MONITORING REPORT

RIVERBEND I

BUFFALO, NY
2018

Prepared by:

BUFFALO NIAGARA WATERKEEPER

721 Main St
Buffalo NY 14203

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1. Introduction:

1.1. Background

This project was designed for the Riverbend Phase I site in order to improve area ecology and support and enhance benefits of restoration efforts at the site, as well as aid in delisting the Buffalo River as an Area of Concern (AOC) by improving approximately 2,800 linear feet of shoreline habitat and approximately 6.29 acres of Buffalo River shoreline and riparian habitat.

1.2. The Project Area and Site Description

The Riverbend I site is located on the Buffalo River in the City of Buffalo, Erie County, New York. The site is located off of South Park Avenue within the 260-acre South Buffalo Brownfield Opportunity Area (BOA). The site is bounded east by Abby Street and South by Tifft Street with the Tifft Nature Preserve west of the adjacent rail lines. The site is owned and managed by John W. Danforth Co. and Patrick 223, Inc. The landowner agreements arranged between the landowners and Buffalo Niagara Waterkeeper (Waterkeeper) can be found in Appendix A.

The Riverbend Phase I site is approximately 2,800 linear feet covering 6.29 acres. The site consists of a high flat floodplain terrace that formerly was 8 to 10 feet above and entirely disconnected from the river channel. Prior to restoration, the site was dominated by various disturbance-adapted and invasive plant species.

Previously home to the Republic Steel and Donner Hanna Coke Facilities, the Riverbend restoration site is now classified as a post-industrial urban brownfield. In 2007, the site completed the NY DEC's Voluntary Cleanup Program in which contaminated soils were removed and capped with fresh topsoil and various beneficial seed mixes. In 2011, the Buffalo Urban Development Corporation completed the Riverbend Commerce Park Site Development Plan in order to redevelop the site and identify shoreline and riparian restoration as key elements of this plan. The Riverbend site remains one of the longest stretches of undeveloped shoreline in the Buffalo River AOC.

1.3. Project Goals

The Post Construction Management of Riverbend I was funded through grants from the US Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA), and the Great Lakes Commission (GLC). Initial construction was funded by US Environmental Protection Agency (USEPA) through the Great Lakes Restoration Initiative (GLRI). The restoration project consisted of the development of detailed engineering and design plans as well as riverbank enhancements (e.g. native vegetation planting, invasive species control). The goals of the project were as follows:

- To restore native shoreline, riparian, and upland native vegetation
- To successfully establish plant assemblages and habitat features within restored native communities that provide forage, cover, nesting, resting, and roosting for a growing number of wildlife species
- To include potential eventualities of climate change including either wetter or drier conditions, or both extremes, over a given time period as a "new normal" in the restoration design and long-term monitoring and adaptive management of the Phase I and Phase II sites
- To incorporate the visions for restoration, connection, transformation, and engagement identified in the Riverbend Commerce Park Site Development Plan; site restoration goal involves the expectation of human use and interaction with the restored areas and the Buffalo River
- To materially and measurably support the Buffalo River AOC Beneficial Use Impairments (BUI) delisting process through advancing the delisting of BUI 3 (degradation of fish and wildlife populations, specifically wildlife) and BUI 4 (loss of fish and wildlife habitats).

1.4. Project Objectives

The overall objective of the Riverbend restoration project is to initiate habitat restoration through the design of Phase I and Phase II improvements. The following objectives have been defined to meet the above-stated goals:

- To design a planting plan to initiate recovery of shoreline, riparian, and upland habitats and biodiversity
- To design habitat features that will result in successful restoration community establishment and that will be resistant and resilient to existing physical and biological stressors within the site
- To design and implement site-specific invasive species control and management protocol
- To design a planting plan to integrate species and assemblage plasticity in order to maximize successful native plant growth
- To create measurable and sustainable replacement shoreline, riparian, and upland habitat communities for faunal species of interest

2. Data Generation and Acquisition

2.1. Ecological and General Site Condition Data Collection Methods

Baseline data for the Riverbend I site was collected by consultant Ecology and Environment Engineering, P.C. and prepared into the *RiverBend Shoreline Restoration Design Buffalo, NY Quality Assurance Project Plan*, 2012 (Appendix B). In 2018, Waterkeeper assumed full project administration and conduction of post-construction data collection as defined in the 2012 QAPP Amendment (Appendix B).

Post-construction monitoring protocols used were consistent with those used to inform initial project design and were used to assess the enhancement of the riparian habitat completed in 2013. Post-construction data collection included meander surveys to characterize habitats, identification of native and invasive plant populations, mapping their extents, and conducting soil sampling and analyses to determine the levels of priority pollutant metals, nitrates and nitrites, total phosphorus, pH, and total organic carbon. These data were collected to reproduce the baseline conditions monitoring conducted in 2012 to assess the enhancement of the restoration of the habitats at the Riverbend Phase I site.

2.2. PCMP Monitoring

2.2.1. Avian Monitoring (Buffalo Audubon Society)

Avian Monitoring was conducted by Buffalo Audubon Society (BAS) over 16 monthly site visits spanning May 2017 through August 2018. The accompanying BAS Monitoring Reports and Final Report are attached (Appendix C).

2.2.2. Soil Monitoring

2.2.2.1. Data Collection Methods

Soil data was collected via sampling on the Riverbend Phase I site by three Waterkeeper field specialists in July of 2018. Samples were gathered using hand trowels, shovels, and buckets for mixing.

The data collection method began by identifying the six community types in which sampling took place (Shoreline & Riparian topsoil, Shoreline & Riparian subsoil, Upland, Upland Meadow, Planting Island

Depressions, Planting Island Berms) as seen in Appendix D. Eight subsamples were collected via randomized meander throughout each community, shown in Figure 2 - 1 and Table 2 - 1, for a total of 48 subsamples. Once gathered for a community type, the eight subsamples were mixed with a hand trowel in a large bucket until homogeneity was attained. Rocks, litter, large twigs and other debris were removed according to Agro-One instructions. De-littered and mixed composite samples were then compacted into the lab's provided sample boxes and labeled appropriately. The samples were shipped the same day via USPS Priority Mail to Agro-One Agronomy Services lab at 730 Warren Road in Ithaca, NY for testing.

2.2.2.2. Data Acquired

Soil Monitoring Data Forms (Appendix E) were utilized to record the following information during the soil sampling process: time of sampling, planting zone, location (latitude/longitude), and relevant observations. Before sampling began, the sample specialist recorded the date, site/phase (RB I), weather conditions, soil sampler name(s), composite soil sample number, composite soil sample ID (as submitted to soil testing laboratory), and type of composite soil sample (topsoil or subsoil).

Vegetation Monitoring

2.2.2.3. Data Collection Methods

Vegetation data was collected via meander surveying on the Riverbend Phase I site, conducted by two Waterkeeper field specialists in July of 2018. Vegetation surveying protocol was adapted from the *Timed-Meander Sampling Protocol for Wetland Floristic Quality Assessment* and was conducted visually while utilizing timers, field guides, and cellular devices for photo capture and reference as needed.

Data collection protocol began with identification of the eight community type areas to be individually surveyed (Meadow, Shoreline, Riparian, Upland, Meadow B, Shoreline B, Riparian B, and Upland B) as seen in Appendix D. The eight community types were surveyed in order to calculate percent coverage for the species found in each assessment area (AA): invasive, native, and non-native. Each meander was timed for a total of ten minutes. The surveyors identified plant species as they walked throughout the AA, stopping the timer if an unknown species needed to be identified or collected for later identification. An additional five minutes were added to the meander for an AA if surveyors encountered more than three new species in the last five minutes of the ten-minute original time frame. The surveyors recorded the start and end GPS points for each individual community type, as shown in Figure 2 - 2.

2.2.2.4. Data Acquired

The eight total meander surveys taken at Riverbend I resulted in eight separate field assessment sheets in which the following information was recorded: start meander time, start meander GPS coordinates (latitude/longitude), species identified (common name and scientific name), location type where found (e.g. open, enclosure), the species' invasive status, end meander time, and end GPS coordinates. After survey completion, the estimated percent cover per each plant species was estimated and recorded (e.g. <1%, 3%, 5%, 30%). Any species that was estimated to be of 5% or more in coverage was classified as "dominant" and recorded as such.

2.2.3. Walkthrough Monitoring

2.2.3.1. Data Collection Methods

Walkthrough monitoring was conducted on the Riverbend I site by appointed Waterkeeper field staff. Monitoring consisted of monthly walks through Riverbend I (June, July, August) in which changes, relevant observations, and current status were recorded. Field notes taken during walkthroughs were recorded onto

walkthrough inspection forms. While there was no exact time frame needed to complete a walkthrough monitoring, Riverbend I would be observed for around two hours per walkthrough monitoring session.

2.2.3.2. Data Acquired

Observations noted during the walkthrough were recorded onto data sheets (see Appendix F). The following information was recorded upon arrival at the site: date, time, weather, site name (Riverbend I), and walkthrough inspector(s) name(s). Data acquired and recorded via visual observation during the walkthrough included: Flood Damage, Plant Disease, Plant Pests, Drought, Tree Tubes, Choking Weeds, Invasive Species, Volunteer Species, Herbivory, Plant Vigor, Deer Exclosure, Amphibian Observations, Reptile Observations, Mammal Observations, and Avian Observations.

2.3. QAPP Monitoring

2.3.1. Soil Monitoring

Soil Monitoring was completed on August 9, 2018 at the RBII site. Samples were collected and sent to Test America Laboratories, Inc., at 10 Hazelwood Drive in Amherst, NY for analysis.

2.3.1.1. Data Collection Methods

Soil data was collected via sampling on the Riverbend I site conducted by Waterkeeper field staff in August of 2018. Sampling was conducted using hand trowels, shovels, and buckets for mixing. The data collection method began by identifying the six (five community types plus one duplicate sample) community types in which sampling would take place (Shoreline/Riparian, Upland, Upland Meadow, Berms, Depressions, Field Duplicate (Meadow)) as seen in Appendix D. Four subsamples were taken (spread evenly) throughout each community for a total of 24 subsamples as displayed by GPS points in Figure 2 - 3 and Table 2 - 2. At the end of each community type sampling, the four samples were mixed thoroughly in a large bucket to produce a composite sample. This composite was compacted into the provided TestAmerica containers and labeled appropriately. TestAmerica testing containers consisted of three different sized glass jars which were filled, labeled appropriately, bubble-wrapped, packed into a provided cooler with ice, and delivered to FedEx for overnight shipping to the lab for testing.

2.3.1.2. Data Acquired

Soil Monitoring Data Forms (see Appendix E) were utilized to record the following information during the soil sampling process: time of sampling, planting zone, location (latitude/longitude), and relevant observations. Before sampling began, the field staff recorded the date, site/phase (RBI), weather conditions, soil sampler name(s), composite soil sample number, composite soil sample ID (as submitted to soil testing laboratory), and type of composite soil sample (topsoil or subsoil).

2.3.2. Vegetation Monitoring

Refer to Section 2.2.3 for full description of Vegetation Monitoring Protocol.

3. Data Analysis, Identification of Problems and Opportunities

3.1. PCMP Monitoring

Waterkeeper field staff conducted several pre-test sampling procedures and observational walkthroughs on the Riverbend I restoration sight from June 2018 to August 2018. The procedures measured soil content, vegetation vigor, weather conditions, wildlife activity, and overall changes.

3.1.1. Data Analysis

3.1.1.1. Soil Monitoring

The results of the soil testing conducted on Riverbend I soil in July 2018, as shown in Appendix E, were produced by Agro-One. The composite soil samples were tested for levels of phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg). In addition, soils were tested in order to measure levels of the pH, iron (Fe) content, manganese (Mn), zinc (Zn), aluminum (Al), soluble salts, and percent organic matter (OM). The soil tests also confirmed soil texture and soil drainage conditions.

3.1.1.2. Vegetation Monitoring

The results of the vegetation meandering surveys conducted on the Riverbend I restoration site in July 2018 conclude the overall approximated percentage coverage of all individual observed plant species (invasive, native, and non-native), as shown in Table 3 - 1. The results of the survey demonstrate that the largely dominant (20% and up) species on the site was Canada Goldenrod (*Solidago canadensis*), unidentified grass, European black alder (*Alnus glutinosa*), burdock (*Arctium*), and Canada thistle (*Cirsium arvense*). The lesser but still "dominant" classified species (5% or higher) on the RB I site included: unidentified grasses, crack willow (*Salix fragilis*), Eastern cottonwood (*Populus deltoides*), blue vervain (*Verbena hastata*), box elder maple (*Acer negundo*), Japanese knotweed (*Fallopia japonica*), Joe Pye weed (*Eutrochium purpureum*), downy wood mint (*Blephilia ciliate*), wild bergamot (*Monarda fistulosa*), American sycamore (*Platanus occidentalis*), Tall Boneset (*Ageratina altissima*), Grass-leaved goldenrod (*Euthamia graminifolia*), oxeye sunflower (*Heliopsis helianthoides*), unidentified grass, spotted knapweed (*Centaurea maculosa*), mugwort (*Artemisia*), and eastern ninebark (*Physocarpus opulifolius*).

3.1.1.3. Walkthrough Monitoring

The results of the walkthrough monitoring of Riverbend I, shown in Table 3 - 2, display results of invasive growth throughout the site, high plant vigor (especially in goldenrod, grasses, mugwort, burdock, and mullein species), observed wildlife each month (deer seen each month through summer, scat from various species), drought conditions throughout the dry summer (dry grasses, dry/crumbling soil), typical herbivory and deer browsing, avian sightings (Canada geese, tree swallows, gold finches, ring billed gulls, blue herons), and structural changes (down fencing at the Meadow East portion, birdhouse in need of straightening, tree tubes in place with one needing removal).

3.2. QAPP Monitoring

3.2.1. Data Analysis

3.2.1.1. Soil Monitoring

The results of the soil testing conducted on Riverbend I soil in August 2018, as shown in Appendix E, were produced by TestAmerica Laboratories Inc. of Buffalo, NY. The composite soil samples were tested for levels of aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), calcium (Ca), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), manganese (Mn), nickel (Ni), potassium (K), sodium (Na), vanadium (V), zinc (Zn), mercury (Hg), phosphorous (P), thallium (Tl), nitrate/nitrite (N), selenium (Se), as well as total organic carbon, pH level, and temperature.

3.2.1.2. Vegetation Monitoring

Vegetation monitoring was executed in July 2018, satisfying meander survey requirements. See 3.1.1.3. "Vegetation Monitoring".

3.3. Overall Summary of Field Findings

3.3.1. Field Findings in the Study Area

The Riverbend I site was visited by Buffalo Niagara Waterkeeper field staff during the months of June, July, and August 2018 in order to conduct walkthrough monitoring, soil sampling, and vegetation meander surveying.

The site is a mixture of open upland meadow, shoreline and riparian slopes, and several planting island berms. During the summer months, the trend of vegetation vigor in the open space was positive, indicating rapid growth in various species including mugwort (*Artemisia vulgaris*), Canada goldenrod (*Solidago canadensis*), mullein (*Verbascum thapsus*), knapweed (*Centaurea maculosa*), burdock (*Arctium minus*), and Canada thistle (*Cirsium arvense*). Invasive species on the Riverbend I site exhibited high vigor. The trend of vegetation vigor in the planting berm was also positive, with rapid growth observed in both native and invasive species such as wild bergamot (*Monarda fistulosa*), Canada goldenrod (*Solidago canadensis*), mugwort (*Artemisia vulgaris*), Eastern ninebark (*Physocarpus opulifolius*), knapweed (*Centaurea maculosa*), burdock (*Arctium minus*), black alder (*Alnus glutinosa*), blue vervain (*Verbena hastate*), chamomile (*Chamaemelum nobile*), and tall boneset (*Eupatorium altissimum*).

The PCMP soil samples collected at Riverbend I sent to Agro One labs for agricultural analysis indicated high levels of Phosphorous (P), Potassium (K), Calcium (Ca), and Magnesium (Mg) with Calcium and Potassium being consistently high throughout the site. The average pH level of the soil sampling locations was 6.8.

The QAPP soil samples collected at Riverbend I and sent to Test America labs for analysis indicated high levels of Aluminum (Al), Calcium (Ca), Iron (Fe), Magnesium (Mg), Potassium (K), and Total Organic Carbon. The average pH level of the soil sampling locations was 7.1.

Soil conditions were generally mesic (dry) throughout habitat zones, likely due to particularly high temperatures and lack of rain during the summer of 2018, and low levels of shade currently present on the remediation site.

Wildlife observations were recorded during monthly walkthrough monitoring procedures. On the Riverbend I site, the following species were observed at the highest frequency during walkthrough and avian monitoring: deer (infant, juvenile, and adult), Canada geese, blue heron, and ducks. Other species observed included mice, ringed-billed gulls, and gold finches. In addition to visual observation of species presence, signs such as heavily browsed woody plants, scat, and holes were noted throughout the site.

The structures monitored on Riverbend I included tree tubes and fencing on the eastern planting berm as a form of deer exclosure. The tree tubes are in sturdy condition and may soon require removal. One tree tube in particular is currently ready for removal. The fencing around the planting berm is overgrown and in portions of it, down due to deer activity.

3.3.2. Successes

Approximately 2,800 linear feet of shoreline were restored to natural habitat, native vegetation was established and invasive species removed. Over six acres of animal habitat including riparian, grassland, and upland forest habitat were established on the site. Two years of avian monitoring, vegetation surveys, walkthrough monitoring, and soil monitoring were completed.

Buffalo River restoration continues in Western New York; this site has served as a pilot for future projects including the restoration of the Toe of Katherine Street Peninsula, Buffalo Motor Generator Corporation, Ohio Street Boat Launch, and many others. Lessons learned on this restoration project have informed restoration techniques along the Buffalo River and elsewhere.

3.3.3. Future Site Management

Invasive species are present throughout the site, predominantly in the shoreline and riparian slope of the project area. While knotweed does not currently dominate the site, other species including Canada goldenrod (*Solidago canadensis*), mugwort (*Artemisia vulgaris*), and burdock (*Arctium minus*), account for 38% of the observed plant species in the Meadow area, 50% in Meadow B, 53% in the Riparian area, 80% in Riparian B, 16% in the Shoreline area, 15% in Shoreline B, 25% in the Upland area, and 45% in Upland B.

Deer foraging on the unprotected slope and meadow of the project site will likely continue, as will the spread of invasive plants facilitating by deer migration in up and down the Buffalo River. Beaver foraging significantly affected the success of tree plantings on the site. The installation of tree tubes appears to have prevented any further damage via deer, beaver, or other animal activity.

Ideally, continued monitoring of the project site will allow us to track the progression of the site's restoration and determine whether invasive species continue to spread unhindered on site.

Follow up invasive plant species removals and native plantings conducted by volunteer groups such as Waterkeeper's Restore Corps as well periodic herbicide spraying targeted to the most prevalent invasives could allow the site to continue its path toward a more natural state.

4. References

Documents referred to in this report can be found in the appendices.

Table 2 – 1. Riverbend I Composite Soil Sample GPS Coordinates, July

Composite Sample 1 - Shoreline & Riparian Top			Composite Sample 4 - Upland Meadow		
Sample no.	Time	GPS Coordinates	Sample no.	Time	GPS Coordinates
SS1	8:48 AM	42.863089, -78.841535	SS1	2:35 PM	42.860421, -78.833790
SS2	8:55 AM	42.863117, -78.841426	SS2	2:40 PM	42.860949, -78.834618
SS3	9:04 AM	42.863019, -78.840047	SS3	2:46 PM	42.862100, -78.837439
SS4	9:11 AM	42.863226, -78.839926	SS4	2:47 PM	42.862299, -78.837758
SS5	9:18 AM	42.862506, -78.838378	SS5	2:29 PM	42.86277, -78.83924
SS6	9:31 AM	42.862645, -78.838139	SS6	2:31 PM	42.86287, -78.83931
SS7	9:56 AM	42.860640, -78.833787	SS7	2:33 PM	42.86326, -78.83995
SS8	10:02 AM	42.860819, -78.834423	SS8	2:35 PM	42.86324, -78.84026
Composite Sample 2 - Shoreline & Riparian Sub			Composite Sample 5 - Planting Island Depressions		
Sample no.	Time	GPS Coordinates	Sample no.	Time	GPS Coordinates
SS1	10:34 AM	42.863117, -78.841426	SS1	1:33 PM	42.861020, -78.834809
SS2	10:37 AM	42.863089, -78.841535	SS2	1:34 PM	42.861055, -78.834760
SS3	10:54 AM	42.863019, -78.840047	SS3	1:35 PM	42.860893, -78.834876
SS4	11:01 AM	42.863226, -78.839926	SS4	1:36 PM	42.860991, -78.835037
SS5	11:15 AM	42.862506, -78.838378	SS5	1:52 PM	42.862479, -78.838081
SS6	11:19 AM	42.862645, -78.838139	SS6	1:55 PM	42.862541, -78.838344
SS7	11:30 AM	42.860937, -78.834527	SS7	1:56 PM	42.862419, -78.838420
SS8	11:35 AM	42.861008, -78.834433	SS8	1:59 PM	42.862600, -78.838546
Composite Sample 3 - Upland			Composite Sample 6 - Planting Island Berms		
Sample no.	Time	GPS Coordinates	Sample no.	Time	GPS Coordinates
SS1	11:46 AM	42.861112, -78.834976	SS1	1:09 PM	42.862497, -78.838589
SS2	11:55 AM	42.861944, -78.836666	SS2	1:09 PM	42.862479, -78.838478
SS3	12:00 PM	42.862301, -78.837828	SS3	1:12 PM	42.862430, -78.838273
SS4	12:12 PM	42.862917, -78.839544	SS4	1:14 PM	42.862374, -78.838190
SS5	12:19 PM	42.863191, -78.840671	SS5	1:21 PM	42.861081, -78.835129
SS6	12:22 PM	42.863123, -78.840900	SS6	1:23 PM	42.861028, -78.835092
SS7	12:24 PM	42.863175, -78.841064	SS7	1:24 PM	42.861023, -78.835043
SS8	12:28 PM	42.853861, -78.828007	SS8	1:25 PM	42.861095, -78.835071

Table 2 – 2. Riverbend I Composite Soil Sample GPS Coordinates, August

Composite Sample No. 1 - Shoreline/Riparian			Composite Sample No. 4 - Berms		
Subsample no.	Time	GPS Coordinates	Subsample no.	Time	GPS Coordinates
SS1	10:39 AM	42.860704, -78.833890	SS1	9:53 AM	42.861047, -78.834982
SS2	10:42 AM	42.860815, -78.834106	SS2	9:55 AM	42.861103, -78.835069
SS3	10:44 AM	42.86296, -78.83935	SS3	10:02 AM	42.862457, -78.838359
SS4	10:45 AM	42.86326, -78.8404	SS4	10:04 AM	42.862618, -78.838593
Composite Sample No. 2 - Upland			Composite Sample No. 5 - Depressions		
Subsample no.	Time	GPS Coordinates	Sample no.	Time	GPS Coordinates
SS1	9:38 AM	42.86194, -78.83706	SS1	8:30 AM	42.862478, -78.838150
SS2	9:45 AM	42.86266, -78.83858	SS2	8:36 AM	42.862430, -78.838421
SS3	9:49 AM	42.86297, -78.83934	SS3	8:40 AM	42.862448, -78.838403
SS4	9:54 AM	42.86311, -78.84106	SS4	8:45 AM	42.861132, -78.834927
Composite Sample No. 3 - Upland Meadow			Composite Sample No. 6 - Field Duplicate (Meadow		
Subsample no.	Time	GPS Coordinates	Sample no.	Time	GPS Coordinates
SS1	8:01 AM	42.86089, -78.83466	SS1	8:01 AM	42.86089, -78.83466
SS2	8:13 AM	42.8623, -78.83784	SS2	8:13 AM	42.8623, -78.83784
SS3	8:21 AM	42.86277, -78.83944	SS3	8:21 AM	42.86277, -78.83944
SS4	8:27 AM	42.86303, -78.84067	SS4	8:27 AM	42.86303, -78.84067

Table 3 – 1. Riverbend I Shoreline Habitat Restoration Project Vegetation and Habitat Assessment Data Sheet

Riverbend I Vegetation Meander - Meadow						
Common Name	**Species**	**Relative % Coverage**	**NY Status**	**Dominant**	**Invasive**	**Location**
Switchgrass	*Panicum virgatum*	5	Native	Yes	No	Open
Tall Fescue	*Festuca arundinacea*	5	Non-native	Yes	No	Open
Virginia wildrye	*Elymus virginicus*	1	Native	No	No	Open
Burdock	*Arctium*	15	Non-native	Yes	Yes	Open
Curly Dock	*Rumex crispus*	1	Non-native	No	Yes	Open
Birdsfoot Trefoil	*Lotus corniculatus*	3	Non-native	No	Yes	Open
Canada Goldenrod	*Solidago canadensis*	20	Native	Yes	No	Open
Knotweed	*Fallopia japonica*	1	Non-native	No	Yes	Open
White Oak	*Quercus alba*	3	Native	No	No	Open
Crown Vetch	*Securigera varia*	<1	Non-native	No	Yes	Open
Knapweed	*Centaurea stoebe*	1	Non-native	No	Yes	Open
Canada Thistle	*Cirsium arvense*	5	Non-native	Yes	Yes	Open
Unindentified	*N/A*	<1	N/A	No	No	Open
Grass leaved goldenrod	*Euthamia graminifolia*	1	Native	No	No	Open
Wood Sorrel	*Oxalis spp.*	1	Native	No	No	Open
Ragweed	*Ambrosia artemisiifolia*	<1	Native	No	No	Open
Bergamot	*Monarda fistulosa*	1	Native	No	No	Open
Allegheny Blackberry	*Rubus allegheniensis*	1	Native	No	No	Open
Oxeye Sunflower	*Heliopsis helianthoides*	1	Native	No	No	Open
Creeping Charlie	*Glechoma hederacea*	3	Non-native	No	Yes	Open
Unindentified (oval leaves)	*N/A*	1	N/A	No	No	Open
Butter and Eggs	*Linaria vulgaris*	1	Non-native	No	Yes	Open
Mugwort	*Artemesia vulgaris*	3	Non-native	No	Yes	Open
Swamp White Oak	*Quercus bicolor*	1	Native	No	No	Open
Red Oak	*Quercus rubra*	1	Native	No	No	Open
Queen Anne's Lace	*Daucus carota*	<1	Non-native	No	Yes	Open
Morning Glory (white)	*Ipomoea lacunosa*	1	Native	No	No	Open
Grass	*N/A*	1	N/A	No	No	Open
Grass	*N/A*	3	N/A	No	No	Open
Stiff Marsh Bedstraw	*Galium Tinctorium*	1	Native	No	No	Open
Crack Willow	*Salix fragilis*	5	Non-native	Yes	Yes	Open
Sycamore	*Platanus occidentalis*	1	Non-native	No	Yes	Open
Tall Boneset	*Ageratina altissima*	5	Non-native	Yes	No	Open
Vervain	*Verbena hastata*	<1	Native	No	No	Open
Black Alder	*Alnus glutinosa*	5	Non-native	Yes	Yes	Open
St. John's Wort	*Hypericum perforatum*	<1	Non-native	No	Yes	Open
Mallow	*Malva neglecta*	<1	Non-native	No	Yes	Open
Eastern Cottonwood	*Populus deltoides*	10	Native	Yes	No	Open
Pepperweed	*Lepidium virginicum*	<1	Native	No	No	Open
Start time: 7:54 AM, Start GPS: 42.86257453, -78.8384561; End time: 8:32 AM, End GPS: 42.8624778, -78.83814036						

Riverbend I Vegetation Meander - Meadow B						
Common Name	**Species**	**Relative % Coverage**	**NY Status**	**Dominant**	**Invasive**	**Location**
Ninebark	*Physocarpus*	5	Native	Yes	No	Planting zone
Rose	*Rosa spp.*	3	Native	No	No	Planting zone
Mullein	*Verbascum thapsus*	1	Non-native	No	Yes	Planting zone
Canada Goldenrod	*Solidago canadensis*	20	Native	Yes	No	Planting zone
Mugwort	*Artemesia vulgaris*	10	Non-native	Yes	Yes	Planting zone
Oxeye Sunflower	*Heliopsis helianthoides*	3	Native	No	Yes	Planting zone
Burdock	*Arctium*	20	Non-native	Yes	Yes	Planting zone
American Basswood	*Tilia americana*	1	Native	No	No	Planting zone
Knapweed	*Centaurea stoebe*	10	Non-native	Yes	Yes	Planting zone
Vervain	*Verbena hastata*	3	Native	No	No	Planting zone
Bergamot	*Monarda*	10	Native	Yes	No	Planting zone
Canada Thistle	*Cirsium arvense*	5	Non-native	Yes	Yes	Planting zone
Morning Glory (white)	*Ipomoea lacunosa*	<1	Native	No	No	Planting zone
Unidentified	*N/A*	3	N/A	No	No	Planting zone
Virginia wildrye	*Elymus virginicus*	1	Native	No	No	Planting zone
Bull Thistle	*Cirsium vulgare*	3	Non-native	No	Yes	Planting zone
Curly Dock	*Rumex crispus*	1	Non-native	No	Yes	Planting zone
Pepperweed	*Lepidium virginicum*	<1	Native	No	No	Planting zone
St. John's Wort	*Hypericum perforatum*	1	Non-native	No	Yes	Planting zone
Grass-leaved Goldenrod	*Euthamia graminifolia*	3	Native	No	No	Planting zone
Queen Anne's Lace	*Daucus carota*	1	Non-native	No	Yes	Planting zone
Black Eyed Susan	*Rudbeckia hirta*	<1	Non-native	No	No	Planting zone
Hackberry	*Celtis occidentalis*	1	Native	No	No	Planting zone
Hawthorne	*Craetegus spp.*	1	Non-native	No	No	Planting zone
Red Oak	*Quercus rubra*	3	Native	No	No	Planting zone
Pin Oak	*Quercus palustris*	1	Native	No	No	Planting zone
Alleghany Blackberry	*Rubus allegheniensis*	1	Native	No	No	Planting zone
White Pine	*Pinus strobus*	1	Native	No	No	Planting zone
Start time: 1:29 PM, Start GPS: 42.86066262, -78.83405046; End time: 1:49 PM, End GPS: 42.86113285, -78.83515039						
Riverbend I Vegetation Meander - Riparian						
Common Name	**Species**	**Relative % Coverage**	**NY Status**	**Dominant**	**Invasive**	**Location**
Common Boneset	*Eupatorium perfoliatum*	1	Non-native	No	No	Open
Bergamot	*Monarda*	5	Native	Yes	No	Open
Allegheny Blackberry	*Rubus allegheniensis*	1	Native	No	No	Open
Vervain	*Verbena hastata*	1	Native	No	No	Open
Larch	*Larix*	1	N/A	No	No	Open
Canada Goldenrod	*Solidago canadensis*	40	Native	Yes	No	Open
Oxeye Daisy	*Leucanthemum vulgare*	1	Non-native	No	Yes	Open
Black Alder	*Alnus glutinosa*	1	Non-native	No	Yes	Open
Sycamore	*Platanus occidentalis*	5	Native	Yes	No	Open
Creeping Charlie	*Glechoma hederacea*	1	Non-native	No	Yes	Open
Morning Glory (white)	*Ipomoea lacunosa*	1	Native	No	No	Open

Deer tongue grass	*Panicum clandestinum*	1	Native	No	No	Open
Unidentified tree	*N/A*	1	N/A	No	No	Open
Tall Boneset	*Ageratina altissima*	5	Non-native	Yes	Yes	Open
Stiff Marsh Bedstraw	*Galium Tinctorium*	<1	Native	No	No	Open
Knapweed	*Centaurea stoebe*	3	Non-native	No	Yes	Open
Cinquefoil	*Potentilla simplex*	<1	Native	No	No	Open
Curly Dock	*Rumex crispus*	<1	Non-native	No	Yes	Open
Grass-leaved Goldenrod	*Euthamia graminifolia*	5	Native	Yes	No	Open
Joe Pye Weed	*Eutrochium purpureum*	1	Native	No	No	Open
Cow Vetch	*Vicia cracca*	<1	Non-native	No	Yes	Open
Oxeye Sunflower	*Heliopsis helianthoides*	5	Native	Yes	No	Open
Burdock	*Arctium*	10	Non-native	Yes	Yes	Open
Canada Thistle	*Cirsium arvense*	5	Non-native	Yes	Yes	Open
St. John's Wort	*Hypericum perforatum*	1	Non-native	No	Yes	Open
White Oak	*Quercus alba*	1	Native	No	No	Open
Queen Anne's Lace	*Daucus carota*	<1	Non-native	No	Yes	Open
Birdsfoot Trefoil	*Lotus corniculatus*	1	Non-native	No	Yes	Open
Sedge	*Carex spp.*	1	Native	No	No	Open
Virginia wildrye	*Elymus virginicus*	1	Native	No	No	Open
Mugwort	*Artemesia vulgaris*	3	Non-native	No	Yes	Open
Black Mustard	*Brassica nigra*	<1	Non-native	No	Yes	Open
Crown Vetch	*Securigera varia*	<1	Non-native	No	Yes	Open
Daisy Fleabane	*Erigeron annuus*	<1	Native	No	No	Open
Start time: 10:15 AM, Start GPS: 42.86281774, -78.83888285; End time: 11:00 AM, End GPS: 42.86324, -78.84021						
Riverbend I Vegetation Meander - Riparian B						
Common Name	**Species**	**Relative % Coverage**	**NY Status**	**Dominant**	**Invasive**	**Location**
Deer tongue grass	*Panicum clandestinum*	3	Native	No	No	Open
Sedge	*Carex spp*	3	Native	No	No	Open
Canada Goldenrod	*Solidago canadensis*	30	Native	Yes	No	Open
Knapweed	*Centaurea stoebe*	10	Non-native	Yes	Yes	Open
Canada Thistle	*Cirsium arvense*	10	Non-native	Yes	Yes	Open
Burdock	*Arctium*	30	Non-native	Yes	Yes	Open
Crown Vetch	*Securigera varia*	<1	Non-native	No	Yes	Open
Mugwort	*Artemesia vulgaris*	20	Non-native	Yes	Yes	Open
Grass-leaved Goldenrod	*Euthamia graminifolia*	1	Native	No	No	Open
Yarrow	*Achillea millefolium*	1	Native	No	No	Open
Curly Dock	*Rumex crispus*	1	Non-native	No	Yes	Open
Ragweed	*Ambrosia*	<1	N/A	No	No	Open
Tall Boneset	*Ageratina altissima*	1	Non-native	No	Yes	Open
Grape	*Vitis vinifera*	1	Non-native	No	Yes	Open
Stiff Marsh Bedstraw	*Galium Tinctorium*	1	Native	No	No	Open
Oxeye Daisy	*Leucanthemum vulgare*	1	Non-native	No	Yes	Open
Butter and Eggs	*Linaria vulgaris*	1	Non-native	No	Yes	Open

Queen Anne's Lace	*Daucus carota*	<1	Non-native	No	Yes	Open
Daisy Fleabane	*Erigeron annuus*	<1	Native	No	No	Open
Start time: 12:56 PM, Start GPS: 42.86080016, -78.83415683; End time: 1:05 PM, End GPS: 42.86080016, -78.83415683						
Riverbend I Vegetation Meander - Shoreline						
Common Name	**Species**	**Relative % Coverage**	**NY Status**	**Dominant**	**Invasive**	**Location**
Motherwort	*Leonurus cardiaca*	1	Non-native	No	Yes	Open
Bittersweet	*Solanum dulcamara*	1	Non-native	No	Yes	Open
Knapweed	*Centaurea stoebe*	1	Non-native	No	Yes	Open
Black Raspberry	*Rubus occidentalis*	1	Native	No	No	Open
Honeysuckle	*Lonicera*	3	Non-native	No	Yes	Open
Wild Grape	*Vitis vinifera*	3	Non-native	No	Yes	Open
Canada Goldenrod	*Solidago canadensis*	10	Native	Yes	No	Open
Burdock	*Arctium*	5	Non-native	Yes	Yes	Open
Morning Glory (white)	*Ipomoea lacunosa*	1	Native	No	No	Open
Crack Willow	*Salix fragilis*	10	Non-native	Yes	Yes	Open
Oxeye Daisy	*Leucanthemum vulgare*	<1	Non-native	No	Yes	Open
Teasel	*Dipsacus*	<1	Non-native	No	Yes	Open
Pepperweed	*Lepidium virginicum*	<1	Native	No	No	Open
Tall Boneset	*Ageratina altissima*	1	Non-native	No	No	Open
Oxeye Sunflower	*Heliopsis helianthoides*	1	Native	No	No	Open
Bergamot	*Monarda*	1	Native	No	No	Open
Black Alder	*Alnus glutinosa*	3	Non-native	No	Yes	Open
Vervain	*Verbena hastata*	5	Native	Yes	No	Open
Grass-leaved Goldenrod	*Euthamia graminifolia*	1	Native	No	No	Open
Butter and Eggs	*Linaria vulgaris*	3	Non-native	No	Yes	Open
Ground cover, with blue flower	*N/A*	1	N/A	No	No	Open
Mugwort	*Artemesia vulgaris*	1	Non-native	No	Yes	Open
Wood Sorrel	*Oxalis*	1	Native	No	No	Open
Ragweed	*Ambrosia*	1	N/A	No	No	Open
Box Elder	*Acer negundo*	10	Native	Yes	No	Open
Canada Thistle	*Cirsium arvense*	10	Non-native	Yes	Yes	Open
Knotweed	*Fallopia japonica*	10	Non-native	Yes	Yes	Open
Joe Pye Weed	*Eutrochium purpureum*	5	Native	Yes	No	Open
Downy wood mint	*Blephilia celiphia*	5	Native	Yes	No	Open
Bindweed	*Convolvulus*	3	Non-native	No	Yes	Open
Dodder	*Cuscuta*	<1	Non-native	No	Yes	Open
Flag, possibly yellow	*Iris spp.*	3	Non-native	No	No	Open
Purple Loosestrife	*Lythrum salicaria*	<1	Non-native	No	Yes	Open
Jewelweed (orange spotted)	*Impatiens capensis*	<1	Native	No	No	Open
Poison Ivy	*Toxicodendron radicans*	1	Native	No	No	Open
Norway Maple	*Acer platanoides*	<1	Non-native	No	Yes	Open
Start time: 9:25 AM, Start GPS: 42.86322, -78.84007; End time: 9:50 AM, End GPS: 42.86312684, -78.84161465						
Riverbend I Vegetation Meander - Shoreline B						
Common Name	**Species**	**Relative % Coverage**	**NY Status**	**Dominant**	**Invasive**	**Location**
Crack Willow	*Salix fragilis*	10	Non-native	Yes	Yes	Open

Black Alder	*Alnus glutinosa*	30	Non-native	Yes	Yes	Open
Canada Thistle	*Cirsium arvense*	20	Non-native	Yes	Yes	Open
Burdock	*Arctium*	15	Non-native	Yes	Yes	Open
Black Raspberry	*Rubus occidentalis*	<1	Native	No	No	Open
Knapweed	*Centaurea stoebe*	5	Non-native	No	Yes	Open
Canada Goldenrod	*Solidago canadensis*	20	Native	Yes	No	Open
Start time: 12:52 PM, Start GPS: N/A; End time: 12:55 PM, End GPS: N/A (Observed from vantage point, area unsafe)						
Riverbend I Vegetation Meander - Upland						
Common Name	**Species**	**Relative % Coverage**	**NY Status**	**Dominant**	**Invasive**	**Location**
White Oak	*Quercus alba*	3	Native	No	No	Open
Tall fescue	*Festuca arundinacea*	30	Non-native	Yes	No	Open
St. John's Wort	*Hypericum perforatum*	1	Non-native	No	Yes	Open
Birdsfoot Trefoil	*Lotus corniculatus*	3	Non-native	No	Yes	Open
Crown Vetch	*Securigera varia*	1	Non-native	No	Yes	Open
Canada Goldenrod	*Solidago canadensis*	10	Native	Yes	No	Open
Canada Thistle	*Cirsium arvense*	5	Non-native	Yes	Yes	Open
Knapweed	*Centaurea stoebe*	5	Non-native	Yes	Yes	Open
Curly Dock	*Rumex crispus*	1	Non-native	No	Yes	Open
Virginia wildrye	*Elymus virganum*	3	Native	No	Yes	Open
Burdock	*Arctium*	5	Non-native	Yes	Yes	Open
Switchgrass	*Panicum spp.*	1	Native	No	No	Open
Mugwort	*Artemesia vulgaris*	10	Non-native	Yes	Yes	Open
Mullein	*Verbascum thapsus*	1	Non-native	No	Yes	Open
Butter and Eggs	*Linaria vulgaris*	3	Non-native	No	Yes	Open
American Basswood	*Tilia americana*	1	Native	No	No	Open
Red Oak	*Quercus rubra*	3	Native	No	No	Open
Bergamot	*Monarda*	3	Native	No	No	Open
Oxeye Sunflower	*Heliopsis helianthoides*	3	Native	No	No	Open
Grass-leaved Goldenrod	*Euthamia graminifolia*	5	Native	Yes	No	Open
Unidentified	*N/A*	1	N/A	No	No	Open
Pin Oak	*Quercus palustris*	1	Native	No	No	Open
American Basswood	*Celtis occidentalis*	1	Native	No	No	Open
Start time: 11:37 AM, Start GPS: 42.86253992, -78.83861151; End time: 12:33 PM, End GPS: 42.86317976, -78.84010852						
Riverbend I Vegetation Meander - Upland B						
Common Name	**Species**	**Relative % Coverage**	**NY Status**	**Dominant**	**Invasive**	**Location**
Knapweed	*Centaurea stoebe*	5	Non-native	Yes	Yes	Planting zone
St. John's Wort	*Hypericum perforatum*	1	Non-native	No	Yes	Planting zone
Curly Dock	*Rumex crispus*	1	Non-native	No	No	Planting zone
Mugwort	*Artemesia vulgaris*	5	Non-native	Yes	Yes	Planting zone
Canada Goldenrod	*Solidago canadensis*	20	Native	Yes	Yes	Planting zone
Burdock	*Arctium*	20	Non-native	Yes	Yes	Planting zone
Oxeye Daisy	*Leucanthemum vulgare*	1	Non-native	No	Yes	Planting zone
Vervain	*Verbena hastata*	5	Native	Yes	No	Planting zone

Borage	*Borago spp.*	1	Non-native	No	No	Planting zone
Crown Vetch	*Securigera varia*	<1	Non-native	No	Yes	Planting zone
Butter and Eggs	*Linaria vulgaris*	<1	Non-native	No	Yes	Planting zone
Queen Anne's Lace	*Daucus carota*	<1	Non-native	No	Yes	Planting zone
Wood Nettle	*Laportea canadensis*	<1	Native	No	No	Planting zone
White Clover	*Trifolium repens*	1	Non-native	No	Yes	Planting zone
Yarrow	*Achillea millefolium*	1	Native	No	No	Planting zone
Bergamot	*Monarda*	3	Native	No	No	Planting zone
Canada Thistle	*Cirsium arvense*	10	Non-native	Yes	Yes	Planting zone
Smartweed	*Polygonum*	1	Non-native	No	Yes	Planting zone
Birdsfoot Trefoil	*Lotus corniculatus*	1	Non-native	No	Yes	Planting zone
Chamomile	*Matricaria chamomilla*	5	Non-native	Yes	Yes	Planting zone
Morning Glory (white)	*Ipomoea lacunosa*	1	Native	No	No	Planting zone
Grass-leaved Goldenrod	*Euthamia graminifolia*	5	Native	Yes	No	Planting zone
Black Mustard	*Brassica nigra*	1	Non-native	No	Yes	Planting zone
Downy wood mint	*Blephilia ciliate*	<1	Native	No	No	Planting zone
Daisy Fleabane	*Erigeron annuus*	<1	Native	No	No	Planting zone
Tall Boneset	*Ageratina altissima*	5	Non-native	Yes	Yes	Planting zone
Oxeye Sunflower	*Heliopsis helianthoides*	1	Native	No	No	Planting zone
Bull Thistle	*Cirsium vulgare*	5	Non-native	Yes	Yes	Planting zone
Start time: 1:10 PM, Start GPS: 42.86055736, -78.83367425; End time: 1:20 PM, End GPS: 42.86073435, -78.83398455						

Table 3 – 2. Riverbend I Walthrough Inspection Forms, June July & August

Riverbend I – Walkthrough Inspection Forms			
	Jun-18	**Jul-18**	**Aug-18**
Flood Damage	N/A	N/A	N/A
Plant Disease	N/A	None evident	None evident
Plant Pests	Nothing outstanding	Typical, nothing problematic, small bugs + beetles	Small bugs + beetles
Drought	N/A	Dry summer, weeds expanding, dry grass, soil crumbly	N/A - recent bouts of rain
Tree Tubes	Good	Wraps around trees in place, one ready for removal	Most fine, one oak needs tube removed
Choking Weeds	Burdock very present, phragmites dominant	Dense burdock monocultures, black mustard, mugwort	N/A
Invasive Species	Mugwort, burdock, phragmites, knapweed	Mugwort, burdock, black alder, thistle, curly dock, birdsfoot, oxeye daisy, queen anne's	Burdock, mugwort lively
Volunteer Species	N/A	N/A	N/A
Herbivory	Average	Some heavily browsed sapplings, could not identify	Normal, small bugs, some trees heavily browsed by deer
Plant Vigor	High, rapid growth	High/rapid	Goldenrod + mugwort lively, grasses, burdock + mullein dried out
Deer Exclosure	Sturdy	Orange fencing around east berm somewhat down, trees ok	Meadow east fences half down
Amphibian Observations	N/A	N/A	N/A
Reptile Observations	N/A	N/A	N/A
Mammal Observations	Scat, deer and fawn spotted in dense goldenrod patches	Insects: monarchs, white skippers, dragonflies, bees, scat	Deer, scat, deer-flattened portions of meadow east
Avian Observations	Many geese, Audubon on site	Ducks, blue heron, Canada geese	Small birds, ducks
Weather, Time, Surveyors:	Partly cloudy, 70°; 10:30 AM; Amelia Lesniak, Christine Bukowski	Sunny, breezy, 80°; 1:30 PM; Amelia Lesniak	Drizzle, overcast, 70°; 7:15 AM; Amelia Lesniak

Figure 2 – 1. Riverbend I Soil Subsample GPS Locations, July

Figure 2 – 2. Riverbend I Vegetation Meander Surveying GPS Start/End

Figure 2 – 3. Riverbend I Soil Subsample GPS Locations, August

APPENDIX A. ACCESS AGREEMENTS

TEMPORARY ACCESS AGREEMENT
BETWEEN
JOHN W. DANFORTH, Co. and Patrick 223 Inc.
AND
BUFFALO NIAGARA RIVERKEEPER
FOR CONSTRUCTION OBERVATION SERVICES
ON RIVERBEND I HABITAT RESTORATION SITE

This agreement is made as of January 3, 2017 by and between John W. Danforth Co. (hereinafter "Danforth"), Patrick 223, Inc. (Herein after "Patrick") and Buffalo Niagara Riverkeeper (hereinafter "Riverkeeper") and is effective upon signature of all parties.

WHEREAS, Patrick is the owner of real property located at 1176 South Park Ave. Buffalo NY 14220l commonly known as Riverbend I; and

WHEREAS, Danforth and Patrick are presently undergoing development on said parcel commonly known as Riverbend I; and

WHEREAS, Riverkeeper had previously expended United States Environmental Protection Agency ("EPA") monies to undergo a habitat restoration project on the Riverbend I parcel noted above; and

WHEREAS, said development will impact Riverkeeper's restoration project; and

WHEREAS, Danforth has offered to enable the relocation of Riverkeeper's restoration project to another portion of the Riverbend I parcel so as to preserve the newly restored habitat enhancements; and

WHEREAS, A long-term landowner agreement is under development between the parties; and

WHEREAS, Danforth and Patrick have hired Pinto Construction Services Inc. to construct the development project on the site; and

WHEREAS, Riverkeeper intends to contract with Pinto Construction Services Inc. to undertake the relocation of previously installed habitat enhancements,

NOW THEREFORE, in consideration of the above premises Danforth, Patrick and Riverkeeper hereby mutually agree as follows:

1. SCOPE OF SERVICES. Danforth and Patrick agree to grant access to Riverkeeper to provide construction observation services during the implementation of the services outlined in the Scope of Services attached hereto at Appendix A.

2. COST. Riverkeeper services shall be provided at no cost to Patrick, any of its affiliates or JTV Construction.

3. TERM. This agreement shall be effective upon execution by all parties and shall terminate upon successful completion of the tasks outlined in Appendix A as mutually agreed to by all parties.

4. INSURANCE. Prior to commencement of any work and until completion and final acceptance of the work, Riverkeeper shall, maintain, on its own behalf and at its sole expense, the following types and limits of insurance:

   a. Worker's Compensation and Occupational Disease Insurance in accordance with the applicable law or laws; Employer's Liability Insurance.

   b. Commercial General Liability with a combined Bodily Injury and Property Damage limit of ONE million ($1,000,000) dollars per occurrence and TWO million ($2,000,000) dollars in the aggregate.

   c. Commercial Automobile Liability Insurance covering the use of all Owned, Non-Owned, and Hired Vehicles with a combined Bodily Injury and Property Damage Limit of at least ONE million ($1,000,000) dollars.

   d. Commercial Umbrella Liability Insurance at a TWO million ($2,000,000) dollars per occurrence and aggregate limit.

   e. Professional Liability of ONE million ($1,000,000).

   f. With the exception of workers' compensation and professional liability, blanket additional insured endorsements should be included reflecting the inclusion of the interests of Danforth, Patrick 223, Pinto Construction Services Inc. and JT Vaeth Construction, LLC., their officers partners, representatives, agents, employees and affiliated companies as an Additional Insured on a direct, primary & non-contributing basis including Completed Operations.

   g. Riverkeeper shall file certificates of insurance prior to the commencement of work with the above named additional insured parties for approval of adequacy of protection and the satisfactory character of the Insurer.

   h. Any type of insurance or any increase of limits of liability not described above which the Riverkeeper requires for its own protection or on account of statute shall be its own responsibility and at its own expense.

   i. The carrying of the insurance described shall in no way be interpreted as relieving the Riverkeeper of any responsibility of liability under contract.

6. INDEMNIFICATION. Riverkeeper, Danforth, and Patrick agree to mutually indemnify, defend and hold the other harmless against any claim of liability or loss or bodily injury or property damage resulting from or arising out of the acts or omissions of either or their agents, employees, invitees, visitors, or contractors which may arise from operations on the River Bend parcel under this Agreement or arising out of any breach or default in the performance of this Agreement. The indemnifications in this paragraph and in this Agreement shall remain operative and in full force for the duration of the Term of this Agreement

7. BINDING EFFECT. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors or assigns.

8. GOVERNING LAW. Regardless of the place of physical execution or performance this Agreement shall be construed according to the laws of the State of New York and shall be deemed to have been executed in the State of New York.

[SIGNATURE PAGE FOLLOWS]

The parties below have executed or have caused this instrument to be executed by them or by their respective duly authorized representatives, on the day and year set forth opposite their respective signatures.

DANFORTH

By _____
Name: Robert Beck
Title: President
Date: December 27, 2016

PATRICK 223, INC.

By _____
Name: Brian Tubo
Title: CFO
Date: December 28, 2016

RIVERKEEPER

By _____
Name: Jill Jedlicka
Title: Executive Director
Date: January 3, 2017

APPENDIX A
Scope of Services

Riverkeeper shall oversee the implementation of the following tasks to be completed by Pinto Construction Services as per agreement with Pinto:

In accordance with the terms of this contract Agreement, RIVERKEEPER retains the services of Pinto Construction Services, Inc. to provide the following services in support of Buffalo Niagara RIVERKEEPER.

Riverbend Phase I Meadow Relocation

Objectives:
The relocation of established restoration meadow at the Riverbend Phase I site at 1176 South Park Avenue, Buffalo, NY 14220

SCOPE OF WORK:

Task 01 - Transplanting

Woody and herbaceous desired vegetation exists in the restoration area(s) receiving relocated meadow and berm material.

1. Transplanting;
    a. Desired vegetation is to be exhumed from the restoration area(s) to receive relocated meadow and berm material and transplanted into the established restoration meadow and shoreline areas, as determined by Buffalo Niagara Riverkeeper's representative (BNR) and Pinto.

Task 02 – Berm Deconstruction

Four (4) existing vegetated berms (approximately 333 CY of soil) are to be cleared of vegetation and the soil relocated.

1. Clearing;
    a. Limited desired vegetation exists on the berms. Desired vegetation is to be relocated as described in Task 01: Transplanting, and Task 03: Meadow Relocation.
    b. Undesired vegetation may be disregarded during berm deconstruction and does not require special treatment. Undesired vegetation may be cleared at the Pinto's discretion.
2. Deconstruction;
    a. The three (3) easternmost berms may be dozed directly into the restoration areas to receive relocation material. Dozed material is to be spread to be reasonably level.

b. The soil from the westernmost berm is required to be relocated to the restoration area(s) receiving relocation material and spread to be reasonably level.

Task 03 – Meadow Relocation

Approximately 0.5 acres of meadow is to be excavated and relocated.

1. Excavation;
   a. The meadow is to be excavated to preserve as much root and soil mass as is reasonably feasible. The method and equipment used may be determined at the Pinto's discretion.
   b. Following excavation, the excavation area is to receive a cover crop of annual rye at 12.5 lbs/acre and straw mulch.
2. Relocation;
   a. The excavated meadow is to be placed in the restoration area(s) to receive relocation material as to preserve desired vegetation existing therein as determined by BNR and Pinto.
   b. Prior to the end of every work day, relocated meadow is to be tamped or rolled to establish soil to root contact.

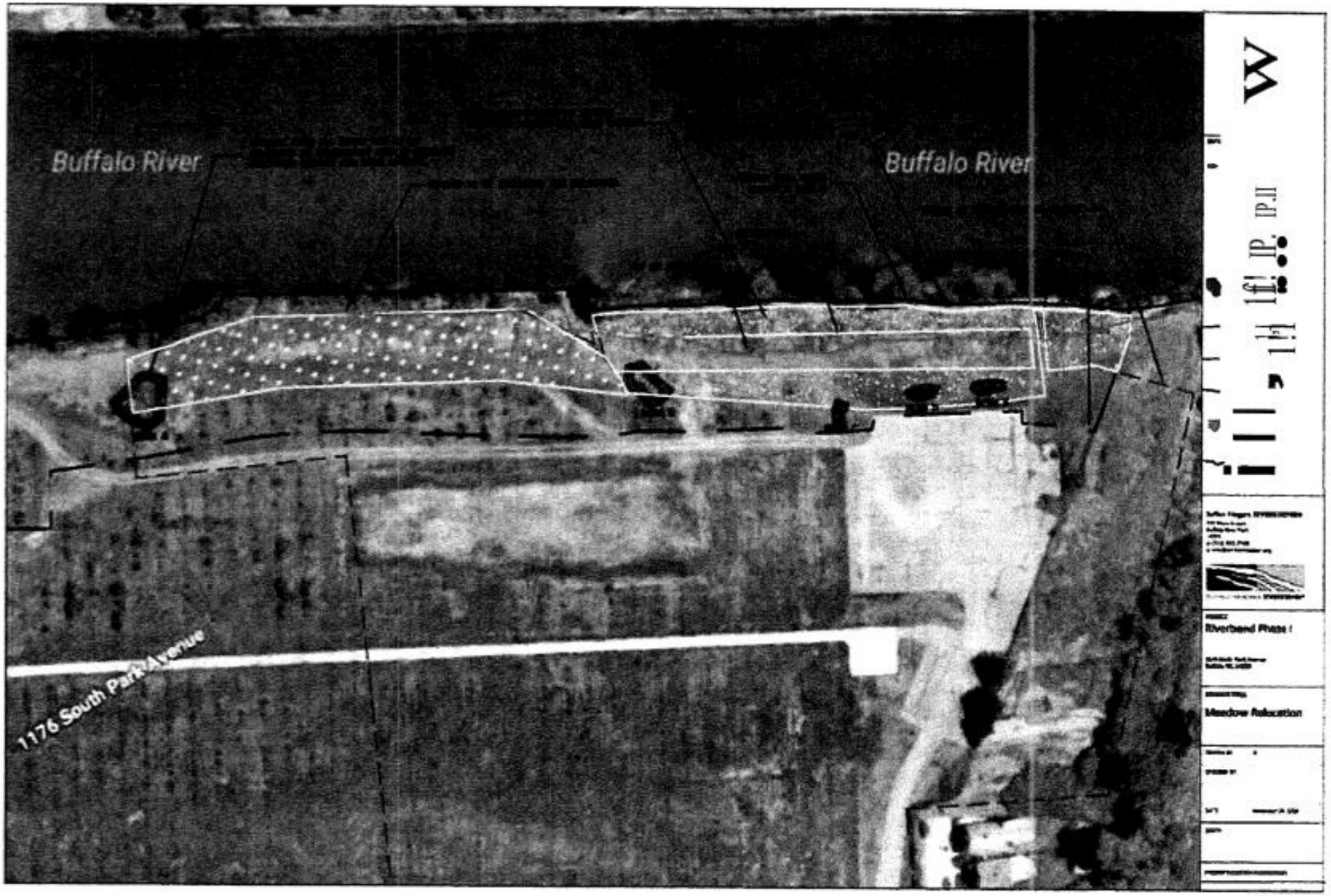
NOTES:

1. BNR will provide the Pinto with its Plans and Technical Specifications which pertain to the habitat restoration, as requested.

2. Pinto will not repair, replace, maintain or guarantee any plantings including trees and/or grass at its own expense. All work performed by Pinto under this contract shall be reimbursed to Pinto.

Please address any questions and comments regarding this Scope of Work to:

Joshua Konovitz
Senior Field Project Coordinator
Buffalo Niagara RIVERKEEPER
721 Main Street
Buffalo, NY 14203
phone: (716) 852-7483 x29
cell: (716) 817-4379
www.bnriverkeeper.org


Buffalo River
Buffalo River
1176 South Park Avenue
Riverbend Phase I
Meadow Relocation

PINTO
CONSTRUCTION SERVICES, INC.

1 BABCOCK STREET • BUFFALO, N.Y. 14210 (716) 825-6666 FAX: (716) 825-6773

December 5, 2016

Buffalo Niagara Riverkeeper
721 Main Street
Buffalo, NY 14203

Attn. Mr. Joshua Konovitz

Ref. Riverbend Phase I Meadow Relocation

Dear Mr. Konovitz:

In response to your pricing request for the above referenced project, we propose to work under the supervision of the Buffalo Niagara Riverkeeper's representative to perform the work on a time and material basis. Listed below are labor and equipment prices to perform the work.

Operating Engineer	$89.36/hr
Laborer	$76.58/hr
Dozer	$80.00/hr
Excavator	$75.00/hr
Skid Steer	$55.00/hr
Roller	$65.00/hr

Clarifications:
No Landscape Maintenance
No Planting Guarantees
All material purchased shall be reimbursed to Pinto by the owner with a 15% markup.
T&M Tickets shall be agreed upon and signed daily.

Thank you in advance for your consideration

Sincerely;

Greg Maziarz, Survey Manager/Project Engineer

APPENDIX B. QAPP

RiverBend Shoreline Restoration Design Buffalo, NY Quality Assurance Project Plan, 2012

-Attached as a separate document-

RiverBend Shoreline Restoration Design Buffalo, NY Quality Assurance Project Plan, 2012

-Attached as a separate document-

APPENDIX C. AVIAN MONITORING REPORT

Riverbend Avian Monitoring Summary

Monthly Bird Surveys were conducted from May 2017 to August 2018. During those surveys, 64 species were observed, with 26 of those species confirmed to be nesting in the site.

Species	Frequency	Site Use	Breeding Status
Canada Goose	C	Year-round	Confirmed
Wood Duck	R	Migratory	
Gadwall	R	Migratory	
Mallard	C	Year-round	Confirmed
Redhead	R	Migratory	
Bufflehead	R	Migratory	
Common Merganser	U	Year-round	
Red-breasted Merganser	R	Migratory	
Rock Pigeon	U	Year-round	
Mourning Dove	U	Year-round	
Chimney Swift	R	Summer	
Killdeer	U	Summer	Suspected
Spotted Sandpiper	U	Summer	Confirmed
Greater Yellowlegs	R	Migratory	
Ring-billed Gull	C	Year-round	
Herring Gull	C	Winter	
Caspian Tern	U	Summer	
Double-crested Cormorant	U	Summer	
Great Blue Heron	U	Year-round	
Green Heron	R	Summer	
Osprey	R	Summer	
Bald Eagle	U	Winter	
Red-tailed Hawk	R	Winter	
Belted Kingfisher	R	Summer	
Downy Woodpecker	U	Summer	Suspected
Northern Flicker	R	Summer	
American Kestrel	R	Summer	
Peregrine Falcon	U	Year-round	
Willow Flycatcher	U	Summer	Confirmed
Eastern Kingbird	C	Summer	Confirmed
Warbling Vireo	U	Summer	Suspected
American Crow	C	Year-round	Confirmed
Northern Rough-winged Swallow	U	Summer	Suspected
Tree Swallow	C	Summer	Confirmed

Bank Swallow	C	Summer	Confirmed
Barn Swallow	C	Summer	
Species	Frequency	Site Use	Breeding Status
Tufted Titmouse	R	Summer	
House Wren	R	Summer	
Carolina Wren	R	Summer	
American Robin	C	Summer	Confirmed
Gray Catbird	U	Summer	Confirmed
Northern Mockingbird	U	Summer	Suspected
European Starling	C	Year-round	Confirmed
House Finch	R	Summer	
American Goldfinch	C	Year-round	Confirmed
Snow Bunting	R	Winter	
Field Sparrow	U	Summer	Suspected
American Tree Sparrow	R	Migratory	
Dark-eyed Junco	U	Winter	
White-Crowned Sparrow	R	Migratory	
White-throated Sparrow	U	Migratory	
Savannah Sparrow	C	Summer	Confirmed
Song Sparrow	C	Year-round	Confirmed
Bobolink	R	Migratory	
Baltimore Oriole	U	Summer	Confirmed
Red-winged Blackbird	C	Summer	Confirmed
Brown-headed Cowbird	R	Summer	Confirmed
Common Grackle	C	Summer	Confirmed
Nashville Warbler	R	Migratory	
Yellow Warbler	C	Summer	Confirmed
Palm Warbler	R	Migratory	
Yellow-rumped Warbler	R	Migratory	
Northern Cardinal	U	Summer	
Indigo Bunting	R	Summer	Suspected

Frequency:

Common – Seen on most visits during species period of expected site use

Uncommon – Seen between one and half of visits during species period of expected site use

Rare – Seen only during one site visit

Site Use:

Summer – Seen during nesting season (May to July)

Migratory – Seen using site as migratory stop-over habitat

Winter – Seen using site for winter habitat

Breeding Status:

Confirmed – Nesting activity, fledglings, and territorial activity observed

Suspected – Territorial activity observed without nesting activity observed

Noteworthy Observations:

Waterfowl and Gulls – While Canada Geese and Mallards were observed nesting in or along the shore of the site, most waterfowl were only seen on the river itself. Gulls were mostly observed flying over the site.

Tree Swallows – The 14 nest boxes along the Buffalo River in the site were surveyed during the June 7th 2018 site visit. Each box was occupied by Tree Swallows with either eggs or chicks. Tree Swallows rely on natural or man-made cavities in open habitat near water. Their diet consists of flying insects caught on the wing. Other swallow species were regularly seen foraging for insects over the site.

Bank Swallows – A Bank Swallow nesting colony was observed in the Spring of 2017 and 2018. The Bank Swallows burrowed into the sand piles left behind by the construction company. The site manager agreed to leave the piles untouched while they were nesting during the construction.

American Goldfinches – Several pairs of Goldfinches were observed in the site during late Summer when many of the wildflowers had gone to seed.

Peregrine Falcons – An unbanded Peregrine Falcon was observed on several occasions near the lift bridge on South Park Avenue. It is suspected that there is a nest in the area, and during two site visits the falcon was seen actively hunting in the site.

Recommendations:

Recording Data – Future Avian Monitoring projects done by Buffalo-Niagara Waterkeeper should use the eBird (either the website or the mobile app) instead of physical data sheets. eBird Checklists can be made in the field and are easily shared by email or by eBird itself.

Monitoring Period – The site visits in the winter months produced very little data. If future avian monitoring is done at the Riverbend Site, Buffalo-Niagara Waterkeeper could consider extra monitoring sessions during the summer in place of sessions from December to March.

Monitoring Procedure – Adding a "mobbing recording playback" element to each survey could yield more data on birds that would respond to mobbing calls, such as Chickadees and Warblers.

APPENDIX D. RIVERBEND I NATIVE COMMUNITIES


RBI Monitoring Outline
Riparian Plot 1
Riparian Plot 2
Upland Plot 1
Upland Plot 2
Upland Plot 3
Meadow Transect Middle
Unmodified Plot
Upland Plot 4
Shoreline Transect East
Upland Plot 5
Riparian Plot 3
Meadow Transect East
Legend
Habitat_Zones
Habitat
Danforth Construction Extent
Meadow
Riparian
Shoreline
Unmodified
Unmodified Shoreline
Upland

APPENDIX E. SOIL SAMPLING TEST RESULTS & FIELD NOTES

Agro-One Soil Analysis

with Cornell Nutrient Guidelines

Also sent to:

Agro-One
730 Warren Road
Ithaca, NY 14850
Phone: (800) 344-2697
Fax: (607) 257-1350
www.dairyone.com

Cornell University
College of Agriculture
and Life Sciences

Agro-One
Agronomy Services

Lab Sample ID:	**72940150**
Field/Location:	RBI SHORE & RIP TOP #1
Date Sampled:	07/27/2018
Date Tested:	08/06/2018
Statement ID:	BUFFALO NIAGRA WATERKEEPER
Description:	
County:	Erie

H

BUFFALO NIAGRA WATERKEEPER
721 MAIN STREET
BUFFALO, NY 14203

Emails/Phones: BUFFALO NIAGRA WATERKEEPER:
cbukowski@bnwaterkeeper.org

Element	lbs/acre*	Very Low	Below Optimum	Optimum	Above Optimum	High
Phosphorus (P)	56					
Potassium (K)	595					
Calcium (Ca)	14,206					
Magnesium (Mg)	1,096					

Element	Value	Element	Value	Element	Value
Soil pH	6.6	Manganese (Mn), lbs/acre	47	Soluble Salts, mmhos/cm	0.2
Buffer pH	6.3	Zinc (Zn), lbs/acre	15	% OM	11.3
Iron (Fe), lbs/acre	12	Aluminum (Al), lbs/acre	35		

Sample Information Summary

Crop Code: SAG
Type: Pre-Plant
Soil Texture: Loamy
Soil Drainage: Good

Soil Fertilizer Recommendations (1=current yr, 2=next yr, etc.)

Year	Crop	lbs / 100 sqft Lime	lbs / 100 sqft N Range	lbs / 100 sqft P2O5 Range	lbs / 100 sqft K2O
1	Woody Plants (pH 6.0 to 7.5)	0.0	0.1 - 0.1	0.0	0.0

Comments - Improve yield and plant quality as well as protect the environment with proper fertilization.

* Modified Morgan analysis results reported in pounds per acre.

Nutrient recommendations provided by Cornell University.

- If an analysis result is not referred to specifically in the recommendations or comments then levels are considered normal.
- Sidedress nutrients over estimated root zone during the first or second growing season, broadcast thereafter.
- The N recommendations above should be increased by 15 lbs/acre (1/3 lbs/1000 sq ft) for vigorous deciduous shade trees.
- Can use a complete fertilizer having a ratio of 2:1:1 or 3:1:1.
- Apply nitrogen after seedlings are established but before July 1.
- Warning - soil test K levels are very high and may induce imbalaces or deficiencies of other nutrients.

Visit www.gardening.cornell.edu for more information. Go to www.dairyone.com/AgroOne to order more sample kits.

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Agro-One Soil Analysis

with Cornell Nutrient Guidelines

Also sent to:

Agro-One
730 Warren Road
Ithaca, NY 14850
Phone: (800) 344-2697
Fax: (607) 257-1350
www.dairyone.com

Cornell University College of Agriculture and Life Sciences

Agro-One Agronomy Services

Lab Sample ID:	**72940160**
Field/Location:	RBI SHORE & RIP SUB #2
Date Sampled:	07/27/2018
Date Tested:	08/06/2018
Statement ID:	BUFFALO NIAGRA WATERKEEPER
Description:	
County:	Erie

H

BUFFALO NIAGRA WATERKEEPER
721 MAIN STREET
BUFFALO, NY 14203

Emails/Phones: BUFFALO NIAGRA WATERKEEPER:
cbukowski@bnwaterkeeper.org

Element	lbs/acre*	Very Low	Below Optimum	Optimum	Above Optimum	High
Phosphorus (P)	7					
Potassium (K)	290					
Calcium (Ca)	11,300					
Magnesium (Mg)	664					

Element	Value	Element	Value	Element	Value
Soil pH	6.7	Manganese (Mn), lbs/acre	45	Soluble Salts, mmhos/cm	0.2
Buffer pH	6.4	Zinc (Zn), lbs/acre	9	% OM	6.3
Iron (Fe), lbs/acre	28	Aluminum (Al), lbs/acre	73		

Sample Information Summary

Crop Code: SAG
Type: Pre-Plant
Soil Texture: Loamy
Soil Drainage: Good

Soil Fertilizer Recommendations (1=current yr, 2=next yr, etc.)

Year	Crop	lbs / 100 sqft Lime	lbs / 100 sqft N Range	lbs / 100 sqft P2O5 Range	lbs / 100 sqft K2O
1	Woody Plants (pH 6.0 to 7.5)	0.0	0.1 - 0.1	0.2	0.0

Comments - Improve yield and plant quality as well as protect the environment with proper fertilization.

* Modified Morgan analysis results reported in pounds per acre.

Nutrient recommendations provided by Cornell University.

- If an analysis result is not referred to specifically in the recommendations or comments then levels are considered normal.
- Sidedress nutrients over estimated root zone during the first or second growing season, broadcast thereafter.
- The N recommendations above should be increased by 15 lbs/acre (1/3 lbs/1000 sq ft) for vigorous deciduous shade trees.
- Apply nitrogen after seedlings are established but before July 1.
- Apply required P2O5 as 0-20-0 ro 0-46-0 prior to planting with lime (if recommended), incorporate both.

Page 1 of 1 Visit www.gardening.cornell.edu for more information. Go to www.dairyone.com/AgroOne to order more sample kits. 4M

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Also sent to:

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730 Warren Road
Ithaca, NY 14850
Phone: (800) 344-2697
Fax: (607) 257-1350
www.dairyone.com

Cornell University
College of Agriculture and Life Sciences

Agro-One
Agronomy Services

Lab Sample ID:	**72940170**
Field/Location:	RBI UPLAND #3
Date Sampled:	07/27/2018
Date Tested:	08/06/2018
Statement ID:	BUFFALO NIAGRA WATERKEEPER
Description:	
County:	Erie

H

BUFFALO NIAGRA WATERKEEPER
721 MAIN STREET
BUFFALO, NY 14203

Emails/Phones: BUFFALO NIAGRA WATERKEEPER:
cbukowski@bnwaterkeeper.org

Element	lbs/acre*	Very Low	Below Optimum	Optimum	Above Optimum	High
Phosphorus (P)	150					
Potassium (K)	928					
Calcium (Ca)	10,043					
Magnesium (Mg)	1,402					

Element	Value	Element	Value	Element	Value
Soil pH	6.5	Manganese (Mn), lbs/acre	35	Soluble Salts, mmhos/cm	0.3
Buffer pH	6.2	Zinc (Zn), lbs/acre	16	% OM	16.1
Iron (Fe), lbs/acre	6	Aluminum (Al), lbs/acre	18		

Sample Information Summary

Crop Code: SAG
Type: Pre-Plant
Soil Texture: Loamy
Soil Drainage: Good

Soil Fertilizer Recommendations (1=current yr, 2=next yr, etc.)

Year	Crop	lbs / 100 sqft Lime	lbs / 100 sqft N Range	P2O5 Range	K2O
1	Woody Plants (pH 6.0 to 7.5)	0.0	0.1 - 0.1	0.0	0.0

Comments - Improve yield and plant quality as well as protect the environment with proper fertilization.

* Modified Morgan analysis results reported in pounds per acre.

Nutrient recommendations provided by Cornell University.

- If an analysis result is not referred to specifically in the recommendations or comments then levels are considered normal.
- Sidedress nutrients over estimated root zone during the first or second growing season, broadcast thereafter.
- The N recommendations above should be increased by 15 lbs/acre (1/3 lbs/1000 sq ft) for vigorous deciduous shade trees.
- Can use a complete fertilizer having a ratio of 2:1:1 or 3:1:1.
- Apply nitrogen after seedlings are established but before July 1.
- Caution - soil test P levels are high and may induce imbalaces or deficiencies of other nutrients.
- Warning - soil test K levels are very high and may induce imbalaces or deficiencies of other nutrients.

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Ithaca, NY 14850
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Fax: (607) 257-1350
www.dairyone.com

Cornell University College of Agriculture and Life Sciences

Agro-One Agronomy Services

Lab Sample ID:	**72940180**
Field/Location:	RBI UPLAND MEADOW #4
Date Sampled:	07/27/2018
Date Tested:	08/06/2018
Statement ID:	BUFFALO NIAGRA WATERKEEPER
Description:	
County:	Erie

H

BUFFALO NIAGRA WATERKEEPER
721 MAIN STREET
BUFFALO, NY 14203

Emails/Phones: BUFFALO NIAGRA WATERKEEPER:
cbukowski@bnwaterkeeper.org

Element	lbs/acre*	Very Low	Below Optimum	Optimum	Above Optimum	High
Phosphorus (P)	150					
Potassium (K)	847					
Calcium (Ca)	14,560					
Magnesium (Mg)	1,270					

Element	Value	Element	Value	Element	Value
Soil pH	6.8	Manganese (Mn), lbs/acre	50	Soluble Salts, mmhos/cm	0.2
Buffer pH	6.3	Zinc (Zn), lbs/acre	17	% OM	18.5
Iron (Fe), lbs/acre	7	Aluminum (Al), lbs/acre	20		

Sample Information Summary

Crop Code: SAG
Type: Pre-Plant
Soil Texture: Loamy
Soil Drainage: Good

Soil Fertilizer Recommendations (1=current yr, 2=next yr, etc.)

Year	Crop	lbs / 100 sqft Lime	lbs / 100 sqft N Range	lbs / 100 sqft P2O5 Range	lbs / 100 sqft K2O
1	Woody Plants (pH 6.0 to 7.5)	0.0	0.1 - 0.1	0.0	0.0

Comments - Improve yield and plant quality as well as protect the environment with proper fertilization.

* Modified Morgan analysis results reported in pounds per acre.

Nutrient recommendations provided by Cornell University.

- If an analysis result is not referred to specifically in the recommendations or comments then levels are considered normal.
- Sidedress nutrients over estimated root zone during the first or second growing season, broadcast thereafter.
- The N recommendations above should be increased by 15 lbs/acre (1/3 lbs/1000 sq ft) for vigorous deciduous shade trees.
- Can use a complete fertilizer having a ratio of 2:1:1 or 3:1:1.
- Apply nitrogen after seedlings are established but before July 1.
- Caution - soil test P levels are high and may induce imbalaces or deficiencies of other nutrients.
- Warning - soil test K levels are very high and may induce imbalaces or deficiencies of other nutrients.

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Phone: (800) 344-2697
Fax: (607) 257-1350
www.dairyone.com

Cornell University
College of Agriculture and Life Sciences

Agro-One
Agronomy Services

Lab Sample ID:	**72940190**
Field/Location:	RBI PI DEP #5
Date Sampled:	07/27/2018
Date Tested:	08/06/2018
Statement ID:	BUFFALO NIAGRA WATERKEEPER
Description:	
County:	Erie

H

BUFFALO NIAGRA WATERKEEPER
721 MAIN STREET
BUFFALO, NY 14203

Emails/Phones: BUFFALO NIAGRA WATERKEEPER:
cbukowski@bnwaterkeeper.org

Element	lbs/acre*	Very Low	Below Optimum	Optimum	Above Optimum	High
Phosphorus (P)	106					
Potassium (K)	521					
Calcium (Ca)	19,531					
Magnesium (Mg)	996					

Element	Value	Element	Value	Element	Value
Soil pH	7.2	Zinc (Zn), lbs/acre	11	% OM	10.5
Iron (Fe), lbs/acre	8	Aluminum (Al), lbs/acre	17		
Manganese (Mn), lbs/acre	71	Soluble Salts, mmhos/cm	0.3		

Sample Information Summary

Crop Code: SAG
Type: Pre-Plant
Soil Texture: Loamy
Soil Drainage: Good

Soil Fertilizer Recommendations (1=current yr, 2=next yr, etc.)

Year	Crop	lbs / 100 sqft Lime	lbs / 100 sqft N Range	lbs / 100 sqft P2O5 Range	lbs / 100 sqft K2O
1	Woody Plants (pH 6.0 to 7.5)	0.0	0.1 - 0.1	0.0	0.0

Comments - Improve yield and plant quality as well as protect the environment with proper fertilization.

* Modified Morgan analysis results reported in pounds per acre.

Nutrient recommendations provided by Cornell University.

- If an analysis result is not referred to specifically in the recommendations or comments then levels are considered normal.
- Sidedress nutrients over estimated root zone during the first or second growing season, broadcast thereafter.
- The N recommendations above should be increased by 15 lbs/acre (1/3 lbs/1000 sq ft) for vigorous deciduous shade trees.
- Can use a complete fertilizer having a ratio of 2:1:1 or 3:1:1.
- Apply nitrogen after seedlings are established but before July 1.
- Caution - soil test P levels are high and may induce imbalaces or deficiencies of other nutrients.
- Warning - soil test K levels are very high and may induce imbalaces or deficiencies of other nutrients.

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730 Warren Road
Ithaca, NY 14850
Phone: (800) 344-2697
Fax: (607) 257-1350
www.dairyone.com

Cornell University College of Agriculture and Life Sciences

Agro-One Agronomy Services

Lab Sample ID:	**72940200**
Field/Location:	RBI PI BERM #6
Date Sampled:	07/27/2018
Date Tested:	08/06/2018
Statement ID:	BUFFALO NIAGRA WATERKEEPER
Description:	
County:	Erie

H

BUFFALO NIAGRA WATERKEEPER
721 MAIN STREET
BUFFALO, NY 14203

Emails/Phones: BUFFALO NIAGRA WATERKEEPER:
cbukowski@bnwaterkeeper.org

Element	lbs/acre*	Very Low	Below Optimum	Optimum	Above Optimum	High
Phosphorus (P)	20					
Potassium (K)	551					
Calcium (Ca)	8,994					
Magnesium (Mg)	511					

Element	Value	Element	Value	Element	Value
Soil pH	7.2	Zinc (Zn), lbs/acre	3	% OM	5.9
Iron (Fe), lbs/acre	5	Aluminum (Al), lbs/acre	39		
Manganese (Mn), lbs/acre	42	Soluble Salts, mmhos/cm	0.1		

Sample Information Summary

Crop Code: SAG
Type: Pre-Plant
Soil Texture: Loamy
Soil Drainage: Good

Soil Fertilizer Recommendations (1=current yr, 2=next yr, etc.)

Year	Crop	lbs / 100 sqft Lime	lbs / 100 sqft N Range	lbs / 100 sqft P2O5 Range	lbs / 100 sqft K2O
1	Woody Plants (pH 6.0 to 7.5)	0.0	0.1 - 0.1	0.0	0.0

Comments - Improve yield and plant quality as well as protect the environment with proper fertilization.

* Modified Morgan analysis results reported in pounds per acre.

Nutrient recommendations provided by Cornell University.

- If an analysis result is not referred to specifically in the recommendations or comments then levels are considered normal.
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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-140228-1
Client Project/Site: Riverbend Phase I

For:
Buffalo Niagara Waterkeepers
721 Main Street
Buffalo, New York 14203

Attn: Christine Bukowski

Joseph V. Giacomazza

Authorized for release by:
9/6/2018 2:24:08 PM
Joe Giacomazza, Project Management Assistant II
joe.giacomazza@testamericainc.com

Designee for

Brian Fischer, Manager of Project Management
(716)504-9835
brian.fischer@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Detection Summary

Client: Buffalo Niagara Waterkeepers
Project/Site: Riverbend Phase I

TestAmerica Job ID: 480-140228-1

Client Sample ID: Shoreline/Riparian - RBI — Lab Sample ID: 480-140228-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	15000	F2	12.4	5.5	mg/Kg	1	☼	6010C	Total/NA
Antimony	1.4	J F1	18.6	0.50	mg/Kg	1	☼	6010C	Total/NA
Arsenic	9.4		2.5	0.50	mg/Kg	1	☼	6010C	Total/NA
Barium	81.0	F1	0.62	0.14	mg/Kg	1	☼	6010C	Total/NA
Beryllium	0.72		0.25	0.035	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.63		0.25	0.037	mg/Kg	1	☼	6010C	Total/NA
Calcium	2780	B	62.0	4.1	mg/Kg	1	☼	6010C	Total/NA
Chromium	19.6		0.62	0.25	mg/Kg	1	☼	6010C	Total/NA
Cobalt	9.9		0.62	0.062	mg/Kg	1	☼	6010C	Total/NA
Copper	28.1		1.2	0.26	mg/Kg	1	☼	6010C	Total/NA
Iron	23300		12.4	4.3	mg/Kg	1	☼	6010C	Total/NA
Lead	24.9		1.2	0.30	mg/Kg	1	☼	6010C	Total/NA
Magnesium	2820	F1	24.8	1.1	mg/Kg	1	☼	6010C	Total/NA
Manganese	490	B	0.25	0.040	mg/Kg	1	☼	6010C	Total/NA
Nickel	30.9		6.2	0.29	mg/Kg	1	☼	6010C	Total/NA
Potassium	2230	F1 F2	37.2	24.8	mg/Kg	1	☼	6010C	Total/NA
Selenium	1.1	J	5.0	0.50	mg/Kg	1	☼	6010C	Total/NA
Sodium	69.3	J	174	16.1	mg/Kg	1	☼	6010C	Total/NA
Thallium	0.94	J	7.4	0.37	mg/Kg	1	☼	6010C	Total/NA
Vanadium	52.8	F1 F2	0.62	0.14	mg/Kg	1	☼	6010C	Total/NA
Zinc	120	^ F1	2.5	0.79	mg/Kg	1	☼	6010C	Total/NA
Mercury	0.066		0.026	0.010	mg/Kg	1	☼	7471B	Total/NA
Total Organic Carbon	54200		1000	380	mg/Kg	1		Lloyd Kahn	Total/NA
Phosphorus	586	B ^	20.0	8.0	mg/Kg	50	☼	SM 4500 P E	Total/NA
Nitrate Nitrite as N	19.0		0.62	0.25	mg/Kg	1	☼	353.2	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.4	HF	0.1	0.1	SU	1		9045D	Total/NA
Temperature	21.7	HF	0.001	0.001	Degrees C	1		9045D	Total/NA

Client Sample ID: Meadow - RBI — Lab Sample ID: 480-140228-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	13600		12.0	5.3	mg/Kg	1	☼	6010C	Total/NA
Antimony	0.75	J	18.0	0.48	mg/Kg	1	☼	6010C	Total/NA
Arsenic	7.3		2.4	0.48	mg/Kg	1	☼	6010C	Total/NA
Barium	80.3		0.60	0.13	mg/Kg	1	☼	6010C	Total/NA
Beryllium	0.60		0.24	0.034	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.63		0.24	0.036	mg/Kg	1	☼	6010C	Total/NA
Calcium	6540	B	60.1	4.0	mg/Kg	1	☼	6010C	Total/NA
Chromium	18.1		0.60	0.24	mg/Kg	1	☼	6010C	Total/NA
Cobalt	8.5		0.60	0.060	mg/Kg	1	☼	6010C	Total/NA
Copper	24.2		1.2	0.25	mg/Kg	1	☼	6010C	Total/NA
Iron	18700		12.0	4.2	mg/Kg	1	☼	6010C	Total/NA
Lead	22.5		1.2	0.29	mg/Kg	1	☼	6010C	Total/NA
Magnesium	3200		24.0	1.1	mg/Kg	1	☼	6010C	Total/NA
Manganese	560	B	0.24	0.038	mg/Kg	1	☼	6010C	Total/NA
Nickel	25.0		6.0	0.28	mg/Kg	1	☼	6010C	Total/NA
Potassium	2070		36.0	24.0	mg/Kg	1	☼	6010C	Total/NA
Selenium	0.83	J	4.8	0.48	mg/Kg	1	☼	6010C	Total/NA
Sodium	58.7	J	168	15.6	mg/Kg	1	☼	6010C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Buffalo

Detection Summary

Client: Buffalo Niagara Waterkeepers
Project/Site: Riverbend Phase I

TestAmerica Job ID: 480-140228-1

Client Sample ID: Meadow - RBI (Continued)

Lab Sample ID: 480-140228-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Thallium	0.71	J	7.2	0.36	mg/Kg	1	☼	6010C	Total/NA
Vanadium	42.8		0.60	0.13	mg/Kg	1	☼	6010C	Total/NA
Zinc	128		2.4	0.77	mg/Kg	1	☼	6010C	Total/NA
Mercury	0.057		0.024	0.0096	mg/Kg	1	☼	7471B	Total/NA
Total Organic Carbon	67800		1000	380	mg/Kg	1		Lloyd Kahn	Total/NA
Phosphorus	732	B ^	21.1	8.4	mg/Kg	50	☼	SM 4500 P E	Total/NA
Nitrate Nitrite as N	21.5		0.56	0.23	mg/Kg	1	☼	353.2	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	6.9	HF	0.1	0.1	SU	1		9045D	Total/NA
Temperature	21.3	HF	0.001	0.001	Degrees C	1		9045D	Total/NA

Client Sample ID: Upland - RBI

Lab Sample ID: 480-140228-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	13000		12.6	5.6	mg/Kg	1	☼	6010C	Total/NA
Antimony	0.85	J	18.9	0.51	mg/Kg	1	☼	6010C	Total/NA
Arsenic	7.4		2.5	0.51	mg/Kg	1	☼	6010C	Total/NA
Barium	78.1		0.63	0.14	mg/Kg	1	☼	6010C	Total/NA
Beryllium	0.62		0.25	0.035	mg/Kg	1	☼	6010C	Total/NA
Cadmium	3.8		0.25	0.038	mg/Kg	1	☼	6010C	Total/NA
Calcium	6090	B	63.1	4.2	mg/Kg	1	☼	6010C	Total/NA
Chromium	18.4		0.63	0.25	mg/Kg	1	☼	6010C	Total/NA
Cobalt	8.5		0.63	0.063	mg/Kg	1	☼	6010C	Total/NA
Copper	28.0		1.3	0.27	mg/Kg	1	☼	6010C	Total/NA
Iron	18300		12.6	4.4	mg/Kg	1	☼	6010C	Total/NA
Lead	25.6		1.3	0.30	mg/Kg	1	☼	6010C	Total/NA
Magnesium	2850		25.3	1.2	mg/Kg	1	☼	6010C	Total/NA
Manganese	623	B	0.25	0.040	mg/Kg	1	☼	6010C	Total/NA
Nickel	24.2		6.3	0.29	mg/Kg	1	☼	6010C	Total/NA
Potassium	2080		37.9	25.3	mg/Kg	1	☼	6010C	Total/NA
Selenium	0.64	J	5.1	0.51	mg/Kg	1	☼	6010C	Total/NA
Sodium	57.7	J	177	16.4	mg/Kg	1	☼	6010C	Total/NA
Thallium	0.65	J	7.6	0.38	mg/Kg	1	☼	6010C	Total/NA
Vanadium	40.7		0.63	0.14	mg/Kg	1	☼	6010C	Total/NA
Zinc	218		2.5	0.81	mg/Kg	1	☼	6010C	Total/NA
Mercury	0.069		0.026	0.010	mg/Kg	1	☼	7471B	Total/NA
Total Organic Carbon	71500		1000	380	mg/Kg	1		Lloyd Kahn	Total/NA
Phosphorus	784	B ^	22.2	8.9	mg/Kg	50	☼	SM 4500 P E	Total/NA
Nitrate Nitrite as N	35.1		0.62	0.25	mg/Kg	1	☼	353.2	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.2	HF	0.1	0.1	SU	1		9045D	Total/NA
Temperature	21.2	HF	0.001	0.001	Degrees C	1		9045D	Total/NA

Client Sample ID: Berms - RBI

Lab Sample ID: 480-140228-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	13600		13.3	5.8	mg/Kg	1	☼	6010C	Total/NA
Antimony	0.85	J	19.9	0.53	mg/Kg	1	☼	6010C	Total/NA
Arsenic	8.3		2.7	0.53	mg/Kg	1	☼	6010C	Total/NA
Barium	76.1		0.66	0.15	mg/Kg	1	☼	6010C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Buffalo

Detection Summary

Client: Buffalo Niagara Waterkeepers
Project/Site: Riverbend Phase I

TestAmerica Job ID: 480-140228-1

Client Sample ID: Berms - RBI (Continued)

Lab Sample ID: 480-140228-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Beryllium	0.69		0.27	0.037	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.66		0.27	0.040	mg/Kg	1	☼	6010C	Total/NA
Calcium	9010	B	66.4	4.4	mg/Kg	1	☼	6010C	Total/NA
Chromium	20.3		0.66	0.27	mg/Kg	1	☼	6010C	Total/NA
Cobalt	9.2		0.66	0.066	mg/Kg	1	☼	6010C	Total/NA
Copper	28.5		1.3	0.28	mg/Kg	1	☼	6010C	Total/NA
Iron	20500		13.3	4.6	mg/Kg	1	☼	6010C	Total/NA
Lead	26.9		1.3	0.32	mg/Kg	1	☼	6010C	Total/NA
Magnesium	3640		26.5	1.2	mg/Kg	1	☼	6010C	Total/NA
Manganese	542	B	0.27	0.042	mg/Kg	1	☼	6010C	Total/NA
Nickel	26.6		6.6	0.31	mg/Kg	1	☼	6010C	Total/NA
Potassium	2160		39.8	26.5	mg/Kg	1	☼	6010C	Total/NA
Selenium	0.86	J	5.3	0.53	mg/Kg	1	☼	6010C	Total/NA
Sodium	79.2	J	186	17.3	mg/Kg	1	☼	6010C	Total/NA
Thallium	0.57	J	8.0	0.40	mg/Kg	1	☼	6010C	Total/NA
Vanadium	44.4		0.66	0.15	mg/Kg	1	☼	6010C	Total/NA
Zinc	124		2.7	0.85	mg/Kg	1	☼	6010C	Total/NA
Mercury	0.071		0.027	0.011	mg/Kg	1	☼	7471B	Total/NA
Total Organic Carbon	46600		1000	380	mg/Kg	1		Lloyd Kahn	Total/NA
Phosphorus	551	B ^	23.3	9.3	mg/Kg	50	☼	SM 4500 P E	Total/NA
Nitrate Nitrite as N	38.9		0.66	0.27	mg/Kg	1	☼	353.2	Soluble

Analyte	Result	Qualifier	RL	RL	Unit	Dil Fac	D	Method	Prep Type
pH	7.2	HF	0.1	0.1	SU	1		9045D	Total/NA
Temperature	20.6	HF	0.001	0.001	Degrees C	1		9045D	Total/NA

Client Sample ID: Depression - RBI

Lab Sample ID: 480-140228-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	11900		12.9	5.7	mg/Kg	1	☼	6010C	Total/NA
Antimony	0.98	J	19.4	0.52	mg/Kg	1	☼	6010C	Total/NA
Arsenic	7.4		2.6	0.52	mg/Kg	1	☼	6010C	Total/NA
Barium	77.0		0.65	0.14	mg/Kg	1	☼	6010C	Total/NA
Beryllium	0.57		0.26	0.036	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.66		0.26	0.039	mg/Kg	1	☼	6010C	Total/NA
Calcium	14000	B	64.7	4.3	mg/Kg	1	☼	6010C	Total/NA
Chromium	18.5		0.65	0.26	mg/Kg	1	☼	6010C	Total/NA
Cobalt	8.4		0.65	0.065	mg/Kg	1	☼	6010C	Total/NA
Copper	39.4		1.3	0.27	mg/Kg	1	☼	6010C	Total/NA
Iron	21200		12.9	4.5	mg/Kg	1	☼	6010C	Total/NA
Lead	25.9		1.3	0.31	mg/Kg	1	☼	6010C	Total/NA
Magnesium	4690		25.9	1.2	mg/Kg	1	☼	6010C	Total/NA
Manganese	562	B	0.26	0.041	mg/Kg	1	☼	6010C	Total/NA
Nickel	24.5		6.5	0.30	mg/Kg	1	☼	6010C	Total/NA
Potassium	1900		38.8	25.9	mg/Kg	1	☼	6010C	Total/NA
Selenium	0.71	J	5.2	0.52	mg/Kg	1	☼	6010C	Total/NA
Sodium	77.9	J	181	16.8	mg/Kg	1	☼	6010C	Total/NA
Thallium	0.45	J	7.8	0.39	mg/Kg	1	☼	6010C	Total/NA
Vanadium	30.8		0.65	0.14	mg/Kg	1	☼	6010C	Total/NA
Zinc	136		2.6	0.83	mg/Kg	1	☼	6010C	Total/NA
Mercury	0.056		0.026	0.011	mg/Kg	1	☼	7471B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Buffalo

Detection Summary

Client: Buffalo Niagara Waterkeepers
Project/Site: Riverbend Phase I

TestAmerica Job ID: 480-140228-1

Client Sample ID: Depression - RBI (Continued) — Lab Sample ID: 480-140228-5

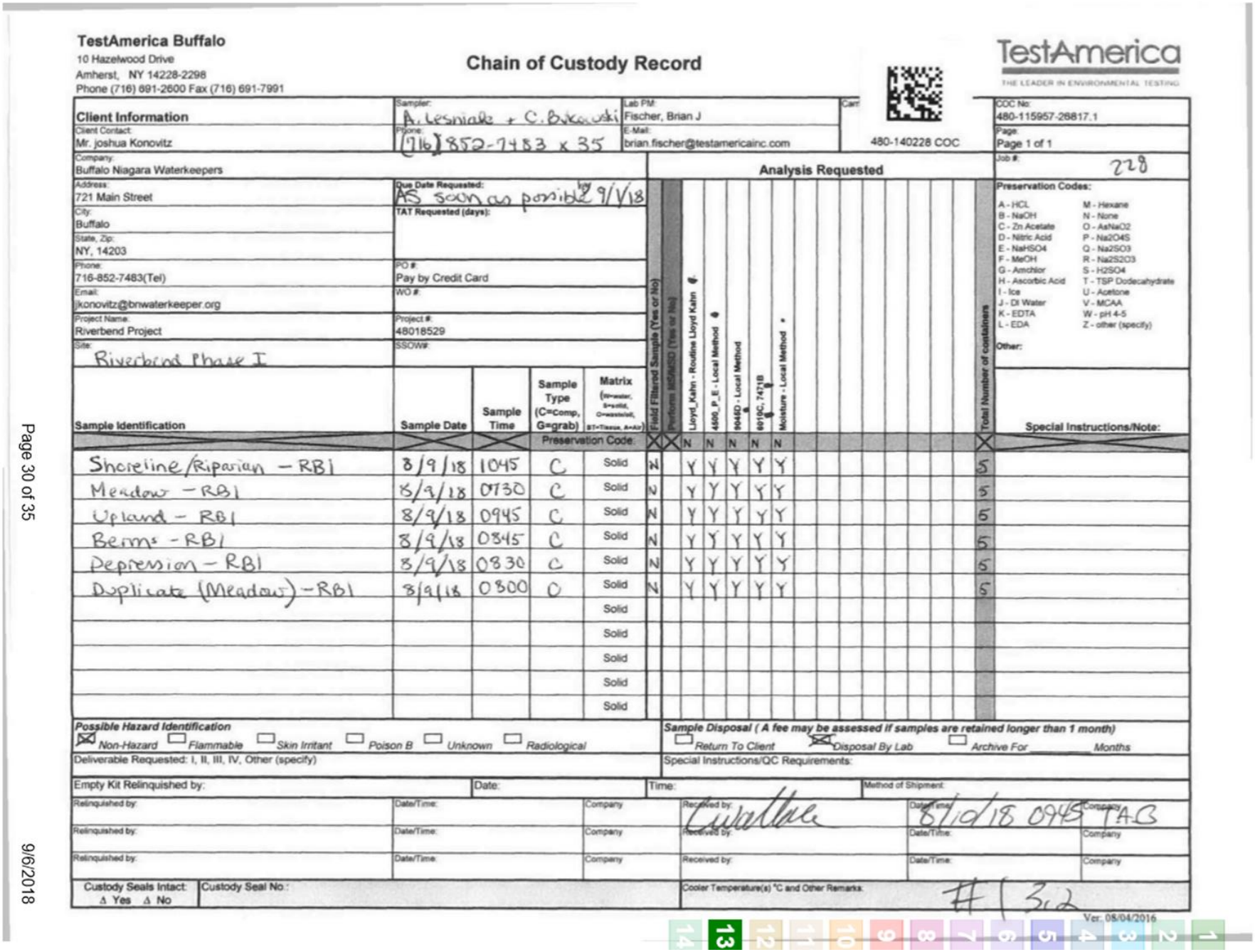
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	52200		1000	380	mg/Kg	1		Lloyd Kahn	Total/NA
Phosphorus	791	B ^	21.8	8.7	mg/Kg	50	☼	SM 4500 P E	Total/NA
Nitrate Nitrite as N	18.6		0.62	0.25	mg/Kg	1	☼	353.2	Soluble
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	7.7	HF	0.1	0.1	SU	1		9045D	Total/NA
Temperature	20.7	HF	0.001	0.001	Degrees C	1		9045D	Total/NA

Client Sample ID: Duplicate (Meadow) - RBI — Lab Sample ID: 480-140228-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	14400		12.3	5.4	mg/Kg	1	☼	6010C	Total/NA
Antimony	0.95	J	18.5	0.49	mg/Kg	1	☼	6010C	Total/NA
Arsenic	8.3		2.5	0.49	mg/Kg	1	☼	6010C	Total/NA
Barium	86.7		0.62	0.14	mg/Kg	1	☼	6010C	Total/NA
Beryllium	0.67		0.25	0.035	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.67		0.25	0.037	mg/Kg	1	☼	6010C	Total/NA
Calcium	5680	B	61.7	4.1	mg/Kg	1	☼	6010C	Total/NA
Chromium	21.7		0.62	0.25	mg/Kg	1	☼	6010C	Total/NA
Cobalt	9.2		0.62	0.062	mg/Kg	1	☼	6010C	Total/NA
Copper	25.8		1.2	0.26	mg/Kg	1	☼	6010C	Total/NA
Iron	20400		12.3	4.3	mg/Kg	1	☼	6010C	Total/NA
Lead	25.6		1.2	0.30	mg/Kg	1	☼	6010C	Total/NA
Magnesium	3160		24.7	1.1	mg/Kg	1	☼	6010C	Total/NA
Manganese	636	B	0.25	0.039	mg/Kg	1	☼	6010C	Total/NA
Nickel	27.3		6.2	0.28	mg/Kg	1	☼	6010C	Total/NA
Potassium	2130		37.0	24.7	mg/Kg	1	☼	6010C	Total/NA
Selenium	0.85	J	4.9	0.49	mg/Kg	1	☼	6010C	Total/NA
Sodium	58.9	J	173	16.0	mg/Kg	1	☼	6010C	Total/NA
Thallium	0.66	J	7.4	0.37	mg/Kg	1	☼	6010C	Total/NA
Vanadium	47.9		0.62	0.14	mg/Kg	1	☼	6010C	Total/NA
Zinc	132		2.5	0.79	mg/Kg	1	☼	6010C	Total/NA
Mercury	0.056		0.025	0.010	mg/Kg	1	☼	7471B	Total/NA
Total Organic Carbon	60900		1000	380	mg/Kg	1		Lloyd Kahn	Total/NA
Phosphorus	616	B ^	19.9	7.9	mg/Kg	50	☼	SM 4500 P E	Total/NA
Nitrate Nitrite as N	26.6		0.58	0.23	mg/Kg	1	☼	353.2	Soluble
Analyte	**Result**	**Qualifier**	**RL**	**RL**	**Unit**	**Dil Fac**	**D**	**Method**	**Prep Type**
pH	7.2	HF	0.1	0.1	SU	1		9045D	Total/NA
Temperature	20.9	HF	0.001	0.001	Degrees C	1		9045D	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Buffalo



TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

480-140228 COC

Client Information	Sampler: A. Lesniak + C. Bykowski	Lab PM: Fischer, Brian J	COC No: 480-115957-26817.1
Client Contact: Mr. joshua Konovitz	Phone: (716) 852-7483 x 35	E-Mail: brian.fischer@testamericainc.com	Page: Page 1 of 1
Company: Buffalo Niagara Waterkeepers		Analysis Requested	Job #: 228
Address: 721 Main Street	Due Date Requested: ASAP as soon as possible by 9/7/18		Preservation Codes:
City: Buffalo	TAT Requested (days):		A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)
State, Zip: NY, 14203			
Phone: 716-852-7483(Tel)	PO #: Pay by Credit Card		Other:
Email: jkonovitz@bnwaterkeeper.org	WO #:		
Project Name: Riverbend Project	Project #: 48018529		
Site: Riverbend Phase I	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Lloyd_Kahn - Routine Lloyd Kahn #	6600_P_E - Local Method #	9045D - Local Method #	6010C, 7471B #	Moisture - Local Method #	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N	N		
Shoreline/Riparian - RB1	8/9/18	1045	C	Solid	N		Y	Y	Y	Y	Y	5	
Meadow - RB1	8/9/18	0730	C	Solid	N		Y	Y	Y	Y	Y	5	
Upland - RB1	8/9/18	0945	C	Solid	N		Y	Y	Y	Y	Y	5	
Berms - RB1	8/9/18	0845	C	Solid	N		Y	Y	Y	Y	Y	5	
Depression - RB1	8/9/18	0830	C	Solid	N		Y	Y	Y	Y	Y	5	
Duplicate (Meadow) - RB1	8/9/18	0800	C	Solid	N		Y	Y	Y	Y	Y	5	
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time:	Company	Received by: Cwallace	Date/Time: 8/10/18 0945	Company TAB
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4 (3.2

Ver: 08/04/2016

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9/6/2018

SOIL MONITORING DATA FORM

Date: 7/27/18
Phase: RBI
Weather:
Soil Sampler: Christine
Composite Soil Sample Number: 1
Composite Soil Sample ID (as submitted to soil testing laboratory): RB1 - Shoreline & Riparian Top
Type of Composite Soil Sample (Topsoil or Subsoil): Topsoil

Subsample Number	Time of Sampling	Shore or Rip Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	8:48 AM	Shoreline	A 42.863089 x -78.841535	burdock + Canada goldenrod predominant here soil soft, moist, loamy, lots of OM / worms
2	8:55 AM	Riparian	B 42.863117 x -78.841426	thistle / goldenrod dominate here
3	9:04 AM	Shoreline	C 42.863019 x -78.840047	according to GPS app map I am in the water (not) goldenrod dominates, clear erosion here too
4	9:11 AM	Riparian	D 42.863226 x -78.839926	goldenrod 95% loamy dry below 2 inches
5	9:18 AM	Riparian	E 42.862506 x -78.838378	50% grass 50% goldenrod loamy, ~~rocky~~ slightly dry throughout
6	9:31 AM	Shoreline	F 42.862645 x -78.838139	← wide variety of flowers + herby plants GPS says I am in the water (not) neither wet nor dry loamy
7	9:56 AM	Riparian	G 42.860640 x -78.833787	40% vetch clear deer presence burdock, goldenrod
8	10:02 AM	Riparian	H 42.860819 x -78.834428	goldenrod 50% burdock, vetch
Wildlife Species Observations				

SOIL MONITORING DATA FORM

Date: 7/27/18
Phase: RBI
Weather:
Soil Sampler: Christine
Composite Soil Sample Number: 2
Composite Soil Sample ID (as submitted to soil testing laboratory): RB1 - Shoreline & Riparian Sub
Type of Composite Soil Sample (Topsoil or Subsoil): Subsoil (6 - 12 inch depth)

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	10:34	Riparian	B from soil sample 1	// loamy
2	10:37	Shoreline	A from 1	// Clay-ey soil noted at depth
3	10:54	Shoreline	C	loamy soil
4	11:01	Riparian	D	loamy, dry at depth ~10 inches
5	11:15	Riparian	E	//
6	11:19	Shoreline	F	//
7	1130	Riparian	42.860937 x -78.834527	50% grass, 50 goldenrod
8	1135	Shoreline	42.861008 x -78.834433	burdock 35% assorted wildflower species 65%
Wildlife Species Observations				

SOIL MONITORING DATA FORM

Date: 7/27/18
Phase: RB1
Weather:
Soil Sampler: Christine
Composite Soil Sample Number: 3
Composite Soil Sample ID (as submitted to soil testing laboratory): RB1 - Upland
Type of Composite Soil Sample (Topsoil or Subsoil): Topsoil

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	1146	Upland	42.861112 x −78.834976	berm dry, loamy, rocky burdock, vetch, QAL, oak trees
2	1155		42.861944 x −78.83666	grasses, clear deer presence loam
3	1200		42.862301 x −78.837828	grasses = loam good drainage
4	1212		42.862917 x −78.839544	= loamy excellent drainage
5	1219		42.863191 x −78.840671	wet soil 100% goldenrod
6	1222		42.863123 x −78.840900	loamy all goldenrod
7	1224		42.863175 x −78.841064	grasses + goldenrod 50/50 wet loamy
8	1228		42.857861 x −78.828007	grasses 75% goldenrod 25% loamy, light
Wildlife Species Observations				doe + two fawns sited 12:26 PM

SOIL MONITORING DATA FORM

Date: 7/27/18
Phase: RB1
Weather:
Soil Sampler:
Composite Soil Sample Number: 4
Composite Soil Sample ID (as submitted to soil testing laboratory): RB1 - Upland Meadow
Type of Composite Soil Sample (Topsoil or Subsoil): Topsoil

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	1435	Meadow	42.860421 x -78.833790	
2	1440		42.860949 x -78.834618	
3	1446		42.862100 x -78.837439	98% grass
4	1447		42.862299 x -78.837758	"
5				
6				
7				
8				
Wildlife Species Observations				

SOIL MONITORING DATA FORM

Date:
Phase:
Weather:
Soil Sampler:
Composite Soil Sample Number: 5
Composite Soil Sample ID (as submitted to soil testing laboratory): RB1 - Planting Island Depressions
Type of Composite Soil Sample (Topsoil or Subsoil): Topsoil

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	1333	Upland	42.861020 x -78.834809	
2	1334	//	42.861055 x -78.834760	
3	1335	//	42.860893 x -78.834876	
4	1336	//	42.860991 x -78.835037	
5	1352	//	42.862479 x -78.838081	goldenrod 50%.
6	1355	//	42.862541 x -78.838344	
7	1356	//	42.862419 x -78.838420	
8	1359	//	42.862606 x -78.838546	
Wildlife Species Observations				

SOIL MONITORING DATA FORM

Date:
Phase:
Weather:
Soil Sampler:
Composite Soil Sample Number: 6
Composite Soil Sample ID (as submitted to soil testing laboratory): RB1 – Planting Island Berms
Type of Composite Soil Sample (Topsoil or Subsoil): Topsoil

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	1309	Upland Berm	42.862497 x -78.838589	grasses dominate 80% burdock 20%
2	1309	//	42.862479 -78.838478	// two samples from this location
3	1312	//	42.862430 x -78.838273	grasses 50% thistle 25% goldenrod 25%
4	1314	//	42.862379 x -78.838190	80% grasses 10% invasives 10% native planted shrubs
5	1321	//	42.861081 x -78.835129	40% vetch 20% native trees + shrubs 20% grasses 20% invasives
6	1323	//	42.861028 x -78.835092	//
7	1324	//	42.861023 x -78.835043	//
8	1325	//	42.861095 x -78.835071	//
Wildlife Species Observations				

SOIL MONITORING DATA FORM

Date: 7/27/18
Phase: RB1
Weather:
Soil Sampler:
Composite Soil Sample Number: 7
Composite Soil Sample ID (as submitted to soil testing laboratory): RB1 - ~~Existing Conservation~~ Meadow West
Type of Composite Soil Sample (Topsoil or Subsoil): Topsoil

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	2:29		42.86277, -78.83924	
2	2:31		42.86287, -78.83931	
3	2:33		42.86326, -78.83995	
4	2:35		42.86329, -78.84026	
5				
6				
7				
8				
Wildlife Species Observations				

SOIL MONITORING DATA FORM

Date: Thurs. Aug 9, 2018
Phase: RB I
Weather: sunny, 70°, no breeze :)
Soil Sampler: Amelia Lesniak, Christine Bukowski
Composite Soil Sample Number: CS 1, Shoreline Rip.
Composite Soil Sample ID (as submitted to soil testing laboratory):
Type of Composite Soil Sample (Topsoil or Subsoil): Top

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	10:39 AM	Shoreline Rip	42.860704, -78.833890	Soil dark/moist from recent rain, easy to sample, healthy lively vegetation
2	10:42 AM	↓	42.860815, -78.834106	↓
3	10:41 AM	↓	42.862916, -78.83935	↓
4	10:45 AM	↓	42.863226, -78.8404	↓
5				
6				
7				
8				
Wildlife Species Observations				

SOIL MONITORING DATA FORM

Date: Thurs. Aug 9, 2018
Phase: RBI
Weather: 70°, sunny, no breeze
Soil Sampler: Amelia Lesniak, Christine Bukowski
Composite Soil Sample Number: CS2 - upland
Composite Soil Sample ID (as submitted to soil testing laboratory):
Type of Composite Soil Sample (Topsoil or Subsoil): Top

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	9:38 AM	upland	42.86194, -78.83706	Dark soil, moist + easily diggable due to reeent spurts of rain, vegetation lively
2	9:45 AM	↓	42.86216, -78.83858	↓
3	9:49 AM	↓	42.86297, -78.83934	↓
4	9:54 AM	↓	42.86311, -78.84106	↓
5				
6				
7				
8				
Wildlife Species Observations				

Thurs

SOIL MONITORING DATA FORM

Date: Aug 9 2018
Phase: RB I
Weather: sunny, 70°, no breeze :)
Soil Sampler: Amelia Lesniak, Christine Bukowski
Composite Soil Sample Number: Meadow, CS3
Composite Soil Sample ID (as submitted to soil testing laboratory):
Type of Composite Soil Sample (Topsoil or Subsoil): Top

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	8:01 AM	Meadow	42.86089, -78.83460	dark soil, moist after recent rain
2	8:13 AM	Meadow	42.8623, -78.53784	dark moist soil, lively vegetation
3	8:21 AM	Meadow	42.84277, -78.53144	medium colored (compost dark), veg. lively
4	8:27 AM	Meadow	42.86303, -78.84067	
5				
6				
7				
8				
Wildlife Species Observations				

SOIL MONITORING DATA FORM

Thurs
Date: Aug 9, 2018
Phase: RBI
Weather: Sunny, 70°, No breeze
Soil Sampler: Amelia Lesniak, Christine Bukowski
Composite Soil Sample Number: CS4, BerMS
Composite Soil Sample ID (as submitted to soil testing laboratory):
Type of Composite Soil Sample (Topsoil or Subsoil): Top

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	9:53 AM	BerMS	42.8le1047, -78.834982	Soil dark, moist,
2	9:55 AM	↓	42.8le1103, -78.835069	easy to sample due
3	10:02 AM	↓	42.8le2457, -78.838359	to recent rain
4	10:04 AM	↓	42.8le2le18, -78.838593	↓
5				
6				
7				
8				
Wildlife Species Observations				

SOIL MONITORING DATA FORM

Date: Thurs Aug 9, 2018
Phase: RB I
Weather: 70°, sunny, no breeze
Soil Sampler: Amelia Lesniak & Christine Bukowski
Composite Soil Sample Number: CSS - Depressions
Composite Soil Sample ID (as submitted to soil testing laboratory):
Type of Composite Soil Sample (Topsoil or Subsoil): Top

Subsample Number	Time of Sampling	Planting Zone	Location (Description or Lat./Long.)	Relevant Observations (ex. vegetation survival, overall color of soil as it could relate to presence of organic matter, etc.)
1	8:30 AM	Depressions	42.862478, -78.838150	Dark moist soil,
2	8:34 AM	↓	42.862430, -78.838421	Wet from recent rain,
3	8:40 AM	↓	42.862448, -78.838403	lively vegetation
4	8:45 AM	↓	42.861132, -78.834927	↓
5				
6				
7				
8				
Wildlife Species Observations				

APPENDIX F. RB I WALK-THROUGH MONITORING INSPECTION FORMS

WALK-THROUGH INSPECTION FORM

Date: JUNE 7 2018, 7-10:30 AM
Phase: [redacted] I
Weather: partly cloudy, ~70°
Walk-through Inspector:
Amelia Leshick Christine Bukowski

	Relevant Observations
Flood Damage	—
Plant Disease	—
Plant Pests	NOTHING OUTSTANDING
Drought	—
Tree Tubes	GOOD
Choking Weeds	BURDOCK VERY PRESENT, PHRAGMITES ALSO VERY DOMINATING
Invasive Species	MUGWORT, BURDOCK, PHRAGMITES, KNAPWEED
Volunteer Species	—
Herbivory	—
Plant Vigor	GOOD, OUTCOMPETED MOSTLY
Deer Exclosure	—
Amphibian Observations	—
Reptile Observations	—
Mammal Observations	SCAT, DEER + FAWN, [redacted] [redacted]
Avian Observations*	LOTS OF GEESE; AUDUBON [redacted] ONSITE

*If Walk-through occurs during Avian Monitoring, avian observations will be recorded on Avian Monitoring Field Data Shee

1:30PM

Date: Thursday, July 26, 2018 **WALK-THROUGH INSPECTION FORM**
Phase: RB I
Weather: sunny, 80°, breeze
Walk-through Inspector: Amelia Lesniak

	Relevant Observations
Flood Damage	—
Plant Disease	none evident
Plant Pests	typical, nothing ~~poor~~ problematic, small bugs + beetles
Drought	very dry summer, weedy areas expanding, dead/dry grasses, soil crumbling
Tree Tubes	wraps holding in place, one needs slight adjustment or removal (GPS pts available)
Choking Weeds	Dense Burdock monocultures, black mustard, mugwort
Invasive Species	ragweed, mugwort, burdock, black alder, thistle, curly dock, birdsfoot, oxeye daisy, Queen Anne's
Volunteer Species	—
Herbivory	some heavily browsed saplings to the point of unidentification
Plant Vigor	high/good
Deer Exclosure	orange fencing around East berm is somewhat down, tree wraps ok
Amphibian Observations	—
Reptile Observations	—
~~**Mammal**~~ **Wildlife Observations**	monarchs, white skippers, dragonflies, bumblebees, large skate
Avian Observations*	ducks, heron, canada geese

*If Walk-through occurs during Avian Monitoring, avian observations will be recorded on Avian Monitoring Field Data Sheet

Date: Tuesday August 14, 2018

Phase: RBI

Weather: drizzle, overcast, ~70°

Walk-through Inspector: Amelia Lesniak 7:15AM

WALK-THROUGH INSPECTION FORM

	Relevant Observations
Flood Damage	———
Plant Disease	Not evident
Plant Pests	~~Ants~~ small bugs
Drought	——— (recent bouts of rain)
Tree Tubes	Most fine, one oak needs ~~new~~ tube removed
Choking Weeds	
Invasive Species	burdock, mugwort lively
Volunteer Species	
Herbivory	normal, small bugs, some trees heavily browsed by deer
Plant Vigor	Golden rod + mugwort lively, grasses, burdock + mullein brown + dried out
Deer Exclosure	Meadow EAST fences half down
Amphibian Observations	———
Reptile Observations	———
Mammal Observations	deer, scat, deer-flattened portions of Meadow East
Observations*	small birds, ducks

*During Avian Monitoring, avian observations will be recorded on Avian Monitoring Field Data Sheet

APPENDIX G. AERIAL PHOTOGRAPHS (EAGLEHAWK)