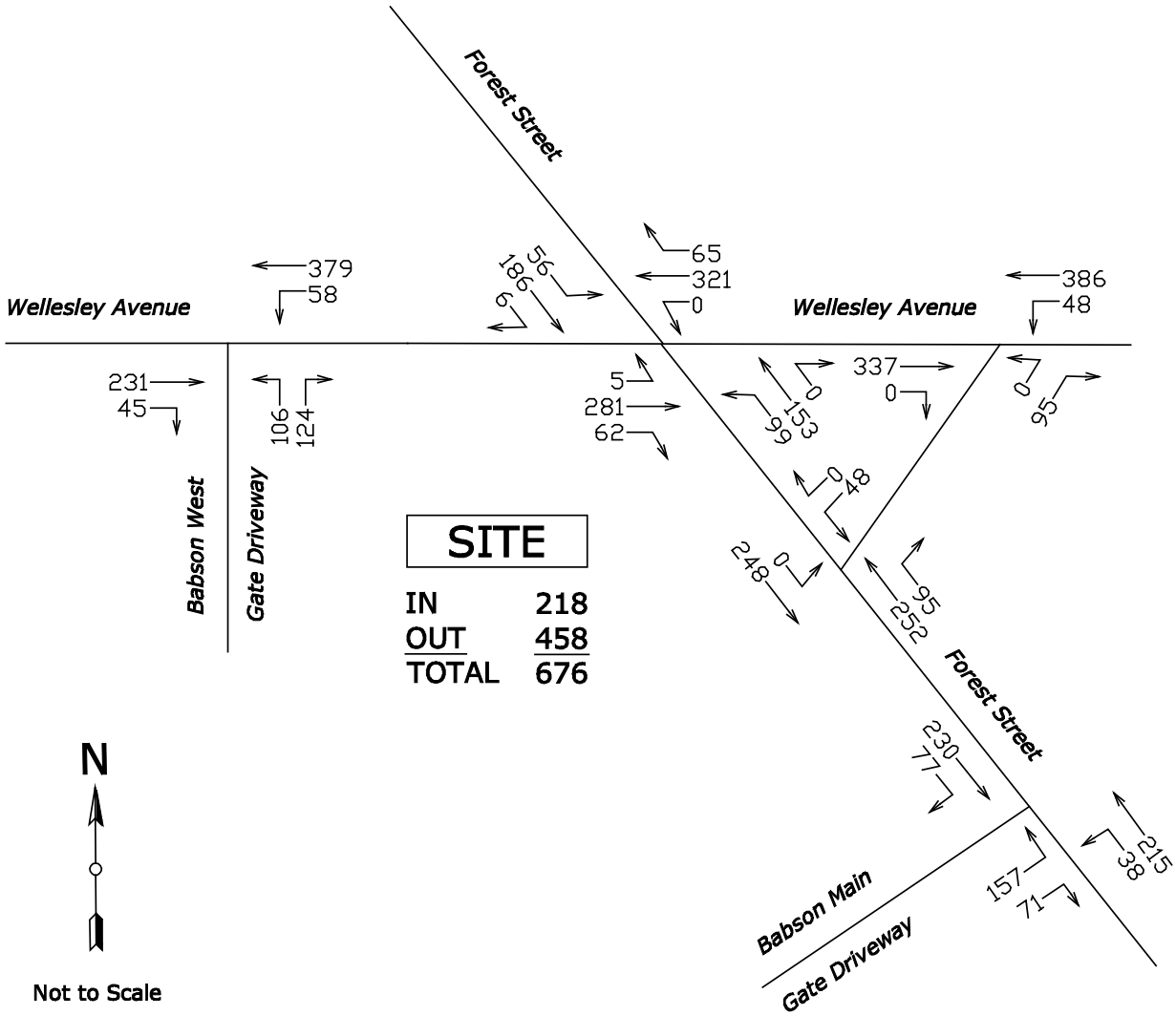


Figure 3. 2016 existing PM peak-hour volumes.

HISTORICAL CAMPUS TRAFFIC GENERATION

Table 2 summarizes historical and campus traffic generation from 1993 to 2016, based on traffic counts at the Main Gate driveway and the West Gate driveway. Weekday AM peak hour and weekday PM peak hour trip generation have been relatively constant. This is despite the addition of several hundred thousand square feet of campus floor area since 1993. Classes being offered at the Babson's Boston campus may decrease graduate school traffic generation.

Table 2. Campus trip generation.

Year	Vehicle-Trips AM Peak Hour	Vehicle-Trips PM Peak Hour
1993	498	757
1999	571	743
2001	498	597
2004	513	612
2006	509	673
2012	518	594
2016	483	676

SIGHT DISTANCES

The American Association of State Highway and Transportation Officials (AASHTO) has established the authoritative policy for sight distances at unsignalized intersections. Stopping Sight Distance (SSD) is considered at unsignalized intersections. SSD provides for safety and is fundamental to intersection operation. SSD enables a driver, on the major road, to perceive and react accordingly to a vehicle entering the major road from a minor road. SSD is conservative because it encompasses a wide range of brake-reaction times and deceleration rates.[1]

TEPP LLC measured/observed relevant available sight distances for following unsignalized intersections:

- Wellesley Avenue/Babson West Gate unsignalized intersection
- Forest Street/Babson Main Gate unsignalized intersection
- Wellesley Avenue/Forest Street unsignalized intersection (all-way stop)

Table 3 shows that available sight distances exceed AASHTO SSD[2] for major-street approach speeds. Sight lines should be and maintained to avoid inappropriate roadside obstructions or vegetation. For all-way stop intersections such as the Wellesley Avenue and Forest Street intersection, AASHTO requires that the first vehicle on each approach be able to see the first

[1] AASHTO, *A Policy on Geometric Design of Highways and Streets*, Fifth Edition (Washington, DC, 2004), page 651.

[2] AASHTO, page 112 and 115.

vehicle of the other approaches. This requirement is met for the Wellesley Avenue and Forest Street intersection.

Table 3. Sight distances.

Intersection	To/From	Speed (mph)		Sight Distances (ft)	
		Posted Limit	85th Percentile	SSD[a]	Available
Wellesley Avenue/ West Gate driveway	East	30	38	280	500+
	West	30	38	280	500+
Forest Street/ Main Gate driveway	East	not posted	37	270	340
	West	not posted	38	280	500+

[a]For observed 85th percentile speed.

As shown in **Table 3**, SSD is provided for the site driveways on Wellesley Avenue and Forest Street.

ACCIDENT HISTORY

Accident data for the study area intersections were obtained from MassDOT for the period between 2012 and 2014, the latest three years of available data. A summary of the MassDOT accident data is provided in **Table 4**. In addition to the summary, accident occurrence should also be compared to the volume of traffic through a particular intersection to determine any significance:

- The accident rate was calculated for each intersection and compared with the state-wide and district-wide averages; crash-rate worksheets are in **Appendix D**.
- Intersection accident rate is a measure of the frequency of accidents compared to the volume of traffic through an intersection and is presented in accidents per million entering vehicles (acc/mev).
- For unsignalized intersections, the state-wide average accident rate is 0.58 acc/mev and the district-wide accident rate is 0.53 acc/mev.
- A comparison of the calculated accident rate to the state-wide and district-wide averages can be used to establish the significance of accident occurrence and whether or not potential safety problems exist.

As shown in **Table 4**, the crash rate experienced at the intersections is below the MassDOT state-wide and District 6 averages.

Table 4. Accident history 2012 through 2014.

	Intersection		
	Wellesley Avenue/ Forest Street	Forest Street/ Main Gate Driveway	Wellesley Avenue/ West Gate Driveway
Number of Accidents			
2012	3	0	0
2013	1	1	0
2014	4	0	0
Average Per Year	2.67	0.33	0
Accident Rate[a]	0.50	0.10	0.00
Severity			
Property Damage Only	7	1	0
Personal Injury	1	0	0
Fatality	0	0	0
Type			
Cross Movement/Angle	4	1	0
Rear End	3	0	0
Head On	0	0	0
Fixed Object	1	0	0
Road Surface			
Dry	4	1	0
Wet	4	0	0
Snow/Ice	0	0	0
Light			
Daylight	8	1	0
Dark	0	0	0
Dark/Lighted	0	0	0
Weather			
Clear/Cloudy	5	1	0
Rain	3	0	0
Snow/Ice	0	0	0

Source: MassDOT Traffic Operations Safety Management System, 2012 through 2014 data.

[a]Per million entering vehicles (mev). MassDOT state-wide average for unsignalized intersections is 0.58 per mev. MassDOT District 6 average is 0.53 per mev.

FUTURE CONDITIONS

INTRODUCTION

Future conditions include:

- Planned road improvements independent of the Proposed Project.
- Future no-build traffic volumes, with background traffic growth and without the Proposed Project.
- Future build traffic volumes, with background traffic growth and with the Proposed Project (in this case, the build volumes are equal to the no-build volumes)

BACKGROUND TRAFFIC GROWTH

Background traffic growth is:

- independent of the Proposed Project;
- related to land development in the immediate area, population and economic development in the region and changes in travel patterns in the region; and
- generally considers two factors: a general traffic-growth rate and specific planned land developments in the immediate area

This TIAS uses a 1.0-percent annual growth rate, considering previous traffic volume counts in 2001, 2004, 2006 and 2012. This yields 7.2-percent growth between 2016 and 2023.

This TIAS considers the following specific land development: the addition of a six-hole golf facility at Wellesley Country Club at 300 Wellesley Avenue. According to the Town, no traffic study was done for this development because the development is not to increase Wellesley Country Club membership.[3]

PLANNED ROAD IMPROVEMENTS

No road improvements are proposed for the study area.

[3] Consultation on September 27, 2016.

NO-BUILD TRAFFIC VOLUMES

The background traffic growth described above was applied to the 2016 existing traffic volumes. **Figures 5 and 6** show the resulting 2023 no-build weekday peak-hour volumes.

SITE TRAFFIC

As described in this report, the Proposed Project will not result in increased student enrollment and the Proposed Project is not anticipated to materially increase area traffic, particularly during the AM and PM peak hours. Accordingly, the No-Build traffic volume networks developed as **Figures 4 and 5** are also considered the Build volumes for the Proposed Project. Classes being offered at the Babson's Boston campus may decrease graduate school traffic generation.

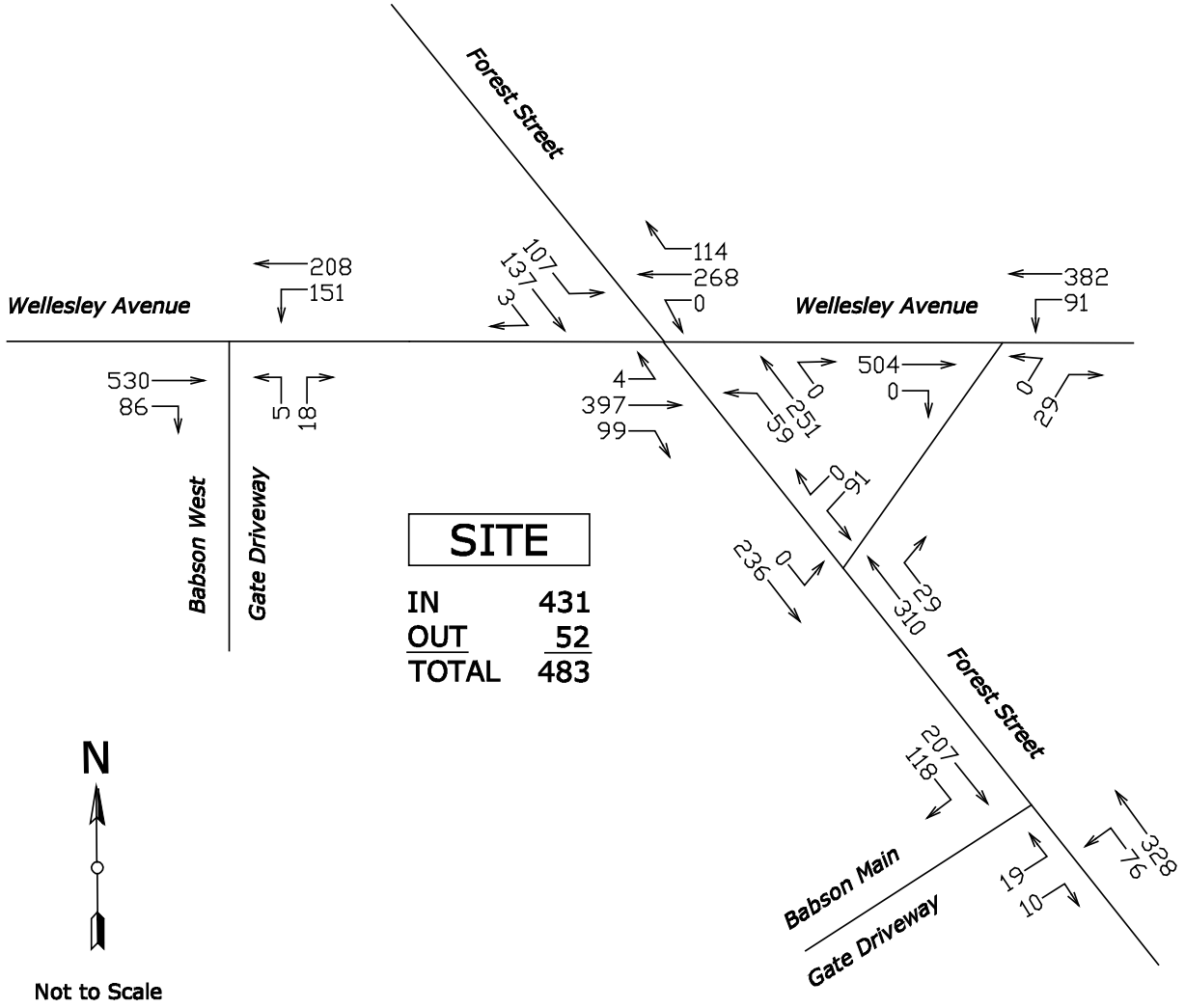


Figure 4. 2023 no-build/build AM peak-hour volumes.

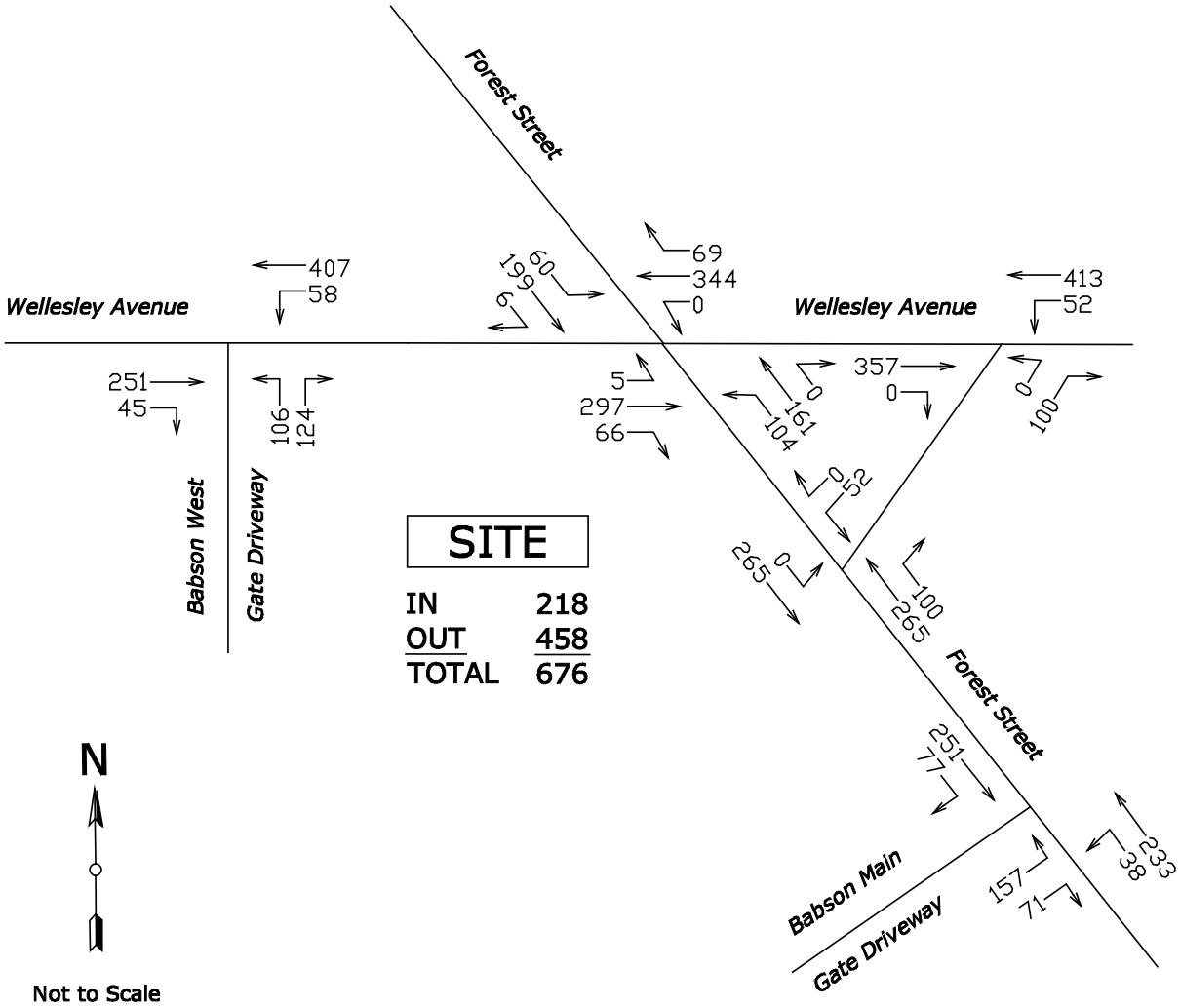


Figure 5 2023 no-build/build PM peak-hour volumes.

OPERATIONS ANALYSIS

INTRODUCTION

This TIAS has *quantified* existing, future-no-build and future-build traffic volumes. Capacity analysis models the *quality* of traffic operations. Although comparing build conditions to the no-build conditions typically indicates impacts of the redevelopment on quality of traffic operations, for the Proposed Project the build volumes equal the no-build volumes.

METHODS

Capacity analysis estimates levels of service (LOS) for transportation facilities. LOS indicates the quality of traffic operations based on delay and other measures. The six LOS are designated A to F. LOS A represents the best or highest operating conditions. LOS F is the lowest, but does not necessarily connote failure.

LOS is a function of traffic volumes and traffic control. Because these volumes can vary, LOS of a transportation facility can differ by time of day, day of the week, or month. For example, a transportation facility with a low LOS during peak hours may have a high LOS during other hours. The operational analysis methods of the Transportation Research Board (TRB)[4] models LOS for intersections based on calculated delay per vehicle, as shown in **Table 5**. Synchro 8 analysis software was utilized.

Table 5. Level-of-service criteria for intersections.

Level of Service	Average Delay at Signalized Intersections (seconds/vehicle)	Average Delay at Unsignalized Intersections (seconds/vehicle)
A	≤10.0	≤10.0
B	>10.0 and ≤20.0	>10.0 and ≤15.0
C	>20.0 and ≤35.0	>15.0 and ≤25.0
D	>35.0 and ≤55.0	>25.0 and ≤35.0
E	>55.0 and ≤80.0	>35.0 and ≤50.0
F	>80	>50

From Transportation Research Board, *Highway Capacity Manual 2010* (Washington, D.C., 2010).

[4] TRB, *Highway Capacity Manual 2010* (Washington, DC, 2010).

Method inputs include:

- intersection geometry
- traffic control, such as YIELD sign, two-way STOP sign, all-way STOP sign or signal (including phasing, timing and progression)
- traffic volumes
- vehicle composition, such as passenger cars and trucks

The methods are all approximate. In particular, the method for two-way and all-way STOP-sign control can be conservative, with observed delays and queuing shorter than those modeled.

RESULTS

Tables 6 through 9 present results for the study-area intersections for weekday AM and PM peak hours under the 2016 existing and 2023 no-build/build conditions. The table shows computed volumes-to-capacity ratios (V/C), levels of service (LOS), vehicle delays and queues. Capacity analysis worksheets that give background and explanation are in **Appendix E**.

Capacity analysis findings are:

- The Wellesley Avenue/Forest Street intersection shows delayed operations during the weekday AM and PM peak hours. However, the Proposed Project is not expected to impact these operations.
- The channelized movements related to the Wellesley Avenue/Forest Street intersection show low-to-moderate delays during the weekday AM and PM peak hours. The Proposed Project is not expected to impact these operations.
- The West Gate driveway approach to Wellesley Avenue shows moderate delays during the weekday AM peak hour and delayed operations during the weekday PM peak hour. The delays are on the Babson campus. Left turns from Wellesley Avenue show low delays for the weekday AM and PM peak hours. The Proposed Project is not expected to impact these operations.
- The Main Gate driveway approach to Forest Street shows low-to-moderate delays for the weekday AM and PM peak hour. Left turns from Forest Street show low delays. The Proposed Project is not expected to impact these operations.

Table 6. 2016 existing weekday AM peak-hour capacity analysis summary.

Intersection and Movements[a]	Volume-to-Capacity	Level of Service	Delay[b]	Queue[c]
Wellesley Avenue/Forest Street Unsignalized Intersection				
Forest Street NB LTR	0.848	E	46.2	8.1
Wellesley Avenue EB LTR	1.165	F	74.0	12.5
Wellesley Avenue WB LTR	0.927	F	59.2	10.6
Forest Street SB LTR	0.807	E	41.5	7.3
Overall	---	E	48.2	---
Wellesley Avenue/Channelized Turns Unsignalized Intersection near Forest Street				
Channelized NB LR	0.079	B	12.0	0.3
Wellesley Avenue WB L	0.085	A	8.7	0.3
Forest Street/Channelized Turns Unsignalized Intersection near Wellesley Avenue				
Forest Street EB LT	0.000	A	0.0	0.0
Channelized SB LR	0.266	C	16.2	1.1
Wellesley Avenue/West Gate Driveway Unsignalized Intersection				
Driveway NB LR	0.084	C	15.3	0.3
Wellesley Avenue WB L	0.173	A	9.4	0.6
Forest Street/Main Gate Driveway Unsignalized Intersection				
Driveway NB L	0.081	C	16.0	0.3
Driveway NB R	0.018	A	9.3	0.1
Forest Street WB L	0.062	A	7.8	0.2

[a] EB = eastbound, WB = westbound, SB = southbound, NB = northbound, L = left, T = through, R = right.

[b] Average delay in seconds per vehicle.

[c] 95th percentile queue in vehicles.

Table 7. 2016 existing weekday PM peak-hour capacity analysis summary.

Intersection and Movements[a]	Volume-to-Capacity	Level of Service	Delay[b]	Queue[c]
Wellesley Avenue/Forest Street Unsignalized Intersection				
Forest Street NB LTR	0.719	D	30.7	5.6
Wellesley Avenue EB LTR	0.879	E	46.4	9.4
Wellesley Avenue WB LTR	0.900	E	49.8	10.0
Forest Street SB LTR	0.675	D	27.7	4.8
Overall	---	D	30.7	---
Wellesley Avenue/Channelized Turns Unsignalized Intersection near Forest Street				
Channelized NB LR	0.210	B	11.4	0.8
Wellesley Avenue WB L	0.042	A	8.1	0.1
Forest Street/Channelized Turns Unsignalized Intersection near Wellesley Avenue				
Forest Street EB L	0.000	A	0.0	0.0
Channelized SB LR	0.129	B	14.6	0.4
Wellesley Avenue/West Gate Driveway Unsignalized Intersection				
Driveway NB LR	0.902	F	53.6	9.7
Wellesley Avenue WB L	0.053	A	8.2	0.2
Forest Street/Main Gate Driveway Unsignalized Intersection				
Driveway NB L	0.387	C	17.2	1.8
Driveway NB R	0.106	B	10.1	0.4
Forest Street WB L	0.030	A	7.8	0.1

[a] EB = eastbound, WB = westbound, SB = southbound, NB = northbound, L = left, T = through, R = right.

[b] Average delay in seconds per vehicle.

[c] 95th percentile queue in vehicles.

Table 8. 2023 no-build/build weekday AM peak-hour capacity analysis summary.

Intersection and Movements[a]	Volume-to-Capacity	Level of Service	Delay[b]	Queue[c]
Wellesley Avenue/Forest Street Unsignalized Intersection				
Forest Street NB LTR	0.951	F	69.2	10.9
Wellesley Avenue EB LTR	1.352	F	76.4	12.1
Wellesley Avenue WB LTR	1.063	F	76.2	12.2
Forest Street SB LTR	0.900	F	58.3	9.4
Overall	---	F	69.2	---
Wellesley Avenue/Channelized Turns Unsignalized Intersection near Forest Street				
Channelized NB LR	0.090	B	12.5	0.3
Wellesley Avenue WB L	0.095	A	8.9	0.3
Forest Street/Channelized Turns Unsignalized Intersection near Wellesley Avenue				
Forest Street EB L	0.000	A	0.0	0.0
Channelized SB LR	0.307	C	17.7	1.3
Wellesley Avenue/West Gate Driveway Unsignalized Intersection				
Driveway NB LR	0.091	C	16.2	0.3
Wellesley Avenue WB L	0.179	A	9.6	0.7
Forest Street/Main Gate Driveway Unsignalized Intersection				
Driveway NB L	0.088	C	17.0	0.3
Driveway NB R	0.019	A	9.5	0.1
Forest Street WB L	0.063	A	7.9	0.2

[a] EB = eastbound, WB = westbound, SB = southbound, NB = northbound, L = left, T = through, R = right.

[b] Average delay in seconds per vehicle.

[c] 95th percentile queue in vehicles.

Table 9. 2023 no-build/build weekday PM peak-hour capacity analysis summary.

Intersection and Movements[a]	Volume-to-Capacity	Level of Service	Delay[b]	Queue[c]
Wellesley Avenue/Forest Street Unsignalized Intersection				
Forest Street NB LTR	0.805	E	39.9	7.0
Wellesley Avenue EB LTR	0.982	F	71.9	12.5
Wellesley Avenue WB LTR	1.042	F	73.6	12.6
Forest Street SB LTR	0.764	E	36.5	6.4
Overall	---	E	39.9	---
Wellesley Avenue/Channelized Turns Unsignalized Intersection near Forest Street				
Channelized NB LR	0.227	B	11.8	0.9
Wellesley Avenue WB L	0.046	A	8.1	0.1
Forest Street/Channelized Turns Unsignalized Intersection near Wellesley Avenue				
Forest Street EB L	0.000	A	0.0	0.0
Channelized SB LR	0.148	C	15.3	0.5
Wellesley Avenue/West Gate Driveway Unsignalized Intersection				
Driveway NB LR	0.965	F	68.7	11.2
Wellesley Avenue WB L	0.054	A	8.3	0.2
Forest Street/Main Gate Driveway Unsignalized Intersection				
Driveway NB L	0.410	C	18.5	2.0
Driveway NB R	0.109	B	10.3	0.4
Forest Street WB L	0.031	A	7.9	0.1

[a] EB = eastbound, WB = westbound, SB = southbound, NB = northbound, L = left, T = through, R = right.

[b] Average delay in seconds per vehicle.

[c] 95th percentile queue in vehicles.

CONCLUSION

PROPOSED PROJECT DESCRIPTION

Babson has retained TEPP LLC to prepare this traffic impact and access study (TIAS) conforming to the Town of Wellesley's Project of Significant Impact (PSI) regulations for Webster Athletic Center Renovation and Expansion Project (Proposed Project) on the Babson campus in Wellesley, Massachusetts.

- The Proposed Project will not result in increased student enrollment.
- The Proposed Project is not anticipated to materially increase area traffic, particularly during the AM and PM peak hours.
- Accordingly, this study will evaluate the impact of the Proposed Project in accordance with the Municipal System Impact Analysis Regulations and other applicable requirements that are contained in the Zoning Bylaw.

SIGHT DISTANCES

TEPP LLC measured/observed relevant available sight distances for following unsignalized intersections:

- Wellesley Avenue/Forest Street unsignalized intersection
- Wellesley Avenue/Babson West Gate unsignalized intersection
- Forest Street/Babson Main Gate unsignalized intersection

The available sight distances will be adequate.

TRAFFIC-VOLUME CHANGES

Since the Proposed Project will not increase the current student enrollment, the Proposed Project is not expected to result in a material increase of traffic on the area roadways and intersections.

CAPACITY ANALYSIS

TEPP LLC conducted capacity analysis:

- for the weekday AM and PM peak hours under all relevant existing and future conditions, as described above
- for all relevant study-area intersections
- to calculate levels of service, delays and queues

Capacity analysis findings are:

- The Wellesley Avenue/Forest Street intersection shows delayed operations during the weekday AM and PM peak hours. However, the Proposed Project is not expected to impact these operations.
- The channelized movements related to the Wellesley Avenue/Forest Street intersection show low-to-moderate delays during the weekday AM and PM peak hours. The Proposed Project is not expected to impact these operations.
- The West Gate driveway approach to Wellesley Avenue shows moderate delays during the weekday AM peak hour and delayed operations during the weekday PM peak hour. The delays are on the Babson campus. Left turns from Wellesley Avenue show low delays for the weekday AM and PM peak hours. The Proposed Project is not expected to impact these operations.
- The Main Gate driveway approach to Forest Street shows low-to-moderate delays for the weekday AM and PM peak hour. Left turns from Forest Street show low delays. The Proposed Project is not expected to impact these operations.

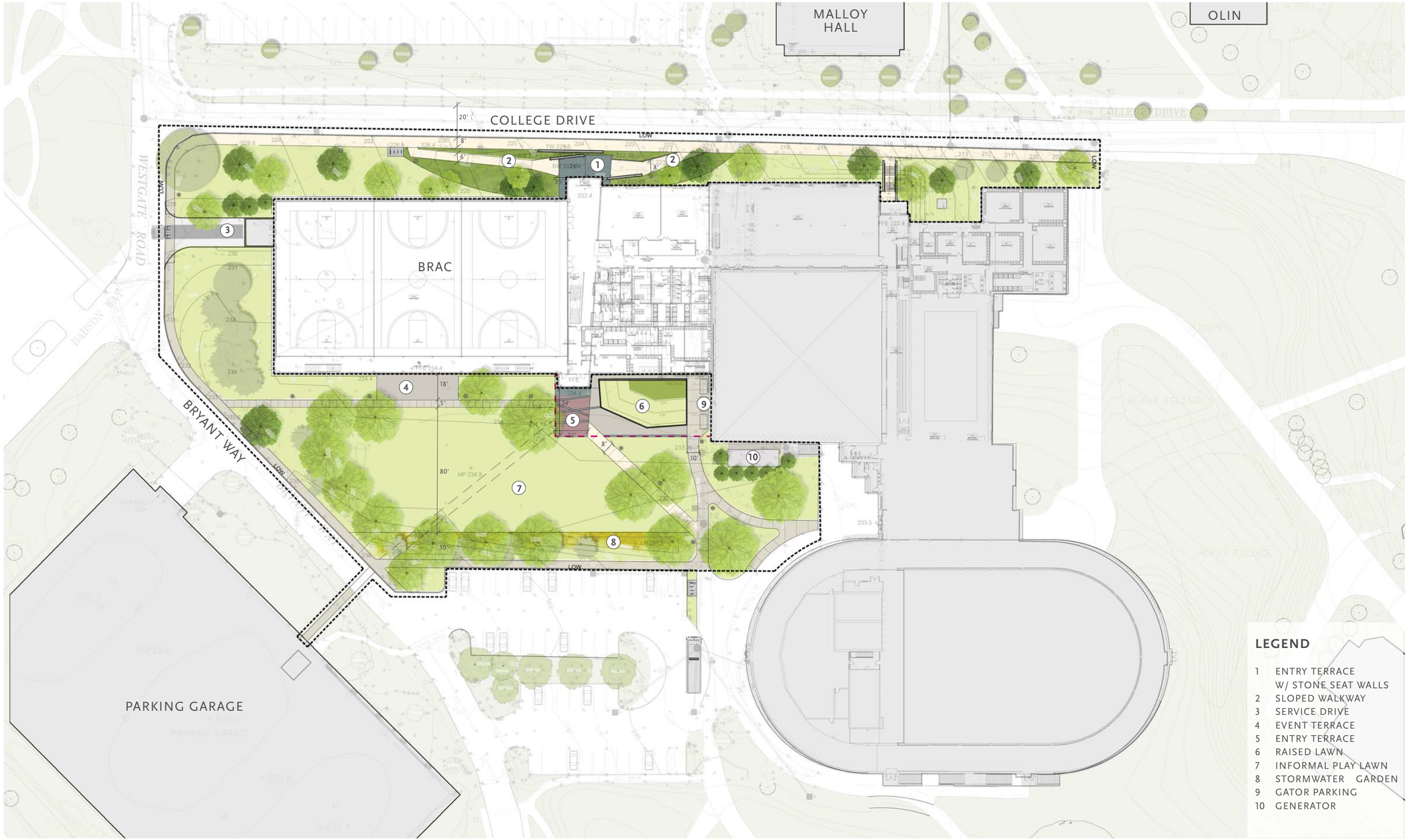
IMPROVEMENT MEASURES

Babson will continue implementation of transportation-demand management, consisting of:

- Weekday shuttle bus service between the Olin College, in the Town of Needham, Massachusetts, Wellesley College, and Babson campuses.
- Weekend shuttle bus service to and from Copley Square, in the City of Boston, Massachusetts, and to and from Woodland Massachusetts Bay Transportation Authority station, in the City of Newton, Massachusetts.
- Sunday shuttles between the Babson campus and the Woodland MBTA, Natick Mall, and Roche Bros. supermarket in the Town of Needham, Massachusetts.
- Carpooling support via designated carpooling spaces.
- Expanded-bicycle-use support with indoor bicycle storage, added bicycle racks, and shower facilities for cyclists.
- Flex-time schedule and summer four-day work week program.

APPENDIX

Appendix A: Site Plan



0 15 30 60 120

SITE PLAN | PHASE 1

BRAC
AUGUST 23, 2016

CAMBRIDGE SEVEN ASSOSIATES
STEPHEN STIMSON ASSOCIATES LANDSCAPE ARCHITECTS

Appendix B: Traffic Counts and Speeds

Accurate Counts

978-664-2565

Location : Forest Street
Location : East of Main Gate
City/State: Wellesley, MA

1339VOL4

Start	9/26/2016		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	2	12	2	13	*	*	*	*	*	*	*	*	2	12
01:00	*	*	2	4	0	6	*	*	*	*	*	*	*	*	1	5
02:00	*	*	3	4	5	2	*	*	*	*	*	*	*	*	4	3
03:00	*	*	3	0	3	1	*	*	*	*	*	*	*	*	3	0
04:00	*	*	6	6	9	3	*	*	*	*	*	*	*	*	8	4
05:00	*	*	44	21	48	23	*	*	*	*	*	*	*	*	46	22
06:00	*	*	107	63	122	71	*	*	*	*	*	*	*	*	114	67
07:00	*	*	223	**212**	244	172	*	*	*	*	*	*	*	*	234	192
08:00	*	*	**361**	188	**344**	**224**	*	*	*	*	*	*	*	*	**352**	**206**
09:00	*	*	263	173	239	185	*	*	*	*	*	*	*	*	251	179
10:00	*	*	160	152	203	117	*	*	*	*	*	*	*	*	182	134
11:00	*	*	167	147	194	214	*	*	*	*	*	*	*	*	180	180
12:00 PM	*	*	196	217	205	172	*	*	*	*	*	*	*	*	200	194
01:00	*	*	195	190	190	190	*	*	*	*	*	*	*	*	192	190
02:00	*	*	174	235	194	239	*	*	*	*	*	*	*	*	184	237
03:00	*	*	226	214	237	242	*	*	*	*	*	*	*	*	232	228
04:00	*	*	245	**293**	252	**284**	*	*	*	*	*	*	*	*	248	**288**
05:00	*	*	**246**	250	**257**	244	*	*	*	*	*	*	*	*	**252**	247
06:00	*	*	222	210	184	239	*	*	*	*	*	*	*	*	203	224
07:00	*	*	74	110	109	138	*	*	*	*	*	*	*	*	92	124
08:00	*	*	59	99	70	103	*	*	*	*	*	*	*	*	64	101
09:00	*	*	51	80	49	84	*	*	*	*	*	*	*	*	50	82
10:00	*	*	23	29	37	53	*	*	*	*	*	*	*	*	30	41
11:00	*	*	10	17	12	11	*	*	*	*	*	*	*	*	11	14
Lane	0	0	3062	2926	3209	3030	0	0	0	0	0	0	0	0	3135	2974
Day	0		5988		6239		0		0		0		0		6109	
AM Peak	-	-	08:00	07:00	08:00	08:00	-	-	-	-	-	-	-	-	08:00	08:00
Vol.	-	-	361	212	344	224	-	-	-	-	-	-	-	-	352	206
PM Peak	-	-	17:00	16:00	17:00	16:00	-	-	-	-	-	-	-	-	17:00	16:00
Vol.	-	-	246	293	257	284	-	-	-	-	-	-	-	-	252	288

Comb. Total	0	5988	6239	0	0	0	0	6109

ADT ADT 7,880 AADT 7,880

Accurate Counts

978-664-2565

Location : Wellesley Avenue
Location : West of West Gate
City/State: Wellesley, MA

1339VOL3

Start	9/26/2016		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	6	8	9	11	*	*	*	*	*	*	*	*	8	10
01:00	*	*	1	2	4	2	*	*	*	*	*	*	*	*	2	2
02:00	*	*	2	1	1	0	*	*	*	*	*	*	*	*	2	0
03:00	*	*	1	2	1	1	*	*	*	*	*	*	*	*	1	2
04:00	*	*	7	2	4	3	*	*	*	*	*	*	*	*	6	2
05:00	*	*	41	19	42	18	*	*	*	*	*	*	*	*	42	18
06:00	*	*	241	31	246	44	*	*	*	*	*	*	*	*	244	38
07:00	*	*	**564**	156	541	157	*	*	*	*	*	*	*	*	552	156
08:00	*	*	539	170	**579**	210	*	*	*	*	*	*	*	*	**559**	190
09:00	*	*	370	200	327	212	*	*	*	*	*	*	*	*	348	206
10:00	*	*	245	166	221	196	*	*	*	*	*	*	*	*	233	181
11:00	*	*	207	**218**	267	**215**	*	*	*	*	*	*	*	*	237	**216**
12:00 PM	*	*	236	179	206	269	*	*	*	*	*	*	*	*	221	224
01:00	*	*	166	206	211	245	*	*	*	*	*	*	*	*	188	226
02:00	*	*	205	271	249	246	*	*	*	*	*	*	*	*	227	258
03:00	*	*	224	380	**266**	305	*	*	*	*	*	*	*	*	245	342
04:00	*	*	209	449	221	435	*	*	*	*	*	*	*	*	215	442
05:00	*	*	**284**	**451**	230	**445**	*	*	*	*	*	*	*	*	**257**	**448**
06:00	*	*	185	426	192	349	*	*	*	*	*	*	*	*	188	388
07:00	*	*	115	194	102	187	*	*	*	*	*	*	*	*	108	190
08:00	*	*	63	157	86	117	*	*	*	*	*	*	*	*	74	137
09:00	*	*	56	102	54	94	*	*	*	*	*	*	*	*	55	98
10:00	*	*	25	39	28	39	*	*	*	*	*	*	*	*	26	39
11:00	*	*	10	16	8	19	*	*	*	*	*	*	*	*	9	18
Lane	0	0	4002	3845	4095	3819	0	0	0	0	0	0	0	0	4047	3831
Day	0		7847		7914		0		0		0		0		7878	
AM Peak	-	-	07:00	11:00	08:00	11:00	-	-	-	-	-	-	-	-	08:00	11:00
Vol.	-	-	564	218	579	215	-	-	-	-	-	-	-	-	559	216
PM Peak	-	-	17:00	17:00	15:00	17:00	-	-	-	-	-	-	-	-	17:00	17:00
Vol.	-	-	284	451	266	445	-	-	-	-	-	-	-	-	257	448

Comb. Total	0	7847	7914	0	0	0	0	7878

ADT ADT 7,880 AADT 7,880

Accurate Counts

978-664-2565

Location : Main Gate
Location : South of Forest Street
City/State: Wellesley, MA

1339VOL1

Start	9/26/2016		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In
12:00 AM	*	*	33	8	30	17	*	*	*	*	*	*	*	*	32	12
01:00	*	*	12	6	13	4	*	*	*	*	*	*	*	*	12	5
02:00	*	*	10	12	4	7	*	*	*	*	*	*	*	*	7	10
03:00	*	*	3	2	2	2	*	*	*	*	*	*	*	*	2	2
04:00	*	*	2	5	2	7	*	*	*	*	*	*	*	*	2	6
05:00	*	*	11	60	8	64	*	*	*	*	*	*	*	*	10	62
06:00	*	*	32	121	28	122	*	*	*	*	*	*	*	*	30	122
07:00	*	*	31	108	31	116	*	*	*	*	*	*	*	*	31	112
08:00	*	*	33	**197**	42	**210**	*	*	*	*	*	*	*	*	38	**204**
09:00	*	*	57	177	49	159	*	*	*	*	*	*	*	*	53	168
10:00	*	*	50	91	63	92	*	*	*	*	*	*	*	*	56	92
11:00	*	*	**74**	115	**92**	116	*	*	*	*	*	*	*	*	**83**	116
12:00 PM	*	*	102	138	89	114	*	*	*	*	*	*	*	*	96	126
01:00	*	*	107	98	134	116	*	*	*	*	*	*	*	*	120	107
02:00	*	*	142	89	135	123	*	*	*	*	*	*	*	*	138	106
03:00	*	*	161	101	163	102	*	*	*	*	*	*	*	*	162	102
04:00	*	*	199	90	200	74	*	*	*	*	*	*	*	*	200	82
05:00	*	*	152	125	166	109	*	*	*	*	*	*	*	*	159	117
06:00	*	*	142	**147**	149	**133**	*	*	*	*	*	*	*	*	146	**140**
07:00	*	*	97	75	126	106	*	*	*	*	*	*	*	*	112	90
08:00	*	*	174	76	158	104	*	*	*	*	*	*	*	*	166	90
09:00	*	*	**275**	103	**256**	103	*	*	*	*	*	*	*	*	**266**	103
10:00	*	*	60	47	94	56	*	*	*	*	*	*	*	*	77	52
11:00	*	*	40	22	33	25	*	*	*	*	*	*	*	*	36	24
Lane	0	0	1999	2013	2067	2081	0	0	0	0	0	0	0	0	2034	2050
Day	0		4012		4148		0		0		0		0		4084	
AM Peak	-	-	11:00	08:00	11:00	08:00	-	-	-	-	-	-	-	-	11:00	08:00
Vol.	-	-	74	197	92	210	-	-	-	-	-	-	-	-	83	204
PM Peak	-	-	21:00	18:00	21:00	18:00	-	-	-	-	-	-	-	-	21:00	18:00
Vol.	-	-	275	147	256	133	-	-	-	-	-	-	-	-	266	140

Comb. Total	0	4012	4148	0	0	0	0	4084

ADT ADT 4,080 AADT 4,080

Accurate Counts

978-664-2565

Location : West Gate
Location : South of Wellesley Avenue
City/State: Wellesley, MA

1339VOL2

Start	9/26/2016		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
12:00 AM	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
01:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
02:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
03:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
04:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
05:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
06:00	*	*	16	9	16	8	*	*	*	*	*	*	*	*	16	8
07:00	*	*	140	25	170	13	*	*	*	*	*	*	*	*	155	19
08:00	*	*	**246**	29	**248**	34	*	*	*	*	*	*	*	*	**247**	32
09:00	*	*	215	33	185	43	*	*	*	*	*	*	*	*	200	38
10:00	*	*	71	49	89	45	*	*	*	*	*	*	*	*	80	47
11:00	*	*	94	**91**	100	**68**	*	*	*	*	*	*	*	*	97	**80**
12:00 PM	*	*	93	74	80	85	*	*	*	*	*	*	*	*	**86**	80
01:00	*	*	89	107	72	118	*	*	*	*	*	*	*	*	80	112
02:00	*	*	61	158	60	167	*	*	*	*	*	*	*	*	60	162
03:00	*	*	56	149	71	103	*	*	*	*	*	*	*	*	64	126
04:00	*	*	73	**264**	54	223	*	*	*	*	*	*	*	*	64	**244**
05:00	*	*	**97**	211	55	204	*	*	*	*	*	*	*	*	76	208
06:00	*	*	69	234	**100**	**235**	*	*	*	*	*	*	*	*	84	234
07:00	*	*	24	119	22	111	*	*	*	*	*	*	*	*	23	115
08:00	*	*	2	10	0	0	*	*	*	*	*	*	*	*	1	5
09:00	*	*	0	0	0	1	*	*	*	*	*	*	*	*	0	0
10:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
11:00	*	*	0	0	0	0	*	*	*	*	*	*	*	*	0	0
Lane	0	0	1346	1562	1322	1458	0	0	0	0	0	0	0	0	1333	1510
Day	0		2908		2780		0		0		0		0		2843	
AM Peak	-	-	08:00	11:00	08:00	11:00	-	-	-	-	-	-	-	-	08:00	11:00
Vol.	-	-	246	91	248	68	-	-	-	-	-	-	-	-	247	80
PM Peak	-	-	17:00	16:00	18:00	18:00	-	-	-	-	-	-	-	-	12:00	16:00
Vol.	-	-	97	264	100	235	-	-	-	-	-	-	-	-	86	244

Comb. Total	0	2908	2780	0	0	0	0	2843

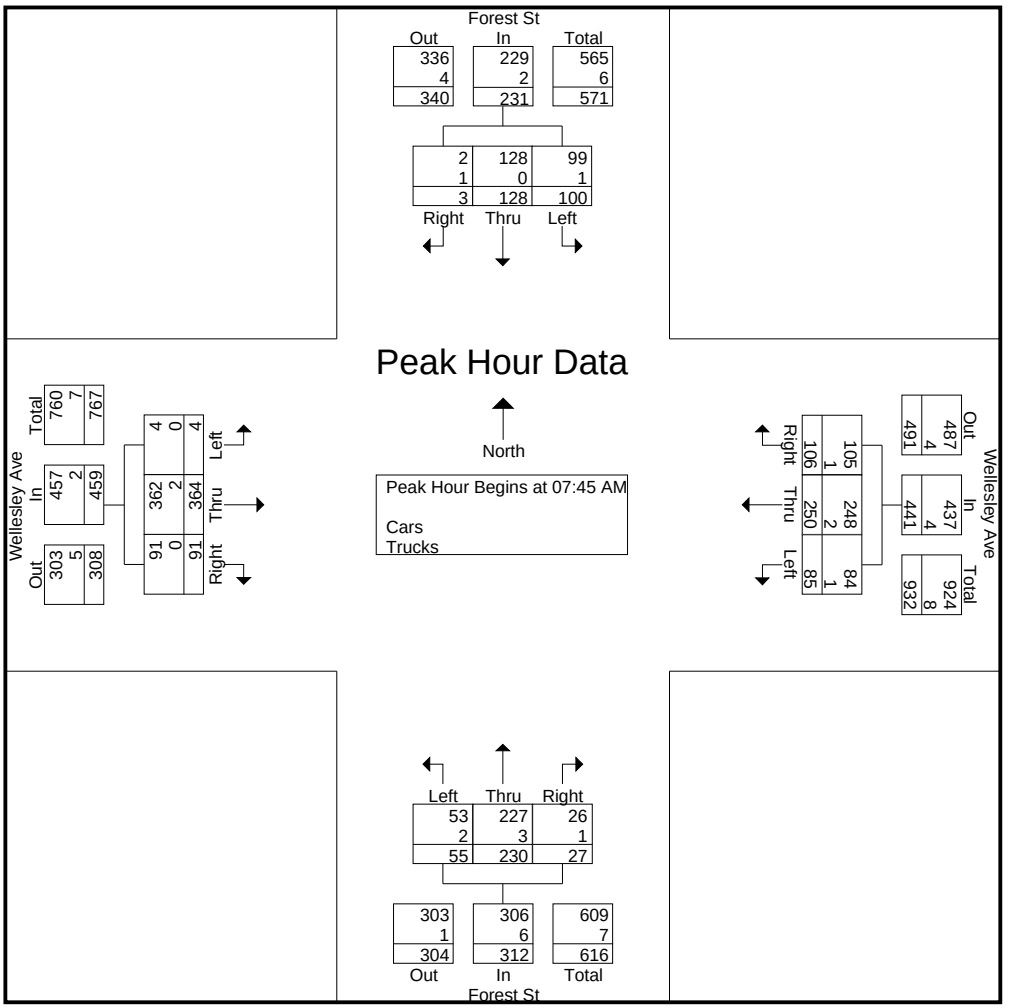
ADT ADT 2,844 AADT 2,844

Accurate Counts
978-664-2565

N/S Street : Forest Street
E/W Street: Wellesley Avenue
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390001
Site Code : 13390001
Start Date : 9/27/2016
Page No : 2

	Forest St From North				Wellesley Ave From East				Forest St From South				Wellesley Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	15	27	0	42	29	74	13	116	15	54	8	77	0	93	30	123	358
08:00 AM	17	26	2	45	14	52	19	85	12	57	5	74	4	85	26	115	319
08:15 AM	36	43	1	80	16	67	35	118	14	51	3	68	0	92	18	110	376
08:30 AM	32	32	0	64	26	57	39	122	14	68	11	93	0	94	17	111	390
Total Volume	100	128	3	231	85	250	106	441	55	230	27	312	4	364	91	459	1443
% App. Total	43.3	55.4	1.3		19.3	56.7	24		17.6	73.7	8.7		0.9	79.3	19.8		
PHF	.694	.744	.375	.722	.733	.845	.679	.904	.917	.846	.614	.839	.250	.968	.758	.933	.925
Cars	99	128	2	229	84	248	105	437	53	227	26	306	4	362	91	457	1429
% Cars	99.0	100	66.7	99.1	98.8	99.2	99.1	99.1	96.4	98.7	96.3	98.1	100	99.5	100	99.6	99.0
Trucks	1	0	1	2	1	2	1	4	2	3	1	6	0	2	0	2	14
% Trucks	1.0	0	33.3	0.9	1.2	0.8	0.9	0.9	3.6	1.3	3.7	1.9	0	0.5	0	0.4	1.0

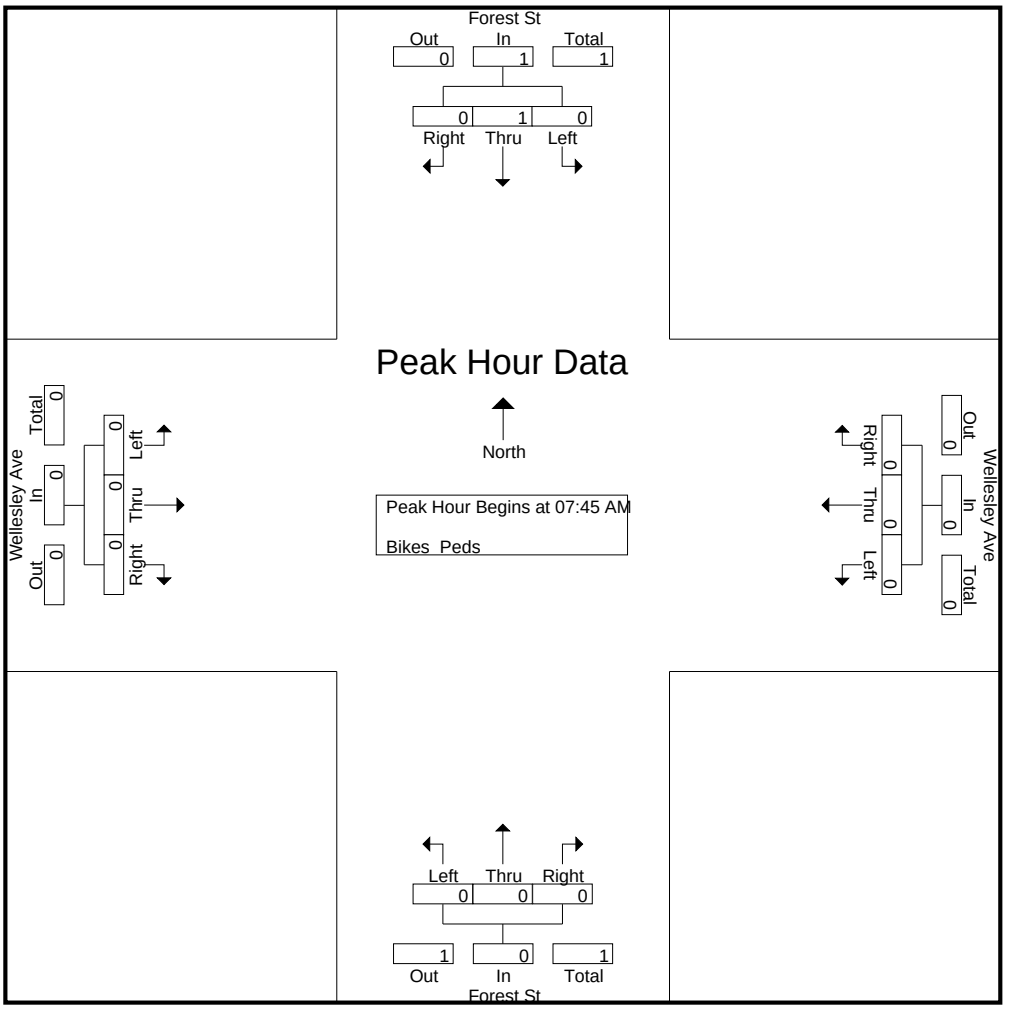


Accurate Counts
978-664-2565

N/S Street : Forest Street
E/W Street: Wellesley Avenue
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390001
Site Code : 13390001
Start Date : 9/27/2016
Page No : 11

	Forest St From North				Wellesley Ave From East				Forest St From South				Wellesley Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

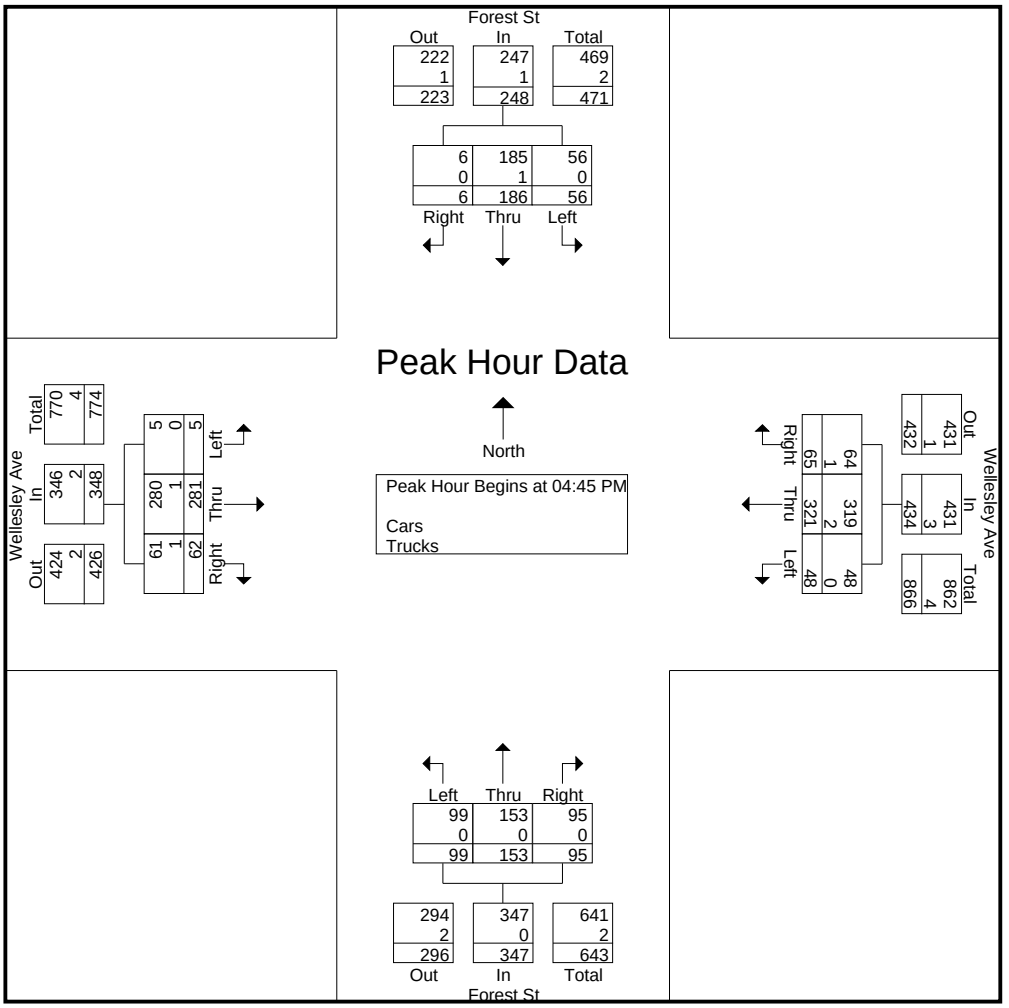


Accurate Counts
978-664-2565

N/S Street : Forest Street
E/W Street: Wellesley Avenue
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390001
Site Code : 13390001
Start Date : 9/27/2016
Page No : 3

	Forest St From North				Wellesley Ave From East				Forest St From South				Wellesley Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 09:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	17	38	2	57	14	75	15	104	31	38	37	106	0	79	22	101	368
05:00 PM	15	55	1	71	12	86	16	114	27	35	23	85	1	60	19	80	350
05:15 PM	13	52	1	66	14	83	20	117	22	38	18	78	1	67	10	78	339
05:30 PM	11	41	2	54	8	77	14	99	19	42	17	78	3	75	11	89	320
Total Volume	56	186	6	248	48	321	65	434	99	153	95	347	5	281	62	348	1377
% App. Total	22.6	75	2.4		11.1	74	15		28.5	44.1	27.4		1.4	80.7	17.8		
PHF	.824	.845	.750	.873	.857	.933	.813	.927	.798	.911	.642	.818	.417	.889	.705	.861	.935
Cars	56	185	6	247	48	319	64	431	99	153	95	347	5	280	61	346	1371
% Cars	100	99.5	100	99.6	100	99.4	98.5	99.3	100	100	100	100	100	99.6	98.4	99.4	99.6
Trucks	0	1	0	1	0	2	1	3	0	0	0	0	0	1	1	2	6
% Trucks	0	0.5	0	0.4	0	0.6	1.5	0.7	0	0	0	0	0	0.4	1.6	0.6	0.4

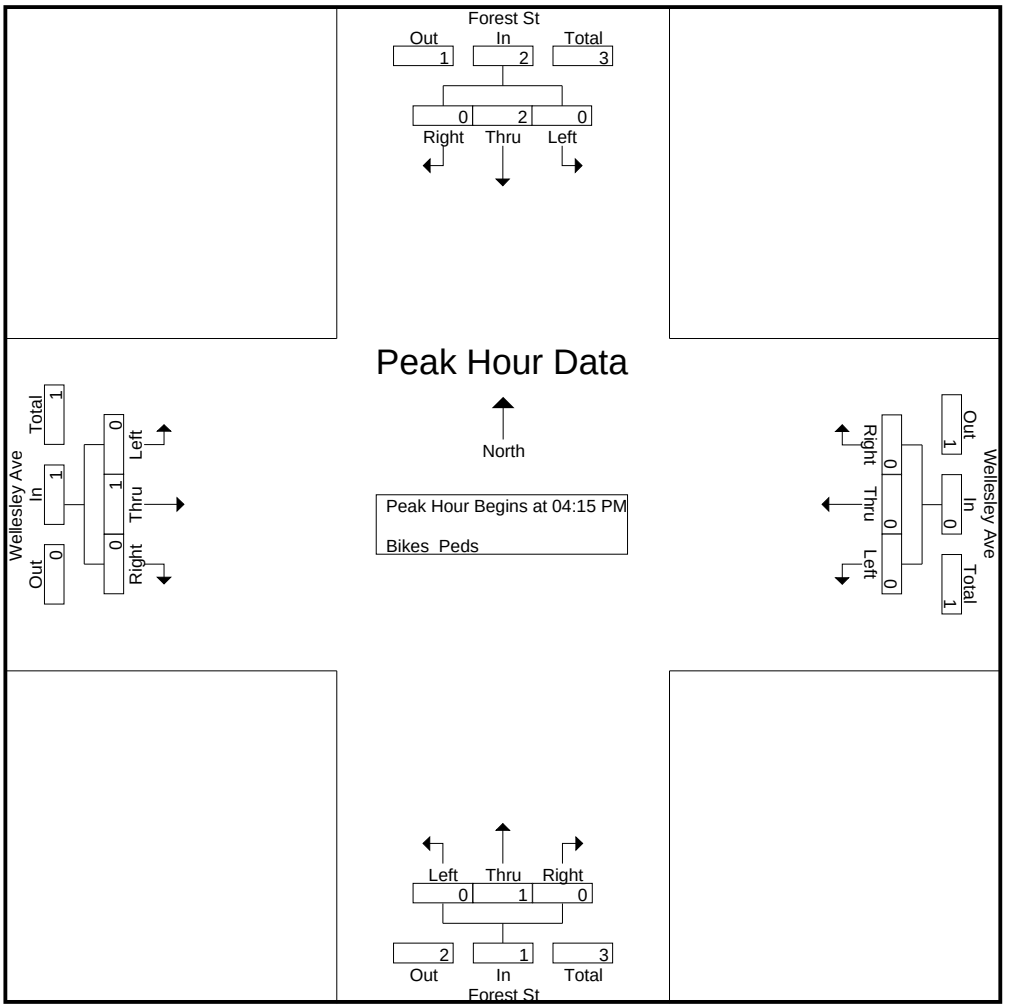


Accurate Counts
978-664-2565

N/S Street : Forest Street
E/W Street: Wellesley Avenue
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390001
Site Code : 13390001
Start Date : 9/27/2016
Page No : 15

	Forest St From North				Wellesley Ave From East				Forest St From South				Wellesley Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 09:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	2	0	2	0	0	0	0	0	1	0	1	0	1	0	1	4
% App. Total	0	100	0		0	0	0		0	100	0		0	100	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.000	.250	.000	.250	.500



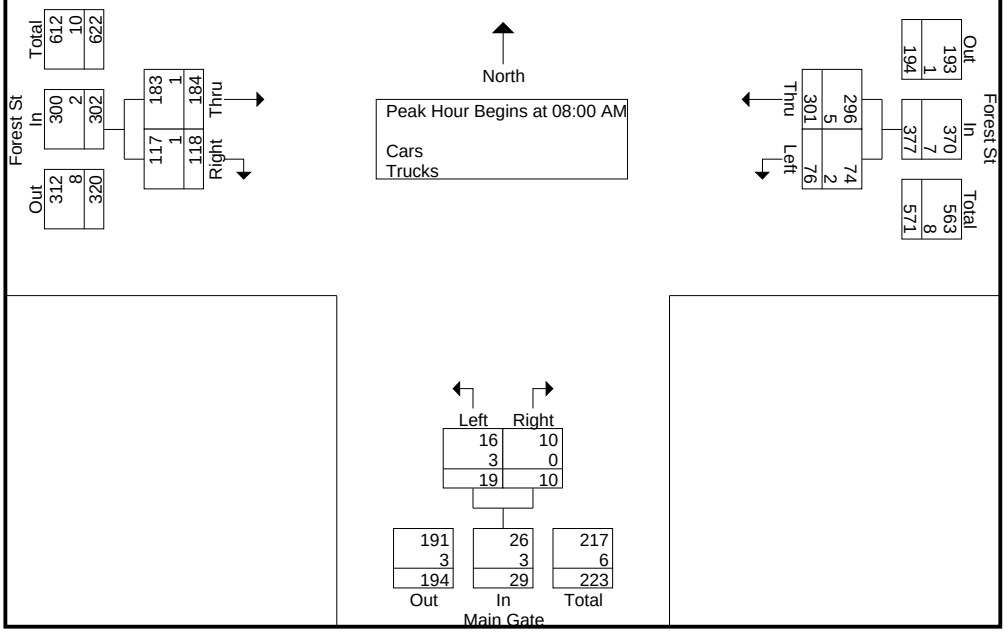
Accurate Counts
978-664-2565

N/S Street : Main Gate
E/W Street : Forest Street
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390003
Site Code : 13390003
Start Date : 9/27/2016
Page No : 2

	Forest St From East			Main Gate From South			Forest St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	20	72	92	2	3	5	52	29	81	178
08:15 AM	19	86	105	8	3	11	39	22	61	177
08:30 AM	18	84	102	6	4	10	41	41	82	194
08:45 AM	19	59	78	3	0	3	52	26	78	159
Total Volume	76	301	377	19	10	29	184	118	302	708
% App. Total	20.2	79.8		65.5	34.5		60.9	39.1		
PHF	.950	.875	.898	.594	.625	.659	.885	.720	.921	.912
Cars	74	296	370	16	10	26	183	117	300	696
% Cars	97.4	98.3	98.1	84.2	100	89.7	99.5	99.2	99.3	98.3
Trucks	2	5	7	3	0	3	1	1	2	12
% Trucks	2.6	1.7	1.9	15.8	0	10.3	0.5	0.8	0.7	1.7

Peak Hour Data

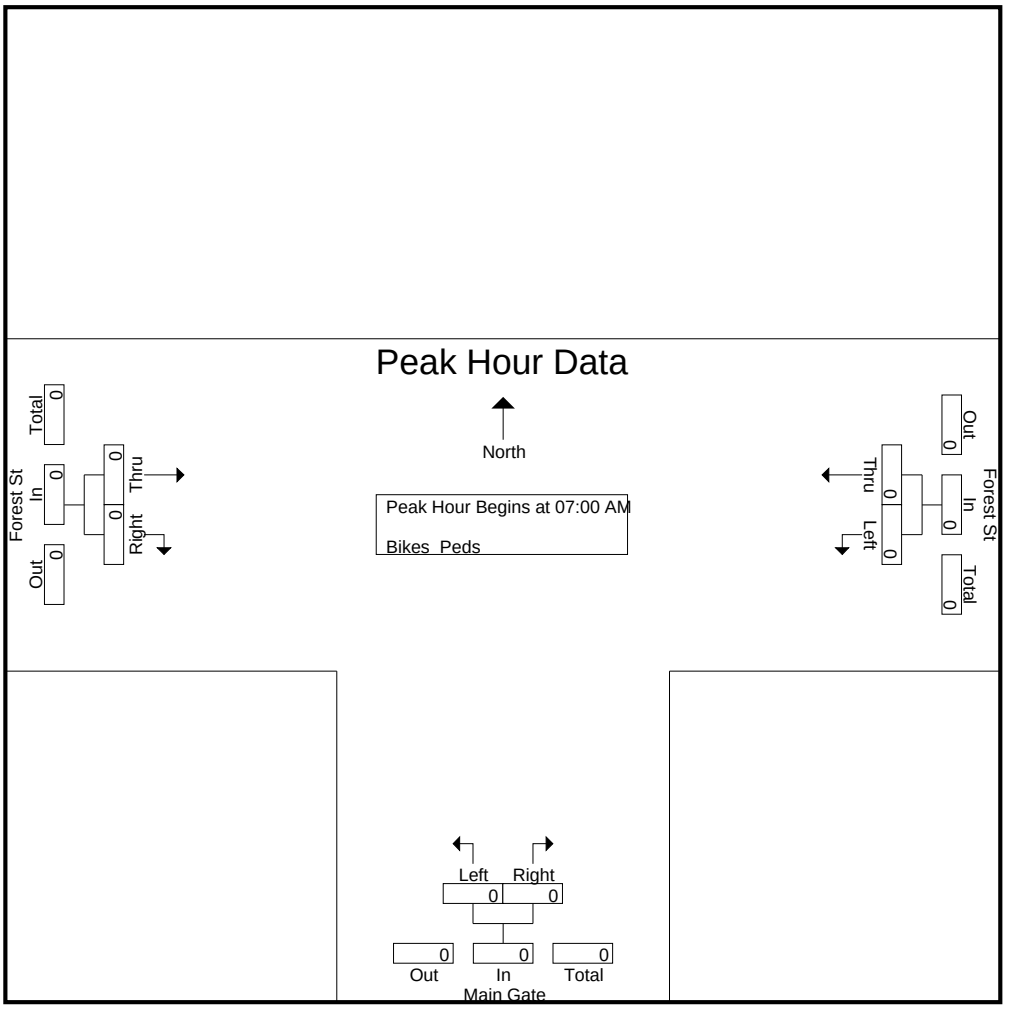


Accurate Counts
978-664-2565

N/S Street : Main Gate
E/W Street : Forest Street
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390003
Site Code : 13390003
Start Date : 9/27/2016
Page No : 11

	Forest St From East			Main Gate From South			Forest St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

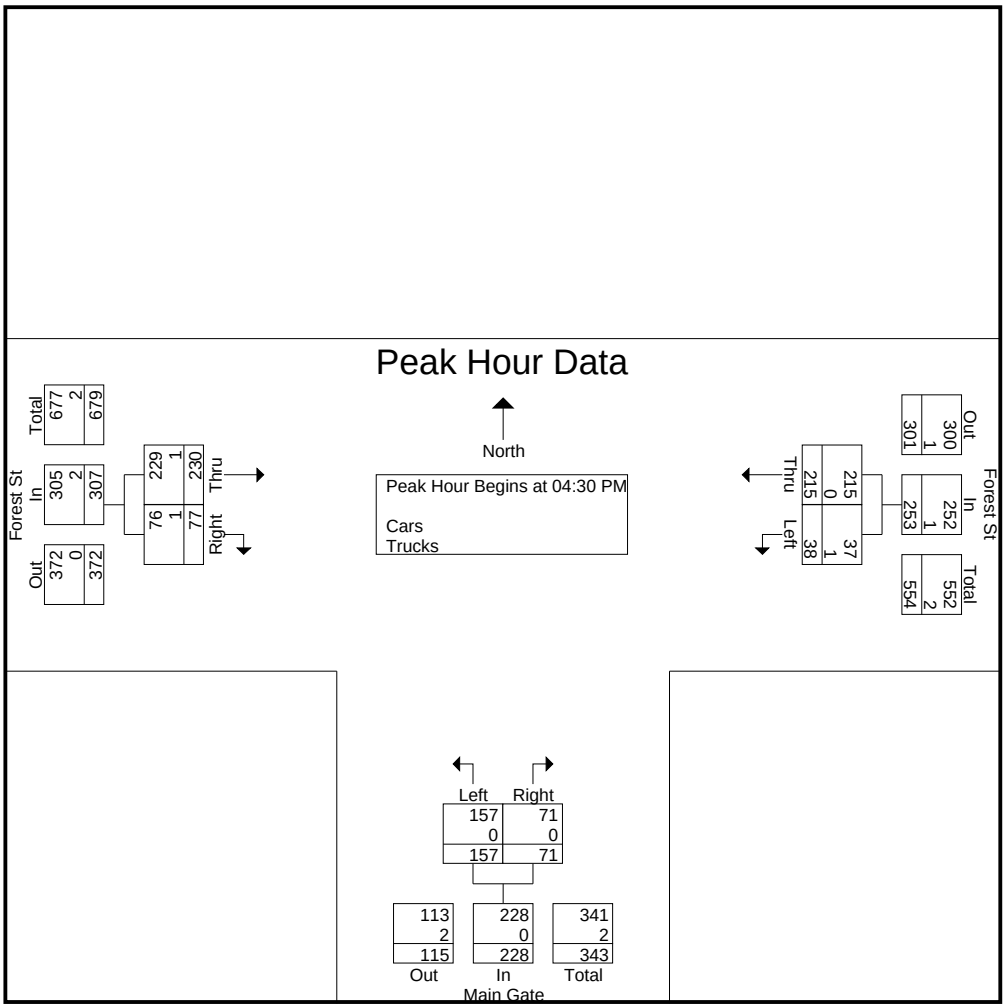


Accurate Counts
978-664-2565

N/S Street : Main Gate
E/W Street : Forest Street
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390003
Site Code : 13390003
Start Date : 9/27/2016
Page No : 3

	Forest St From East			Main Gate From South			Forest St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 09:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	7	57	64	49	18	67	74	11	85	216
04:45 PM	8	58	66	43	17	60	59	21	80	206
05:00 PM	12	50	62	41	18	59	50	24	74	195
05:15 PM	11	50	61	24	18	42	47	21	68	171
Total Volume	38	215	253	157	71	228	230	77	307	788
% App. Total	15	85		68.9	31.1		74.9	25.1		
PHF	.792	.927	.958	.801	.986	.851	.777	.802	.903	.912
Cars	37	215	252	157	71	228	229	76	305	785
% Cars	97.4	100	99.6	100	100	100	99.6	98.7	99.3	99.6
Trucks	1	0	1	0	0	0	1	1	2	3
% Trucks	2.6	0	0.4	0	0	0	0.4	1.3	0.7	0.4

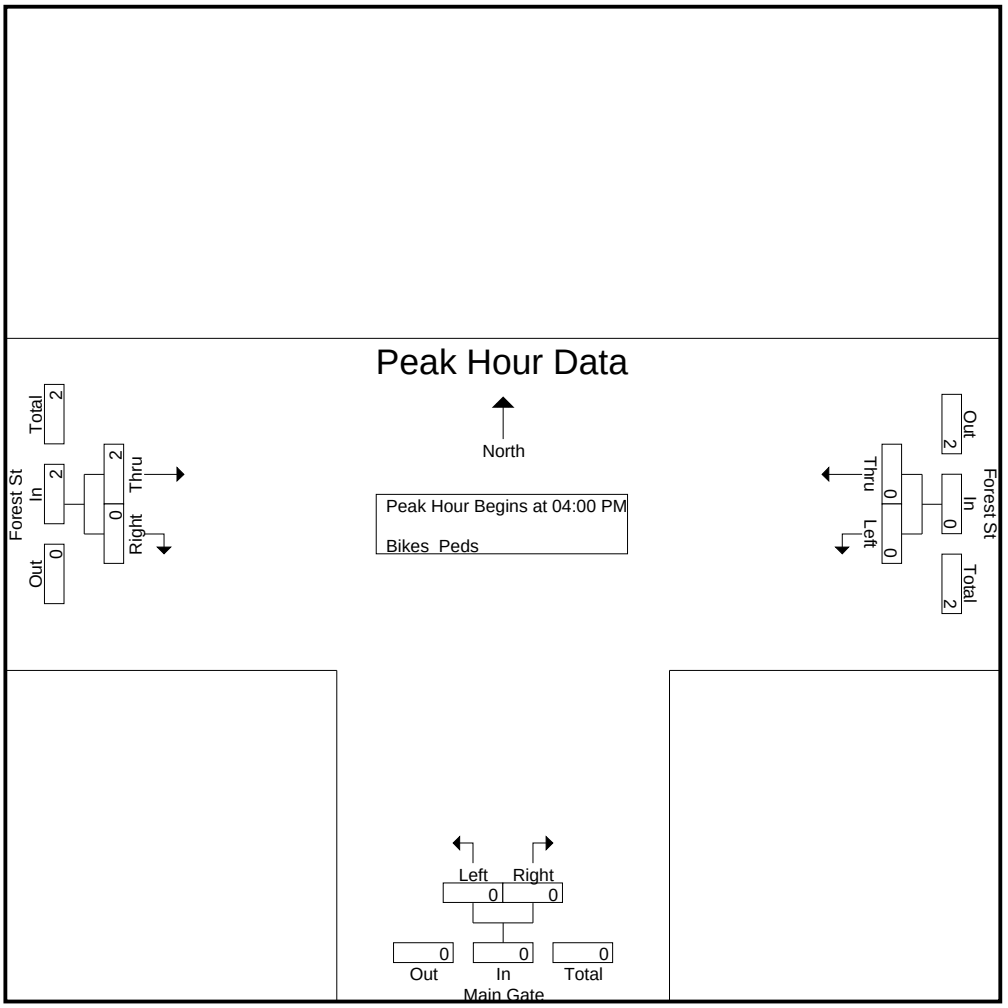


Accurate Counts
978-664-2565

N/S Street : Main Gate
E/W Street : Forest Street
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390003
Site Code : 13390003
Start Date : 9/27/2016
Page No : 15

	Forest St From East			Main Gate From South			Forest St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 09:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	2	0	2	2
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.000	.500	.500



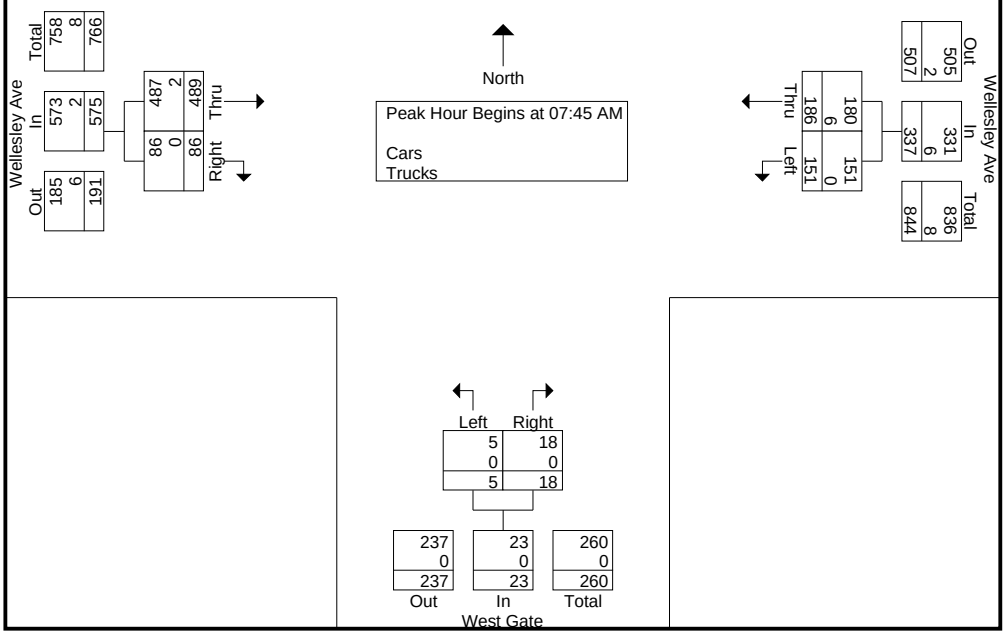
Accurate Counts
978-664-2565

N/S Street : West Gate
E/W Street: Wellesley Avenue
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390002
Site Code : 13390002
Start Date : 9/27/2016
Page No : 2

	Wellesley Ave From East			West Gate From South			Wellesley Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	40	55	95	1	4	5	125	14	139	239
08:00 AM	38	42	80	0	4	4	131	21	152	236
08:15 AM	40	38	78	2	6	8	123	16	139	225
08:30 AM	33	51	84	2	4	6	110	35	145	235
Total Volume	151	186	337	5	18	23	489	86	575	935
% App. Total	44.8	55.2		21.7	78.3		85	15		
PHF	.944	.845	.887	.625	.750	.719	.933	.614	.946	.978
Cars	151	180	331	5	18	23	487	86	573	927
% Cars	100	96.8	98.2	100	100	100	99.6	100	99.7	99.1
Trucks	0	6	6	0	0	0	2	0	2	8
% Trucks	0	3.2	1.8	0	0	0	0.4	0	0.3	0.9

Peak Hour Data

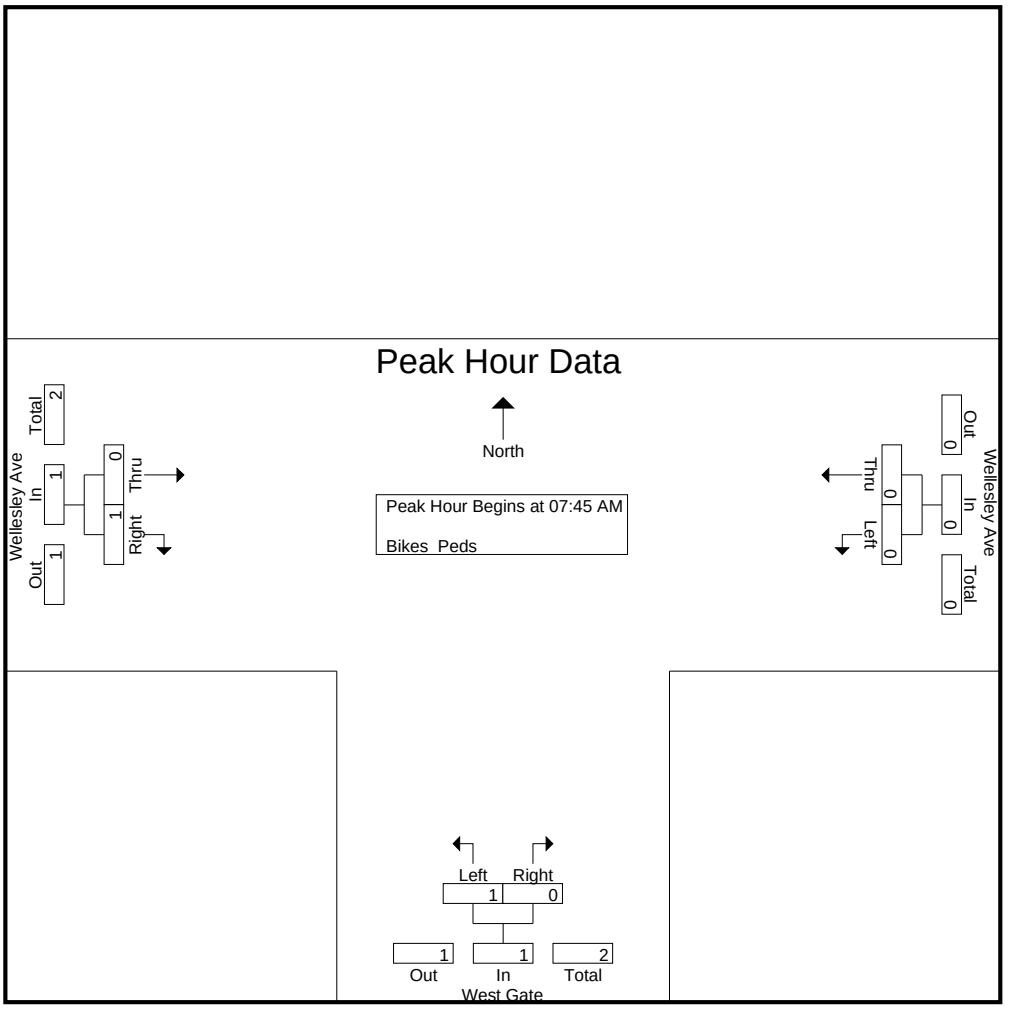


Accurate Counts
978-664-2565

N/S Street : West Gate
E/W Street: Wellesley Avenue
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390002
Site Code : 13390002
Start Date : 9/27/2016
Page No : 11

	Wellesley Ave From East			West Gate From South			Wellesley Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	1	0	1	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	1	0	1	0	1	1	2
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.250	.000	.250	.000	.250	.250	.500

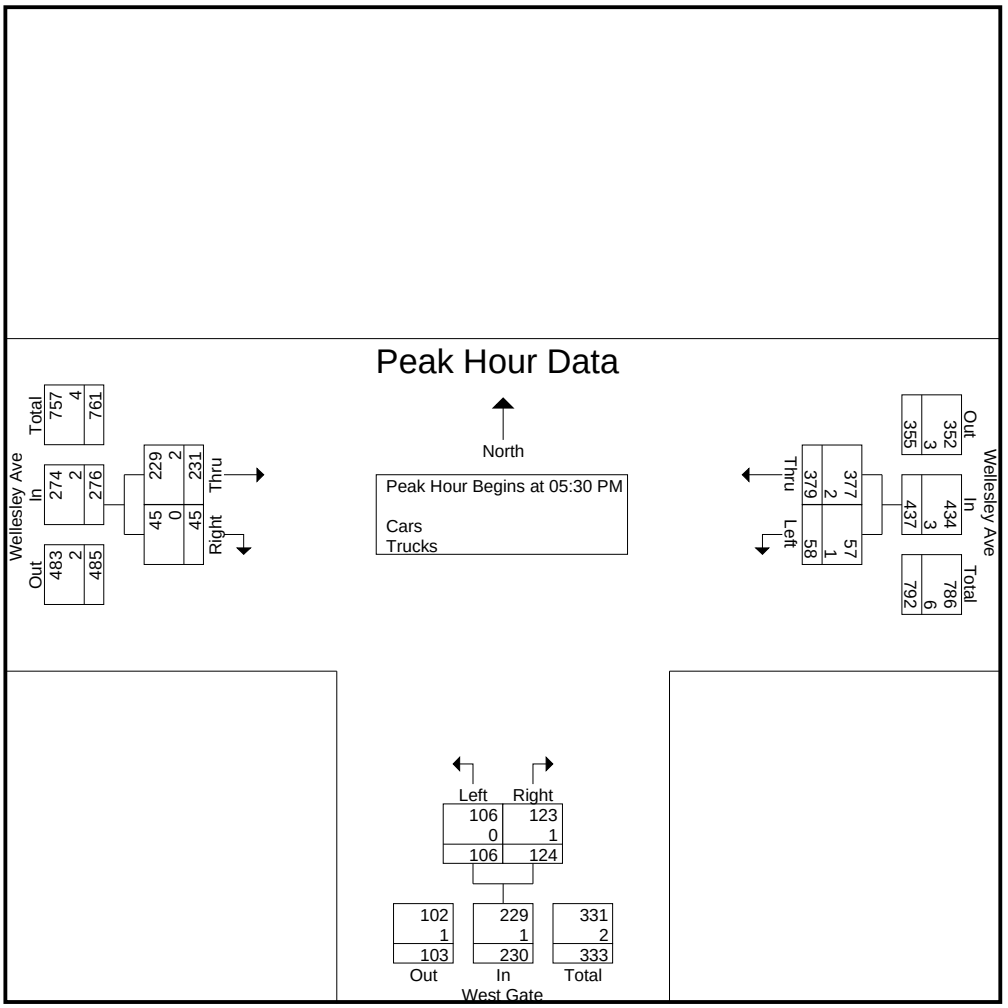


Accurate Counts
978-664-2565

N/S Street : West Gate
E/W Street: Wellesley Avenue
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390002
Site Code : 13390002
Start Date : 9/27/2016
Page No : 3

	Wellesley Ave From East			West Gate From South			Wellesley Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 09:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:30 PM										
05:30 PM	10	106	116	16	20	36	74	7	81	233
05:45 PM	20	87	107	15	31	46	70	24	94	247
06:00 PM	17	80	97	17	33	50	43	9	52	199
06:15 PM	11	106	117	58	40	98	44	5	49	264
Total Volume	58	379	437	106	124	230	231	45	276	943
% App. Total	13.3	86.7		46.1	53.9		83.7	16.3		
PHF	.725	.894	.934	.457	.775	.587	.780	.469	.734	.893
Cars	57	377	434	106	123	229	229	45	274	937
% Cars	98.3	99.5	99.3	100	99.2	99.6	99.1	100	99.3	99.4
Trucks	1	2	3	0	1	1	2	0	2	6
% Trucks	1.7	0.5	0.7	0	0.8	0.4	0.9	0	0.7	0.6

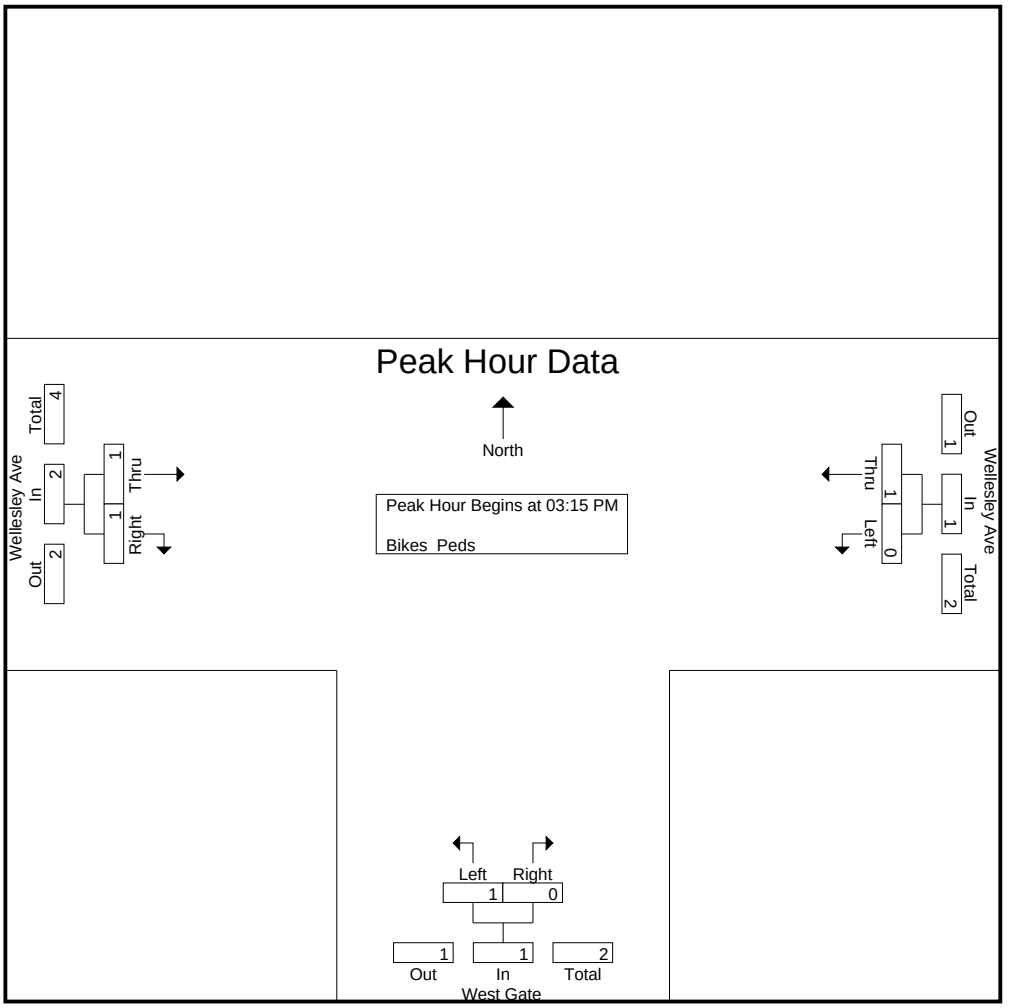


Accurate Counts
978-664-2565

N/S Street : West Gate
E/W Street: Wellesley Avenue
City/State : Wellesley, MA
Weather : Rain / Cloudy

File Name : 13390002
Site Code : 13390002
Start Date : 9/27/2016
Page No : 15

	Wellesley Ave From East			West Gate From South			Wellesley Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 09:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:15 PM										
03:15 PM	0	1	1	0	0	0	0	0	0	1
03:30 PM	0	0	0	0	0	0	0	1	1	1
03:45 PM	0	0	0	0	0	0	1	0	1	1
04:00 PM	0	0	0	1	0	1	0	0	0	1
Total Volume	0	1	1	1	0	1	1	1	2	4
% App. Total	0	100		100	0		50	50		
PHF	.000	.250	.250	.250	.000	.250	.250	.250	.500	1.00



Accurate Counts

978-664-2565

Location : Forest Street
Location : East of Main Gate
City/State: Wellesley, MA

1339SPD4

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/27/16	0	0	1	8	2	0	1	0	0	0	0	0	0	0	12
01:00	0	1	0	1	1	1	0	0	0	0	0	0	0	0	4
02:00	0	0	0	2	0	1	0	1	0	0	0	0	0	0	4
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	1	5	0	0	0	0	0	0	0	0	0	6
05:00	0	0	0	3	13	5	0	0	0	0	0	0	0	0	21
06:00	0	0	3	18	27	14	0	1	0	0	0	0	0	0	63
07:00	0	0	3	19	82	88	20	0	0	0	0	0	0	0	212
08:00	1	0	5	9	73	79	21	0	0	0	0	0	0	0	188
09:00	0	0	6	16	72	66	11	2	0	0	0	0	0	0	173
10:00	0	0	3	23	66	46	12	2	0	0	0	0	0	0	152
11:00	0	0	2	20	65	57	3	0	0	0	0	0	0	0	147
12 PM	0	0	4	48	101	58	5	1	0	0	0	0	0	0	217
13:00	0	1	10	49	73	53	4	0	0	0	0	0	0	0	190
14:00	0	1	8	51	86	75	13	0	0	0	0	0	0	1	235
15:00	0	0	8	45	74	69	16	1	0	0	1	0	0	0	214
16:00	0	0	15	52	134	84	6	2	0	0	0	0	0	0	293
17:00	0	1	5	43	106	77	15	2	0	0	1	0	0	0	250
18:00	0	0	8	62	74	61	4	1	0	0	0	0	0	0	210
19:00	0	0	12	23	42	30	3	0	0	0	0	0	0	0	110
20:00	0	0	3	38	37	15	6	0	0	0	0	0	0	0	99
21:00	0	1	4	33	34	8	0	0	0	0	0	0	0	0	80
22:00	0	0	3	9	10	6	1	0	0	0	0	0	0	0	29
23:00	1	0	4	5	5	2	0	0	0	0	0	0	0	0	17
Total	2	5	107	578	1182	895	141	13	0	0	2	0	0	1	2926

Daily

15th Percentile :	27 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	40 MPH
Mean Speed(Average) :	34 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	2077
Percent in Pace :	71.0%
Number of Vehicles > 35 MPH :	1052
Percent of Vehicles > 35 MPH :	36.0%

Accurate Counts

978-664-2565

Location : Forest Street
Location : East of Main Gate
City/State: Wellesley, MA

1339SPD4

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/28/16	0	0	1	6	5	1	0	0	0	0	0	0	0	0	13
01:00	0	0	0	2	2	1	0	1	0	0	0	0	0	0	6
02:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
05:00	0	0	0	3	8	8	3	1	0	0	0	0	0	0	23
06:00	0	0	4	11	34	20	2	0	0	0	0	0	0	0	71
07:00	0	0	1	20	66	67	18	0	0	0	0	0	0	0	172
08:00	1	2	4	24	103	69	21	0	0	0	0	0	0	0	224
09:00	0	3	7	19	78	65	12	0	0	0	1	0	0	0	185
10:00	0	0	10	18	45	39	4	1	0	0	0	0	0	0	117
11:00	0	0	4	41	94	63	12	0	0	0	0	0	0	0	214
12 PM	0	1	3	37	71	54	6	0	0	0	0	0	0	0	172
13:00	1	3	8	38	70	56	14	0	0	0	0	0	0	0	190
14:00	0	0	13	45	109	64	8	0	0	0	0	0	0	0	239
15:00	0	2	6	52	90	72	17	1	0	1	0	1	0	0	242
16:00	0	1	12	54	117	89	10	1	0	0	0	0	0	0	284
17:00	0	0	12	53	101	66	11	0	0	0	1	0	0	0	244
18:00	0	0	5	47	113	66	7	0	1	0	0	0	0	0	239
19:00	0	0	10	33	65	27	3	0	0	0	0	0	0	0	138
20:00	0	0	7	32	45	16	3	0	0	0	0	0	0	0	103
21:00	0	0	13	44	20	6	0	1	0	0	0	0	0	0	84
22:00	0	0	4	24	17	8	0	0	0	0	0	0	0	0	53
23:00	0	1	0	5	2	1	0	2	0	0	0	0	0	0	11
Total	2	13	124	610	1259	858	151	8	1	1	2	1	0	0	3030

Daily

15th Percentile :	27 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	40 MPH
Mean Speed(Average) :	34 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	2117
Percent in Pace :	69.9%
Number of Vehicles > 35 MPH :	1022
Percent of Vehicles > 35 MPH :	33.7%

Grand Total	4	18	231	1188	2441	1753	292	21	1	1	4	1	0	1	5956

Overall

15th Percentile :	27 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	40 MPH
Mean Speed(Average) :	34 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	4194
Percent in Pace :	70.4%
Number of Vehicles > 35 MPH :	2074
Percent of Vehicles > 35 MPH :	34.8%

Accurate Counts

978-664-2565

Location : Forest Street
Location : East of Main Gate
City/State: Wellesley, MA

1339SPD4

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/27/16	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
01:00	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
02:00	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3
03:00	0	0	0	1	1	1	0	0	0	0	0	0	0	0	3
04:00	0	0	1	3	1	0	1	0	0	0	0	0	0	0	6
05:00	0	0	4	5	22	11	1	1	0	0	0	0	0	0	44
06:00	0	0	2	29	52	21	3	0	0	0	0	0	0	0	107
07:00	0	0	10	42	113	51	7	0	0	0	0	0	0	0	223
08:00	0	0	12	82	164	89	13	0	0	1	0	0	0	0	361
09:00	0	3	16	53	127	60	4	0	0	0	0	0	0	0	263
10:00	0	5	1	39	73	37	5	0	0	0	0	0	0	0	160
11:00	0	0	1	24	95	36	10	1	0	0	0	0	0	0	167
12 PM	1	3	4	46	94	45	3	0	0	0	0	0	0	0	196
13:00	0	0	1	48	104	37	5	0	0	0	0	0	0	0	195
14:00	0	0	4	44	86	37	3	0	0	0	0	0	0	0	174
15:00	0	0	5	57	107	48	8	0	0	1	0	0	0	0	226
16:00	1	1	3	55	115	66	3	0	1	0	0	0	0	0	245
17:00	0	0	1	57	100	83	5	0	0	0	0	0	0	0	246
18:00	0	1	6	58	114	34	8	0	0	0	0	1	0	0	222
19:00	0	0	3	18	30	20	3	0	0	0	0	0	0	0	74
20:00	0	0	0	14	35	10	0	0	0	0	0	0	0	0	59
21:00	0	0	0	23	23	5	0	0	0	0	0	0	0	0	51
22:00	0	0	2	12	4	4	1	0	0	0	0	0	0	0	23
23:00	0	1	0	2	5	1	1	0	0	0	0	0	0	0	10
Total	2	14	76	713	1467	698	86	2	1	2	0	1	0	0	3062

Daily

15th Percentile :	27 MPH
50th Percentile :	32 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	33 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	2180
Percent in Pace :	71.2%
Number of Vehicles > 35 MPH :	790
Percent of Vehicles > 35 MPH :	25.8%

Accurate Counts

978-664-2565

Location : Forest Street
Location : East of Main Gate
City/State: Wellesley, MA

1339SPD4

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/28/16	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	2	1	2	0	0	0	0	0	0	0	0	5
03:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
04:00	0	0	0	4	1	3	1	0	0	0	0	0	0	0	9
05:00	0	0	3	7	22	8	8	0	0	0	0	0	0	0	48
06:00	0	0	3	28	54	36	1	0	0	0	0	0	0	0	122
07:00	0	1	6	49	128	55	5	0	0	0	0	0	0	0	244
08:00	0	1	13	84	179	63	4	0	0	0	0	0	0	0	344
09:00	0	3	9	32	122	68	5	0	0	0	0	0	0	0	239
10:00	0	1	3	32	112	45	9	0	1	0	0	0	0	0	203
11:00	0	0	0	30	102	51	9	0	1	1	0	0	0	0	194
12 PM	0	1	6	57	92	42	6	1	0	0	0	0	0	0	205
13:00	0	0	0	30	91	64	5	0	0	0	0	0	0	0	190
14:00	0	2	3	43	104	36	6	0	0	0	0	0	0	0	194
15:00	0	0	3	66	106	58	4	0	0	0	0	0	0	0	237
16:00	0	0	1	45	134	67	2	3	0	0	0	0	0	0	252
17:00	0	1	10	46	129	64	6	1	0	0	0	0	0	0	257
18:00	0	0	6	46	91	38	1	1	0	0	0	0	0	1	184
19:00	0	0	1	27	65	13	3	0	0	0	0	0	0	0	109
20:00	0	1	1	16	37	15	0	0	0	0	0	0	0	0	70
21:00	0	0	2	20	24	3	0	0	0	0	0	0	0	0	49
22:00	0	0	4	11	16	5	1	0	0	0	0	0	0	0	37
23:00	0	0	0	6	5	1	0	0	0	0	0	0	0	0	12
Total	0	11	74	682	1618	738	76	6	2	1	0	0	0	1	3209

Daily

15th Percentile :	27 MPH
50th Percentile :	32 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	33 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	2356
Percent in Pace :	73.4%
Number of Vehicles > 35 MPH :	824
Percent of Vehicles > 35 MPH :	25.7%

Grand Total	2	25	150	1395	3085	1436	162	8	3	3	0	1	0	1	6271

Overall

15th Percentile :	27 MPH
50th Percentile :	32 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	33 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	4521
Percent in Pace :	72.1%
Number of Vehicles > 35 MPH :	1614
Percent of Vehicles > 35 MPH :	25.7%

Accurate Counts

978-664-2565

Location : Wellesley Avenue
Location : West of West Gate
City/State: Wellesley, MA

1339SPD3

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/27/16	0	0	2	0	1	1	2	0	0	0	0	0	0	0	6
01:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:00	0	0	1	1	2	2	0	0	1	0	0	0	0	0	7
05:00	0	0	1	5	15	16	4	0	0	0	0	0	0	0	41
06:00	0	7	7	19	118	77	13	0	0	0	0	0	0	0	241
07:00	4	35	30	43	235	189	26	1	1	0	0	0	0	0	564
08:00	13	72	59	43	164	148	36	1	1	1	0	0	1	0	539
09:00	2	29	32	40	110	119	38	0	0	0	0	0	0	0	370
10:00	0	15	9	11	77	109	23	1	0	0	0	0	0	0	245
11:00	0	12	10	15	76	80	12	2	0	0	0	0	0	0	207
12 PM	3	7	18	10	80	94	22	2	0	0	0	0	0	0	236
13:00	0	14	10	9	44	68	20	1	0	0	0	0	0	0	166
14:00	1	12	13	14	74	68	18	4	0	0	0	0	0	1	205
15:00	1	17	16	15	69	73	32	1	0	0	0	0	0	0	224
16:00	3	13	8	14	81	73	14	3	0	0	0	0	0	0	209
17:00	7	24	16	23	93	92	26	2	0	0	0	0	0	1	284
18:00	2	22	14	11	58	61	13	3	1	0	0	0	0	0	185
19:00	7	5	9	12	44	24	14	0	0	0	0	0	0	0	115
20:00	1	2	1	4	27	22	5	1	0	0	0	0	0	0	63
21:00	2	2	3	4	13	23	8	1	0	0	0	0	0	0	56
22:00	0	2	1	1	8	7	4	0	1	1	0	0	0	0	25
23:00	1	0	0	0	2	4	2	0	1	0	0	0	0	0	10
Total	47	290	260	294	1391	1352	334	23	6	2	0	0	1	2	4002

Daily

15th Percentile :	25 MPH
50th Percentile :	33 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH
Mean Speed(Average) :	33 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	2743
Percent in Pace :	68.5%
Number of Vehicles > 35 MPH :	1720
Percent of Vehicles > 35 MPH :	43.0%

Accurate Counts

978-664-2565

Location : Wellesley Avenue
Location : West of West Gate
City/State: Wellesley, MA

1339SPD3

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/28/16	0	0	0	0	1	5	2	1	0	0	0	0	0	0	9
01:00	0	0	0	0	0	2	0	1	1	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4
05:00	0	2	1	5	12	15	6	1	0	0	0	0	0	0	42
06:00	4	9	0	19	82	105	25	2	0	0	0	0	0	0	246
07:00	5	31	49	74	209	157	14	2	0	0	0	0	0	0	541
08:00	10	65	59	51	202	172	17	2	1	0	0	0	0	0	579
09:00	3	27	29	27	118	95	25	3	0	0	0	0	0	0	327
10:00	3	15	11	18	74	84	14	2	0	0	0	0	0	0	221
11:00	3	15	16	23	97	91	21	1	0	0	0	0	0	0	267
12 PM	4	18	7	20	72	64	20	1	0	0	0	0	0	0	206
13:00	3	15	17	17	68	69	20	2	0	0	0	0	0	0	211
14:00	2	12	13	27	79	93	21	2	0	0	0	0	0	0	249
15:00	3	10	17	18	90	96	32	0	0	0	0	0	0	0	266
16:00	4	12	5	23	66	88	21	2	0	0	0	0	0	0	221
17:00	1	16	13	28	81	75	16	0	0	0	0	0	0	0	230
18:00	6	18	16	24	81	40	6	1	0	0	0	0	0	0	192
19:00	3	11	3	18	40	25	2	0	0	0	0	0	0	0	102
20:00	0	3	3	10	29	37	3	1	0	0	0	0	0	0	86
21:00	0	3	3	4	17	21	4	1	1	0	0	0	0	0	54
22:00	1	1	0	6	6	8	3	2	1	0	0	0	0	0	28
23:00	1	0	0	0	1	5	0	0	1	0	0	0	0	0	8
Total	56	284	262	412	1427	1350	272	27	5	0	0	0	0	0	4095

Daily

15th Percentile :	25 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	33 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	2777
Percent in Pace :	67.8%
Number of Vehicles > 35 MPH :	1654
Percent of Vehicles > 35 MPH :	40.4%

Grand Total	103	574	522	706	2818	2702	606	50	11	2	0	0	1	2	8097

Overall

15th Percentile :	25 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	42 MPH
Mean Speed(Average) :	33 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	5520
Percent in Pace :	68.2%
Number of Vehicles > 35 MPH :	3374
Percent of Vehicles > 35 MPH :	41.7%

Accurate Counts

978-664-2565

Location : Wellesley Avenue
Location : West of West Gate
City/State: Wellesley, MA

1339SPD3

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/27/16	0	0	0	1	5	0	2	0	0	0	0	0	0	0	8
01:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
04:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2
05:00	0	0	1	3	7	7	1	0	0	0	0	0	0	0	19
06:00	0	3	0	0	18	9	1	0	0	0	0	0	0	0	31
07:00	3	8	17	35	54	36	3	0	0	0	0	0	0	0	156
08:00	1	6	17	29	65	44	6	1	0	0	1	0	0	0	170
09:00	0	7	11	22	80	68	11	0	0	0	0	0	1	0	200
10:00	1	5	11	15	63	54	15	1	0	0	0	0	0	1	166
11:00	3	10	11	17	63	97	17	0	0	0	0	0	0	0	218
12 PM	0	15	15	16	59	63	10	1	0	0	0	0	0	0	179
13:00	1	17	12	15	78	67	15	1	0	0	0	0	0	0	206
14:00	1	27	23	26	75	92	25	2	0	0	0	0	0	0	271
15:00	0	23	31	25	113	164	17	5	0	0	2	0	0	0	380
16:00	2	32	35	37	148	169	25	1	0	0	0	0	0	0	449
17:00	2	37	40	42	130	169	30	1	0	0	0	0	0	0	451
18:00	4	55	51	38	145	119	13	1	0	0	0	0	0	0	426
19:00	1	22	7	15	93	49	6	1	0	0	0	0	0	0	194
20:00	0	3	1	13	79	52	8	1	0	0	0	0	0	0	157
21:00	1	0	2	12	51	30	4	2	0	0	0	0	0	0	102
22:00	0	0	1	6	8	20	4	0	0	0	0	0	0	0	39
23:00	0	0	0	0	8	4	3	1	0	0	0	0	0	0	16
Total	20	270	286	369	1343	1316	217	19	0	0	3	0	1	1	3845

Daily

15th Percentile :	25 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	33 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	2659
Percent in Pace :	69.2%
Number of Vehicles > 35 MPH :	1557
Percent of Vehicles > 35 MPH :	40.5%

Accurate Counts

978-664-2565

Location : Wellesley Avenue
Location : West of West Gate
City/State: Wellesley, MA

1339SPD3

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
09/28/16	0	0	0	1	4	2	3	1	0	0	0	0	0	0	11
01:00	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
05:00	0	0	2	1	5	7	3	0	0	0	0	0	0	0	18
06:00	0	2	0	3	15	19	5	0	0	0	0	0	0	0	44
07:00	2	7	28	37	43	39	1	0	0	0	0	0	0	0	157
08:00	1	6	27	39	75	53	9	0	0	0	0	0	0	0	210
09:00	2	10	16	28	84	60	10	2	0	0	0	0	0	0	212
10:00	3	6	9	23	70	76	8	1	0	0	0	0	0	0	196
11:00	0	18	10	25	73	68	21	0	0	0	0	0	0	0	215
12 PM	2	14	18	38	104	78	14	1	0	0	0	0	0	0	269
13:00	2	17	16	17	72	98	23	0	0	0	0	0	0	0	245
14:00	1	23	18	16	67	96	25	0	0	0	0	0	0	0	246
15:00	1	11	19	14	117	117	25	1	0	0	0	0	0	0	305
16:00	1	34	52	32	132	145	35	3	1	0	0	0	0	0	435
17:00	0	29	31	38	158	157	30	0	0	1	0	0	1	0	445
18:00	2	34	29	38	131	100	15	0	0	0	0	0	0	0	349
19:00	2	18	12	20	74	55	5	1	0	0	0	0	0	0	187
20:00	0	0	2	5	57	45	8	0	0	0	0	0	0	0	117
21:00	3	0	1	5	49	32	4	0	0	0	0	0	0	0	94
22:00	1	1	0	3	20	13	0	0	1	0	0	0	0	0	39
23:00	0	1	0	0	7	6	4	0	1	0	0	0	0	0	19
Total	23	231	290	383	1361	1267	248	11	3	1	0	0	1	0	3819

Daily

15th Percentile :	25 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	33 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	2628
Percent in Pace :	68.8%
Number of Vehicles > 35 MPH :	1531
Percent of Vehicles > 35 MPH :	40.1%

Grand Total	43	501	576	752	2704	2583	465	30	3	1	3	0	2	1	7664

Overall

15th Percentile :	25 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	33 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	5287
Percent in Pace :	69.0%
Number of Vehicles > 35 MPH :	3088
Percent of Vehicles > 35 MPH :	40.3%

Appendix C: Monthly Traffic Volumes

MASSACHUSETTS HIGHWAY DEPARTMENT - STATEWIDE TRAFFIC DATA COLLECTION

2010 WEEKDAY SEASONAL FACTORS *

* Note: These are weekday factors. The average of the factors for the year will not equal 1, as weekend data are not considered.

FACTOR GROUP	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GROUP 1 - WEST INTERSTATE	0.97	0.93	0.89	0.88	0.89	0.87	0.91	0.89	0.89	0.90	0.93	0.95
Use group 2 for R5, R6, & R0 GROUP 2 - **RURAL MAJOR COLLECTOR (R-5)**	1.11	1.10	1.07	1.00	0.91	0.89	0.87	0.86	0.90	0.92	1.02	1.06
GROUP 3A - RECREATIONAL **(1-4) See below	1.26	1.25	1.19	1.08	0.95	0.88	0.77	0.76	0.93	1.00	1.08	1.15
GROUP 3B - RECREATIONAL ***(5) See below	1.25	1.23	1.16	1.10	0.96	0.90	0.75	0.73	0.93	0.99	1.13	1.16
GROUP 4 - I-495 INTERSTATE	1.02	0.99	0.98	0.95	0.92	0.88	0.86	0.84	0.93	0.95	0.99	1.03
GROUP 5 - EAST INTERSTATE	1.04	1.00	0.97	0.93	0.92	0.91	0.92	0.89	0.92	0.93	0.97	1.01
GROUP 6: Use group 6 for U2, U3, U5, U6, U0, R2, & R3 **URBAN ARTERIALS, COLLECTORS & RURAL ARTERIALS (R-2, R-3)**	1.01	1.00	0.96	0.93	0.91	0.90	0.91	0.90	0.92	0.93	0.97	0.99
GROUP 7 - I-84 PROXIMITY (STA. 17, 3921)	1.21	1.20	1.11	1.06	1.00	1.01	0.95	0.90	1.06	1.06	1.06	1.14
GROUP 8 - I-295 PROXIMITY (STA. 6590)	1.00	0.99	0.95	0.92	0.88	0.87	0.92	0.88	0.91	0.91	0.92	0.94
GROUP 9 - I-195 PROXIMITY (STA. 7)	1.10	1.05	1.03	0.96	0.90	0.86	0.85	0.79	0.88	0.93	0.99	1.04

RECREATIONAL: (ALL YEARS)

****GROUP 3A:**

1. CAPE COD (ALL TOWNS)

2.PLYMOUTH(SOUTH OF RTE.3A)

7014, 7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108,7178

3.MARTHA'S VINEYARD

4.NANTUCKET

*****GROUP 3B:**

5.PERMANENTS 2 & 189

1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,

1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,

1105,1106,1107,1108,1113,1114,1116,2196,2197,2198

2010 AXLE CORRECTION FACTORS

ROAD INVENTORY FUNCTIONAL CLASSIFICATION	AXLE CORRECTION FACTOR
RURAL	
1	0.93
2	0.97
3	0.98
0,5,6	0.98
URBAN	
1	0.96
2,3	0.97
5	0.98
0,6	0.98
I-84	0.78

ROUND OFF

0 - 999.....10

> 1,000.....100

Apply I-84 factor to stations:

3290, 3921, 3929

SECTION I - CONTINUOUS COUNTING STATION MONTHLY AVERAGE DAILY TRAFFIC

STATION 415 - NEWTON - RTE.I-95 (128) - SOUTH OF RTE.I-90

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
06	126,000	126,906	136,149	136,322	140,602	142,863	135,563	142,863	140,973	*141,211*	138,206	133,710	136,781
Adjustment to Avg.	**-7.88%**	**-7.22%**	**-0.46%**	**-0.34%**	**2.79%**	**4.45%**	**-0.89%**	**4.45%**	**3.07%**	**3.24%**	**1.04%**	**-2.24%**	**0.00%**

ITALICS = ESTIMATED DATA

MADT

Appendix D: Crash-Rate Worksheets

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wellesley MA COUNT DATE : 9/27/2016

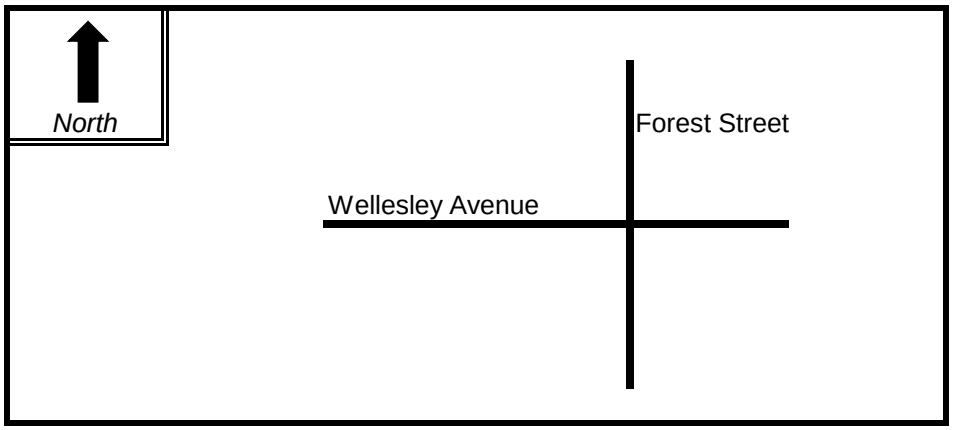
DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Wellesley Avenue

MINOR STREET(S) : Forest Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (~~AM~~/PM) :	347	248	348	434		**1,377**

" K " FACTOR : **0.094** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **14,649**

TOTAL # OF CRASHES : 8 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **2.67**

CRASH RATE CALCULATION : 0.50 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 1339 Babson College--Wellesley MA 10/05/2016

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wellesly MA COUNT DATE : 9/27/2016

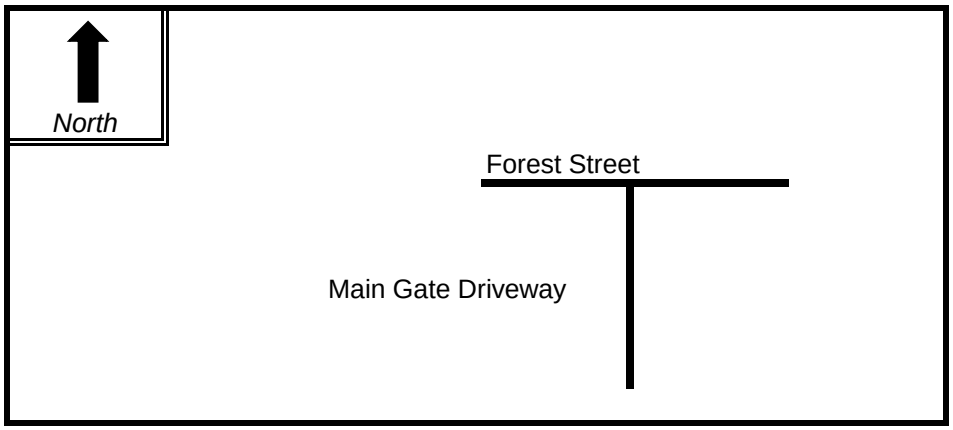
DISTRICT : 6 UNSIGNALIZED : Yes SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Forest Street

MINOR STREET(S) : Main Gate Driveway

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB			
PEAK HOURLY VOLUMES (~~AM~~/PM) :	307	253	228			**788**

" K " FACTOR : **0.088** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **8,955**

TOTAL # OF CRASHES : 1 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.33**

CRASH RATE CALCULATION : 0.10

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 1339 Babson College--Wellesley MA 10/05/2016

Appendix E: Capacity Analysis Worksheets

Intersection	
Intersection Delay, s/veh	57.4
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	SEU	SEL	SET	SER
Vol, veh/h	0	4	364	91	0	0	250	106	0	100	128	3
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.90	0.90	0.90	0.92	0.72	0.72	0.72
Heavy Vehicles, %	2	0	1	0	2	1	1	1	2	1	0	33
Mvmt Flow	0	4	391	98	0	0	278	118	0	139	178	4
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	SE
Opposing Approach	WB	EB	NW
Opposing Lanes	1	1	1
Conflicting Approach Left	SE	NW	WB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NW	SE	EB
Conflicting Lanes Right	1	1	1
HCM Control Delay	74	59.2	41.5
HCM LOS	F	F	E

Lane	NWLn1	EBLn1	WBLn1	SELn1
Vol Left, %	19%	1%	0%	43%
Vol Thru, %	81%	79%	70%	55%
Vol Right, %	0%	20%	30%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	285	459	356	231
LT Vol	55	4	0	100
Through Vol	230	364	250	128
RT Vol	0	91	106	3
Lane Flow Rate	339	494	396	321
Geometry Grp	1	1	1	1
Degree of Util (X)	0.85	1	0.937	0.812
Departure Headway (Hd)	9.019	8.558	8.528	9.106
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	400	424	427	398
Service Time	7.075	6.638	6.582	7.16
HCM Lane V/C Ratio	0.848	1.165	0.927	0.807
HCM Control Delay	46.2	74	59.2	41.5
HCM Lane LOS	E	F	F	E
HCM 95th-tile Q	8.1	12.5	10.6	7.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	NWU	NWL	NWT	NWR
Vol, veh/h	0	55	230	0
Peak Hour Factor	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	4	1	4
Mvmt Flow	0	65	274	0
Number of Lanes	0	0	1	0

Approach	NW
Opposing Approach	SE
Opposing Lanes	1
Conflicting Approach Left	EB
Conflicting Lanes Left	1
Conflicting Approach Right	WB
Conflicting Lanes Right	1
HCM Control Delay	46.2
HCM LOS	E

Lane

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	184	118	76	301	19	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	50	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	90	90	66	66
Heavy Vehicles, %	1	1	3	2	15	0
Mvmt Flow	202	130	84	334	29	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	202	0	705	202
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	503	-
Critical Hdwy	-	-	4.13	-	6.55	6.2
Critical Hdwy Stg 1	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.227	-	3.635	3.3
Pot Cap-1 Maneuver	-	-	1364	-	384	844
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	582	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1364	-	355	844
Mov Cap-2 Maneuver	-	-	-	-	355	-
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	538	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	355	844	-	-	1364	-
HCM Lane V/C Ratio	0.081	0.018	-	-	0.062	-
HCM Control Delay (s)	16	9.3	-	-	7.8	0
HCM Lane LOS	C	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.2	-

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	489	86	151	186	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	89	89	72	72
Heavy Vehicles, %	0	0	0	3	0	0
Mvmt Flow	515	91	170	209	7	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	605	0	1108	560
Stage 1	-	-	-	-	560	-
Stage 2	-	-	-	-	548	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	983	-	234	532
Stage 1	-	-	-	-	576	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	983	-	188	532
Mov Cap-2 Maneuver	-	-	-	-	188	-
Stage 1	-	-	-	-	576	-
Stage 2	-	-	-	-	469	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.2	15.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	381	-	-	983	-
HCM Lane V/C Ratio	0.084	-	-	0.173	-
HCM Control Delay (s)	15.3	-	-	9.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.6	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	464	0	85	356	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	94	94	61	61
Heavy Vehicles, %	0	0	1	1	0	4
Mvmt Flow	510	0	90	379	0	44

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	510	0	1070	510
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	560	-
Critical Hdwy	-	-	4.11	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.336
Pot Cap-1 Maneuver	-	-	1060	-	247	559
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	576	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1060	-	220	559
Mov Cap-2 Maneuver	-	-	-	-	220	-
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	514	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	559	-	-	1060	-
HCM Lane V/C Ratio	0.079	-	-	0.085	-
HCM Control Delay (s)	12	-	-	8.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.3	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	219	285	27	85	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	84	84	73	73
Heavy Vehicles, %	0	0	2	4	1	0
Mvmt Flow	0	292	339	32	116	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	371	0	-	0	647	355
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	292	-
Critical Hdwy	4.1	-	-	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.3
Pot Cap-1 Maneuver	1199	-	-	-	437	693
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	760	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1199	-	-	-	437	693
Mov Cap-2 Maneuver	-	-	-	-	437	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	760	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1199	-	-	-	437
HCM Lane V/C Ratio	-	-	-	-	0.266
HCM Control Delay (s)	0	-	-	-	16.2
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1.1

Intersection	
Intersection Delay, s/veh	40.2
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	SEU	SEL	SET	SER
Vol, veh/h	0	5	281	62	0	0	321	65	0	56	186	6
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.93	0.93	0.93	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	2	2	0	1	2	2	0	1	0
Mvmt Flow	0	6	327	72	0	0	345	70	0	64	214	7
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	SE
Opposing Approach	WB	EB	NW
Opposing Lanes	1	1	1
Conflicting Approach Left	SE	NW	WB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NW	SE	EB
Conflicting Lanes Right	1	1	1
HCM Control Delay	46.4	49.8	27.7
HCM LOS	E	E	D

Lane	NWLn1	EBLn1	WBLn1	SELn1
Vol Left, %	39%	1%	0%	23%
Vol Thru, %	61%	81%	83%	75%
Vol Right, %	0%	18%	17%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	252	348	386	248
LT Vol	99	5	0	56
Through Vol	153	281	321	186
RT Vol	0	62	65	6
Lane Flow Rate	307	405	415	285
Geometry Grp	1	1	1	1
Degree of Util (X)	0.722	0.882	0.903	0.675
Departure Headway (Hd)	8.461	7.85	7.833	8.521
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	427	461	461	422
Service Time	6.533	5.918	5.898	6.594
HCM Lane V/C Ratio	0.719	0.879	0.9	0.675
HCM Control Delay	30.7	46.4	49.8	27.7
HCM Lane LOS	D	E	E	D
HCM 95th-tile Q	5.6	9.4	10	4.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	NWU	NWL	NWT	NWR
Vol, veh/h	0	99	153	0
Peak Hour Factor	0.92	0.82	0.82	0.82
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	121	187	0
Number of Lanes	0	0	1	0

Approach	NW
Opposing Approach	SE
Opposing Lanes	1
Conflicting Approach Left	EB
Conflicting Lanes Left	1
Conflicting Approach Right	WB
Conflicting Lanes Right	1
HCM Control Delay	30.7
HCM LOS	D

Lane

Intersection	
Int Delay, s/veh	5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	230	77	38	215	157	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	50	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	96	96	85	85
Heavy Vehicles, %	0	1	3	0	0	0
Mvmt Flow	256	86	40	224	185	84

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	256	0	559	256
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	303	-
Critical Hdwy	-	-	4.13	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.227	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1303	-	494	788
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1303	-	477	788
Mov Cap-2 Maneuver	-	-	-	-	477	-
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	728	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	477	788	-	-	1303	-
HCM Lane V/C Ratio	0.387	0.106	-	-	0.03	-
HCM Control Delay (s)	17.2	10.1	-	-	7.8	0
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	1.8	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	17.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	231	45	58	379	106	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	93	93	59	59
Heavy Vehicles, %	1	0	2	1	0	1
Mvmt Flow	316	62	62	408	180	210

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	378	0	879	347
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	532	-
Critical Hdwy	-	-	4.12	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.309
Pot Cap-1 Maneuver	-	-	1180	-	321	698
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	593	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1180	-	299	698
Mov Cap-2 Maneuver	-	-	-	-	299	-
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	553	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	53.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	432	-	-	1180	-
HCM Lane V/C Ratio	0.902	-	-	0.053	-
HCM Control Delay (s)	53.6	-	-	8.2	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	9.7	-	-	0.2	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	337	0	48	386	0	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	93	93	64	64
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	340	0	52	415	0	148

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	340	0	858	340
Stage 1	-	-	-	-	340	-
Stage 2	-	-	-	-	518	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1230	-	330	707
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1230	-	312	707
Mov Cap-2 Maneuver	-	-	-	-	312	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	569	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	707	-	-	1230	-
HCM Lane V/C Ratio	0.21	-	-	0.042	-
HCM Control Delay (s)	11.4	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	248	252	95	48	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	82	82	86	86
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	295	307	116	56	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	423	0	-	0	660	365
Stage 1	-	-	-	-	365	-
Stage 2	-	-	-	-	295	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1147	-	-	-	431	685
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	760	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1147	-	-	-	431	685
Mov Cap-2 Maneuver	-	-	-	-	431	-
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	760	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1147	-	-	-	431
HCM Lane V/C Ratio	-	-	-	-	0.129
HCM Control Delay (s)	0	-	-	-	14.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection	
Intersection Delay, s/veh	71.1
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	SEU	SEL	SET	SER
Vol, veh/h	0	4	397	99	0	0	268	114	0	107	137	3
Peak Hour Factor	0.92	0.93	0.93	0.93	0.92	0.90	0.90	0.90	0.92	0.72	0.72	0.72
Heavy Vehicles, %	2	0	1	0	2	1	1	1	2	1	0	33
Mvmt Flow	0	4	427	106	0	0	298	127	0	149	190	4
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	SE
Opposing Approach	WB	EB	NW
Opposing Lanes	1	1	1
Conflicting Approach Left	SE	NW	WB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NW	SE	EB
Conflicting Lanes Right	1	1	1
HCM Control Delay	76.4	76.2	58.3
HCM LOS	F	F	F

Lane	NWLn1	EBLn1	WBLn1	SELn1
Vol Left, %	19%	1%	0%	43%
Vol Thru, %	81%	79%	70%	55%
Vol Right, %	0%	20%	30%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	310	500	382	247
LT Vol	59	4	0	107
Through Vol	251	397	268	137
RT Vol	0	99	114	3
Lane Flow Rate	369	538	424	343
Geometry Grp	1	1	1	1
Degree of Util (X)	0.965	1	1	0.91
Departure Headway (Hd)	9.415	9.175	9.13	9.548
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	388	398	399	381
Service Time	7.47	7.175	7.13	7.603
HCM Lane V/C Ratio	0.951	1.352	1.063	0.9
HCM Control Delay	69.2	76.4	76.2	58.3
HCM Lane LOS	F	F	F	F
HCM 95th-tile Q	10.9	12.1	12.2	9.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	NWU	NWL	NWT	NWR
Vol, veh/h	0	59	251	0
Peak Hour Factor	0.92	0.84	0.84	0.84
Heavy Vehicles, %	2	4	1	4
Mvmt Flow	0	70	299	0
Number of Lanes	0	0	1	0

Approach	NW
Opposing Approach	SE
Opposing Lanes	1
Conflicting Approach Left	EB
Conflicting Lanes Left	1
Conflicting Approach Right	WB
Conflicting Lanes Right	1
HCM Control Delay	69.2
HCM LOS	F

Lane

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	207	118	76	328	19	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	50	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	90	90	66	66
Heavy Vehicles, %	1	1	3	2	15	0
Mvmt Flow	227	130	84	364	29	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	227	0	760	227
Stage 1	-	-	-	-	227	-
Stage 2	-	-	-	-	533	-
Critical Hdwy	-	-	4.13	-	6.55	6.2
Critical Hdwy Stg 1	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	5.55	-
Follow-up Hdwy	-	-	2.227	-	3.635	3.3
Pot Cap-1 Maneuver	-	-	1335	-	356	817
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	563	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1335	-	328	817
Mov Cap-2 Maneuver	-	-	-	-	328	-
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	519	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	328	817	-	-	1335	-
HCM Lane V/C Ratio	0.088	0.019	-	-	0.063	-
HCM Control Delay (s)	17	9.5	-	-	7.9	0
HCM Lane LOS	C	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.2	-

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	530	86	151	208	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	89	89	72	72
Heavy Vehicles, %	0	0	0	3	0	0
Mvmt Flow	558	91	170	234	7	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	648	0	1176	603
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	573	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	947	-	213	503
Stage 1	-	-	-	-	550	-
Stage 2	-	-	-	-	568	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	947	-	169	503
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	550	-
Stage 2	-	-	-	-	451	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.1	16.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	352	-	-	947	-
HCM Lane V/C Ratio	0.091	-	-	0.179	-
HCM Control Delay (s)	16.2	-	-	9.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.7	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	504	0	91	382	0	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	94	94	61	61
Heavy Vehicles, %	0	0	1	1	0	4
Mvmt Flow	554	0	97	406	0	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	554	0	1154	554
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	600	-
Critical Hdwy	-	-	4.11	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.336
Pot Cap-1 Maneuver	-	-	1021	-	220	528
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	552	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1021	-	193	528
Mov Cap-2 Maneuver	-	-	-	-	193	-
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	484	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	528	-	-	1021	-
HCM Lane V/C Ratio	0.09	-	-	0.095	-
HCM Control Delay (s)	12.5	-	-	8.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.3	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	236	310	29	91	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	84	84	73	73
Heavy Vehicles, %	0	0	2	4	1	0
Mvmt Flow	0	315	369	35	125	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	404	0	-	0	701	386
Stage 1	-	-	-	-	386	-
Stage 2	-	-	-	-	315	-
Critical Hdwy	4.1	-	-	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.3
Pot Cap-1 Maneuver	1166	-	-	-	406	666
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	742	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1166	-	-	-	406	666
Mov Cap-2 Maneuver	-	-	-	-	406	-
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	742	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1166	-	-	-	406
HCM Lane V/C Ratio	-	-	-	-	0.307
HCM Control Delay (s)	0	-	-	-	17.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1.3

Intersection	
Intersection Delay, s/veh	58.3
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	SEU	SEL	SET	SER
Vol, veh/h	0	5	297	66	0	0	344	69	0	60	199	6
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.93	0.93	0.93	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	2	2	0	1	2	2	0	1	0
Mvmt Flow	0	6	345	77	0	0	370	74	0	69	229	7
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	SE
Opposing Approach	WB	EB	NW
Opposing Lanes	1	1	1
Conflicting Approach Left	SE	NW	WB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NW	SE	EB
Conflicting Lanes Right	1	1	1
HCM Control Delay	71.9	73.6	36.5
HCM LOS	F	F	E

Lane	NWLn1	EBLn1	WBLn1	SELn1
Vol Left, %	39%	1%	0%	23%
Vol Thru, %	61%	81%	83%	75%
Vol Right, %	0%	18%	17%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	265	368	413	265
LT Vol	104	5	0	60
Through Vol	161	297	344	199
RT Vol	0	66	69	6
Lane Flow Rate	323	428	444	305
Geometry Grp	1	1	1	1
Degree of Util (X)	0.801	0.996	1	0.768
Departure Headway (Hd)	9.071	8.381	8.516	9.082
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	401	436	426	399
Service Time	7.071	6.402	6.561	7.11
HCM Lane V/C Ratio	0.805	0.982	1.042	0.764
HCM Control Delay	39.9	71.9	73.6	36.5
HCM Lane LOS	E	F	F	E
HCM 95th-tile Q	7	12.5	12.6	6.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	NWU	NWL	NWT	NWR
Vol, veh/h	0	104	161	0
Peak Hour Factor	0.92	0.82	0.82	0.82
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	127	196	0
Number of Lanes	0	0	1	0

Approach	NW
Opposing Approach	SE
Opposing Lanes	1
Conflicting Approach Left	EB
Conflicting Lanes Left	1
Conflicting Approach Right	WB
Conflicting Lanes Right	1
HCM Control Delay	39.9
HCM LOS	E

Lane

Intersection	
Int Delay, s/veh	5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	251	77	38	233	157	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	50	-	-	0	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	96	96	85	85
Heavy Vehicles, %	0	1	3	0	0	0
Mvmt Flow	279	86	40	243	185	84

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	279	0	601	279
Stage 1	-	-	-	-	279	-
Stage 2	-	-	-	-	322	-
Critical Hdwy	-	-	4.13	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.227	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1278	-	467	765
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	739	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1278	-	450	765
Mov Cap-2 Maneuver	-	-	-	-	450	-
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	712	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	450	765	-	-	1278	-
HCM Lane V/C Ratio	0.41	0.109	-	-	0.031	-
HCM Control Delay (s)	18.5	10.3	-	-	7.9	0
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	2	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	21.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	251	45	58	407	106	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	93	93	59	59
Heavy Vehicles, %	1	0	2	1	0	1
Mvmt Flow	344	62	62	438	180	210

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	405	0	937	375
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	562	-
Critical Hdwy	-	-	4.12	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.309
Pot Cap-1 Maneuver	-	-	1154	-	296	674
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	575	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1154	-	275	674
Mov Cap-2 Maneuver	-	-	-	-	275	-
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	534	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	68.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	404	-	-	1154	-
HCM Lane V/C Ratio	0.965	-	-	0.054	-
HCM Control Delay (s)	68.7	-	-	8.3	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	11.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	357	0	52	413	0	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	93	93	64	64
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	361	0	56	444	0	156

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	361	0	917	361
Stage 1	-	-	-	-	361	-
Stage 2	-	-	-	-	556	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1209	-	304	688
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	578	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1209	-	285	688
Mov Cap-2 Maneuver	-	-	-	-	285	-
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	543	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	688	-	-	1209	-
HCM Lane V/C Ratio	0.227	-	-	0.046	-
HCM Control Delay (s)	11.8	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	265	265	100	52	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	82	82	86	86
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	315	323	122	60	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	445	0	-	0	699	384
Stage 1	-	-	-	-	384	-
Stage 2	-	-	-	-	315	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1126	-	-	-	409	668
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	744	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1126	-	-	-	409	668
Mov Cap-2 Maneuver	-	-	-	-	409	-
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	744	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1126	-	-	-	409
HCM Lane V/C Ratio	-	-	-	-	0.148
HCM Control Delay (s)	0	-	-	-	15.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.5