Wetland Establishment Report

BJ's Gas Site
1146 Route 9
Town of Wappinger
Dutchess County, NY

February 4, 2022

Prepared by:

Michael Nowicki
Ecological Solutions, LLC
121 Leon Stocker Drive
Stratton, VT 05360
(203) 910-4716

1.0 ESTABLISHMENT JUSTIFICATION

1.1 Project Description

The Applicant is proposing a BJ's Gas Kiosk on an 4.56 acre site located at 1146 Route 9 in the Town of Wappinger. The site contains old fill material, field area and 2 wetland areas at the east side of the site and south side of the site.

1.2 Site Design and Minimization of Impacts

The proposed BJ's Gas Kiosk development on this site has no wetland impact but does have approximately 1 acre of impact to the Town regulated 100 foot buffer to the northern side of this wetland. The applicant has re-engineered the site to keep all fuel components including underground storage tanks, lines and dispensers outside of the 100 foot wetlands buffer area. As shown on the proposed plan the southern buffer of this wetland contains a parking lot adjacent to its boundary on the south. The impact proposed to the existing buffer on the site from the project will occur to successional field and sparsely wooded area adjacent to Route 9. This buffer which in reality is only half a buffer provides virtually no protection to the wetland that barely functions as a typical wetland would. Especially since the buffer has already been compromised to the south.

To compensate for the loss of wetland buffer area, the Applicant is committed to the establishment of 0.265 acres of additional wetland on the site ("Establishment Area") that will connect the two wetland segments on the site to form one contiguous wetland. The additional wetland area will more than compensate for the impact to a previously impacted marginal buffer since additional wetland is provided and the total wetland area on the site increases by 0.265 acres. The amount of wetland is more important to wetland functions which will increase than a loss of buffer that does not increase the wetland functions.

The purpose of this report is to document the criteria upon which the total wetland establishment has been designed and provide guidance to the contractor during implementation of the plan. The ultimate goal is to produce a method to create a viable long-term (permanent) wetland community from an area that is currently young woods. The work described herein includes the establishment of 0.265 acres of shrub and forested wetland. Plans describe the techniques and materials proposed to establish the water table in the establishment wetland, transplant substrate material, and establish wetland vegetation.

1.3 Methodology

An approach to consider is to connect the wet meadow or southerly wetland to the eastern or the forested wetland on the eastern section of the site in a contiguous way by removing old fill material and constructing a wetland mitigation area (by grading and planting of wetland vegetation) allows for an increase the wildlife habitat function of this wetland and provides functions that this wetland currently does not provide.

The use of stormwater basin from the proposed development area that allows clear water to flow to the wet meadow which after mitigation efforts is connected to the eastern wetland would create and more

functioning wetland complex then currently exists on the site. There would be a net increase in function and therefore benefits provided to the Town.

The wetland establishment plan is based on the proposed establishment area being similar in spatial relation and existing features, and the following principles:

- The water table in the establishment wetlands must be maintained near the finished grade;
- The establishment areas must not be flooded for prolonged periods of time as a result of significant rainstorms;
- The area must be planted with sufficient hydrophytic vegetation, seed, and, rootstock to allow wetland communities to emerge within a reasonable time period.

1.4 Seeding and Establishment Planting

The final design of the establishment area strives to create edge habitat around the existing wetland. Wetland plantings will be installed after the placement of the suitable substrate material in the establishment area. This bedding material will keep soil moisture high during summer dry periods when establishment of vegetation is critical.

2.0 ESTABLISHMENT GOALS AND OBJECTIVES - ECOLOGICAL CONSIDERATIONS

The design of an interconnected system of existing wetland with the proposed additional shrub/forested wetland is intended so that the existing wetlands functions are greatly increased over existing conditions on the site.

2.1 Prescription of Vegetative Cover Types

The proposed combination of shrub and wooded swamp is expected to enhance the bio-diversity and the wildlife habitat functions of the entire wetland ecosystem once they are connected and contiguous.

Prescriptions for supplemental seeding of those areas not receiving establishment plantings is based on published data regarding the water depth tolerances of indigenous wetland species[1], as well as the commercial availability of seed of those species. Wherever possible, seed of indigenous wetland species and genera were prescribed, and potentially problematic, weedy species also were deliberately not prescribed for the establishment area.

The establishment effort involves two major components: one to produce the required hydrological regime, and the other to establish wetland terrain and wetland plantings throughout the establishment area. The establishment lines have been adjusted to take advantage of the natural contours and proximity to the existing wetlands such that the two existing wetlands on the site are connected. Successional wetland cover types other than the wooded swamp, such as shrub plantings will provide stability, biological diversity, interspersion of cover types, increased wildlife habitat, and provide the potential for increased structural/floristic complexity, and functional value of the establishment/existing wetland ecosystem.

[1] Southern Tier Consulting, Inc - Wetland Plant Catalog 2022.

3.0 PREFORMANCE STANDARDS

3.1 Wetland Functions

An assessment of wetland functions and values was conducted on the small wet meadow identified on the southern side of the site. I have delineated the same wetlands on the site several times in the past 12-15 years in accordance with both the Town of Wappinger code and US Army Corps of Engineers Wetland Delineation Manual. The wet meadow on the southern section of the site is man made and due to the compression of the soil in this area via past truck/vehicle movement and existing wheel ruts which traps precipitation and isolates this wetland from other wetland. The compacted soil then acts as a barrier to infiltration whereas the other upland section of the field on the site that was not compacted allows infiltration. The wetland at the eastern side of the site is a forested wetland that has old fill material along its western boundary.

Using a widely accepted method for wetland functions and values assessment developed by the New England District, U.S. Army Corps of Engineers, 13 distinct wetland functions and values were assessed for only this wetland on the site since there is proposed impact to the Town of Wappinger regulated 100 foot buffer to this wetland. This method yielded an objective, descriptive quality index of each wetland rather than a subjective quantified rating of each wetland.

This assessment had two major objectives:

1. Objectively identify the functions and values provided by the wetland identified on the southern section of the site.

2. Provide baseline data with which the Applicant could work in planning land uses, and against which the Applicant could assess potential impacts of proposed development of the site.

The descriptive quality index of each wetland, based on this methodology, is summarized in this report.

Wetlands are legally protected because of the functions they perform and the benefits that society reaps from those functions. Wetland functions are chemical, physical, and biological processes that wetlands naturally perform as a matter of course, such as absorption of nutrients or floodwaters, or provision of habitat for fish and wildlife. Wetland values are the benefits that society derives from wetland functions, such as flood abatement, or water quality maintenance.

The functions and values assessment conducted on the property was based on the method outlined in *The Highway Methodology Workbook Supplement: Wetland Functions and Values, A Descriptive Approach*, by the U.S. Army Corps of Engineers New England District. This method was selected over an arbitrary numeric quantifying assessment scheme because it provides an objective, descriptive approach to functions and values assessment based on professional observation and judgment rather than a simple numeric value rating system. Quantified functions and values assessments do not always provide for descriptive information about wetlands and therefore may overlook important aspects of wetland functions and values. The Highway Method provides for assessment of the wetland for thirteen defined functions and

values. Of these, the first eight are considered wetland functions, and the last five are considered to be wetland values.

Findings of the assessment for the are outlined below.

Functions and values provided by the wet meadow is limited to wildlife habitat. The following functions were reviewed:

1. Groundwater Recharge/Discharge – the potential for a wetland to serve as a recharge area for an aquifer or as a surface discharge point for groundwater.

As described previously this wetland is man made and due to the compression of the soil in this area via past truck/vehicle movement and existing wheel ruts which traps precipitation and isolates this wetland from other wetland. The compacted soil then acts as a barrier to infiltration whereas the other upland section of the field on the site that was not compacted allows infiltration. There is no groundwater recharge or discharge function provided by this wet meadow.

2. Floodflow Attenuation– A wetland's ability to store and attenuate floodwaters during prolonged precipitation events, thereby reducing or preventing flood damage.

This small wet meadow is not connected or associated with a tributary that could overflow and trap rapidly rising water during storm events from watershed areas. This wetland is small in size and generally only hold very low amounts of water during storms because it just isn't that large in size and there is no large watershed that it serves. Water that enters this wetland is not slowly released to the watershed to attenuate flooding. There is no floodflow attenuation function provided by this wet meadow.

3. Fish and Shellfish Habitat – The ability of permanent or temporary water bodies to provide suitable habitat for fish or shellfish.

There is no fish or shellfish habitat provided by the wet meadow.

4. Sediment/Toxicant/Pathogen Retention – The effectiveness of the wetland in trapping sediments, toxicants or pathogens, thereby protecting water quality.

As with floodflow attenuation there is no flow from the surrounding watershed to this wetland where water could be cleansed of pollutants or water quality enhanced through infiltration by this wet meadow.

5. Nutrient Removal/Retention/Transformation – The effectiveness of the wetland at absorbing, retaining, and transforming or binding excess nutrients, thereby protecting water quality.

There currently is no source of excess nutrients that flow to the site or this wetland in particular to provide nutrient retention functions.

6. Production Export – The wetland's ability to produce food or usable products for humans or other living organisms.

There is no impact to this function because the wet meadow is not connected to other waters where export of material can occur.

7. Sediment/Shoreline Stabilization – The wetland's ability to prevent erosion and sedimentation by stabilizing soils along stream banks or the shorelines of water bodies.

This wet meadow does not contain a shoreline and there is currently no source of sedimentation that requires stabilization so this function is not currently provided by this wetland.

8. Wildlife Habitat – The ability of wetlands to provide food, water, cover, or space for wildlife populations typically associated with wetlands or their adjacent areas, both resident and migratory.

This is one of the functions provided by the wet meadow albeit in a limited way given the wetland location and it's small size. Mammal tracks and nesting birds were observed here.

9. Recreation – The value placed on a wetland by society for providing consumptive and non-consumptive as well as active or passive recreational opportunities such as canoeing/boating, fishing, hunting, bird/wildlife watching, hiking, etc.

This wet meadow does not provide this function.

10. Education/Scientific Value – The value placed on a wetland by society for providing subjects for scientific study or research or providing a teaching resource for schools.

This wet meadow does not provide this function.

.

11. Uniqueness/Heritage – The value placed on a wetland by society for having unique characteristics such as archaeological sites or sites of historical events, unusual aesthetic qualities, or unique plants, animals, or geologic features, etc.

The wet meadow is not unique or of high value.

12. Visual Quality/Aesthetics – The value placed on a wetland by society for having visual and/or other aesthetic qualities.

There is no impact to this function. Visually this wet meadow does not resemble most wetlands in that there is no standing water and few vegetative indicators usually associated with dominant wetlands.

13. Threatened or Endangered Species Habitat – The value placed on a wetland by society for effectively harboring or providing habitat for threatened or endangered species.

This wet meadow provide no habitat for known threatened or endangered species.

4.0 ESTABLISHMENT SITE SELECTION

The proposed wetland establishment area was selected due to its proximity to both wetland areas on the site and to remove old fill from this area and establish one highly functioning wetland system. Currently the establishment area is dominated by pioneer forest species only a few decades old. The establishment area will also take advantage of the existing red maple swamp to which it will be attached. Hydrology – a driving factor in establishment design - is evident in the inundated/saturated condition of the surrounding soil and constant flow of a drainage swale on the southern boundary of the site.

5.0 BASELINE INFORMATION

5.1 Hydrology of the Establishment Area

Two test pits were dug during the site investigation within the establishment areas during 2021 to determine the water level available for wetland plantings. The results of these test pits generally confirmed the presence of silty clay loam. Groundwater was observed in the test pits of the establishment area at depths of 2-3 feet in quantities that are considered sufficient to support hydrophytic vegetation and the establishment of hydric soils.

The existing wetlands and inter-connecting establishment area will exhibit a wide range of moisture requirements and flooding tolerances, the proposed elevation ranges will provide a micro-topographic moisture gradient conducive to high species diversity.

The proposed layout of the establishment area is designed to facilitate construction and sedimentation control efforts by minimizing excavation and grading requirements.

5.2 Soil Preparations and Vegetative Establishment

The test pits confirmed the presence of mineral soil horizons at varying depths in the establishment areas so that the existing soil fertility is expected to be adequate for the establishment and growth of the wetland plantings and seed. Additional soil amendments are not expected to be required, since the proposed vegetative cover types will thrive in a wide range of soil conditions, with pH values from slightly acidic to neutral. Baseline soil analyses for the establishment area and adjacent wetland, however, will be indispensable in the monitoring and assessment phase of the relative success or failure of the establishment effort.

The combination of existing wetland with shrub swamp establishment area is expected to ensure vegetative establishment and long-term survival, even under summer conditions. The design of this system will maximize surface water availability to wetland plantings and area to be seeded with herbaceous wetland species.

The finished grades of the establishment area will create a increasing moisture gradient that will improve chances for establishment of a diverse wetland community. These finished grades also will make use of seasonal fluctuations in water elevations, which are widely recognized as crucial to seed germination and seedling establishment of both woody and herbaceous wetland plant species. The remainder of the terrain will be seeded with a mixture of herbaceous, wet meadow species in order to stabilize soils and establish a perennial wetland vegetative community.

5.3 Diversity and Proposed Locations of Vegetative Cover Types

One major goal of the wetland establishment plan is to maximize the floristic diversity and availability of ecotonal, “edge habitat” for subsequent colonization by wildlife. The strategy to achieve this goal is to

enhance the proposed wetland plant species with seeding of commercially available wetland species at appropriate elevations and water depths within the establishment area.

As shown on the two (2) sheet plan set containing "Site Plan" and "Wetland Creation Plan and Details" Sheets CA-1 and CA-2 prepared by Bohler, a minimum of 0.265 acres of wetland establishment is proposed. Shrub wetlands will be constructed to add "edge habitat" to the existing wetland vegetation. The existing wetland will remain in its current condition. It is expected that even with successful establishment of diverse cover types, their relative patterns and proportions will fluctuate over ecological time due to weather patterns and natural processes. The majority of the proposed wetland area should develop, ultimately, into a mature forested wetland via an intermediate, shrub swamp successional stage.

Supplemental seeding of the establishment area with wetland seed will stabilize and enhance the vegetative establishment of wetland communities in areas that will not be planted with wetland plants.

The supplemental seeding prescriptions of the establishment area, presented on the plans are based on the site-specific ecological suitability of commercially available seed of indigenous wetland plant species. As is discussed in detail in the following sections, these plants provide excellent food and cover resources for wildlife populations.

6.0 ESTABLISHMENT WORK PLAN

This section includes an outline of the construction schedule and descriptions of the planting techniques. The last portion describes the erosion control plan proposed to control erosion from the site during construction of the establishment areas.

6.1 Construction Schedule

This construction schedule is based on estimates to complete the major items of work and outlines the work necessary to complete the establishment work by the spring or fall of 2022.

Work includes:

- Rough grading of establishment area;
- Fine grading;
- Planting of all establishment area;
- Seeding of all establishment area.

Equipment that will be utilized for work at the establishment areas includes: conventional earth moving equipment including bulldozers, pay loaders, track mounted excavators and dump trucks. The soils being moved include silt loam.

The following is a rough estimate of material to be moved:

- Rough grade establishment areas 0.265 acres;
- Spread material (rootstock over bottom of establishment areas approximately 100 cubic yards;
- Fine grade establishment areas approximately 20 cubic yards.

<u>Grading of Establishment area</u>

Approximately 0.265 acres of wetland establishment area is proposed. Excavation of rough grades are expected to require approximately 100 cubic yards of earth movement at 400 cubic yards/day/dozer (D-8) = 1 dozer days.

Formulation of the establishment area after completion of rough grading will require an additional 20 cubic yards of earthwork. This operation should occur immediately behind the rough grading work.

Planting Establishment area

Delivery and installation of all plant material will require approximately 1-2 weeks depending on the availability of the proposed species and number of laborers used for the planting.

Seeding

Seeding will occur via hydro-seed technique at approximately two acres/unit/day to cover the establishment areas of 0.265 acres, approximately 1 unit day is required to seed the area.

7.0 SITE PROTECTION

Erosion control and earth works are proposed via conventional techniques. The flat condition of the establishment area will limit runoff velocities and only suspended clay particles are troublesome from an erosion standpoint.

The overall plan is outlined as follows:

Earthworks

- Install erosion controls along establishment front;
- Along wetland use silt fences or hay bales;
- Along waterways use silt fences or hay bales;
- Across waterways, for silt traps use hay bales down gradient from work/excavation area and provide rapid installation of controls to minimize siltation.
- Over-seed establishment area with a mixture of wet meadow herbs and cover with straw mulch;

8.0 MONITORING PLAN AND REPORT

The establishment area will be monitored for a five-year period after installation of plantings and seed. Mortality rates will be calculated and dead or dying plant material will be replaced. Also, the reasons for the mortality will be examined, and the most likely cause for the loss will be corrected before any further establishment efforts are put forth.

9.0 MAINTENANCE AND ADAPTIVE MANAGEMENT PLAN

9.1 Fall Supplemental Seeding

If some of the originally planted material from commercial suppliers has become established successfully in certain areas, a second attempt will be made using the same species in areas where establishment had failed. Soil analyses for the under vegetated areas will be performed, and considerations of other ecological factors that may be responsible for the failure also will be performed before re-planting such areas. Any obvious zone patterns, such as failure to survive at certain elevations relative to water levels, may help to "fine tune" the locations and methods for the re-planting.

9.2 Nuisance Vegetation Control Plan

The presence of at least two, potentially invasive weedy grass species require the following for their surveillance and containment or eradication.

Phragmites communis is an exotic (Australian) grass and is widely recognized as a noxious weed that rapidly displaces indigenous wetland vegetation, especially in disturbed or polluted areas, but provides little or no food and cover value for wildlife. Patches of this species occur in wet depressions scattered throughout the upland agricultural field and along the existing wetland habitat.

Phalaris arundinacea, although an indigenous North American wetland grass, recently has been reported to proliferate and cause an aquatic weed problem in open water areas following wetland creation projects. This commercially available grass is found scattered in the existing wetland, but is not being prescribed for seeding in the establishment areas.

Lythrum salicaria (Purple Loosestrife) is another exotic perennial species that rivals *Phragmites* in its ability to displace indigenous wetland vegetation, while similarly providing no food and cover resources for use by wildlife.

9.3 Map Existing Locations of Problem Species

Any patches of these weeds within the establishment area during construction will be eradicated using the procedures described below. Those sub-populations found outside of the establishment area will not be dealt with until after all site preparation and planting efforts are finalized. Surveillance of these weed species will be performed during the monitoring phase of the establishment project, for all known locations nearby, as part of the biological monitoring plan for the entire establishment areas.

Following completion of earthwork, site preparation and planting activities, a base map of the establishment area and proposed vegetative cover types will be shown. At that time, the locations of nearby populations of these weedy species will be added to the base map, together with a grid-location system to monitor future expansions or contractions of each patch. This map then will be used during monitoring efforts of the

wetland vegetative colonization/establishment, to determine the relative success of the containment and eradication efforts.