

**Natural Resource Compensatory Restoration  
Plan for the Design, Permitting and Construction  
Howe Farm Habitat Restoration**

**1.0 INTRODUCTION**

In partial satisfaction of the Natural Resource Damages Claims for alleged injury to aquatic resources associated with the Pine Street Canal Superfund Site, the Performing Defendants will conduct a habitat improvement project in accordance with the Natural Resource Compensatory Restoration Plan (NRCRP) and the Consent Decree. The Natural Resource Trustees (Trustees) responsible to oversee the project for the Pine Street Canal Superfund Site are the U. S. Fish and Wildlife Service, and the State of Vermont. The attached site plan (Figure 1) shows the area of proposed conservation improvements to the former Howe Farm property that would provide approximately 26 acres of habitat improvement.

These improvements would require approximately eight acres of property owned by Theresa Tomasi and 18 acres owned by the State of Vermont (State). The Performing Defendants will regrade three acres of the Tomasi land and three acres of State land to increase emergent wetland area for the Waterfowl Improvement Area pond. (See Figure 2) An additional five acres of Tomasi property will be needed to provide a 100-foot buffer around the reconfigured pond margin. The 26 acres of habitat improvement are achieved as follows:

Improved pond margin habitat	6 acres
Tomasi property	3 acres
State	3 acres
100-foot buffer zone - Tomasi property	5 acres
Improved open water habitat - State	15 acres
TOTAL	26 acres

The northern two-thirds of the existing Waterfowl Improvement Area pond does not provide optimal quality habitat for wetland dependent species because the pond's sides are too steep for the development of a pond shoreline that is a gradual transition from dry conditions to open water. The proposed enhancements will provide a gradual slope into the pond so that a variety of plant communities develop. (See Figure 3) The outer edge would have woody wetland vegetation in the relatively dry zone such as red osier dogwood, alders, or silver maple.

In areas that have standing water for most of the year, emergent vegetation such as cattails would grow. In shallow water areas that are wet all the time, aquatic plants with floating leaves, such as water lilies, would be the next zone, and then the deeper area

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of the pond would support aquatic plants that are fully submerged.

These plant communities would provide the food and cover for a greater variety of animals than can be provided by the steep sided pond that exists now. For example, presently there is poor cover for water fowl, fur bearing mammals, fish, reptile and amphibians along the northeaster margin of the pond because the nearshore terrain is too steep to promote development of a diverse aquatic plant community that is the basis for the habitat of these animal groups.

To establish high quality habitat, emergent wetland will be created by excavating areas that are now dry most of the year and using the material to reduce the side slope of the pond and create an irregular shoreline. A 100-foot buffer will be established around the excavated area in which the vegetation will be allowed to develop naturally for the most part. Some woody wetland plants may be planted to accelerate the development of the woody zone. Wetland plants that already exist on the site will provide seed stock for the newly created emergent wetland areas.

The property owner who will grant the conservation easement has requested that farm road access to the northern end of her property be replaced after the construction along the pond margin has been completed. The reconfiguration of the pond margin will destroy the existing access road. A replacement farm road will be part of the settlement between the land owner and the Performing Defendants.

## **2.0 Work Plan**

A Work Plan and Schedule will be prepared immediately following the lodging of the Consent Decree. It will be submitted to the Trustees and EPA for review and approval by the Trustees within 30 days of the lodging of the Consent Decree.

## **3.0 DESIGN**

### **3.1 PRELIMINARY INFORMATION GATHERING AND RESEARCH**

#### **3.1.1 Surveying/Property Line Research**

An eight acre conservation easement must be established and agreed to by the current property owner. It is possible that the easement can be established and described from the common property line with the State property. Field evidence such as survey pins set by the State must be located, if extant. Survey information must be collected based on the field evidence and that information must agree with that recorded in the State warranty deed.

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Otherwise a complete boundary survey of the Howe Farm parcel will be needed. Additional topographic surveying will be needed along the alignment selected for the proposed access road to northern end of the property and existing topography will need to be expanded to provide better coverage in the active work area. A survey is being arranged.

**3.1.2 Permits/Approvals and Possible Jurisdictional issues**

Previously identified permits that will be needed include:

- Army Corps of Engineers Individual Permit
- State Wetlands Conditional Use Determination
- Act 250 Permit Amendment

Local issues that may exist with regard to zoning, floodplain and conformance with City Plans need to be determined. The site is currently in the zoning district "RCO - Recreation, Conservation, Open Space" and as such the proposed project could be approved under the Zoning bylaws, if approval is necessary. This is also believed to be true of conformance with the City Plan. Therefore, no serious issues are expected with local approval for the project.

The site lies within the 100 year floodway and proposed activities cannot fill or obstruct the floodway in any way that will increase flood hazard. The conceptual design is based on a balance of cut (excavation) and fill and therefore the net impact on flood storage capacity would be zero. The proposed project will not obstruct the flood carrying capacity of the site.

The Vermont Agency of Natural Resources is acting as Natural Resource Trustee for the State of Vermont, so it, along with the U.S. F.W.S., will approve the design and construction of the project. Because the State is owner of a portion of the project area, its consent and cooperation will be required for the plan to be implemented. The Water Quality Division has indicated that a Conditional Use Determination will be required. Issues that might otherwise be addressed by a Stream Alteration Permit or Shoreland Encroachment Permit are expected to be included in the Conditional Use Determination. Other state agencies, such as Department of Fish and Wildlife and Division for Historic Preservation, will need to be contacted as part of the Act 250 process.

**3.1.3 Soils Investigation**

The on-site soils to be excavated and used to flatten the slopes of the pond must be evaluated. Test pits will be needed to examine the existing soil and to collect samples for laboratory analyses, such as grain size distribution. The test pits will be logged by a geologist or

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engineer and the depth to seasonal high groundwater estimated and qualitative assessment of potential groundwater recharge rate performed based on soil morphology. The test pits will be located and shown on the site plan.

### **3.2 SURVEY AND DEFINE EASEMENT**

A conservation easement for the work and 100 foot buffer zone will be established based on the common property line with the State property and the Vermont Coordinate System. A Vermont licensed land surveyor will prepare an easement suitable for recording in the land records. Prior to any construction activity, the easement will be staked and monuments placed as appropriate to delineate the easement.

### **3.3 PRELIMINARY DESIGN**

A preliminary design will be prepared for use in discussions with regulators. The preliminary design will include: design drawings - grading plans, cross-sections, details, erosion control, plantings / site restoration; access road alignment and cross-section; specifications - materials, workmanship, site control, project meetings, performance standards, and a construction narrative.

The preliminary design will be presented to the Trustees and state and federal regulators for review and approval. After incorporating their comments, a meeting or meetings will be arranged to identify regulatory concerns with the preliminary design. Much of the same information will be needed to apply to the federal and state permit programs so that information will be developed in a standard format for efficiency and continuity.

### **3.4 DRAFT FINAL DESIGN**

Following receipt of comments from the Trustees and federal and state regulators, the preliminary design will be revised. The draft final design will address issues raised and incorporate revisions as appropriate. The draft final design shall be subject to approval by the Trustees.

## **4.0 PERMITTING**

### **4.1 FILE PERMIT APPLICATIONS**

Once the draft final design is complete, the required permit applications will be prepared and submitted. The completed applications, along with the required fees, will be submitted to the regulatory agencies involved. These applications include Army Corps of Engineers

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Individual Permit, Vermont Wetlands Conditional Use Application, and Act 250 Land Use Permit Amendment. The City of Burlington will receive copies of the draft final design so that it can provide comment on consistency with local planning and zoning for the Act 250 permit amendment.

**4.2 FINAL DESIGN**

Conditions in one or more permit may require revisions to the draft final design. These revisions will be made and additional specifications developed as required. The revised information will be circulated to the Trustees, Performing Defendants, owner, and regulatory agencies for review and approval.

**4.3 RECEIPT OF PERMITS**

The project engineer will attend hearings and respond to comments from regulators and the public. These responses may require work by scientists or other engineers. Following closure of public comment periods on draft permits, permits will be issued. Once all of the required permits have been issued, the work plan and design will be finalized.

**5.0 CONSTRUCTION**

**5.1 PREPARE CONSTRUCTION DOCUMENTS**

Following receipt of permits, construction documents will be prepared in accordance with the schedule and the final project Work Plan. The construction documents will consist of final plans, specifications, copies of permits and the construction contract. Bonding and insurance requirements for the project will also be set forth in the construction documents

**5.2 CONSTRUCTION SUBCONTRACTOR SELECTION**

The construction subcontractors will be selected by a method developed by the Performing Defendants and consistent with the Consent Decree.

**5.3 CONSTRUCTION**

Once all permits have been obtained and a contract for the work negotiated, construction will commence in accordance with the schedule in the Final Project Work Plan. A conceptual sequence and description of the work will follow.

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**5.3.1 Clearing**

The approved plans will depict clearing limits, those areas of active construction where the vegetation must be cut. The contractor will establish the clearing limits for review and approval by the engineer and the property owner. A tractor and brushhog and chainsaws will be used to cut vegetation at or above the ground surface. The woody growth will be removed and disposed of off-site or if the volume warrants it, chipped on-site. Other vegetation will be left to lie on the ground surface.

**5.3.2 Construction Control and Layout**

Survey control will be provided to the contractor by the engineer. In addition to providing coordinate values and elevations for various control points, the easement will be temporarily staked in the field. The contractor will be required to erect a warning barrier along the easement to prevent equipment movement outside of it. The engineer will provide a "layout" drawing following consultation with the contractor regarding the format of the information. The contractor will be responsible for staking out the work as needed to construct the project in accord with the approved plans. The contractor will also have to establish "offsets" to allow staking of the work as construction progresses. Areas of excavation will be staked and elevation control points established as will areas of proposed filling.

The contractor will be required to provide temporary sanitary facilities for workers and to designate a location for equipment fueling approved by the engineer. It is anticipated that the contractor will have fuel provided, as needed, from tank trucks, eliminating the need for on-site fuel storage. Should the contractor desire to store fuel, a containment berm will be required around the tank and absorbent materials provided.

**5.3.3 Site Preparation**

The contractor will strip and stockpile for future use the topsoil from the borrow areas and in areas of fill above the water line at the Howe Farm property. The contractor will be required to install and maintain temporary erosion control and siltation migration measures. The erosion control plan will have been prepared for the Act 250 Permit Amendment. Stockpile locations will be designated on the plans. The stockpile locations will be outside of the active work area but within the easement. Silt fence and/or hay bales will be installed by the contractor to prevent sediment transport from the stockpiles from precipitation.

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**5.3.4 Earth Borrow**

The areas of excavation and proposed grades/elevations will be staked. The soil will be excavated to the proposed grade lines and stockpiled temporarily in the areas to be filled. Floating silt curtains extending near or to the bottom of the existing pond, will be set-up around the peripheries of the areas to be filled to contain sediments from the remainder of the surface water. As much soil as possible will be excavated keeping the existing access road in place to facilitate movement of materials and to prevent surface water entry into the excavation. A groundwater extraction well, consisting of a temporary crushed stone sump and perforated culvert riser, will be constructed at a low point in the excavation. The well will be extended downward as excavation proceeds. Using the well as the extraction point, groundwater seeping into the excavation will be managed by pumping to a siltation basin. A siltation basin, typically a ring of silt fence and hay bales, will be constructed out of the active construction area and within the easement. Once the rough grade of the excavated areas are achieved, topsoil will be applied to those areas that will be above average water level.

**5.3.5 Placement of Fill**

Working from the north towards the south the fill will be placed into the water to create a varied water's edge and to flatten submerged slopes. The fill will be placed in a fashion that allows equipment to reach the fill extremities without operating (with the exception of buckets, booms, etc.) in the water. Fill will be placed to the outer edge of the slope as proposed on the plans, initially with a steep slope. The equipment will then work back towards land cutting the slope back to the desired grade and placing the material on each side. The last step in each area will be to remove the existing access road and placing the soil in the adjacent fill area. Following the establishment of rough grades, the stockpiled topsoil will be spread in areas above the average water elevation.

**5.3.6 Site Restoration**

Once the ground surface and planned static water level in the excavated/filled areas have been established in the design process, the wetland restoration plans will be developed. It is expected to include a seeding effort with a wetland seed bank mix and a planting plan for woody vegetation. This plan will have been approved during the permit process. A wetland seed bank mix such as the Northeast Diversity Mix, available from Southern Tier Consulting, Inc., West Clarksville, NY, will be specified. This mix will provide wetland herbaceous cover for the newly disturbed topsoil and will stabilize the margin. This seed mix contains 40 species, predominantly rushes and sedges, but includes grasses and dicots. The soil will be thinly

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mulched during the germination period to achieve damp soil but no continued inundation. Complete vegetation cover on the restored areas should be achieved within one year although a stable vegetation pattern will take a few years. The introduction of a large variety of wetland seeds provides for stable community development through natural selection. Those species best suited to site conditions will develop into a stable community. Plantings of woody vegetation will be done according to the approved planting plan. The undisturbed wetland vegetation at the site will provide seeds to the area which will also contribute to the restoration of the pond margin.

**5.4 CONSTRUCTION OVERSIGHT AND CONTRACT ADMINISTRATION**

The engineer will provide oversight of the work and administration of the construction contract. The engineer will coordinate a pre-construction meeting as well as progress meetings. In attendance will be the contractor, engineer, and representatives for the Performing Defendants, property owner, and Trustees. The engineer will be on-site as needed to assure the work is performed in accordance with the project plans and specifications. The frequency and duration of on-site inspections will be a function of the type and amount of work being performed. Inspection reports will be prepared documenting all on-site inspections by the engineer.

The engineer will perform contract administration. This will consist of reviewing and approving pay requests, negotiating change orders, approving materials, and assuring that all permit conditions are met. The engineer will perform a final inspection of the work and review and approve the final pay request.

**5.5 AS-BUILT CONSTRUCTION**

An as-built survey will be prepared to demonstrate that the project was constructed in accordance with the approved plans. The engineer will prepare as-built drawings and provide copies to the Trustees, Performing Defendants, owner, and other parties as required. If unanticipated conditions changed the configuration of the construction, the easement will be revised and re-recorded.

**6.0 POST CONSTRUCTION**

**6.1 WARRANTY PERIOD AND CONTRACT CLOSE-OUT.**

Construction contracts typically contain a one year warranty clause from the time of final completion. The project engineer will perform inspections as needed and prepare a "punch list" of any deficiencies and coordinate with the contractor to correct the problems. A final inspection



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will be conducted at the end of the warranty period and the contract closed out.

**6.2 ANNUAL INSPECTIONS FOR 5 YEARS**

The project engineer will perform annual inspections or more often as may be required by permit conditions. The Trustees will be invited to participate in the annual inspections. Inspection of the wetland restoration to monitor success of the project will be conducted annually for the first three years and again in year five. Any problems noted will be corrected by the Performing Defendants and coordinated by the project engineer.

**6.3 FINAL CERTIFICATION**

Within 60 days after completion of the NRCR project, the Performing Defendants will schedule and conduct a final inspection of the restoration by the Trustees. Within 30 days from the inspection, the Performing Defendants will submit a project completion report and request for Certification of Completion to the Trustees.

Reviewed By: dol  
J:\PROJECTS\1-0756-1\plan revision.wpd September 30, 1999 sas

