Bedford Wetlands Control Commission

425 Cherry Street
Bedford Hills, NY 10507
2nd Floor Conference Room

August 1, 2016
7:30 P.M.

Announcements:

7:30 PM – 7:35 PM - Submission Deadlines
- Site Walk Date

Supplemental Submissions:

7:35 PM – 7:50 PM Renovations, Alterations and Additions to Residence, Rebuild of Gravel Driveway, Wetlands Drainage Course Restoration
Section **50.7** Block **1** Lot **6**, **R-4A** Zone
249 Mt. Holly Road, Katonah
Owner: **Clare Reinbergen Trust**
Applicant: **Roger Van Loveren, AIA**

7:50 PM – 8:05 PM Addition to Existing Residence, Reconstructed Pool & Deck, New Patio Areas, Walking Deck & Dock, Re-Delineated Driveway
Section **84.5** Block **1** Lot **2**, **R-4A** Zone
564 Guard Hill Road, Bedford
Owner/Applicant: **Nicholas Matfus & Gao Jing**

New Applications:

8:05 PM – 8:15 PM Restoration of Tennis Court and Drainage System
Section **60.18** Block **2** Lot **14**, **R-4A** Zone
33 Bedford Center Road, Bedford Hills
Owners: **Michael and Nellie Gilligan**
Applicant: **Jeri D. Barrett, R.L.A.**

8:15 PM – 8:25 PM Removal of Invasive Wetland Plant Species
Section **85.13** Block **1** Lot **11**, **R-4A** Zone
12 Twin Lakes Drive, Bedford
Owner: **Maria Pence**
Applicant: **Pennington Marchael, Landscape Architect**

Open Meetings and FOIL:

8:25 PM – 8:30 PM Update on Open Meetings and FOIL

Reports:

8:30 PM – 8:35 PM A – Status of Violations/Enforcement Actions
B – Town Wetland Official (Beth Evans) Monthly Report: Administrative Permits

Minutes to be Approved:

8:35 PM – 8:40 PM June 6, 2016

Supporting documentation for all items on this agenda is available at the Town of Bedford website. (www.bedfordny.gov)
Larger documents and plans are available at the office of the Wetlands Commission.

TOWN OF BEDFORD - WETLANDS CONTROL COMMISSION

Application for Permit

Identification of Owner(s):

Name(s) of owner(s) [as shown on Deed]: NICHOLAS MATFUS & GAO JING

Mailing Address: 564 GUARD HILL ROAD, BEDFORD, NY 10506

Phone: 6467614864 (home) _____ (work); Fax: _____ E-Mail: sjmatfus@nineKings.ne

Identification of Applicant (if other than owner(s)):

Name of Applicant: SAME AS OWNER

Mailing Address: _____

Phone: _____ (home) _____ (work); Fax: _____ E-Mail: _____

Professional Preparing Site Plan:

Name /Address: CRONIN ENGINEERING P.E. P.C., 39 ARLO LANE, CORTLANDT MANOR NY 105

_____ Phone: 914-736-3664 Fax: _____ E-Mail: KEITH@CRONINENGINEERING.N

Identification of Property:

Bedford Tax Map Designation: Section 84.5 Block 01 Lot 02 Area 4.111 ACRES

Zoning District: R-4A **Project Address:** 564 GUARD HILL ROAD

Approximate year of construction of any structure: 1996

Prior Applications/Other Applications (write "N/A" if not applicable; Project Cost):

Dates of any prior Wetlands Control Commission permits: N/A

Identify any other Town of Bedford approvals required: ZONING VARIANCE, WETLANDS, BUILDING PERMI

Identify any other governmental approvals required: NYS DEC - NOI

Project cost (including professional fees): 180,000.00

Project Description/Proposed Use (MUST BE DETAILED – Use Additional Pages if Needed):

INVOLVES ADDITION TO HOUSE, RECONSTRUCTED POOL DECK, NEW PATIO AREAS, WALKING DECK + DOCK, RE-DELINEATED DRIVEWAY

Proposed Project Start Date: FALL 2016 **Estimated Date of Completion:** FALL 2017

The owner(s) hereby give(s) permission to the Town of Bedford, its agents, servants and employees, including, without limit, members of the Wetlands Control Commission and consultants to the Town to enter upon the Property solely for the purposes incidental to the within application (including without limit, inspection of the project after completion) at reasonable times upon reasonable notice to the owner or tenant in possession, which notice may be by telephone. If the applicant is different than the owner(s), the owner(s) hereby approves this application and consents to the applicant acting as agent for the owner in submitting this application and the applicant accepts its designation as agent for the owner(s).

I/we affirm by the signatures below that I/we are the rightful legal owner(s) of the property herein described in this application.

ature of owner(s): NICHOLAS MATFUS Date: 5/4/2016

ers must sign *Print name/title:* _____

GAO JING Date: 5-4-2016

Print name/title: _____

cant (if different): _____ Date: _____

Print name/title: _____

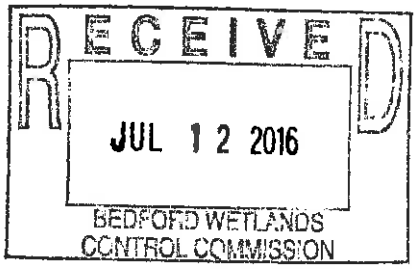
RECEIVED
MAY 6 2016
BEDFORD WETLANDS CONTROL COMMISSION

CRONIN
ENGINEERING P.E., P.C.
Professional Engineering & Consulting

39 Arlo Lane
Cortlandt Manor, NY 10567
T:(914) 736-3664 F:(914) 736-3593

July 11, 2016

Mr. Andrew Messinger, Chairman
Town of Bedford Wetlands Control Commission
425 Cherry Street
Bedford Hills, NY 10507



Re: ***Wetlands Permit Application***
Matfus Residence
564 Guard Hill Road

Dear Mr. Messinger and Members of the Wetlands Control Commission:

Find enclosed the following for the above referenced project:

1. Nine copies of the Wetland Mitigation Plan prepared by this office, dated as revised July 11, 2016.
2. Nine copies of the Architectural plans of the walkway and dock details.

The following is a description of the sewage treatment system for Matfus and the implications of expanding to a 6 bedroom residence for the current 4 bedroom layout:

The existing septic system serving the four bedroom residence located at 564 Guard Hill Rd in the Town of Bedford was constructed in 1988 under the Westchester County Department of Health (WCDH) Permit # B87-27. Based on a review of the WCDH file the septic system consists of a 1,250 gallon septic tank, 300 lineal feet of two foot wide tile fields, a pump chamber and an overflow seepage pit with a volume of approximately 1,500 gallons. The soil data on which the septic system was designed indicated a superior soil profile, i.e.; fine sands, and a soil percolation rate of less than 5 minutes per inch drop.

The current owner, Nicholas Matfus is considering increasing the size of the residence to become a six bedroom residence. At a minimum it will be necessary to add an additional septic tank that results in a total volume in excess of 1,800 gallons. In this case it is proposed to add one additional 1,000 gallon septic tank. The resulting septic tank capacity will then be 2,250 gallons. The new septic tank will be located outside the 100 ft. wetland buffer.

The WCDH code in effect at the time this residence was constructed required 250 LF of two foot wide tile fields to serve a four bedroom residence with a soil percolation rate of less than 5 minutes per inch drop. In 2002 the WCDH Code was modified to require 336 LF of two foot tile fields.

Currently the WCDH is proposing to modify their codes once again to require only 184 LF of two foot tile fields for a four bedroom residence. Based on discussion with the WCDH, Assistant Commissioner of Health, Paul Kutzy, PE, it is expected that this code revision will be adopted prior to the end of 2016. When this code revision is adopted, the required length of tile fields for a six bedroom residence will be 275 LF.

If the schedule outlined by Mr. Kutzy works for Mr. Matfus, no modifications to the tile field length, pumping cycle or overflow seepage pit will be required.

In the event Mr. Matfus would like to have the septic system upgraded to meet the current code requirements for a six bedroom residence a total of 500 LF of two foot wide tile fields are necessary. This additional footage would be added to the ends of each of the existing tile fields resulting in 5 runs each of 100 LF. If additional tile fields are proposed their installation would be in an area outside the 100 ft. wetland buffer. Additional soil testing in the proposed disposal area may also be required.

It would also be required to modify the current pump dosing volume and may very well require the replacement of the existing pump chamber with a larger pump chamber / overflow tank. Prior WCDH Code allowed for the overflow from the pump chamber, which would only occur during a pump failure, to discharge to an overflow seepage pit, as is currently the case. The current WCDH requirements do not permit this and would require the pump and emergency overflow volume be located within a single tank. If a new pump chamber is proposed, installation of the tank would be close to the 100 foot buffer line.

Based on the above, this office believes that the potential upgrades would be constructed outside of the wetland buffer.

In addition to the above, the wetland mitigation plan and Site Plan have been revised to show the following:

1. Monument markers will be placed approximately 20 feet on-center on the outside edge of the wetland mitigation line.
2. The planting plan has been revised and extended towards the edge of the pond in the location of the existing spruce trees.

Kindly review the enclosed information and place the application on the August 01, 2016 agenda. Should you have any questions or require additional information, please contact me at the above number. Thank you for your time and consideration in this matter.

Respectfully submitted,

Keith C. Staudohar
Cronin Engineering P.E. P.C.

cc: Nicholas Matfus w/ encl. via email
Armand Graham, RA w/ encl via email
Steve Coleman, w/ encl. via email

Bwcc-bedford-matfus-564 guard hill road-wetland commission-resubmission1-ks-20160711b.doc

Wetland and Wetland Buffer Monitoring & Maintenance Plan
Matfus Residence, 564 Guard Hill Road
July 11, 2016

1. Wetland Buffer Monitoring & Maintenance Plan

The purpose of the Wetland Buffer Monitoring & Maintenance Plan is to ensure that development in the wetland and wetland buffer including installation of a dock and walkway; maintaining new wetland mitigation plantings and existing vegetation; and management of invasive plant species; as shown on the drawings prepared by Cronin Engineering, dated last revised 07-11-16, does not compromise the functional integrity of the wetland buffer, and the resulting mitigation meets its stated goals as described in the final resolution adopted by the Bedford Wetland Control Commission (BWCC) (the "Permitee"):

2. Protocol for Commencement of Wetlands Buffer Monitoring & Maintenance Plan

a. Permittee shall implement the mitigation plan approved by the BWCC.

b. Following the installation of all wetland buffer mitigation in accordance with the final resolution and plans adopted by the BWCC, the Permittee shall submit two (2) copies of the following:

   i. Certification from a Licensed Landscape Architect or Environmental Consultant verifying the proper installation of all plants and materials in accordance with the approved BWCC resolution. The Landscape Architect or Environmental Consultant shall note any deficiencies in the installation of the plant materials or deviations from the approved resolution so that these can be corrected before final approval.

   ii. As-built plan prepared by a Licensed Landscape Architect, Engineer or Licensed Surveyor detailing the (1) specific locations of plantings and (2) number and species of individual plants.

c. The monitoring period shall begin with the review of all required submitted information/materials and final written approval by the Town's Environmental Consultant.

3. Assurances

a. All plantings and seed mixture applications in conjunction with the mitigation work shall be accomplished in accordance with the approved drawings and completed within the first growing season after site clean up is complete and topsoil is re-spread on the disturbed areas to be re-vegetated.

b. The Permittee shall ensure that all woody plants in conjunction with the wetlands buffer restoration mitigation plan shall have a minimum 85% survival of installed plants, which must be met or exceeded at the end of the 2nd (second) growing season following the initial planting/seeding. If the 85% survival rate is not met at the end of the second growing season, the Permittee shall take all necessary measures to ensure the level of survival by the end of the next growing season, including replanting and re-grading with topsoil, if necessary.

4. Monitoring Reports

a. The purpose of the mitigation monitoring and maintenance reports shall be to: (1) evaluate the progress of the establishment of the mitigation areas, (2) assess compliance with plant survival and plant condition requirements, and (3) identify those aspects of the mitigation areas that may require remediation by the Permittee in order to achieve the mitigation objectives.

b. Permittee shall submit the mitigation monitoring and maintenance reports prepared by a landscape architect or environmental professional annually no later than November 1st to the Town's Environmental Consultant for review.

c. Information for said reports shall be collected a minimum of seven times: (1) once prior to construction, (2) once immediately post construction, and (3) annually for five years post construction between the months of June 1st and September 1st.

d. Minimum Requirements of the Monitoring Reports:

i. Identification of the number of surviving approved woody plants and area coverage at the time of the observation. The report should detail the condition, vigor, size (dbh for trees and height for shrubs) of all planted material and compliance with approved PB resolution.

ii. Color photographs from established stations approved by the Environmental Consultant showing representative areas of the mitigation sites taken annually during the designated period defined above.

iii. An estimate of the vegetative cover at the mitigation sites, noting, in particular, areas which are bare of vegetation and/or locations where erosion and sedimentation are occurring; or where invasive plant species have become established. Aerial coverage of invasive plant species must be less than 15% of wetland buffer mitigation area.

iv. Detailed description of the overflow outlets noting any soil instability and/or erosion.

v. A qualitative analysis of the extent to which the mitigation has been successful. Said reports shall note areas of deficiencies and/or non-compliance and provide recommendations/measures to be taken to ensure continued success of the mitigation efforts and soil stabilization.

vi. Additional observations should be noted (e.g., observation of wildlife) and/or information as recommended by the Town's Environmental Consultant.

5. Completion of Monitoring Period

a. Final report submitted by Permittee and certified by landscape architect and/or environmental consultant.

b. The Town's Environmental Consultant will review the submittal material and perform an inspection of the site for conformance with the approved BWCC resolution and as-built plans. Upon review and inspection, Town's Environmental Consultant shall submit written approval of all compliance measures.

STEPHEN W. COLEMAN
ENVIRONMENTAL CONSULTING, LLC

Environmental Planning & Site Analysis
Wetland Mitigation & Restoration Plans
Wetland Delineation & Assessment
Natural Resource Management
Pond & Lake Management
Wildlife & Plant Surveys
Breeding Bird Surveys
Landscape Design

July 11, 2016

Mr. Andrew Messinger, Chairman
Bedford Wetlands Control Commission
425 Cherry Street
Bedford Hills, New York 10507

Re: Matfus Residence, 564 Guard Hill Road, Bedford, New York – Revised Wetland and Wetland Buffer Mitigation Measures, 5-year Wetland Monitoring and Maintenance Plan, Monumentation

Dear Mr. Messinger:

As per the BWCC meeting on June 6th, the proposed Site Development and Wetland Mitigation Plan has been revised to address comments provided from members of the BWCC. As discussed, the proposed plans for the Matfus Residence include several mitigation measures that are designed to reduce the overall amount of wetland and or wetland buffer disturbance and provide opportunities to improve the functional value of the wetland buffer. These changes include the following:

Existing Wetland and Wetland Buffer Disturbance

As previously noted, the parcel was developed in the 1980's and included development of the majority of the existing wetland buffer area. A majority of the house, the entire pool, pool patio, equipment and fencing are located within the wetland buffer. A stone boulder retaining wall was constructed to define the edge of disturbance for construction of the pool. A post and rail fence was installed along the edge of the wetland at the base of the slope and extends along the northern and western boundary of the wetland towards the existing residence to the southeast.

Proposed Improvements and New Wetland and Wetland Buffer Disturbance

The proposed improvements include re-locating the existing garage to the northwestern side of the existing residence, which will be accessed by a new gravel driveway and turnaround area, plus an on-grade flagstone patio. The new addition for the garage and patio will be located within the regulated wetland buffer. The existing garage area will be converted to living space.

Proposed Wetland and Wetland Buffer Mitigation Measures

- The existing pool currently does not provide any water quality treatment for winter draw down or other situations where temporary draw down of pool volume is required. Draw down from the pool will now be directed into a stormwater treatment practice that will treat at a minimum 20% of the pool volume. This will allow the water to be stored and treated prior to release towards the pond.

- The existing pool equipment and propane tanks that are located within the wetland buffer will be relocated further away from the wetland and placed in the area of the existing electrical transformer pad area. The propane tanks will be buried in the front of the property outside of the wetland buffer. The equipment area will be screened as needed to buffer potential noise within the buffer.

- The runoff from the proposed addition for the garage and new patio area will be conveyed to properly designed stormwater practices to comply with NYSDEC standards. In addition, a large portion of the existing driveway will be removed and converted to lawn surface.

- The existing debris pile located in the northwestern corner of the wetland will be removed and the area restored with new wetland plantings as needed.

- The existing stone boulder retaining wall that contains the pool area will now serve as the limit of disturbance. The buffer area below the stone boulder wall that currently consists of lawn grasses will be restored to native buffer area. This will include removal of lawn turf and re-planting will native ground covers. The existing fencing will be removed and relocated on top of the stone boulder wall to serve as fencing for the existing pool and patio area.

- The proposed patio around the pool will consist of lawn and stone pavers with separation to allow for natural infiltration of runoff.

- The proposed walkway and dock will be slightly elevated above the surface to minimize compaction within the wetland. Disturbance will be restricted to footings for placing of the boardwalk and dock planking.

- Existing lawn that is along the edge of the wetland will be removed and the area replanted with a combination of native trees, shrubs and herbaceous ground covers. Approximately 35 feet of the wetland buffer along the edge of the existing pond will be restored to natural buffer area.

- The northern property line will be supplemented with shrub plantings to offset the impact of paddocks located to the property line from the adjacent parcel. The addition of a shrub layer will buffer the impacts and provide a better functioning edge to the existing pond.

- As part of the restoration effort, existing invasive species including multi-flora rose, honeysuckle and purple loosestrife will be removed from the pond edge.

Proposed Wetland Mitigation Plan

Please refer to Wetland Mitigation Plan as prepared by Cronin Engineering last revised 07-11-16 for specific details. As requested, the planting plan has been extended towards the eastern side of the pond and blended into an area of existing trees and shoreline vegetation. The newly restored wetland buffer along the pond edge will enhance the functional value of the wetland buffer in closest proximity to the pond edge. The mitigation includes extensive plantings of trees, shrubs, perennials and ground covers that will create an effective vegetative filter strip, and provide opportunities for habitat improvement, water quality maintenance and nutrient retention. Temporary deer netting will be installed around the perimeter of new plantings to allow plants to become successfully established.

Monuments have been added at 20 foot intervals along the outer edge of the wetland buffer mitigation planting plan, and are shown on the Wetland Mitigation Plan.

Proposed 5- Year Wetland Mitigation and Monitoring Plan and Proposed Mitigation Estimate

Attached is a 5-year wetland mitigation and monitoring plan that follows recommended protocols. The estimated cost for implementation of the proposed wetland and wetland buffer mitigation planting plan is 24,875.00. This estimate includes plant materials, labor for removal of invasive plant species and planting, and installation of temporary deer netting.

We are requesting that the BWCC consider granting a four (4) year Wetland Permit to allow the homeowner to phase in the required mitigation measures. It is anticipated that the wetland buffer mitigation measures will be completed over a three (3) year period.

Proposed Dock and Walkway

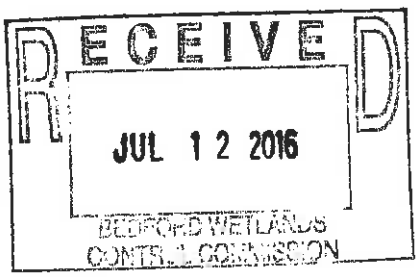
The project architect has prepared details on the proposed dock and walkway that are included with this submission. The proposed wood walkway and dock will consist of environmentally friendly wood products that will be slightly elevated from the existing ground surface. Within the wetland edge and pond, a series of footings will be installed to anchor the proposed dock. The dock will also be constructed with certified wood products that are free of known contaminants. During construction, a very narrow limit of disturbance on both sides of the walkway and dock will be created to minimize disturbance to existing wetland. Any disturbed areas will be immediately re-planted upon completion of walkway and dock.

We look forward to discussing the merits of this project with the Wetlands Control Commission at its August 1st meeting. Please let me know if you have any questions or require any additional information.

Sincerely,

Stephen W. Coleman

Stephen W. Coleman
Principal
SWC/tbh
cc: N. Matfus
A.Graham, R.A.
Cronin Engineering



STEPHEN W. COLEMAN
ENVIRONMENTAL CONSULTING, LLC

Environmental Planning & Site Analysis
Wetland Mitigation & Restoration Plans
Wetland Delineation & Assessment
Natural Resource Management
Pond & Lake Management
Wildlife & Plant Surveys
Breeding Bird Surveys
Landscape Design

June 5, 2016

Mr. Andrew Messinger, Chairman
Bedford Wetlands Control Commission
425 Cherry Street
Bedford Hills, New York 10507

Re: Matfus Residence, 564 Guard Hill Road, Bedford, New York – Proposed Wetland and Wetland Buffer Mitigation Measures

Dear Mr. Messinger:

As per the BWCC field site visit on 05-19-16, the project team has taken your recommendations into consideration and have prepared a revised site plan that includes several mitigation measures in an effort to reduce the amount of wetland and or wetland buffer disturbance. These changes include the following:

Existing Wetland and Wetland Buffer Disturbance

As previously noted, the parcel was developed in the 1980's and included development of the majority of the existing wetland buffer area. A majority of the house, the entire pool, pool patio, equipment and fencing are located within the wetland buffer. A stone boulder retaining wall was constructed to define the edge of disturbance for construction of the pool. A post and rail fence was installed along the edge of the wetland at the base of the slope and extends along the northern and western boundary of the wetland towards the existing residence to the southeast.

Proposed Improvements and New Wetland and Wetland Buffer Disturbance

The proposed improvements include re-locating the existing garage to the northwestern side of the existing residence, which will be accessed by a new gravel driveway and turnaround area, plus an on-grade flagstone patio. The new addition for the garage and patio will be located within the regulated wetland buffer. The existing garage area will be converted to living space.

Proposed Wetland and Wetland Buffer Mitigation Measures

- The existing pool currently does not provide any water quality treatment for winter draw down or other situations where temporary draw down of pool volume is required. Draw down from the pool will now be directed into a stormwater treatment practice that will treat at a minimum 20% of the pool volume. This will allow the water to be stored and treated prior to release towards the pond.

- The existing pool equipment and propane tanks that are located within the wetland buffer will be relocated further away from the wetland and placed in the area of the existing electrical transformer pad area. The propane tanks will be buried in the front of the property outside of the wetland buffer. The equipment area will be screened as needed to buffer potential noise within the buffer.

- The runoff from the proposed addition for the garage and new patio area will be conveyed to properly designed stormwater practices to comply with NYSDEC standards. In addition, a large portion of the existing driveway will be removed and converted to lawn surface.

- The existing debris pile located in the northwestern corner of the wetland will be removed and the area restored with new wetland plantings as needed.

- The existing stone boulder retaining wall that contains the pool area will now serve as the limit of disturbance. The buffer area below the stone boulder wall that currently consists of lawn grasses will be restored to native buffer area. This will include removal of lawn turf and re-planting will native ground covers. The existing fencing will be removed and relocated on top of the stone boulder wall to serve as fencing for the existing pool and patio area.

- The proposed patio around the pool will consist of lawn and stone pavers with separation to allow for natural infiltration of runoff.

- The proposed walkway and dock will be slightly elevated above the surface to minimize compaction within the wetland. Disturbance will be restricted to footings for placing of the boardwalk and dock planking.

- Existing lawn that is along the edge of the wetland will be removed and the area replanted with a combination of native trees, shrubs and herbaceous ground covers. Approximately 35 feet of the wetland buffer along the edge of the existing pond will be restored to natural buffer area.

- The northern property line will be supplemented with shrub plantings to offset the impact of paddocks located to the property line from the adjacent parcel. The addition of a shrub layer will buffer the impacts and provide a better functioning edge to the existing pond.

- As part of the restoration effort, existing invasive species including multi-flora rose, honeysuckle and purple loosestrife will be removed from the pond edge.

Proposed Planting – Species, quantities and locations:

Please refer to Site Plan which shows approximate layout of proposed mitigation planting plan, plant list and quantities.

Summary

The proposed improvements will not result in a net increase in impervious surfaces. Existing and impervious surfaces including pool draw-down, will be captured and treated via stormwater practices, which will help to off-set disturbances within the wetland buffer. The proposed wood walkway and dock will consist of environmentally friendly wood products that will be slightly elevated from the existing ground surface. Within the wetland edge and pond, a series of footings will be installed to anchor the proposed dock. The dock will also be constructed with certified wood products that are free of known contaminants. Sections of the wetland and wetland buffer are proposed to be restored and enhanced via removal of debris, invasive species and lawn grasses. New native plantings will be added along the wetland edge to provide better quality habitat and attractiveness to resident wildlife species.

We look forward to discussing the merits of this project with the Wetlands Control Commission at its June meeting. Please let me know if you have any questions or require any additional information.

Sincerely,

Stephen W. Coleman

Stephen W. Coleman
Principal
SWC/tbh
cc: N. Matfus
A.Graham, R.A.
Cronin Engineering

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May 05, 2016

Mr. Andrew Messinger, Chairman
Town of Bedford Wetlands Control Commission
425 Cherry Street
Bedford Hills, NY 10507

Re: ***Wetlands Permit Application***
Matfus Residence
564 Guard Hill Road

Dear Mr. Messinger and Members of the Wetlands Control Commission:

Find enclosed the following for the above referenced project:

1. Application fee of $200.
2. Escrow check for $500.
3. Nine copies of the Application Form.
4. Nine copies of the Wetland Permit Application package.
5. Nine copies of the EAF.
6. One copy of the property deed.
7. Nine copies of the property survey.
8. Nine copies of the report from the Applicant's Environmental Consultant.
9. Nine copies of the Site Development Plan prepared by this office, dated May 03, 2016.
10. Nine copies of the Architectural plans (11x 17).

This project involves proposed improvements to the property located at 564 Guard Hill Road. The improvements include an addition to the existing residence, the removal of a portion of the existing driveway, a new pool patio/deck, the replacement of a deck with a patio and the addition of a walking deck and dock platform at the pond. Some of the improvements will take place within the limiting distance of 100 feet from a Town regulated wetland as well as NYSDEC regulated Freshwater Wetland K-5 and the walking deck and dock platform will occur within the wetland boundary.

The project site currently contains many improvements within 100 foot wetland buffer which include the swimming pool and existing deck, the eastern half of the house, a shed, walkways and decks/patios, pool equipment among other minor items. These items have been there for over 20 years.

Since some of the improvements are located within the regulated areas, the Applicant has provided a wetland mitigation plan which is referenced on the Site Development Plan.

Kindly review the enclosed information and place the application on the June 06, 2016 agenda. Should you have any questions or require additional information, please contact me at the above number. Thank you for your time and consideration in this matter.

Respectfully submitted,

Keith C. Staudohar
Cronin Engineering P.E. P.C.

cc: Nicholas Matfus w/ encl.
Armand Graham, RA
Steve Coleman, w/ encl.

Bwcc-bedford-matfus-564 guard hill road-wetland commission-submission1-ks-20160505.doc

617.20
Appendix B
Short Environmental Assessment Form

Instructions for Completing

Part 1 - Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 - Project and Sponsor Information

Nicholas Matfus

Name of Action or Project:

Wetland Permit for Matfus Site Development Plan

Project Location (describe, and attach a location map):

564 Guard Hill Road, Town of Bedford

Brief Description of Proposed Action:

Proposed addition to an existing house and a new patio around existing in ground swimming pool along with a walking deck to a dock, new patios and driveway modifications. There is work to be performed within the 100' wetland buffer and minor work (proposed dock) proposed within the wetland.

Name of Applicant or Sponsor:	Telephone: 646-761-4864
Nicholas Matfus	E-Mail: keith@croninengineering.net

Address:

564 Guard Hill Road, Tax Map ID Section: 84.5; Block: 02; Lot: 03

City/PO:	State:	Zip Code:
Town of Bedford	**NY**	**10506**

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☑	☐
2. Does the proposed action require a permit, approval or funding from any other governmental Agency? If Yes, list agency(s) name and permit or approval: **Town of Bedford - Wetland Permit, ZBA variance, Building Permit, NYSDEC Stormwater NOI**	☐	☑

3.a. Total acreage of the site of the proposed action? **4.111** acres
b. Total acreage to be physically disturbed? **+-0.17** acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? **4.111** acres

4. Check all land uses that occur on, adjoining and near the proposed action.
☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☐ Commercial ☑ Residential (suburban)
☑ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): _____
☐ Parkland

	NO	YES	N/A
5. Is the proposed action, a. A permitted use under the zoning regulations? **Area Variance required for house addition**	☑	☐	☐
b. Consistent with the adopted comprehensive plan?	☐	☑	☐
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑	
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: **Geographic area overlaying aquifer**	☐	☑	
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐	
b. Are public transportation service(s) available at or near the site of the proposed action?	☑	☐	
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☑	☐	
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies:	☐	☑	
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: **Potable water on site via existing drilled well.**	☑	☐	
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: **Wastewater treatment via existing sewage treatment system.**	☑	☐	
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☑	☐	
b. Is the proposed action located in an archeological sensitive area?	☐	☑	
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑	
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody? If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: **house addition, pool patio within 100' buffer, approximately 5,819 sq ft or 0.13 acres** **walking deck and dock within wetland, approximately 503 sq ft or 0.01 acres**	☐	☑	

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:
☐ Shoreline ☑ Forest ☐ Agricultural/grasslands ☐ Early mid-successional
☑ Wetland ☐ Urban ☐ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☑	☐
16. Is the project site located in the 100 year flood plain?	☐	☑
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes, a. Will storm water discharges flow to adjacent properties? ☑ NO ☐ YES	☐	☑
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: ☑ NO ☐ YES	☐	☑

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	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size: _____	☑	☐
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe: _____	☑	☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe: _____	☑	☐

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: Cronin Engineering P.E. P.C. / Keith Standohar Date: 05-03-16

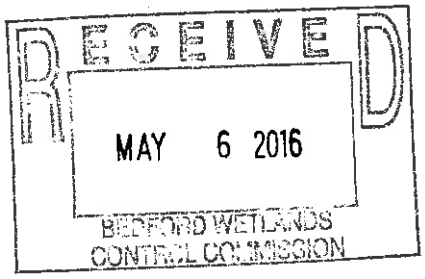
Signature: _____

Part 2 - Impact Assessment. The Lead Agency is responsible for the completion of Part 2. Answer all of the following questions in Part 2 using the information contained in Part 1 and other materials submitted by the project sponsor or otherwise available to the reviewer. When answering the questions the reviewer should be guided by the concept "Have my responses been reasonable considering the scale and context of the proposed action?"

	No, or small impact may occur	Moderate to large impact may occur
1. Will the proposed action create a material conflict with an adopted land use plan or zoning regulations?	☐	☐
2. Will the proposed action result in a change in the use or intensity of use of land?	☐	☐
3. Will the proposed action impair the character or quality of the existing community?	☐	☐
4. Will the proposed action have an impact on the environmental characteristics that caused the establishment of a Critical Environmental Area (CEA)?	☐	☐
5. Will the proposed action result in an adverse change in the existing level of traffic or affect existing infrastructure for mass transit, biking or walkway?	☐	☐
6. Will the proposed action cause an increase in the use of energy and it fails to incorporate reasonably available energy conservation or renewable energy opportunities?	☐	☐
7. Will the proposed action impact existing: a. public / private water supplies?	☐	☐
b. public / private wastewater treatment utilities?	☐	☐
8. Will the proposed action impair the character or quality of important historic, archaeological, architectural or aesthetic resources?	☐	☐
9. Will the proposed action result in an adverse change to natural resources (e.g., wetlands, waterbodies, groundwater, air quality, flora and fauna)?	☐	☐

	No, or small impact may occur	Moderate to large impact may occur
10. Will the proposed action result in an increase in the potential for erosion, flooding or drainage problems?	☐	☐
11. Will the proposed action create a hazard to environmental resources or human health?	☐	☐

Part 3 - Determination of significance. The Lead Agency is responsible for the completion of Part 3. For every question in Part 2 that was answered "moderate to large impact may occur", or if there is a need to explain why a particular element of the proposed action may or will not result in a significant adverse environmental impact, please complete Part 3. Part 3 should, in sufficient detail, identify the impact, including any measures or design elements that have been included by the project sponsor to avoid or reduce impacts. Part 3 should also explain how the lead agency determined that the impact may or will not be significant. Each potential impact should be assessed considering its setting, probability of occurring, duration, irreversibility, geographic scope and magnitude. Also consider the potential for short-term, long-term and cumulative impacts.



☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action may result in one or more potentially large or significant adverse impacts and an environmental impact statement is required.

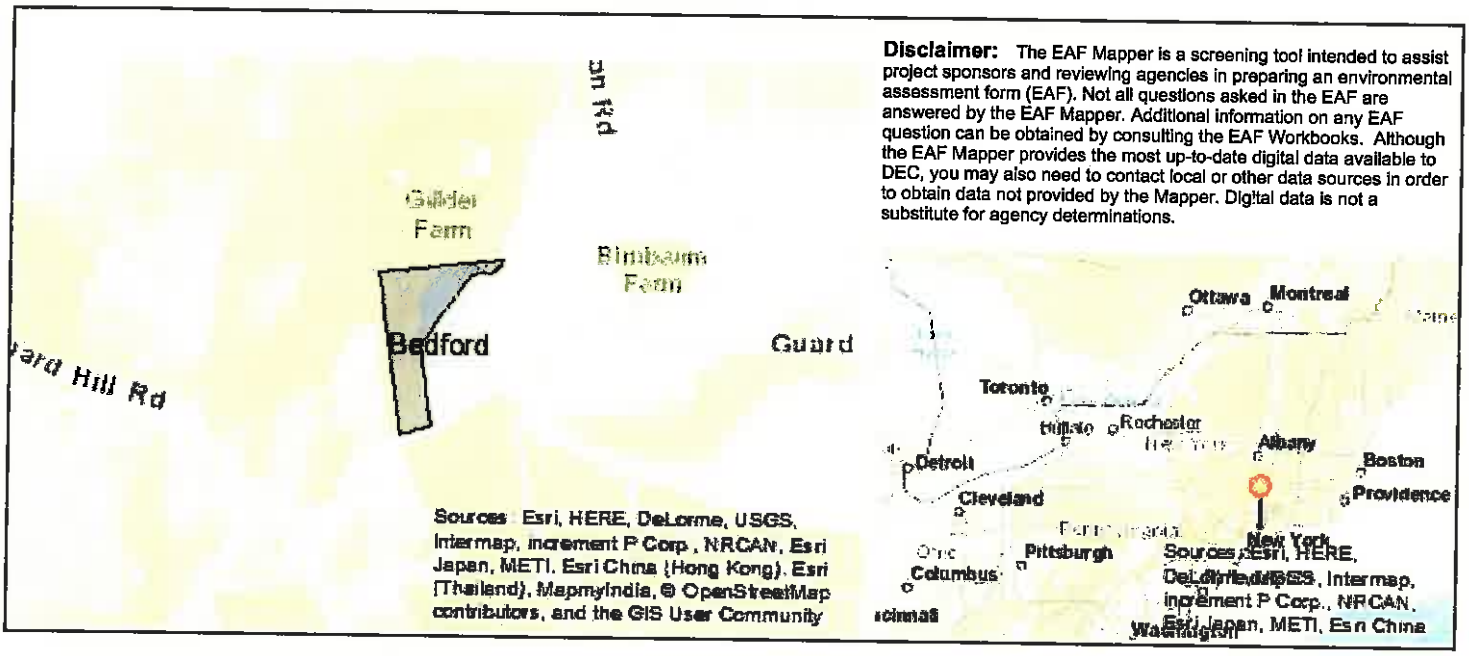
☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action will not result in any significant adverse environmental impacts.

Town of Bedford Wetlands Control Commission	**05-03-16**
Name of Lead Agency	Date
Print or Type Name of Responsible Officer in Lead Agency	Title of Responsible Officer
Signature of Responsible Officer in Lead Agency	Signature of Preparer (if different from Responsible Officer)

PRINT

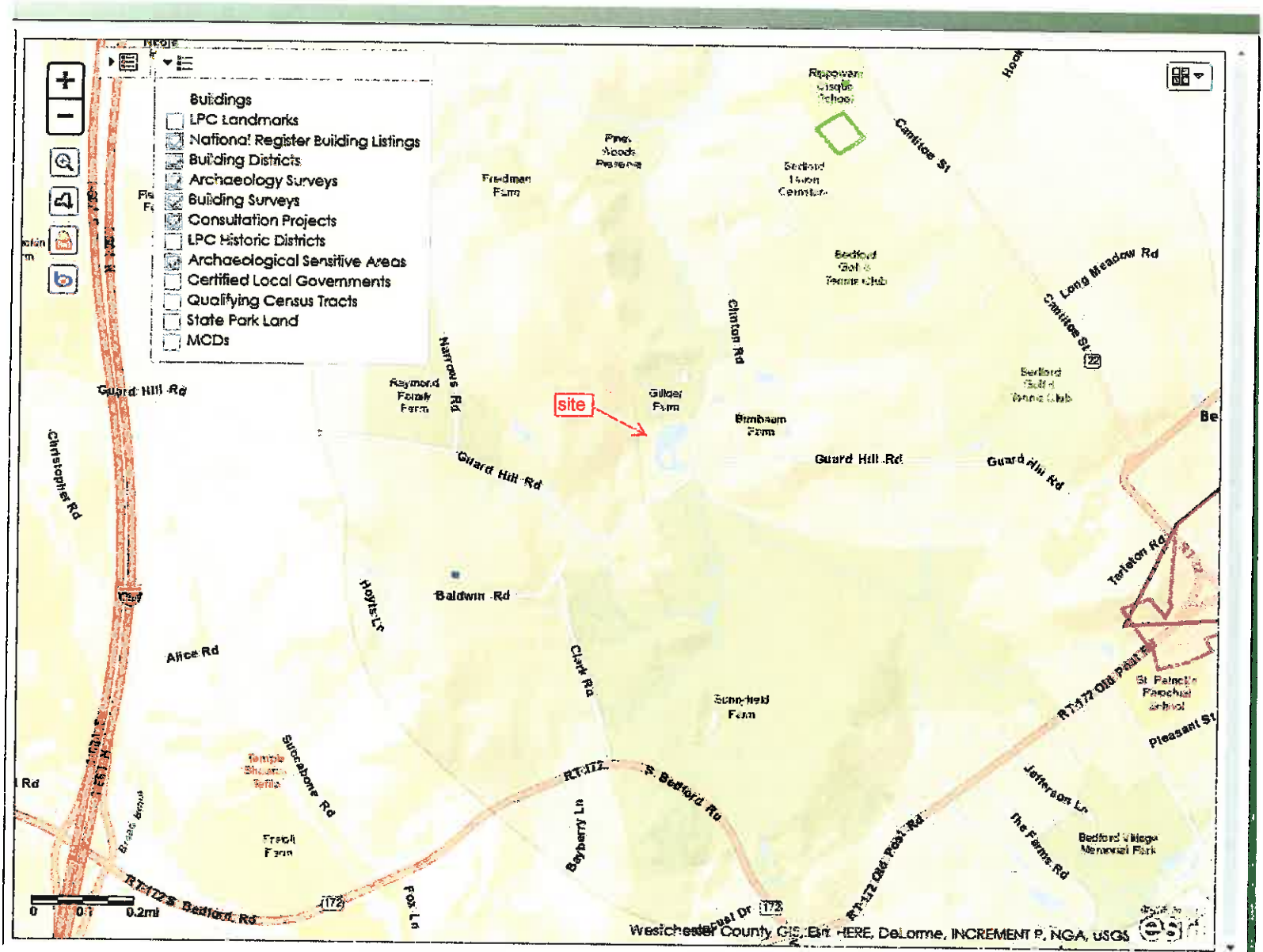
EAF Mapper Summary Report

Monday, May 02, 2016 11:22 AM



Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.

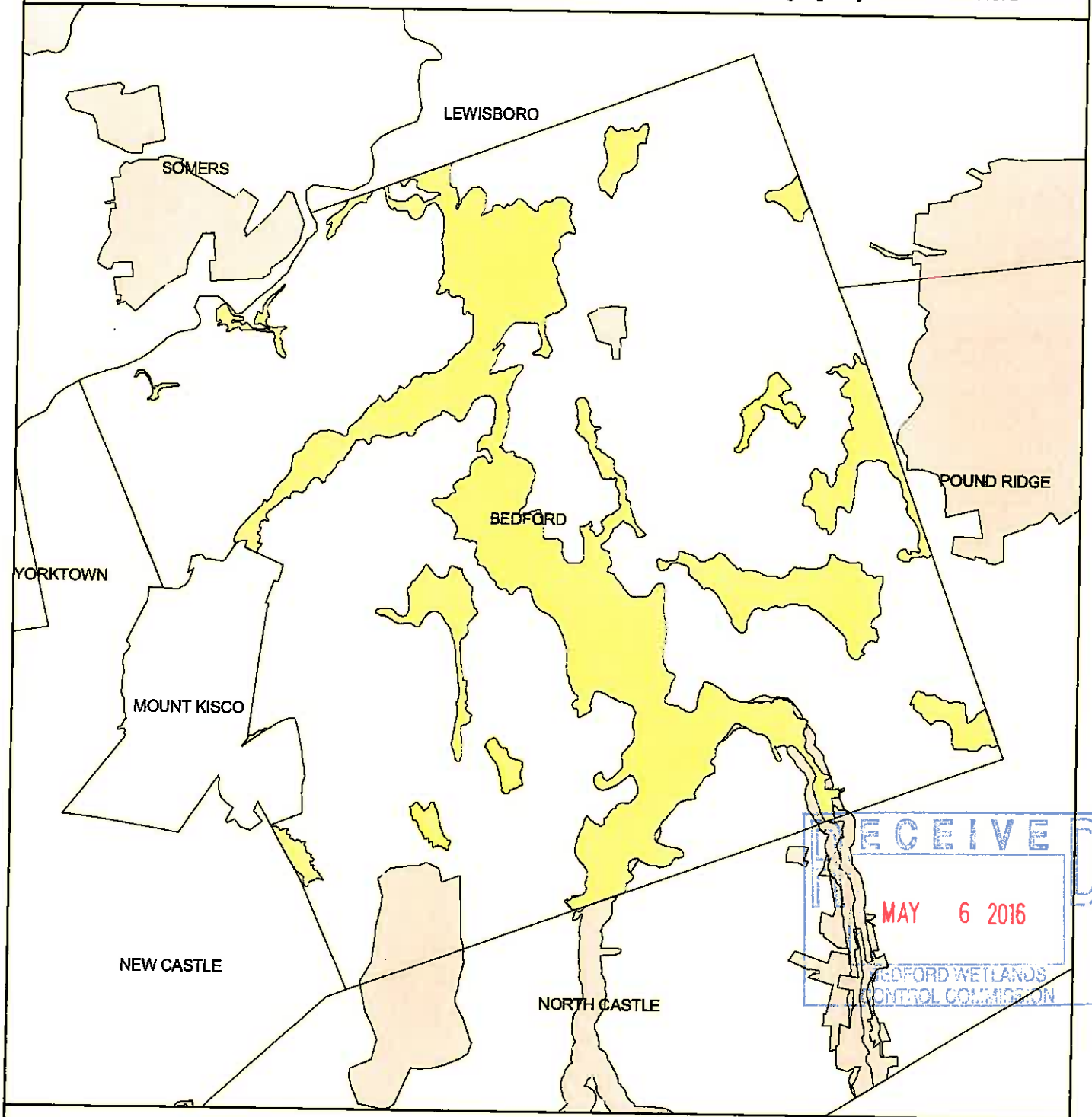
Part 1 / Question 7 [Critical Environmental Area]	Yes
Part 1 / Question 7 [Critical Environmental Area - Identify]	Name:Geographic Area Overlaying Aquifer, Reason:Exceptional or unique character, Agency:Bedford, Town of, Date:11-3-84
Part 1 / Question 12a [National Register of Historic Places]	No
Part 1 / Question 12b [Archeological Sites]	Yes
Part 1 / Question 13a [Wetlands or Other Regulated Waterbodies]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
Part 1 / Question 15 [Threatened or Endangered Animal]	No
Part 1 / Question 16 [100 Year Flood Plain]	Yes
Part 1 / Question 20 [Remediation Site]	No



Geographic Area Overlaying the Aquifer Within Town Critical Environmental Area (CEA)

Effective Date of Designation: 11-03-84

Designating Agency: Town of Bedford



Legend

- Geographic Area Overlaying the Aquifer Within Town CEA
- Adjacent CEA

0 0.375 0.75 1.5 2.25 Miles

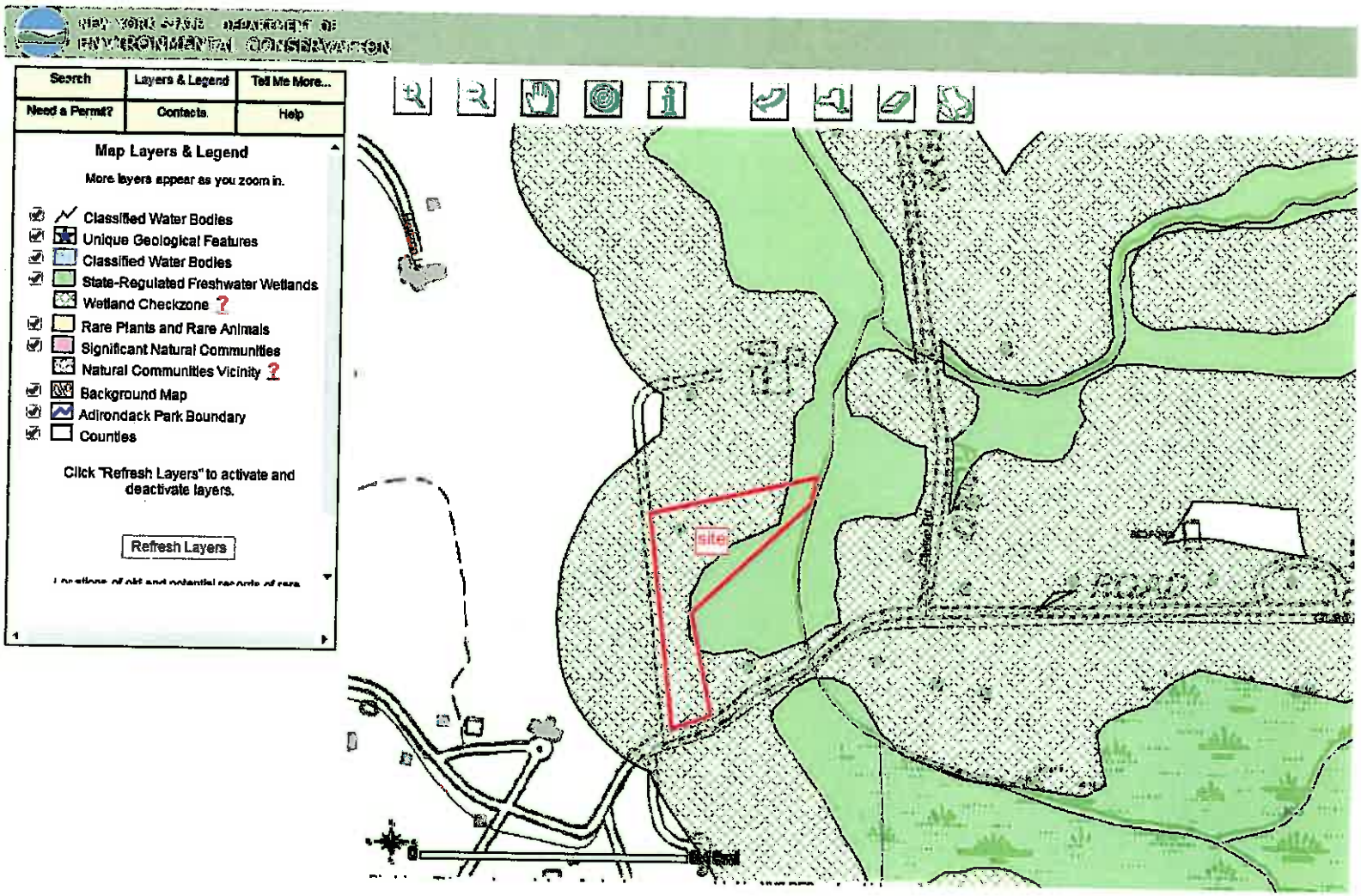
1 inch equals 1.25 miles

For Adjacent CEAs see map:
Mianus Gorge Preserve CEA
Byram Lake CEA
Mianus River CEA
County & State Park Lands CEA
County Designated Watershed Properties CEA
All Land 500' Peripheral to Amawalk Reservoir Boundary CEA

®

Base Map: Town or City Boundary for New York State

Disclaimer: This map was prepared by the New York State Department of Environmental Conservation using the most current data available. It is deemed accurate but is not guaranteed. NYS DEC is not responsible for any inaccuracies in the data. Please contact the designating authority for additional information regarding legal boundary descriptions.



STEPHEN W. COLEMAN
ENVIRONMENTAL CONSULTING.

Environmental Planning & Site Analysis
Wetland Mitigation & Restoration Plans
Wetland Delineation & Assessment
Natural Resource Management
Pond & Lake Management
Wildlife & Plant Surveys
Breeding Bird Surveys
Landscape Design

May 03, 2016

Mr. Andrew Messinger, Chairman
Bedford Wetlands Control Commission
425 Cherry Street
Bedford Hills, New York 10507

Re: Matfus Residence, 564 Guard Hill Road, Bedford, New York - Wetland/Watercourse Investigation and Delineation, Evaluation and Functional Assessment of Pond and Adjacent Wetland Features, Proposed Addition and Site Improvements, Proposed Restoration, Enhancement and Mitigation of Wetland and Wetland Buffer Areas

Dear Mr. Messinger:

As part of the proposed improvements for the property at 564 Guard Hill Road, I have completed a wetland delineation and performed a site analysis of potential impacts to existing wetland resources that are present on the property. The environmental assessment included investigation and determination of all wetland and watercourse resources present on the subject property, completion of a wetland functional assessment, evaluation of proposed wetland and wetland buffer impacts, and recommendations regarding mitigation measures for disturbances within regulated wetland and wetland buffer areas.

The subject property contains local wetlands that are part of NYSDEC wetlands (K-5) that consist of an existing pond and fringe riparian and forested wetland system. The letter is in support of a wetland permit application submitted to the Bedford Wetlands Control Commission.

Existing Conditions

The property was originally Lot # 1 of a Subdivision that was approved in 1986. At the time of approval, the property was developed as a single family residential home that included an in-ground pool and patio, on-site septic system and several ancillary structures and improvements. Several of the improvements at that time were approved within the regulated wetland buffer area. The wetland boundary referenced in 1986 was the edge of the existing pond. Restrictions were placed on portions of the parcel along Guard Hill Road that prevented the construction of any additional structures. The driveway access is provided off a shared easement with the adjacent parcel to the west.

The majority of the residence and the entire pool and patio, shed and pool equipment and fencing are located within the regulated wetland buffer. A large percentage of the wetland buffer area adjacent to the pond has been converted to residential lawn and landscaped areas. Along the wetland edge, several invasive clumps of multi-flora rose and Japanese stilt grass have become established. The northeastern corner of the wetland has been used to dump excess lawn related debris. Existing trees on the property consist of remnant upland wooded species and planted ornamental trees. The wetland extends onto adjacent parcels to the north, east and southern side of the parcel.

Wetland Delineation

Wetlands and watercourses on the subject property were flagged on January 22, 2016 in accordance with the Freshwater Wetlands Code of the Town of Bedford, NY, and supplemented by the technical

criteria as outlined in the 1995 NYSDEC Freshwater Wetlands Manual. Vegetation, soils and hydrological parameters were used to determine the outer wetland boundary limits. The wetland/upland boundary was field determined and pink surveyors flagging labeled "Wetland Boundary" were hung on vegetation along the respective boundary. Due to the topography and recent developments along the perimeter, the wetland boundary is distinct and well defined. The site was visited in April, 2016 during the growing season to re-confirm that the wetland boundary accurately represents existing field conditions.

One wetland system was located on the property and includes a large pond and riparian wetland system. The wetland extends onto adjacent properties to the north and east of the parcel and includes a meandering watercourse and remnant forested and open water wetland areas. A large percentage of the wetland had previously been converted to an open water pond that has since filled in along the edges with riparian obligate wetland plants. Sections of the wetland with higher topographic relief consist of a combination of native and invasive shrub species. The pond depth appears to be shallow and range from 3-6 feet. Sections of the eastern pond edge have become dominated by phragmites grass and other invasive plant species. The southern end of NYSDEC wetland K-5 is where the pond was historically created. Ownership of the pond is shared with the adjacent neighbor to the southeast. The section of the wetland to the north of the parcel consists of a residential property that has previously converted the wetland buffer to extensive and well maintained horse paddocks.

Several obligate wetland plants were observed and include red maple, American elm, willow and cottonwood trees. The shrub layer includes silky dogwood, winterberry, arrowood viburnum, swamp azalea, gray dogwood and willow. The emergent layer is dominated by tussock sedge, skunk cabbage, phragmites grass, common rush, and lake sedge. Several invasive plant species have become well established within the shrub and ground layers within the wetland proper and buffer area. Dominant species include multi-flora rose, Japanese stilt grass, garlic mustard, wineberry, reed canary grass and oriental bittersweet.

Hydric soils were present and included solid organic soils with a histic epipedon layer. Soils were inundated or saturated at the surface. Hydrological features included standing water, inundation at or near the surface, positive water flows and drainage patterns, and water-stained leaves. The outer boundary of the wetland closest to the subject property was flagged with flag numbers A-01 (a-c) to A-11. The wetland boundary followed the bottom of the slope and clear topographic break present along the edge of the pond and the residential portion of the property. An existing post and rail fence with wire is installed along the outer boundary of the wetland.

Wetland Functional Assessment

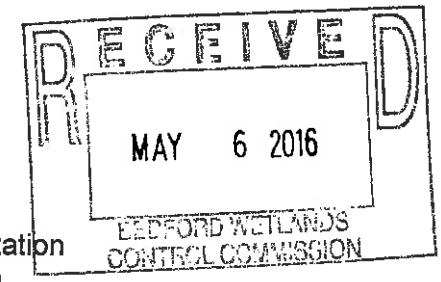
A functional assessment was completed on April 22, 2016. The wetlands located on the property consist of a combination of an open water pond and remnant forested wetland complex. The pond is an extension of the larger wetland complex from the adjoining property to the northeast.

The wetlands were evaluated according to "A Rapid Procedure for Assessing Wetland Functional Capacity" by Magee and Hollands, 1998. This particular method is based on the Hydrogeomorphic Classification system (HGM) as developed by the Army Corps of Engineers. The wetlands on the property are classified as a forested watercourse complex that generally drains from a north to south direction. The wetlands on the property are classified as a depressional wetland (pond). The watercourse within the wetland complex off of the property to the northeast would be classified as a Slope wetland.

This model examines the functions and values of freshwater wetlands based upon biological characteristics, landscape position, geology, hydrology and vegetation present. The majority of the

wetland system occurs on slopes ranging from 1% to 10%. Within the model, several key attributes of wetlands are evaluated that relate to specific wetland values and functions, including:

- Modification of groundwater discharge
- Modification of groundwater recharge
- Storm and flood-water storage
- Modification of stream flow
- Modification of water quality
- Export of detritus
- Contribution to abundance and diversity of wetland vegetation
- Contribution to abundance and diversity of wetland fauna



The above functions are evaluated based upon the existing site conditions that are present within the wetland area. The data collected is used to evaluate the functional capacity of the existing wetland (rated from 0 to 1), and allows the investigator to make preliminary planning decisions on wetland functions and values as it related to future conditions and proposed changes. Functions are rated low to high with low levels 0 to 0.33, moderate levels from 0.34 to 0.66, and high levels from 0.67 to 1.0.

The wetland complex consisted of two HGMs: 1.) A depressional wetland consisting of the pond and 2.) slope wetlands consisting of the watercourse within the larger forested wetland complex located off-site on adjacent parcels. These HGMs were evaluated based upon the depressional and sloped wetland characteristics and criteria. Each of the functions performed by these HGMs is briefly described below. This discussion is based on the wetland assessment model scores achieved from collecting site-specific data on the wetland system. The scores represent the potential for this wetland type to perform that specific function. It is important to evaluate the data based upon the size of the wetland, its landscape setting and not just the numerical scores. The wetland functional model scores have been summarized in the tables below.

Depressional Wetland - Pond – Functional Model Scores Summary

WETLAND FUNCTION	RANGE	SITE-SPECIFIC SCORE	FUNCTIONAL CAPACITY INDEX (FCI)
Modification of Groundwater Discharge	3-18	12	0.66
Modification of Groundwater Recharge	4-21	12	0.57
Storm and Flood Water Storage	4-27	15	0.55
Modification of Stream Flow	1-9	6	0.67
Modification of Water Quality	4-18	16	0.89
Export of Detritus	5-18	13	0.72
Contribution to Abundance and Diversity of Wetland Vegetation	2-15	11	0.73
Contribution to Abundance and Diversity of Wetland Fauna	4-33	26	0.72

Slope Wetland – watercourse/wetland complex off-site- Functional Model Scores Summary			
WETLAND FUNCTION	**RANGE**	**SITE-SPECIFIC SCORE**	**FUNCTIONAL CAPACITY INDEX (FCI)**
Modification of Groundwater Discharge	2-15	11	0.73
Modification of Groundwater Recharge	N/A	N/A	N/A
Storm and Flood Water Storage	4-21	12	0.57
Modification of Stream Flow	1-9	6	0.67
Modification of Water Quality	3-15	13	0.87
Export of Detritus	4-15	8	0.53
Contribution to Abundance and Diversity of Wetland Vegetation	2-15	11	0.73
Contribution to Abundance and Diversity of Wetland Fauna	4-33	28	0.78

Description of Functional Summary Scores (for both wetland types):

Modification of Groundwater Discharge

Depressional wetlands collect surface and groundwater from many directions and may or may not have specific outlets. The pond serve as a depressional wetland and can collect and discharge groundwater on the site. The wetland model scores for this function of the depressional wetland are considered moderate (66%). Off-site Slope wetlands serve as areas that discharge groundwater (water intersecting the land surface). The slope wetland areas are a combination of a sloping hillside intermittent watercourse which collects water from characteristics such as seasonal hillside seeps, and springs where the groundwater emerges at the surface and is transmitted as surface flows. The wetland model scores for this function are considered moderate to high (73%).

Modification of Groundwater Recharge

Depressional wetlands on glacial till can often intercept with groundwater and function in groundwater recharge. The open pond wetland model scores for this function are considered moderate (57%). Consistent with the HGM model for sloped wetlands, this area of the wetland is not capable of modifying groundwater recharge.

Storm and Flood Water Storage

Depressional wetlands are often good sources for retaining and detaining storm and flood water. The open depressional pond collects water and stores it before it leaves via evaporation and via an intermittent outlet to the northeast. In general, slope wetlands do not typically provide for storm and floodwater storage but the intermittent flow of the watercourse may permit some temporary storm and floodwater storage. The pond size does increase the ability of this type of wetland to serve a higher

degree of storm and flood water storage. The wetland model scores for this function are shown to be at moderate levels (55% and 57% respectively).

Modification of Stream Flow

The sloping watercourse helps to modify the outlet stream flow and provide preliminary storage and treatment. The open pond's storage of storm and flood waters does serve to modify stream flow, due to its storage capacity. The wetland model scores were considered high (67%) for the depressional ponds and also for the sloping wetlands (67%) for this function.

Modification of Water Quality

To modify water quality requires the wetland to be able to trap and dissolve sediments and other elements that are transported from surface water flows. The pond allows settling of sediments and other debris, so their does exist a greater ability to modify water quality. The pond and wetland's ability at storm and flood water retention allows for sediments to settle and biochemical transformations to occur thus increasing the water quality potential. As a result, the wetland model scores were high for this function for both the depressional pond and the sloping wetlands (89% and 87% respectively).

Export of Detritus

The depressional pond does provide the potential for some export of detritus during larger storm events. The outlet height regulates the amount of detritus that may leave the site. The wetland model scores for this wetland function were moderate to high (72%). The hillside seepage and watercourse channels normally transport detritus more rapidly, but the intermittent flows limit the ability to provide this function. Therefore the wetland model scores for the sloping wetlands on site were lower (53%) for this function.

Contribution to Abundance and Diversity of Wetland Vegetation

Plant species diversity and density are important factors for this function. Slope wetlands in general are unpredictable in their ability to retain soil saturation or standing water during the growing season. The diversity and density of plant strata layers at the site increase the attractiveness and species diversity. The plant community is considered of medium diversity and the juxtaposition within the landscape is fairly intact in this rural setting and support a typical diversity of wetland vegetation. The vegetation along the edge of the pond provides good horizontal and vertical stratification which creates attractive habitat for resident wildlife species. The wetland model scores for this wetland function were moderate to high (73%) for both the depressional and sloping wetlands.

Contribution to Abundance and Diversity of Wetland Fauna

The moderate land use impacts, flooded water regime, and number of vegetation layers and percent cover increase this system's ability to maintain habitat conditions utilized by a variety of species. The variety of wetland types (pond, and watercourse/forested wetland complex) contribute to the moderate potential for contributing to a diversity of wetland fauna. The wetland model score for this function reflects a moderate to high score of (72%) for depressional and 78% for the sloping wetland.

Summary

The model scores for both the depressional and off-site slope wetlands represent a moderate functioning wetland system. The combination of the off-site forested wetland/watercourse complex and the existing pond within the landscape combine to provide important functional attributes, and

have the capacity to provide water quality treatment measures, plus, provide habitat for wetland dependent plant and animal species. . The property does exhibit impacts from former land use practices including the spread of invasive plant species from disturbance and excess nutrient loading from adjacent horse farm operations.

References

Cowardin, L.M., V.Carter, F.G. Golet, E.T. LaRow, 1979. "Classification of Deepwater Habitats of the United States," USFWS, US Dept. of Interior, pg. 1-131.

D.W.Magee and G.G.Hollands. 1998. A Rapid Procedure for Assessing Wetland Functional Capacity based on Hydrogeomorphic (HGM) Classification. Normandeau Associates and ENSR. 190 pg.

Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. "Ecological Communities of New York State", Second Edition. New York Natural Heritage Program, New York Department of Environmental Conservation, Albany, New York.

Existing Wetland and Wetland Buffer Disturbance

As noted, the parcel was developed in the 1980's and included development of the majority of the existing wetland buffer area. A majority of the house, the entire pool, pool patio, equipment and fencing are located within the wetland buffer. A stone boulder retaining wall was constructed to define the edge of disturbance for construction of the pool. A post and rail fence was installed along the edge of the wetland at the base of the slope and extends along the northern and western boundary of the wetland towards the existing residence to the southeast.

Proposed Improvements and New Wetland and Wetland Buffer Disturbance

The proposed improvements include re-locating the existing garage to the northwestern side of the existing residence, which will be accessed by a new gravel driveway and turnaround area, plus an on-grade flagstone patio. The new addition for the garage and patio will be located within the regulated wetland buffer. The existing garage area will be converted to living space. The portion of the existing driveway that serves the current garage will be removed and converted to lawn area. The location of the new addition for the garage and patio will also require a side yard variance from the Zoning Board of Appeals.

Proposed stormwater facilities will also be located within the wetland buffer. An elevated wood walkway and dock is proposed within the wetland buffer and will extend into the wetland and pond edge to allow access to the open water section of the pond.

Wetland and Wetland Buffer Impacts and Proposed Mitigation Measures

The existing impervious surfaces represent approximately 12,073 square feet. Currently, none of the impervious surfaces (including roof leaders, and pool or pool patio areas) are captured and treated prior to discharge into the adjacent wetlands.

The runoff from the proposed addition for the garage and new patio area will be conveyed to properly designed stormwater practices to comply with NYSDEC standards. In addition, a large portion of the existing driveway will be removed and converted to lawn surface. The existing pool will include a drywell to capture the first 6 inches of the pool, or 20 % of the pool water volumes and store and treat prior to discharge.

As a result of the planned stormwater practices, the proposed impervious surfaces will remain the same as the existing development. No increases will occur in the amount of impervious cover.

The edge of the pond and adjacent riparian wetlands will be restored and enhanced by removal of existing stockpiles of debris, and selective removal of invasive shrubs and grasses. New native plantings consisting of native shrubs and grasses are also proposed. Please refer to the proposed Site Plan that shows the location of invasive plant removal and re-planting areas.

The proposed wood walkway and dock will create a temporary disturbance within the existing buffer and wetland. The buffer within this area along the existing fence currently consists of lawn grasses. The walkway will be installed on top of the existing lawn surface. The walkway will consist of environmentally friendly wood products that will rest on the existing surface. Within the wetland edge and pond, a series of footings will be installed to anchor the proposed dock. The dock will also be constructed with certified wood products that are free of known contaminants.

Summary

The proposed improvements will not result in a net increase in impervious surfaces. Existing pool and pool drawdown will be captured and treated via stormwater practices, which will help to off-set disturbances within the wetland buffer. Sections of the wetland and wetland buffer are proposed to be restored and enhanced via removal of debris and invasive species. New native plantings will be added along the wetland edge to provide better quality habitat and attractiveness to resident wildlife species.

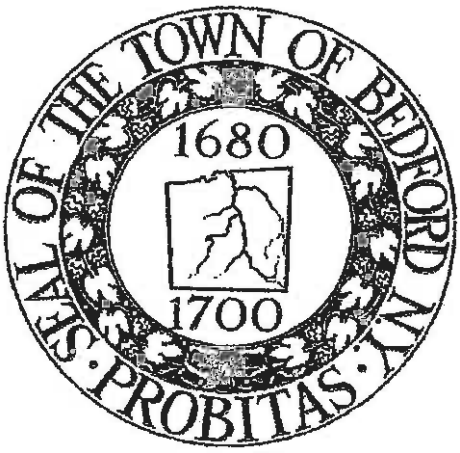
We look forward to discussing the merits of this project with the Wetlands Control Commission at its June meeting. Please let me know if you have any questions or require any additional information.

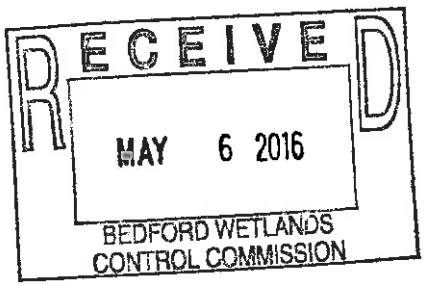
Sincerely,

Stephen W. Coleman

Stephen W. Coleman
Principal
SWC/tbh
cc: N. Matfus
A.Graham, R.A.
Cronin Engineering

Application for Wetlands Permit





Town Of Bedford
Wetlands Control Commission

425 Cherry Street
Bedford Hills, New York 10507
Tel: (914) 666-5140 • Fax: (914) 666-2026

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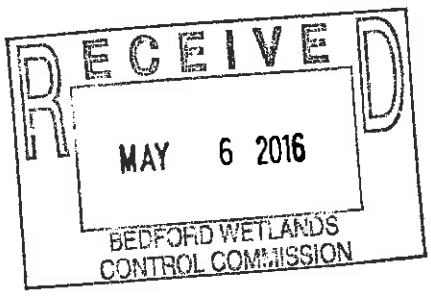

(Last revised 4/6/2015.)

Dear Applicant:

Enclosed are the required forms for completing an application for a wetlands permit for the Town of Bedford. Also included are materials which may assist you in the process. This package is designed to be self-explanatory, but please feel free to call the Town of Bedford's Wetlands Control Commission at 914-666-5140 with any questions.

The Wetlands Control Commission may only act upon *complete applications with all required supporting materials*. To allow adequate review of your application and to meet public notice requirements, applications are to be submitted to Town of Bedford Wetlands Control Commission, 425 Cherry Street, Bedford, New York 10507 *not later than twenty business days* prior to the next regular meeting of the Commission. Supplemental submissions (i.e., additional required materials) are due *not later than fifteen business days* prior to the next regular meeting of the Commission. Regular meetings usually are scheduled for the first Monday of each month, but call the number above to confirm. The owner or applicant should be present at the meeting. You can also find a schedule of meetings, submission cut-off dates and site walks on the Town website – www.bedfordny.gov. Please submit the following with your application:

1. Application Fee: Check or money order made payable to "Town of Bedford" for the fee as follows: (a) project involving a single lot: $200.00; or (b) project involving more than one lot: $200.00 plus $25 for each additional lot or $50 per acre of affected wetlands, *whichever is higher.*

2. Plans: Plans for the proposed work, unless otherwise specified, shall be drawn to a scale of not less than one (1) inch equals thirty (30) feet. The plans shall be certified by an engineer, architect, land surveyor or landscape architect licensed in the State of New York. Plans must show the following:

✓ (a) The location of all wetlands as determined by a qualified ecologist, botanist and/or soil scientist no earlier than twelve (12) months prior to the date of filing the application.

✓ (b) Location of construction or area proposed to be disturbed and its relation to property lines, buildings, roads and watercourses within two hundred fifty (250) feet.

✓ (c) Estimated quantities of material of excavation or fill.

✓ (d) Location of any well and depth thereof and any sewage or wastewater disposal system within one hundred (100) feet of the disturbed area.

✓ (e) Existing and proposed contours at two-foot intervals in the proposed disturbed area and to a distance of one hundred (100) feet beyond.

✓ (f) Details of any drainage system proposed, both for the conduct of the work and after completion thereof, and measures proposed to control erosion and siltation during and after the work.

N/A (g) Where creation of a lake or alteration of a watercourse or wetland is proposed, details of the construction of any dams, embankments and outlets or other water control devices.

✓ (h) A property location map.

✓ (i) Most recent deed and survey of the property.

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Note: the Commission is permitted to waive or modify the plan requirements listed above if it determines that sufficient information and documentation is submitted to enable it to make its determinations required under the law. You should check with the staff if you believe a waiver may be

appropriate. This waiver or modification does not apply to wetlands listed on the State Freshwater Wetlands Map.

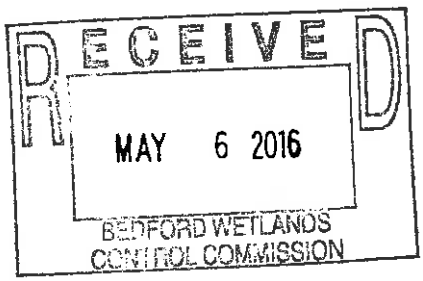
3. Applications Affecting Water Retention Capacity, Water Flow or Drainage (if applicable): Applications affecting the water retention capacity, water flow or other drainage characteristics of any pond, lake, reservoir, natural drainage system or wetland shall include a statement prepared by a professional engineer licensed in the State of New York of the impact of the project on upstream and downstream areas, giving appropriate consideration to flood or drought levels of watercourses and amounts of rainfall.

4. Other Permits (if applicable): Copies of all applicable town, county, state or federal permits or permit applications which are required for such work or improvement, unless such permits are conditioned upon obtaining a Wetlands Permit.

5. Other Information and Details: After initial review of your application, you may be asked to submit additional information or details.

6. Reimbursement for Town's Professional Consultants: Your application may be referred to the Commission's consultant(s) and you will be required to reimburse the Town for the cost of such consultant services. In addition to the application fee, you are required to submit a deposit to be held in escrow which the Town will apply toward reimbursement for the Town's professional consulting services. The current rate for these services is $125.00 per hour. In some instances, the deposit will be insufficient and you will be billed to reimburse the Town the difference. *Please note that the Commission is not authorized under the Town Code to issue your permit unless and until such reimbursement is made.*

Please remember that an incomplete application package will result in delay. Your cooperation is appreciated!



Section A

Each Applicant must complete all items listed in Section A.
Place a checkmark next to each completed item.
Return this checklist with your application.

I. Fees and Escrow Deposits:

In this category place a checkmark next to the items appropriate to your application.

✓ Please include two (2) separate checks or money orders made payable to "Town of Bedford" for

Escrow Fee:

✓ $500 as escrow deposit for Wetlands Permit Application

OR

____ $1,000 as escrow deposit for Remediation of Wetlands Law Violation Application

A $200 minimum balance is required in the "Escrow Fee Account" for:

a) The application to be considered on any future agenda
b) A compliance inspection of the project to be scheduled

Application Fee (computed as follows):

✓ $200 for a project involving a single lot

OR

____ $200 for a project involving more than one lot

PLUS Either $25 for each additional lot
Or $50 per acre of affected wetlands –
Whichever is higher

Example: A 3-lot subdivision with 5 acres of affected wetlands requires payments totaling $750, based on:

$500 – Escrow Fee
$450 – Application Fee: $200 = Project involving more than one lot
$250 = 5 acres of affected wetlands X $50 per acre of affected wetlands
$950 – Total of Fees Required

II. Application Form

✓ Nine (9) sets each of a completed application form with all current owner(s) signature(s). The name of the owner(s) on the application should be the same as the name(s) on the deed.

III. Environmental Assessment Form

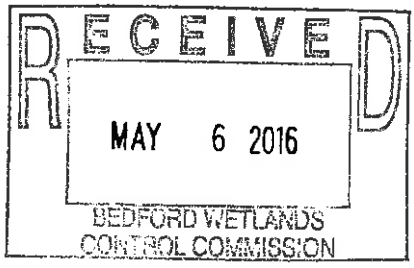
✓ Nine (9) sets of the Environmental Assessment form with all current owner(s) signatures(s) with – only side 1 is to be completed.

IV. Deed

✓ One copy of the most recent deed(s).

V. Survey of Property

✓ Nine (9) sets of survey of property.



VI. Plans

_____ Plan which contains all of the following:
- _____ site plans
- _____ architectural plans
- _____ landscape architectural plans
- _____ wetlands plans (plans showing wetland delineation in conjunction with wetlands investigation/report do not have to conform to the stated scale.)
- _____ mitigation plan
- _____ planting plan

— OR —

__✓__ combined site plans that include wetlands, wetlands mitigation, or planting plan of the proposed work

__✓__ Unless otherwise specified, all plans shall be drawn to a scale of not less than one (1) inch equals thirty (30) feet.

__✓__ The plans shall be dated (with the last revision dates) and certified by an engineer, architect, land surveyor or landscape architect licensed in the State of New York.

__✓__ Plans should be individually folded so as to fit into an 8 ½ X 14 legal size folder with the property owner(s) and tax map reference written to appear on the top of the folded plan.

_____ The preparer of such plans shall comply with the attached Guidelines for Wetlands Studies and Reports as adopted by the Commission at its BWCC meeting of 5/7/01.

Plans must show the following:

__✓__ The location of all wetlands as determined by a qualified ecologist, botanist and/or soil scientist.

__✓__ The survey location of the wetlands needs to have been performed no earlier than twelve (12) months prior to the date of filing the application.
***Please note that on all new applications, the wetlands located surveys must be updated if the survey was performed earlier than twelve (12) months prior to the filing of the application.*

__✓__ All property lines, buildings, roads and watercourses within two hundred fifty (250) feet of any proposed construction of disturbance.

__✓__ Watershed and destination of water courses.

__✓__ Estimated quantities of material of excavation or fill.

__✓__ Location of access route for construction.

_____ Identification of whether the work is to be done by hand or machine.

__✓__ Cost estimate of the work (including all materials, plantings and professional services)

__✓__ Location of any well and depth thereof and any sewage or wastewater disposal system within one hundred (100) feet of disturbed area.

__N/A__ Written proof that septic systems within regulated/controlled wetlands within the Town of Bedford have been properly maintained within the four (4) year time period prior to application.

__✓__ Existing and proposed contours at two-foot intervals in the proposed disturbed area and to a distance of one hundred (100) feet beyond.

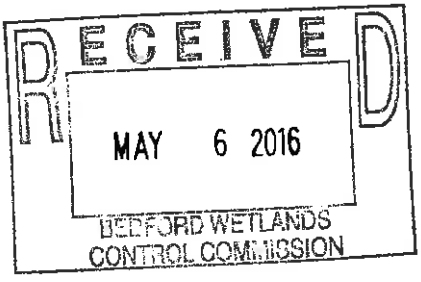
__✓__ Details of any drainage system proposed, both for the conduct of the work and after completion thereof, and measures proposed to control erosion and siltation during and after work (erosion control).

__N/A__ Where creation of a lake, pond or alteration of a watercourse or wetland is proposed, details of topography and proposed new grading, and the construction of any dams, embankments and outlets or other water control devices.

__✓__ A property location map.

__N/A__ Prior wetland permit and resolution number if applicable.

__✓__ Date



Section B

Each applicant need only complete the category that is applicable to the site conditions of the property.
Choose the appropriate category(ies)
Place a check mark next to each completed item
Submit checklist with your application

I. Applications Affecting Water Retention Capacity, Water Flow or Drainage

Application affecting the water retention capacity, water flow or other drainage characteristics of any pond, lake, reservoir, natural drainage system or wetland shall include:

_____ A statement prepared by a professional engineer licensed in the State of New York of the impact of the project on upstream and downstream areas. This statement should give appropriate consideration to flood or drought levels of watercourses and amounts of rainfall.

II. Fence Permits Within Wetlands or Within the 100 Foot Wetlands Buffer

Fence permit applications must be accompanied by:

_____ Nine (9) sets of site plans OR Nine sketches clearly showing:
- _____ the location and height of the proposed fence
- _____ a statement of the type of material(s) to be used to construct the fence
- _____ a design that allows the passage of small wildlife through the bottom of the fence to maintain corridors for upland and wetland habitat
- _____ an erosion control plan

III. Deck Permit Within Wetlands or Within the 100 Foot Wetlands Buffer

Deck permit applications must be accompanied by:

_✓_ Nine (9) sets of site plans OR Nine (9) sketches clearly showing:
- _✓_ the proposed location of the deck
- _✓_ a statement of the type of material(s) used to construct the deck
- _____ the construction detail
- _____ deck and elevation detail
- _✓_ an erosion control plan

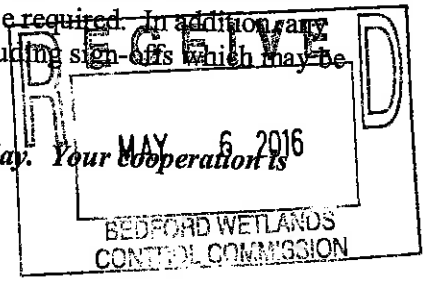
IV. Other Permits (if applicable)

It should be noted that in addition to a wetlands permit, all applications may be subject to other applicable town, county, state, or federal permits.

Reimbursement for Town's Professional Consultants:

Your application will be referred to the Commission's consultant(s) and you will be required to reimburse the Town for the cost of such consultant services. The escrow mentioned above is an *estimate* of the amount needed to cover the cost for the Town's professional consulting service to review and comment on your application. The actual cost may vary. Additional payments may be required. In addition any escrow balance cannot be refunded until all sign-offs have been issued, including sign-offs which may be required one or two years after the project is completed.

Please remember that an incomplete application package will result in delay. Your cooperation is appreciated.



Bedford Wetlands Control Commission
Guidelines for Fences
(Revised and Adopted 4/6/2015)

1. Erection of the fence will be done by hand without the operation of machinery or heavy equipment within the Wetland or Wetland/Watercourse Buffer (the "Regulated Area").
2. Erection of the fence does not result in any vegetation clearing, grading, filling or other construction or development activities within the Regulated Area.
3. The following requirements shall apply in the event the fence is to cross any stream or other watercourse:
    a. The fence shall not inhibit or alter the natural drainage flow or cause the blocking or damming of surface water.
    b. No fence post is to be placed in the bed or within three feet from the edge of such stream or other watercourse.
    c. The bottom portion of the fence shall be no lower than 12 inches above seasonal high water of such stream or other watercourse;
4. Care shall be taken to stabilize disturbed areas promptly after construction.
5. All necessary precautions shall be taken to prevent contamination in the Regulated Area by silt, sediment, fuels, solvents, lubricants, or any other pollutant or toxic substance.
6. Openings at no less than fifteen-foot intervals shall be placed for the entire course of the fence which is located in the Regulated Area so as to allow the passage of small animals. Each such opening shall be at least six inches in height above ground level and twelve inches in length.

6a. As an alternative to item 6 above the Commission or the Town Environmental Consultant may recommend that fencing be installed in such a manner that it will run continuoulsy 6 inches or more above the established grade to permit the free movement of wetland dependent mammals, amphibians and reptiles.

Bedford Wetlands Control Commission
Guidelines For Larger Projects
(Adopted 5/1/2006)

Detailed plans should be provided which include:

1. **An up-to-date survey of the entire property** which shows the existing improvements and the location of all regulated wetlands and watercourses (including wetland flag numbers, if possible) and the 100' wetland setback. The survey should be prepared by a licensed surveyor. For properties where the wetland delineation is older than 1 year, the professional who did the original delineation should reconfirm the accuracy of the boundary in writing as part of the application. A property location map should also be provided, either as an inset or on a separate sheet.

2. **A detailed site plan showing the proposed improvements**. The site plan should include:
    a. Clear identification of the location of construction and area proposed to be disturbed and its relation to property lines, buildings, roads and watercourses within two hundred fifty (250) feet;
    b. new improvements should be distinguished from existing improvements by hatching, cross-hatching, shading or other clear designation;
    c. the nearest point of the improvements to the wetlands;

d. the dimensions, square footage of the improvements and the square footage increase in disturbance;
e. The limits of disturbance (building envelope) and construction ingress/egress should be identified with care given to restrict disturbance, to the fullest extent practicable, to areas outside of the wetlands and wetlands buffer;
f. Identify whether any proposed structure will have a foundation;
g. Identify the means for carrying out the construction and the equipment to be used (e.g., whether hand tools will be used);
h. Estimated quantities of material of excavation or fill and whether there will be any stockpiling of excavated soils for the project;
i. the disposition of any stockpiled soils;
j. whether any ledge or bedrock is expected to be encountered in excavating any portion of the site (e.g., for a foundation);
k. Identify how any roof run-off will be handled and whether there will be gutters and downspouts to carry the run-off. If stormwater drywells are being considered, identify the location of the lines running from the structure to the drywells;
l. Location of any well and depth thereof and any sewage or wastewater disposal system within one hundred (100) feet of the disturbed area;
m. Existing and adjusted contours at two-foot intervals in the proposed disturbed area and to a distance of one hundred (100) feet beyond;
n. Description of any proposed grading;
o. Details of any drainage system proposed, both for the conduct of the work and after completion thereof, and measures proposed to control erosion and siltation both during and after the work;
p. Details of any proposed erosion control plans and identification of location of siltation fences and other measures.

3. Where the proposed project entails *unavoidable* impacts, the wetlands law requires **a mitigation plan**. Please note that mitigation is distinct from avoidance and minimization of impacts. All plans must reflect every reasonable effort to avoid impacts and, where not possible, to minimize impacts to the maximum extent practical. Examples of mitigation include:
   a. Where a pre-existing septic system is located within the regulated area, relocation of the septic system as far as practicable from the regulated area.
   b. Allowing any lawn area current in the wetland or bordering the wetland to revert to a natural state.
   c. Creation of limited mow areas for other portions of existing lawn in the regulated area.
   d. Enhancement of existing wetlands through any of the following or a combination thereof: (a) removal of invasive species; (b) removal of any inorganic and organic debris; and/or (c) planting of wetlands species identifying size, type, quantity, location, protocol for installation and including the legends pertaining to no use of fertilizers, herbicides, chemicals, pesticides, etc. in the regulated area.
   e. Creation of a permanent non-disturbance area (which may include any area to revert to natural wetlands or a limited mow area) for the wetlands and a portion of the buffer through a declaration of restrictive covenants or granting of a conservation easement to a not-for-profit conservancy organization qualified to handle such easements. In either event, the document is to be recorded in the land records.

Bedford Wetlands Control Commission
Guidelines For Proposed Wetlands Delineations
(Adopted 10/1/2001)

(1) All requests will require the following items:
   (a) Application form.

(b) Deed to the property (we do not need a title report)
(c) $100 payment to the Town of Bedford.

(2) The Town Environmental Consultant will review the application and materials submitted with it, inspect the site and advise the Commission whether additional information and documentation may be required in order to ascertain the wetlands delineation, in which case the following additional items would be required:
(a) flagging in the field (by the soil scientist) of the wetlands boundary
(b) wetlands report (please see the Commission's May 7, 2001 Guidelines for wetlands reports.)
(c) confirmation by the Town Environmental Consultant of the wetlands boundary
(d) survey-location of the wetlands and wetlands buffer based on the confirmation of the wetlands boundary by the Town Environmental Consultant.

(3) Following the Town Environmental Consultant's review of the materials and confirmation of the wetlands boundary, seven sets of all required to be submitted to the Commission.

(4) The Commission then will act upon the request and, as needed, its own inspection of the site. The Commission's action will be in the form of a resolution adopted at a regular meeting of the Commission.

If you have any questions, please contact the staff. Your cooperation is appreciated.

Bedford Wetlands Control Commission
Guidelines For Swimming Pools
(Adopted 9/11/2006)

***IMPORTANT NOTE**: If the pool is down slope of the regulated area (that is, the wetlands and buffer area), then these guidelines **may not apply at all**. We would suggest discussing the matter with the Commission's staff.*

The following assumes that the Commission is comfortable with the location and size of the pool. In addition, the site plan should provide the following:

1. Please identify the limits of disturbance.
2. Please identify the ingress/egress for the project, which to the greatest degree possible should avoid encroaching into the regulated area, so as to minimize disturbance.
3. A drywell should be considered for draining the pool (even if only partial drainage is required). Explain how this will be constructed to minimize disturbance. The drywell should be sized in proportion to the size of the pool. We would suggest consulting the Commission's staff.
4. Please identify the type of fuel proposed to heat the pool and its location.
5. Please identify any fuel, electric or other utility lines and conduits passing through the regulated area to the pool area.
6. Please add the following legends on the plan:
   i. "Discharge of pool water into the regulated area is prohibited."
   ii. "A self-contained filtration system for the pool shall be utilized, thus requiring no backwash whatsoever."
   iii. "There shall be no storage of pool chemicals or other toxic substances in the regulated area."

Bedford Wetlands Control Commission
Guidelines For Wetland Studies And Reports
(Adopted 5/7/2001)

(1) Soil borings and other commonly accepted tests should be performed to determine the presence of hydric soils.

(2) The report should include the following:
- (a) general description, identification and location of soil types including any hydric soils
- (b) identification and location of plant types and whether they are typical of wetland species

(3) The report should describe the wetland in detail including:
- (a) functional values with supporting explanation
- (b) flora
- (c) fauna
- (d) the source of the wetlands and whether it is part of a larger wetland system both on or off site
- (e) explain where the wetland ultimate drains (e.g., reservoir, river or other water body).

(4) Describe the wetland buffer in detail covering the same items as above in (3).

(5) Once the wetland and the wetland buffer has been flagged on the subject property, it is to be survey-located and the survey-located and certified plan is to be submitted to the Commission for review and approval.

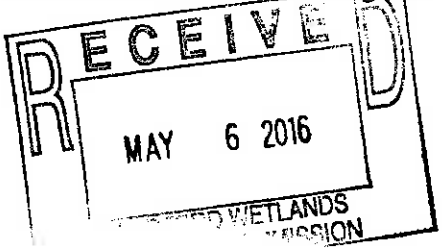
(6) Winter wetland delineations are discouraged and will be subject to verification during the growing season.

(7) Wetlands and the one hundred (100) foot setback area must be delineated and survey-located based upon flagging set by the wetlands consultant. These are subject to the verification of the Commission.

(8) Any wetland study must have been (i) prepared not more than one year prior to the submission of the application; or (ii) if a study was prepared more than one year prior to the submission of the application, then reviewed and updated within one year.

The Commission notes that a wetland study and report is not required for every application. However, they are commonly provided with regard to properties with extensive or sensitive wetland features. Submission of the reports with the application, rather than after the first Commission hearing on the application, will facilitate and expedite the review process.

The Commission notes that these are general guidelines to assist applicants and their consultants. They are not intended to be exclusive or exhaustive. Applicants and their consultants should exercise discretion in following the guidelines and should recognize that the Commission reserves the right to request further information and study.



Legends for Mitigation Plans

A) **Prohibition Against Application of Organic or Inorganic Chemicals (i.e.,fertilizers):**
"There shall be no organic or inorganic chemicals (including, but not limited to, fertilizers, pesticides, herbicides and fungicides) deposited or introduced in the wetlands or within the wetland buffer area. To the extent any such deposits or introduction has occurred, it shall immediately be terminated."

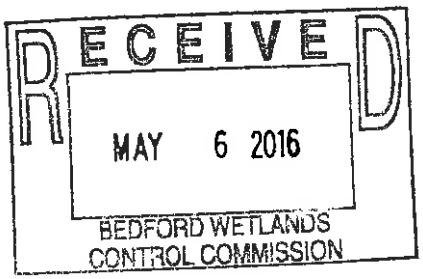
B) **Wetlands Plantings – Shrubs or Trees:**
"At the time of planting of the indicated trees or shrubs, no fertilizers are to be used or added to the planting hole or top dressing. The use of biostimulants (such as, but not limited to, mycorhizal fungi) not regulated by the New York State Department of Environmental Conservation may be applied as appropriate until one year after installation of plant materials and shall be discontinued thereafter. Horticultural oils may be applied to trees and shrubs as part of a monitored Integrated Pest Management (I.P.M.) program, however, these oils shall not be permitted to be applied to any plant material in any manner that might permit the introduction of the oil onto or into any wetlands or wetlands buffer area as delineated on the site plan approved by the Town of Bedford Wetlands Control Commission."

Protocol for Limited Mowing Area

1) Identify with cross-hatching the area where mowing is to be limited.

2) Identify the cross-hatching as "Limited Mow Area."

3) Add the following legend to the Site Plan:
"Limited Mow Area
The Limited Mow Area may be mowed twice (and no more than twice) each calendar year as follows: the first mowing of the year should be carried out in late summer (between August 15 and September 15) to a height of not less than 6 inches. If there is growth to a height of one foot or more following the first mowing, a second mowing may be done in late fall (between November 15 and December 15) or early spring (between March 15 and April 15) to a height of between 4 and 6 inches.
The owner acknowledges that the purpose of the limited mowing is to maintain meadow areas to provide habitat for nesting grassland birds and small mammals, thereby increasing the diversity of habitats found on the subject property. Meadow areas adjacent to ponds and streams also provide significant benefits relative to maintaining water quality."



Legend for Permanent Non-Disturbance Conservation Area

1. **Purpose:** It is the purpose of the Permanent Non-Disturbance Conservation Area to preserve and protect such area against despoliation and destruction and to that purpose to prohibit certain activities in such area.

2. **Prohibited Activities:** Excepting Owner's Reserved Rights (listed below), any act prohibited or regulated by the Town of Bedford's Freshwater Wetlands Law the shall be prohibited in the Permanent Non-Disturbance Conservation Area and without limiting the generality of the foregoing, the following activities and uses are expressly prohibited in, to, on, over, through, under or with respect to the Permanent Non-Disturbance Conservation Area:

   a) Placing or depositing materials or chemical wastes or introducing influents of sufficiently high thermal or chemical content as to cause deleterious ecological effect in the Permanent Non-Disturbance Conservation Area.

   b) Any structure, accessory structure, swimming pool or tennis court.

   c) Any form of draining, dredging, dewatering, excavation or removal of material, either directly or indirectly.

   d) Any form of dumping, filling or depositing of material, either directly or indirectly.

   e) Introduction of any form of pollution, including but not limited to the installation of a septic tank, the running of a sewer outfall or the discharge of sewage treatment effluent or other liquid wastes into or so as to drain into the Permanent Non-Disturbance Conservation Area.

   f) Alteration or grading natural features and contours, alteration of drainage conditions or diversion of any flow of a watercourse, water body, marsh or swamp.

   g) Construction of docks, dams, other water control devices, pilings or bridges, whether or not they change the ebb and flow of the water.

   h) Installation of any service lines, cable conduits, pipes or wells.

   i) Construction of driveways or roads.

   j) Cutting any healthy trees, shrubs or non-invasive material.

   k) Depositing or introducing organic or inorganic chemicals, including without limitation any fertilizers, pesticide, herbicide or fungicides.

   l) Conducting any other activity that substantially impairs any of the functions or benefits to wetlands as described in the Law.

   m) Operation of snowmobiles, dune buggies, motorcycles, all-terrain vehicles, or any other types of motorized vehicles on the Protected Property.

   n) Conducting any other activity which under the Law, as may be amended from time to time, constitutes a controlled act or otherwise would require a permit.

3. **Owner's Reserved Rights:** Notwithstanding any of the foregoing provisions to the contrary and as expressly limited herein, the Owner reserves the following reserved rights (the "Owner's Reserved Rights"), without prior notice to the Town; provided, however, that the exercise of such rights will not interfere with or have an adverse impact on the essential natural, open and scenic quality of or the conservation interests associated with the property:

   a) The right to hike and observe nature.

   b) The right to maintain existing walls and fences.

c) The right to remove dead and diseased vegetation.

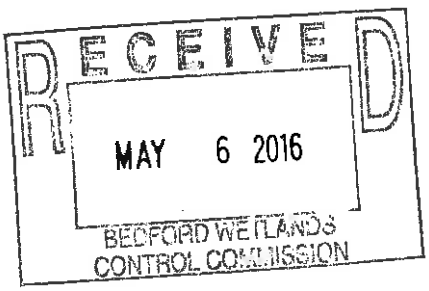
d) The right to sell, give or otherwise convey the property any portion or portions of the property, provided such conveyance is subject to these terms..

e) The right to restore any existing structure on the property in the event of damage or destruction; provided, however, that (i) Owner shall make application to the Town of Bedford Wetlands Control Commission with respect thereto; and (ii) in no event shall any restored structure exceed the footprint or area of the pre-existing structure.

f) The right to maintain existing structures at the property without otherwise violating these terms.

4. **Enforcement:** The Town and its successors and assigns shall have the right to enforce these provisions by proceedings at law or in equity, including but not limited to the right to require the restoration of the Permanent Non-Disturbance Conservation Area.

5. **Easement to the Town for Monitoring and Enforcement:** Owner hereby grants the Town an easement over the property for the purposes of monitoring and enforcing these terms.



TOWN OF BEDFORD - WETLANDS CONTROL COMMISSION
Application for Permit

Identification of Owner(s):

Name(s) of owner(s) [as shown on Deed]: Maria Pence

Mailing Address: 12 Twin Lakes Drive, Bedford New York 10506

Phone: (home) 914-234-3401 (work): Fax: _____ E-Mail: mariapence@gmail.com

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Identification of Applicant (if other than owner(s)):

Name of Applicant: Pennington Marchael

Mailing Address: 2246 79th Street, Brooklyn New York 11214

Phone: 603-315-6030 Fax: _____ E-Mail: pmarchael@lweanerdesign.com

Professional Preparing Site Plan:

Name /Address: Larry Weaner Landscape Associates, 2920 Mt Carmel Avenue, Glenside PA 19038

Phone: 215-886-9740 E-Mail: bjones@lweanerdesign.com

Identification of Property:

Bedford Tax Map Designation: Section 85.13 Block 1 Lot 11 Area _____

Zoning District: R-4A Project Address: 12 Twin Lakes Drive, Bedford NY 10506

Approximate year of construction of any structure: _____

Prior Applications/Other Applications (write "N/A" if not applicable; Project Cost):

Dates of any prior Wetlands Control Commission permits: ADMIN PERMIT 5.31.16

Identify any other Town of Bedford approvals required: N/A

Identify any other governmental approvals required: N/A

Project cost (including professional fees): $ 15K

Project Description/Proposed Use (MUST BE DETAILED – Use Additional Pages if Needed): Removing invasive wetland plant species, THROUGH THE USE OF AQUATIC APPROVED HERBICIDE.

Proposed Project Start Date: FALL 2016 **Estimated Date of Completion:** FALL 2017

The owner(s) hereby give(s) permission to the Town of Bedford, its agents, servants and employees, including, without limit, members of the Wetlands Control Commission and consultants to the Town to enter upon the Property solely for the purposes incidental to the within application (including without limit, inspection of the project after completion) at reasonable times upon reasonable notice to the owner or tenant in possession, which notice may be by telephone. If the applicant is different than the owner(s), the owner(s) hereby approves this application and consents to the applicant acting as agent for the owner in submitting this application and the applicant accepts its designation as agent for the owner(s).

I/we affirm by the signatures below that I/we are the rightful legal owner(s) of the property herein described in this application.

Signature of owner(s): _____ Date: 6.27.16

All owners must sign *Print name/title:* MARIA PENCE HOMEOWNER

Print name/title: _____ Date: _____

Signature of applicant (if different): _____ Date: 6.28.16

Print name/title: PENNINGTON MARCHAEL

Revised 8/9/13

Our Pesticide Business License number is 4962
Drew O'Neill's Pesticide Applicator License number is C0838930

WEEDS, INC.
250 Bodley Road
Aston, PA 19014
Phone 610-358-9430
Fax 610-358-9438

Applying herbicide Late August early September of 2016 and 2017

Specimen Label

Dow AgroSciences

Rodeo®

Herbicide

®Trademark of Dow AgroSciences LLC

For control of annual and perennial weeds and woody plants in natural and production (plantations), forests for site preparation, mid-rotation release treatments, timber stand improvement activities, noncrop sites including industrial sites, rights-of-way (including roadsides, electric utility and communication transmission lines, pipelines, railroads, airports), irrigation and drainage ditches, canals, reservoirs, natural areas (including wildlife management areas, wildlife openings, wildlife habitats and refuges, parks and recreational areas, campgrounds, trailheads and trails), rangeland, and in and around aquatic sites and wetlands; also for perennial grass release, and grass growth suppression and grazed areas on these sites.

Avoid contact of herbicide with foliage, green stems, exposed non-woody roots or fruit of crops, desirable plants and trees, because severe injury or destruction may result.

Group	9	HERBICIDE

Active Ingredient:

glyphosate† N-(phosphonomethyl)glycine, isopropylamine salt	53.8%
Other Ingredients	46.2%
Total	100.0%

†Contains 5.4 lb per gallon glyphosate, isopropylamine salt (4 lb per gallon glyphosate acid).

Precautionary Statements

Hazards to Humans and Domestic Animals

EPA Reg. No. 62719-324

CAUTION

Harmful if inhaled

Avoid breathing spray mist. Remove contaminated clothing and wash before reuse. Wash thoroughly with soap and water after handling.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear:
- Long-sleeved shirt and long pants
- Shoes plus socks.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Controls

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

First Aid

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

In case of leak or spill, soak up and remove to a landfill.

Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

Do not mix, store or apply this product or spray solutions of this product in galvanized steel or unlined steel (except stainless steel) containers or spray tanks. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas, which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read all Directions for Use carefully before applying.

This is an end-use product. Dow AgroSciences does not intend and has not registered it for reformulation.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:
- Coveralls
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks

Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep people and pets off treated areas until spray solution has dried.

Storage and Disposal

Do not contaminate water, food, feed or seed by storage or disposal.
Pesticide Storage: Store above 10°F (-12°C) to keep product from crystallizing. Crystals will settle to the bottom. If allowed to crystallize, place in a warm room 68°F (20°C) for several days to redissolve and roll or shake container or recirculate in mini-bulk containers to mix well before using.
Pesticide Disposal: Wastes resulting from use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state or local procedures.

Nonrefillable containers 5 gallons or less:
Container Handling: Nonrefillable container. Do not reuse or refill this container.
Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Refillable containers larger than 5 gallons:
Container Handling: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. If practical, agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Nonrefillable containers 5 gallons or larger:
Container Handling: Nonrefillable container. Do not reuse or refill this container.
Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse** as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse** as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Product Information

This product is a broad spectrum, systemic, postemergent herbicide with no soil residual activity. It is intended for control of annual and perennial weeds and woody plants and brush. It is formulated as a water soluble liquid.

Time to Symptoms: The active ingredient in this product moves through the plant from the point of foliage contact to and into the root system. Visible effects are a gradual wilting and yellowing of the plant that advances to complete browning of above ground growth and deterioration of underground plant parts. Visible effects on most annual weeds occur within two to four days, but on most perennial weeds visible effects may not occur for seven days or more. Extremely cool or cloudy weather following treatment may slow the activity of this product and delay development of visual symptoms.

Stage of Weeds: Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Refer to the annual, perennial and woody brush and trees rate tables for specific weeds. Always use the higher rate within the rate range for heavy or dense weed growth or when weeds are growing in an undisturbed (noncultivated) area. When treating weeds with disease or insect damage, weeds heavily covered with dust, or weeds under poor growing conditions, reduced weed control may result.

Cultural Considerations: Reduced control may result when applications are made to annual or perennial weeds that have been mowed, grazed, or cut, and have not been allowed to regrow to the specified stage for treatment.

Rainfastness: Heavy rainfall soon after application may wash off this product from the foliage and a repeat application may be required for adequate control.

Spray Coverage: For best results, spray coverage should be uniform and complete.

Mode of Action: The active ingredient in this product inhibits an enzyme. This enzyme is found only in plants and microorganisms that are essential to forming specific amino acids.

No Soil Activity: Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants arising from unattached underground rhizomes or rootstocks of perennials will not be affected by the herbicide and will continue to grow.

Biological Degradation: Degradation of this product is primarily a biological process carried out by soil microbes.

Maximum Application Rates: The maximum application rates specified in this label are given in units of volume, either fluid ounces, pints or quarts, of this product per acre. The maximum allowed application rates apply to this product combined with the use of any and all other glyphosate- or sulfosate-containing herbicides, either applied separately or in a tank mix, on the basis of total pounds of glyphosate (acid equivalents) per acre. If more than one glyphosate- or sulfosate-containing product is applied to the same site within the same year, ensure that the total of pounds acid equivalent gyphosate does not exceed the maximum allowed.

Do not apply more than 8 quarts of this product (8 lb glyphosate acid) per acre per year for all use sites listed on this label.

IMPORTANT: When using this product, unless otherwise specified, mix with a surfactant, such as a nonionic surfactant containing 80% or greater active ingredient. For conifer release (pine release) use only surfactants that are approved for conifer release and specified on the surfactant label as safe for use in conifer release (pine release). Use of this product without surfactant will result in reduced herbicide performance. Ammonium sulfate, drift control additives, or dyes and colorants may be used. See Mixing Directions and the surfactant manufacturer's label for more information.

Grazing Restrictions: This product may be used to treat undesirable vegetation in utility rights-of-way that pass through pastures, rangeland, and forestry sites that are being grazed. For tank mix applications, comply with all restrictions appearing on the tank mix product label.

Except for lactating dairy animals there are no grazing restrictions following the labeled applications of this product.

For lactating dairy animals there are no grazing restrictions for the following labeled applications of this product:
- Where the spray can be directed onto undesirable woody brush and trees, including in handgun spray to wet or low volume directed spray treatments.
- For tree injection of frill applications and for cut stump treatments.

For broadcast applications, observe the following restrictions for lactating dairy animals:
- For application rates between 4.5 and 7.5 quarts per acre, no more than 15 percent of the available grazing area may be treated.
- For application rates less than 4.5 quarts per acre, no more than 25 percent of the available grazing area may be treated.

These restrictions do not apply to pastures, rangeland or forestry sites outside of utility rights-of-way.

Herbicide Resistance Management

Glyphosate, the active ingredient in this product, is a group 9 herbicide (inhibitor of EPSP synthase). Some naturally occurring weed biotypes that are tolerant (resistant) to glyphosate may exist due to genetic variability in a weed population. Where resistant biotypes exist, the repeated use

of herbicides with the same mode of action can lead to the selection for resistant weeds. Certain agronomic practices reduce the likelihood that resistant weed populations will develop, and can be utilized to manage weed resistance once it occurs.

To delay the selection for glyphosate resistant weeds, use the following practices:

- Scout fields before and after application to detect weed escapes or shifts in weed species.
- Start with a clean field by applying a burndown herbicide or by tillage.
- Control weeds early when they are small.
- Add other herbicides, including a selective and/or a residual herbicide, and cultural practices, including tillage or crop rotation, where appropriate.
- Use the application rate for the most difficult to control weed in the field. Do not tank mix with other herbicides that reduce this product's efficacy through antagonism or with ones that encourage application rates of this product below those specified on this label.
- Control weed escapes and prevent weeds from setting seeds.
- In situations where resistant weeds are a problem, before moving from one site to another, clean equipment to minimize the spread of weed seeds or plant parts.
- Use new commercial seed that is as free of weed seed as possible.
- Report any incidence of repeated non-performance of this product against a particular weed species to the local retailer, county extension agent, or Dow AgroSciences representative.

The following good agronomic practices are recommended to reduce the spread of confirmed glyphosate-resistant biotypes:

- Tank mix this product or apply it sequentially with an appropriately labeled herbicide with a different mode of action to achieve control if a naturally occurring resistant biotype is present in the site.
- Cultural and mechanical control practices, including crop rotation or tillage, may also be used.
- To control weed escapes, including resistant biotypes, before they set seed, scout treated sites after applying this product.
- Thoroughly clean equipment before leaving any site known to contain resistant biotypes.

Because the presence of glyphosate resistance in weed populations is difficult to detect prior to use, Dow AgroSciences accepts no liability for any losses that may result from the failure of this product to control glyphosate-resistant weeds.

Attention

Avoid contact of herbicide with foliage, green stems, exposed non-woody roots or fruit of crops, desirable plants and trees, because severe injury or destruction may result.

AVOID DRIFT. Use extreme care when applying this product to prevent injury to desirable plants and crops.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing, or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. **Avoid applying at excessive speed or pressure.**

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. Keep container closed to prevent spills and contamination.

Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and-weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

- The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
- Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they must be observed.

The applicator should be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory.

Aerial Drift Reduction Advisory
This section is advisory in nature and does not supersede the mandatory label requirements.

Importance of Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent adverse effects from drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversions).

Controlling Droplet Size:

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows product larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. Use the lower spray pressures for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

Boom Length: For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

Application Height: Applications must not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Do not apply this product when wind speed is below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Do not apply this product during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a connected cloud (under low wind conditions) indicates an inversion, while smoke that moves upwards and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas: Apply this pesticide only when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Mixing Directions

Use only clean, stainless steel, fiberglass, plastic or plastic-lined steel containers to mix, store and apply spray solutions of this product. Do not mix, store or apply this product or spray solutions of this product in galvanized steel or unlined steel, except stainless steel, containers or spray tanks.

Eliminate any risk of siphoning the contents of the tank mix back into the carrier source while mixing. Use approved anti-back-siphoning devices where required by state or local regulations.

Note: Reduced results may occur if water containing soil is used, including visibly muddy water or water from ponds and ditches that is not clear.

Rodeo – Alone
This product mixes readily with water. Mix spray solutions of this product as follows:

1. Fill the mixing or spray tank with the required amount of clean water.
2. Add the specified amount of this product and nonionic surfactant near the end of the filling process and mix well.
3. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foaming, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.

Rodeo – Tank Mix
This product does not provide residual weed control. For residual weed control or an alternate mode of action, tank mix this product with other herbicides. Read and carefully observe the precautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive label directions for each product in the mixture.

Under certain conditions, at certain growth stages, and/or under other circumstances, some tank mix products have the potential to cause injury. Read all labels for products used in the tank mix prior to using them to determine the potential for crop injury.

Tank mixing with other herbicides, insecticides, fungicides, micronutrients or foliar fertilizers may result in reduced weed control or injury. Do not use these products in applications with this product unless otherwise noted in this label. Buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly specified in this labeling. Mixing this product with herbicides or other materials not specified on this label may result in reduced performance.

The user is responsible for ensuring that the specific application being made is included on the label of the product used in the tank mix when a tank mixture with a generic active ingredient, including 2,4-D, atrazine, dicamba, diuron, or pendimethalin, is used.

Read all individual product labels for all products in the tank mix and observe all precautions and restrictions on the label. Use according to the most restrictive directions for each product in the tank mix. Always predetermine the compatibility of all tank mix products, together in the carrier, by mixing small proportional quantities in advance of mixing and applying them to the use site. Add the tank mix product to the tank as directed by the label. Maintain agitation and add the required amount of this product.

Maintain good agitation at all times until the contents in the tank are sprayed. If the mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying resumes. Keep the bypass line on or near the bottom of the tank to minimize foaming. The screen size in the nozzle or line strainers should be no finer than 50 mesh.

Note: If tank mixing with Garlon® 3A herbicide, ensure that Garlon 3A is well mixed with at least 75 percent of the total spray volume before adding this product to the spray tank to avoid incompatibility.

Hand-Held Sprayers
Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Nonionic Surfactant
When using this product, unless otherwise specified, mix with a surfactant, including a nonionic surfactant containing 80% or more active ingredient. For conifer release (pine release), use only surfactants that are approved for conifer release and specified on the surfactant label as safe for use in conifer release. Using this product without surfactant will result in reduced herbicide performance.

Colorants or Dyes
Agriculturally-approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilutions. Use colorants or dyes according to the manufacturer's directions.

Drift Control Additives
Drift control additives may be used with all equipment types except wiper applicators, sponge bars and CDA equipment. When a drift control additive is used, read and carefully observe the precautionary statements and all other information appearing on the additive label.

Application Equipment and Application Methods

Chemigation: Do not apply this product through any type of irrigation system.

Apply spray solutions in properly maintained and calibrated equipment capable of delivering desired volumes.

This product may be applied with the following application equipment and application methods.

Aerial Application
Equipment: Fixed wing and helicopter

Do not apply this product using aerial spray equipment except under conditions as specified within this label.

For aerial application in California, refer to the supplemental label entitled for aerial applications in that state for specific instructions, restrictions, and requirements. **Note:** Do not aerially apply this product in a tank mix with dicamba in California.

Avoid drift. Do not apply when winds are gusty or under any other condition which favors drift. Drift may cause damage to any vegetation contacted to which treatment is not intended. To prevent injury to adjacent desirable vegetation, maintain appropriate buffer zones.

Do not directly apply to any body of water.

Use the specified rates of this herbicide in 3 to 25 gallons of water per acre unless otherwise specified on this label. Refer to the specific use directions of this label for volumes and application rates.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations that dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure. A drift control additive may be used. When a drift control additive is used, carefully read and observe the precautionary statements and all other information specified on the additive label.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Ground Application
Equipment: Boom or boomless systems, pull-type sprayer, floaters, pick-up sprayers, spray coupes and other ground broadcast equipment.

Use the specified rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified on this label. As density of weeds increases, increase the spray volume within the rate range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

Hand-Held and High-Volume Including Backpack Application
Equipment: Knapsack and backpack sprayers, pump up pressure sprayers, handguns, hand wands, mistblowers, lances, and other hand-held and motorized spray equipment used to direct the spray onto weed foliage. **Note:** This product is not registered in Arizona or California for use in mistblowers.

Apply to foliage of vegetation to be controlled. Do not spray to the point of runoff for applications made on a spray to wet basis. Use coarse sprays only. For best results, cover the top half of the plant and at least half of the total foliage. To ensure adequate spray coverage, spray both sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple sprouts.

High Volume Sprays: Prepare a 3/4 to 2 percent solution of this product in water, add a nonionic surfactant and apply to foliage of vegetation to be controlled. For specific rates of application and instructions for control of various annual and perennial weeds, see the Weeds Controlled section.

Make applications on a spray to wet basis with uniform and complete spray coverage. Do not spray to point of runoff.

Low Volume Directed Sprays: This product may be used as a 5 to 10 percent solution in low volume directed sprays for spot treatment of trees and brush. This treatment method is most effective in areas where there is a low density of undesirable trees or brush. If a straight stream nozzle is used, start the application at the top of the targeted vegetation and spray from top to bottom in a lateral zigzag motion. Ensure that at least 50 percent of the leaves are contacted by the spray solution. For flat fan and cone nozzles and with hand-directed mist blowers, mist the application over the foliage of the targeted vegetation. Treat small, open-branched trees only from one side. If the foliage is thick or there are multiple root sprouts, apply from several sides to ensure adequate spray coverage. Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table.

Spray Solution:

Desired Volume	Amount of This Product								
	0.5	0.75	1	1.25	1.5	2	5	8	10
1 gal	2/3 fl oz	1 fl oz	1 1/3 fl oz	1 2/3 fl oz	2 fl oz	2 2/3 fl oz	6 1/2 fl oz	10 1/4 fl oz	13 fl oz
25 gal	1 pt	1 1/2 pt	1 qt	1 1/4 qt	1 1/2 qt	2 qt	1 1/4 gal	2 gal	2 1/2 gal
100 gal	2 qt	3 qt	1 gal	1 1/4 gal	1 1/2 gal	2 gal	5 gal	8 gal	10 gal

2 Tablespoons = 1 fl oz

For best results when using knapsack sprayers, mix the specified amount of product with water in a larger container. Fill the knapsack sprayer with the solution and add the correct amount of surfactant.

Selective Equipment
Equipment: Recirculating sprayers, shielded and hooded sprayers, wiper applicators and sponge bars.

Do not contact desirable vegetation with herbicide. Droplets, mist, foam, or splatter of the herbicide settling on desirable vegetation is likely to result in discoloration, stunting or destruction.

Better results are obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations, or when the height of weeds varies so that not all weeds are contacted. If this occurs, repeat treatment may be necessary.

Shielded and Hooded Applicators: A shielded or hooded applicator directs the herbicide solution onto weeds while shielding desirable vegetation from the herbicide. Use nozzles that provide uniform coverage within the treated area. Keep shields on these sprayers adjusted to protect desirable vegetation. **Exercise extreme care to avoid contact of the herbicide with desirable vegetation.**

Wiper Applicators: Wiper applicators are devices that physically wipe appropriate amounts of this product directly onto the weed. Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation.

Adjust wiper applicators used over the top of desirable vegetation so that the wiper contact point is at least 2 inches above the desirable vegetation. Better results are obtained when more of the weed is exposed to the herbicide solution. Weeds should be a minimum of 6 inches above the desirable vegetation. Adjust the applicator height to ensure adequate contact with weeds as weeds not contacted by the herbicide solution will not be affected. Poor contact may occur when weeds are growing in dense clumps, in severe weed infestations, or when weed height varies dramatically. If this occurs, repeat treatment may be necessary.

Operate this equipment at ground speeds no more than 5 mph. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if two applications are made in opposite directions.

Droplets, mist, foam, or splatter of the herbicide settling onto desirable vegetation may result in discoloration, stunting or destruction. Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that on sloping ground the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a one-day period as reduced activity may result from use of leftover solutions. Clean wiper parts by thoroughly flushing with water immediately after using this product.

For best results, use a nonionic surfactant at a rate of 10 percent by volume of total herbicide solution for all wiper applications.

Injection Systems
Equipment: Aerial or ground injection sprayers.

This product may be used in aerial or ground injection spray systems. It may be used as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this product with the concentrate of other products when using injection systems.

Controlled Droplet Applicator (CDA)
Equipment: Hand-held or boom-mounted applicators that produce a spray consisting of a narrow range of droplet sizes.

The rate of this product applied per acre by vehicle-mounted CDA equipment must not be less than the amount specified on this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 3 to 15 gallons of water per acre.

For the control of annual weeds with hand-held CDA units, apply a 20 percent solution of this product at a flow rate of 2 fl oz per minute and a walking speed of 1.5 mph (1 1/2 pints of product per acre). For control of perennial weeds, apply a 20 to 40 percent solution of this product at a flow rate of 2 fl oz per minute and a walking speed of 0.75 mph (3 to 6 pints of product per acre).

CDA equipment produces a spray pattern that is not easily visible. Exercise extreme care to avoid spray or drift contacting the foliage or any other green tissue of desirable vegetation as damage or destruction may result.

Use Sites

Use this product in noncrop areas, including airports, apartment complexes, aquatic sites, Christmas tree farms, commercial sites, Conservation Reserve Program (CRP) areas, ditch banks, driveways, dry ditches, dry canals, fencerows, golf courses, greenhouses, habitat management, industrial areas, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, ornamentals, parking areas, parks, pastures, petroleum tank farms and pumping installations, plant nurseries, public areas, railroads, rangeland, recreation areas, utility rights-of-way, roadsides, shadehouses, sod or turf seed farms, sports complexes, storage areas, substations, turfgrass areas, utility sites, warehouse areas, wildlife habitat management areas, and in grazed areas on these sites.

Aquatic Sites

This product may be applied to emerged weeds in all bodies of fresh and brackish water that may be flowing, nonflowing or transient including lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wastewater treatment facilities, wildlife habitat restoration and management areas and similar sites.

If aquatic sites are present in the noncrop area and are part of the intended treatment, read and observe the following directions:

- This product does not control plants that are completely submerged or have a majority of their foliage under water.
- There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.
- Consult local and state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.
- To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made **only** in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after the application.
- For treatments after draw down of water or in dry ditches, allow 7 days or more after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after draw down to ensure application to actively growing weeds.
- Floating mats of vegetation may require retreatment. Avoid wash off of sprayed foliage by spray boat or recreational boat backwash or by rainfall within 6 hours of application. Do not re-treat within 24 hours following the initial treatment.
- Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in water. When making any bankside applications, do not overlap more than 1 foot into open water. Do not spray in bodies of water where weeds do not exist. The maximum application rate of 7 1/2 pints per acre must not be exceeded in any single broadcast application that is being made over water.
- When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

Restrictions:
- Do not apply this product directly to water within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.),

or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond or reservoir. This restriction does not apply to intermittent inadvertent overspray of water in terrestrial use sites.

Wetland Sites

This product may be applied to undesirable vegetation in and around water (aquatic areas) and wetlands found in forestry, utility rights-of-way sites or other site listed on the label, including where these sites are adjacent to or surrounding domestic water supply reservoirs, supply streams, lakes and ponds.

If wetland sites are present, read and observe the following directions:

- There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.
- Consult local public water control authorities before applying this product in and around public water. Permits may be required to treat in such areas.

Restrictions:

- Do not apply this product directly to water within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.), or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond or reservoir. This restriction does not apply to intermittent inadvertent overspray of water in terrestrial use sites.
- Do not spray open bodies of water where woody brush, trees and herbaceous weeds do not exist. Do not apply more than 3 3/4 quarts per acre in a single over water broadcast application except in stream crossings in utility right-of-way or where applications will result in less than 20 percent of the total water area being treated. In either of these locations, any specified rate may be applied.

Christmas Tree Plantations

Broadcast Application (Oregon and Washington Only)
Broadcast apply this product over the established Christmas tree species Douglas fir (*Pseudotsuga menziesii*), fir species (*Abies* spp.), pine species (*Pinus* spp.) (except eastern white, loblolly, longleaf, shortleaf, slash), and spruce species (*Picea* spp.). Use 1 quart of this product per acre in 5 to 30 gallons of water per acre. For best results, add up to 10 fl oz of Entry II surfactant per acre. If using a different surfactant, follow the manufacturer's directions for use and ensure conifer safety has been adequately tested for that surfactant. Apply after trees have completed at least a full growing season since planting or transplanting.

Apply only in the fall after the formation of the final conifer resting buds or in the spring prior to initial bud swell. Final resting buds must be fully hardened and in the dormant stage. Applying this product at any other time may result in unacceptable injury to the Christmas trees. Avoid spray pattern overlap as injury may occur.

In some areas, 1 to 2 quarts of this product per acre may be used. Consult your local representative for specific use instructions if rates greater than 1 quart per acre are required.

For best results, do not use drift control additives as they may increase injury to Christmas trees.

Precautions and Restrictions:

- **Preharvest Interval:** Do not apply within 1 full year prior to tree harvest.
- Ensure that adequate buffers are maintained to prevent drift onto nearby desirable crops or vegetation.

Cut Stump

Treat cut stumps in any noncrop site listed on this label. This product will control regrowth of freshly cut stumps and resprouts of many types of woody brush and tree species, some of which are listed below. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50 to 100 percent solution of this product to freshly cut surface immediately after cutting. Delays in application may result in reduced performance. For best results, make applications during periods of active growth and full leaf expansion.

When used according to directions for cut stump application, this product will control, partially control or suppress most woody brush and tree species, some of which are listed below:

Common Name	Scientific Name
alder	*Alnus* spp.
coyotebrush[1]	*Baccharis pilularis*
dogwood[1]	*Cornus* spp.
eucalyptus	*Eucalyptus* spp.
hickory[1]	*Carya* spp.
madrone, Pacific	*Arbutus menziesii*
maple[1]	*Acer* spp.
oak	*Quercus* spp.
peppertree, Brazilian	*Schinus terebinthifolius*
Australian-pine,	*Casuarina equisetifolia*
poplar[1]	*Populus* spp.
reed, giant	*Arundo donax*
saltcedar	*Tamarix ramosissima*
sweetgum[1]	*Liquidambar styraciflua*
sycamore[1]	*Platanus occidentalis*
tan oak	*Lithocarpus densiflorus*
willow	*Salix* spp.

[1]Do not use this product on these species in the state of California.

Precautions and Restrictions:

- Do not make cut stump applications when the roots of desirable woody brush or trees may be grafted to the roots of the cut stump. Some sprouts, stems, or trees may share the same root system.
- Adjacent trees that are of a similar age, height and spacing may indicate shared roots.
- Injury is likely to occur to non-treated stems or trees when one tree or more that shares a common root is treated.

Injection and Frill (Woody Brush and Trees)

Woody vegetation may be controlled by injection or frill application of this product. Apply this product using suitable equipment that penetrates into the living tissue. Apply the equivalent of 1 mL of this product per each two to three inches of trunk diameter at breast height (DBH). This is best achieved by applying 50 to 100 percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying diluted material to a continuous frill or more closely spaced cuttings. Do not make any applications that allow runoff to occur from frilled or cut areas in species that exude sap freely. In species such as this, make frill or cuts at an oblique angle to produce a cupping effect and use a 100 percent undiluted concentration of this product. For best results, apply during periods of active growth and full leaf expansion.

This product controls the following woody species:

Common Name	Scientific Name
oak	*Quercus* spp.
poplar	*Populus spp.*
sweetgum	*Liquidambar styraciflua*
sycamore	*Platanus occidentalis*

This product suppresses the following woody species:

Common Name	Scientific Name
blackgum[1]	*Nyssa sylvatica*
dogwood	*Cornus* spp.
hickory	*Carya* spp.
maple, red	*Acer rubrum*

[1]Do not use this product on these species in the state of California.

Forestry Site Preparation

This product is for the control or partial control of woody brush, trees, and herbaceous weeds in forestry. This product is also for use in preparing or establishing wildlife openings within these sites and maintaining logging roads.

In forestry sites, use this product in site preparation prior to planting any tree species including Christmas trees, eucalyptus, hybrid tree cultivars and silvicultural nursery sites. Unless otherwise specified, make applications of this product for control or partial control of herbaceous weeds, woody brush and trees listed in the Weeds Controlled section.

Application Rates

Method of Application	Rate	Spray Volume (gal/acre)
Broadcast		
aerial	1.5 - 7.5 qt/acre	5 - 30.
ground		10 - 60
Spray to Wet		
handgun, backpack	0.75 - 2%	spray to wet
mistblower	by volume	
Low Volume Directed Spray[1]		
handgun, backpack	5 - 10%	partial coverage
mistblower	by volume	

[1] For low volume directed spray applications, coverage should be uniform with at least 50% of the foliage contacted. For best results, coverage of the top one-half of the plant, including the growing tip, is important (over the top and down coverage) To ensure adequate spray coverage, spray all sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple sense or tall sprouts.

Use a higher rate in the rate range for control or partial control of woody brush, trees and hard to control perennial herbaceous weeds. For best results, apply to actively growing woody brush and trees after full leaf expansion and before leaf drop. Use increased rates within the rate range to control perennial herbaceous weeds from emergence up to the appearance of seedheads, flowers or berries. Use a lower rate in the rate range to control annual herbaceous weeds and actively growing perennial herbaceous weeds after seedheads, flowers or berries appear. Apply to foliage of actively growing annual herbaceous weeds anytime after emergence.

This product has no herbicidal or residual activity in the soil. Where repeat applications are necessary, do not apply more than 8 quarts of product per acre per year.

Tank Mixes
This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled. When tank mixing, read and observe applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Note: For forestry site preparation, make sure the tank mix product is approved for use prior to planting the desired species. Observe planting interval restrictions.

Any specified rate of this product may be used in a tank mix with the following products for forestry site preparation:

Product	Method of Application	Rate
Milestone VM[1]	broadcast[3]	5 – 7 fl oz/acre
Garlon 3A[2]		1 – 4 qt/acre
Garlon 4		
Arsenal Applicators Concentrate		2 – 16 fl oz/acre
Escort		1/2 – 1 1/2 oz/acre
Chopper		4 – 32 fl oz/acre
Oust XP		1 – 4 oz/acre
Arsenal Applicators Concentrate	spray to wet	1/32 – 1/2% by volume
Arsenal Applicators Concentrate	low volume directed spray	1/8 – 1/2% by volume

[1]Use Milestone VM only in those states that have a Special Local Need label for use in forestry.
[2]Ensure that Garlon 3A is thoroughly mixed with water before adding this product. Agitation is required while mixing this product with Garlon 3A to avoid compatibility problems.
[3]When using a tank mix partner, up to the maximum labeled rate for a treatment site may be applied in combination with this product.

For control of herbaceous weeds, use the lower specified tank mixture rates. For control of dense stands or difficult to control woody brush and trees, use the higher specified rates.

Aerial Application
Aerially apply this product by helicopter only in forestry sites. See Aerial Application in Application Equipment and Application Methods for more details.

Ground Application
Apply this product using suitable ground equipment for broadcast applications in forestry sites. See Ground Application in Application Equipment and Application Methods for more details. Unless otherwise specified, apply the specified rates of this product as a broadcast spray in sufficient spray volume to provide complete and uniform coverage of plant foliage. Check for even distribution throughout the spray pattern.

Hand-Held and Backpack Application
Apply this product using handgun and backpack equipment in forestry sites. See Hand-Held and Backpack Application in Application Equipment and Application Methods for more details. For spray to wet applications, coverage should be uniform and complete, but not to the point of runoff.

This product may be used for low volume directed sprays for spot treatment of trees and brush. It is most effective in areas where there is a low density of undesirable trees or brush. For flat fan and cone nozzles, spray the foliage of the targeted vegetation. Small, open branched trees need only be treated from one side. If the foliage is thick or there are multiple root sprouts, apply from several sides to ensure adequate spray coverage.

Forestry Conifer and Hardwood Release

Directed Sprays and Selective Equipment
Apply this product as a directed spray or with selective equipment in forestry conifer and hardwood sites, including Christmas tree plantations and silvicultural nurseries. A surfactant must be used with this product. Use only surfactants approved for conifer release and specified on the surfactant label as safe for use in conifer release (pine release). Using this product without a surfactant will result in reduced herbicide performance. See Mixing Directions and Application Equipment and Application Methods sections.

Avoid contact of spray drift, mist or drips with foliage, green bark or non-woody surface roots of desirable plant species.

Tank Mixes: When tank mixing, read and observe applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture.

Broadcast Application Outside Area of Southeastern United States
Apply this product as a broadcast application for release of Douglas fir (*Pseudotsuga menziesii*), fir (*Abies* species), hemlock (*Tsuga* species), pines (*Pinus* species) (includes all species except loblolly, longleaf, shortleaf, or slash), and California redwood (*Sequoia* species) outside the area of the southeastern United States. Apply this product as a broadcast application only after formation of final conifer resting buds in the fall or prior to initial bud swelling in the spring. Note: Except where specified, make broadcast applications of this product only where conifers have been established for more than one year.

Injury may occur to conifers treated for release, especially where spray patterns overlap or the higher rates are applied. Damage can be accentuated if applications are made when conifers are actively growing, are under stress from drought, flood water, improper planting, insects, animal damage or diseases.

Apply 3/4 to 1 1/2 quarts per acre as a broadcast spray. Apply 3/4 to 1 1/8 quarts of this product per acre to release Douglas fir, pine and spruce species at the end of the first growing season (except California). Ensure all conifers are well hardened off.

A surfactant must be used with this product for optimum weed control. Use only surfactants approved for use in over the top release applications. Using this product without a surfactarit will result in reduced herbicide performance. For best results, do not use a surfactant for release of hemlock species or California redwood. In mixed conifer stands, injury to these species may result if a surfactant is used. See Mixing Directions and Application Equipment and Application Methods sections.

For release of Douglas fir, a nonionic surfactant for over the top foliar spray may be used. To avoid possible conifer injury, use nonionic surfactants at 2 fl oz per acre at elevations above 1500 feet, or 1 fl oz per acre in the coastal range or at elevations below 1500 feet. Using a higher rate of surfactant may result in unacceptable conifer injury. Ensure the nonionic surfactant has been adequately tested for safety to Douglas fir before using.

Tank Mixes with Oust XP: Apply 3/4 to 1 1/2 quarts of this product with 1 to 3 oz of Oust XP per acre to release jack pine and white. Use 1 to 1 1/2 oz of Oust XP per acre with this product to release white pine. Make applications to actively growing weeds as a broadcast spray over the top of established conifers. Make applications after formation of conifer resting buds in the late summer or fall.

Tank Mixes with Arsenal Applicators Concentrate: Apply 3/4 to 1 1/8 quarts of this product with 2 to 6 fl oz of Arsenal Applicators Concentrate per acre to release Douglas fir. Apply 1 1/2 quarts of this product with 1 to 2 1/2 fl oz of Arsenal Applicators Concentrate per acre to release balsam fir and red spruce.

In **Maine** and **New Hampshire**, apply up to 2 1/4 quarts of this product per acre to control or suppress difficult to control hardwood species. For the release of red pine, balsam fir, red spruce, white spruce, Norway spruce, and black spruce with dense tough to control brush, and where maples make up a large component of the undesirable trees, this product may be tank mixed with 1 to 2 1/2 fl oz of Arsenal Applicators Concentrate and 1 to 3 oz of Oust XP per acre. Apply this mix as a broadcast spray.

Broadcast Application in Southeastern United States
Apply this product as a broadcast application for release of loblolly pine (*Pinus taeda*), eastern white pine (*Pinus strobus*), shortleaf pine (*Pinus echinata*), slash pine (*Pinus elliottii*), Virginia pine (*Pinus virginiana*), and longleaf pine (*Pinus palustris*) in the southeastern United States.

Apply 1 1/8 to 1 7/8 quarts of this product per acre as a broadcast spray during late summer or early fall after the conifers have hardened off. For applications at the end of the first growing season, use 3/4 quart of this product alone or in a tank mix.

Tank Mixes with Arsenal Applicators Concentrate: For conifer release, apply 3/4 to 1 1/2 quarts of this product with 2 to 16 fl oz of Arsenal Applicators Concentrate per acre as a broadcast spray. Use only on conifer species that are labeled for over the top spray for both products. Use the higher specified rates for dense tough to control wood brush and trees.

Herbaceous Release
When applied as directed, this product plus listed residual herbicides provide postemergence control of the annual weeds and control or suppression of the perennial weeds listed in this label, and residual control of the weeds listed in the residual herbicide label. Make applications to actively growing weeds as a broadcast spray over the top of labeled conifers.

Use a surfactant labeled for use in over the top herbaceous release applications. Using this product without a surfactant will result in reduced herbicide performance. See Mixing Directions and Application Equipment and Application Methods sections on this label.

Weed control may be reduced if spray solution water volumes exceed 25 gallons per acre for these treatments.

Tank Mixes with Oust XP: Apply 12 to 18 fl oz of this product with 2 to 4 oz of Oust XP per acre to release loblolly pines. Apply 9 to 12 fl oz of this product with 2 to 4 oz of Oust XP per acre to release slash pines.

Tank Mix with Atrazine: Apply 3/4 quarts of this product with 4 lb ai of atrazine per acre to release Douglas fir. Apply only over Douglas fir that has been established for at least one full growing season. Apply in the early spring, usually mid-March through early April. Injury will occur if applications are made after bud swell in the spring. For this use, do not add surfactant to the tank mix.

In **Maine** and **New Hampshire**, for release of red pine, balsam fir, red spruce, white spruce, Norway spruce, and black spruce with heavy grass and herbaceous weeds infesting the site, up to 2 1/4 quarts of this product per acre may be tank mixed with 1 to 3 oz of Oust XP to control grass, herbaceous weeds and woody brush. Apply this mix as a broadcast spray.

Mid-Rotation Conifer Release and Spot Treatments for Crop Tree Release and Timber Stand Improvement

This product is applied as a ground broadcast or directed spray application for mid-rotation release applications under the canopy of pines (and other conifers) and hardwoods. Make applications using application techniques that prevent or minimize direct contact to the foliage of crop trees (including in stands of pine, other conifers, or hardwood). This may be accomplished using directed sprays and ground equipment with nozzles oriented to target only undesirable understory vegetation below the crop tree canopy. This product is applied as a spot, individual plant treatment for woody and herbaceous weeds (see Hand-Held and Backpack Application in Application Equipment and Application Methods section). When making spot applications, do not allow spray to contact the foliage of desirable crop trees.

Noncrop Areas and Industrial Sites

See the rate tables in the Annual Weeds, Perennial Weeds, and Woody Brush and Trees sections for specific application rates. This product has no herbicidal or residual activity in the soil. Where repeat applications are necessary, do not apply more than 8 quarts of this product per acre per year.

Use a higher rate in the rate range for control or partial control of woody brush, trees, and hard to control perennial herbaceous weeds. For best results, apply to actively growing woody brush and trees after full leaf expansion and before fall color and leaf drop. Use increased rates within the rate range for difficult to control species, where dense stands occur, or where conditions for control are not ideal and to control perennial herbaceous weeds from emergence up to the appearance of seedheads, flowers or berries. Use a lower rate in the rate range to control annual herbaceous weeds and actively growing perennial herbaceous weeds after seedheads, flowers or berries appear. Apply to foliage of actively growing annual herbaceous weeds anytime after emergence.

Tank Mixing for Noncrop Areas
This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled. When tank mixing, read and observe applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Maintain good agitation at all times during the mixing process and application. Ensure that the tank mix product(s) is well mixed with the spray solution before adding this product. Mix only the amount of spray solution that will be used during the same day. Reduced weed control may result if a tank mixture is allowed to stand overnight. If the spray mix is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed.

Weed Control, Trim and Edge, and Bare Ground
This product may be used in general noncrop and non-food areas. It may be applied with any application equipment described in this label. This product may be used to trim and edge around objects in noncrop sites, for spot treatment of unwanted vegetation, and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

To maintain bare ground, repeated applications of this product may be used.

This product provides control of emerged annual weeds and control or partial control of emerged perennial weeds, woody brush and trees when applied in a tank mix to bare ground.

Turfgrass Renovation, Seed or Sod Production

This product controls most existing vegetation prior to renovating turfgrass areas or establishing turfgrass grown for seed or sod. For maximum control of existing vegetation, delay planting or sodding to determine if any regrowth from escaped underground plant parts occurs. When repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm season turfgrass, including bermudagrass, summer or fall applications provide the best control. Where existing vegetation is growing under mowed turfgrass management, apply this product after omitting at last one regular mowing to allow sufficient grown for good interception of the spray.

Do not disturb soil or underground plant parts before treatment. Delay tillage or renovation techniques, including vertical mowing, coring, or slicing, for seven days after application to allow translocation into underground plant parts.

Desirable turfgrass may be planed following the above procedures.

Hand-held equipment may be used for spot treatment of unwanted vegetation growing in existing turfgrass. Broadcast or hand-held equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

Do not feed or graze turfgrass grown for seed or sod production for eight weeks following application.

Ornamentals and Plant Nurseries

Post-Direct and Trim and Edge
This product may be used as a post-directed spray around established woody ornamental species, including arborvitae, azalea, boxwood, crabapple, euonymus, fir, Douglas fir, jojoba, hollies, lilac, magnolia, maple, oak, provet, pine, spruce and yew. This product may also be used to trim and edge around trees, buildings, sidewalks and roads, potted plants and other objects in a nursery setting.

Desirable plants may be protected from the spray solution by using shields or coverings made of cardboard or other impermeable material. Do not use this product for any over the top broadcast spray in ornamentals. Exercise care to avoid contact of spray, drift or mist with foliage or green bark of established ornamental species.

Site Preparation
This product may be used prior to planting any ornamental, nursery or Christmas tree species.

Greenhouse/Shadehouse
This product may be used to control weeds growing in and around greenhouses and shadehouses. Desirable vegetation must not be present during application and air circulation fans must be turned off.

Wildlife Habitat Management

This product may be used to control exotic and other undesirable vegetation in habitat management and natural areas, including rangeland and wildlife refuges. Apply to allow recovery of native plant species, prior to planting desirable native species, and for broad spectrum vegetation control. Apply spot treatments to selectively remove unwanted plants for habitat enhancement.

Wildlife Food Plots
This product may be used as a site preparation treatment to control annual and perennial weeds prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tilling to allow translocation into underground plant parts.

Hollow Stem Injection

Apply this product to control giant knotweed (*Polygonum sachalinense*), Japanese knotweed (*Polygonum cuspidatum*), or other invasive knotweeds using individual stem treatment. Use a hand-held injection device that delivers the specified amount of this product into these hollow stem plants.

Make a hole through both sides of the stem about 6 inches above the ground, just below a node, using an awl or other pointed tool. Inject 5 mL of undiluted product directly into this hole in the hollow stem. Treat each stem of the knotweed plant.

Restrictions:

- Do not apply more than a total of 8 quarts of this product per acre for all treatments combined. At 5 mL per stem, 8 quarts will treat approximately 1420 stems per acre.

Parks, Recreational and Residential Areas

Use this product in parks, recreational and residential areas. Apply it with any application equipment described in this label. Use this product to trim and edge around trees, fences, paths, around buildings, sidewalks, and other objects in these areas. This product may be used for spot treatment of unwanted vegetation, eliminate unwanted weeds growing in established shrub beds or ornamental plantings, and prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

All of the label instructions apply to park and recreational areas.

Railroads

All of the instructions in the Noncrop Areas and Industrial Sites and Roadside sections apply to railroads.

Bare Ground, Ballast and Shoulders, Crossings, and Spot Treatment
Use this product to maintain bare ground on railroad ballast and shoulders. Repeat applications of this product may be used as weeds emerge to maintain bare ground. Use this product to control tall growing weeds to improve line of sight at railroad crossings and reduce the need for mowing along rights-of-way.

Brush Control
Apply 3 to 8 quarts of this product per acre as a broadcast spray, using boom-type or boomless nozzles. Applications up to 80 gallons of spray solution per acre may be used. Apply a 3/4 to 1.5 percent solution of this product when using high volume spray to wet applications. Apply a 5 to 10 percent solution of this product when using low volume directed sprays for spot treatment.

Roadsides

All of the instructions in the Noncrop Areas and Industrial Sites and Railroads sections apply to roadsides.

Shoulder Treatments
Use this product on road shoulders. Apply it with boom sprayers, shielded boom sprayers, high volume off-center nozzles, OC nozzle clusters, manifold nozzle systems, hand-held equipment, and similar equipment, and under-deck mowing plus herbicide systems..

Guardrails and Other Obstacles to Mowing
Use this product to control weeds growing under guardrails and around signposts and other objects along the roadside.

Spot Treatment
Use this product as a spot treatment to control unwanted vegetation growing along roadsides.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. Follow applicable use directions, precautions and limitations on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Chemical Mowing
Perennials: This product suppresses perennial grasses listed in this section to serve as a substitute for mowing. Use 4.5 fl oz of this product per acre when treating Kentucky bluegrass, tall fescue, fine fescue, orchardgrass, or quackgrass. Apply 12 fl oz of this product per acre when treating bermudagrass. Apply 4.5 to 8 fl oz of this product per acre when treating bahiagrass. Use the higher rates when grass is under heat stress. Apply 3 pints of this product per acre when treating torpedograss or paragrass. Apply treatments in 10 to 20 gallons of spray solution per acre.

Annuals: For growth suppression of some annual grasses, including annual ryegrass, wild barley and wild oats growing in coarse turfgrass on roadsides or other industrial areas, apply 3 to 3.75 fl oz of this product in 10 to 40 gallons of spray solution per acre. Apply when annual grasses are actively growing and before the seedheads are in the boot stage of development. Treatments may cause injury to the desired grasses.

Release of Dormant Bermudagrass or Bahiagrass
Apply 6 to 48 fl oz of this product per acre in 10 to 40 gallons of water per acre. Use only in areas where bermudagrass or bahiagrass are desirable groundcovers and where some temporary injury or discoloration can be tolerated. Treatments of more than 12 fl oz per acre may result in injury or delayed greenup in highly maintained areas, including golf courses and lawns.

For best results on winter annuals, treat when weeds are in an early growth stage (less than 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is in or beyond the 4- to 6-leaf stage.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. When tank mixing, read and follow all applicable use directions, precautions, and limitation on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Actively Growing Bermudagrass
Use this product to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Use only in areas where some temporary injury or discoloration can be tolerated. Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications of the tank mix in the same season are not specified since severe injury may occur.

Apply up to 2.25 pints of this product in 10 to 40 gallons of spray solution per acre. Use the lower rate when treating annual weeds less than 6 inches in height (or runner length). Use the higher rate as weeds increase in size or as they approach flower or seedhead formation.

Actively Growing Bahiagrass
For suppression of vegetable growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 4.5 fl oz of this product in 10 to 40 gallons of water per acre. Apply one to two weeks after full greenup or after mowing to a uniform height of 3 to 4 inches. Make this application prior to seedhead emergence. For suppression up to 120 days, apply 3 fl oz of this product per acre, followed by an application of 1.5 to 3 fl oz per acre about 45 days later. Make no more than two applications per year.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. When tank mixing, read and follow all applicable use directions, precautions, and limitation on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Utility Sites

Use this product for control of brush, tree, and weed control and side trimming in areas including electrical power, pipeline and telephone rights-of-ways, and other sites associated with these rights-of-ways including substations, roadsides, and railroads. this product may be applied with any application equipment or method described on this label unless specifically prohibited.

Tank Mixes: This product may be used in tank mix combination with other herbicide products to broaden the spectrum of vegetation controlled and for residual weed control. When tank mixing, read and follow all applicable use directions, precautions, and limitation on the respective product labels. Use according to the most restrictive precautionary statements for each product in the mixture. Any specified rate of this product may be used in a tank mix.

Rangelands

Use this product to control or suppress many annual weeds growing in perennial cool and warm season grass rangelands. Preventing weed seed production is critical to the successful control of annual grassy weeds invading these perennial grass sites. Eliminate most of the viable seeds with follow up applications in sequential years. Delay grazing of treated areas to encourage growth of desirable perennials. Allowing desirable perennials to flower and reseed in the treated area will encourage successful transition.

***Bromus*:** Use this product to control or suppress downy brome/ cheatgrass (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*), cheat (*Bromus secalinus*), cereal rye and jointed goatgrass. Apply 6 to 12 fl oz of this product per acre as a broadcast treatment.

For best results, coincide treatments with early seedhead emergence of the most mature plants. Delaying the application until this growth stage maximizes the emergence of other weedy grass flushes. Make applications to the same site each year until seed banks are depleted and the desirable perennial grasses become established on the site.

Medusahead: Apply 12 fl oz of this product per acre to control or suppress medusahead at the 3-leaf stage when plants are actively growing. Delaying applications beyond this stage results in reduced or unacceptable control. Repeat applications in subsequent years to eliminate the seed bank before reestablishing desirable perennial grasses. Apply in the fall or spring.

Apply by ground or air. Make aerial applications for these uses with fixed wing or helicopter equipment. For aerial applications, apply in 2 to 10 gallons of water per acre. For ground applications, apply in at least 10 to 20 gallons of water per acre.

Spot Treatment and Wiper Application
Apply this product in rangeland, pastures, or industrial sites as a spot treatment or over the top of desirable grasses using wiper applicators to control tall weeds. See Wiper Application section for specific instructions. Make repeat applications in the same area at 30-day intervals.

The entire site or any portion of it may be treated when using 2.25 quarts or less of this product per acre for spot treatments or wiper applications. No more than 10 percent of the total site may be treated at any one time when using more than 2.25 quarts of this product per acre for spot treatments or wiper applications. To achieve maximum performance, remove domestic livestock before application and wait 7 days after application before grazing livestock or harvesting for feed.

Pastures

Type of Pastures: Bahiagrass, bermudagrass, bluegrass, brome, fescue, orchardgrass, ryegrass, timothy, wheatgrass, alfalfa, clover

Spot Treatment and Wiper Application
This product may be applied as a spot treatment or as a wiper application. Make applications in the same area at 30-day intervals. See Wiper Application section for specific instructions.

Precautions and Restrictions:
- For spot treatment and wiper applications, the entire field or any portion of it may be treated when using a rate of 2.25 quarts or less per acre.
- Do not treat more than 10 percent of any acre at one time if applying more than 2.25 quarts per acre as a spot treatment or wiper application.
- To achieve maximum performance, remove domestic livestock before application and wait 14 days after application before grazing livestock or harvesting.

Preplant, Preemergence, and Pasture Renovation
Apply this product prior to planting or emergence of forage grasses and legumes. In addition, this product may be used to control perennial pasture species listed on this label prior to re-planting.

Precautions and Restrictions:
- If the application rates total 2.25 quarts or less per acre, there is no waiting period between treatment and feeding or livestock grazing is required.
- If the application rates total more than 2.25 quarts per acre, remove domestic livestock before application and wait eight weeks after application before grazing or harvesting.
- Crops listed for treatment in this label may be planted into the treated area at any time. Wait 30 days between application and planting for all other crops.

Bamboo

Use this product on roadside rights-of way to control or suppress bamboo. Use the higher rate in the rate range for dense stands and larger plants. Mow or cut bamboo and allow it to resprout to have sufficient foliage in order for the spray solution to completely cover the foliage. Optimum control or suppression of bamboo is achieved when this product is applied between August and October (prior to frost). One application of this product plus a surfactant will not eradicate bamboo. Several mowings and applications are required to completely control bamboo.

Apply the specified rate plus a surfactant (1/4 to 1/2% v/v), such as a nonionic surfactant containing 80% active ingredient or more. Using this product without a surfactant results in reduced performance.

Application Method	Rate	Spray Volume (gal/acre)
ground broadcast	1.5 – 7.5 qt/acre	10 - 60
handgun spray to wet	0.75 – 2%	spray to wet
handgun or backpack low volume directed spray	4 – 10%	spray to cover

Restrictions:
- Do not apply more than a total of 8 quarts of this product per acre per year.

Annual Weeds, Perennial Weeds, and Woody Brush and Trees

Annual Weeds
Apply 24 fl oz of this product per acre if weeds are less than 6 inches in height or runner length. Use 1.25 to 3 quarts of this product per acre if weeds are more than 6 inches in height or runner length or when weeds are growing under stressed conditions. Use a higher rate in the rate range for tough to control species regardless of the size of the weed at the time of application. Treat tough to control weeds when they are relatively small. Tank mix this product with only those products that are labeled for application at the target site. Refer to the label of the tank mix partner for use sites and application rates.

Apply a 0.4 percent solution of this product as a spray to wet application to weeds less than 6 inches in height or runner length. Use a 0.7 to 1.5 percent solution for annual weeds more than 6 inches tall or for smaller weeds growing under stressed conditions. Use the higher concentration for tough to control species or for weeds more than 24 inches tall. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds.

Use a 4 to 7 percent solution of this product for low volume directed spray applications. Spray coverage should be uniform with at least 50 percent of the foliage contacted. For best results, cover the top one-half of the plant. To ensure adequate spray coverage, spray both sides of large or tall weeds when foliage is thick and dense or where there are multiple sprouts.

Common Name	Scientific Name
anoda, spurred	*Anoda cristata*
balsamapple[1]	*Momordica charantia*
barley	*Hordeum vulgare*
barnyardgrass	*Echinochloa crus-galli*
bassia, fivehook	*Bassia hyssopifolia*
bittercress	*Cardamine* spp.
bluegrass, annual	*Poa annua*
bluegrass, bulbous	*Poa bulbosa*
brome, downy/cheatgrass	*Bromus tectorum*
brome, Japanese	*Bromus japonicus*
buttercup	*Ranunculus spp.*
Carolina foxtail	*Alopecurus carolinianus*
Carolina geranium	*Geranium carolinianum*
castorbean	*Ricinus communis*
chamomile, mayweed	*Anthemis cotula*
cheat	*Bromus secalinus*
chervil	*Anthriscus cerefolium*
chickweed	*Cerastium vulgatum*
cocklebur, common	*Xanthium strumarium*
coreopsis, plains	*Coreopsis tinctoria*
corn, volunteer	*Zea mays*
crabgrass	*Digitaria* spp.
dwarfdandelion, Virginia	*Krigia virginica*
eastern mannagrass	*Glyceria* spp.
eclipta	*Eclipta prostrata*
falsedandellori	*Pyrrhopappus carolinianus*
falseflax, smallseed	*Camelina microcarpa*
fiddleneck	*Amsinckia* spp.
field pennycress	*Thlaspi arvense*
fleabane, annual	*Erigeron annuus*
fleabane, hairy	*Conyza bonariensis*
fleabane, rough	*Erigeron strigosus*
Florida pusley	*Richardia scabra*
foxtail	*Setaria* spp.
goatgrass, jointed	*Aegilops cylindrica*
goosegrass	*Eleusine indica*
groundsel, common	*Senecio vulgaris*
henbit	*Lamium amplexicaule*
horseweed/marestail	*Conyza canadensis*
itchgrass	*Rottboellia cochinchinensis*
johnsongrass	*Sorghum halepense*
junglerice	*Echinochloa colona*
knotweed	*Polygonum* spp.
kochia[2]	*Kochia scoparia*
lambsquarters, common	*Chenopodium album*
mallow, little	*Malva parviflora*
medusahead	*Taeniatherum caput-medusae*
morningglory	*Ipomoea* spp.
mustard, blue	*Chorispora tenella*
mustard, tumble	*Sisymbrium altissimum*
mustard, wild	*Sinapis arvensis*
oats, wild	*Avena fatua*
panicum, fall	*Panicum dichotomiflorum*
pigweed, redroot	*Amaranthus retroflexus*
pigweed, smooth	*Amaranthus hybridus*
prickly lettuce	*Lactuca serriola*

Common Name (Cont.)	Scientific Name
puncturevine	*Tribulus terrestris*
purslane, common	*Portulaca oleracea*
ragweed, common	*Ambrosia artemisiifolia*
ragweed, giant	*Ambrosia trifida*
rocket, London	*Sisymbrium irio*
Russian-thistle	*Salsola tragus*
rye, cereal	*Secale cereale*
ryegrass, Italian[3]	*Lolium perenne*
sandbur, field	*Cenchrus spinifex*
sesbania, hemp	*Sesbania herbacea*
shattercane	*Sorghum bicolor*
shepherd's-purse	*Capsella bursa-pastoris*
sicklepod	*Senna obtusifolia*
signalgrass, broadleaf	*Urochloa platyphylla*
smartweed, Pennsylvania	*Polygonum pensylvanicum*
sowthistle, annual	*Sonchus oleraceus*
Spanishneedles[3]	*Bidens bipinnata*
speedwell, corn	*Veronica arvensis*
speedwell, purslane	*Veronica peregrina*
sprangletop	*Leptochloa* spp.
spurge, annual	*Chamaesyce* spp.
spurge, prostrate	*Chamaesyce humistrata*
spurge, spotted	*Chamaesyce maculata*
spurry, umbrella	*Holosteum umbellatum*
stinkgrass	*Eragrostis cilianensis*
sunflower, common	*Helianthus annuus*
tansymustard, pinnate	*Descurainia pinnata*
teaweed/sida, prickly	*Sida spinosa*
Texas panicum	*Panicum* spp.
velvetleaf	*Abutilon theophrasti*
Virginia pepperweed	*Lepidium virginicum*
wheat	*Triticum aestivum*
witchgrass	*Panicum capillare*
woolly cupgrass	*Eriochloa villosa*
yellow rocket	*Barbarea vulgaris*

[1]Apply with hand-held equipment only.
[2]Do not treat kochia in the button stage.
[3]Apply 3 pints of product per acre.

Perennial Weeds
Best results are obtained when perennial weeds are treated after they reach the reproductive stage of growth (seedhead initiation in grasses and bud formation in broadleaves). Best results are obtained when non-flowering plants are treated when they reach a mature stage of growth. In many situations, applications are required prior to these growth stages. Under these conditions, use a higher rate in the rate range.

When using spray to wet treatments with hand-held equipment, ensure thorough coverage of the plant. For best results, use a 1.5 percent solution on harder to control perennials including bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

Use a 4 to 7 percent solution of this product in low volume directed spray applications. Spray coverage should be uniform with at least 50 percent of the foliage contacted. For best results, cover the top one-half of the plant. To ensure adequate spray coverage, spray both sides of large or tall weeds when foliage is thick and dense or where there are multiple sprouts.

Allow 7 days or more after application before tillage.

Common Name	Scientific Name
alfalfa	*Medicago sativa*
alligatorweed[1]	*Alternanthera philoxeroides*
anise/fennel	*Foeniculum vulgare*
artichoke, Jerusalem	*Helianthus tuberosus*
bahiagrass	*Paspalum notatum*
beachgrass, European	*Ammophila arenaria*
bentgrass	*Agrostis* spp.
bermudagrass	*Cynodon dactylon*
bindweed, field	*Convolvulus arvensis*
bluegrass, Kentucky	*Poa pratensis*
blueweed, Texas	*Helianthus ciliaris*
brackenfern	*Pteridium aquilinum*
brome, smooth	*Bromus inermis*
bursage, woollyleaf	*Ambrosia grayi*
canarygrass, reed	*Phalaris arundinacea*
cattail	*Typha* spp.
clover, red	*Trifolium pratense*
clover, white	*Trifolium repens*
cogongrass	*Imperata clylindrica*
cordgrass	*Spartina spp.*
cutgrass, giant[1]	*Zizaniopsis milliacea*
dallisgrass	*Paspalum dilatatum*
dandelion	*Taraxacum officinale*
dock, curly	*Rumex crispus*
dogbane, hemp	*Apocynum cannabinum*
fescue	*Festuca* spp.
fescue, tall	*Lolium arundinaceum*
German ivy	*Senecio mikanioides*

Common Name	Scientific Name
guineagrass	*Urochloa maxima*
horsenettle	*Solanum carolinense*
horseradish	*Armoracia rusticana*
iceplant, crystalline	*Mesembryanthemum crystallinum*
johnsongrass	*Sorghum halepense*
kikuyugrass	*Pennisetum clandestinum*
knapweed, Russian	*Acroptilon repens*
lantana, largeleaf	*Lantana camara*
lespedeza, common	*Kummerowia striata*
lespedeza, sericea	*Lespedeza cuneata*
loosestrife, purple	*Lythrum salicaria*
lotus, American	*Nelumbo lutea*
maidencane	*Panicum hemitomon*
milkweed	*Asclepias* spp.
muhly, wirestem	*Muhlenbergia frondosa*
mullein, common	*Verbascum thapsus*
napiergrass	*Pennisetum purpureum*
nightshade, silverleaf	*Solanum elaeagnifolium*
nutsedge, purple	*Cyperus rotundus*
nutsedge, yellow	*Cyperus esculentus*
orchardgrass	*Dactylis glomerata*
pampasgrass	*Cortaderia selloana*
paragrass	*Urochloa mutica*
phragmites[2]	*Phragmites* spp.
poison-hemlock	*Conium maculatum*
quackgrass	*Elymus repens*
redvine	*Brunnichia ovata*
reed, giant	*Arundo donax*
ryegrass, perennial	*Lolium perenne*
smartweed, swamp	*Polygonum amphibium*
sowthistle, perennial	*Sonchus arvensis*
spatterdock	*Nuphar lutea*
starthistle, yellow	*Centaurea solstitialis*
sweet potato, wild[1]	*Ipomoea pandurata*
thistle, artichoke	*Cynara cardunculus*
thistle, Canada	*Cirsium arvense*
timothy	*Phleum pratense*
torpedograss[1]	*Panicum repens*
trumpetcreeper	*Campsis radicans*
tules, common	*Scirpus acutus*
vaseygrass	*Paspalum urvillei*
velvetgrass	*Holcus* spp.
waterhyacinth	*Eichornia crassipes*
waterlettuce	*Pistia stratiotes*
waterprimrose	*Ludwigia* spp.
wheatgrass, western	*Pascopyrum smithii*

[1] Partial control.
[2] Partial control in southeastern states.

Woody Brush and Trees
Apply this product after full leaf expansion unless otherwise directed. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation.

In arid areas, best results are obtained when applications are made in the spring or early summer when brush species are at high moisture content and are flowering.

Ensure thorough coverage when using hand-held equipment.

See Low Volume Directed Spray Application section of label. Spray coverage should be uniform with at least 50 percent of the foliage contacted. For best results, cover the top half to 2/3 of the plant foliage. Spray both sides of large or tall woody brush and trees to ensure adequate spray coverage when foliage is thick and dense or where there are multiple sprouts. Symptoms may not appear prior to frost or senescence with fall treatments.

Allow seven days or more after application before tillage, mowing or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

Note: If brush has been mowed or tilled, or trees have been cut, do not treat until regrowth has reached the specified stage of growth.

This product will control, partially control, or suppress the following woody brush and trees.

Common Name	Scientific Name
alder	*Alnus* spp.
ash[1]	*Fraxinus* spp.
aspen, quaking	*Populus tremuloides*
bearclover, bearmat	*Ceanothus prostratus*
beach	*Fagus* spp.
birch	*Betula* spp.
bittercherry	*Prunus emarginata*

Common Name (Cont.)	Scientific Name
blackberry	*Rubus* spp.
blackgum	*Nyssa sylvatica*
blue gum, Tasmanian	*Eucalyptus globulus*
brackenfern	*Pteridium aquilinum*
broom, French	*Genista monspessulana*
broom, Scotch	*Cytisus scoparius*
buckwheat, California[1]	*Eriogonum fasciculatum*
cascara[1]	*Frangula purshiana*
catclaw-vine[1]	*Macfadyena unguis-cati*
ceanothus	*Ceanothus* spp.
chamise	*Adenostoma fasciculatum*
cherry	*Prunus* spp.
cherry, black	*Prunus serotina*
cherry, pin	*Prunus pensylvanica*
copperleaf, hophornbeam	*Acalypha ostryifolia*
coyotebrush	*Baccharis pilularis*
deer vetch	*Lotus unifoliolatus*
dewberry, southern	*Rubus trivialis*
dogwood	*Cornus* spp.
elderberry	*Sambucus nigra*
elm[1]	*Ulmus* spp.
gorse	*Ulex europaeus*
hasardia[1]	*Haplopappus squarrosus*
hawthorn	*Crataegus* spp.
hazel	*Corylus* spp.
hickory	*Carya* spp.
holly, Florida	*Schinus terebinthifolius*
honeysuckle	*Lonicera* spp.
hornbeam, American	*Carpinus caroliniana*
kudzu	*Pueraria montana*
locust, black[1]	*Robinia pseudoacacia*
madrone, Pacific	*Arbutus menziesii*
manzanita	*Arctostaphylos* spp.
maple	*Acer* spp.
maple, red[1]	*Acer rubrum*
maple, sugar	*Acer saccharum*
maple, vine[1]	*Acer circinatum*
monkeyflower[1]	*Mimulus guttatus*
oak	*Quercus* spp.
oak, black[1]	*Quercus kellogia*
oak, pin	*Quercus palustris*
oak, post	*Quercus stellata*
oak, red	*Quercus rubra*
oak, southern red	*Quercus falcata*
oak, white[1]	*Quercus alba*
peppertree, Brazilian	*Schinus terebinthifolius*
persimmon[1]	*Diospyros* spp.
pine	*Pinus* spp.
poison-ivy, eastern	*Toxicodendron radicans*
poison-oak	*Toxicodendron* spp.
poison-sumac[1]	*Toxicodendron vernix*
prunus	*Prunus* spp.
raspberry	*Rubus* spp.
redbud, eastern	*Cercis canadensis*
rose, multiflora	*Rosa multiflora*
Russian-olive	*Elaeagnus angustifolia*
sage,: black, white	*Salvia* spp.
sagebrush, California	*Artemisia californica*
salmonberry	*Rubus spectabilis*
saltcedar[1]	*Tamarix ramosissima*
saltbush, sea myrtle	*Baccharis halimifolia*
sassafras	*Sassafras albidum*
sourwood[1]	*Oxydendrum arboreum*
sumac, smooth[1]	*Rhus glabra*
sumac, dwarf[1]	*Rhus copallinum*
sweetgum	*Liquidambar styraciflua*
swordfern[1]	*Polystichum munitum*
tallowtree, Chinese	*Triadica sebifera*
oak, tanbark resprouts	*Lithocarpus densiflorus*
thimbleberry, western	*Rubus parviflorus*
tobacco, tree[1]	*Nicotiana glauca*
trumpetcreeper	*Campsis radicans*
Virginia-creeper[1]	*Parthenocissus quinquefolia*
waxmyrtle, southern[1]	*Myrica cerifera*
willow	*Salix* spp.
yellow-poplar [1]	*Liriodendron tulipifera*
yerba santa	*Eriodictyon californicum*

[1]Partial control

Terms and Conditions of Use

If terms of the following Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, use by the buyer or any other user constitutes acceptance of the terms under Warranty Disclaimer, Inherent Risks of Use and Limitations of Remedies.

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Dow AgroSciences warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. Dow AgroSciences MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

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It is impossible to eliminate all risks associated with use of this product . Crop injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of Dow AgroSciences or the seller. To the extent permitted by law, all such risks shall be assumed by buyer.

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(1) Refund of purchase price paid by buyer or user for product bought, or
(2) Replacement of amount of product used.

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Revisions

1. Added resistance management section.
2. Added use directions for Christmas tree plantations; mid-rotation conifer release and spot treatments for crop tree release and timber stand improvement; noncrop areas and industrial sites; turfgrass renovation, seed or sod production; ornamentals and plant nurseries; hollow stem injection; parks; recreational and residential areas; roadsides; rangelands; pastures; bamboo.
3. Added Brazilian peppertree and Australian-pine to cut stump.
4. Added spurred anoda, bittercress, Japanese brome, Carolina geranium, castorbean, mayweed chamomile, chervil, plains coreopsis, eastern mannagrass, eclipta, falsedandelion, hairy fleabane, rough fleabane, Florida pusley, jointed goatgrass, goosegrass, henbit, itchgrass, johnsongrass, junglerice, knotweed, little mallow, medusahead, smooth pigweed, puncturevine, common purslane, hemp sesbania, sicklepod, corn speedwell, purslane speedwell, sprangletop, annual spurge, prostrate spurge, spotted spurge, teaweed/prickly sida, Virginia pepperweed, woolly cupgrass, and yellow rocket to annual weeds.
5. Added European beachgrass, bentgrass, woollyleaf bursage, German ivy, redvine, perennial sowthistle, and trumpetcreeper to perennial weeds.
6. Added beach, blackgum, brackenfern, cherry, hophornbeam copperleaf, deer vetch, gorse, Pacific madrone, maple, oak, Brazilian peppertree, pine, tanbark oak resprouts, and yerba santa to woody brush and trees.

Dow AgroSciences

SAFETY DATA SHEET
DOW AGROSCIENCES LLC

Product name: RODEO Herbicide

Issue Date: 11/10/2015
Print Date: 11/10/2015

DOW AGROSCIENCES LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: RODEO Herbicide

Recommended use of the chemical and restrictions on use
Identified uses: End use herbicide product

COMPANY IDENTIFICATION
DOW AGROSCIENCES LLC
9330 ZIONSVILLE RD
INDIANAPOLIS IN 46268-1053
UNITED STATES

Customer Information Number: 800-992-5994
info@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 800-992-5994
Local Emergency Contact: 352-323-3500

2. HAZARDS IDENTIFICATION

Hazard classification
This material is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Other hazards
No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature: Mixture
This product is a mixture.

Component	CASRN	Concentration
Glyphosate IPA salt	38641-94-0	53.75%

Isopropylamine	75-31-0	5.8%
Balance	Not available	40.45%

4. FIRST AID MEASURES

Description of first aid measures
General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.

Skin contact: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Eye contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

Ingestion: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed
Notes to physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Straight or direct water streams may not be effective to extinguish fire. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture
Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. Container may vent and/or rupture due to fire. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. May produce flash fire. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Flammable mixtures may exist within the vapor space of containers at room temperature.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water may not be effective in extinguishing fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Refer to section 7, Handling, for additional precautionary measures. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. For large spills, warn public of downwind explosion hazard. Check area with combustible gas detector before reentering area. Ground and bond all containers and handling equipment. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from heat, sparks and flame. No smoking, open flames or sources of ignition in handling and storage area. Electrically bond and ground all containers and equipment before transfer or use of material. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Containers, even those that have been emptied,

can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Never use air pressure for transferring product. Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation.

Conditions for safe storage: Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Do not store in: Carbon steel. Galvanized containers. Steel. Flammable mixtures may exist within the vapor space of containers at room temperature. Store in a dry place. Store in original container. Do not store near food, foodstuffs, drugs or potable water supplies.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value/Notation
Isopropylamine	ACGIH	TWA	5 ppm
	ACGIH	STEL	10 ppm
	OSHA Z-1	TWA	12 mg/m3 5 ppm

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Wear clean, body-covering clothing.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator.

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Physical state	Liquid.
Color	Yellow
Odor	Odorless
Odor Threshold	No data available
pH	4.8 *pH Electrode*
Melting point/range	Not applicable
Freezing point	No data available
Boiling point (760 mmHg)	No data available
Flash point	**closed cup** > 93 °C (> 199 °F) *Setaflash Closed Cup ASTM D3828* none below boiling point
Evaporation Rate (Butyl Acetate = 1)	No data available
Flammability (solid, gas)	No data available
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapor Pressure	No data available
Relative Vapor Density (air = 1)	No data available
Relative Density (water = 1)	1.21 at 22 °C (72 °F) / 4 °C *Pyknometer*
Water solubility	Soluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	none below 400 degC
Decomposition temperature	No test data available
Dynamic Viscosity	64.6 mPa.s at 20 °C (68 °F)
Kinematic Viscosity	53.4 mm2/s at 20 °C (68 °F)
Explosive properties	No
Oxidizing properties	No significant increase (>5C) in temperature.
Liquid Density	1.20 g/cm3 at 20 °C (68 °F) *Digital density meter*
Molecular weight	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Thermally stable at recommended temperatures and pressures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures. Avoid static discharge.

Incompatible materials: Heat produced by the reaction with water will cause vaporization. Flammable hydrogen may be generated from contact with metals such as:

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity
Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product:
LD50, Rat, male and female, > 5,000 mg/kg

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product:
LD50, Rabbit, male and female, > 5,000 mg/kg

Acute inhalation toxicity
No adverse effects are anticipated from single exposure to mist. Excessive exposure may cause irritation to upper respiratory tract (nose and throat).

As product:
LC50, Rat, male and female, 4 Hour, dust/mist, > 6.37 mg/l No deaths occurred at this concentration.

Skin corrosion/irritation
Brief contact is essentially nonirritating to skin.

Serious eye damage/eye irritation
May cause slight temporary eye irritation.
Corneal injury is unlikely.

Sensitization
Did not cause allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
For similar active ingredient(s).
Glyphosate.
Based on available data, repeated exposures are not anticipated to cause significant adverse effects.
For the minor component(s):
In animals, effects have been reported on the following organs after inhalation:
Eye.
Respiratory tract.

Carcinogenicity
For similar material(s): Glyphosate. Did not cause cancer in laboratory animals. Weight of evidence evaluation of epidemiology studies supports no association between glyphosate exposure and cancer.

Teratogenicity
For similar active ingredient(s). Glyphosate. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive toxicity
For similar active ingredient(s). Glyphosate. In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Mutagenicity
For the active ingredient(s): In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative in some cases and positive in other cases.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

Carcinogenicity

Component	List	Classification
Glyphosate IPA salt	IARC	Group 2A: Probably carcinogenic to humans

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Acute toxicity to fish
Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), 96 Hour, > 2,500 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), 48 Hour, 918 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), 72 Hour, 127 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to Above Ground Organisms
Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

oral LD50, Colinus virginianus (Bobwhite quail), > 2000mg/kg bodyweight.

contact LD50, Apis mellifera (bees), > 100µg/bee

oral LD50, Apis mellifera (bees), > 100µg/bee

Persistence and degradability

Glyphosate IPA salt

Biodegradability: For similar active ingredient(s). Glyphosate. Biodegradation may occur under aerobic conditions (in the presence of oxygen).

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Atmospheric half-life: 0.115 d
Method: Estimated.

Isopropylamine

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).
10-day Window: Pass
Biodegradation: 70 - 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 3.53 mg/mg

Chemical Oxygen Demand: 1,300 - 1,975 mg/g

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	18.3 %
10 d	54 %
20 d	59 %

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Atmospheric half-life: 3.26 Hour
Method: Estimated.

Balance

Biodegradability: No relevant data found.

Bioaccumulative potential

Bioaccumulation: For similar active ingredient(s). Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Mobility in soil

For similar active ingredient(s).
Expected to be relatively immobile in soil (Koc > 5000).

13. DISPOSAL CONSIDERATIONS

Disposal methods: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code: Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

OSHA Hazard Communication Standard
This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Components	CASRN
Isopropylamine	75-31-0

Pennsylvania (Worker and Community Right-To-KnowAct): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

United States TSCA Inventory (TSCA)
This product contains chemical substance(s) exempt from U.S. EPA TSCA Inventory requirements. It is regulated as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

Federal Insecticide, Fungicide and Rodenticide Act
EPA Registration Number: 62719-324
This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

CAUTION

Harmful if inhaled

16. OTHER INFORMATION

Hazard Rating System
NFPA

Health	Fire	Reactivity
1	2	0

Revision
Identification Number: 101188488 / A211 / Issue Date: 11/10/2015 / Version: 4.0
DAS Code: NAF-552
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
OSHA Z-1	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
STEL	Short-term exposure limit
TWA	8-hour, time-weighted average

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DOW AGROSCIENCES LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

617.20
Appendix B
Short Environmental Assessment Form

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Instructions for Completing

Part 1 - Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 - Project and Sponsor Information

Name of Action or Project: PENCE INVASIVE WEED CONTROL

Project Location (describe, and attach a location map):
12 TWIN LAKES DR, BEDFORD NY 11214

Brief Description of Proposed Action:
REMOVING INVASIVE WETLAND PLANT SPECIES THROUGH THE USE OF AQUATIC - APPROVED HERBICIDE.

Name of Applicant or Sponsor:	Telephone: 603 315 6030
PENNINGTON MARCHAEL	E-Mail:

Address: 2246 79TH ST

City/PO:	State:	Zip Code:
BROOKLYN	NY	11214

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☒	☐
2. Does the proposed action require a permit, approval or funding from any other governmental Agency? If Yes, list agency(s) name and permit or approval:	☒	☐

3.a. Total acreage of the site of the proposed action? LESS THAN ONE acre
b. Total acreage to be physically disturbed? 0 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 15 acres

4. Check all land uses that occur on, adjoining and near the proposed action.
☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☐ Commercial ☒ Residential (suburban)
☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): _____
☐ Parkland

	NO	YES	N/A
5. Is the proposed action, a. A permitted use under the zoning regulations?	☐	☐	☐
b. Consistent with the adopted comprehensive plan?	☐	☐	☐
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☒	
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: _____	☒	☐	
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☒	☐	
b. Are public transportation service(s) available at or near the site of the proposed action?	☒	☐	
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☒	☐	
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies: _____	☐	☒	
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: _____	☒	☐	
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: _____	☒	☐	
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☒	☐	
b. Is the proposed action located in an archeological sensitive area?	☒	☐	
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☒	☒	
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody? If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: _____	☒	☐	
14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply: ☐ Shoreline ☒ Forest ☐ Agricultural/grasslands ☐ Early mid-successional ☒ Wetland ☐ Urban ☒ Suburban			
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☒	☐	
16. Is the project site located in the 100 year flood plain?	☒	☐	
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,	☒	☐	
a. Will storm water discharges flow to adjacent properties? ☒ NO ☐ YES			
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? ☒ NO ☐ YES If Yes, briefly describe: _____			

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	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size: _____	☒	☐
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe: _____	☒	☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe: _____	☒	☐

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: REMINGTON MANEHAEL Date: 6.28.16

Signature: _____

Part 2 - Impact Assessment. The Lead Agency is responsible for the completion of Part 2. Answer all of the following questions in Part 2 using the information contained in Part 1 and other materials submitted by the project sponsor or otherwise available to the reviewer. When answering the questions the reviewer should be guided by the concept "Have my responses been reasonable considering the scale and context of the proposed action?"

	No, or small impact may occur	Moderate to large impact may occur
1. Will the proposed action create a material conflict with an adopted land use plan or zoning regulations?	☒	☐
2. Will the proposed action result in a change in the use or intensity of use of land?	☒	☐
3. Will the proposed action impair the character or quality of the existing community?	☒	☐
4. Will the proposed action have an impact on the environmental characteristics that caused the establishment of a Critical Environmental Area (CEA)?	☒	☐
5. Will the proposed action result in an adverse change in the existing level of traffic or affect existing infrastructure for mass transit, biking or walkway?	☒	☐
6. Will the proposed action cause an increase in the use of energy and it fails to incorporate reasonably available energy conservation or renewable energy opportunities?	☒	☐
7. Will the proposed action impact existing: a. public / private water supplies?	☒	☐
b. public / private wastewater treatment utilities?	☒	☐
8. Will the proposed action impair the character or quality of important historic, archaeological, architectural or aesthetic resources?	☒	☐
9. Will the proposed action result in an adverse change to natural resources (e.g., wetlands, waterbodies, groundwater, air quality, flora and fauna)?	☒	☐

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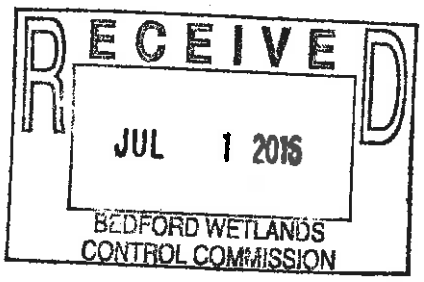
	No, or small impact may occur	Moderate to large impact may occur
10. Will the proposed action result in an increase in the potential for erosion, flooding or drainage problems?	☒	☐
11. Will the proposed action create a hazard to environmental resources or human health?	☒	☐

Part 3 - Determination of significance. The Lead Agency is responsible for the completion of Part 3. For every question in Part 2 that was answered "moderate to large impact may occur", or if there is a need to explain why a particular element of the proposed action may or will not result in a significant adverse environmental impact, please complete Part 3. Part 3 should, in sufficient detail, identify the impact, including any measures or design elements that have been included by the project sponsor to avoid or reduce impacts. Part 3 should also explain how the lead agency determined that the impact may or will not be significant. Each potential impact should be assessed considering its setting, probability of occurring, duration, irreversibility, geographic scope and magnitude. Also consider the potential for short-term, long-term and cumulative impacts.



☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action may result in one or more potentially large or significant adverse impacts and an environmental impact statement is required.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action will not result in any significant adverse environmental impacts.

Name of Lead Agency	Date
Print or Type Name of Responsible Officer in Lead Agency	Title of Responsible Officer
Signature of Responsible Officer in Lead Agency	Signature of Preparer (if different from Responsible Officer)

PRINT

MATERIAL SAFETY DATA SHEET

Dow AgroSciences

Emergency Phone: 800-992 5994
Dow AgroSciences LLC
Indianapolis, IN 46268

RODEO* HERBICIDE

Effective Date: 3 23/04
Product Code: 34629
MSDS: 006234

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Rodeo* Herbicide

COMPANY IDENTIFICATION:
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Glyphosate I.P.A. (N-phosphonomethyl glycine isopropylamine Salt	CAS # 38641-94-0	53.8%
Balance Total		46.2%

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Clear pale yellow liquid. May cause eye irritation. Highly toxic to aquatic organisms.

EMERGENCY PHONE NUMBER: 800-992-5994

4. FIRST AID:

EYE: Flush eyes thoroughly with water for several minutes. Remove contact lenses after initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

SKIN: Wash skin with plenty of water.

INGESTION: No emergency medical treatment necessary.

INHALATION: Remove person to fresh air. If effects occur, consult a physician.

NOTE TO PHYSICIAN: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: >214 °F (>101 °C)
METHOD USED: Setaflash

FLAMMABLE LIMITS:
LFL: Not applicable
UFL: Not applicable

EXTINGUISHING MEDIA: Foam, CO2, Dry Chemical

FIRE AND EXPLOSION HAZARDS: Foam fire extinguishing system is preferred because water stream will can spread possible contamination. Toxic smoke gases may be formed under fire conditions.

FIRE-FIGHTING EQUIPMENT: Wear positive-pressure self-contained breathing apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS: Absorb small spills with an inert absorbent material such as Fuller's Earth, sand, or dirt. Report large spills to Dow AgroSciences at 800-992-5994.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Do not swallow. Avoid contact with eyes, skin and clothing. Avoid breathing vapors and spray mist. Handle only in well ventilated area. Wash thoroughly with soap and water after handling and before eating, chewing gum, using tobacco, using the toilet or smoking. Keep away from food, feedstuffs and water supplies. Store in original container with the lid tightly closed. Store above 10°F (-12.2°C) to keep from crystallizing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINES: None established.

ENGINEERING CONTROLS: Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

EYE/FACE PROTECTION: Use safety glasses.

SKIN PROTECTION: No precautions other than clean body-covering clothing should be needed.

*Trademark of Dow AgroSciences LLC

MATERIAL SAFETY DATA SHEET

Dow AgroSciences

Emergency Phone: 800 992 5994
Dow AgroSciences LLC
Indianapolis, IN 46268

RODEO® HERBICIDE

Effective Date: 2/2/16
Product Code: 64870
MSDS: 62164

RESPIRATORY PROTECTION: Engineering conditions not normally required; however, if discomfort is experienced, use a NIOSH approved air purifying respirator.

APPLICATIONS AND ALL OTHER HANDLERS: Please refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE: Clear dark yellow liquid
DENSITY: 9.0 – 10.5 lbs/gal
pH: 4.5 – 5.0
ODOR: None
SOLUBILITY IN WATER: Miscible
SPECIFIC GRAVITY: 1.21 gm/l
FREEZING POINT: 7°F – 10°F (-21°C – -23°C)

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID): Stable under normal storage conditions.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID): Galvanized or unlined steel (except stainless steel) containers or spray tanks may produce hydrogen gas which may form a highly combustible gas mixture.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

EYE: May cause slight transitory eye irritation. Corneal injury is unlikely.

SKIN: Essentially non-irritating to skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD_{50} for skin absorption in rabbits is >5000 mg/kg. Did not cause allergic skin reactions when tested in guinea pigs.

INGESTION: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. The oral LD_{50} for rats is >5000 mg/kg.

INHALATION: Brief exposure (minutes) is not likely to cause adverse effects. The aerosol LC_{50} for rats is >6.3 mg/L for 4 hours.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: For a similar material, glyphosate, in animals, effects have been reported on the following organ(s):

CANCER INFORMATION: A similar material, glyphosate, did not cause cancer in laboratory animals.

TERATOLOGY (BIRTH DEFECTS): For glyphosate IPA, available data are inadequate for evaluation of potential to cause birth defects.

REPRODUCTIVE EFFECTS: For glyphosate IPA, available data are inadequate to determine effects on reproduction.

MUTAGENICITY: For a similar material, glyphosate, in vitro and animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL DATA:

ECOTOXICOLOGY:
Material is practically non-toxic to aquatic organisms on an acute basis (LC_{50} or EC_{50} is > 100 mg/l, in most sensitive species tested).
Acute LC_{50} for rainbow trout (*Oncorhynchus mykiss*) is >2000 mg/L.
Acute immobilization EC_{50} in water flea (*Daphnia magna*) is >18 mg/l.
Material is practically non-toxic to birds on an acute basis (LD_{50} is >2000 mg/kg).
Acute oral LD_{50} in bobwhite (*Colinus virginianus*) is >2000 mg/kg.
The LC_{50} in earthworm (*Eisenia foetida*) is >1000 mg/kg.
Acute contact LD_{50} in honey bee (*Apis mellifera*) is >100 ug/bee.
Acute oral LD_{50} in honey bee (*Apis mellifera*) is >100 ug/bee.
Growth inhibition EC_{50} in green algae (*Selenastrum capricornutum*) is 27 mg/l.
Growth inhibition EC_{50} in duckweed (*Lemna gibba*) is 14.4 mg/L.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities.

MATERIAL SAFETY DATA SHEET

Dow AgroSciences

Emergency Phone: 800-992 5994
Dow AgroSciences LLC
Indianapolis, IN 46268

RODEO* HERBICIDE

Effective Date: 3/20/04
Product Code: 64526
MSDS: 062564

This information presented below only applies to the material as supplied. The information based on characteristics listed may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

If this material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION:

U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION

For all package sizes and modes of transportation:
This material is not regulated for transport.

15. REGULATORY INFORMATION

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with various federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: This product is not known to contain any substances subject to the provisions requirements of:

New Jersey
Pennsylvania

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

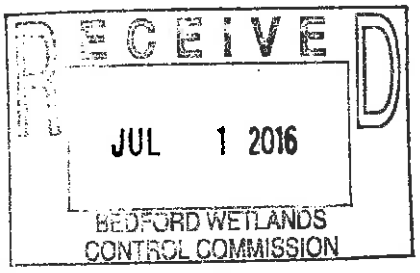
CATEGORY	RATING
Health	1
Flammability	1
Reactivity	0

16. OTHER INFORMATION:

MSDS STATUS: Revised Sections: 3,4,11,12,13,14 & 15
Reference: DH 0361 2028
Replaces MSDS Dated: 1/12/00
Document Code: D03 148 002
Replaces Document Code: D97 148-001

The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Contact Dow AgroSciences For Further Information.

Appendix F. Specimen Label for Rodeo® Herbicide



TOWN OF BEDFORD - WETLANDS CONTROL COMMISSION

Application for Permit

Identification of Owner(s):

Name(s) of owner(s) (as shown on Deed): CLARE REINBERGEN

Mailing Address: 147 CHERRY ST. KATONAH, NY 10536

Phone: 914-428-1314 (home) 800-648-7226 (work): Fax: 914-428-7740 E-Mail: CREINBERGEN@MAIL-GROUT-PRODUCTS.COM

Identification of Applicant (if other than owner(s)):

Name of Applicant: ROGER VAN LOVEREN, AIA

Mailing Address: C/O SPRUCE POND LANE, BEDFORD, NY 10506

Phone: 914-588-5309 (home) 914-234-7823 (work): Fax: 234-7534 E-Mail: RVLARCH@AOL.COM

Professional Preparing Site Plan:

Name, Address: ROGER VAN LOVEREN, AIA - C/O SPRUCE POND LANE, BEDFORD NY

Phone: 914-234-7823 Fax: 234-7534 E-Mail: RVLARCH@AOL.COM

Identification of Property:

Bedford Tax Map Designation: Section 50.7 Block 1 Lot 6 Area 4.378 Ac.

Zoning District: 4A Project Address: 249 MT. HOLLY ROAD

Approximate year of construction of any structure: 1966

Prior Applications/Other Applications (write "N/A" if not applicable; Project Cost):

Dates of any prior Wetlands Control Commission permits: NA

Identify any other Town of Bedford approvals required: BUILDING

Identify any other governmental approvals required: NYSDEC

Project cost (including professional fees): 600,000

RECEIVED APR 8 2016 WETLANDS CONTROL COMMISSION

Project Description/Proposed Use (MUST BE DETAILED – Use Additional Pages if Needed):

SEE ATTACHED PAGE

Proposed Project Start Date: AUGUST 2016 **Estimated Date of Completion:** AUGUST 2017

The owner(s) hereby give(s) permission to the Town of Bedford, its agents, servants and employees, including, without limit, members of the Wetlands Control Commission and consultants to the Town to enter upon the Property solely for the purposes incidental to the within application (including without limit, inspection of the project after completion) at reasonable times upon reasonable notice to the owner or tenant in possession, which notice may be by telephone. If the applicant is different than the owner(s), the owner(s) hereby approves this application and consents to the applicant acting as agent for the owner in submitting this application and the applicant accepts its designation as agent for the owner(s).

I/we affirm by the signatures below that I/we are the rightful legal owner(s) of the property herein described in this application.

Signature of owner(s): *All owners must sign* — *Print name/title* Clare Reinbergen — Date: 7/7/16

Print name/title — Date

Signature of applicant (if different): — *Print name/title* ROGER VAN LOVEREN — Date: 4/8/16

Revised 8/9/13

RECEIVED JUL 12 2016 BEDFORD WETLANDS CONTROL COMMISSION

RVL Architecture

Roger van Loveren, AIA, Architect • 6 Spruce Pond Lane, Bedford, NY 10506 • (914) 234-7823 • E-Mail: rvlarch@aol.com

July 11, 2016

Mr. Andrew Messinger, Chairman
Town of Bedford
Wetlands Control Commission
425 Cherry St. Bedford Hills, NY 10507

Re: Clare Reinbergen Property, 249 Mount Holly Road, Katonah, NY

Dear Mr Messinger,

Per the June 6, 2016 WCC meeting comments and review, we are submitting to the Wetlands Control Commission for the referenced property application revised dated 7/11/16: SP-1, SP-2, SP-3, SP-4 & SP-7, SP-5 & SP-6 are re-submitted Dated 5/13/16.

We are also submitting revised dated 7/11/16: drawings MP-1, MP-2, MP-3 & TS-1 work prepared by Paul Jaehnig, Wetlands consultant.

Drawings have been revised as follows:

- SP-1 : Previous drawing SP-1 had both demolition and proposed site plan. SP-1 now is "Full Site Demolition Plan"
  a. Protection of soft ground has been stipulate with item "6" on the Demolition Sequence Notes
  b. Item "7" of same Legend has been added in regards to use of equipment in removing demolition materials
  c. Item "8" of same Legend has been added in regards to No Reprocessing or reduction of demoed materials on site
  d. A bold "IMPORTANT NOTE" has been added in regards to Timing, Professional Consultants Role and documentation and communication with Town Officials.
  e. Demolition Legend key "S" has been expanded in regards to the removal of Ash Trees and the harvesting and milling of these Trees.
  f. Key "W" has been added, same as item "6" in regards to the soft ground protection

- SP-2: (Former SP-2 is now SP-7), Drawing displays partial Demolition Site Plan at a larger scale. Erosion Control details and "Zoning Information block formerly on SP-1 are on this drawing

- SP-3: Previous drawing SP-1 had both demolition and proposed site plan. SP-3 now is "Full Site Plan" (Former SP-3 is now SP-5)
  a. "Quantities has been amended to indicate the bringing in of 40 yards of clean Top Soil for the purpose of driveway berming and mitigation plantings
  b. Added to the notes is a block titled: " PROPOSED SWIMMING POOL CONDTIONS", notes contain the procedure requirements for full draw down of pool water and contains the Pool sanitation Chemical use restriction. We are working with Owner's Attorney to draft a Deed restriction amendment.
  c. Added to the notes is "POWER SUPPLY AND BACK UP NOTES" outlining the upgrade of utility service, introduction of Solar Power, and proposed battery storage and power outage supply method.
  d. The proposed Site Plan has been revised to reflect all the proposed grading, topographical changes and is now coordinated with the proposed grading work shown on the revised MP-1,2 & 3 Drawings

- SP-4: (Former SP-4 is now SP-5), Drawing displays partial Site Plan at a larger scale. In addition Drawing displays:
  a. "Storm Water Management Overview and Design calculations and notes, Pool overflow Seasonal drain down etc. detail had formerly been on SP-1
  b. Added to the drawing is: "GEOTHERMAL INSTALLATION SECTION DIAGRAM" and "GEOTHERMAL WELL DRILLING PROCEDURE DIAGRAM

The projected Photovoltaic Solar Panel Roof Array will not be sufficient to provide a 24 hour electric load supply alternate. Furthermore a total electric heating system would draw four times the energy required for a Geothermal System
For a 3,200 SF super insulated Residence proposed: two 500' max. depth closed loop wells are required for sufficient heating and cooling conditioning.

- MP-1: Mitigation & Grading Plan: Proposed overall mitigation plan has been added, drainage course and mitigation earth work calculations have been added, grading coordinated with SP-3 Grading. Deer fencing has been added.
- MP-2: Mitigation Planting Plan Notes: Notes regarding removal of invasive Barberry and Multiflora Rose Shrubs have been added.
- MP-3: Mitigation Planting Plan Details: detail titling clarifications added.
- TS-1: Tree Survey Plan: Drawing created for identifying trees to be removed.

- Additional Project Submission items:
  a. Wetland Application Form has been signed by Clare Reinbergen as Trustee of the Revocable Trust of Clare Reinbergen
  b. All Site Plan drawings SP-1 to 7 and Mitigation Plans MP-1 to 3 are signed and sealed
  c.

Roger van Loveren, AIA

RvL/dm
Cc: CR, PJ

Town of Bedford – Wetlands Control Commission

Clare Reinbergen Application 4/8/16

249 Mt. Holly Road, 50.7 – 1 – 6

Project Description/Proposed:

Renovation, Alterations of, and Additions to, existing 2 story, 4 Bedroom, 2,267 SF Residence. 28 SF Addition to 1st. Floor, 647 SF Addition to 2nd Floor over existing 1st.

One Bedroom on 1st Floor to be converted to Den and full Bathroom to be removed. 2nd Floor Addition rearranges existing two Bedrooms and expands with a Studio/Guest Room (4 Bedroom status maintained).

Front Entrance Deck replaced and altered with Entry steps up to covered Stoop. Rear Deck replaced and altered with larger raised Patio, above/inground Swimming Pool, Deck and Planter.

Existing Gravel Driveway to be raised. Crowned and rebuild with new underground electrical service from pole to house.

Existing man made structures in wetland watercourse to be removed, drainage course to be restored and enhanced.

617.20
Appendix B
Short Environmental Assessment Form

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Instructions for Completing

Part 1 - Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 - Project and Sponsor Information

Name of Action or Project:
REINBERGEN RESIDENCE

Project Location (describe, and attach a location map):
249 MT HOLLY ROAD, KATONAH NY, A LOT ON THE SOUTH SIDE OF ROAD

Brief Description of Proposed Action:
RENOVATIONS, ALTERATIONS & ADDITIONS TO A SMALL RESIDENCE, REBUILD OF GRAVEL DRIVEWAY, WETLANDS DRAINAGE COURSE RESTORATION.

Name of Applicant or Sponsor:	Telephone: 914-234-7823 / 914-588-5309 cell
ROGER VAN LOVEREN, AIA	E-Mail: RVLARCH@AOL.COM

Address:
60 SPRUCE POND LANE

City/PO:	State:	Zip Code:
BEDFORD	NY	10506

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☒	☐
2. Does the proposed action require a permit, approval or funding from any other governmental Agency? If Yes, list agency(s) name and permit or approval: NYS DEC, TOWN OF BEDFORD WATER CONTROL COMMISSION	☐	☒

3.a. Total acreage of the site of the proposed action? 4.378 acres
b. Total acreage to be physically disturbed? 0.491 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 4.378 acres

4. Check all land uses that occur on, adjoining and near the proposed action.
☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☐ Commercial ☒ Residential (suburban)
☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): _____
☐ Parkland

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APR 8 2016
BEDFORD WETLANDS CONTROL COMMISSION

	NO	YES	N/A
5. Is the proposed action, a. A permitted use under the zoning regulations?	☐	☒	☐
b. Consistent with the adopted comprehensive plan?	☐	☒	☐
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☒	
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify:	☒	☐	
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☒	☐	
b. Are public transportation service(s) available at or near the site of the proposed action?	☒	☐	
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☒	☐	
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies: SUPER INSULATION, GEOTHERMAL HEATING & COOLING, PHOTO VOLTAIC AND HYDRO HEAT ROOF PANELS, LED LIGHTING ECOSMART FIREPLACE	☐	☒	
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: PRIVATE ON SITE WELL	☒	☐	
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: PRIVATE ON SITE SEPTIC	☒	☐	
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☒	☐	
b. Is the proposed action located in an archeological sensitive area?	☒	☐	
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☒	
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody? If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: 1318 SF ARE IN THE DRAINAGE COURSE CONTAINS MAN MADE STRUCTURES THAT WILL BE REMOVED AND AREA TO BE RESTORED AND PROTECTED	☐	☒	

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:
☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☐ Early mid-successional
☐ Wetland ☐ Urban ☒ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☒	☐
16. Is the project site located in the 100 year flood plain?	☒	☐
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,	☒	☐
a. Will storm water discharges flow to adjacent properties? ☐ NO ☐ YES		
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: ☐ NO ☐ YES		

	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size:	☒	☐
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe:	☒	☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe:	☒	☐

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: ROGER VON LOUEREN, AIA Date: 4/8/16

Signature:

Part 2 - Impact Assessment. The Lead Agency is responsible for the completion of Part 2. Answer all of the following questions in Part 2 using the information contained in Part 1 and other materials submitted by the project sponsor or otherwise available to the reviewer. When answering the questions the reviewer should be guided by the concept "Have my responses been reasonable considering the scale and context of the proposed action?"

	No, or small impact may occur	Moderate to large impact may occur
1. Will the proposed action create a material conflict with an adopted land use plan or zoning regulations?	☐	☐
2. Will the proposed action result in a change in the use or intensity of use of land?	☐	☐
3. Will the proposed action impair the character or quality of the existing community?	☐	☐
4. Will the proposed action have an impact on the environmental characteristics that caused the establishment of a Critical Environmental Area (CEA)?	☐	☐
5. Will the proposed action result in an adverse change in the existing level of traffic or affect existing infrastructure for mass transit, biking or walkway?	☐	☐
6. Will the proposed action cause an increase in the use of energy and it fails to incorporate reasonably available energy conservation or renewable energy opportunities?	☐	☐
7. Will the proposed action impact existing: a. public / private water supplies?	☐	☐
b. public / private wastewater treatment utilities?	☐	☐
8. Will the proposed action impair the character or quality of important historic, archaeological, architectural or aesthetic resources?	☐	☐
9. Will the proposed action result in an adverse change to natural resources (e.g., wetlands, waterbodies, groundwater, air quality, flora and fauna)?	☐	☐

	No, or small impact may occur	Moderate to large impact may occur
10. Will the proposed action result in an increase in the potential for erosion, flooding or drainage problems?	☐	☐
11. Will the proposed action create a hazard to environmental resources or human health?	☐	☐

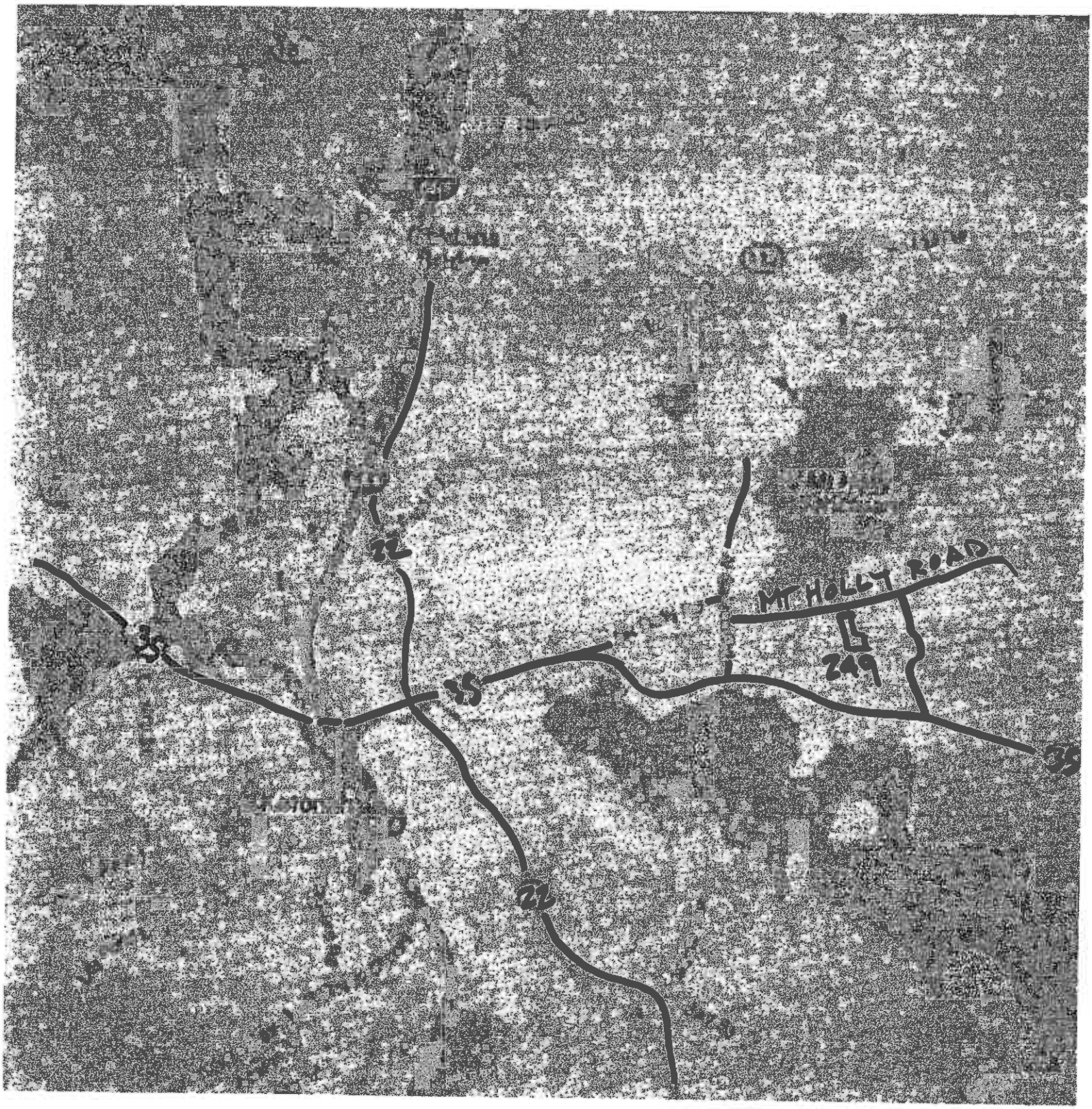
Part 3 - Determination of significance. The Lead Agency is responsible for the completion of Part 3. For every question in Part 2 that was answered "moderate to large impact may occur", or if there is a need to explain why a particular element of the proposed action may or will not result in a significant adverse environmental impact, please complete Part 3. Part 3 should, in sufficient detail, identify the impact, including any measures or design elements that have been included by the project sponsor to avoid or reduce impacts. Part 3 should also explain how the lead agency determined that the impact may or will not be significant. Each potential impact should be assessed considering its setting, probability of occurring, duration, irreversibility, geographic scope and magnitude. Also consider the potential for short-term, long-term and cumulative impacts.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action may result in one or more potentially large or significant adverse impacts and an environmental impact statement is required.

☐ Check this box if you have determined, based on the information and analysis above, and any supporting documentation, that the proposed action will not result in any significant adverse environmental impacts.

Name of Lead Agency	Date
Print or Type Name of Responsible Officer in Lead Agency	Title of Responsible Officer
Signature of Responsible Officer in Lead Agency	Signature of Preparer (if different from Responsible Officer)

PRINT



REINBERGER.
-4/8/16

MAP

LETTER OF PERMIT DENIAL

Town of Bedford
Building Dept.
425 Cherry St.
914-666-8040

Application #:

Date: 1/1/1900

Parcel ID: 50.7-1-6

Owner Information

Reinbergen Trust, Clare

Applicant Information

Reinbergen Trust, Clare
c/o Clare Reinbergen
249 Mt Holly Rd
Katonah NY 10536

Location: 249 Mt Holly Rd
Parcel ID: 50.7-1-6
Permit Type: Additions & Alterations
Work Description: Additions to second floor and alteration of existing residence

Dear Resident,
Regarding the application for a Building Permit on the property referenced above, the following facts are noted. This property is located in R-4A Zoning District. The requirements of the Zoning Ordinance of the Town of Bedford in comparison to your proposal are listed as follows:

Additions and alterations to an existing residence will require review and approve from the Wetland Control Commission.

Because your project does not meet the requirements of the Town of Bedford Zoning Ordinance, your application for a building permit is DENIED. If you wish to proceed with your request, you may, within sixty days of this letter, apply to the of the above provisions

Very truly yours,

Ralph Tarchine, Jr.
Building Inspector

75 Plan#6569 Receipt 10393

APPLICATION FOR BUILDING PERMIT
TOWN OF BEDFORD

☐ New Building ☒ Addition ☒ Alteration ☐ Demolition ☐ Roof ☐ Pool ☐ Already Built Bldg. Permit No. _____

To the Building Inspector:

Application is hereby made for permission to perform the work in accordance with the plans and specifications herewith submitted and in compliance with the information given below.

It is agreed that if such permission is granted, said building will conform in all respects to said plans and specifications and shall comply with all provisions of the Town of Bedford Zoning Ordinance, and all State and Federal Laws or regulations pertaining in any way thereto.

Attached hereto are duplicate copies of the survey showing to scale position of building on the plot.

Owner CLARE REINBERGEN Address 147 CHERRY ST. KATONAH NY 10536 Tel.# 914-428-1316

Applicant ROGER VAN LOVEREN, AIA Address COSPRUCE POND LANE, BEDFORD NY Tel.# 914-234-7823

Architect/Engineer ROGER VAN LOVEREN Address _____ Tel.# _____

Builder T.B.D. Address _____

Building is located at 249 MT. HOLLY ROAD,

Section 50.7 Block 1 Lot 6 Town of Bedford Assessment Map.

INFORMATION MUST BE PROVIDED:

Detail of proposed construction: SEE ATTACHED PAGE
Add/Alt to exist Residence

RECEIVED
MAY 26 2016
Bedford Building Dept.

Estimated **COST OF CONSTRUCTION**: $ 500,000

AFFIDAVIT OF CONSTRUCTION COST: This affidavit must be completed by the Design Professional if the estimated cost is $20,000 or more OR for Legalizations

I ROGER VAN LOVEREN do hereby affirm and certify as follows: (i) I am an architect/engineer (circle one) licensed by the State of New York; (ii) I have reviewed the plans, drawings and specifications for this application and am fully familiar with the proposed construction; (iii) based on my training and experience, I estimate the total cost of construction including all labor, all materials, all professional fees and all associated costs to be approximately $ 500,000, and (iv) pursuant to Penal Law § 210.45, I acknowledge that a false written statement made knowingly is a Class A misdemeanor.

Signature: _____ Date: 5/25/16

Sign and Affix Seal

REGISTERED ARCHITECT ROGER VAN LOVEREN 020798 STATE OF NEW YORK

Amount of square feet for new project 2,929.3 Total % of Building Coverage of property 1.83%

Total % of Impervious Surface of property 1.93 Area of disturbance 3,000 **If over 5000 sq. ft. submit erosion & sediment control plan.**

Age of Building or year built 1963

TYPE OF STRUCTURE

☒ One Family Dwelling ☐ Two Family Dwelling ☐ Multiple Dwelling

Accessory Structure _____ Pool ☐ Tennis Court ☐ Commercial ☐

ZONING DISTRICT (circle) R-4A 2A 1A 1/2A 1/4A TF VA MF EL

RO CB NB LI RB PBO PBR PBOK

Number of stories 2; Height 27'-7½" feet. Interior only _____

Front yard 413.7' feet. Rear yard 236.3' feet. Side yard 62.9' feet one side.

Side yard 126.4' feet other side.

The above setbacks must be filled in.

I hereby certify that the statements and data on this sheet are correct and true to the best of my knowledge and belief. Property Owner shall sign application or file letter of approval to:

(Signed) _____

Telephone No. 914-234-7873 /Email RVLARCH@AOL.com

Action By Building Inspector

The foregoing application and accompanying plans and specifications have been examined and considered, and the following action taken by me:

☐ Board of Health Approval
☐ Highway Approval
Town of Bedford ☐
Westchester County ☐
State of New York ☐

☐ Application Rejected
☐ Application Granted
☐ Referred to Board of Appeals

Variance Requested _____

_____

_____

_____

_____

_____

Building Inspector of the Town of Bedford, New York

FEES:

Building: _____

Certificate of Compliance _____

Total: _____

Permit No. _____

Date Approved _____

Date Notified _____

RECEIVED
MAY 26 2016
Bedford Building Dept.

Town of Bedford – Wetlands Control Commission / BUILDING DEPARTMENT

Clare Reinbergen Application 4/8/16

249 Mt. Holly Road, 50.7 – 1 – 6

Project Description/Proposed:

Renovation, Alterations of, and Additions to, existing 2 story, 4 Bedroom, 2,267 SF Residence. 28 SF Addition to 1st. Floor, 647 SF Addition to 2nd Floor over existing 1st.

One Bedroom on 1st Floor to be converted to Den and full Bathroom to be removed. 2nd Floor Addition rearranges existing two Bedrooms and expands with a Studio/Guest Room (4 Bedroom status maintained).

Front Entrance Deck replaced and altered with Entry steps up to covered Stoop. Rear Deck replaced and altered with larger raised Patio, above/inground Swimming Pool, Deck and Planter.

Existing Gravel Driveway to be raised. Crowned and rebuild with new underground electrical service from pole to house.

Existing man made structures in wetland watercourse to be removed, drainage course to be restored and enhanced.

LETTER OF PERMIT DENIAL

Town of Bedford
Building Dept.
425 Cherry St.
914-666-8040

Application #:

Date: 5/26/2016

Parcel ID: 50.7-1-6

Owner Information

Reinbergen Trust, Clare

Applicant Information

Reinbergen Trust, Clare
c/o Clare Reinbergen
249 Mt Holly Rd
Katonah NY 10536

Location: 249 Mt Holly Rd
Parcel ID: 50.7-1-6
Permit Type: Swimming Pool
Work Description: In ground swimming pool

Dear Resident,
Regarding the application for a Building Permit on the property referenced above, the following facts are noted. This property is located in R-4A Zoning District. The requirements of the Zoning Ordinance of the Town of Bedford in comparison to your proposal are listed as follows:

The construction an in ground swimming pool will require review and approval from the Wetland Control Commission

Because your project does not meet the requirements of the Town of Bedford Zoning Ordinance, your application for a building permit is DENIED. If you wish to proceed with your request, you may, within sixty days of this letter, apply to the of the above provisions

Very truly yours,

Ralph Tarchine, Jr.
Building Inspector

Pd Cash #75 Receipt 6570 10394

APPLICATION FOR BUILDING PERMIT
TOWN OF BEDFORD

☐ New Building ☐ Addition ☐ Alteration ☐ Demolition ☐ Roof ☒ Pool ☐ Already Built Bldg. Permit No. _____

To the Building Inspector:

Application is hereby made for permission to perform the work in accordance with the plans and specifications herewith submitted and in compliance with the information given below.

It is agreed that if such permission is granted, said building will conform in all respects to said plans and specifications and shall comply with all provisions of the Town of Bedford Zoning Ordinance, and all State and Federal Laws or regulations pertaining in any way thereto.

Attached hereto are duplicate copies of the survey showing to scale position of building on the plot.

Owner CLARE REINBERGEN Address 147 CHEROT ST. KATONAH NY 10536 Tel.# 914-428-1316

Applicant ROGER VAN LOVEREN, AIA Address SPRUCE POND LANE, BEDFORD NY Tel.# 914-234-7827

Architect/Engineer ROGER VAN LOVEREN Address _____ Tel.# _____

Builder T.B.D. Address _____

Building is located at 249 MT. HOLLY ROAD,

Section 50.7 Block 1 Lot 6 Town of Bedford Assessment Map.

RECEIVED
MAY 26 2016
Bedford Building Dept.

INFORMATION MUST BE PROVIDED:

Detail of proposed construction: SEE ATTACHED PAGE FOR FULL PROJECT. THIS APPLICATION FOR INGROUND SWIMMING POOL BEHIND HOUSE SET WITHIN PATIO/PLANTER STRUCTURE

Estimated **COST OF CONSTRUCTION**: $ 100,000

AFFIDAVIT OF CONSTRUCTION COST: This affidavit must be completed by the Design Professional if the estimated cost is $20,000 or more OR for Legalizations

I ROGER VAN LOVEREN do hereby affirm and certify as follows: (i) I am an architect/engineer (circle one) licensed by the State of New York; (ii) I have reviewed the plans, drawings and specifications for this application and am fully familiar with the proposed construction; (iii) based on my training and experience, I estimate the total cost of construction including all labor, all materials, all professional fees and all associated costs to be approximately $ 100,000, and (iv) pursuant to Penal Law § 210.45, I acknowledge that a false written statement made knowingly is a Class A misdemeanor.

Signature: _____ Date: 5/25/16

Sign and Affix Seal

REGISTERED ROGER VAN LOVEREN ARCHITECT 020798 STATE OF NEW YORK

Amount of square feet for new project 2,929.13 Total % of Building Coverage of property 1.83%

Total % of Impervious Surface of property 1.93 Area of disturbance 3,000 **If over 5000 sq. ft. submit erosion & sediment control plan.**

Age of Building or year built 1963

TYPE OF STRUCTURE

☒ One Family Dwelling ☐ Two Family Dwelling ☐ Multiple Dwelling

Accessory Structure IN GROUND Pool ☒ Tennis Court ☐ Commercial ☐

ZONING DISTRICT (circle) R-4A 2A 1A 1/2A 1/4A TF VA MF EL RO CB NB LI RB PBO PBR PBOK

RECEIVED
MAY 26 2016
Bedford Building Dept.

Number of stories 2; Height 27'-7½" feet. Interior only _____

Front yard 413.7' feet. Rear yard 236.3' feet. Side yard 62.9' feet ~~one side~~.

Side yard 126.4' feet other side.

The above setbacks must be filled in.

I hereby certify that the statements and data on this sheet are correct and true to the best of my knowledge and belief. Property Owner shall sign application or file letter of approval to:

(Signed) _____

Telephone No. 914-234-7823 /Email RVLArch@aol.com

Action By Building Inspector

The foregoing application and accompanying plans and specifications have been examined and considered, and the following action taken by me:

☐ Board of Health Approval
☐ Highway Approval
Town of Bedford ☐
Westchester County ☐
State of New York ☐

☐ Application Rejected
☐ Application Granted
☐ Referred to Board of Appeals

Variance Requested _____

_____

_____

_____

_____

_____
Building Inspector of the Town of Bedford, New York

FEES:

Building: _____

Certificate of Compliance _____

Total: _____

Permit No. _____

Date Approved _____

Date Notified _____

SURVEY OF GEOTHERMAL HEAT PUMP REGULATIONS IN THE UNITED STATES

Karen Den Braven

University of Idaho
Mechanical Engineering Department
Moscow, ID 83844-0902
(208) 885-7655
FAX (208) 885-9031

ABSTRACT

Geothermal heat pump systems (GHPs) are becoming more common. As more of these systems are installed, and practitioners move into new operating areas, it is becoming increasingly important that designers and installers be aware of the pertinent environmental regulations which affect system design and installation.

To this end, a survey has been conducted of US Federal and State Regulations which govern the design and installation of both open and closed loop geothermal heat pump systems. The appropriate officials in the Federal and state governments were located, and copies of the regulations were obtained.

The regulations which affect GHPs show no uniformity across the nation. Most (but not all) states simply apply their water well regulations to open loop systems. The status of regulations for closed loop (borehole) systems is more disorganized. While a few states have adopted industry standard practice in their regulations, many have no specific regulations whatsoever, while others have adopted (or are in the process of adopting) regulations which are proscriptive, and likely to hamper the industry.

A summary of the regulations was written, and was approved by the governing officials. The summaries and copies of the regulations themselves are available on the World Wide Web at http://www.uidaho.edu/ghpc/. Contact information for governing officials, including addresses and phone numbers, is also available at the site.

1. INTRODUCTION

Geothermal heat pump systems (GHPs) are becoming more common. For example, the Geothermal Heat Pump Consortium (GHPC), has as its goal a ten-fold increase in the number of GHP systems installed by 2001. If more of these systems are to be installed, it will be necessary for both new practitioners to enter the field and for the experienced to move into new operating areas. As this occurs, it is essential that designers and installers are aware of the environmental regulations which affect system design and installation in their locale.

To this end, a survey has been conducted of the appropriate US Federal and State Regulations which govern the design and installation of both open and closed loop geothermal heat pump systems. The appropriate officials in the Federal and state governments were located, and a copy of the regulations was obtained. A summary of the regulations was written, and was approved by the governing officials. The summaries and copies of the regulations themselves are available on the World Wide Web at http://www.uidaho.edu/ghpc/. Information on the governing officials, and their addresses and phone numbers is also available at the site.

This work began as a part of the attempt to characterize existing grouting regulations (applicable to vertical boreholes). It was initially supported by the Electric Power Research Institute (EPRI) and the National Rural Electric Cooperatives Association (NRECA) as part of the effort to revise the International Ground-Source Heat Pump Association (IGSHPA) Grouting Manual. [Den Braven and Jensen, (1996)] This work was extended to include Canadian National, Provincial and Territorial regulations [Den Braven and Schiers, (1996)] but this work is not included on the US Regulations website.

The regulations survey was first extended with support from the Geothermal Heat Pump Consortium to include horizontal and open system regulations, and to place them on the World Wide Web. Later extensions to the work included gathering applicable building code regulations. This information is also available on our Website. Work in progress includes determining local codes and regulations, names and contact addresses of the local officials, and continuous updating of the existing information.

2. SUMMARY OF GEOTHERMAL HEAT PUMP REGULATIONS

2.1 Open Loop Geothermal Heat Pump Systems

Regulations governing open loop systems fall into the following five general governing categories:

-well driller licensing,
-pump installer licensing,
-water well construction standards,
-reinjection regulations, and,
-surface discharge.

While there is no nationwide consensus among regulators concerning appropriate regulations for drilling open loop geothermal heat pump systems, each state tends to apply its water well regulations to these systems. In addition, the National Ground Water Association disseminates information to its members on what is considered good well drilling practice. Forty six of the fifty states require licensing of well drillers, while about half also require separate licensing for pump installers.

On the discharge side, there are Federal regulations which govern both above-ground and below ground discharge. The Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES) regulations specifically govern surface discharge, unless a state has applied for and received "primacy" from EPA (the right to govern discharges at the state level). In addition, nothing in Federal statutes prevents a state or other governing body from adopting regulations which are more strict than the NPDES. Some states will prefer surface discharge for systems, while others will forbid it. Many are only worried about surface discharge if the change in the water temperature through the geothermal system is large, which is typically not the case for a geothermal heat pump system.

The situation is similar for reinjection. Since water is being reinjected underground, these wells are covered by the Underground Injection Control (UIC) regulations. Many states have regulations governing spacing of wells, allowable depths, etc.

2.2 Closed Loop Geothermal Heat Pump Systems

Closed loop geothermal heat pump systems are unlike any technology which has been used before. While it makes some sense to apply water well regulations to open loop supply wells, there is no existing body of regulations which are immediately appropriate for closed loop systems.

As the number of systems increases, environmental concerns are also coming to the forefront. Responsibility for groundwater quality can come under the purview of Federal, state, and local or regional governmental entities.

The Federal UIC and NPDES regulations were designed to prevent contamination of groundwater, aquifer, and surface water. However, the UIC portion of the Safe Water Drinking Act (40 CFR, Parts 144-147) precludes a closed-loop ground source system from being defined as an injection well as it is not used for the emplacement of fluids underground. Similarly, the NPDES portion of the Clean Water Act (40 CFR, Parts 122-124) which covers surface discharge of fluids, does not include ground-coupled heat pump systems under the definition it uses for "waters of the United States", which specifically limits its influence to such water bodies as wetlands, ponds, streams, sloughs, and navigable waterways. However, nothing in either the UIC or NPDES regulations precludes any state, county, parish, water district, municipality, etc. from adopting more stringent regulations. The majority of regulatory activity concerning closed loop ground-coupled heat pump systems has occurred at the state level.

The primary concern of the states is protection of groundwater quality, and all are at least concerned about the potential for groundwater contamination due to these systems. However, the reaction of the various states to this concern has varied greatly. The resulting action ranges from benign neglect to proscriptive policies which dictate materials and methods of design and installation very precisely. The recent increase in the number of installed systems has improved awareness, but has not necessarily increased understanding and knowledge among those who are responsible for promulgating and enforcing environmental regulations. The current status of regulatory requirements is a mish-mash, with little rhyme or reason. All wish to protect groundwater, but do not agree on how this is best accomplished.

In some cases, regulators have consulted with the practitioners in a particular state or region, and have worked out acceptable statutes which the industry accepts as sensible. In other cases, regulators have been hostile to concerns from industry practitioners, and have enacted debilitating legislation despite technical and scientific arguments to the contrary. Yet again, others have acted out of a sense of protective duty, but with ignorance of the technology and a lack of understanding of various options and their environmental impact.

Existing regulations for closed-loop systems tend to fall into the following categories:

-horizontal loop construction,
-vertical borehole and loop construction,
-grouting or backfill methods and materials,
-antifreeze specifications, and
-direct expansion specifications.

(A very few will also mention such lesser used systems as mains-connected systems, and standing columns wells.)

A typical example of the type of regulatory chaos that one will find is shown by looking at antifreeze specifications in the different states.

Closed-loop heat pump systems installed in most locations in the United States require the use of an antifreeze within the ground loop piping in order to prevent damage due to freezing. While approximately half of the states do not have specific regulations, all are at least somewhat concerned about the potential for groundwater contamination due to ground-coupled heat pump systems. Numerous antifreeze solutions have been tried over the years, with varying success.

The perfect antifreeze has not yet been invented. It would be:

- non-toxic,
- non-flammable,
- stable,
- compatible with other system materials,
- non-polluting (with respect to such characteristics as biological oxygen demand (BOD),
- non-corrosive,
- cheap, *and*
- would have excellent heat transfer and low viscosity characteristics.

Every antifreeze in use represents a compromise in the above characteristics. The most commonly used fluids to this point in time have been aqueous mixtures of:

- ethylene glycol,
- propylene glycol,
- methanol,
- ethanol,
- sodium chloride,
- calcium chloride, and
- potassium acetate.

Each of these has benefits and drawbacks. Each is acceptable in some locations in the United States, while at the same time being unacceptable in others. Ethylene glycol is the most common automotive antifreeze. However, it is toxic, and is not commonly used in ground-coupled heat pump systems, except in Europe [Heinonen, Tapscott, Wildin, and Beall, (1997)]. The salt solutions are non-toxic and non-flammable, but present potentially serious corrosion problems. Methanol is common, but is toxic, and is flammable in high concentrations. Ethanol is also common, and is less toxic than methanol, but can also be flammable, requiring care in handling. Potassium acetate is non-toxic and non-flammable, but its use can cause leakage and consequent corrosive problems which have resulted in litigation. Propylene glycol is non-toxic, and if food- or pharmaceutical-grade, is acceptable as a food additive. However, propylene glycol is more viscous than the other fluids, resulting in higher energy usage for the system. This higher viscosity also makes it more difficult to handle in cold weather. Three fluids have been recommended for use by the International Ground Source Heat Pump Association (IGSHPA) (a ground source heat pump industry association) in their standards. These are potable water, water plus potassium acetate, and water plus propylene glycol.

A detailed study of the relative advantages and disadvantages of numerous antifreeze solutions was recently completed by Heinonen, Tapscott, Wildin, and Beall, (1997), which is summarized in [Heinonen, Wildin, Beall, and Tapscott, (1997)]. Their conclusions detail:

- life cycle costs,
- corrosive risks,
- leakage risks,
- health, fire and environmental concerns, and
- regulatory risks (termed concern for future risk).

They also identified two other potential antifreezes which may be worth considering due to their characteristics and use in similar applications: calcium magnesium acetate (CMA), and urea ($CO(NH_2)_2$). They note CMA has high leakage potential and high long-term costs, while urea is also prone to leakage and is also corrosive. In general, the authors agree with IGSHPA, which recommended potable water, water plus potassium acetate, or water plus propylene glycol.

At present, twenty-six (26) of the fifty (50) states have no specific regulations or recommendations about what fluids are acceptable for use in ground-coupled heat pump ground

loop piping. Most of these also have no specific regulations regarding the construction or grouting of boreholes either.

Most of the rest of the states that have considered the issue have taken what may be referred to as a "belt-and-suspenders" approach to groundwater protection. That is, they will not only dictate proper construction of the ground loop to prevent joint leakage, they also require proper grouting of the borehole to minimize damage should leakage occur, and then also specify use of a non-toxic fluid for the loop to prevent any damage should construction and grouting measures both fail.

Of the remaining twenty-four (24) states, six (6) do not have specific regulations (or in some cases, regulatory authority) but do have "recommendations" or "policies" which in some cases are optional, but may be made part of a drilling permit. Some of these do recommend specific fluids. Another six (6) states merely have a requirement that any fluid used be "non-toxic". As was mentioned previously, in two states jurisdiction over closed-loop fluids lies with regional or local authorities; the state does not have jurisdiction. In the remaining ten (10) states, detailed directives have been written concerning acceptable fluids (and usually other aspects of ground-coupled heat pump system construction as well). The roster of fluids that are or are not acceptable varies widely from state to state.

The only fluid which is always acceptable is potable water. Other than that, there is no universal agreement, and no universally acceptable fluid. In Table 1, the number of states listed as accepting each of the following fluids will include both those of the six states who make "recommendations" and those of the ten states which have specific requirements. They will not include those who merely require a "non-toxic" fluid.

Several fluids acceptable to some of the states, as shown in Table 1, have not yet been mentioned. HCFC-22 is a chlorofluorocarbon refrigerant most commonly used in refrigeration systems. Its use as a heat transfer fluid in ground source heat pump systems is primarily limited to what are known as direct expansion systems, in which the evaporator/condenser piping itself is buried as the ground loop without the use of an intermediary heat exchanger. This type of system is not yet common. Glycerin, dipotassium phosphate, and calcium carbonate have also seen limited use in ground source heat pump systems.

As can be seen from Table 1, a majority of those states which specify fluids prefer potable water, propylene glycol, and potassium acetate. It is no accident that these fluids are the ones recommended by IGSHPA, as a number of states looked to them for industry input as they constructed their regulations.

A detailed list of the fluids which are approved by each state is given in [Den Braven, (1998)].

It is strongly recommended that the reader contact the pertinent regulatory officials within each state or other regulatory body to determine in detail the current application of regulations, as these do evolve and change over time.

TABLE 1: *FLUIDS ACCEPTABLE TO THE STATES*
(of the sixteen states who specify fluids)

FLUID	**NUMBER WHICH ACCEPT THE FLUID**
Potable Water	All
Aqueous propylene glycol	13
Aqueous potassium acetate	10
Aqueous calcium chloride	6
Aqueous sodium chloride	3
Aqueous ethanol	3
HCFC-22	2
Glycerin (Pharmaceutical grade)	2
Dipotassium phosphate	2
Aqueous methanol	2
Calcium carbonate	1
Aqueous ethylene glycol	1
Salt water	1
"Others on approval"	1

2.3 Local Regulations

In addition to the state regulations, a number of localities have adopted regulations concerning geothermal heat pump systems. We are in the process of collecting local regulations. Once again there is no systematic agreement on the part of local officials on appropriate regulations for this technology. Local regulations often exist due to the efforts (for good or ill) of only one or a few individuals. The situation is even more variable than on the state level.

By way of example, we have discovered the following:

-In Washington, thirteen counties have authority to expand on the state's water well construction standards as they see fit.

-Several counties in Montana have the authority to regulate water wells and driller licensing.

-All counties in Minnesota have the authority to expand upon state reinjection well standards.
-Several townships in Pennsylvania forbid the construction of open loop systems.

These regulations typically exist on the county or town (or city) level. Again, it is again strongly recommended that the practitioner contact officials in his or her location to determine whether there are any applicable regulations *before* commencing activities in a new location.

3. REGULATORY CLIMATE CHANGE

In addition to the regulations listed above, a number of states also have regulatory changes in progress, including Wyoming, Illinois, Iowa, Kansas, Washington, Ohio, and Maryland. The majority of these involve open loop systems. However, a few are developing detailed regulations. These include California and New Jersey. Still others with no regulatory authority have developed detailed "guidelines" to encourage proper construction of geothermal heat pump systems (Pennsylvania).

To assist in the development of appropriate construction practices, the National Ground Water Association in 1997 gathered together regulators, scientists, installers and other interested parties in an effort to develop industry supported guidelines for the construction of vertical boreholes for closed loop systems. This resulted in the publication in July, 1997 of "Guidelines for the Construction of Vertical Boreholes for Closed Loop Heat Pump Systems" [McCray, Ed., (1997)]. Their primary concern is that the subsurface environment is protected, and that industry practice be consistent with that concern. In this document, they address such issues as drilling , sanitary protection, control of drilling fluids, grouts, grout placement techniques, piping, pipe joining, heat transfer fluids, decommissioning, and many other topics. It should be noted that many of their suggestions, such as recommendations on acceptable piping materials, refer to that accepted by IGSHPA.

4. SUMMARY AND CONCLUSIONS

The regulations which presently govern the design and construction of open and closed loop geothermal heat pump systems across the US are a patchwork of appropriate and inappropriate responses to potential environmental problems. As these systems become more common, fear of environmental degradation can cause the passage of proscriptive legislation.

It is imperative that GHP system designers and installers recognize and acknowledge the concerns of regulatory officials. It is also imperative that they help educate officials in current and suggested industry practice. The existence of the Website which summarizes the existing regulations can be useful, as many states or other governing locales will study the response of other regulators to the technology, or even contact them for input.

The totality of state regulations in the US is so broad that is impossible to cover them thoroughly in this short paper. It is recommended that the reader consult the Web site mentioned before and their state regulators for complete information.

ACKNOWLEDGMENTS

The support of EPRI and NRECA in the original idea for regulations gathering is acknowledged and appreciated. The support by the Geothermal Heat Pump Consortium in the furthering of the regulations and construction of the Website is also greatly appreciated.

The hard work by my past and present students at the University of Idaho in gathering regulations and converting them to Web pages made all of this possible.

REFERENCES

Den Braven, K. R. (1998). Antifreeze Acceptability for Ground-Coupled Heat Pump Loops in the United States, ASHRAE Transactions, (104)1, January.

Den Braven, K. R., and Jensen, J., (1996). State and Federal Vertical Borehole Grouting Regulations. Final report to the Electric Power Research Institute on Project RP 33881-01, July.

Den Braven, K. R., and Schiers, C., (1996). Canadian Provincial and Territorial Vertical Borehole Grouting Regulations. Final report to the Electric Power Research Institute on Project RP 33881-01, November.

Heinonen, E. W., Tapscott, R. E., Wildin, M. W., and Beall, A. N., (1997). Assessment of Anti-Freeze Solutions for Ground-Source Heat Pump Systems. ASHRAE Report 908RP, February.

Heinonen, E. W., Wildin, M. W., Beall, A. N., and Tapscott, R. E,. (1997). Assessment of Anti-Freeze Solutions for Ground-Source Heat Pump Systems. ASHRAE Transactions, (103)2.

McCray, K., B, Editor, (1997), Guidelines for the Construction of Vertical Boreholes for Closed Loop Heat Pump Systems, National Ground Water Association, Westerville, Ohio.

Green Fact Sheet

INFILTRATOR water technologies

Infiltrator Plays Significant Role in Sustainability

January 2016

Introduction

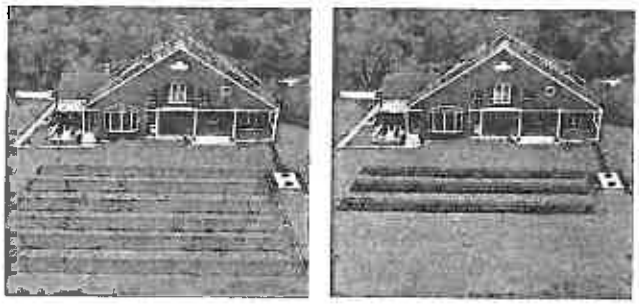
Infiltrator Water Technologies, LLC is the original and world's leading manufacturer of plastic leachfield drainage chambers and septic tanks for environmental onsite waste-water solutions. The chambers are a direct replacement for stone and pipe leachfields, and have revolutionized the septic industry. They provide cost-effective, efficient methods for the design of residential and commercial wastewater systems.

There are more than 2.6 million Infiltrator systems installed and over 138 million chambers in-ground worldwide. Infiltrator chamber systems have stood the test of time with an established history of performance and reliability, since 1987. Today, nearly half of the septic systems installed in the US use an Infiltrator Water Technologies product.

Infiltrator chambers are the original plastic leachfield drainage chambers.

Background

By being an industry leader, Infiltrator plays a significant role in implementing sustainable manufacturing practices. Infiltrator's technologies complement nature's own processes for recycling wastewater. For over twenty five years, Infiltrator has applied science and technology to further the onsite industry's goals of improved public health and better water quality. While we continue to make septic systems healthier, more reliable and longer-lasting, we are committed to manufacture products that also help to conserve our precious natural resources.



Traditional full-size stone and pipe leachfield vs. reduced size chamber system leachfield.

Infiltrator owns and operates Champion Polymer Recycling (Champion). Champion, formed in 1995, is one of the top twenty recycling companies in the country which is uniquely positioned to procure, certify, accept and process large quantities of plastic scrap. The use of recycled plastic materials goes directly into the manufacture of our products instead of being land filled or burned in an incinerator. Everyday we purchase and process post-consumer and post-industrial plastics to manufacture our products, putting over 150 million pounds (75,000 tons) of recycled plastics to better, environmentally friendly use every year.

Reducing the environmental footprint of materials, product manufacturing, and transportation is a global movement. Infiltrator recently funded a quantitative research study to understand more about the carbon footprint of the onsite wastewater industry. The study evaluated the environmental impacts of both conventional septic systems consisting of a concrete septic tank and stone/pipe drainfield and systems using recycled thermoplastics tanks and chambers.

For more information, contact Infiltrator Water Technologies, LLC at 1-800-221-4436.

Green Fact Sheet

INFILTRATOR water technologies

Infiltrator Plays Significant Role in Sustainability

January 2016

Infiltrator found that even when transporting the recycled thermoplastic system 1030 miles and conventional systems only 30 miles, the recycled systems reduced electricity consumption by 88%, fuel consumption by 67%, water consumption by 97% and carbon emissions by 44%.

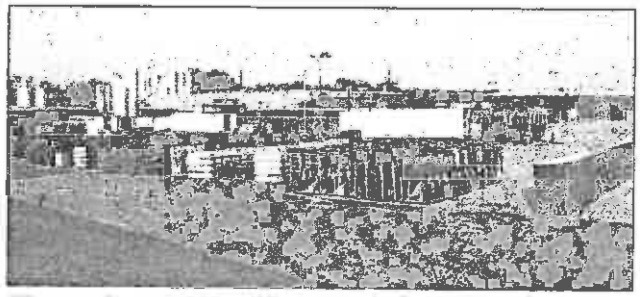
When compared to the total number of septic systems installed each year (estimated at 400,000 installed septic systems in 2013), this could amount to a total yearly savings of 2.2 billion kWh of electricity, 1.8 billion kBtu of fuel, 380 million gallons of water, and 59 kilotons of carbon if every septic system was composed of recycled thermoplastics rather than conventional materials.

Quick Facts

Here are some ways Infiltrator and Champion are working to improve the environment in which we live.

- We seek polypropylene, polyethylene (LDPE & HDPE) and materials (parts, purging, regrind, pellets) from the following industries: automotive, building materials, beverage and bottling, food processing, grocery/bakery, and distribution centers.
- Infiltrator products are made of 95% recycled material.
- The post-consumer and post-industrial plastics we purchase keep 75,000 tons per year from being landfilled.
- Infiltrator has the ability to process up to 500,000 pounds of plastic daily.
- Champion one of the top 20 purchasers of recycled plastics in the United States.
- Procurement Breakdown
  - 25% Post-consumer
  - 75% Post-industrial

Infiltrator products are made from 95% recycled material.



We recycle over 150 million pounds (75,000 tons) of plastic per year to manufacture our products.

- With our unique procurement procedure we visit dump sites to reclaim materials before they are land filled.
- Proprietary processing method allows us to utilize waste streams that are otherwise unusable to other recycling/manufacturing companies.
- Infiltrator was awarded the Chairman's Award by Global Plastics Environmental Conference (GPEC) in 2013
- Champion participates in many recycling organizations and associations including the Association of Post-Consumer Plastic Recyclers, Carpet America Recovery Effort, Automotive Body Parts Association, and Automobile Recyclers Association.
- Total Barrels of oil saved by recycling (2014-2016) = 1.53 million barrels.
- Tons of CO2 reduced by recycling (2014-2016) = 198,000 tons.

[1] Recycling a ton of polypropylene saves 10.2 barrels of oil.

[2] Recycling a ton of polypropylene reduce CO2 emissions by 1.32 tons.

Sources: Argonne National Labs, DOE, Franklin Associates, Phillips 66 and Wellman.

www.infiltratorwater.com

1-800-221-4436

EnviroTest Laboratories Inc.

ANALYTICAL REPORT

Job Number: 420-95546-4

SDG Number: 41877

Job Description: Carnell Environmental

For:
Carnell Environmental
7-11 Legion Drive
Suite G3
Valhalla, NY 10595

Attention: Mr. Michael Carnicelli

Debra Bayer
Customer Service Manager
dbayer@envirotestlaboratories.com
10/05/2015

cc: Cheryl Charles
Lab reports

EnviroTest Laboratories, Inc. Certifications and Approvals: NYSDOH 10142, NJDEP NY015, CTDOPH PH-0554

ACCREDITED IN ACCORDANCE WITH nelac

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
No analytical or quality issues were noted.

Metals
No analytical or quality issues were noted.

General Chemistry
Method SM 4500 H+ B: The holding time for pH is 15 minutes, the samples were received outside of the holding time.

No other analytical or quality issues were noted.

Biology
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Carnell Environmental

Job Number: 420-95546-4
SDG Number: 41877

Description	Lab Location	Method	Preparation Method
Matrix: Water			
ICP Metals by 200.7	EnvTest	EPA 200.7 Rev 4.4	
200 Series Drinking Water Prep Determination Step	EnvTest		EPA 200
ICPMS Metals by 200.8	EnvTest	EPA 200.8 Rev.5.4	
200 Series Drinking Water Prep Determination Step	EnvTest		EPA 200
Anions by Ion Chromatography	EnvTest	MCAWW 300.0	
Anions by Ion Chromatography	EnvTest	EPA 300.0 Rev. 2.1	
Purgeable Organic Compounds in Water by GC/MS	EnvTest	EPA-DW 524.2	
pH	EnvTest	SM19 SM 4500 H+ B	
Total Coliform and Escherichia coli by Colilert - Presence/Absence	EnvTest	SMWW SM 9223	

Lab References:

EnvTest = EnviroTest

Method References:

EPA = US Environmental Protection Agency

EPA-DW = "Methods For The Determination Of Organic Compounds In Drinking Water", EPA/600/4-88/039, December 1988 And Its Supplements.

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM19 = "Standard Methods For The Examination Of Water And Wastewater", 19Th Edition, 1995."

SMWW = "Standard Methods for the Examination of Water and Wastewater"

METHOD / ANALYST SUMMARY

Client: Carnell Environmental

Job Number: 420-95546-4
SDG Number: 41877

Method	Analyst	Analyst ID
EPA-DW 524.2	Andersen, Eric C	ECA
EPA 200.7 Rev 4.4	Cusack, Renee	RC
EPA 200.8 Rev.5.4	Pistole, Maria	MP
MCAWW 300.0	Sirico, Derek	DS
EPA 300.0 Rev. 2.1	Cruz, Joshua	JC
SM19 SM 4500 H+ B	O'Driscoll, Kate	KO
SMWW SM 9223	O'Driscoll, Kate	KO

SAMPLE SUMMARY

Client: Carnell Environmental

Job Number: 420-95546-4
SDG Number: 41877

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
420-95546-6	249 Mt. Holly Rd, Katonah (First)	Drinking Water	09/24/2015 1235	09/24/2015 1530
420-95546-7	249 Mt. Holly Rd, Katonah (Flush)	Drinking Water	09/24/2015 1243	09/24/2015 1530

Mr. Michael Carnicelli
Carnell Environmental
7-11 Legion Drive
Suite G3
Valhalla, NY 10595

Job Number: 420-95546-4
Sdg Number: 41877

Client Sample ID: **249 Mt. Holly Rd, Katonah (First)**
Lab Sample ID: **420-95546-6**

Date Sampled: 09/24/2015 1235
Date Received: 09/24/2015 1530
Client Matrix: Drinking Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 200.8 Rev.5.4			Date Analyzed:	09/28/2015 1547	
Prep Method: 200			Date Prepared:	09/25/2015 1337	
Lead	14	ug/L	1.0	1.0	1.0

Mr. Michael Carnicelli
Carnell Environmental
7-11 Legion Drive
Suite G3
Valhalla, NY 10595

Job Number: 420-95546-4
Sdg Number: 41877

Client Sample ID: **249 Mt. Holly Rd, Katonah (Flush)**
Lab Sample ID: **420-95546-7**

Date Sampled: 09/24/2015 1243
Date Received: 09/24/2015 1530
Client Matrix: Drinking Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: 300.0		Date Analyzed:		09/24/2015 1852	
Nitrate as N	0.97	mg/L	0.010	0.25	1.0

Mr. Michael Carnicelli
Carnell Environmental
7-11 Legion Drive
Suite G3
Valhalla, NY 10595

Job Number: 420-95546-4
Sdg Number: 41877

Client Sample ID: **249 Mt. Holly Rd, Katonah (Flush)**
Lab Sample ID: **420-95546-7**

Date Sampled: 09/24/2015 1243
Date Received: 09/24/2015 1530
Client Matrix: Drinking Water

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: SM 9223		Date Analyzed:	09/24/2015 1656		
Coliform, Total	Absent	CFU/100mL			1.0
Escherichia coli	Absent	CFU/100mL			1.0

Mr. Michael Carnicelli
Carnell Environmental
7-11 Legion Drive
Suite G3
Valhalla, NY 10595

Job Number: 420-95546-4
Sdg Number: 41877

Client Sample ID: **249 Mt. Holly Rd, Katonah (Flush)**
Lab Sample ID: **420-95546-7**

Date Sampled: 09/24/2015 1243
Date Received: 09/24/2015 1530
Client Matrix: Drinking Water

Analyte	Result/Qualifier		Unit	RL	RL	Dilution
Method: 524.2			Date Analyzed:	09/25/2015 1351		
1,1,1,2-Tetrachloroethane	0.50	U	ug/L	0.50	0.50	1.0
1,1,1-Trichloroethane	0.50	U	ug/L	0.50	0.50	1.0
1,1,2,2-Tetrachloroethane	0.50	U	ug/L	0.50	0.50	1.0
1,1,2-Trichloroethane	0.50	U	ug/L	0.50	0.50	1.0
1,1-Dichloroethane	0.50	U	ug/L	0.50	0.50	1.0
1,1-Dichloroethene	0.50	U	ug/L	0.50	0.50	1.0
1,1-Dichloropropene	0.50	U	ug/L	0.50	0.50	1.0
1,2,3-Trichlorobenzene	0.50	U	ug/L	0.50	0.50	1.0
1,2,3-Trichloropropane	0.50	U	ug/L	0.50	0.50	1.0
1,2,4-Trichlorobenzene	0.50	U	ug/L	0.50	0.50	1.0
1,2,4-Trimethylbenzene	0.50	U	ug/L	0.50	0.50	1.0
1,2-Dichloroethane	0.50	U	ug/L	0.50	0.50	1.0
1,2-Dichlorobenzene	0.50	U	ug/L	0.50	0.50	1.0
1,2-Dichloropropane	0.50	U	ug/L	0.50	0.50	1.0
1,3-Dichloropropane	0.50	U	ug/L	0.50	0.50	1.0
1,4-Dichlorobenzene	0.50	U	ug/L	0.50	0.50	1.0
2,2-Dichloropropane	0.50	U	ug/L	0.50	0.50	1.0
Benzene	0.50	U	ug/L	0.50	0.50	1.0
Bromobenzene	0.50	U	ug/L	0.50	0.50	1.0
Bromochloromethane	0.50	U	ug/L	0.50	0.50	1.0
Bromomethane	0.50	U	ug/L	0.50	0.50	1.0
n-Butylbenzene	0.50	U	ug/L	0.50	0.50	1.0
cis-1,2-Dichloroethene	0.50	U	ug/L	0.50	0.50	1.0
cis-1,3-Dichloropropene	0.50	U	ug/L	0.50	0.50	1.0
Carbon tetrachloride	0.50	U	ug/L	0.50	0.50	1.0
Chlorobenzene	0.50	U	ug/L	0.50	0.50	1.0
Chloroethane	0.50	U	ug/L	0.50	0.50	1.0
Chloromethane	0.50	U	ug/L	0.50	0.50	1.0
Dibromomethane	0.50	U	ug/L	0.50	0.50	1.0
Ethylbenzene	0.50	U	ug/L	0.50	0.50	1.0
Dichlorodifluoromethane	0.50	U	ug/L	0.50	0.50	1.0
Hexachlorobutadiene	0.50	U	ug/L	0.50	0.50	1.0
Isopropylbenzene	0.50	U	ug/L	0.50	0.50	1.0
p-Isopropyltoluene	0.50	U	ug/L	0.50	0.50	1.0
Methylene Chloride	0.50	U	ug/L	0.50	0.50	1.0
m-Xylene & p-Xylene	1.0	U	ug/L	1.0	1.0	1.0
Methyl tert-butyl ether	0.50	U	ug/L	0.50	0.50	1.0
o-Xylene	0.50	U	ug/L	0.50	0.50	1.0
Tetrachloroethene	0.50	U	ug/L	0.50	0.50	1.0
Toluene	0.50	U	ug/L	0.50	0.50	1.0

Mr. Michael Carnicelli
Carnell Environmental
7-11 Legion Drive
Suite G3
Valhalla, NY 10595

Job Number: 420-95546-4
Sdg Number: 41877

Client Sample ID: **249 Mt. Holly Rd, Katonah (Flush)**
Lab Sample ID: **420-95546-7**

Date Sampled: 09/24/2015 1243
Date Received: 09/24/2015 1530
Client Matrix: Drinking Water

Analyte	Result/Qualifier		Unit	RL	RL	Dilution
trans-1,2-Dichloroethene	0.50	U	ug/L	0.50	0.50	1.0
trans-1,3-Dichloropropene	0.50	U	ug/L	0.50	0.50	1.0
Trichloroethene	0.50	U	ug/L	0.50	0.50	1.0
tert-Butylbenzene	0.50	U	ug/L	0.50	0.50	1.0
Trichlorofluoromethane	0.50	U	ug/L	0.50	0.50	1.0
Vinyl chloride	0.50	U	ug/L	0.50	0.50	1.0
Xylenes, Total	1.5	U	ug/L	1.5	1.5	1.0
Styrene	0.50	U	ug/L	0.50	0.50	1.0
sec-Butylbenzene	0.50	U	ug/L	0.50	0.50	1.0
1,3,5-Trimethylbenzene	0.50	U	ug/L	0.50	0.50	1.0
N-Propylbenzene	0.50	U	ug/L	0.50	0.50	1.0
1,3-Dichlorobenzene	0.50	U	ug/L	0.50	0.50	1.0
2-Chlorotoluene	0.50	U	ug/L	0.50	0.50	1.0
4-Chlorotoluene	0.50	U	ug/L	0.50	0.50	1.0
Surrogate					Acceptance Limits	
4-Bromofluorobenzene	98		%		71 - 120	
Toluene-d8 (Surr)	95		%		79 - 121	
1,2-Dichloroethane-d4 (Surr)	112		%		70 - 128	
Method: 200.7 Rev 4.4			Date Analyzed:		09/29/2015 1327	
Prep Method: 200			Date Prepared:		09/28/2015 1616	
Iron	0.060	U	mg/L	0.060	0.060	1.0
Sodium	6.6		mg/L	0.20	0.20	1.0
Method: 200.8 Rev.5.4			Date Analyzed:		09/29/2015 0940	
Prep Method: 200			Date Prepared:		09/28/2015 1616	
Lead	1.3		ug/L	1.0	1.0	1.0
Arsenic	0.0014	U	mg/L	0.0014	0.0014	1.0
Manganese	0.010	U	mg/L	0.010	0.010	1.0
Method: 300.0 Rev. 2.1			Date Analyzed:		09/29/2015 1741	
Chloride	37		mg/L	15	15	10
Method: SM 4500 H+ B			Date Analyzed:		09/25/2015 1602	
pH	7.19	H	SU	0.200	0.200	1.0
Temp @ pH Measurement	16.0		Degrees C	5.00	5.00	1.0

DATA REPORTING QUALIFIERS

Client: Carnell Environmental

Job Number: 420-95546-4
Sdg Number: 41877

Lab Section	Qualifier	Description
GC/MS VOA		
	U	The analyte was analyzed for but not detected at or above the lowest stated limit.
Metals		
	U	The analyte was analyzed for but not detected at or above the lowest stated limit.
General Chemistry		
	H	Sample was prepped or analyzed beyond the specified holding time

Definitions and Glossary

Client: Carnell Environmental

Job Number: 420-95546-4

Sdg Number: 41877

Abbreviation	These commonly used abbreviations may or may not be present in this report.
%R	Percent Recovery
DL, RA, RE	Indicates a Dilution, Reanalysis or Reextraction.
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit - an estimate of the minimum amount of a substance that an analytical process can reliably detect. A MDL is analyte- and matrix-specific and may be laboratory-dependent.
ND	Not detected at the reporting limit (or MDL if shown).
QC	Quality Control
RL	Reporting Limit - the minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence.
RPD	Relative Percent Difference - a measure of the relative difference between two points.

EnviroTest
Laboratories, Inc.

CHAIN OF CUSTODY

315 Fullerton Avenue
Newburgh, NY 12550
TEL (845) 562-0890
FAX (845) 562-0841

95546-4
REPORT # (Lab Use Only)

CUSTOMER Carnell
ADDRESS 2-11 Legion Dr. Ste G-3
CITY/STATE/ZIP Valhalla NY 10595
CONTACT M. Fescoe PHONE 914 996-9300
PROJECT LOCATION 249 Mt. Holly Rd. Katonah, NY
PRJ NUMBER/P.O.# 41877

REPORT TYPE
- [X] STANDARD
- [ ] ISRA
- [ ] NJ REG
- NYASP [ ] A [ ] B
- [ ] OTHER

TURNAROUND
- [X] NORMAL
- [ ] QUICK
- VERBAL

NOTE: SAMPLE TEMPERATURE UPON RECEIPT MUST BE 4C +/- 2C.
SAMPLE TEMP. 6.5 °C
SAMPLE REC'D. ON ICE [ ] Y [ ] N
pH CHECK [ ] Y [ ] N
CHLORINE RESIDUAL [ ] Y [ ] N

NY PUBLIC WATER SUPPLIES
SOURCE ID
ELRP TYPE
FEDERAL ID

MATRIX: DW=DRINKING WATER S=SOIL O=OIL WW=WASTE WATER SL=SLUDGE GW=GROUND WATER

Sample #	SAMPLING DATE	TIME	COMP (Y / N)	GRAB (Y / N)	MATRIX	Client I.D.	Total # of containers	40ml Glass HCL	Liter Glass HCL	250ml Amber H2SO4	Liter Amber Plain	250ml Plastic HNO3	250ml Plastic NaOH	Liter Plastic	Liter Plastic H2SO4	250ml Plastic	125ml Plastic Sterile	8oz Glass	2oz Glass	250ml Pl. NaOH/ZnAcc
	9/24/15			Y	DW		5	2			1					1	1			
	9/24/15			Y	DW															

ANALYSIS REQUESTED
West Cty First Draw Lead
West Cty Flush Draw

SAMPLES SUBMITTED FOR ANALYSIS WILL BE SUBJECTED TO THE ENVIROTEST TERMS AND CONDITIONS OF SALE (SHORT FORM) UNLESS ALTERNATE TERMS ARE AGREED IN WRITING.

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
SAMPLED BY	Carnell	9/24/15				9/24/15	1200
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
	Carnell	9/24/15					
COMMENTS	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
	EQ	9/24/15	2200	Marcano	EQ	9/24/15	330

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Carnell Environmental

Job Number: 420-95546-4
SDG Number: 41877

Login Number: 95546

Question	T/F/NA	Comment
Samples were collected by ETL employee as per SOP-SAM-1	NA	
The cooler's custody seal, if present, is intact.	NA	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is recorded.	True	6.5 C
Cooler Temp. is within method specified range.(0-6 C PW, 0-8 C NPW, or BAC <10 C	True	
If false, was sample received on ice within 6 hours of collection.	NA	
Based on above criteria cooler temperature is acceptable.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	False	pH
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	NA	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

Table 1 - Primary Parameters

Information obtained from the New York State Department of Health Website
http://www.health.state.ny.us/environmental/water/drinking/ccr/table1.htm
http://www.epa.gov/safewater/contaminants/index.html#mcls

Contaminant	MCL*	Sources in Drinking Water	Health Effects	Recommended Treatment
Total Coliform Bacteria	Any Positive sample	Naturally present in the environment	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful bacteria may be present.	Ultraviolet Disinfection System
E. Coli	Any Positive sample	Human and animal fecal water	E. Coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in the wastes can cause short-term effects such as diarrhea cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children and people with severely compromised immune systems.	Ultraviolet Disinfection System
Nitrate	10 mg/L	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.	Infants below the age of six months who drink water containing nitrates in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Reverse Osmosis Filters
Arsenic	10 ug/L	Erosion of natural deposits; Runoff from orchards: Runoff from glass and electronics production wastes	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.	Reverse Osmosis Filters or Activated Alumina Filters
Lead	15 ug/L action level	Corrosion of household plumbing systems; Erosion of natural deposits	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.	Reverse Osmosis Filters
Vinyl Chloride	2 ug/L	Degradation of other chemicals leaching from waste sites, spills, etc.	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.	Carbon Filters

Table 1 - Primary Parameters - continued

Information Obtained from the New York State Department of Health Website
http://www.health.state.ny.us/environmental/water/drinking/ccr/table1.htm
http://www.epa.gov/safewater/contaminants/index.html#mcls

Contaminant	MCL*	Sources in Drinking Water	Health Effects	Recommended Treatment
Vinyl Chloride	10 ug/L	Degradation of other chemicals leaching from waste sites, spills, etc.	Some people who drink water containing vinyl chloride in excess of the MCL over many years have an increased risk of getting cancer.	Carbon Filters
Methyl Tertiary Butyl Ether (MTBE)	10 ug/L	Releases from gasoline storage tanks. MTBE is an octane enhancer in unleaded gasoline. Atmospheric deposition.	EPA reviewed available health effects information on MTBE In its 11997 Drinking Water Advisory guidance and decided that there was insufficient information available to allow EPA to establish quantitative estimates for health risks and as such would not set health advisory limits. The drinking water advisory document indicates that there is little likelihood that MTBE in drinking water will cause adverse health effects at concentrations between 20 and 40 ppb or below.	Carbon Filters
Primary Organic Contaminants (POC's)	5 ug/L	Discharge from industrial activities or petroleum spills	Refer to the following websites for further information: http://www.health.state.ny.us/environmental/water/drinking/ccr/table.htm or http://www.epa.gov/safewater/contaminants/index.html#mcls	

* Maximum Contaminant Level (MCL) - Maximum permissible level of a contaminant in drinking water as established in Part 5 of the New York State Sanitary Code.

** Other treatment options may be available

Table 2 - Secondary Parameters

Information Obtained from the New York State Department of Health Website
http://www.health.state.ny.us/environmental/water/drinking/ccr/table1.htm

Contaminant	MCL*	Sources in Drinking Water	Health Effects	Recommended Treatment
Iron	300 ug/L	Naturally occurring	Iron has no health effects. At 1,000 ug/L a substantial number of people will note the bitter astringent taste of iron. Also, at this concentration, it imparts a brownish color to laundered clothing and stains plumbing fixtures with a characteristic rust color. Staining can result at levels of 50 ug/L, lower than those detectable to taste buds. Therefore, the MCL of 300 ug/L represents a reasonable compromise as adverse aesthetic effects are minimized at this level. Many multi-vitamins may contain 3,000 or 4,000 micrograms or iron per capsule.	No Treatment Required
Manganese	300 ug/L	Naturally occurring; Indicative of landfill contamination	The Food and Nutrition Board of the National Research determined an estimated safe and adequate daily dietary intake of manganese to be 2,000-5,000 micrograms for adults. However, many peoples diets lead them to consume even higher amounts of manganese, especially those who consume high amounts of vegetable or are vegetarian. The infant population is of greatest concern. It would be better if the drinking water were not used to make infant formula since it already contains iron and manganese. Excess manganese produced a brownish color in laundered goods and impairs the taste of tea, coffee, and other beverages. Concentrations may cause a dark brown stain on porcelain plumbing fixtures. As with iron, manganese may form a coating on distribution pipes. These may slough off causing brown blotches on laundered clothing or black particles in the water.	No Treatment Required
Sodium	(see Health Effects)	Naturally occurring; Road salt; Water softeners; Animal Waste	Water containing more than 20 mg/L of sodium should not be used for drinking by people on severely restricted sodium diets. Water containing more than 270 mg/L of sodium should not be used by people on moderately restricted sodium diets.	No Treatment Required

Table 2 - Secondary Parameters...continued

Information Obtained from the New York State Department of Health Website
http://www.health.state.ny.us/environmental/water/drinking/ccr/table1.htm

Contaminant	MCL*	Sources in Drinking Water	Health Effects	Recommended Treatment
Chloride	250 mg/L	Naturally occurring or indicative of road salt contamination	No health effects. The MCL for chloride is the level above which the taste of water may become objectionable. In addition, to the adverse taste effects, high chloride concentration levels in the water contribute to the deterioration of domestic plumbing and water heaters. Elevated chloride concentrations may also be associated with the presence of sodium in drinking water.	No Treatment Required
pH	N/A	Naturally occurring	A low pH (acidic) can cause corrosion of household plumbing causing lead to be leached out into the drinking water from any lead solder joints, the water service line from private well, and/or plumbing fixtures containing lead. A high pH (basic) can cause slippery feel, soda taste and deposits. pH range should be 6.5 to 8.5.	No Treatment Required

Additional information may be obtained from http://www.epa.gov/safewater/
* Maximum Contaminant Level (MCL) - Maximum permissible level of a contaminant in drinking water as established in Part 5 of the New York State Sanitary Code.

Well, Water Storage Tank, and Household Plumbing Disinfection Procedure

Private wells, water storage tanks, and/or household plumbing may become contaminated with Total Coliform Bacteria. Such contamination may results from an isolated source of contamination from an isolated event, e.g. floor or unclean faucet; or from a continuous source of contamination, e.g. poor well design or construction, cracked well casing, or defective sanitary seal on well casing allowing ground water near the surface of the ground to continually infiltrate the well.

This disinfection procedure is not intended where there is continuous source of contamination. Satisfactory well disinfection as discussed in Section 3.0 of the Rules & Regulations would suggest an isolated source of contamination.

The following disinfection procedure is from Section 8.0 of the Westchester County Health Department Rules & Regulations For the Design And Construction Of Residential Subsurface Sewage Treatment Systems And Wells In Westchester County, New York:

1. For each 50 foot depth, mix one quart of solution containing 5-1/4% available chlorine in 5 gallons of water. Recent guidelines from the New York State Health Department advises that **laundry bleach** with additives (i.e., scented, softening agents, etc.) lacking NSF/ANSI Standard 60 approval for use in drinking water treatment **should not be used** for well disinfection purposes.

2. Pour this solution into the well and recirculate water through the household plumbing and a garden hose back into the well to assure the entire well water column is chlorinated. Open all taps one at a time until a noticeable chlorine odor appears at the tap then turn them off.

3. Again add chlorine solution to the well and recirculate water through the garden hose back into the well to assure the entire well water column is chlorinated. Shut off the pump and replace the well cap or sanitary seal on top of the casing. Allow the chlorine solution to remain in the system for a minimum of eight (8) hours, or overnight if possible.

4. Thoroughly flush the system until the chlorine odor dissipates. A DPD chlorine test kit may be used to determine when the chlorine has dissipated.

5. Collect a sample for bacteriological examination by a NYS ELAP approved lab.

Concrete Washout Area
Best Management Practice

from Ecology's Water Quality Program

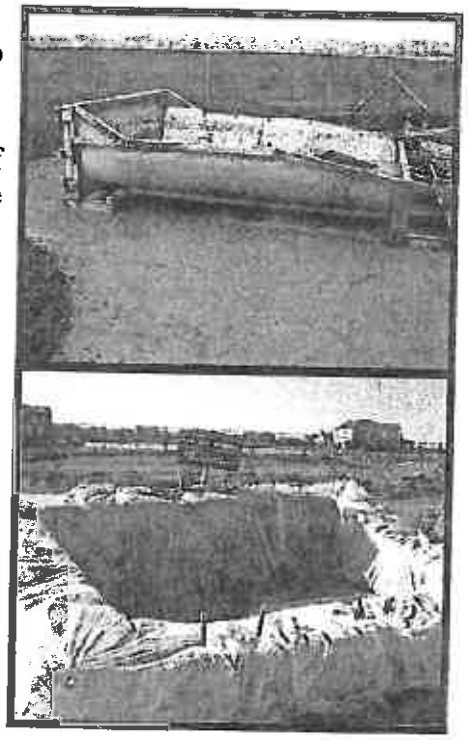
Reminder: The Construction Stormwater General Permit does not allow operators to discharge concrete wash water to waterways, storm drains or groundwater. Operators must manage and contain this water to prevent spills, leaks or discharges.

Description: Concrete wash water is generated from washing out ready-mix trucks, drums and pumps; it also includes the water from rinsing off chutes, equipment, and concrete truck exteriors. Concrete wash water is toxic to fish and aquatic life and can contaminate drinking water supplies. Improper disposal can clog storm drain pipes and cause flooding. Operators must prevent concrete wash water from entering waterways, storm drains and groundwater. If possible, all concrete waste and wash water should be returned with each concrete truck for disposal at the concrete batch plant. If this is not possible, operators can install an on-site **concrete washout area**. This best management practice can prevent water pollution and comply with state and federal laws.

Education for Concrete Contractors: The success of your on-site concrete washout area depends on whether or not concrete truck drivers use your designated concrete washout areas. Bring attention to the designated washout area with signs, and provide careful oversight to prevent improper dumping of concrete wash water. Operators should ensure that concrete contracts include requirements that concrete truck drivers use designated concrete washout areas.

Types of Concrete Washout Areas

Prefabricated washout containers: A growing number of companies offer sturdy, prefabricated concrete washout containers that are delivered to the site. Some services provide the containers alone without providing maintenance and disposal of materials, while other companies offer complete service that includes delivery of containers and regular pickups of solid and liquid waste materials. The prefabricated containers resist damage and protect against spills and leaks. Full-service option relieves the site superintendent of the burden of disposing of materials. Some companies offer prefabricated washout containers with ramps to accommodate concrete pump trucks.



Self-installed concrete washouts: You can also build your own concrete washout facility - although self-installed structures are much less reliable than prefabricated containers and are prone to leaks.

- **Below-grade washouts** will prevent breaches and reduce the likelihood of spills and contaminated stormwater runoff.
- **Above-grade washouts** must be carefully sized, inspected and maintained to prevent leaks and spills.

Sizing Self-Installed Concrete Washout Areas

Refer to Ecology BMP C154 for detailed design standards. You must size your washouts to handle solids, wash water, and rainfall to prevent overflow.

- Approximately 7 gallons of wash water are used to wash one truck chute.
- Approximately 50 gallons are used to wash out the hopper of a concrete pump truck.

Below-grade washouts on must be sized to contain all liquid and solid waste you expect to generate in between cleanout periods. On larger sites, the pit should be at least 10 feet wide by 10 feet long and accommodate a minimum 12 inch freeboard (safety margin) in the sizing calculations. Line the pit with plastic sheeting of at least 10-mil thickness that has no holes or tears to prevent leaching of liquids into the ground.

Above-grade washouts on larger sites must be at least 10 feet wide by 10 feet long and sized to contain all liquid and solid waste you expect to generate in between cleanout periods. Washouts at smaller sites can be smaller according to the expected capacity needed. Include a minimum of 12 inch freeboard in the sizing calculations. You can make the structures from staked straw bales or sandbags double- or triple-lined with plastic sheeting of at least 10-mil thickness that has no holes or tears.

Placement of Concrete Washout Areas

You should not place concrete washout facilities within 50 feet of storm drains, open ditches, or water bodies. Consider multiple areas based upon demand for storage capacity. Allow convenient access for concrete trucks, preferably near the area where the concrete is being poured. If trucks need to leave a paved area to access washout, prevent track-out with a pad of rock or quarry spalls (see Ecology BMP C105). These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills.

Operation

Inspection: Check all concrete washout facilities daily to determine if they have been filled to 75% capacity. The facility needs to be cleaned or changed when 75% full. Inspect self-installed washouts daily to ensure that plastic linings are intact and sidewalls have not been damaged by construction activities. If contractors have washed out chutes or hoppers in other unapproved locations, you may need to provide more education, install additional signage, or place additional washouts in more convenient locations.

Material Removal: If the washout is nearing capacity, vacuum and dispose of the waste material in an approved manner. Do not discharge liquids to waterways, storm drains or directly onto ground. Do not use sanitary sewer without local approval. Remove liquids or cover the structures before predicted storms to prevent overflows.

You can remove hardened concrete whole or you can break it up first, depending on the type of equipment available at your site. You can then reuse the concrete onsite or haul it away for disposal or recycling.

When you remove materials from the concrete washout, inspect for signs of weakening or damage, and rebuild structure or make necessary repairs. Install a new plastic liner after every cleaning.

Resources

Ecology's Stormwater Management Manuals:
http://www.ecy.wa.gov/programs/wq/stormwater/construction/#More%20Stormwater%20Guidance%20Information%20

For more information, please contact:

Jeff Killelea
Washington State Dept. of Ecology - Water Quality Program
(360) 407-6127 or jkil461@ecy.wa.gov

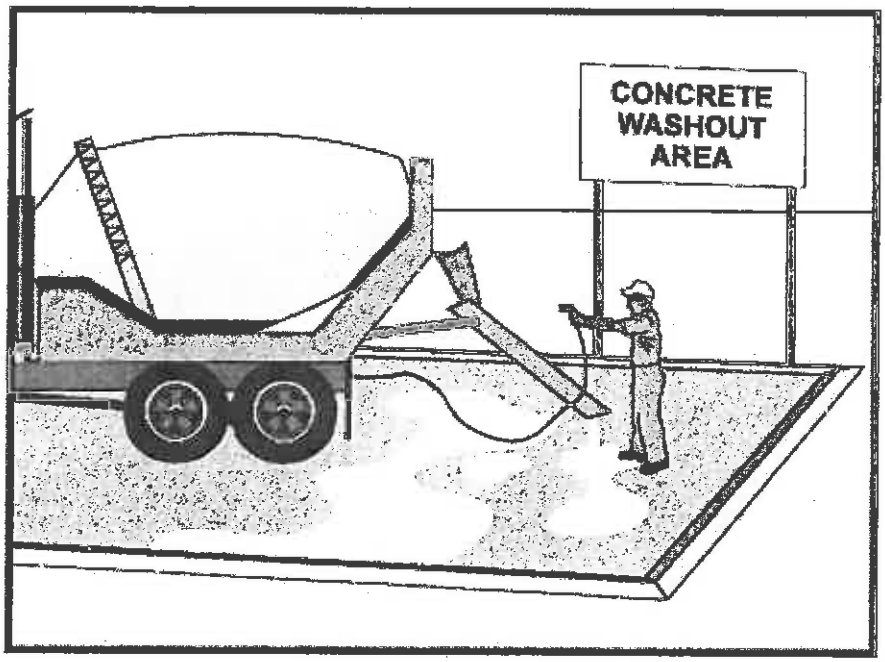
Visit Ecology's Construction Stormwater Website: http://www.ecy.wa.gov/programs/wq/stormwater/construction

If you need this information in an alternate format, please call the Program Development Services Section Secretary at 360-407-6401. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

BMP C154: Concrete Washout Area

Purpose

Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, or performing onsite washout in a designated area to prevent pollutants from entering surface waters or groundwater.



Conditions of Use

Concrete washout area best management practices are implemented on construction projects where:

- Concrete is used as a construction material
- It is not possible to dispose of all concrete wastewater and washout offsite (ready mix plant, etc.).
- Concrete trucks, pumpers, or other concrete coated equipment are washed onsite.

Design and Installation Specifications

Implementation

The following steps will help reduce stormwater pollution from concrete wastes:

- Perform washout of concrete trucks offsite or in designated concrete washout areas only.
- Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped onsite, except in designated concrete washout areas.

- Concrete washout areas may be prefabricated concrete washout containers, or self-installed structures (above-grade or below-grade).
    - Prefabricated containers are most resistant to damage and protect against spills and leaks. Companies may offer delivery service and provide regular maintenance and disposal of solid and liquid waste.
    - If self-installed concrete washout areas are used, below-grade structures are preferred over above-grade structures because they are less prone to spills and leaks.
    - Self-installed above-grade structures should only be used if excavation is not practical.

Education

- Discuss the concrete management techniques described in this BMP with the ready-mix concrete supplier before any deliveries are made.
- Educate employees and subcontractors on the concrete waste management techniques described in this BMP.
- Arrange for contractor's superintendent or Certified Erosion and Sediment Control Lead (CESCL) to oversee and enforce concrete waste management procedures.
- A sign should be installed adjacent to each temporary concrete washout facility to inform concrete equipment operators to utilize the proper facilities.

Contracts

- Incorporate requirements for concrete waste management into concrete supplier and subcontractor agreements.

Location and Placement

- Locate washout area at least 50 feet from sensitive areas such as storm drains, open ditches, or water bodies, including wetlands.
- Allow convenient access for concrete trucks, preferably near the area where the concrete is being poured.
- If trucks need to leave a paved area to access washout, prevent track-out with a pad of rock or quarry spalls (see Ecology BMP C105). These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills.
- The number of facilities you install should depend on the expected demand for storage capacity.
- On large sites with extensive concrete work, washouts should be placed in multiple locations for ease of use by concrete truck drivers.

Onsite Temporary Concrete Washout Facility, Transit Truck Washout Procedures:

- Temporary concrete washout facilities shall be located a minimum of 50 ft from sensitive areas including storm drain inlets, open drainage facilities, and watercourses.
- Concrete washout facilities shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
    - Approximately 7 gallons of wash water are used to wash one truck chute.
    - Approximately 50 gallons are used to wash out the hopper of a concrete pump truck
- Washout of concrete trucks shall be performed in designated areas only.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed of offsite.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed of per applicable solid waste regulations. Dispose of hardened concrete on a regular basis.

- Temporary Above-Grade Concrete Washout Facility
    - Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
    - Straw bales and staking materials shall conform to the provisions in BMP C230: Straw Bale Barrier.
    - Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

- Temporary Below-Grade Concrete Washout Facility
    - Temporary concrete washout facilities (type below grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
    - Lath and flagging should be commercial type.
    - Plastic lining material shall be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears,

or other defects that compromise the impermeability of the material.
    - Liner seams shall be installed in accordance with manufacturers' recommendations.
    - Soil base shall be prepared free of rocks or other debris that may cause tears or holes in the plastic lining material.

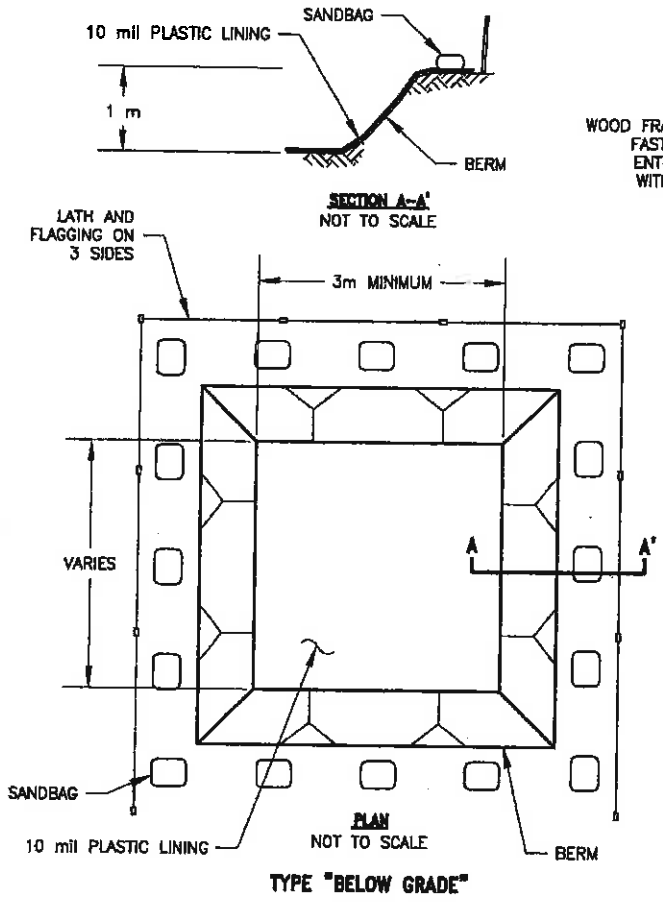
Inspection and Maintenance

- Inspect and verify that concrete washout BMPs are in place prior to the commencement of concrete work.
- During periods of concrete work, inspect daily to verify continued performance.
    - Check overall condition and performance.
    - Check remaining capacity (% full).
    - If using self-installed washout facilities, verify plastic liners are intact and sidewalls are not damaged.
    - If using prefabricated containers, check for leaks.
- Washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 12 inches.
- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- If the washout is nearing capacity, vacuum and dispose of the waste material in an approved manner.
    - Do not discharge liquid or slurry to waterways, storm drains or directly onto ground.
    - Do not use sanitary sewer without local approval.
    - Place a secure, non-collapsing, non-water collecting cover over the concrete washout facility prior to predicted wet weather to prevent accumulation and overflow of precipitation.
    - Remove and dispose of hardened concrete and return the structure to a functional condition. Concrete may be reused onsite or hauled away for disposal or recycling.
- When you remove materials from the self-installed concrete washout, build a new structure; or, if the previous structure is still intact, inspect for signs of weakening or damage, and make any necessary repairs. Re-line the structure with new plastic after each cleaning.

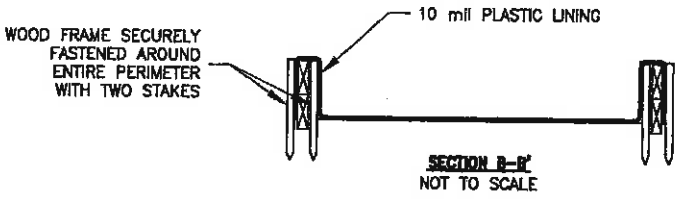
Removal of Temporary Concrete Washout Facilities

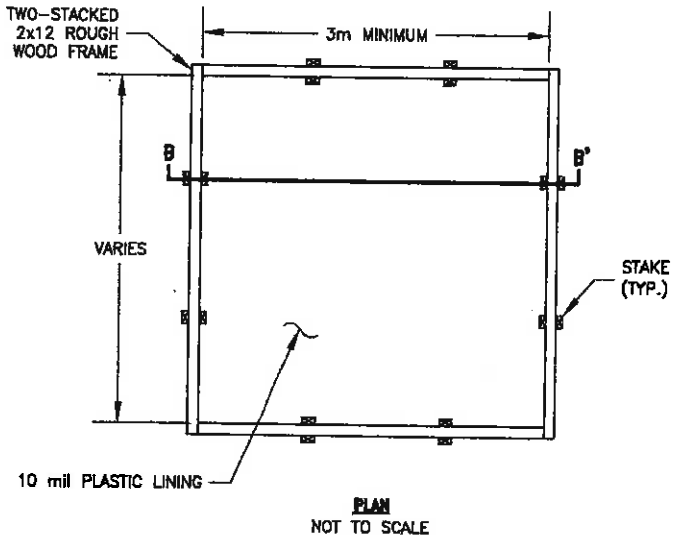
- When temporary concrete washout facilities are no longer required for the work, the hardened concrete, slurries and liquids shall be removed and properly disposed of.

- Materials used to construct temporary concrete washout facilities shall be removed from the site of the work and disposed of or recycled.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled, repaired, and stabilized to prevent erosion.



TYPE "BELOW GRADE"

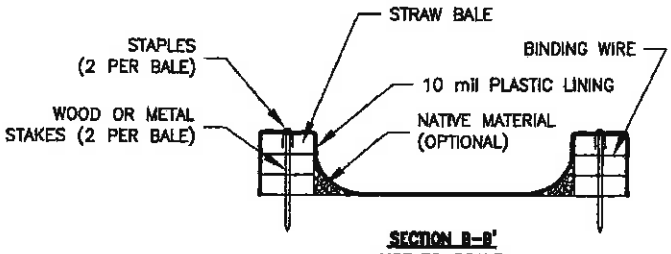




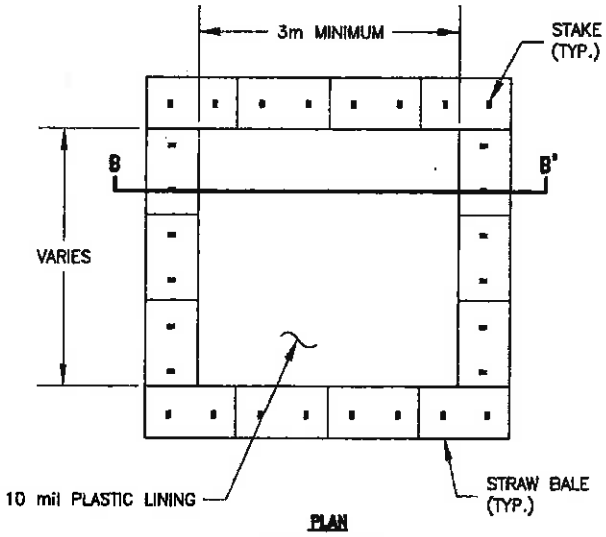
TYPE "ABOVE GRADE" WITH WOOD PLANKS

NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN (SEE PAGE 6) SHALL BE INSTALLED WITHIN 10 m OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

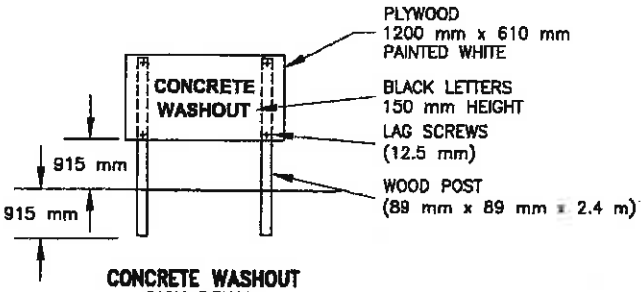


SECTION B–B'
NOT TO SCALE

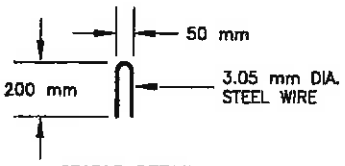


PLAN
NOT TO SCALE

TYPE "ABOVE GRADE" WITH STRAW BALES



CONCRETE WASHOUT SIGN DETAIL (OR EQUIVALENT)

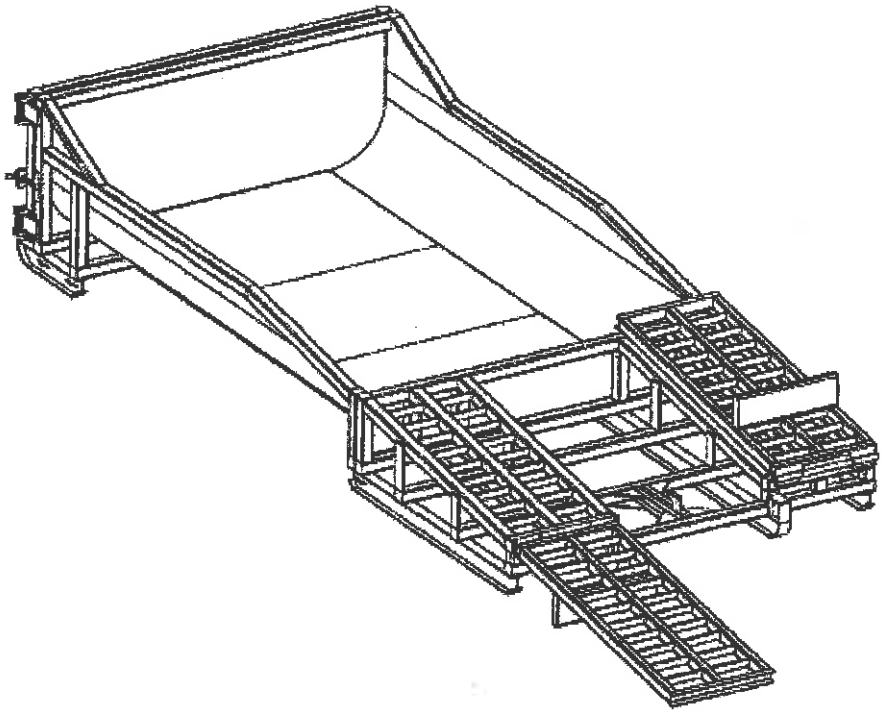


STAPLE DETAIL

NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN (SEE FIG. 4–15) SHALL BE INSTALLED WITHIN 10 m OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

CALTRANS/FIG4-14.DWG SAC 8-14-02

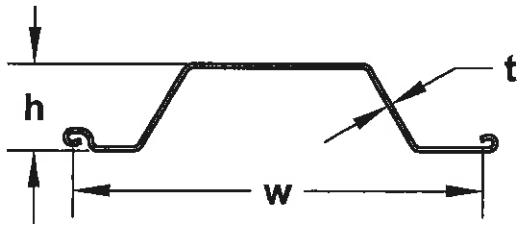


Prefabricated Concrete Washout Container w/Ramp

skylinesteel
a NUCOR company

SKL/SKS

SKL/SKS Cold Formed Steel Sheet Pile



SECTION	Width (w) in (mm)	Height (h) in (mm)	Thickness (t) in (mm)	Cross Sectional Area in²/ft (cm²/m)	WEIGHT		SECTION MODULUS		Moment of Inertia	COATING AREA	
					Pile lb/ft (kg/m)	Wall lb/ft² (kg/m²)	Elastic in³/ft (cm³/m)	Plastic in³/ft (cm³/m)	in⁴/ft (cm⁴/m)	Both Sides ft²/ft (m²/m)	Coating Area ft²/ft² (m²/m²)
SKL 9	21.65 550	3.54 90	0.157 4.0	2.53 53.50	15.52 23.10	8.60 42.00	2.55 137	3.28 176.43	4.50 615	4.23 1.29	1.17 1.17
SKL 10	21.65 550	3.54 90	0.177 4.5	2.83 59.90	17.40 25.90	9.63 47.00	2.88 155	3.67 197.23	5.09 695	4.23 1.29	1.17 1.17
SKL 12	21.65 550	3.54 90	0.217 5.5	3.43 72.60	21.10 31.40	11.67 57.00	3.53 190	4.42 237.66	6.22 850	4.23 1.29	1.17 1.17
SKS 11	27.56 700	5.91 150	0.197 5.0	3.29 69.60	25.69 38.23	11.26 55.00	6.34 341	7.54 405.36	18.67 2550	5.87 1.79	1.28 1.28
SKS 13	27.56 700	5.91 150	0.217 5.5	3.61 76.40	28.22 42.00	12.29 60.00	6.98 375	8.44 454.03	20.48 2810	5.87 1.79	1.28 1.28
SKS 14	27.56 700	5.91 150	0.250 6.4	4.17 88.20	32.58 48.49	14.19 69.27	8.05 433	9.48 509.87	23.78 3247	5.87 1.79	1.28 1.28
SKS 16	27.56 700	5.91 150	0.276 7.0	4.57 96.70	35.61 53.00	15.57 76.00	8.89 478	10.40 559.20	26.25 3585	5.87 1.79	1.28 1.28

Interlock Compatibility

	SKL 9	SKL 10	SKL 12	SKS 11	SKS 13	SKS 14	SKS 16
SKL 9	●	●	●	●	●	●	●
SKL 10	●	●	●	●	●	●	●
SKL 12	●	●	●	●	●	●	●
SKS 11	●	●	●	●	●	●	●
SKS 13	●	●	●	●	●	●	●
SKS 14	●	●	●	●	●	●	●
SKS 16	●	●	●	●	●	●	●

● Interlock compatible O Interlock not compatible

SKL/SKS

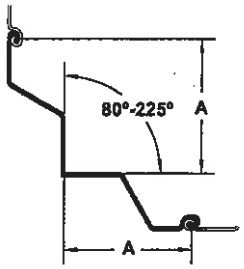
SKL/SKS Cold Formed Steel Sheet Pile

Available Steel Grades					
ASTM	YIELD STRENGTH		ASTM	YIELD STRENGTH	
	(ksi)	(MPa)		(ksi)	(MPa)
A 572 Grade 50	50	345	A 572 Grade 65 (Mod)**	80	555
A 572 Grade 55	55	380	A 588	50	345
A 572 Grade 60	60	415	A 690	50	345
A 572 Grade 65*	65	450			

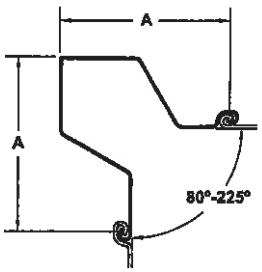
*Not available for thicknesses ≥ 0.375" (9.525mm). **Not available for thicknesses > 0.276" (7.0mm).

Corner Piles

D1 Corner Piles

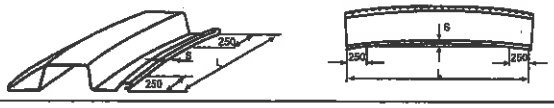
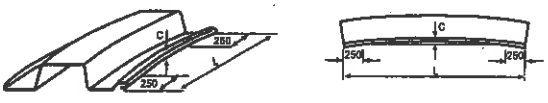
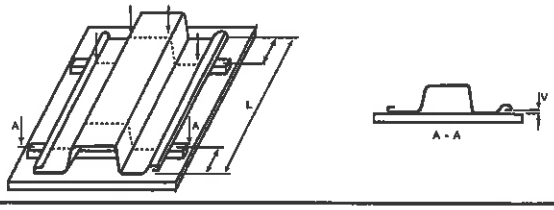


D3 Corner Piles



SKL 9-12: A = 10.8 inches (275.0 mm)
SKS 11-16: A = 13.8 inches (350.0 mm)

Delivery Conditions & Tolerances

	ASTM A6		EN 10249-2	
Mass	± 2.5%		± 7%	
Length	+5 inches	−0 inches	± 50 mm	
Straightness				
Bending (S)			0.25% of the length	
Curving (C)			0.25% of the length	
Twisting (V)			2% of the length	

Standard Rolled Lengths*

SKL, SKS	70 feet	(21.3 m)

* Longer lengths may be possible upon request.

RVL Architecture

Roger van Loveren, AIA, Architect • 6 Spruce Pond Lane, Bedford, NY 10506 • (914) 234-7823 • E-Mail: rvlarch@aol.com

May 13, 2016

Mr. Andrew Messinger, Chairman
Town of Bedford
Wetlands Control Commission
425 Cherry St. Bedford Hills, NY 10507

Re: Clare Reinbergen Property, 249 Mount Holly Road, Katonah, NY

Dear Mr Messinger,

We are submitting the following additional materials, revisions to the Wetlands Control Commission for the referenced property application:

A. Evidence of Septic System maintenance: Vogler Brothers 8/5/15 Cleaning and inspection
B. Evidence of suitable potable water at the residence: Carnell Environmental inspections, inc. Private Well test, 2-page statement paper submission, the full 20 page report submitted on disk
C. Geothermal Closed Loop Well System Proposal:
    a. NYS, West. County and Bedford have no regulations regarding specific closed loop geothermal systems
    b. Well Drillers follow State of Connecticut standards specifying distances to private Drinking Water Wells, Private on site Septic Systems. Distances are indicated on Site Plan SP-1
    c. The closed Loop Piping in the Well Pipe is encased in a solid energy transferring slurry
    d. The proposed closed loop fluid is: "Environol" for the "WaterFurnace" System. The Product info and msds sheets are included. The product is 75.6% water and 21.4% Ethanol
D. Private Swimming Pool Proposal:
    a. The Proposed 30'x12' Pool is designed to be primarily within a 4' raised box of planters, deck& patio. The proposed level of the box is one step down from the existing floor level
    b. The resulting excavation and construction below existing grade is only for the concrete retaining walls and a small deep end section equal to 22% of the Pool.
    c. The Pool Maintenance & Sanitation is proposed as follows:
        i. Automatic Pool Cover. Covering the Pool not only provides safety but also prevents accidental harm to wildlife. A cover further reduces the requirement for maintenance by 50-70%
        ii. Energy efficient variable speed pump & Cartridge filtration (no back wash)
        iii. "Ozone Plus UV" Pool sanitation as an alternate to Chlorine/Salt Generation system, coupled with a mineral dispenser providing a complete non chlorine based process.
        iv. Additionally for overflow from the pool cover box, (a rainwater pump on the cover prevents push down overflow) and season end 20% draw down underground storage and infiltration system has been designed and indicated on the revised SP-1 Site Plan
E. Drawing revisions and supplements:
    a. SP-1 has been revised:
        i. Additional notes regarding construction sequence, methods, Quantities Notes and Calculations
        ii. Pool water storage calculation and details
        iii. Addition of Concrete Truck Washout and Capture (detailed information on Disk)
        iv. SP-3 & Sp-4: Driveway reconstruction Details and drainage crossings
F. Alternate Pool location Study:
    a. A partial Site Plan drawing is submitted illustrating the placement of a full in ground Pool in the only are available outside the 100' Wetland delineation offset

Very truly yours,

Roger van Loveren, AIA

RvL/dm
Cc: CR, PJ

Carnell
ENVIRONMENTAL
INSPECTIONS, INC.

Private Well Water Test

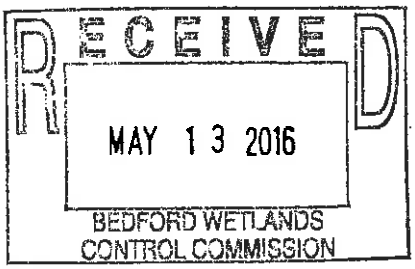
Carnell Environmental Inspections, Inc. was retained to conduct a water test for the purpose of meeting the Westchester County Private Well Testing Law (Chapter 707). More information on the regulation can be found at http://health.westchestergov.com/private-well-water.

For home sales, test results are valid for a period of one (1) year, except the bacteriological result, which is valid for a period of six (6) months from the date of sample collection. For home leases, test results are valid for a period of five (5) years from the date of sample collection.

Below find the summary of the results. Attached find a laboratory analytical report.

Project Description

Inspection Address	249 Mount Holly Road Katonah, NY 10536.
Section/Lot/Block	50.7/1/6.
Inspection Type	Initial.



Sample Collection

Date of Inspection	September 24, 2015.
Time of Sample Collection Visit	12:35 PM.
Inspector	Michael H. Fescoe.
Sample Location	kitchen.

Analytical Results

Analytical Laboratory	Envirotest (NYS ELAP Certification # 10142)
Analytical Report #	420-95546-4.
Primary Parameter Results	All analytical parameters meet primary contaminant standards for drinking water parameters tested. A primary parameter or primary contaminant is a drinking water contaminant or parameter related to the sanitary quality of water for which New York State Department of Health has specified a maximum contaminant level (MCL). Westchester County Private Well Testing regulation requires remediation where a water test discloses a primary water test failure.
Secondary Parameter Results	All analytical results meet secondary contaminant standards for drinking water for parameters tested. A secondary parameter or secondary contaminant is a drinking water contaminant related to the aesthetic water quality for which either the New York State Department of Health has specified a maximum contaminant level or there exists guidelines or an optimum range. The secondary parameters for the Westchester County Private Well testing regulation include the following; Chloride, Manganese, Iron, Sodium and pH. The Westchester County Private Well Testing regulation **DOES NOT** require remediation when a water test discloses a secondary water test failure.

Notification

DOH Notification It is YOUR responsibility to provide the buyer or tenant of the home these water test results.

It is YOUR responsibility to provide the buyer or tenant of the home these water test results.

SIGNATURE

Signed for Carnell Environmental Inspections, Inc.

Michael V. Carnicelli, Director
CARNELL ENVIRONMENTAL INSPECTIONS, INC.
914 946 4300 x 114.

Invoice

Vogler Brothers Inc.
39 North Street
Katonah, New York 10536

(914) 232-5535

Date	Invoice #
8/5/2015	80300

PAID 08/05/2015

Bill To
Claire Reinbergen 147 Cherry Street Katonah, NY 10536

Bills are due when received... A Finance charge of 1½% per month will be charged on all past due Accounts. We Now accept Visa, Discover, MasterCard and American Express.

PO No.	Terms
469-2691	Due on receipt

Item	Quantity	Description	Rate	Amount
Inspection		Cleaned and inspected 1000 gallon precast septic tank, water level at proper height, inlet and outlet baffles are in place, no sign of drain fields running back into the tank or over above ground. The system is in working order at the Bartell residence located at 249 Mt. Holly Road,Katonah, NY.	590.00	590.00T
		Sales Tax	7.375%	43.51

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Total	$633.51
Payments/Credits	-$633.51
Balance Due	$0.00

TOWN OF BEDFORD - WETLANDS CONTROL COMMISSION

Application for Permit

Identification of Owner(s):

Name(s) of owner(s) [as shown on Deed]: Michael & Nellie Gilligan

Mailing Address: 33 Bedford Center Rd., Bedford Hills, NY 10507

Phone: _____ (home) 212 756-2208 (work); Fax: _____ E-Mail: Michael.Gilligan@srz.com

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Identification of Applicant (if other than owner(s)):

Name of Applicant: Same

Mailing Address: _____

Phone: _____ (home) _____ (work); Fax: _____ E-Mail: _____

Professional Preparing Site Plan:

Name /Address: JD Barrett & Associates, LLC, Easton, CT 06612

Phone: (203) 372-5805 Fax: (203) 372-0499 E-Mail: Jen@JDBarrett.com

Identification of Property:

Bedford Tax Map Designation: Section 60.18 Block 2 Lot 14 Area 4.02 Acres

Zoning District: 4A **Project Address:** 33 Bedford Center Rd., Bedford Hills, NY 10507

Approximate year of construction of any structure: 1926

Prior Applications/Other Applications (write "N/A" if not applicable; Project Cost):

Dates of any prior Wetlands Control Commission permits: NA

Identify any other Town of Bedford approvals required: NA

Identify any other governmental approvals required: NA

Project cost (including professional fees): TBD

Project Description/Proposed Use (MUST BE DETAILED – Use Additional Pages if Needed):

Proposal is to restore an existing tennis court in disrepair in backyard. New drainage improvements + native plantings are proposed. Tennis court is located partially w/in 100' wetland buffer setback.

Proposed Project Start Date: TBD **Estimated Date of Completion:** TBD

The owner(s) hereby give(s) permission to the Town of Bedford, its agents, servants and employees, including, without limit, members of the Wetlands Control Commission and consultants to the Town to enter upon the Property solely for the purposes incidental to the within application (including without limit, inspection of the project after completion) at reasonable times upon reasonable notice to the owner or tenant in possession, which notice may be by telephone. If the applicant is different than the owner(s), the owner(s) hereby approves this application and consents to the applicant acting as agent for the owner in submitting this application and the applicant accepts its designation as agent for the owner(s).

I/we affirm by the signatures below that I/we are the rightful legal owner(s) of the property herein described in this application.

Signature of owner(s): _____ Date: 7/5/16
All owners must sign *Print name/title:* Michael Gilligan

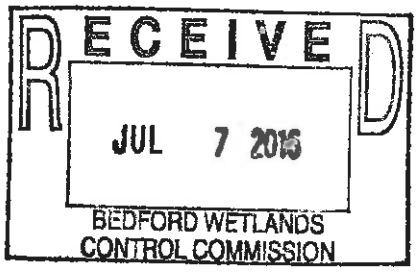
_____ Date: 7/5/16
Print name/title: Nellie Gilligan

Signature of applicant (if different): _____ Date: _____
Print name/title: _____

Revised 8/9/13

J.D. BARRETT & ASSOCIATES, LLC www.jdbarrett.com
Landscape Architects • Site Planners • Environmental Scientists

July 7, 2016



Mr. Andrew Messinger, Chairman
Bedford Wetland Control Commission (BWCC)
425 Cherry Street
Bedford Hills, NY 10507

Re: 33 Bedford Center Road
Sheet 60.18, Block 2, Lot 14

Dear Chairman Messinger & Members of the BWCC:

On behalf of our clients, Michael and Nellie Gilligan, we are providing information in support of a Wetland Permit Application to renovate an existing tennis court on the Gilligan property, portions of which occur in the regulated wetland buffer area. We enclose nine copies of the following information for your review and consideration.

- This explanatory **Cover Letter**, prepared by J.D. Barrett & Associates, LLC, dated July 7, 2016.
- A completed **Wetland Permit Application Form and Checklist**.
- A completed **Environmental Assessment Form (EAF),** prepared by J.D. Barrett & Associates, LLC.
- **Application Fee** ($200.00) and **Escrow Review Fee** ($500.00). Checks will be delivered separately to Town Hall by the property owner.
- **Deed to the Property**.
- **Wetland Delineation Report**, prepared by Stephen W. Coleman Environmental Consulting, LLC, dated July 6, 2016.
- A **Survey of the Property**, prepared by Link Land Surveyors, dated May 24, 2016.
- **Site Plans**, prepared by J.D. Barrett & Associates, LLC, dated July 6, 2016, including:
  - Sheet 1 of 3 – Site Information Plan
  - Sheet 2 of 3 – Proposed Site Plan
  - Sheet 3 of 3 – Erosion Control & Mitigation Planting Plan

Overview

The subject 4.02-acre property positioned on the west side of Bedford Center Road is developed with a single-family residence, driveway, septic system and well, swimming pool, tennis court and several patios and walkways. Ornamental landscaping, mowed lawn with mature trees, natural wooded areas and a wetland system surround the developed areas.

109 Sport Hill Road Easton, Connecticut 06612 **Phone 203•372•5805** Fax 203•372•0499 jeri@jdbarrett.com

An off-site wetland system extends into the property along its southern property line. A wetland investigation was performed in May 2016 by Stephen Coleman and his report is included in this application package.

The property owners wish to make improvements to their property by renovating the existing clay tennis court which has deteriorated over the years. It is proposed that a new asphalt surface tennis court and perimeter fencing be installed to replace the existing clay court and broken fence. A curtain drain will be installed to provide stormwater management. Plantings around the tennis court will be renovated and new native species will be planted as wetland buffer enhancement.

Proposed Site Plan

The subject tennis court is located in the southeastern corner of the property adjacent to an offsite wetland system that extends into the property along the southern property line. Approximately 5,700 SF of the 7,200 SF tennis court is located within the 100' buffer to the wetland and, therefore, a Wetland Permit from the BWCC is requested to undertake the renovations. The key features of the application are presented on Sheet 2 of 3 of the Site Plan drawings. The following main site plan features are keyed to the plan.

A. New asphalt tennis court to replace existing clay tennis court in disrepair. Asphalt surface to have 1% cross-pitch towards new drainage trench.
B. New tennis court fencing to replace existing fence in disrepair.
C. Proposed curtain drain, 2' x 2' x 185 LF to capture first flush stormwater runoff from tennis court. See drainage calculations and details on the plan.
D. Level spreader discharge at terminus of PVC drainage pipe to dissipate flows.
E. Native wetland buffer enhancement plantings proposed to provide added plant diversity, value and function to buffer.
F. Renovated slope planting to include removal and replacement of damaged vegetation.
G. New timber/grass steps, 8" x 6" x 8' pressure treated timbers anchored with rebar to navigate slope.
H. Renovated stone patio. Replace or reset stones, as needed.
I. Construction access point from Bedford Center Road.
J. Traffic safety cones at 50' on center at Bedford Center Road to alert drivers of construction vehicles entering/exiting property.
K. Norway spruce trees at edge of tennis court in poor condition to be removed to allow construction access.
L. Replacement plantings proposed to naturalize former construction access.
M. Work limit line measures approximately 24,000 SF.

Stormwater Management

The proposed new tennis court shall be cross-pitched south to north at 1% and runoff from the new tennis court will be captured in a proposed gravel trench drain system spanning the length of the court. The proposed south to north pitch will redirect stormwater away from the wetland to filter and detain stormwater for slow release back to the wetland. The gravel trench was sized to

capture the "first flush", or one-half inch of rainfall from the new asphalt surface. Drainage calculations are shown on Sheet 2 which indicates that 2,160 gallons of stormwater runoff requires management from a 7,200 SF tennis court.

The proposed drainage trench shall contain a 6-inch perforated pipe and ¾" trap rock, surrounded by filter fabric. The 2' x 2' x 185 LF trench will accommodate 2,220 gallons of stormwater storage and provide filtration for any sediment laden flows. Water transported via the PVC pipe will daylight at a level spreader before entering the wetland.

Mitigation Planting Plan

In addition to stormwater management, new plantings are proposed around the tennis court and within the wetland buffer to renovate an existing planted slope and enhance the function of the wetland buffer. Native trees, shrubs and groundcovers are proposed to supplement the existing vegetation closest to the wetland and adjacent to the tennis court to increase species diversity and provide additional wildlife habitat opportunities. The proposed native plantings will provide a superior buffer and protection to the off-site wetland, thereby providing a higher quality and better functioning wetland system.

Summary

We trust that this information is helpful to the BWCC's review of the project and we look forward to discussing the project at the August 2016 BWCC meeting.

Thank you for your consideration.

Sincerely,

Jeri D. Barrett, R.L.A.
JDB:lj

Enc.
cc: Mr. & Mrs. Gilligan

Section A

Each Applicant must complete all items listed in Section A.
Place a checkmark next to each completed item.
Return this checklist with your application.

I. Fees and Escrow Deposits:

In this category place a checkmark next to the items appropriate to your application.

✓ Please include two (2) separate checks or money orders made payable to "Town of Bedford" for

Escrow Fee:

✓ $500 as escrow deposit for Wetlands Permit Application

OR

____ $1,000 as escrow deposit for Remediation of Wetlands Law Violation Application

A $200 minimum balance is required in the "Escrow Fee Account" for:

a) The application to be considered on any future agenda

b) A compliance inspection of the project to be scheduled

Application Fee (computed as follows):

✓ $200 for a project involving a single lot

OR

____ $200 for a project involving more than one lot

PLUS Either $25 for each additional lot

Or $50 per acre of affected wetlands – Whichever is higher

Example: A 3-lot subdivision with 5 acres of affected wetlands requires payments totaling $750, based on:

$500 – Escrow Fee

$450 – Application Fee: $200 = Project involving more than one lot

$250 = 5 acres of affected wetlands X $50 per acre of affected wetlands

$950 – Total of Fees Required

II. Application Form

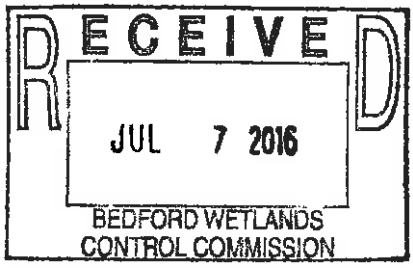
✓ Nine (9) sets each of a completed application form with all current owner(s) signature(s). The name of the owner(s) on the application should be the same as the name(s) on the deed.

III. Environmental Assessment Form

✓ Nine (9) sets of the Environmental Assessment form with all current owner(s) signatures(s) with – only side 1 is to be completed.

IV. Deed

✓ One copy of the most recent deed(s).



V. Survey of Property

✓ Nine (9) sets of survey of property.

Section B

Each applicant need only complete the category that is applicable to the site conditions of the property.
Choose the appropriate category(ies)
Place a check mark next to each completed item
Submit checklist with your application

I. Applications Affecting Water Retention Capacity, Water Flow or Drainage

Application affecting the water retention capacity, water flow or other drainage characteristics of any pond, lake, reservoir, natural drainage system or wetland shall include:

_____ A statement prepared by a professional engineer licensed in the State of New York of the impact of the project on upstream and downstream areas. This statement should give appropriate consideration to flood or drought levels of watercourses and amounts of rainfall.

II. Fence Permits Within Wetlands or Within the 100 Foot Wetlands Buffer

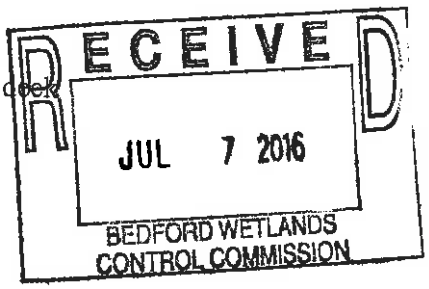
Fence permit applications must be accompanied by:

_____ Nine (9) sets of site plans OR Nine sketches clearly showing:
- _____ the location and height of the proposed fence
- _____ a statement of the type of material(s) to be used to construct the fence
- _____ a design that allows the passage of small wildlife through the bottom of the fence to maintain corridors for upland and wetland habitat
- _____ an erosion control plan

III. Deck Permit Within Wetlands or Within the 100 Foot Wetlands Buffer

Deck permit applications must be accompanied by:

_____ Nine (9) sets of site plans OR Nine (9) sketches clearly showing:
- _____ the proposed location of the deck
- _____ a statement of the type of material(s) used to construct the deck
- _____ the construction detail
- _____ deck and elevation detail
- _____ an erosion control plan



IV. Other Permits (if applicable)

It should be noted that in addition to a wetlands permit, all applications may be subject to other applicable town, county, state, or federal permits.

Reimbursement for Town's Professional Consultants:

Your application will be referred to the Commission's consultant(s) and you will be required to reimburse the Town for the cost of such consultant services. The escrow mentioned above is an *estimate* of the amount needed to cover the cost for the Town's professional consulting service to review and comment on your application. The actual cost may vary. Additional payments may be required. In addition, any escrow balance cannot be refunded until all sign-offs have been issued, including sign-offs which may be required one or two years after the project is completed.

Please remember that an incomplete application package will result in delay. Your cooperation is appreciated.

VI. Plans

✓ Plan which contains all of the following:
- ____ site plans
- ____ architectural plans
- ____ landscape architectural plans
- ____ wetlands plans (plans showing wetland delineation in conjunction with wetlands investigation/report do not have to conform to the stated scale.)
- ____ mitigation plan
- ____ planting plan

OR

✓ combined site plans that include wetlands, wetlands mitigation, or planting plan of the proposed work

✓ Unless otherwise specified, all plans shall be drawn to a scale of not less than one (1) inch equals thirty (30) feet.

✓ The plans shall be dated (with the last revision dates) and certified by an engineer, architect, land surveyor or landscape architect licensed in the State of New York.

✓ Plans should be individually folded so as to fit into an 8 ½ X 14 legal size folder with the property owner(s) and tax map reference written to appear on the top of the folded plan.

✓ The preparer of such plans shall comply with the attached Guidelines for Wetlands Studies and Reports as adopted by the Commission at its BWCC meeting of 5/7/01.

Plans must show the following:

✓ The location of all wetlands as determined by a qualified ecologist, botanist and/or soil scientist.

✓ The survey location of the wetlands needs to have been performed no earlier than twelve (12) months prior to the date of filing the application.
***Please note that on all new applications, the wetlands located surveys must be updated if the survey was performed earlier than twelve (12) months prior to the filing of the application.*

✓ All property lines, buildings, roads and watercourses within two hundred fifty (250) feet of any proposed construction of disturbance.

____ Watershed and destination of water courses.

____ Estimated quantities of material of excavation or fill.

✓ Location of access route for construction.

✓ Identification of whether the work is to be done by hand or machine.

____ Cost estimate of the work (including all materials, plantings and professional services)

____ Location of any well and depth thereof and any sewage or wastewater disposal system within one hundred (100) feet of disturbed area.

____ Written proof that septic systems within regulated/controlled wetlands within the Town of Bedford have been properly maintained within the four (4) year time period prior to application.

✓ Existing and proposed contours at two-foot intervals in the proposed disturbed area and to a distance of one hundred (100) feet beyond.

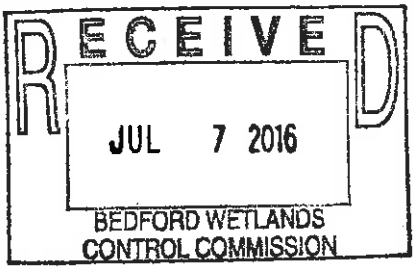
✓ Details of any drainage system proposed, both for the conduct of the work and after completion thereof, and measures proposed to control erosion and siltation during and after work (erosion control).

____ Where creation of a lake, pond or alteration of a watercourse or wetland is proposed, details of topography and proposed new grading, and the construction of any dams, embankments and outlets or other water control devices.

✓ A property location map.

____ Prior wetland permit and resolution number if applicable.

✓ Date



Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

Part 1 - Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 - Project and Sponsor Information

Name of Action or Project:
Gilligan Property

Project Location (describe, and attach a location map):
33 Bedford Center Rd., Bedford Hills, NY 10507

Brief Description of Proposed Action:
Proposal is to restore an existing tennis court in disrepair in owner's backyard. New drainage improvements + native plantings are proposed. The tennis court is located partially within the 100' wetland buffer setback.

Name of Applicant or Sponsor:	Telephone: 212 756-2208
Michael Gilligan	E-Mail: Michael.Gilligan@srz.com
Address: 33 Bedford Center Rd.	
City/PO: Bedford Hills	State: NY / Zip Code: 10507

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☑	☐
2. Does the proposed action require a permit, approval or funding from any other governmental Agency? If Yes, list agency(s) name and permit or approval: Wetland Permit - BWCC	☐	☑

3.a. Total acreage of the site of the proposed action? 4.0213 acres
b. Total acreage to be physically disturbed? +/- .5 acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 4.0213 acres

4. Check all land uses that occur on, adjoining and near the proposed action.
☐ Urban ☐ Rural (non-agriculture) ☐ Industrial ☐ Commercial ☑ Residential (suburban)
☐ Forest ☐ Agriculture ☐ Aquatic ☐ Other (specify): _____
☐ Parkland

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	NO	YES	N/A
5. Is the proposed action,			
a. A permitted use under the zoning regulations?	☐	☑	☐
b. Consistent with the adopted comprehensive plan?	☐	☑	☐
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑	
7. Is the site of the proposed action located in, or does it adjoin a State Listed Critical Environmental Area? If Yes, identify:	☑	☐	
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐	
b. Are public transportation service(s) available at or near the site of the proposed action?	☑	☐	
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☑	☐	
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies: N/A	☐	☐	
10. Will the proposed action connect to an existing public/private water supply? N/A	☐	☐	
If No, describe method for providing potable water:			
11. Will the proposed action connect to existing wastewater utilities? N/A	☐	☐	
If No, describe method for providing wastewater treatment:			
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☑	☐	
b. Is the proposed action located in an archeological sensitive area?	☑	☐	
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑	
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody? If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres: * Approx work area within wetland buffer is 15,000 sf	☐	☑*	
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☑	☐	
16. Is the project site located in the 100 year flood plain?	☑	☐	
17. Will the proposed action create storm water discharge, either from point or non-point sources? If Yes,			
a. Will storm water discharges flow to adjacent properties? ☑NO ☐YES	☐	☑	
b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: Proposed on site curtain drain & level spreader ☐NO ☑YES			

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:
☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☐ Early mid-successional
☑ Wetland ☐ Urban ☑ Suburban

	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size: _____	☑	☐
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe: _____	☑	☐
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe: _____	☑	☐

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: _____ Date: 7/5/16

Signature: Michael Gillon

Michael Gillon

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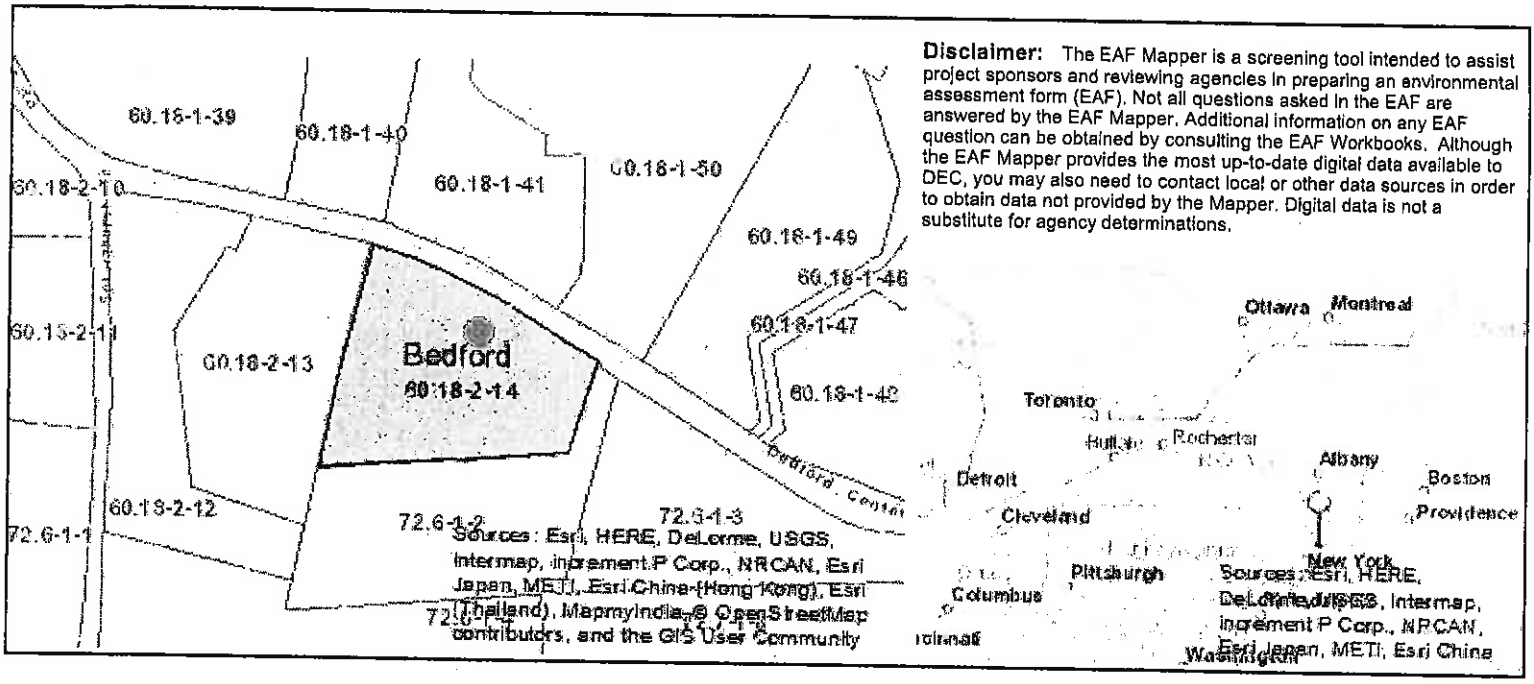
CONTROL COMMISSION

PRINT FORM

EAF Mapper Summary Report

Friday, June 10, 2016 2:31 PM



Part 1 / Question 7 [Critical Environmental Area]	No
Part 1 / Question 12a [National Register of Historic Places]	No
Part 1 / Question 12b [Archeological Sites]	No
Part 1 / Question 13a [Wetlands or Other Regulated Waterbodies]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
Part 1 / Question 15 [Threatened or Endangered Animal]	No
Part 1 / Question 16 [100 Year Flood Plain]	No
Part 1 / Question 20 [Remediation Site]	No

STEPHEN W. COLEMAN
ENVIRONMENTAL CONSULTING, LLC

Environmental Planning & Site Analysis
Wetland Mitigation & Restoration Plans
Wetland Delineation & Assessment
Natural Resource Management
Pond & Lake Management
Wildlife & Plant Surveys
Breeding Bird Surveys
Landscape Design

July 6, 2016

Mr. Michael Gilligan
33 Bedford Center Road
Bedford, New York 10506

Re: Wetlands Delineation

Dear Mr. Gilligan:

This report is submitted in support of a Wetlands Permit application for your residence located at 33 Bedford Center Road, Town of Bedford.

Wetland Delineation

I completed on 05-10-2016, a wetland/watercourse investigation of the subject property located at 33 Bedford Center Road, Town of Bedford, New York. The environmental review included investigation and determination of selected wetland and watercourse resources present on the property. The respective wetland/watercourse features were flagged in accordance with Chapter 122 "Wetlands" of the Code of the Town of Bedford. As noted in the Town's Code, vegetation, soils and hydrological parameters were used to determine the outer wetland boundary limits. Pink surveyor flagging labeled "Wetland Boundary" were hung on the respective boundaries of each wetland/watercourse area.

Vegetation was sampled along each of the wetland areas. Dominant vegetation was noted at each point, and hydrophytic (wetland) vegetation was considered to be present when 50 % or more of the vegetation throughout the strata of each plant community was classified as either facultative, facultative wet, or obligate. Hydrophytic vegetation was also positively identified based on the presence of secondary characteristics including morphological adaptations for occurrence in wetlands.

Soils were then sampled where facultative or facultative wet vegetation was dominant. Soils samples were taken with a dutch auger to a depth of 16 inches of the soil profile where possible. Hydric soil indicators noted include: presence of a seasonal high water table, inundation, presence of hydrogen sulfide odor, soil chroma of 1 (without mottles) or 2 (with mottles) as per the Munsell Soil Color Chart, gleying, iron and manganese concretions, and oxidized rhizospheres. Hydric soils were determined to be present when any one of these indicators was observed.

Each area along the wetland/upland interface was also examined to determine if wetland hydrology was present at some time during the growing season. Indicators of

wetland hydrology noted within the wetland areas included soil saturation within the test hole or at the soil surface, inundation, positive drainage patterns, and watermarks on the tree trunks or water-stained leaves on the ground.

When an observation point along the wetland/upland interface contained all three wetland parameters: dominant hydrophytic vegetation, hydric soils, and evidence of hydrology, the point was determined to be wetland. The area surrounding the observation point was then investigated to determine the upland boundary via the same methodology. The delineation was then confirmed by placing sequentially numbered flags at the edge of the wetland and upland boundary. Areas identified as watercourses may not meet all three parameters. Please refer to the field sketch which shows the approximate wetland boundary. The respective wetland boundary will require confirmation from the Town's Wetlands Consultant.

Existing Conditions

The wetlands located on the property consist of one wetland area located generally along the southern property line. The wetland runs parallel to Bedford Center Road and extends onto the property as an extension of a much larger wetland located on the adjacent property to the south. Based upon review of available map resources, it is possible that the wetland that extends onto the subject parcel is the outer limits of a NYSDEC wetland # K-2.

The wetland consists of a forested wetland that runs along the southern property line parallel to the existing tennis court. The wetland extends further into the property past the tennis court and includes a hillside seepage area that is dominated by emergent herbaceous wetland plants. The wetland continues to the property line and then continues on the adjoining property to the south. The wetland appears to drain in a north to southern direction and receives surface and subsurface water from the adjacent lawn areas. An existing clay tennis court is located within the buffer to the wetland. The rest of the buffer area consists of remnant trees with significant area converted to lawn, ornamental ground covers, and plantings.

The wetland was marked with sequential flags A-01-A-10 and B-01-B-07. Flag numbers B-07 merges with flag # A-10. An existing fence separates the wetland into two areas, but is one continuous line. As noted, a review of NYSDEC Freshwater Wetlands Maps, may include this area as part of NYSDEC wetland "K-2". This will require confirmation from NYSDEC field personnel. Please refer to field sketch of approximate wetland boundary.

In general, the wetland plant community is typical of a remnant red maple dominated forested wetland. Dominant tree species within the wetland consisted of red maple and American elm with several upland trees represented. The sapling/shrub layer is dominated by saplings of dominant trees, and dominant shrubs consisting of spicebush, winterberry, with minor representation from arrowood viburnum and silky dogwood. Tussock sedge, skunk cabbage and sensitive fern dominate the herbaceous layer. The

wetland and watercourse areas are interspersed with small pockets of upland areas that are dominated by black birch and red oak. A small amount of invasive plant species (approximately 25%) were observed within the wetland and buffer areas, including Japanese barberry, multi-flora rose, pachysandra, and Japanese stilt grass. The wetland/upland boundary is very distinct due to the steeper slopes which occur adjacent to the property line.

Hydric or wetland soils are readily apparent and quite uniformly distributed within the wetland sections. The soils exhibited permanent signs of inundation or saturated soils near or at the surface. A solid dark organic layer 6-8 inches in depth was evident within the A horizon of the soil with clear indication of mottling and low chroma colors within the B soil horizon. Primary and secondary hydrological characteristics are readily apparent throughout the wetland. The presence of standing water, water stained leaves, high water marks, and buttressed tree roots were some of the features noted.

This completes my initial investigation of the wetland resources present on the property. Please notify me if you have questions or require additional information.

Sincerely,

Stephen W. Coleman

Stephen W. Coleman
SWC/tbh
cc: J. Barrett, RLA