Attachment 1

Watershed Map

WATERSHED MAP

CITY OF ALBANY
BUCKINGHAM POND LAKE ASSESSMENT
ALBANY COUNTY, NEW YORK

Barton & Loguidice, D.P.C.

Date
JANUARY 2015

Scale
1"=500'

Figure Number
1

Project Number
967.002.001

Attachment 2

Rainfall Values

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	73.808 degrees West
Latitude	42.664 degrees North
Elevation	Unknown/Unavailable
Date/Time	Tue, 11 Nov 2014 15:53:09 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.54	0.70	0.88	1.09	**1yr**	0.76	0.95	1.24	1.52	1.84	2.22	2.50	**1yr**	1.97	2.40	2.82	3.37	3.88	**1yr**
2yr	0.34	0.53	0.66	0.86	1.09	1.34	**2yr**	0.94	1.20	1.53	1.84	2.20	2.61	2.94	**2yr**	2.31	2.82	3.29	3.89	4.43	**2yr**
5yr	0.40	0.63	0.79	1.06	1.35	1.68	**5yr**	1.17	1.46	1.92	2.31	2.74	3.22	3.65	**5yr**	2.85	3.51	4.06	4.69	5.33	**5yr**
10yr	0.45	0.71	0.90	1.22	1.59	1.99	**10yr**	1.37	1.70	2.28	2.73	3.23	3.78	4.29	**10yr**	3.34	4.13	4.76	5.41	6.13	**10yr**
25yr	0.54	0.85	1.09	1.50	1.98	2.50	**25yr**	1.71	2.08	2.85	3.42	4.03	4.67	5.34	**25yr**	4.13	5.13	5.89	6.54	7.39	**25yr**
50yr	0.60	0.96	1.24	1.74	2.34	2.97	**50yr**	2.02	2.42	3.40	4.07	4.76	5.48	6.30	**50yr**	4.85	6.06	6.92	7.55	8.51	**50yr**
100yr	0.69	1.11	1.44	2.03	2.77	3.52	**100yr**	2.39	2.82	4.03	4.81	5.61	6.44	7.44	**100yr**	5.70	7.15	8.14	8.73	9.80	**100yr**
200yr	0.78	1.27	1.65	2.37	3.27	4.19	**200yr**	2.82	3.29	4.80	5.71	6.64	7.57	8.78	**200yr**	6.70	8.45	9.58	10.09	11.30	**200yr**
500yr	0.93	1.54	2.01	2.92	4.09	5.25	**500yr**	3.53	4.03	6.02	7.15	8.28	9.39	10.96	**500yr**	8.31	10.54	11.88	12.24	13.66	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.21	0.32	0.39	0.53	0.65	0.84	**1yr**	0.56	0.83	0.96	1.26	1.50	1.83	2.17	**1yr**	1.62	2.09	2.38	3.09	3.64	**1yr**
2yr	0.33	0.51	0.63	0.85	1.05	1.19	**2yr**	0.90	1.16	1.33	1.70	2.18	2.54	2.85	**2yr**	2.25	2.74	3.19	3.78	4.31	**2yr**
5yr	0.37	0.57	0.71	0.97	1.24	1.38	**5yr**	1.07	1.35	1.55	1.98	2.50	3.01	3.39	**5yr**	2.66	3.26	3.75	4.38	4.97	**5yr**
10yr	0.40	0.62	0.77	1.07	1.39	1.54	**10yr**	1.20	1.51	1.74	2.20	2.80	3.38	3.86	**10yr**	2.99	3.72	4.24	4.89	5.51	**10yr**
25yr	0.45	0.69	0.86	1.22	1.61	1.80	**25yr**	1.39	1.76	2.02	2.56	3.20	3.95	4.59	**25yr**	3.49	4.41	4.97	5.67	6.29	**25yr**
50yr	0.49	0.75	0.93	1.33	1.80	2.02	**50yr**	1.55	1.97	2.26	2.86	3.53	4.44	5.24	**50yr**	3.93	5.04	5.60	6.35	6.95	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.27	**100yr**	1.74	2.22	2.53	3.20	3.88	4.99	6.00	**100yr**	4.41	5.77	6.33	7.11	7.71	**100yr**
200yr	0.59	0.89	1.12	1.63	2.27	2.57	**200yr**	1.96	2.51	2.85	3.59	4.26	5.59	6.87	**200yr**	4.95	6.61	7.16	7.99	8.54	**200yr**
500yr	0.68	1.01	1.30	1.88	2.68	3.02	**500yr**	2.31	2.96	3.33	4.18	4.82	6.49	8.25	**500yr**	5.75	7.94	8.45	9.32	9.81	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.48	0.59	0.80	0.98	1.05	**1yr**	0.84	1.02	1.27	1.61	2.02	2.42	2.69	**1yr**	2.14	2.58	3.00	3.56	4.12	**1yr**
2yr	0.36	0.56	0.69	0.93	1.15	1.28	**2yr**	0.99	1.25	1.44	1.83	2.31	2.71	3.03	**2yr**	2.40	2.92	3.39	4.01	4.58	**2yr**
5yr	0.44	0.68	0.84	1.15	1.47	1.62	**5yr**	1.27	1.59	1.85	2.33	2.95	3.41	3.92	**5yr**	3.02	3.77	4.38	4.99	5.72	**5yr**
10yr	0.52	0.80	0.99	1.38	1.79	1.95	**10yr**	1.54	1.90	2.24	2.80	3.44	4.16	4.77	**10yr**	3.68	4.59	5.31	6.05	6.80	**10yr**
25yr	0.65	0.99	1.23	1.76	2.32	2.48	**25yr**	2.00	2.42	2.90	3.57	4.32	5.36	6.19	**25yr**	4.74	5.95	6.87	7.64	8.54	**25yr**
50yr	0.77	1.17	1.46	2.10	2.82	2.97	**50yr**	2.43	2.90	3.51	4.29	5.12	6.50	7.54	**50yr**	5.75	7.25	8.34	9.12	10.16	**50yr**
100yr	0.92	1.38	1.73	2.50	3.43	3.56	**100yr**	2.96	3.48	4.25	5.15	6.08	7.89	9.18	**100yr**	6.99	8.83	10.15	10.90	12.09	**100yr**
200yr	1.09	1.64	2.08	3.00	4.19	4.27	**200yr**	3.62	4.17	5.16	6.18	7.24	9.61	11.19	**200yr**	8.51	10.76	12.35	13.01	14.38	**200yr**
500yr	1.38	2.05	2.63	3.83	5.44	5.41	**500yr**	4.69	5.29	6.66	7.89	9.17	12.50	14.52	**500yr**	11.06	13.96	16.03	16.46	18.14	**500yr**

Powered by ACIS Northeast Regional Climate Center

Attachment 3

Web Soil Survey

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Albany County, New York

October 24, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

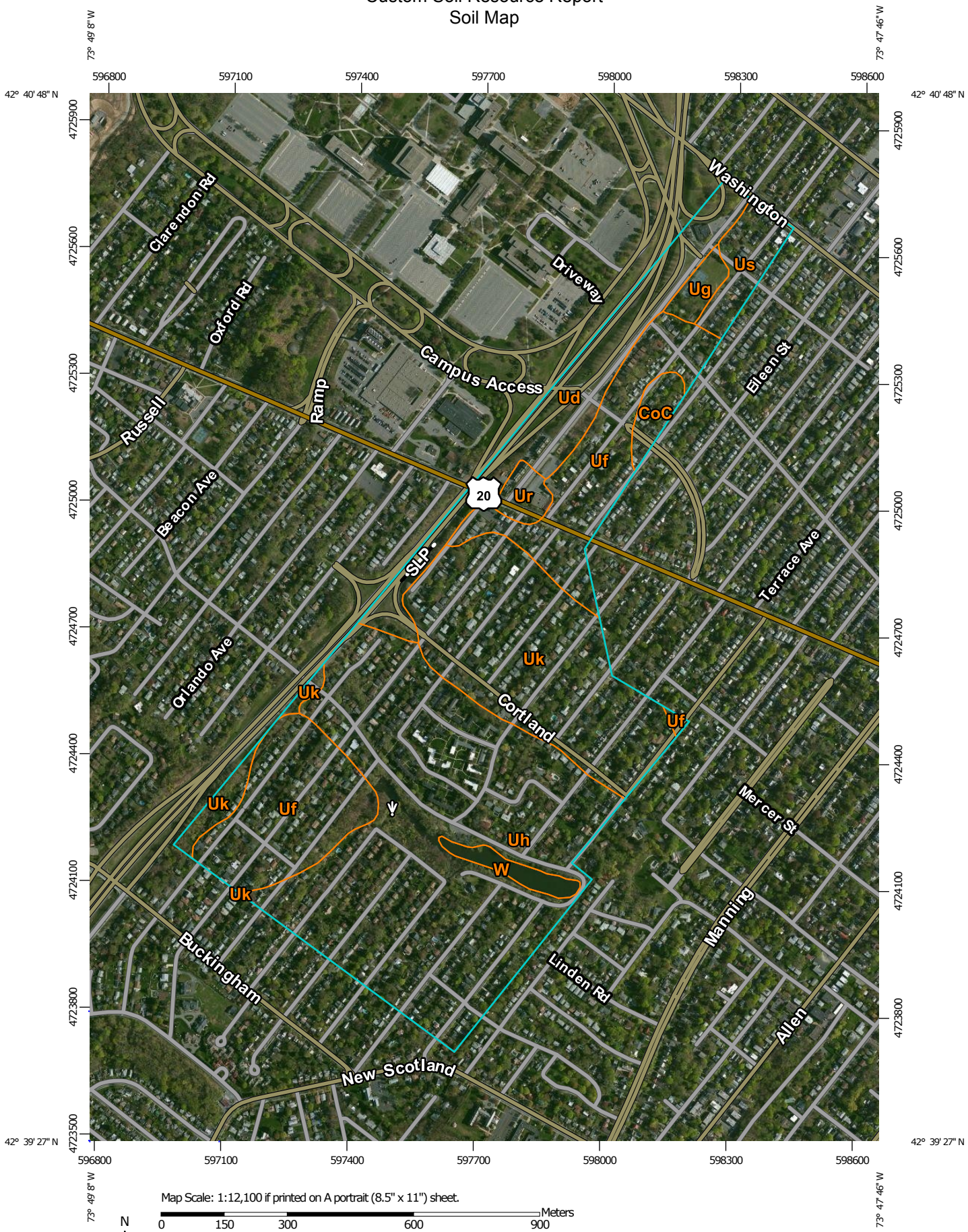
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:15,800.

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: Albany County, New York
Survey Area Data: Version 12, Sep 13, 2014

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

Date(s) aerial images were photographed: Jun 19, 2010—May 12, 2011

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.

Map Unit Legend

Albany County, New York (NY001)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
CoC	Colonie loamy fine sand, rolling	3.7	1.4%
Ud	Udipsamments, smoothed	27.6	10.5%
Uf	Udipsamments-Urban land complex	52.2	19.8%
Ug	Udorthents, loamy	3.1	1.2%
Uh	Udorthents, clayey-Urban land complex	108.3	41.1%
Uk	Udorthents, loamy-Urban land complex	53.9	20.5%
Ur	Urban land	3.3	1.3%
Us	Urban land-Udipsamments complex, 0 to 8 percent slopes	7.7	2.9%
W	Water	3.4	1.3%
Totals for Area of Interest		**263.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with

some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Albany County, New York

CoC—Colonie loamy fine sand, rolling

Map Unit Setting

National map unit symbol: 9pff
Elevation: 150 to 1,000 feet
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Colonie, rolling, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Colonie, Rolling

Setting

Landform: Beach ridges, deltas
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy glaciofluvial or eolian deposits

Typical profile

H1 - 0 to 7 inches: loamy fine sand
H2 - 7 to 68 inches: loamy fine sand
H3 - 68 to 74 inches: loamy fine sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Minor Components

Unnamed soils

Percent of map unit: 9 percent

Claverack

Percent of map unit: 5 percent

Granby
Percent of map unit: 1 percent
Landform: Depressions

Ud—Udipsamments, smoothed

Map Unit Setting
National map unit symbol: 9phy
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Udipsamments, smoothed, and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udipsamments, Smoothed

Typical profile
H1 - 0 to 70 inches: coarse sand

Properties and qualities
Slope: 0 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.6 inches)

Minor Components

Urban land
Percent of map unit: 10 percent

Unnamed soils
Percent of map unit: 10 percent

Colonie
Percent of map unit: 5 percent

Elnora
Percent of map unit: 5 percent

Uf—Udipsamments-Urban land complex

Map Unit Setting

National map unit symbol: 9pj0
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Udipsamments and similar soils: 50 percent
Urban land: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udipsamments

Typical profile

H1 - 0 to 70 inches: coarse sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.6 inches)

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Minor Components

Psammaquents

Percent of map unit: 10 percent
Landform: Depressions

Unnamed soils

Percent of map unit: 10 percent

Ug—Udorthents, loamy

Map Unit Setting

National map unit symbol: 9pj1
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, loamy, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Loamy

Typical profile

H1 - 0 to 4 inches: loam
H2 - 4 to 70 inches: channery loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.5 inches)

Minor Components

Unnamed soils

Percent of map unit: 10 percent

Uh—Udorthents, clayey-Urban land complex

Map Unit Setting

National map unit symbol: 9pj2
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, clayey, and similar soils: 40 percent
Urban land: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Clayey

Typical profile
H1 - 0 to 18 inches: silty clay
H2 - 18 to 72 inches: stratified silt loam to clay

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.2 inches)

Description of Urban Land

Typical profile
H1 - 0 to 6 inches: variable

Minor Components

Scio
Percent of map unit: 10 percent

Hudson
Percent of map unit: 10 percent

Rhinebeck
Percent of map unit: 7 percent

Madalin
Percent of map unit: 3 percent
Landform: Depressions

Uk—Udorthents, loamy-Urban land complex

Map Unit Setting
National map unit symbol: 9pj3
Mean annual precipitation: 36 to 41 inches

Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, loamy, and similar soils: 40 percent
Urban land: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Loamy

Typical profile
H1 - 0 to 4 inches: loam
H2 - 4 to 70 inches: channery loam

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.5 inches)

Minor Components

Valois
Percent of map unit: 10 percent

Nunda
Percent of map unit: 10 percent

Riverhead
Percent of map unit: 9 percent

Ilion
Percent of map unit: 1 percent
Landform: Depressions

Ur—Urban land

Map Unit Setting
National map unit symbol: 9pj8
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile
H1 - 0 to 6 inches: variable

Minor Components

Unnamed soils
Percent of map unit: 10 percent

Udorthents
Percent of map unit: 5 percent

Us—Urban land-Udipsamments complex, 0 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9pj9
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Urban land: 50 percent
Udipsamments and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile
H1 - 0 to 6 inches: variable

Description of Udipsamments

Typical profile
H1 - 0 to 70 inches: coarse sand

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water storage in profile: Low (about 3.6 inches)

Minor Components

Unnamed soils, moderately well
Percent of map unit: 10 percent

Unnamed soils, somewhat poorly
Percent of map unit: 10 percent

W—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Buckingham Pond HSG)

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.

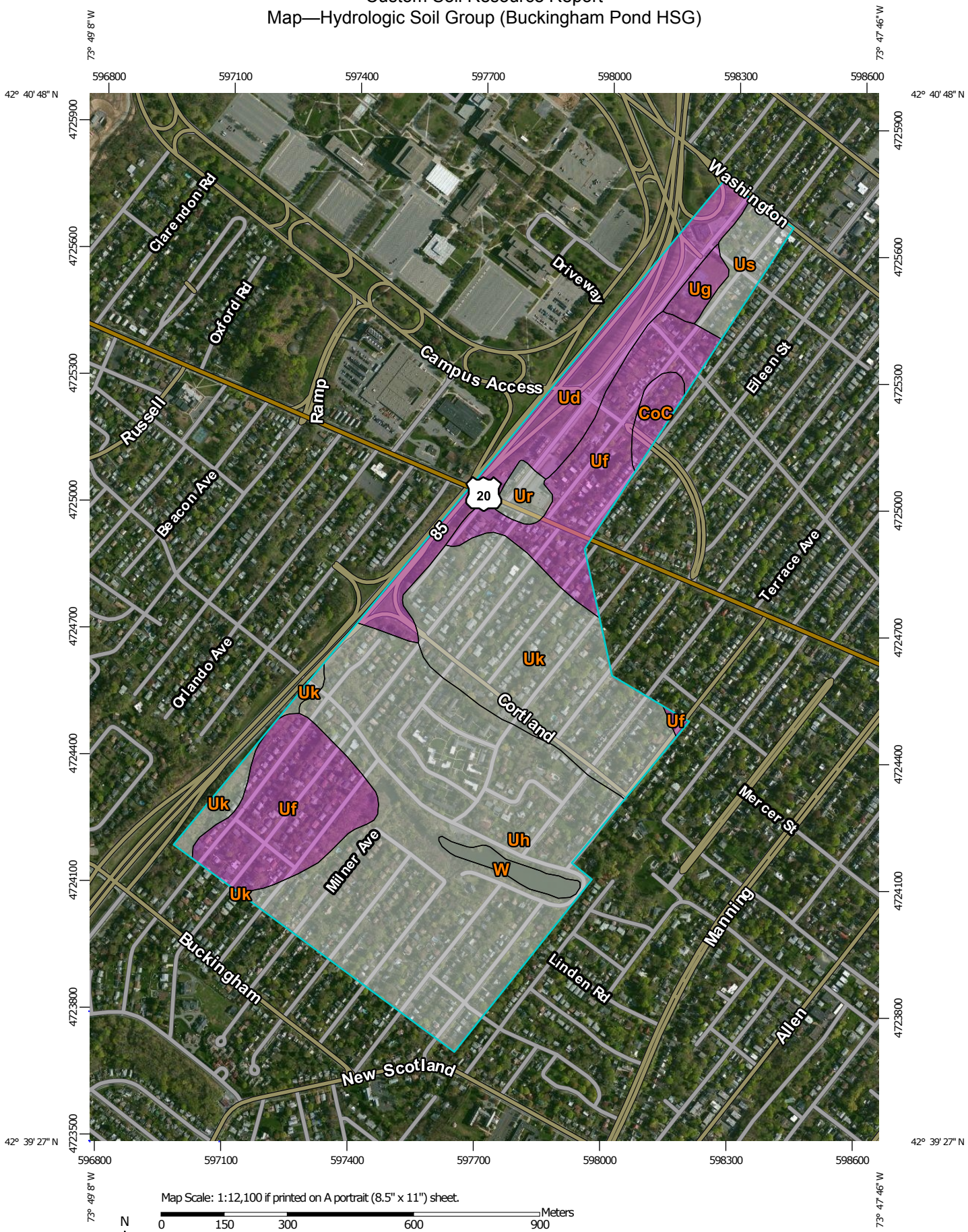
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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.

Custom Soil Resource Report
Map—Hydrologic Soil Group (Buckingham Pond HSG)



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 1:15,800.

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: Albany County, New York
Survey Area Data: Version 12, Sep 13, 2014

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

Date(s) aerial images were photographed: Jun 19, 2010—May 12, 2011

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.

Table—Hydrologic Soil Group (Buckingham Pond HSG)

Hydrologic Soil Group— Summary by Map Unit — Albany County, New York (NY001)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
CoC	Colonie loamy fine sand, rolling	A	3.7	1.4%
Ud	Udipsamments, smoothed	A	27.6	10.5%
Uf	Udipsamments-Urban land complex	A	52.2	19.8%
Ug	Udorthents, loamy	A	3.1	1.2%
Uh	Udorthents, clayey-Urban land complex		108.3	41.1%
Uk	Udorthents, loamy-Urban land complex		53.9	20.5%
Ur	Urban land		3.3	1.3%
Us	Urban land-Udipsamments complex, 0 to 8 percent slopes		7.7	2.9%
W	Water		3.4	1.3%
Totals for Area of Interest			**263.3**	**100.0%**

Rating Options—Hydrologic Soil Group (Buckingham Pond HSG)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Attachment 4

Pump Submittal

AURORA PUMP
A UNIT OF GENERAL SIGNAL

Submittal Data For

- ☐ Regen. Turbine Pumps
- ☐ Split Case Pumps
- ☐ End Suction Pumps
- ☒ Sewage Pumps
- ☐ Inline Pumps
- ☐ Other

NO. OF PRINTS	
11	For Approval
	Final
	Reproducible

SALES OFFICE: STARKWEATHER SUPPLY, INC. **PO#:** 801

Factory Order #: 8F2-03733 **Service:**

Job:

Engineer:

Contractor:

Sold To: J V WARREN INC. **PO#:**

Reference: MARKS - BERKSHIRE BLVD PS

PUMP

Number of Units: TWO
Model: 613A
Size: 10X10X15
GPM: 2400
TDH: 40.3'
RPM: 900

Construction:
- ☒ Standard Fitted
- ☐ Bronze Fitted
- ☐ _____

Case: CI
Imp.: CI
Shaft: STL
Sleeve: HARDN'D SS.
Case Ring: BRZ
Imp. Ring: BRZ
Ch. Ring:
Spacer:

Pump only ☐
Rotation: RH ☒ LH ☐

Connections:
- ☐ Threaded
- ☒ Flanged
  - ☒ 125#
  - ☐ 150#
  - ☐ 250#
  - ☐ 300#

Lubrication:
- ☒ Grease
- ☐ Oil

Stuffing Box:
- ☐ Mechanical Seal
- ☐ _____
- ☐ _____
- ☒ Packing
- ☒ Lantern Ring

MOTOR

HP: 40
Phase: 3
Hertz: 60
Volts: 200
RPM: 900
Frame: 365HP

Enclosure:
- ☒ ODP
- ☐ TEFC
- ☐ X Proof

- ☒ Vertical
- ☐ Horizontal
- ☐ Part Winding
- ☒ Hi Efficiency

- ☒ Aurora To Furnish
- ☐ Others To Furnish
- ☒ Factory Choice

Mfg:

OPTIONS

Base:
- ☐ Steel Drip Rim
- ☐ Steel Form
- ☐ Fabricated Steel
- ☐ Cast Iron Ring Type
- ☒ Fab. Steel Ring Type

- ☐ Close Coupled Unit
- ☒ Pedestal Unit

Coupling:
Mfg: WOODS
Size: 11B
- ☐ Spacer
- ☐ Guard

Test:
- ☒ Certified Performance
- ☐ Wit. Certified Performance
- ☒ Hydro
- ☐ _____

NOTE: Motor not mounted at factory on vertical units.

SPECIAL REQUIREMENTS

EXTERNAL LIQUID LANTERN RING FLUSH

CERTIFIED PRINT: Section: 610 Page: 210 Curve Number: 8PC-116809N

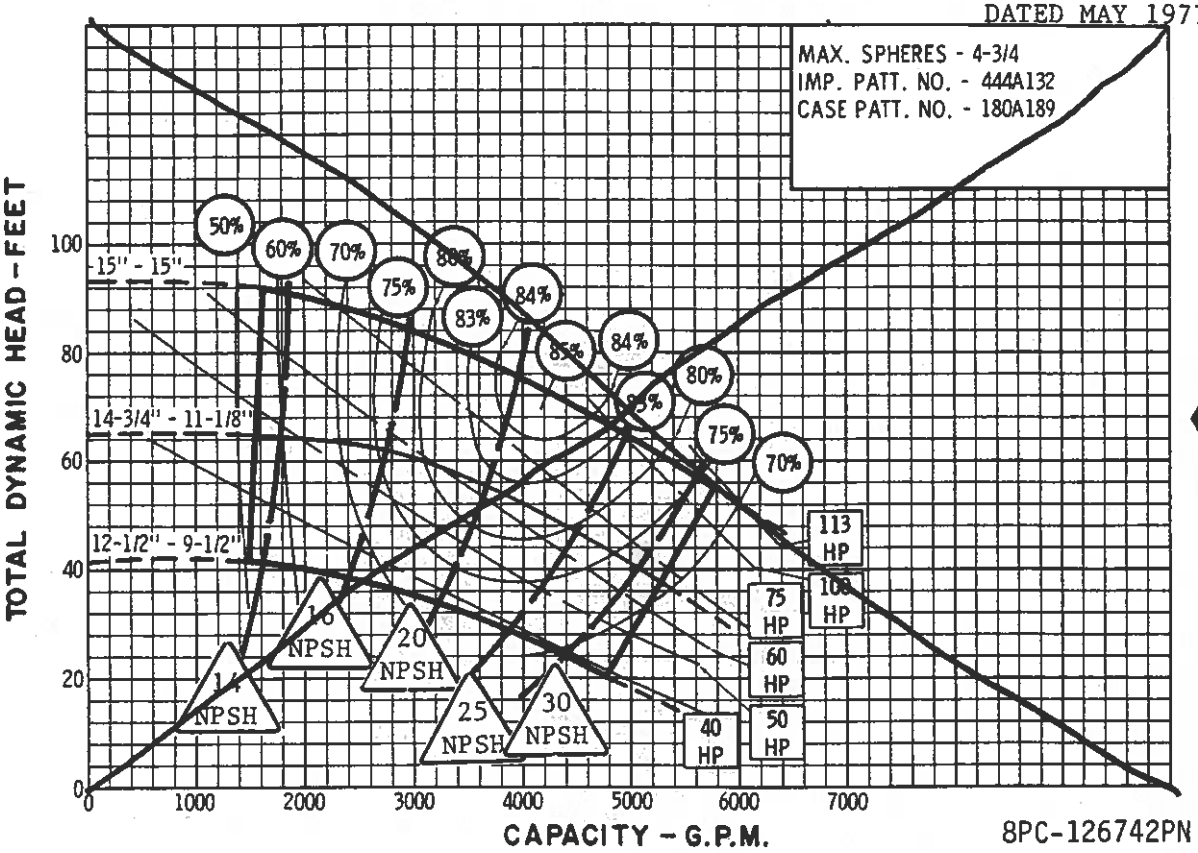
Special: Maintenance Sent:

By: JEFF MK Date: 3-26-92 Office: N. AURORA

This order will not be processed for manufacturing until approval is received. Prints are not to scale and are certified correct only for this order. All orders are subject to acceptance at Aurora Pump, North Aurora, Illinois.

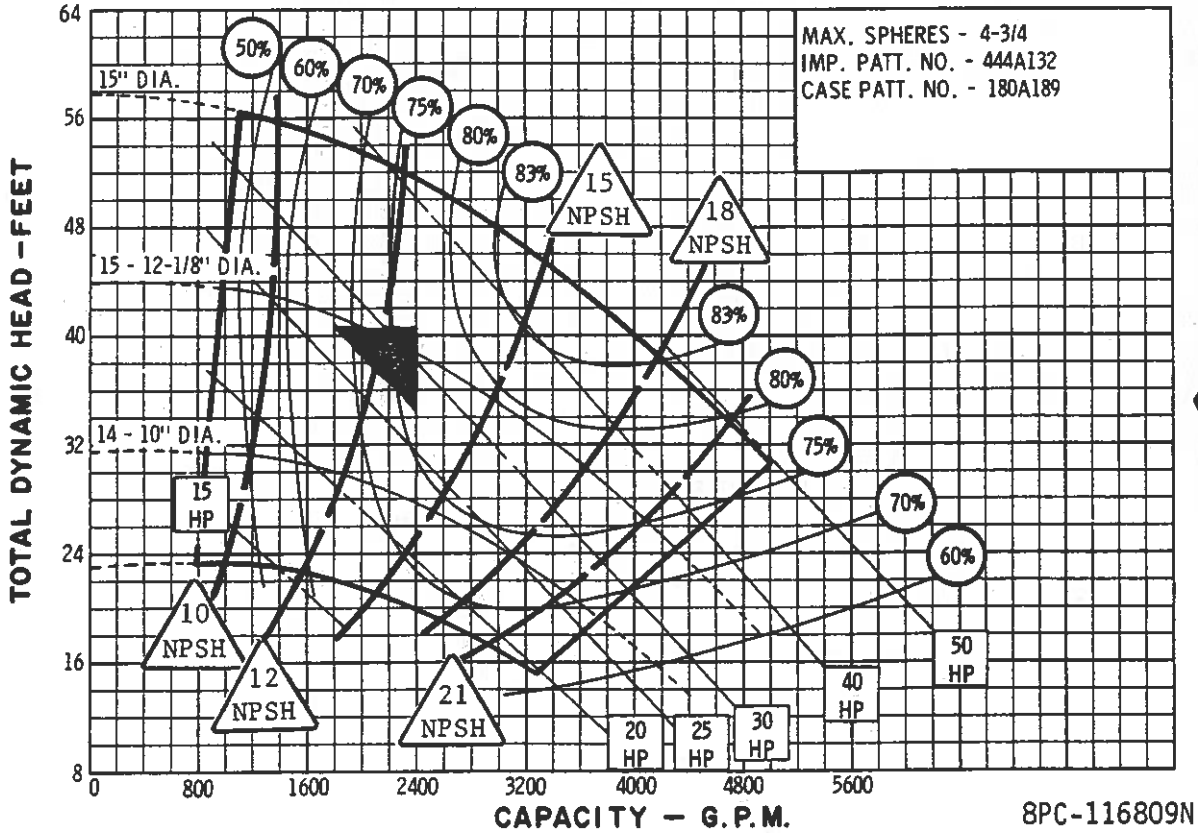
40130(10-90)

10x10x15 SPHER-FLO
ENCLOSED IMPELLER



1150 R.P.M.

8PC-126742PN



875 R.P.M.

8PC-116809N

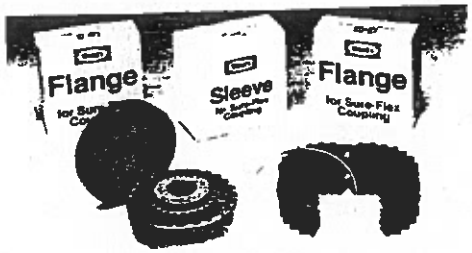
AURORA PUMPS
AURORA PUMP
A UNIT OF GENERAL SIGNAL
800 AIRPORT ROAD · NORTH AURORA, ILLINOIS · 60542

CURVE

SURE-FLEX® COUPLINGS

Installation Instructions

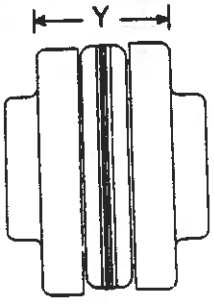
Sure-Flex flanges (outer metallic parts) and sleeves (inner elastomeric members) come in many sizes and types. First, determine the size and type of components being used. Remove all components from their boxes, and loosely assemble the coupling on any convenient surface. (Do not attempt to install the wire ring on the two-piece E or N sleeve at this time.) Also check maximum RPM values in the table against operating speed. All rubber sleeves (EPDM and Neoprene) have the same ratings for a given size and may be used interchangeably. However, because rubber and Hytrel sleeves have completely different ratings, they never should be used interchangeably.

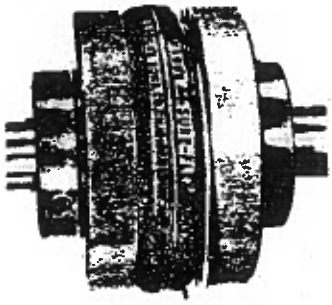


1 Inspect all coupling components and remove any protective coatings or lubricants from bores, mating surfaces and fasteners. Remove any existing burrs, etc. from the shafts.

2 Slide one coupling flange onto each shaft, using snug-fitting keys where required. When using Type B flanges, follow the instructions furnished with the Sure-Grip bushing.

3 Position the flanges on the shafts to approximately achieve the Y dimension shown in the table. It is usually best to have an equal length of shaft extending into each flange. Move one flange to its final position. Torque fasteners to proper values. Slide the other flange far enough away to install the sleeve. With a two-piece sleeve, do not move the wire ring to its final position; allow it to hang loosely in the groove adjacent to the teeth.

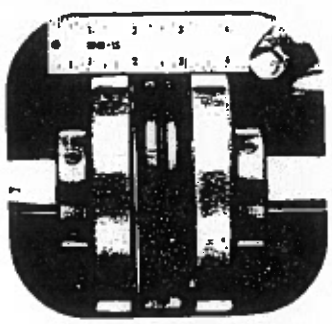




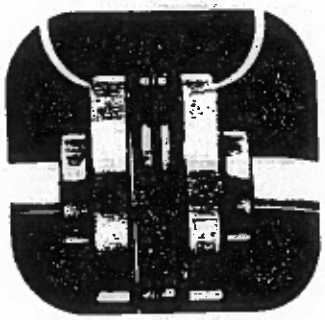
4 Slide the loose flange on the shaft until the sleeve is completely seated in the teeth of each flange. (The "Y" dimension is for reference and not critical.) Secure the flange to the shaft. Different coupling sleeves require different degrees of alignment precision. Locate the alignment values for your sleeve size and type in the table.

5 Check parallel alignment by placing a straightedge across the two coupling flanges and measuring the maximum offset at various points around the periphery of the coupling **without rotating** the coupling. If the maximum offset exceeds the figure shown under "Parallel" in the table, realign the shafts.

6 Check angular alignment with a micrometer or caliper. Measure from the outside of one flange to the outside of the other at intervals around the periphery of the coupling. Determine the maximum and minimum dimensions **without rotating** the coupling. The difference between the maximum and minimum must not exceed the figure given under "Angular" in the table. If a correction is necessary, be sure to recheck the parallel alignment.



Parallel



Angular

MAXIMUM RPM AND ALLOWABLE MISALIGNMENT

(Dimensions in inches)

Sleeve Size	Maximum RPM	Types JE, JN, JES, JNS, E & N			*Type H & HS		
		Parallel	Angular	Y	Parallel	Angular	Y
3	9200	.010	.035	1.188	....	....	....
4	7600	.010	.043	1.500	....	....	....
5	7600	.015	.056	1.938	....	....	....
6	6000	.015	.070	2.438 †	.010	.015	2.500
7	5250	.020	.081	2.563	.012	.020	2.625
8	4500	.020	.094	2.938	.015	.025	3.000
9	3750	.025	.109	3.500	.017	.028	3.563
10	3600	.025	.128	4.063	.020	.032	4.125
→ 11	3600	.032	.151	4.875	.022	.037	4.938
12	2800	.032	.175	5.688	.025	.042	5.750
13	2400	.040	.195	6.688	.030	.050	6.688
14	2200	.045	.242	7.750	.035	.060	7.813
16	1500	.062	.330	10.250	....	....	....

Note: Values shown above apply if the actual torque transmitted is more than ¼ the coupling rating. For lesser torque, reduce the above values by ½.

*Type H and HS sleeves **should not** be used as direct replacements for EPDM or Neoprene sleeves.

(†) Value when using 6J flanges is 2.125.

7 If the coupling employs the two-piece sleeve with the wire ring, force the ring into its groove in the center of the sleeve. It may be necessary to pry the ring into position with a blunt screwdriver.

8 Install coupling guards per OSHA requirements.

CAUTION: Coupling sleeves may be thrown from the coupling assembly with substantial force when the coupling is subjected to a severe shock load or abuse.

OPERATING CHARACTERISTICS

ENERGY EFFICIENT — HOLLOSHAFT & SOLIDSHAFT -- WP-1

HP	SPEED R.P.M. NO LOAD	SPEED R.P.M. FULL LOAD	% EFFICIENCY NEMA ▲NOM.	% EFFICIENCY FULL LOAD	% EFFICIENCY 3/4 LOAD	% EFFICIENCY 1/2 LOAD	% POWER FACTOR FULL LOAD	% POWER FACTOR 3/4 LOAD	% POWER FACTOR 1/2 LOAD	CURRENT IN AMPERES 460 VOLTS FULL LOAD	CURRENT IN AMPERES 460 VOLTS LOCK-ED.	TORQUE AT FULL VOLTAGE FULL LOAD TORQUE AT FULL LOAD SPEED (LB.FT.)	TORQUE AT FULL VOLTAGE LOCKED (STARTING) PERCENT OF FULL LOAD	TORQUE AT FULL VOLTAGE PULL OUT (BREAKDOWN) PERCENT OF FULL LOAD	CODE
2	900	860	80.0	80.0	79.0	74.5	58.5	50.0	38.0	4.0	20.0	12.2	130	210	K
3	1800	1745	85.5	85.5	84.5	81.5	82.5	78.0	70.0	4.2	28.5	9.0	215	250	J
	1200	1160	85.5	85.5	85.5	83.5	69.5	63.0	51.0	4.8	24.5	13.5	155	230	H
	900	860	81.5	82.0	81.0	77.0	58.0	49.0	37.5	6.0	31.5	18.2	130	205	K
5	1800	1735	85.5	86.0	86.0	84.5	83.0	78.0	68.5	6.9	43.0	15.1	85	225	H
	1200	1160	85.5	85.5	85.5	83.5	67.0	59.0	47.0	8.4	43.0	22.6	150	215	H
	900	875	87.5	88.0	87.5	85.5	68.0	60.5	48.0	7.6	46.0	29.9	130	205	J
7-1/2	★1800	1765	90.2	90.6	90.7	89.4	85.7	83.0	76.2	9.3	63.5	22.3	175	215	H
	1200	1165	88.5	89.0	89.5	88.0	78.0	71.5	60.0	10.4	63.5	33.6	150	205	H
	900	870	87.5	88.0	88.5	87.5	72.5	66.0	54.4	11.5	59.0	45.1	125	200	H
10	★1800	1760	90.2	90.7	91.2	90.4	86.1	83.5	77.0	12.3	78.9	29.8	165	200	G
	1200	1165	89.5	89.5	90.0	89.0	79.5	73.5	63.0	13.6	81.0	44.9	150	200	H
	900	875	88.5	89.0	89.5	88.5	72.5	65.5	54.0	15.0	81.0	59.9	125	200	H
15	★1800	1770	91.7	92.1	92.6	91.9	82.1	78.5	69.6	19.0	116.0	44.5	160	200	G
	1200	1170	90.2	90.2	91.0	90.5	81.0	75.5	65.0	19.8	116.0	67.3	140	200	H
	900	870	88.5	88.5	89.0	88.5	73.0	66.0	54.5	22.5	116.0	90.2	125	200	H
20	★1800	1770	92.4	92.7	93.5	93.3	84.5	82.6	76.4	24.6	145.0	59.3	150	200	G
	1200	1165	90.2	90.2	91.0	91.0	81.0	76.5	66.6	26.2	167.0	89.9	135	200	H
	900	880	89.5	89.5	90.0	89.5	73.5	68.0	57.5	29.5	135.0	119.0	125	200	F
25	★1800	1770	92.4	92.8	93.6	93.4	83.6	81.2	74.0	31.0	182.5	74.2	150	200	G
	1200	1175	90.2	90.5	91.5	91.5	84.5	83.5	77.0	31.5	165.0	111.7	135	200	F
	900	880	90.2	90.5	91.5	91.0	76.0	72.0	62.5	35.8	168.0	149.0	125	200	F
30	★1800	1770	93.0	93.0	93.8	93.8	83.9	82.0	75.6	37.1	210.3	89.0	150	200	F
	1200	1175	91.0	91.5	92.5	92.0	85.0	83.5	78.0	37.0	213.0	134.0	135	200	G
	900	880	90.2	90.2	91.0	90.5	73.5	68.0	57.6	44.0	211.0	179.0	125	200	G
40	★1800	1780	93.0	93.2	93.4	92.5	83.9	81.1	73.7	49.0	290.0	118.0	140	200	G
	1200	1170	91.0	91.0	92.5	92.5	84.0	82.0	75.0	50.5	277.0	179.0	135	200	G
	900	875	90.2	90.2	92.0	92.0	76.5	73.0	63.0	56.0	253.0	239.0	125	200	F
50	★1800	1780	93.6	93.7	94.1	93.4	85.0	82.9	76.3	60.0	362.5	147.5	140	200	G
	1200	1170	91.0	91.0	92.5	93.0	84.5	83.0	76.5	62.5	340.0	224.0	135	200	F
	900	875	90.2	90.5	92.0	91.5	78.5	74.5	64.5	68.0	334.0	299.0	125	200	F
60	★1800	1780	93.6	93.9	94.3	93.9	85.4	83.5	77.2	72.0	435.0	177.0	140	200	G
	1200	1170	91.7	92.0	93.0	93.0	86.0	84.0	77.5	73.0	395.0	268.0	135	200	F
	900	875	91.0	91.5	92.5	92.0	79.0	75.0	66.0	80.0	413.0	358.5	125	200	G
75	★1800	1780	94.1	94.2	94.7	94.4	85.5	83.7	77.8	89.0	542.5	221.3	140	200	G
	1200	1170	91.7	92.0	93.0	93.5	87.5	86.5	81.5	90.0	510.0	336.0	135	200	F
	900	890	93.0	93.0	93.5	93.0	77.5	73.0	62.5	100.0	541.0	442.5	125	200	G
100	★1800	1775	94.1	94.2	94.8	94.6	88.0	87.4	83.8	115.0	725.0	296.0	125	200	G
	1200	1185	93.0	93.5	93.5	93.0	83.0	79.5	70.5	125.0	718.0	442.0	125	200	G
	900	885	93.0	93.5	94.0	93.5	79.0	75.0	65.0	131.0	718.0	590.0	125	200	G
125	★1800	1780	94.1	94.3	95.0	94.9	87.7	87.0	83.0	145.0	907.5	368.8	110	200	G
	1200	1185	93.6	93.6	94.0	93.5	83.0	80.0	71.0	155.0	908.0	553.0	125	200	G
150	★1800	1780	95.0	95.0	95.1	94.4	84.7	81.7	73.8	176.0	1085.0	442.6	110	200	G
	1200	1185	94.1	94.5	95.0	95.0	87.0	85.5	80.5	176.0	995.0	664.5	120	200	F
200	★1800	1780	95.4	95.4	95.6	95.2	86.4	84.4	78.0	230.0	1402.4	590.1	100	200	F
250	1800	1775	94.5	94.5	95.0	95.0	87.0	85.0	78.0	292.0	1825.0	738.5	70	175	G

GENERAL INFORMATION

The code letter is an indication of the locked rotor K. V. A. in accordance with the National Electric Code.

When performance values have been quoted, they should be shown on the order.

For data not listed, refer to office.

▲Efficiency values shown on motor nameplate. These values are determined by NEMA testing and marking standards in MG1-12.53a and 12.53b.

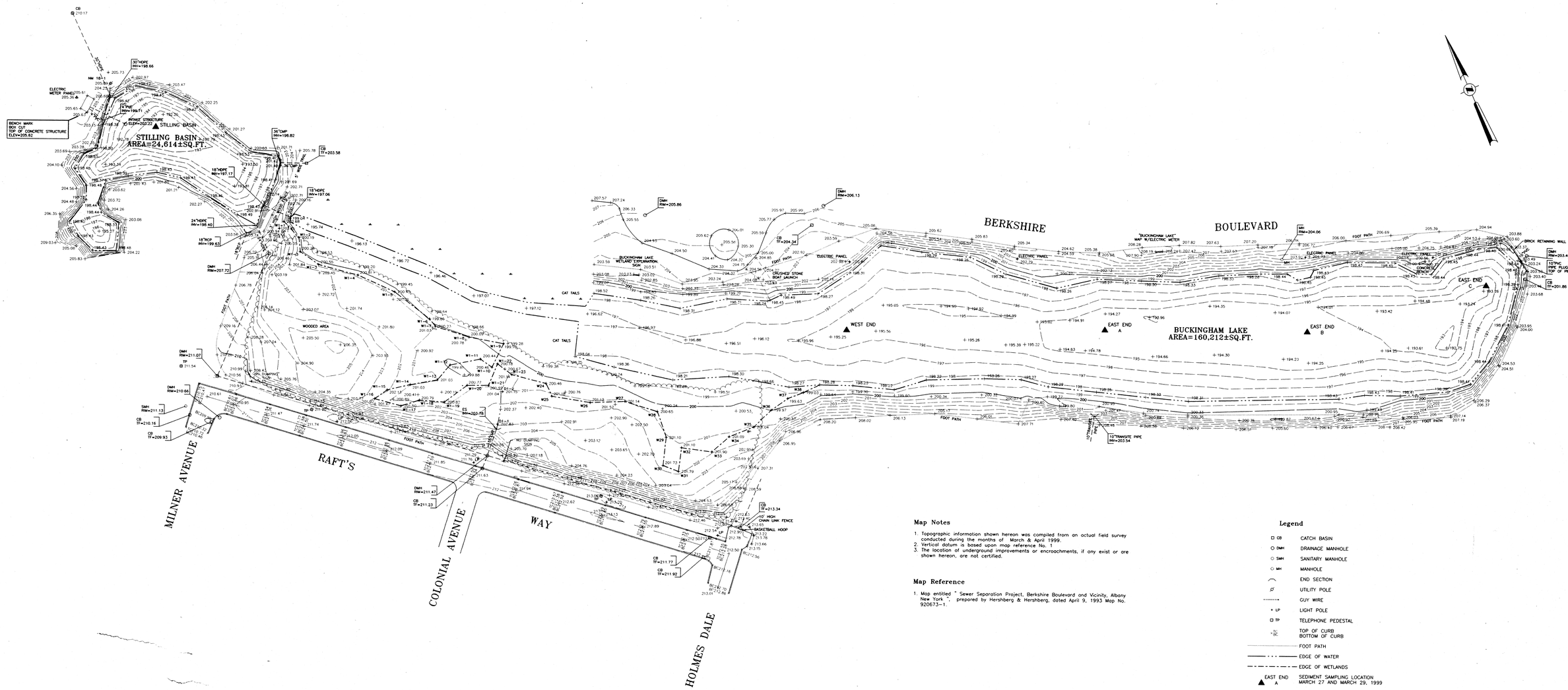
Typical (average) efficiencies and power factors are shown at full load, three-quarters and half load. For guaranteed data, refer to office.

THRUST LOAD LOSSES NOTE: Efficiency values are for motor with no thrust load apllied. The additional thrust load of the pump will cause additional loss in the thrust bearing. This loss is approximately 0.0075 HP per 100 RPM per 1000 Lbs. thrust load. This additional loss should be taken into consideration by the pump manufacturer in calculating the pump unit efficiency.

Attachment 5

Topographic Map

PROJECT NUMBER: 99051660



Map Notes

1. Topographic information shown hereon was compiled from an actual field survey conducted during the months of March & April 1999.
2. Vertical datum is based upon map reference No. 1
3. The location of underground improvements or encroachments, if any exist or are shown hereon, are not certified.

Map Reference

1. Map entitled " Sewer Separation Project, Berkshire Boulevard and Vicinity, Albany New York ". prepared by Hershberg & Hershberg, dated April 9, 1993 Map No. 920673-1.

Legend

- CB — CATCH BASIN
- DMH — DRAINAGE MANHOLE
- SMH — SANITARY MANHOLE
- MH — MANHOLE
- END SECTION
- UTILITY POLE
- GUY WIRE
- LP — LIGHT POLE
- TP — TELEPHONE PEDESTAL
- TC / BC — TOP OF CURB / BOTTOM OF CURB
- FOOT PATH
- EDGE OF WATER
- EDGE OF WETLANDS
- EAST END A — SEDIMENT SAMPLING LOCATION MARCH 27 AND MARCH 29, 1999

BAR SCALE
50 0 25 50 100
1 inch = 50 ft.

"ONLY COPIES OF THIS MAP SIGNED IN RED INK AND EMBOSSED WITH THE SEAL OF AN OFFICER OF C.T. MALE ASSOCIATES, P.C. OR A DESIGNATED REPRESENTATIVE SHALL BE CONSIDERED TO BE A VALID TRUE COPY."

C.T. MALE ASSOCIATES, P.C.
APR 15 1999
PRINTED AND ISSUED

WILLIAM J. NETTLETON
PLS NO. 49513

DATE	REVISIONS RECORD/ DESCRIPTION	DRAFTER	CHECK	APPR.
	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

© 1999 C.T. MALE ASSOCIATES P.C.

PROJ. NO : 99.5160
DESIGNED :
DRAFTED : BRIZZEE
CHECKED :

TOPOGRAPHIC/HYDROGRAPHIC SURVEY
BUCKINGHAM LAKE
PREPARED FOR
THE CITY OF ALBANY

CITY OF ALBANY — ALBANY COUNTY, NEW YORK

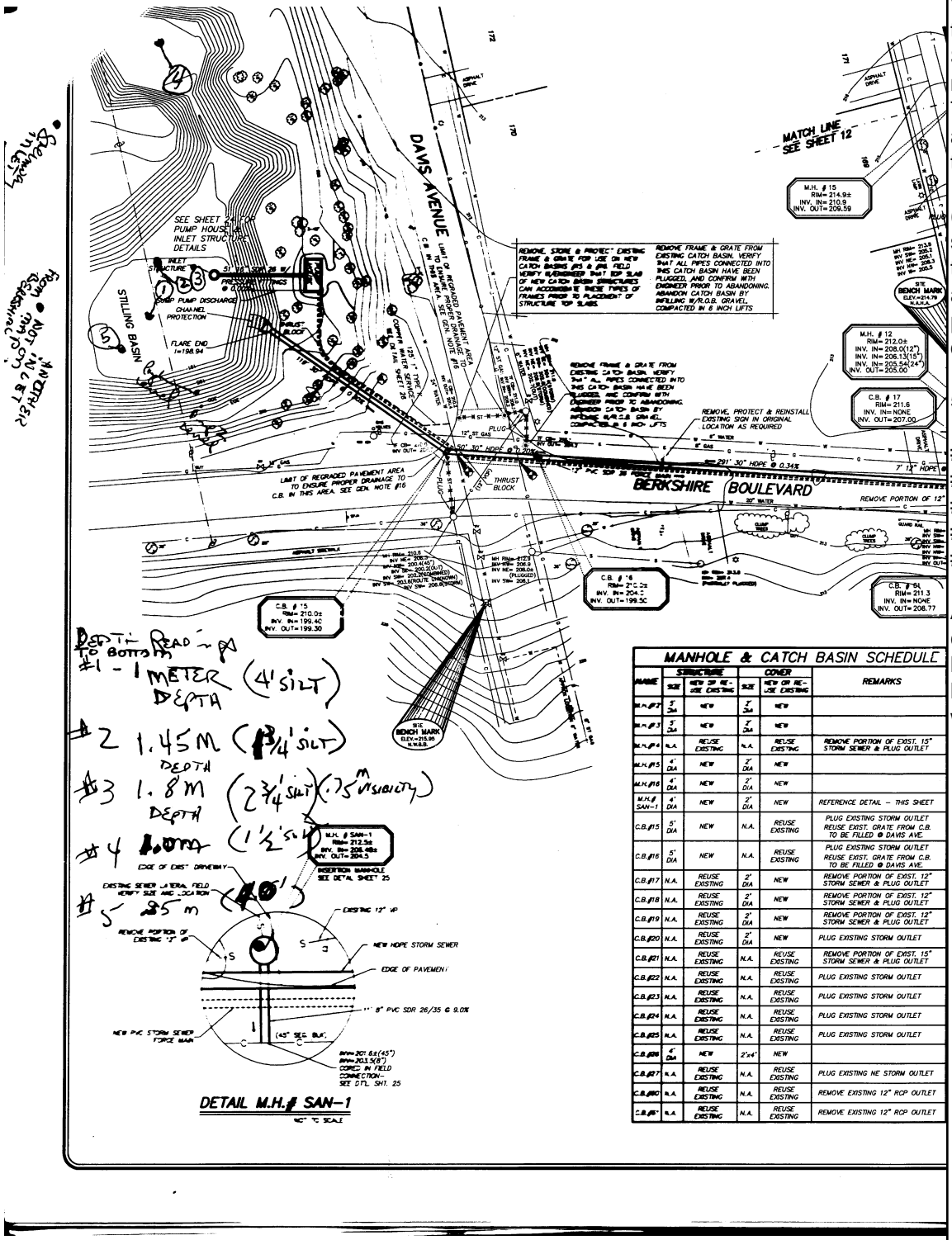
C.T. MALE ASSOCIATES, P.C.
50 CENTURY HILL DRIVE, P.O. BOX 727, LATHAM, NY 12110
518.786.7400 * FAX 518.786.7299
ARCHITECTURE & BUILDING SYSTEMS ENGINEERING * CIVIL ENGINEERING
ENVIRONMENTAL SERVICES * SURVEY & LAND INFORMATION SERVICES

SCALE: 1" = 50'
SHEET 1 OF 1
DATE: APRIL 14, 1999
DWG. NO: 99-257R

CAD. DWG. FILE NAME: TS2.DWG

Attachment 6

Stilling Basin and
Pond Sediment Depth Measurements



E-mail from Harry Hermides (dated 11/17/2013):

"Felton McLaughlin, John Caplis and I proceeded to measure the depths of the stilling basin along with silt depths on Saturday, November 16, 2013. The measurements below were recorded in meters for depth to bottom using our Sechi Disc. The depth of the silt on the bottom was measured in feet using an 8ft pole with 1ft interval markings. The pole was thrust into the silt until the tip hit rocks.

(Note: 2 inlets do not appear on the map attached map of the stilling basin. There are three inflows to the pond: One is next to the walk path, another on the south side from Milner/Greenway, and the third on the Davis Ave side to the right and behind the pumping station. The 3 inlets were confirmed visually and are on the maps we received)

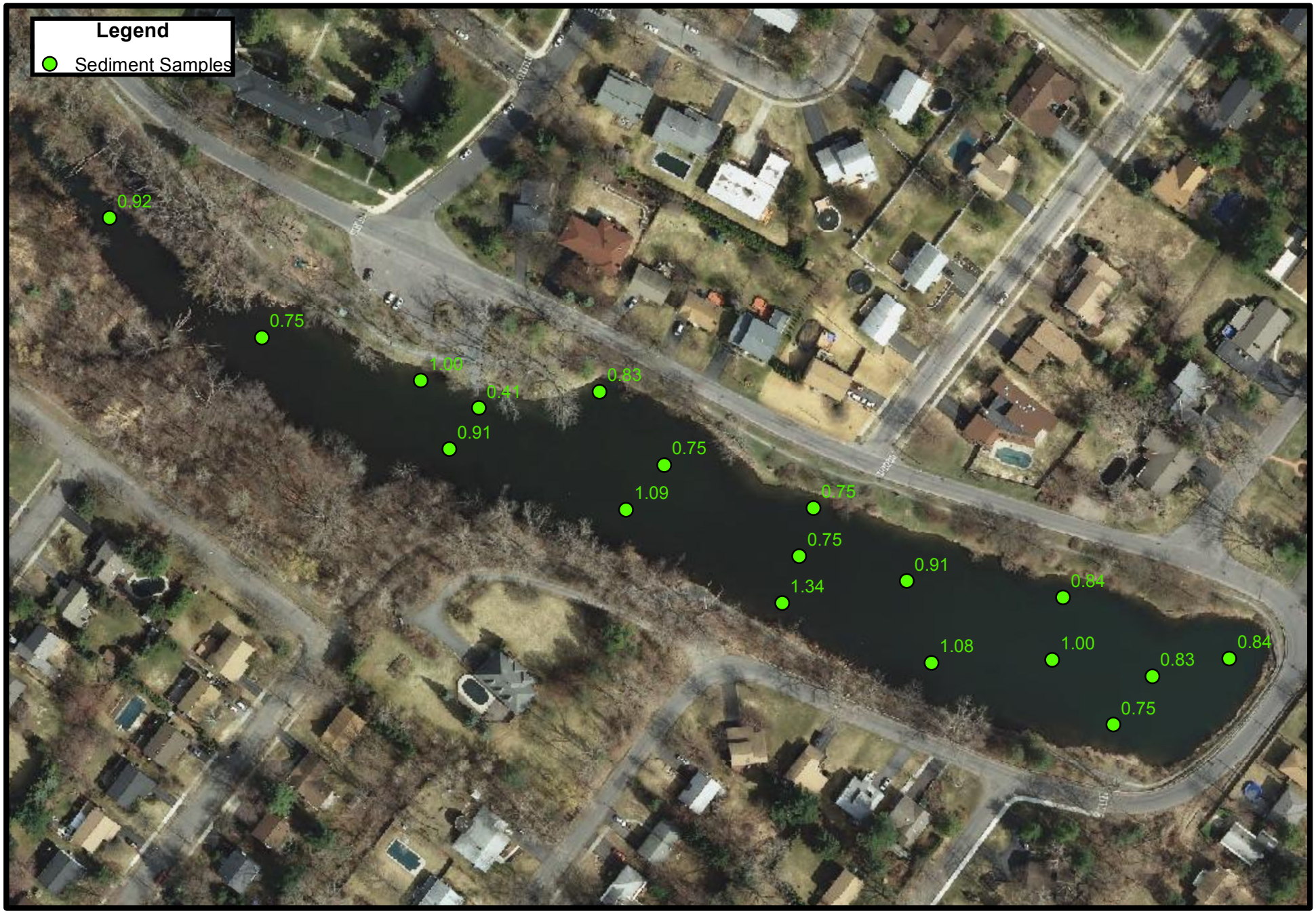
5 measurements were taken, with the following results:

#1 Depth to bottom 1meter ----------(Silt depth 4ft)
#2 Depth to bottom 1.45meters-----(silt depth 1 3/4ft)
#3 Depth to bottom 1.8 meters------ (silt depth 2 ¾ ft)
#4 Depth to bottom 1.0 meters -----(silt depth 1 ½ ft)
#5 Depth to bottom .85 meters ----(silt depth 4')

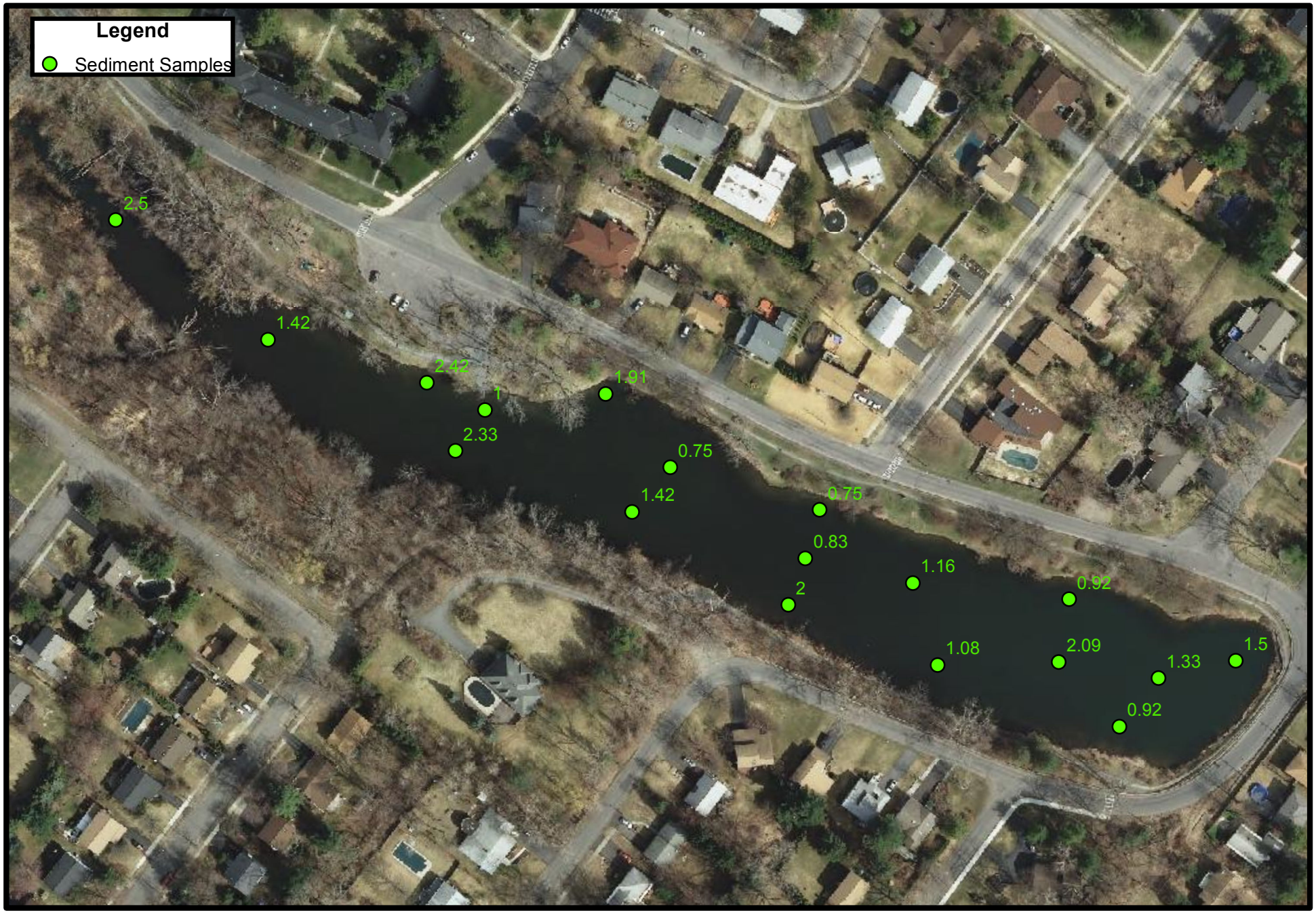
Another Map (marked #3 in bottom right corner.) shows a pipe connecting the stilling pond to the regular pond.. We could not locate it and, it appears as though the pipe is long but our map has no scale to size so we cannot determine where it is and whether or not it is plugged or even if it is functioning."

Buckingham Pond Sediment Samples

Buckingham Pond Sediment Samples
Sediment Depth 1 (ft.)



Buckingham Pond Sediment Samples
Sediment Depth 2 (ft.)



Buckingham Pond Sediment Samples

Wednesday, February 04, 2015

Samplers: A. Walsh/J. Arabski/Z. Kosa

Ice thickness: 10"

Conditions: Mostly cloudy/28°F

Sample #	Depth to top of Sediment (ft.)	Depth to bottom of sediment (1st Resistance) (ft.)	Sediment Depth (1st Resistance)(ft.)	Depth to bottom of sediment (2nd & Final Resistance)(ft.)	Sediment Depth (2nd & Final Resistance)(ft.)	Coordinates (DMS)
1	1.50	2.42	0.92	4.00	2.50	42°39'52.3039", -073°48'34.6818"
2	2.83	3.58	0.75	4.25	1.42	42°39'50.9756", -073°48'32.4724"
3	2.33	3.33	1.00	4.75	2.42	42°39'50.5037", -073°48'30.0889"
4	2.67	3.08	0.41	3.67	1.00	42°39'50.1855", -073°48'29.2218"
5	3.67	4.58	0.91	6.00	2.33	42°39'49.7409", -073°48'29.6786"
6	4.42	5.25	0.83	6.33	1.91	42°39'50.3637", -073°48'27.4267"
7	4.92	5.67	0.75	5.67	0.75	42°39'49.5412", -073°48'26.4617"
8	4.08	5.17	1.09	5.50	1.42	42°39'49.0610", -073°48'27.0383"
9	3.67	4.42	0.75	4.42	0.75	42°39'49.0476", -073°48'24.2452"
10	5.25	6.00	0.75	6.08	0.83	42°39'48.5249", -073°48'24.4605"
11	3.08	4.42	1.34	5.08	2.00	42°39'48.0153", -073°48'24.7163"
12	5.92	6.83	0.91	7.08	1.16	42°39'48.2474", -073°48'22.8664"
13	4.00	5.08	1.08	5.08	1.08	42°39'47.3395", -073°48'22.4984"
14	5.33	6.17	0.84	6.25	0.92	42°39'48.0404", -073°48'20.5196"
15	5.33	6.33	1.00	7.42	2.09	42°39'47.3537", -073°48'20.6850"
16	4.50	5.25	0.75	5.42	0.92	42°39'46.6394", -073°48'19.7969"
17	6.67	7.50	0.83	8.00	1.33	42°39'47.1807", -073°48'19.2102"
18	6.58	7.42	0.84	8.08	1.50	42°39'47.3549", -073°48'18.0791"
Notes	When measuring to the bottom of the sediment there was resistance felt initially. After which, applied heavier pressure and the measuring rod went down deeper to a harder, final resistance. Both depths were recorded above.					

Attachment 7

HydroCAD Calculations

Attachment 8

Watershed Treatment Model

Watershed Treatment Model (WTM) - 2013 Off the Shelf Edition

The Watershed Treatment Model (WTM) is a spreadsheet-based approach that quantifies pollutant loads, and incorporates the full suite of watershed treatment options. The WTM captures a range of pollutants, and estimates annual runoff volume, as well as pollutant loads for Total Nitrogen, Total Phosphorus, Total Suspended Solids, and Fecal Coliform. The WTM is designed for rapid watershed analysis, and incorporates a range of treatment options, including both structural and non-structural practices.

Each worksheet of this model serves a specific function, as outlined to the right, and contains guidance for how to enter data. While some of the sheets are hidden, and need to be revealed using buttons to the right, others are visible by default.

Pollutant Sources
Pollutant sources include both "Primary Sources," which include land cover types that generate stormwater runoff and "Secondary Sources," which include pollutant sources ranging from Sanitary Sewer Overflows (SSOs) to urban stream channel erosion. Go to the "Sources" tab to enter data quantifying these pollutant sources.

Treatment Practices.
The WTM estimates the pollutant load reductions from both s*tructural* practices such as stormwater ponds and filters, and *programmatic* practices such as turf management education programs. The WTM accounts for factors such as long term maintenance and imperfect application, which may result in less than optimal practice performance using "Discount Factors". Enter data for current conditions and practices to be implemented in the future on the "Existing Practices" and "Future Practices" tabs, respectively.

Accounting For Growth
On the "New Development" tab, account for future growth in the watershed.

Other Model Versions and Documentation
Documentation of all model assumptions, as well as some additional data sources, are summarized in the WTM Model Documentation

In addition to this version of the WTM, the "WTM-Custom" version is also available. While the calculations are the same, the "WTM-Custom" version allows the user to customize the tool to a greater extent, but is not as user friendly as this edition.

Acknowledgment:
WTM 2013 "Off the Shelf" Edition was developed in collaboration with Michael Baker Jr., Inc.

Baker

Worksheets

Visible Worksheets

Sources
Enter data for all sources within the watershed in Sources Sheet.
Existing Practices
Enter data related all existing management practices on this sheet.
Future Management Practices
Enter data related all futures or planned management practices here.
New Development Sheet
Enter data related future development in the New Development Sheet.
Results
Results Sheet displays all model results

Hidden Sheets
(click buttons to reveal these sheets)

☐ ***Defaults***

Use the Defaults Sheet to set all the default constants used in the WTM.

☐ ***Results - Unlocked***

This version of the Results sheet is unlocked to allow the user to copy results to another spreadsheet or other analysis program.

☐ ***Calculations***

This sheet includes the equations that underly the WTM results.

Light Blue cells require input values from the user.
Yellow cells are optional to override a default or calculated values.
Grey cells are calculated values and are not editable by the user.

- [x] Primary Sources
- [x] General Sewage and Stream
- [ ] On-site Sewage Disposal
- [x] SSO/CSO/Illicit
- [ ] Urban Channel Erosion
- [ ] Livestock
- [ ] Marinas
- [x] Road Sanding
- [ ] Non-Stormwater Point

This worksheet includes both "Primary Sources" and "Secondary Sources" of pollutants. For a more detailed description of these sources, consult Chapters 3 (Primary Sources) and 4 (Secondary Sources) of the WTM Documentation. Use check boxes to the left to select sources you would like to model, and enter data in blue boxes below. More detailed guidance is provided in text above sources, as well as in pop-up boxes above some pollutant sources. To begin with, enter the watershed area, annual rainfall and approximate stream length below. For many of the sources below, "mouse over" guidance appears if you click on the source name.

Watershed Data

Watershed Area (acres)	265.3
Annual Rainfall (inches)	37.2
Stream Length (miles)	2

Loading rates from primary sources are calculated as a product of the loading rate for each pollutant and the land area. Fill in blue boxes for land area and distribution of soils to calculate loading rates. You may also override the default (calculated) loading rates by entering alternative loading rates or runoff rates (in lb/acre) to the right of the grey cells. While the annual runoff rate is reported in the grey boxes below, it cannot be altered here, and needs to be adjusted by adjusting data such as the runoff coefficients and turf/impervious cover associated with the land use on the "Defaults" tab. To alter the root data (pollutant concentrations and turf/impervious cover associated with each land use), or to add additional land use categories, go to the "Defaults" tab and select the "Primary Sources" check box. On the Defaults tab, you may add new land uses by typing a new description in blank "Detailed Description" boxes.

PRIMARY SOURCES - Land Use

			Annual Loading Rates (Calculated) - User can override this using the optional cells to the right.					Annual Loading Rates - User Defined (Optional to override calculated value)			
Land Use		Area	TN	TP	TSS	FC	Runoff	TN	TP	TSS	FC
Category	Detailed Description		(lb/acre)	(lb/acre)	(lbs/acre)	(# billion/acre)	(inches/year)	(lb/acre)	(lb/acre)	(lbs/acre)	(# billion/acre)
Residential	LDR (<1du/acre)	0	4.35	0.64	101.52	188.85	9.17				
Residential	MDR (1-4 du/acre)	0	5.45	0.80	127.16	236.55	11.48				
Residential	HDR (>4 du/acre)	213	6.91	1.02	161.35	300.14	14.57				
Residential	Multifamily	17	8.26	1.22	192.69	358.44	17.40				
Commercial	Commercial	2.8	11.68	1.22	239.09	506.82	24.60				
Roadway	Roadway	24	13.86	1.51	807.40	549.22	26.66				
Industrial	Industrial	0	9.80	1.11	360.90	406.13	19.72				
Forest	Forest	3.5	2.50	0.20	100.00	12.00	1.34				
Rural	Rural	0	4.60	0.70	100.00	39.00	1.34				
Open Water	Open Water	5	12.80	0.50	155.00	0.00	0.00				
Active Construction	Active Construction	0	3.78	0.76	2572.60	0.00	16.74				
Total	Total Acres	265									

Soils Information

HYDROLOGIC SOIL GROUP	Soil Fraction(%)
A Soils	33%
B Soils	
C Soils	
D Soils	67%
DEPTH TO GROUNDWATER	
<3 Feet	0%
3-5 Feet	
>5 Feet	100%

Secondary Sources cannot be calculated solely based on land use. For more description of secondary sources, consult Chapter 4 of the WTM Documentation. Many of the Secondary Sources in the WTM require basic data on sewage treatment, as well as information regarding nutrient concentrations in stream channels (See Figures 4.1 and 4.2 of the WTM Documentation for maps of default data)

SECONDARY SOURCES

WWTP Efficiencies

	TN Efficiency	TP Efficiency	TSS Efficiency	Bacteria Log Reduction
WWTP Efficiency				

General Sewage Use Data

Dwelling Units	
Individuals/Dwelling Unit	2.7
Water Use (gpcd)	70

Nutrient Concentration in Stream Channels

Soil P (%)	
Soil TN (%)	

SSOs

Miles of Sanitary Sewer	

CSOs

Median Storm Event (inches)	
Sewershed Area (acres)	
Sewershed Impervious Cover (%)	
Number of CSOs/year	

Illicit Connections

Percentage of WS Population Illicitly Connected	
Number of Illicit Connections	0
Number of Businesses	
Percentage of Businesses with Illicit Connections	
Percentage of Business Connections that are Wash Water Only	
Wash Water Flow (gpd)	
Total Flow/business (gpd)	

Road Sanding

Sand Application (lbs/year)	
Percentage of Roads that are Open Section	

Light Blue cells require input values from the user.
Yellow cells are optional to override a default or calculated values.
Grey cells are calculated values and are not editable by the user.

Existing Practices

Select Management Practices

- [ ] All Practices
- [ ] Turf Practices : Other
- [ ] Erosion and Sediment Control
- [ ] Structural Stormwater Management Practices
- [ ] Catch Basin Cleanouts
- [x] Turf Practices : Residential
- [ ] Pet Waste Education
- [ ] Street Sweeping
- [ ] Riparian Buffers
- [ ] Marina Pumpouts

This sheet summarizes stormwater practices currently in place throughout the watershed, including both structural and non-structural practices. Chapter 5 of the WTM Documentation summarizes efficiencies for Structural Stormwater Management Practices, and Chapter 6 provides example data and documents assumptions for non-structural practices. Chapter 7 discusses application of practices "In Series" which may provide useful background for WTM Users. Many of the practices included in this section include the concept of a "Discount Factor," which reduces the effectiveness of practices to account for imperfect application in the field. The Users' Guide provides some guidance on these factors, as does pop-up guidance on this page. Pop-up boxes will also guide you to places where default values can be changed.

Turf Condition and Management Practices - Residential

		User Defined (Optional to override calculated values)
Residential Turf Area	121.784	
Percent of Lawns Bare/ Compacted	**5%**	
Factors that Affect Nutrient Loading		
Percent of Homes <10 Years Old	**10%**	
Percent of Lawn Area "Highly Managed" (high input)	**90%**	
Recommended Fertilizer Rate (N lb/acre)	150	
Estimated Average Fertilizer Application (N lb/acre)	**200**	
Form	**% of Fertilizer Use (N Application)**	
Organic	0%	
Soluble/Urea	50%	
Slow Release	50%	
Phosphorus Free	0%	

Light Blue cells require input values from the user.
Yellow cells are optional to override a default or calculated values.
Grey cells are calculated values and are not editable by the user.

Future Practices

Select Management Practices

- [ ] **All Practices**
- [ ] **Residential Lawn Care Education and Turf Practices**
- [ ] **Erosion and Sediment Control**
- [ ] **Impervious Cover Disconnection Program**
- [ ] **Catch Basin Cleanouts**
- [ ] **Urban Downsizing/Redevelopment with Improvements**
- [ ] **Stream Restoration**
- [ ] **OSDS Education, Repair, Upgrade and Retirement**
- [ ] **Pet Waste Education**
- [ ] **Street Sweeping**
- [ ] **Riparian Buffers**
- [ ] **Marina Pumpouts**
- [ ] **Stormwater Retrofit**
- [ ] **Illicit Connection Removal, CSO/SSO Repair**
- [ ] **Point Source Reduction**

The practices on this sheet represent future implementation of management practices, including both structural BMPs and programmatic practices. Some of the practices are simply updates or enhancements of those on the "Existing Practices" tab, while others are new practices implemented only in the future condition. Chapter 5 of the WTM Documentation summarizes efficiencies for Structural Stormwater Management Practices, and Chapter 6 provides example data and documents assumptions for non-structural practices. Chapter 7 discusses application of practices "In Series" which may provide useful background for WTM Users. Many of the practices included in this section include the concept of a "Discount Factor," which reduces the effectiveness of practices to account for imperfect application in the field. All data necessary to calculate the benefits of these practices can be entered on this sheet, and underlying assumptions can be modified on the "Defaults" tab.

Light Blue cells require input values from the user.
Yellow cells are optional to override a default or calculated values.
Grey cells are calculated values and are not editable by the user.

New Development

	Land Use	Additional Development (Acres)
Residential	LDR (<1du/acre)	
Residential	MDR (1-4 du/acre)	
Residential	HDR (>4 du/acre)	
Residential	Multifamily	
Commercial	Commercial	
Roadway	Roadway	
Industrial	Industrial	
Forest	Forest	
Rural	Rural	
Rural		
Active Construction	Active Construction	

The previous sheets ("Sources", "Existing Practices" and "Future Practices") provide enough information for the user to understand baseline loads (i.e., Existing Conditions) and the loads if a set of management practices were implemented throughout the watershed. This sheet allows the user to account for future growth or land conversion in the watershed. For a description of the elements of this sheet, consult Chapter 8 of the Model Documentation. Guidance for data entry is provided for each table in mouse-over comment boxes.

Option 3: Show no increase on each parcel

Stormwater Controls on New Development and Construction

Program Discounts	Fraction of New Development Regulated	Capture Discount	Design Discount	Maintenance Discount	
Existing	0%	0%	0	0	
User Defined					
Program Option	Option 3: Show no increase on each parcel.				
	TN (lb/acre/year)	TP (lb/acre/year)	TSS (lb/acre/year)	FC(billion/acre/year)	Runoff Volume(in/year)
Is Channel Protection Required?	Yes				
	TN	TP	TSS	FC	Runoff Volume
Load Reduction (lb/year)	0.00	0.00	0.00	0.00	0.00
Load to GW	0.00	0.00	0.00	0.00	0.00

Data to Quantify Wastewater Loads

OSDSs

New OSDS Customers (households)		OSDS Failure Rate	OSDS Efficiency
	5.00%		Highly Improved (Twice as Efficient)

SSOs

Miles of Sewer Constructed	SSOs/Mile	User Defined SSOs/Mile (To Override Calculated)
	140	

CSOs

% of Development on Combined Sewer	

Illicit Connections

% of new connections cross connected	

WWTP Dischargers: Only Report Discharges to WWTPs within the Watershed

New Wastewater Customers (Households)								
	N	N (User Defined to override)	P	P (User Defined to override)	TSS	TSS (User Defined to override)	FC Log Reduction	FC (User Defined to override)
Plant Efficiency	0%		0%		0%		0.0	
Load	0		0		0		0	

Active Construction

	Active Construction	Program Efficiency	User Defined Program Efficiency	Fraction Regulated	User Defined Fraction Regulated	Maintenance/Design	User Defined Maintenance/Design
	0	70%		0%		0	

Show/Hide Results

- ☐ **Source Loads**
- ☐ **Benefits of Existing Practices**
- ☐ **Benefits of Future Practices**
- ☐ **Loads With Existing Practices**
- ☐ **Loads With Future Practices**
- ☐ **Loads With New Development**

This sheet provides a summary of results of the WTM model runs. The first table provides an overview of all loads (existing, with future practices and with new development). Use the check boxes to select more detailed descriptions of pollutant loads or practice benefits. Note that the cells in this sheet are locked. The "**Results-Unlocked**" tab has the same information, but unlocked so that the user can copy data from the model results.

This summary table summarizes pollutant loads and runoff volume in the Existing Condition, with Future Practices in place, and with New Development. The purple cells in this table represent final loads (or % change from Existing). The grey cells are interim calculations, such as the load reduction from practices (summarized). Surface water loads represents all loads during stormflow or during non-storm events that are delivered to surface waters, and Groundwater Loads include loads directly to groundwater from urban lawns, On-Site Sewage Disposal Systems, and BMPs that provide infiltration. While some of the loads to groundwater may ultimately be delivered to surface waters, the WTM does not make this calculation. To calculate loads to surface waters from groundwater, multiply the groundwater loads by a delivery ratio (known from local conditions), and add to surface water loads.

Summary Table

	TN (lb/year)	TP (lb/year)	TSS (lb/year)	Fecal Coliform (billion/year)	Runoff Volume (acre-feet/year)
Surface Water Loads					
Uncontrolled Load from Primary Sources	2,051.3	280.9	58,814.9	84,665.9	342.7
Uncontrolled Load from Secondary Sources	0.0	0.0	19,593.3	0.0	0.0
Load Reduction from Existing Practices	-389.6	-210.4	0.0	0.0	-11.0
Existing Surface Water Load	**2,441.0**	**491.3**	**78,408.2**	**84,665.9**	**353.7**
Existing Load - Storm	**2,436.6**	**491.1**	**78,373.2**	**84,665.9**	**353.7**
Existing Load - Nonstorm	**2,441.0**	**491.3**	**78,408.2**	**84,665.9**	
Load Reduction from Future Practices	0.0	0.0	0.0	0.0	0.0
Surface Load with Future Practices in Place	**2,441.0**	**491.3**	**78,408.2**	**84,665.9**	**353.7**
Surface Load Change From Existing (%)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Surface Load with Future Practices - Storm	**2,436.6**	**491.1**	**78,373.2**	**84,665.9**	**353.7**
Surface Load with Future Practices - Nonstorm	**4.4**	**0.2**	**35.0**	**0.0**	
Load from New Development	0.0	0.0	0.0	0.0	0.0
Total Surface Load Including New Development	**2,441.0**	**491.3**	**78,408.2**	**84,665.9**	**353.7**
Surface Load Change From Existing (%)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Surface Load Including New Development - Storm	**2,436.6**	**491.1**	**78,373.2**	**84,665.9**	**353.3**
Surface Load Including New Development - Storm	**4.4**	**0.2**	**35.0**	**0.0**	**0.4**
Groundwater Loads					
Groundwater Loads with Existing Practices in Place	**9,151.0**	**614.8**	**0.0**	**0.0**	**0.0**
Groundwater Loads with Future Practices	**9,151.0**	**614.8**	**0.0**	**0.0**	**0.0**
Groundwater Loads Including New Development	**9,151.0**	**614.8**	**0.0**	**0.0**	**0.0**

Attachment 9

Pump Station Assessment

Barton & Loguidice
Engineers • Environmental Scientists • Planners • Landscape Architects
10 Airline Drive • Suite 200 • Albany, NY 12205
Telephone: 518-218-1801 • Facsimile: 518-218-1805

JOB 976.002.001
SHEET NO. 1 OF 3
CALCULATED BY AFJ DATE December 12, 2014
CHECKED BY JAB DATE 12/14
SUBJECT City of Albany Buckingham Pond Pump Station

City of Albany Buckingham Pond Pump Station Evaluation

Head loss Calculation

Static Head:

Pump #1 On LWL =	197.1	ft
Connection to Storm Sewer at Rte. 85 Invert Elevation =	217.5	ft
Static Head =	20.4	ft

Frictional / Minor Losses:

	Start: Discharge of Pump Station			
1	10-inch Check Valve =	114	ft	*assumed swing check valve
2	10-inch Plug Valve =	20.4	ft	*2-way plug valve
3	10x12 inch DIP tee (side) =	72	ft	*tee (side outlet) plus sudden expansion
4	Length of 12-inch DIP =	6.4	ft	
5	12" 90° DIP Bend =	20	ft	
6	Length of 12-inch DIP =	2.6	ft	
7	12" 45° DIP Bend =	15	ft	
8	Length of 12-inch DIP =	4.8	ft	
9	PVC/DIP Transition =	20	ft	*assumed straight run of tee
10	12" 45° PVC Bend =	15.5	ft	
11	Length of 12" PVC Pipe =	135	ft	
12	12" 45° PVC Bend =	15.5	ft	
13	Length of 12" PVC Pipe =	700	ft	
14	12" 45° PVC Bend =	15.5	ft	
15	12" 45° PVC Bend =	15.5	ft	
16	12" 45° PVC Bend =	15.5	ft	
17	12" 45° PVC Bend =	15.5	ft	
18	Length of 12" PVC Pipe =	475	ft	
19	12" 45° PVC Bend =	15.5	ft	
20	12" 45° PVC Bend =	15.5	ft	
21	12" 45° PVC Bend =	15.5	ft	
22	12" 45° PVC Bend =	15.5	ft	
23	Sudden Expansion =	51	ft	*at Manhole connecting to 36-inch RCSP by Route 85

Equivalent Length of 10-inch DIP:	206.4	ft
Equivalent Length of 12-inch DIP:	68.8	ft
Equivalent Length of 12-inch PVC:	1516	ft

** All piping items are DIP unless otherwise stated. See next page for total lengths and notes.*

*** PVC Equivalent Lengths from http://www.engineeringtoolbox.com/pvc-pipes-equivalent-length-fittings-d_801.html*

****Valves & PVC Sudden Expansion from http://www.katmarsoftware.com/articles/pipe-fitting-equivalent-length.htm for valves, assumed commericial steel material*

*****All other Equivalent Lengths taken from Peerless Pump Handbook of Engineering Pumping Data*

Barton & Loguidice
Engineers • Environmental Scientists • Planners • Landscape Architects
10 Airline Drive • Suite 200 • Albany, NY 12205
Telephone: 518-218-1801 • Facsimile: 518-218-1805

JOB	967.002.001		
SHEET NO.	2	OF	3
CALCULATED BY	AFJ	DATE	December 12, 2014
CHECKED BY	JAB	DATE	12/14
SUBJECT	City of Albany Buckingham Pond Pump Station		

City of Albany Buckingham Pond Pump Station Evaluation

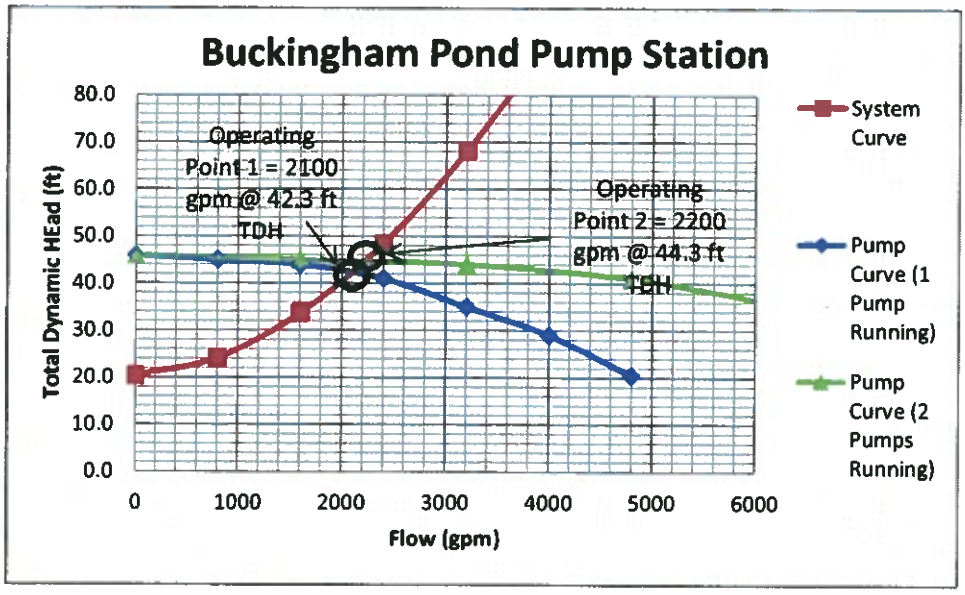
Head loss Calculation

Equivalent Length of 10-inch DIP:	206.4	ft
Equivalent Length of 12-inch DIP:	68.8	ft
Equivalent Length of 12-inch PVC:	1516	ft

	Buckingham Pnd Pump Station		
L (ft)	206.4	68.8	1,516.0
Q (gpm)	2,200	2,200	2,200
C	120	120	130
D (in)	10	12	12
Hf	6.381	0.876	16.647
Headloss, ft	23.904		
Static, ft	20.4		
TDH, ft	44.304		

System Curve:

Flow , gpm	TDH, ft
0	20.4
800	24.1
1600	33.7
2400	48.5
3200	68.2
4000	92.6
4800	121.6
5600	155.0



** Hazen Williams C Values from http://www.engineeringtoolbox.com/hazen-williams-coefficients-d_798.html*

Barton & Loguidice
Engineers • Environmental Scientists • Planners • Landscape Architects
10 Airline Drive • Suite 200 • Albany, NY 12205
Telephone: 518-218-1801 • Facsimile: 518-218-1805

JOB 967.002.001
SHEET NO. 3 OF 3
CALCULATED BY AFJ DATE December 12, 2014
CHECKED BY JAB DATE 12/14
SUBJECT City of Albany Buckingham Pond Pump Station

City of Albany Buckingham Pond Pump Station Evaluation

Stormwater Volume and Pump Station Capacity

Stilling Basin Available Storage	2.446	acre-feet
Pond Available Storage	15.978	acre-feet
Pond Sediment Buildup Available Storage	12.209	acre-feet
Total Existing Available Storage	14.655	acre-feet
Future Available Storage	18.424	acre-feet

Storm	Stilling Basin Volume (acre-feet)	Stilling Basin Volume (gallons)	Pond Volume (acre-feet)
1-inch rainfall event	2.042	665,342.41	
1-year	15.202	4,953,249.42	10.375
1-year, back to back (2 storms)	30.404	9,906,498.84	20.75
2-year	20.779	6,770,396.64	15.826
10-year	37.698	12,283,094.10	31.403
25-year	42.893	13,975,774.72	36.19
50-year*	47.675	15,533,888.04	40.648
100-year*	53.347	17,381,988.99	46.026
500-year*	61.336	19,985,035.28	53.206

**The stilling basin cannot handle storm events of this magnitude and is inadequately sized. Actual volume observed may be greater.*

Utilize Total Available Existing Storage								
Storm	Volume to Remove Before Storm (acre-feet)	Total Vol. to Remove During Storm (acre-feet)	Total Vol. to Remove Before Storm (Gallons)	Time to Remove (hours)	Overflow Volume (acre-feet)	Overflow Volume (gallons)	Proposed Pumping Capacity (gpm)
1-inch rainfall event	0	2.042	665,342.41	5.04	N/A	N/A	N/A
1-year	5.479	9.723	1,785,249.42	13.52	N/A	N/A	N/A
1-year, back to back (2 storms)	10.958	19.446	3,570,498.84	27.05	N/A	N/A	N/A
2-year	11.056	9.723	3,602,396.64	27.29	N/A	N/A	N/A
10-year	14.655	9.723	4,775,021.06	36.17	13.320	4,340,073.04	5,213.94
25-year	14.655	9.723	4,775,021.06	36.17	18.515	6,032,753.65	6,389.41
50-year*	14.655	9.723	4,775,021.06	36.17	23.297	7,590,866.98	7,471.44
100-year*	14.655	9.723	4,775,021.06	36.17	28.969	9,438,967.93	8,754.84
500-year*	14.655	9.723	4,775,021.06	36.17	36.958	12,042,014.21	10,562.51

Utilize Total Available Future Storage						
Storm	Volume to Remove Before Storm (acre-feet)	Total Vol. to Remove During Storm (acre-feet)	Total Vol. to Remove Before Storm (Gallons)	Time to Remove (hours)	Overflow Volume (acre-feet)	Overflow Volume (gallons)
1-inch rainfall event	0	2.042	665,342.41	5.04	N/A	N/A
1-year	5.479	9.723	1,785,249.42	13.52	N/A	N/A
1-year, back to back (2 storms)						
2-year	11.056	9.723	3,602,396.64	27.29	N/A	N/A
10-year	27.975	9.723	9,115,094.10	69.05	9.55	3,112,024.29
25-year	33.170	9.723	10,807,774.72	81.88	14.75	4,804,704.91
50-year*	37.952	9.723	12,365,888.04	93.68	19.53	6,362,818.23
100-year*	43.624	9.723	14,213,988.99	107.68	25.20	8,210,919.18
500-year*	51.613	9.723	16,817,035.28	127.40	33.19	10,813,965.47

Utilize Total Available Future Storage																
Storm	Stilling Basin Volume (acre-feet)	Stilling Basin Volume (gallons)	Pond Volume (acre-feet)	Volume to Remove Before Storm (acre-feet)	Total Vol. to Remove During Storm (acre-feet)	Total Vol. to Remove Before Storm (Gallons)	Time to Remove (hours)	Overflow Volume (acre-feet)	Overflow Volume (gallons)	Proposed Pumping Capacity (gpm)	Volume to Remove Before Storm (acre-feet)	Total Vol. to Remove During Storm (acre-feet)	Total Vol. to Remove Before Storm (Gallons)	Time to Remove (hours)	Overflow Volume (acre-feet)	Overflow Volume (gallons)
1-inch rainfall event	2.042	665,342.41		0	2.042	665,342.41	5.04	N/A	N/A	N/A	0	2.042	665,342.41	5.04	N/A	N/A
1-year	15.202	4,953,249.42	10.375	5.479	9.723	1,785,249.42	13.52	N/A	N/A	N/A	5.479	9.723	1,785,249.42	13.52	N/A	N/A
1-year, back to back (2 storms)	30.404	9,906,498.84	20.75	10.958	19.446	3,570,498.84	27.05	N/A	N/A	N/A						
2-year	20.779	6,770,396.64	15.826	11.056	9.723	3,602,396.64	27.29	N/A	N/A	N/A	11.056	9.723	3,602,396.64	27.29	N/A	N/A
10-year	37.898	12,283,094.10	31.403	14.655	9.723	4,775,021.06	36.17	13.320	4,340,073.04	5,213.94	27.975	9.723	9,115,094.10	69.05	9.55	3,112,024.29
25-year	42.893	13,975,774.72	36.19	14.655	9.723	4,775,021.06	36.17	18.515	6,032,753.65	6,389.41	33.170	9.723	10,807,774.72	81.88	14.75	4,804,704.91
50-year*	47.675	15,533,888.04	40.648	14.655	9.723	4,775,021.06	36.17	23.297	7,590,866.98	7,471.44	37.952	9.723	12,365,888.04	93.68	19.53	6,362,818.23
100-year*	53.347	17,381,988.99	46.026	14.655	9.723	4,775,021.06	36.17	28.969	9,438,967.93	8,754.84	43.624	9.723	14,213,988.99	107.68	25.20	8,210,919.18
500-year*	61.336	19,985,035.28	53.206	14.655	9.723	4,775,021.06	36.17	36.958	12,042,014.21	10,562.51	51.613	9.723	16,817,035.28	127.40	33.19	10,813,965.47

*The stilling basin cannot handle storm events of this magnitude and is inadequately sized -> Actual volume observed may be greater.

			Volume to drop 1 foot (CF)	Volume to drop 1 foot (Gal)	Time to drop 1 foot (hours)
Stilling Basin Are	0.65		28,314.00	211,788.72	1.88
Pond Area (acres	5.16		224,769.60	1,681,276.61	13.34
Total				*1,893,065.33*	15.02
901.46	*15.02*				

Stilling Basin Available	2.446	acre-feet
Pond Available	15.978	acre-feet
Pond Sediment Buildup	12.209	acre-feet
Total Existing Available	14.655	acre-feet
Future Available Storage (after	18.424	acre-feet