

**MOSES CREEK WETLAND MITIGATION SITE**  
**2011 MONITORING REPORT**  
**Year 1**

ACOE Permit #: GP-001-WI (2006-00979-CKK)  
WisDOT Project ID: 6351-01-74

Schmeckle Reserve, in the City of Stevens Point, Portage County,  
Wisconsin

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## 1.0 Introduction

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The Wisconsin Department of Transportation (WisDOT) North Central Region (NCR) directed monitoring and evaluation of the Moses Creek Mitigation Site during 2011. The Moses Creek mitigation site (the Site) was constructed on an approximately 40.2-acre parcel to compensate for the wetland impacts associated with the U. S. Highway 10 (USH 10) [Wood Co B – WIS 34 South] Project in Wood County (WisDOT Project Design ID 6350-06-02).

The project site is located in the Wisconsin River watershed. The Site is located in the N ½ of Section 28, Township 24 North, Range 8 East, in the city of Stevens Point, Portage County, Wisconsin (Appendix A). Specifically, the project site is located within the UW-SP's Schmeckle Reserve, and is northeast of the intersection of Maria Drive and Michigan Avenue. The site is bounded to the north by North Point Drive and the Sentry Insurance golf course. The City of Stevens Point and the University of Wisconsin – Stevens Point (UWSP) campus exist south of the site. The proposed project area is linear and varies in width up to approximately 450 feet and extends from the southwest of the intersection of North Point Drive and Wood Lane to just southwest of the intersection of Maria Drive and Michigan Avenue.

Schmeckle Reserve staff approached the United States Army Corps of Engineers (USACE) and WisDOT indicating their willingness to provide land within Schmeckle Reserve for wetland mitigation. The Moses Creek and its location provide a unique opportunity to satisfy the goals of WisDOT, UWSP, and the community by restoring a wetland to fulfill the vision of Schmeckle Reserve. The Conceptual Wetland Mitigation Plan for the Site was submitted to the Wisconsin Department of Natural Resources (WDNR) and the USACE on September 8, 2008. Concurrence was received from both agencies. The USACE also issued a letter of permission authorizing construction of the Site on July 28, 2008. The Wetland Mitigation Monitoring, Management, & Maintenance Plan ("Mitigation Plan") was submitted to the agencies on March 9, 2010. The objective of the Mitigation Plan was to enhance existing wetlands, enhance upland buffer habitats, realigning the degraded stream channel, and creating and enhancing riparian wetland habitats.

This report has been prepared to document monitoring and maintenance activities completed at the Moses Creek mitigation site during 2011, the initial monitoring year. Monitoring and report preparation was completed in accordance with the Mitigation Plan. This 2011 report represents the first of ten years of monitoring and maintenance that will be completed to document the response to wetland restoration activities at the Site.

## **2.0 Project Background**

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The Site was selected by WisDOT after the Wetland Mitigation Site Search Technical Memorandum dated January 2002 (prepared by Earth Tech) was completed. The Lost Creek Mitigation Site was initially created after this site search, however the anticipated restored wetland acreage at the Lost Creek site was not enough. In 2008, Schmeeckle Reserve had discussed restoring a section of Moses Creek and its associated floodplain with the USACE. WisDOT agreed to partner in this project for the additional mitigation acres that were needed. The site for the project provides not just environmental benefits but also educational and scientific opportunities.

### **2.1 BASELINE INFORMATION**

The Site is located in the Wisconsin River watershed; however, Moses Creek flows into the Wisconsin River through the Stevens Point municipal storm sewer. The contributing watershed for the Site is approximately 7.6 square miles. Regional topography is generally flat with a gradient to the west towards the Wisconsin River (Appendix A).

The surrounding land use includes recreational, agricultural, commercial, residential and woodland. Plainfield and Friendship sands are the prominent soil types for the watershed.

Presettlement vegetation indicates the Site was marsh, sedge meadow, wet prairie, and lowland shrubs. The Site was likely cleared for agriculture and the hydrology was altered by ditching and channeling. This Site was historically pastured and farmed and reverted into the existing forested and marginal wetland complex. Local hydrology from precipitation and overland runoff are the primary sources of hydrology for the Site; in some areas there is a perched water table, contributing to the existence of the wetlands. The existing groundwater hydrology was altered by the channelization of Moses Creek.

### **2.2 SUMMARY**

The final construction plans (e.g., plan notes, details, standard specifications and special provisions) were prepared in accordance with the preparatory performance standards outlined in the WDNR and USACE approved Mitigation Plan (Appendix B). Construction and final seeding of the Site was completed in fall 2010.

WisDOT retained a full-time resident inspector to be present during construction, and part-time restoration specialists from the design team to be present periodically during construction to ensure conformance with final plans and specifications. Specific attention was given during construction, through regular inspection activities, to verify that implementation of the plans relative to wetland and riparian zone establishment (e.g., elevation, slope, topsoil, microtopography, planting) was completed.

The preparatory performance standards allowed for alterations to the proposed design criteria based on site specific conditions observed during the construction inspection period, providing these alterations were documented within a detailed as-built plan. There was one minor modification from the construction plan and it consisted of not filling in the ditch line as was recommended by the original plan. The modification from the construction plans was necessary based on site conditions, weather and field observations by the project supervisor.

The as-built survey along with a detailed description of the construction process, plan modifications, and associated justifications prepared by Quest is provided in Appendix B.

## **3.0 Mitigation Goals, Objectives, and Performance Standards**

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### **3.1 MITIGATION GOALS**

The goals of the Moses Creek mitigation site are to improve Site functions in the following categories:

- Wetland Creation by Acreage, Vegetation, Hydrology and Soils
- Vegetative Diversity and Integrity
- Wildlife and Amphibian Habitat Structure
- Create a Hydrologic Regime with Groundwater Interaction
- Flood and Storm Water Attenuation
- Downstream and Wetland Water Quality
- Shoreline Protection
- Aesthetic, Recreational, Scientific and Educational Values
- Cultural Resource Preservation
- Native Species Establishment
- Floristic Quality

A detailed description of the Site mitigation goals is outlined in the Mitigation Plan. Many of these goals were partially or completely achieved by the conversion from agricultural land to a restored wetland mitigation site. Over the course of the monitoring period it is expected that site functions will improve in all of the above categories.

### **3.2 MITIGATION OBJECTIVES**

The wetland mitigation design included the restoration of a floodplain wetland along Moses Creek, enhancing existing wetlands, realigning the degraded stream channel, creating and enhancing riparian wetland habitats, and enhancing upland buffer habitats. The objective of this project was to create approximately 40 acres of wet meadow (M), scrub shrub (SS), riparian emergent (RPE), and wooded swamp (WS) habitats. WisDOT is operating this site to compensate for wetland and aquatic habitat impacts from the Wood Co B – WIS 34 Project.

### **3.3 ECOLOGICAL PERFORMANCE STANDARDS**

Typical performance standards are the measures by which it can be determined, through post construction monitoring activities, whether specific objectives relating to the overall mitigation goal have been met. These standards are usually basic indicators of important physical and biological elements that contribute to wetland functional effectiveness, as well as those characteristics that define an area as wetland versus upland. Ecological performance standards will be applied throughout the post-construction monitoring phase to assess progress toward functional objectives.



**Table 1. Status of Ecological Performance Standard Achievement**

Ecological Performance Standards (PS)	Years Evaluated	Achieved ?	Comments
<b>Vegetation</b>			
<p>The area meeting wetland criteria as established in the 1987 Federal Wetland Delineation Manual will be delineated during the fifth and tenth growing season following the completion of construction activities. The total area of re-established wetlands will be calculated and reported in the final year of monitoring. The Moses Creek mitigation project will be considered successful if approximately <b>13.37 acres</b> of wetland has been restored and 5.90 acres of existing wetland has been enhanced.</p>	Final (2020)	<b>(Yes)</b>	<p>A formal wetland delineation was not completed during 2011, however mapped wetland communities cover approximately <b>20.27 acres</b>. It is likely that this PS will be achieved.</p>
<p>A Minnesota Rapid Assessment Methodology form for Evaluating Wetland Functional Values (MnRAM) will be completed at the end of the monitoring period to evaluate the functions of each wetland community restored. At least five of the ten wetland functions outlined in the summary table on the MnRAM form will rank medium or higher by the end of the monitoring period (10 years).</p>	Final (2020)	<b>NA</b>	<p>The MnRAM form will be completed at the end of the monitoring period.</p>
<p>Vegetative cover of native species shall be dominated by three or more species of native graminoids and herbaceous plants and achieve <b>80%</b> or more after 10 years (based on estimated aerial extent).</p>	Final (2020)	<b>In Progress</b>	<p>Average vegetative cover of native species during 2011 was <b>89%</b> in the wetlands and <b>70%</b> in the uplands. Continued management will be necessary to achieve this PS. Some of the native species that germinated were not included in the seed mix.</p>
<p>More than 50% of the dominant plant species from all vegetative strata of the wetland shall have an indicator status of Facultative (FAC), Facultative Wetland (FACW), and/or Obligate (OBL). Dominance shall be determined using the 50/20 rule for determining dominance in accordance with the <i>Guidelines for Submitting Wetland Delineations in Wisconsin to the St. Paul District Corps of Engineers</i> (USACE 1996).</p>	Final (2020)	<b>(Yes)</b>	<p>Dominant plant species in the wetland were greater than 50% FAC, FACW, and OBL.</p>
<p>The tree and shrub planting areas shall have living, healthy trees and shrubs established with a minimum survival of <b>80%</b> at the end of the monitoring period.</p>	Every monitor year	<b>(Yes)</b>	<p>All trees and shrubs identified as dead will be replanted in the spring of 2012 and their health will be evaluated in subsequent years.</p>
<p>The total vegetative cover of the site by non-native invasive species shall not exceed more than <b>20%</b> at the end of the 10 year monitoring period.</p>	Final (2020)	<b>(Yes)</b>	<p>Non-native, invasive species comprised a total cover of only <b>7.5%</b>.</p>
<p>A FQA utilizing the methods outlined in the "Development of a FQA Methodology for Wisconsin" (WDNR 2003) will be conducted during each year and applied to the entire site and each plant community. Both the floristic quality index (FQI) and mean coefficient of conservatism (C) will be calculated. The FQI will be compared to the previous years' FQI to determine if the site vegetation is in need of any adaptive management.</p>	Final (2020)	<b>NA</b>	
<p>At the end of the monitoring period, approximately <b>75%</b> of the dominant plants shall be wet meadow, shrub-carr, wooded</p>	Final (2020)	<b>(Yes)</b>	<p>Dominant species associated with M, SS,</p>

**Table 1. Status of Ecological Performance Standard Achievement**

Ecological Performance Standards (PS)	Years Evaluated	Achieved ?	Comments
swamp, or riparian emergent associated plant species, either planted or through natural colonization.			WS and RPE comprise 89%.
<b>Hydrology</b>			
The established wetlands will be saturated within 12 inches of the soil surface for 14 or more consecutive days during the growing season in most years.	All	<b>Yes</b>	All monitoring wells were saturated or inundated for greater than 14 consecutive days of the growing season.
Create approximately 422 feet of new stream habitat along with the 3,818 feet of re-aligned and naturalized stream habitat to replace the existing degraded channel and reestablish and floodplain connection.	Final (2020)	<b>Yes</b>	Stream will be assessed at the end of the monitoring period.
Shallow groundwater wells will be installed and monitored throughout the wetland compensation monitoring period.	Every monitor year	<b>Yes</b>	
<b>Soils</b>			
Soils shall fulfill one or more of the <i>Field Indicators of Hydric Soils in the U.S.</i> (NRCS Ver. 6.0, 2006 or later), or conditions necessary for the long-term development of hydric soils will be accomplished as development of hydric soils make take longer than 10 years.	Every other	<b>In Progress</b>	Baseline established in 2010.
<b>Wildlife</b>			
Establish higher quality wildlife habitat and increase vegetative diversity.	All	<b>In Progress</b>	Restoration of the site has already improved habitat for wetland-dependent wildlife. Habitat quality is expected to improve as time progresses.
<b>Human Values</b>			
Enhance aesthetic and recreation functions and values, as well as scientific and educational opportunities.	All	<b>Yes</b>	This area was used regularly by recreationists and the university was already using the Site for student education and research opportunities during the summer and fall of 2011.

## **4.0 Monitoring Methods**

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Methods for all monitoring activities completed during 2009-2011 are detailed below and include surveys for vegetation, hydrology, soils, and wildlife.

### **4.1 VEGETATION**

DOT completed sample points within representative communities throughout site.

#### *Vegetation & Community Mapping*

A meander survey technique was utilized to identify all plant species, vegetation cover types, and wetland community types present in the wetland and upland portions of the Site. A count of surviving trees and shrubs in the tree and shrub planting areas was also conducted during the meander survey. Vegetation cover types were identified based upon major plant associations and were later categorized according to the WisDOT wetland classification system. Upland communities were further classified into more specific categories as needed. Boundaries of all vegetation stands were determined in the field and sketched on vertical aerial photographs, and then later digitized using GIS technology.

Species lists were compiled for each plot (Appendix C) and dominant species were identified using the 50/20 rule.

#### *Plot Sampling*

Vegetation data was collected from sixteen predetermined and permanent vegetation monitoring plots established within each representative vegetative community type. Each plot was assessed for its community strata (herbaceous, shrub, and tree strata) and each plant was identified and assessed for its percent abundance within its given parameters (5 foot radius for the herbaceous stratum, 15 foot radius for the shrub stratum, and 30 foot radius for the tree stratum). The average percent cover (based upon median cover class values) frequency and percentage of total vegetation was computed for each plant species within all community types.

### **4.2 HYDROLOGY**

Data collected to characterize the Site hydrology includes: stream observations and discharges, shallow groundwater levels across the site, and staff gauge levels.

#### **4.2.1 Stream Observations and Discharges**

Stream observations were made by the consultant and by WisDOT employees Janet Smith, Kelsey Reimann and Rochelle Hayes during monitoring in the summer and fall of 2011.

#### **4.2.2 Shallow Groundwater Levels**

Shallow groundwater levels were monitored by Stantec during the 2011 growing season at four shallow monitoring wells (MW's 1-4). The monitoring wells were installed during the summer of 2011 and are located throughout the wet meadow community (Appendix D). In June 2011, each monitoring well was fitted with a HOBO water level recorder which recorded water level measurements at 1-hour increments. Hydrographs of the recorded water levels from each

well are included in Appendix D. The data loggers recorded water levels from June 22, 2011 when they were installed to October 27, 2011 when the growing season ended. It should be noted that the growing season began on May 5, 2011 however the authorization for hydrologic monitoring was not in effect until June 2011. The summary statistics were computed with data truncated to reflect the growing season. According to data from a local weather station, the 2011 growing season near Stevens Point began on May 5, with the last spring frost, and ended on October 1, with the first fall frost (149 days). The average growing season, based on 1971 to 2000 averages, begins on May 6 and ends on October 1 (148 days).

Precipitation data was obtained from a weather station at the Stevens Point Municipal Airport in Stevens Point, Wisconsin. A 30 Day Rolling Total Analysis (Appendix D) was used to help determine whether precipitation values and hydrology observations were within the normal range during the monitoring period.

### **4.2.3 Staff Gauge Readings**

Two staff gauges were installed at the Site (Appendix C). WisDOT recorded staff gauge measurements from both staff gauges on from August to October 2011.

## **4.3 SOILS**

Prior to construction, the predominant soil types mapped on the Site, from largest to smallest area, included Meehan loamy sand (MnA), Roscommon muck (Rm), Friendship loamy sand (FrA), and Plainfield sandy loam, and granite substratum (PgB). The Roscommon Series is considered a hydric soil, whereas the Meehan Series are considered to contain inclusions of Roscommon muck.

WisDOT completed 8 soil borings during the monitoring period in August 2011 to evaluate and document topsoil depths and classify soil textures, as well as observe any evidence of a water table near the surface (Appendix E).

## **4.4 WILDLIFE**

Incidental wildlife observations were documented at the Site during 2011. Presence of mammals and avian species were recorded if they were visually observed or tracks could be accurately identified. Amphibian and reptiles were recorded if visually observed or audible calls were identified.

## 5.0 Monitoring Results

Results are provided below for all monitoring activities completed during 2011 including data and analysis of surveys for vegetation, hydrology, soils and wildlife. Baseline data collected during the 2011 monitoring season will be used for comparison purposes in subsequent years to determine the overall progress of the Site.

### 5.1 VEGETATION

WisDOT conducted botanical surveys and vegetation cover type mapping of the Site during the period of August 3 to August 9, 2011. The botanical survey was completed using a meander survey technique to gather comprehensive species lists for each distinct vegetation community (Appendix C). Results for this method are summarized below.

#### *Plant Community Summary*

Four WisDOT wetland types, comprising approximately 19 acres, were identified on the Site: wet and sedge meadow (M), shrub scrub/alder thicket (SS), wooded swamp (WS) and riparian emergent (RPE) (Appendix A). In addition, approximately 21 acres of upland vegetation, comprised of managed upland prairie or forestland, were identified and mapped. The 2011 monitoring results are summarized in Table 2, and the WisDOT wetland community types are described in more detail below. Species lists for each plot can be found in Appendix C.

**Table 2.** Dominant species of the Site, 2011.

Dominant Species	Species Diversity	
	Native	All
<b>M – Wet Meadow</b> (Plots: PT1-5)		
Path rush, Water cress, Green bulrush, Wool grass, Narrow-panicle rush, Water plantain	33	46
<b>WS – Wooded Swamp</b> (Tree and Shrub Survey)		
Silver maple, Tamarack, Black spruce, Balsam fir, Swamp white oak	5	5
<b>SS - Shrub Scrub/ Alder Thicket</b> (Tree and Shrub Survey)		
Steeplebush, Highbush cranberry, Nannyberry, Winterberry, Silky dogwood, Black choke cherry, Elderberry	7	7
<b>RPE – Emergent Riparian</b> (Plots: SP1-2, PO1-2)		
Water plantain, Broad-leaved cattail, Wool grass, Path rush, Blunt spike-rush, Annual rye grass, Marsh seedbox	23	29
<b>Entire WETLAND Area</b> <b>(All Wetland Communities)</b>		

Dominant Species	Species Diversity	
	Native	All
<i>(See dominance under specific wetland type)</i>	56	67
<b>UPL – Upland Prairie Buffer</b> (Plots: UPR 1-2)		
Wool grass, Common cinquefoil, St. John's wort, New England aster, Alsike clover, Common ragweed, Carolina foxtail, Partridge pea, Switchgrass, Canada goldenrod, Lamb's quarters, Black medick, Water cress, Panic grass	28	40
<b>UPL – Prairie Upland</b> (Plots: UP 1-5)		
Glossy buckthorn, Royal fern, Bracken fern, Cottonwood, Pennsylvania sedge, Common sheep sorrel, Quaking aspen, Red maple, Black huckleberry, Black cherry, Red oak	23	27
<b>Entire UPLAND Area</b> (All Upland Communities)		
<i>(See dominance under specific upland type)</i>	48	62
<b>Entire SITE</b> (All Communities)		
<i>(See dominance under specific community type)</i>	91	113

#### *M – Wet Meadow*

One Wet Meadow community type, totaling approximately 13 acres, was identified, mapped and inventoried within the Site. The wet meadow community is comprised of the five vegetation plots identified in Table 2 above and shown on the Anticipated Vegetation Communities figure in Appendix A. These plots are located in scattered locations throughout the wetland portion of the Site. Desirable native species represent the largest cover class categories, with minimal cover of non-native species. Dominant species include: Path rush (*Juncus tenuis*), Water cress (*Rorippa palustris*), Dark-Green bulrush (*Scirpus atrovirens*), Wool grass (*Scirpus cyperinus*), Narrow-panicle rush (*Juncus brevicaudatus*), and Water plantain (*Alisma plantago-aquatica*). Two native species, path rush and rice cutgrass, along with one non-native species, barnyard grass, are the most abundant species and are present to some degree in almost all of these stands. Hydrology, substrate and duration since seed installation largely determine species composition within these stands. For example, PT1, PT3 and PT4 are dominated by dense stands of path rush; which was not a component of the installed seed mix, and might therefore be a historic seed source from the muck soils. Irregularities in the native species cover were often noted in areas of lower elevation. Pockets which exhibited seasonal to permanent standing water were often dominated by broad-leaved cattail and other undesirable native and non-native species.

A total of 46 species (33 native, 13 non-native) were noted in the five wet meadow stands. This community group contains the highest species diversity for any wetland community on the Site.

#### *SS - Shrub Scrub/ Alder Thicket*

Shrubs were planted throughout the Site in groups and were surveyed for their survival rate but not surveyed for their dominance. All of the planted shrubs are native species and throughout the entire Site all of the species survived in one place or another. At the time of the field investigation, the majority of this community was along the stream channel and not under any water.

Dominant vegetation was not determined, though a survey of the living species was conducted. The species planted and living were Steeplebush, High cranberry, Winterberry, Black choke cherry, Nannyberry, Silky dogwood, and Elderberry for a total of 7 species (all native).

#### *WS – Wooded Swamp*

Many species of native wetland trees were planted throughout the Site in groups and were surveyed for their survival rate, but not surveyed for their dominance. Throughout the entire Site, all of the species survived in at least one plot.

Dominant vegetation was not determined, though a survey of the living species was conducted. The species planted and living were Silver maple, Tamarack, Swamp white oak, Balsam fir and Black spruce, for a total of 5 species (all native). Though all species did survive and the survival rate for the trees was above 80%, the majority of the tamarack trees did not survive and as such it was decided that the next replanting of the trees in the spring of 2012 will not include Tamarack trees, or their locations will be very carefully selected.

#### *RPE – Riparian Emergent*

Several riparian emergent communities were created throughout the site- along scrapes (PO1-2) and along the stream channel (SP1-2). These restoration and creation of these areas totaled approximately 4 acres. The vegetation within this stand is dependent upon the water levels within the created stream channel and the scrapes, and is comprised of wet meadow, emergent, shrub carr and open water community types. The riparian emergent community is dominated by Water plantain (*Alisma plantago-aquatica*), Broad-leaved cattail (*Typha latifolia*), Wool grass (*Scirpus cyperinus*), Path rush (*Juncus tenuis*), Blunt spike-rush (*Blunt spike rush*), Annual rye grass (*Festuca arundinacea*), and Marsh seedbox (*Ludwigia palustris*). A total of 29 species (23 native, 6 non-native) were noted in this community type.

#### *UPL - Upland*

The upland community is divided into the five stands of upland prairie and two stands of upland prairie buffer identified in Table 2 above. These stands contain a mixture of native, conservative prairie species and early successional non-native species that typically occur in recently disturbed sites. The upland stands comprised approximately 20 acres and are located along the wet meadow and forested buffer portions of the Site.

The prairie stands are located in scattered locations throughout the Site. These stands are dominated by Wool grass (*Scirpus cyperinus*), Common cinquefoil (*Potentilla simplex*), St. John's wort (*Hypericum canadense*), New England aster (*Aster novae-angliae*), Alsike clover (*Trifolium hybridum*), Common ragweed (*Ambrosia artemisiifolium*), Carolina foxtail (*Alopecurus carolinianus*), Partridge pea (*Cassia fasciculata*), Switchgrass (*Panicum virgatum*), Canada goldenrod (*Solidago canadensis*), Lamb's quarters (*Chenopodium album*), Black medick (*Medicago lupulina*), Water cress (*Rorippa palustris*), Panic grass (*Panicum longifolium*), Glossy buckthorn (*Rhamnus frangula*), Royal fern (*Osmunda regalis*), Bracken fern (*Pteridium aquilinum*), Cottonwood (*Populus deltoides*), Pennsylvania sedge (*Carex pennsylvanicus*), Common sheep sorrel (*Rumex crispus*), Quaking aspen (*Populus tremuloides*), Red maple

(*Acer rubrum*), Black huckleberry (*Gaylussacia baccata*), Black cherry (*Prunus serotina*), and Red oak (*Quercus rubra*). One of the upland forested sites only had data of the invasive species of Glossy buckthorn (*Rhamnus frangula*) as it was clearly the dominant species (UP5). In upcoming years, it should hopefully be controlled enough that other species will be dominant in that area.

A total of 62 species (48 native, 14 non-native) were noted in the upland prairie plots.

#### *Compliance with Vegetation Performance Standards*

Specific performance standards relating to plant community characteristics, native species establishment and floristic quality were created for the wetland and upland mitigation areas. Although many of the performance standards are not applicable to the first monitoring year, data collected from the vegetation plots was evaluated to determine compliance with performance standards.

Performance criteria relating to plant community characteristic require two or more distinct cover types within the wetland portion of the Site and greater than 80 percent average cover of native species at the end of the ten year monitoring period. It is expected that vegetative density will be low during the first growing season, and shall exhibit a positive trend during subsequent years. Currently, the Site contains four distinct (i.e., wet meadow, wooded swamp, shrub scrub and emergent riparian) wetland community types and two upland communities. Native species of the wetland community types contribute an average percent cover of approximately 89 percent, which is roughly 53 percent of the total vegetative cover. Native species of the upland communities contribute an average percent cover of approximately 70 percent, which is roughly 30 percent of the total vegetative cover. At present, the Site does not meet the greater than 80 percent cover of native species requirement; however, these results are typical for mitigation sites during the early phase of restoration and the wetland communities are already fulfilling the performance standard.

Performance criteria also require the tree and shrub planting areas to have a survival rate of 80 percent at the end of the ten year monitoring period. Several tree and shrub areas were installed in scattered locations throughout the mitigation Site. A survey of these areas yielded approximately 29 dead trees and shrubs and 6 half-alive trees and shrubs. The dead trees and shrubs will be replanted during the spring of 2012 and notes on viability will be recorded during each monitoring event in subsequent years.

In addition to native species establishment, specific performance criteria relating to non-native species require that the upland and wetland portions of the Site cannot contain greater than 20 percent cover of non-native species (excluding non-native cattail species in the scrapes) at the end of the ten year monitoring period. Currently the wetland portion of the mitigation Site contains an average percent cover of approximately 21 percent for non-native species, which is roughly 14 percent of the total vegetative cover. A total of fourteen non-native species were noted within the vegetation plots. Barnyard grass and glossy buckthorn existed in several of these plots. The upland portion of the Site contains an average percent cover of approximately 9 percent for non-native species, which is roughly 3 percent of the total vegetative cover. A total of fifteen non-native species were noted within the plots. Barnyard grass and common sheep sorrel existed in these plots and the common sheep sorrel was dominant in one of the upland plots.



## 5.2 HYDROLOGY

Hydrology data was collected for both surface water and groundwater on the Site in 2011. The data collected and summarized below includes stream observations and discharges, shallow groundwater levels, and staff gauge readings. The 2011 hydrology monitoring results show the Site's surface water and groundwater response to climate conditions.

### 5.2.1 Stream Observations and Discharges

The stream system at the Site comprises of one north-south channel and one channel that connects to the main north-south channel from the east in the middle of Moses Creek. The main channel starts in the north by the Sentry Golf Course and runs south through the Milano-Sciarrone crossing. From there it moves through an area owned by a private landowner and emerges into more of Schmeeckle Reserve running east-west just north of Maria Drive. It then runs into the stormwater runoff system made by the City of Stevens Point and drains into the Wisconsin River.

During the summer, the main channel and its riparian plain were flooded often, and the stream had a stagnant appearance, though discharge moved through it. These were often choked with algae, and in places where water velocity was low, such as near the Milano-Sciarrone crossing, duckweed sometimes covered the surface of the channel.

### 5.2.2 Shallow Groundwater Levels

Hydrology across the entire Site is influenced by precipitation and overland flow. Water levels in a network of 4 shallow groundwater wells were monitored by Stantec to document the Site's response to precipitation events throughout the growing season.

#### Climate Summary

Average monthly precipitation values were obtained from the Stevens Point WETS table which averages 1971 to 2000 data. In general, total precipitation for the growing season was slightly higher than average; however, the consistency of precipitation was sporadic with dry conditions occurring in May, June, August and October. Rainfall events in July and September likely enhanced hydrologic conditions throughout the Site (Table 5) (Appendix D).

---

**Table 3.** Precipitation Data, May - October, 2011.\*

Month	Average Monthly Precipitation (in)	2010 Monthly Precipitation (in)	2010 Precipitation Difference from Average (in)
May	3.63	2.52	-1.11
June	3.66	3.34	-0.32
July	4.12	9.19	5.07
August	4.11	2.18	-1.93
September	3.78	4.3	0.52
October	2.31	1.48	-0.83

\*Data was obtained from a weather station in Stevens Point, Portage County, WI.

#### Shallow Groundwater Well Summary

Data collected from the 4 shallow groundwater monitoring wells is presented below. Data from wells tended to show similar responses to precipitation events. A hydrograph showing all wells can be found in Appendix D.

Results for the wet meadow in Moses Creek are from monitoring wells MW 1-4. A hydrograph for wells 1-4 is illustrated in Appendix D.

**Table 4.** Water Level Summary Statistics, June 22 – October 1, 2011<sup>1</sup>

Well ID	Mean (inches)	Median (inches)	Max (inches)	Min (inches)	Lower Quartile (inches)	Upper Quartile (inches)	Interquartile Range (inches)
Well 1	-11.6	-13.2	-0.6	-15.0	-14.1	-10.2	3.9
Well 2	-12.9	-14.6	1.4	-17.9	-16.4	-10.3	6.1
Well 3	-8.3	-9.9	10.8	-17.1	-13.3	-4.0	9.3
Well 4	-15.6	-17.7	2.1	-23.2	-18.9	-13.8	5.1

<sup>1</sup>Water levels are summarized as depth to water from the ground surface and expressed in inches.

**Table 5.** Water Level Threshold Summary Statistics, June 22 – October 1, 2011

Well ID	Root Zone Saturation <sup>1</sup> Frequency <sup>4</sup>	Inundation <sup>3</sup> Frequency <sup>4</sup>	Max. Duration <sup>2</sup> of Root Zone Saturation <sup>1</sup> (days)	Number of Root Zone Saturation <sup>1</sup> Events with Durations <sup>2</sup> > 15 days	Max. Duration <sup>2</sup> of Inundation <sup>3</sup> (days)	Number of Inundation <sup>3</sup> Events with Durations <sup>2</sup> > 15 days
Well 1	40.2%	0.0%	31.0	1.0	0.0	0.0
Well 2	32.4%	2.0%	21.0	1.0	1.0	0.0
Well 3	62.7%	10.8%	39.0	1.0	6.0	0.0
Well 4	17.6%	2.0%	16.0	1.0	1.0	0.0

<sup>1</sup> Saturation (for the purpose of this evaluation) is the recorded presence of free water within 12 inches of the ground surface

<sup>2</sup> Max. duration is defined as the maximum, continuous length of time where water levels are at or above the specific threshold

<sup>3</sup> Inundation is defined as free water at or above the ground surface

<sup>4</sup> Frequency is defined as the percentage of time water levels are at or above the specific threshold

The hydrology at the four wells appears to be heavily influenced by antecedent precipitation and shallow groundwater levels with relatively moderate fluctuations in water levels (Table 4). Soils were saturated for greater than 14 consecutive days in all the wells during the growing season and therefore they exceed the performance criteria for wetland hydrology (Table 5). Well 1 was not inundated during the growing season though wells 2 and 4 were inundated for 2% of the growing season and well 3 was inundated for 10.8% of the growing season (Table 5). The hydrograph in Appendix D supports this data.

#### Compliance with Hydrology Performance Standards

The performance criteria for this Site require that the established wetlands will be saturated within 12 inches of the soil surface for at least 14 consecutive days during the growing season in most years. All four of the wells met and exceeded the hydrology performance standard.

#### **5.2.3 Staff Gauge Readings**

Two staff gauges (SG 1-2) located across the Site (Appendix C) were monitored to document water levels in the created stream channel. Due to the hydrology monitoring being approved later in the growing season and the staff gauges being installed in late June, monitoring did not begin until later in the growing season. The water levels were measured in feet.

**Table 6.** Stream Gauge measurements for the 2011 growing season.

<b>Sample Date</b>	<b>SG1</b>	<b>SG2</b>
<b>8/3/2011</b>	2.18	2.60
<b>8/23/2011</b>	0.20	1.00
<b>9/9/2011</b>	0.20	1.00
<b>10/17/2011</b>	0.98	0.46
<b>10/31/2011</b>	0.98	0.46

Over the course of 2011, the data shows that water levels near each staff gauge decreased substantially and seemingly became stagnant. There appeared to be a much deeper channel or a much higher water level at the north end of the channel than at the south end of the channel by the end of the growing season, which was the opposite earlier in the growing season. During late August and early September, there was significant erosion in the north end of the stream channel which was fixed and must have changed the depths of the stream (Appendix G). Other possible reasons for this fluctuation could be storm events that may have caused sedimentation.

### **5.3 SOILS**

WisDOT evaluated topsoil depths by completing 8 hand auger borings during the monitoring period in 2011. Five of the eight soil profiles contained indication of hydric soils. Summarized soil log data is contained in Appendix E.

### **5.4 WILDLIFE**

The Site provided habitat for wildlife during the 2011 monitoring period. While wildlife was not actively monitored, a total of 4 bird species were recorded on Site and the presence of White-tailed deer and seven amphibian and reptilian species were also observed. The complete list of wildlife species observed in 2011 can be found in Appendix F.

#### *Compliance with Wildlife Performance Standards*

Wildlife performance standards require that the Site will have an increased species diversity by the end of the monitoring period.

After one year post construction, the Site is not meeting the wildlife performance standard yet. This is to be expected with a disturbance in the ecosystem. In subsequent monitoring years, monitoring of bird species should include documentation of active nesting and a more thorough survey for amphibians and reptiles should be completed.

## 6.0 Management and Maintenance

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Site management was completed by enacting the prescribed activities outlined in the Mitigation Plan and implementing an adaptive management approach. Activities employed include: herbicide treatments, replanting, and reseeding. A detailed log and weekly summaries of all Site management activities is available in Appendix G.

Herbicide treatments were conducted by Quest LLC in the spring and summer for reed canary grass and the fall of 2011 for buckthorn. Emphasis was placed on treating the reed canary grass (RCG) found in patches within the site and the buckthorn in the upland buffer and upland prairie areas. Care was taken not to impact the desirable species.

Die back occurred in several areas of the wetland site for the RCG and both new and old plants were treated, especially where the plants were encroaching on other wetland vegetation. Due to standing water present across much of the Site, much of the native vegetation was stunted in areas, enabling better RCG growth. Priority was placed on treating those areas where RCG densities were the highest.

Herbicide treatments were also conducted to treat buckthorn (*Rhamnus frangula*). Several buckthorn areas were identified and treated during the fall of 2011 in the upland areas within the site and bordering the site in the upland buffer.

Additional seeding was performed in select areas on the ditchlines as well as the floodplain where there was likely loss of seed from large spring storm events.

Sixteen tamarack trees (*Larix laricina*), five balsam fir trees (*Abies balsamea*), three black spruce trees (*Picea mariana*), two sugar maple trees (*Acer saccharum*), one swamp white oak (*Quercus bicolor*), one highbush cranberry shrub (*Viburnum opulus*), one winterberry shrub (*Ilex verticillata*), and one nannyberry shrub (*Viburnum lentago*) were noted as dead; two swamp white oak trees (*Quercus bicolor*), one tamarack tree (*Larix laricina*), two highbush cranberry shrubs (*Viburnum opulus*), and two nannyberry shrubs (*Viburnum lentago*) were noted as poor in health by WisDOT during the fall monitoring surveys. These trees will be replanted by Quest LLC in the spring of 2012. The tamaracks will likely be replaced with other trees as they had a low success rate.

The realigned stream channel was monitored for erosion, and in the summer of 2011 an area of the northern section of the Site stream channel was realigned in order to fix the stream bank from erosion. Monitoring for any further stream bank erosion will continue in future years.

Future maintenance and management may include potential corrective measures such as grade modifications, design changes, revisions to maintenance requirements, and revised monitoring requirements. The measures will be designed to ensure that the modified compensatory mitigation project provides functions comparable to those described in the objectives.

## 7.0 Reporting

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This is the first of five monitoring reports which are to be completed and submitted to the USACE. Subsequent monitoring reports are scheduled to be submitted to the USACE in monitoring years 3, 5, 7, and 10 or after the 2013, 2015, 2017, and 2020 growing seasons. This first year monitoring report contains a section documenting the as-built conditions and deviations from the plans and specifications.

All subsequent monitoring reports shall assess attainment of performance standards, restoration goals and objectives, and comparison to previously reported results. The monitoring reports will also discuss maintenance activities performed, adaptive management recommendations, and future maintenance activities. The final report shall include the notification of completion if the Site meets the established wetland criteria. Monitoring reports will be prepared per the USACE Regulatory Guidance Letter No. 06-03 (August 3, 2006).

A portion of mitigation credits expected at the Site have been allocated (debited) to compensate for impacts from the U. S. Highway 10 (USH 10) Wood Co B – WIS 34 South Project in Wood County (WisDOT Project ID 6350-06-02) as outlined in the USACE permits and shown in Table 7 below. The final wetland delineation will determine if this allocation has been met or exceeded.

**Table 7.** Mitigation Credit Allocation.

<b>Community</b>	<b>Credit Type</b>	<b>Anticipated Debits</b>	<b>Proposed Ratio</b>	<b>Proposed Credits</b>
Wet Meadow (M)	Restoration	12.665	1:1	<b>12.665</b>
Riparian Emergent (RPE)	Restoration	0.118	1:1	<b>0.118</b>
Wooded Swamp (WS)	Restoration	0.450	1:1	<b>0.450</b>
Scrub Shrub (SS)	Restoration	0.140	1:1	<b>0.140</b>
RPE, WS, M, SS	Enhancement	3.692	1:1	<b>3.692</b>
WS & M	Enhancement	2.197	3:1	<b>0.732</b>
Upland Buffer- Forest	Enhancement	17.709	4:1	<b>4.427</b>
Upland Buffer- Prairie	Enhancement	2.297	4:1	0.574
<b>Total</b>		<b>39.27</b>		<b>22.79</b>

## 8.0 Conclusions and Recommendations

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Wetland monitoring, data analysis, and maintenance of the Moses Creek Mitigation Site during 2011 was completed by several parties including Stantec, Quest LLC, the University of Wisconsin – Stevens Point, and WisDOT. WisDOT has compiled and summarized the data and recommendations provided by these parties in this Year 1 Monitoring Report.

One deviation from the Mitigation Plan design was made during construction due to site conditions, weather, and field observations by the project supervisor. This change consisted of not filling in the ditch line as was specified in the original as-built plan.

Several studies were performed during 2011 to evaluate the Site's achievement of ecological performance standards and collect baseline data for future comparison. These studies included vegetation monitoring and community mapping, measurement of surface and groundwater levels, evaluation of soil depths and documentation of wildlife use.

Vegetation is developing as expected during the initial year. Four wetland communities were mapped on the Site and the wetland acreage appears to be approximately what was expected. Success of seed installation and the need for supplemental plantings will be addressed in the 2014 monitoring report. However, much of the upland buffer was dominated by species other than desirable natives repeated treatments were conducted to better control invasive species such as reed canary grass (RCG) and buckthorn. It is strongly recommended that at least one meander survey is completed during the second growing season to document site progress, the location of reed canary grass and other buckthorn, and identify areas that may require additional maintenance or management.

Precipitation during the 2011 growing season was above average which contributed to high water levels throughout the Site. All hydrology criteria were exceeded. It is expected that both surface water and groundwater levels would be lower in an average year. Several hydrology monitoring parameters were not surveyed as outlined in the Mitigation Plan due to the late monitoring start date.

Soil borings across the site indicate that a hydric soil is present in approximately half of the boring locations.

The stream channel in the northern portion of the Site appears to be functioning normally and according to design specifications. Aside from the late summer, there was good water flow and there were defined channel features throughout the growing season. It is recommended that the water levels continue to be monitored and appropriate steps be taken, if necessary, to maintain the stream hydrology to fit performance standards.

The Site would also benefit from replacement plantings of shrubs and trees in the wetland area and along the stream channel as several trees and shrubs did not survive the 2011 growing season. These replacement trees and shrubs will be replanted in the spring of 2012. Further analysis is needed to fully understand the dynamic nature of this stream ecosystem and how it reacts to different levels of precipitation, temperature and flooding events.

The amount of wildlife use at the Site is not significantly known after only one monitoring year. The Monitoring Plan requires that incidental wildlife observations are made during monitoring events, however it is recommended that at some point during the monitoring period a more detailed survey of wildlife using the Site is conducted. This would provide a more accurate level of seasonal wildlife use on the Site.

Overall, the Site performed very well during the initial monitoring season. All applicable ecological performance standards were met or baselines were established for comparison during future monitoring seasons. Several of the performance standards cannot be formally achieved until the final monitoring season; however, progress towards achieving them was evaluated during 2011. Many of these performance standards were informally achieved after this first year including: the establishment of approximately 40 acres of wetland, the presence of hydrophytic vegetation within the wetland, and less than 20% cover of non-native invasive species in the wetland.

However, vegetative cover across Site was not comprised of greater than 80% native species. This is partially due to the age of the site and the presence of non-native annual or early successional species whose dominance generally decreases over time. If progress towards this performance standard is not shown in the next monitoring season, management efforts may be necessary to decrease the dominance of non-natives. Management for native species should be a focus in the upland and upland prairie areas.



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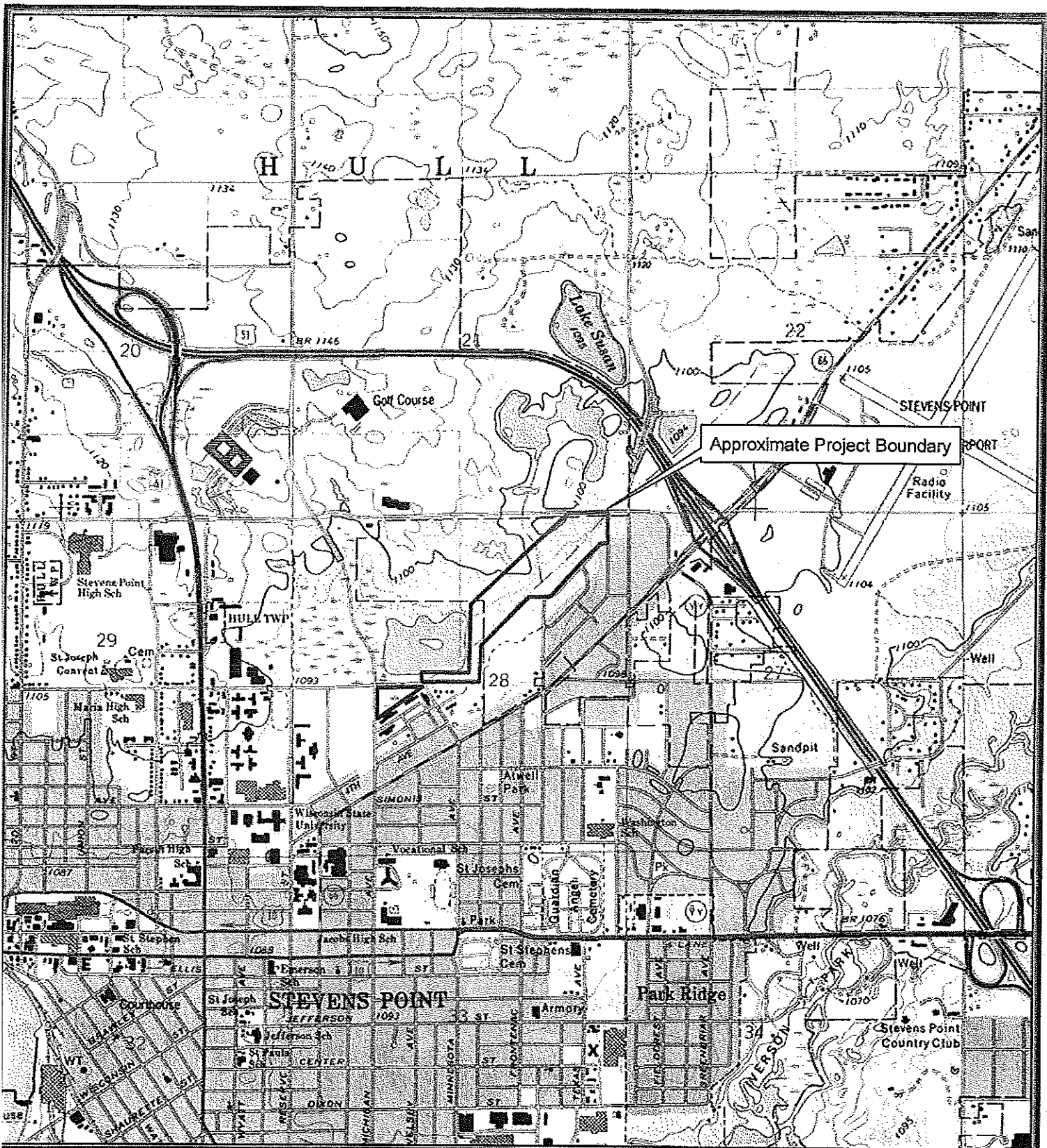
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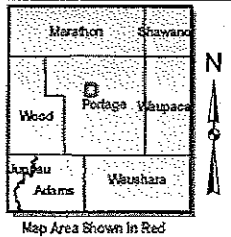
## **Appendix A**

### **Figures**


- **Project Location and Topography**
- **Project Property Corner Coordinate Map**
- **Moses Creek Watershed Map**
- **Soil Survey Data**
- **Field Delineated Wetland Data (Pre-construction)**
- **Plant Communities (Pre-construction)**
- **Anticipated Communities**
- **Plant Communities (Post-construction)**



**FIGURE 1. PROJECT LOCATION & TOPOGRAPHY**  
**Proposed Moses Creek Wetland Mitigation Project Area**



<p><b>Project Location</b>          Section 28, T24N, R8E          City of Stevens Point, Portage County, WI</p>
<p><b>Project Information</b>          NRC Project Number : 008-0099-01          Modified June 26, 2008</p>
<p>0 1,000 2,000 Feet</p>

<p><b>Legend</b></p> <p> Approximate Project Boundary</p>
--

**NRC**  
 Natural Resources Consulting, Inc.  
 119 South Main Street  
 P.O. Box 128  
 Cottage Grove, WI 53527-0128  
 phone: 608-839-1998  
 fax: 608-839-1995  
 www.nrc-inc.net

# PROPERTY CORNER COORDINATE MAP WISCONSIN DEPARTMENT OF TRANSPORTATION MOSES CREEK MITIGATION SITE CITY OF STEVENS POINT, PORTAGE COUNTY WISCONSIN

**SURVEYOR'S CERTIFICATE**

I, LANCE J. HABECK, REGISTERED LAND SURVEYOR, HEREBY CERTIFY:

THAT I HAVE SURVEYED AND MAPPED THE PROPERTY CORNERS SHOWN ON THIS MAP AND THAT THIS MAP IS A TRUE AND CORRECT REPRESENTATION OF THE MONUMENTATION FOUND AND SET TO THE BEST OF MY KNOWLEDGE AND BELIEF.

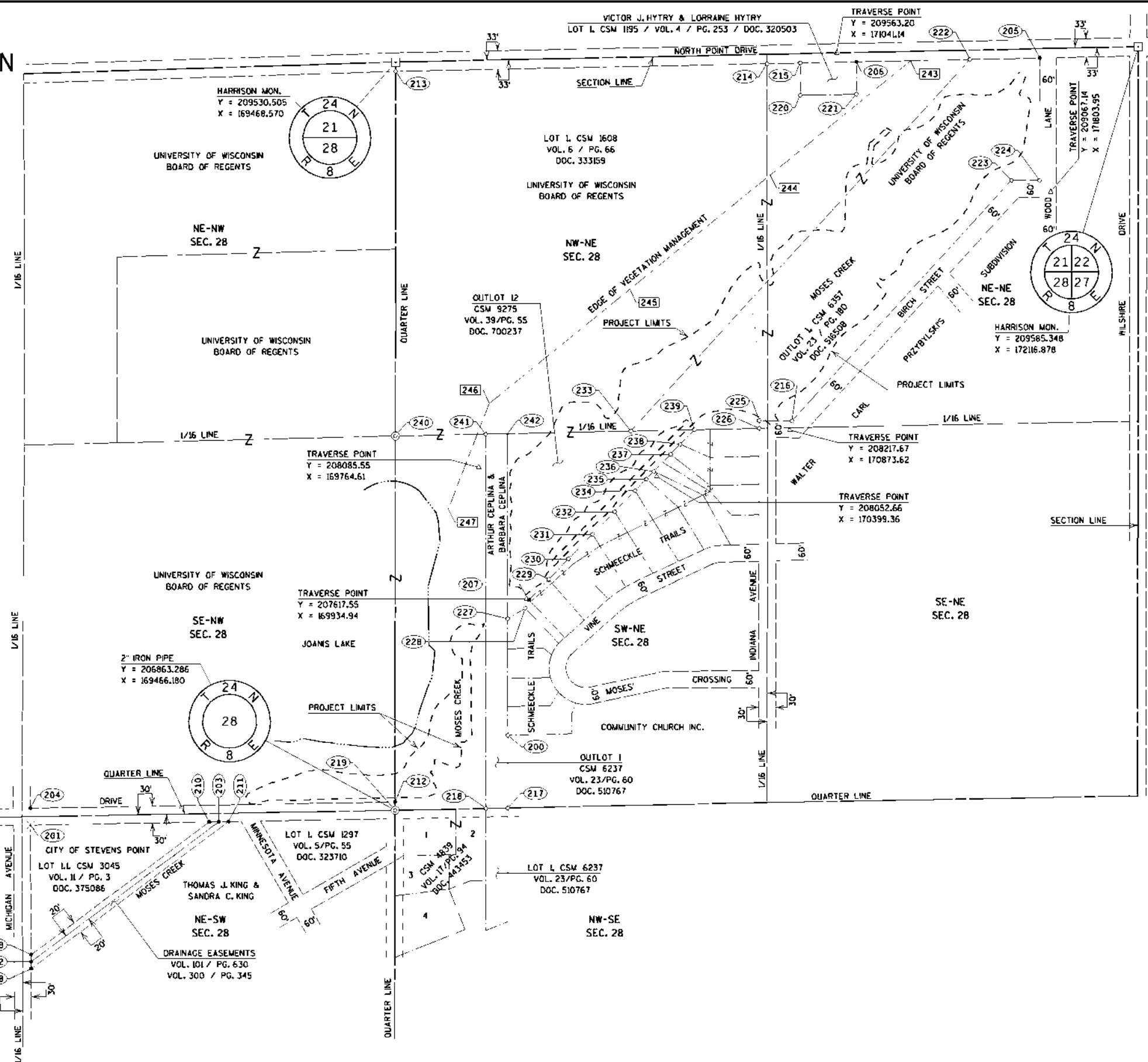
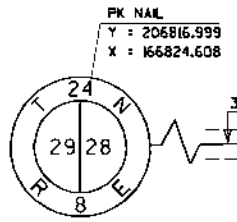
DATED THIS 20TH DAY OF NOVEMBER, 2009

*Lance J. Habeck*  
LANCE J. HABECK RLS 1444  
AECOM  
200 INDIANA AVENUE  
STEVENS POINT, WI 54481



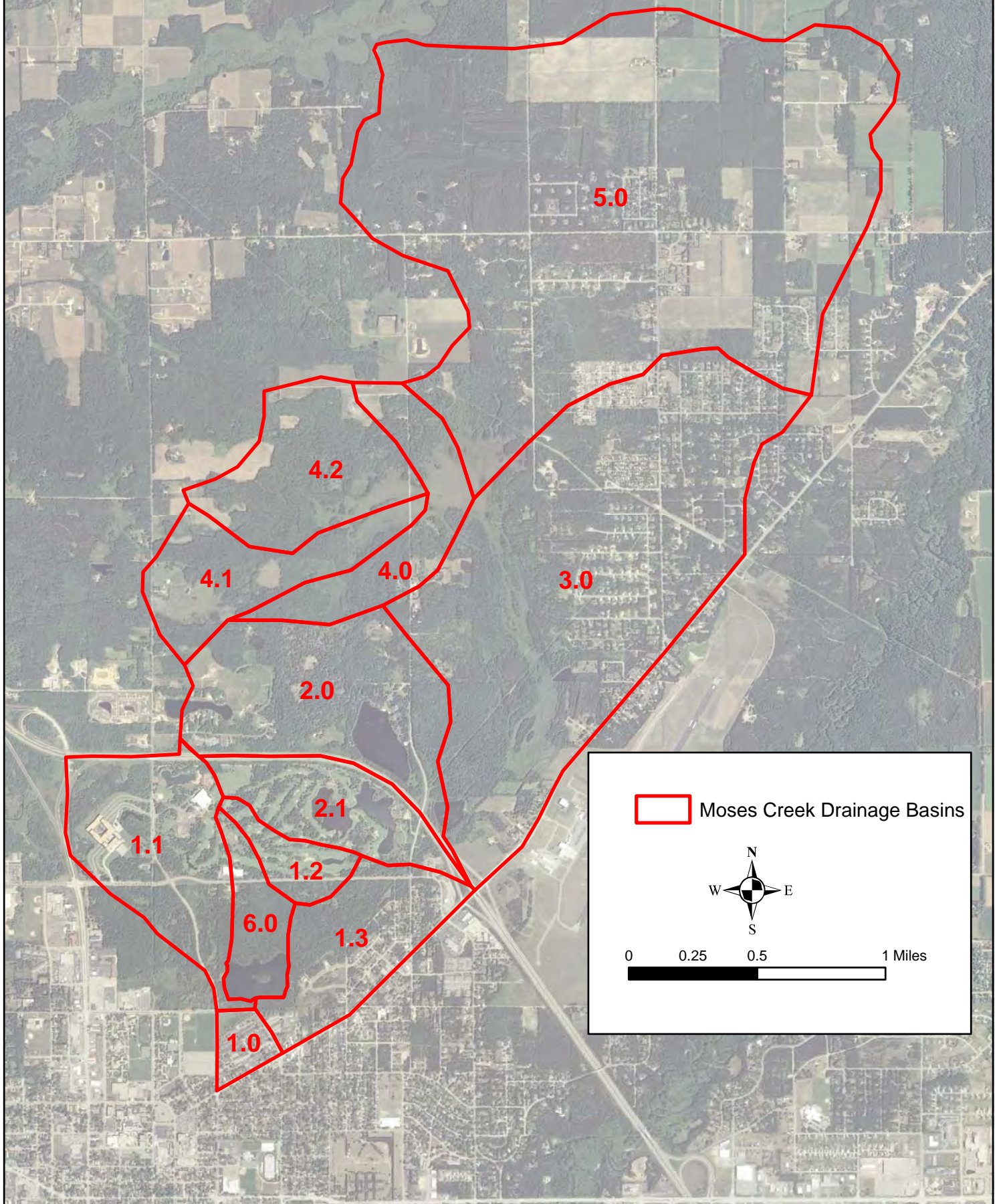
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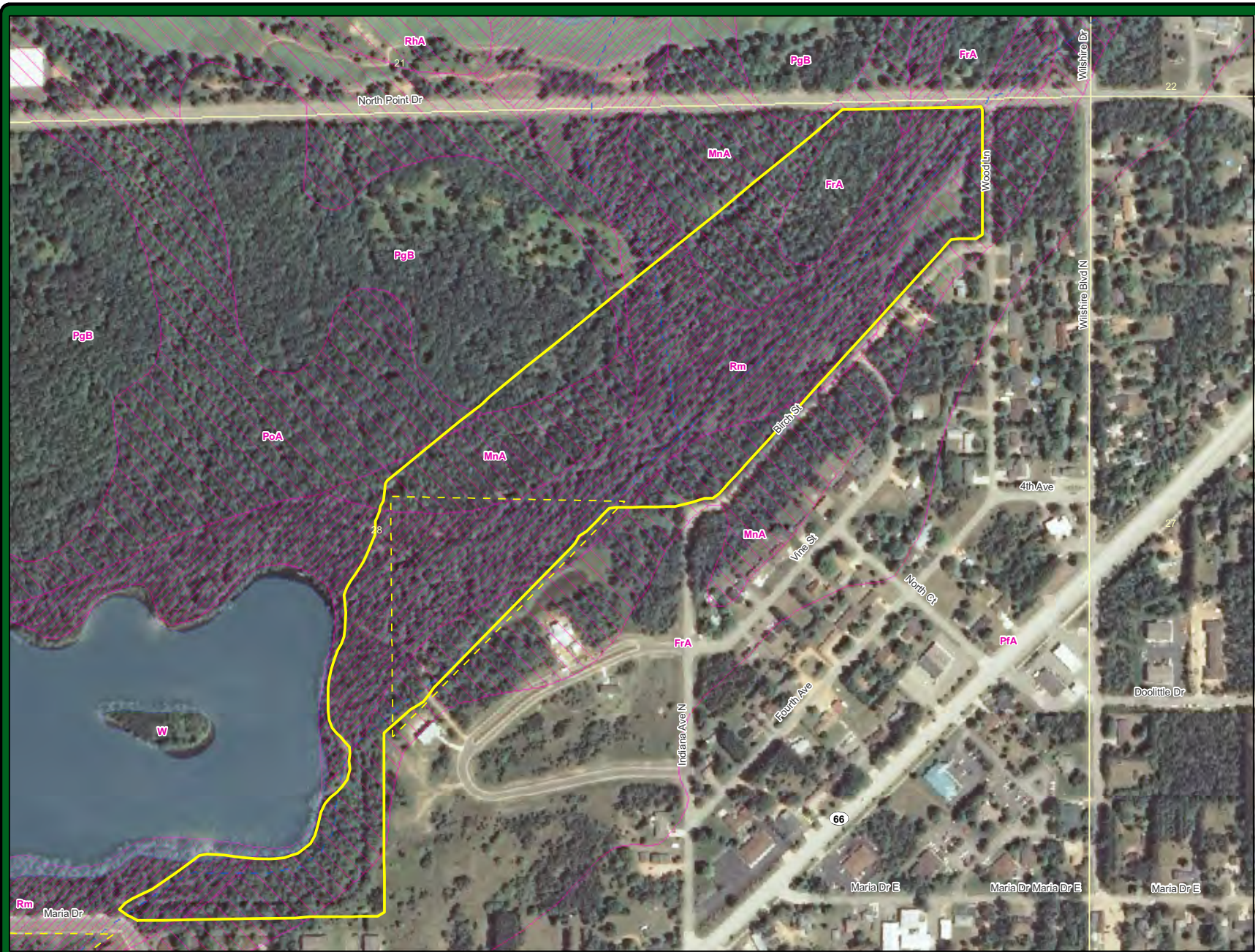
POINT	Y	X	DESCRIPTION
200	207131.101	169868.130	1" IRON PIPE FOUND
201	208810.519	168165.816	CHISELED X FOUND
202	206323.266	168168.400	3/4" X 24" REBAR SET
203	206822.270	168837.783	3/4" X 24" REBAR SET
204	206870.499	168165.498	3/4" X 24" REBAR SET
205	209545.058	171765.188	3/4" X 24" REBAR SET
206	209531.526	171111.730	3/4" X 24" REBAR SET
207	207613.806	169943.874	3/4" X 24" REBAR SET
208	206298.418	168168.532	3/4" X 24" REBAR SET
209	206348.113	168168.268	3/4" X 24" REBAR SET
210	206821.670	168803.514	3/4" X 24" REBAR SET
211	206822.871	168872.052	3/4" X 24" REBAR SET
212	206893.291	169466.207	3/4" X 24" REBAR SET
213	209497.525	169468.402	1" IRON PIPE FOUND
214	209524.972	170792.625	1" IRON PIPE FOUND
215	209527.569	170911.570	1" IRON PIPE FOUND
216	208250.906	170881.700	3/4" REBAR FOUND
217	206871.140	169868.375	3/4" REBAR FOUND
218	206870.101	169790.342	1" IRON PIPE FOUND
219	206863.286	169466.180	2" IRON PIPE FOUND
220	209412.144	170911.424	1-1/4" IRON PIPE FOUND
221	209416.066	171111.584	1-1/4" IRON PIPE FOUND
222	209539.948	171516.577	3/4" REBAR FOUND
223	209108.600	171664.017	1-1/4" ROUND IRON BAR FOUND
224	209108.483	171764.523	1-1/4" ROUND IRON BAR FOUND
225	208251.927	170764.714	1-1/4" IRON PIPE FOUND
226	208224.388	170764.670	1-1/4" IRON PIPE FOUND
227	207546.515	169867.671	1" IRON PIPE FOUND
228	207584.334	169930.466	1" IRON PIPE FOUND
229	207686.067	170014.358	1" IRON PIPE FOUND
230	207758.655	170084.992	1" IRON PIPE FOUND
231	207846.329	170170.514	1" IRON PIPE FOUND
232	207926.939	170249.136	1" IRON PIPE FOUND
233	208214.272	170306.642	3/4" REBAR FOUND
234	208002.204	170322.256	1" IRON PIPE FOUND
235	208043.232	170362.387	1" IRON PIPE FOUND
236	208070.659	170389.032	1" IRON PIPE FOUND
237	208131.950	170448.786	1" IRON PIPE FOUND
238	208167.255	170483.069	1" IRON PIPE FOUND
239	208219.305	170533.561	1" IRON PIPE FOUND
240	208197.203	169467.610	2" IRON PIPE FOUND
241	208203.511	169789.244	3/4" REBAR FOUND
242	208204.349	169867.048	1" IRON PIPE FOUND
243	209535.512	171304.223	
244	209128.270	170803.660	
245	208721.029	170303.098	
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247	207936.708	169656.466	



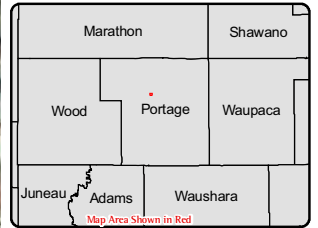
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	GRID FACTOR N/A		COUNTY: PORTAGE	CONSTRUCTION PROJECT NUMBER 6351-01-74	PS&E SHEET

# Figure 1 Moses Creek Watershed





**Figure 2.**  
NRCS Soil Survey Data  
Moses Creek



**Location**  
Section 28, Township 24 North, Range 08 East,  
City of Stevens Point, Portage County, WI

0 150 300 Feet

**Project Information**  
NRC Project Number #: 008-0099-01  
Modified February 17, 2010

**Legend**

- Project Limits
- Private Property
- Section Line
- NRCS SOIL SURVEY DATA
- Hydric Soils
- Poss. Hydric Inclusions
- Non-Hydric Soils
- DNR 24k Hydrography
- Perennial Stream
- Intermittent Stream
- Waterbody

Data Sources include: WDNR, WDOA, & WDOT.  
©2008/03/03/04/05/06/07/08

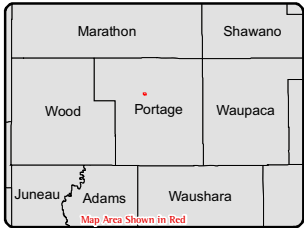
**NRC**  
Natural Resources Consulting, Inc.

209 Commerce Parkway  
P.O. Box 128  
Cottage Grove, WI 53527-0128  
phone: 608-839-1998  
fax: 608-839-1995  
[www.nrcdifference.com](http://www.nrcdifference.com)

The information presented in this map document is advisory and is intended for reference purposes only.



**Figure 4.**  
Field Delineated Wetland Data  
Moses Creek



**Location**  
Section 28, Township 24 North, Range 08 East  
City of Stevens Point, Portage County, WI



**Project Information**  
NRC Project Number #: 008-0099-01  
Modified February 26, 2010

**Legend**

- Field Delineated Wetland
- Project Limits
- Private Property
- Sample Points
- Section Line
- DNR 24k Hydrography**
- Perennial Stream
- Intermittent Stream
- Waterbody

Data Sources include WDNR, WDOA, II, WDOT.  
Date: 02/26/2010 10:08:00 AM

**NRC**  
Natural Resources Consulting, Inc.

209 Commerce Parkway  
P.O. Box 128  
Cottage Grove, WI 53527-0128  
phone: 608-839-1998  
fax: 608-839-1995  
[www.nrcdifference.com](http://www.nrcdifference.com)

The information presented in this map document is advisory and is intended for reference purposes only.

Figure 4 Field Delineated Wetland Data.mxd Map Created By D. Giblin



Figure 5. Existing Plant Communities Moses Creek

- Community Type**
- 1 = Alder Thicket / Shrub-Carr
  - 2 = Old Field
  - 3 = Mesic Prairie Planting
  - 4 = Shallow Marsh
  - 5 = Wet Mesic Prairie Planting
  - 6 = Northern Mesic / Dry Mesic Forest
  - 7 = Glossy Buckthorn Woods
  - 8 = Savannah / Prairie Restoration
  - 9 = Drained Muck Field / Old Field
  - 10 = Wet Meadow
  - 11 = Forested, Drained Wet Meadow
  - 12 = Wooded Wetland
  - 13 = Wet Mesic Forest
  - 14 = Forested Wet Depression

Marathon		Shawano	
Wood	Portage	Waupaca	
Juneau	Adams	Waushara	

Map Area Shown in Red

**Location**  
 Section 28, Township 24 North, Range 08 East,  
 City of Stevens Point, Portage County, WI

0 200 400 Feet

**Project Information**  
 NRC Project Number #: 008-0099-01  
 Modified January 20, 2009

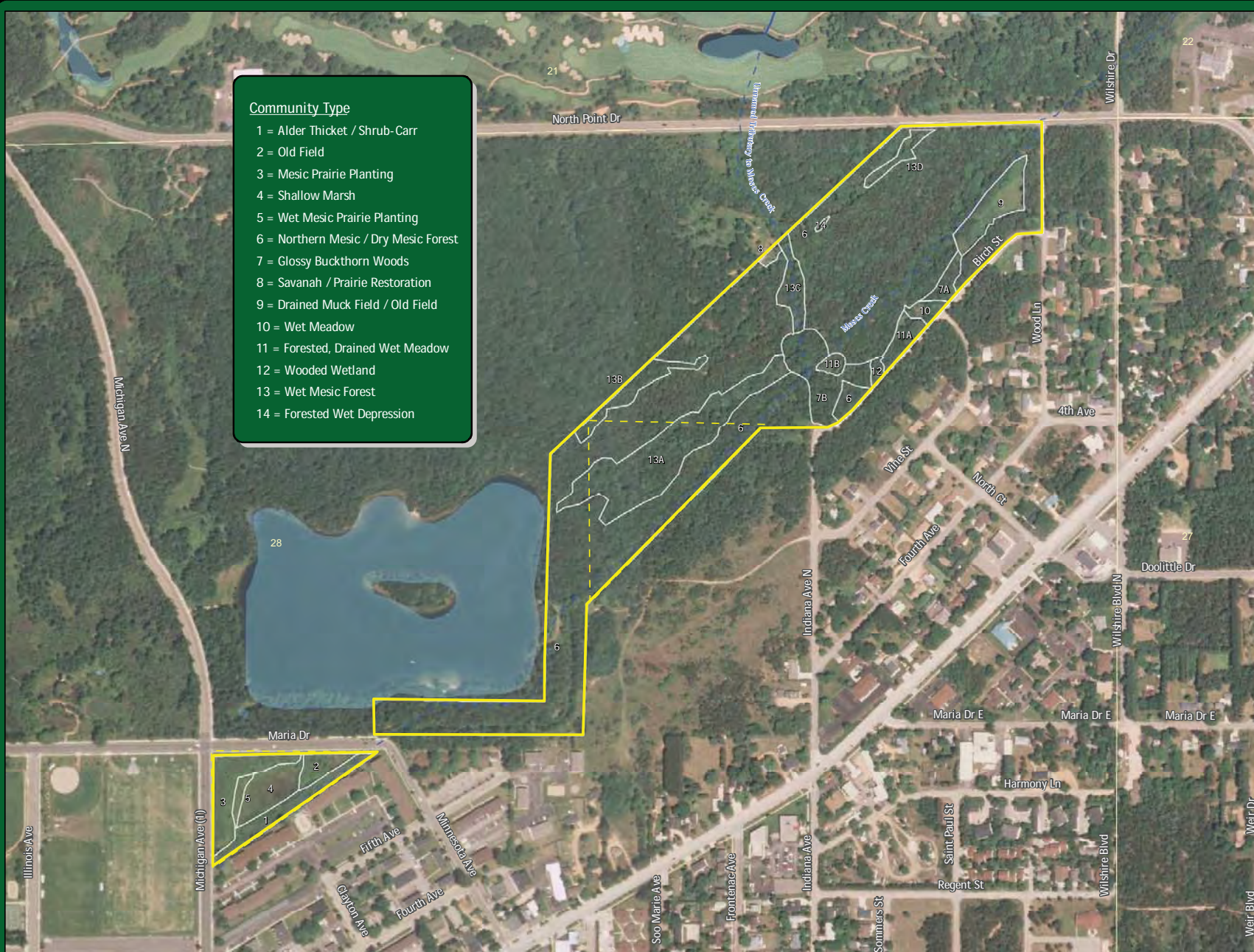
**Legend**

- Approximate Project Boundary\*
- Private Property
- Section Line
- DNR 24k Hydrography**
- Perennial Stream
- Intermittent Stream
- Waterbody

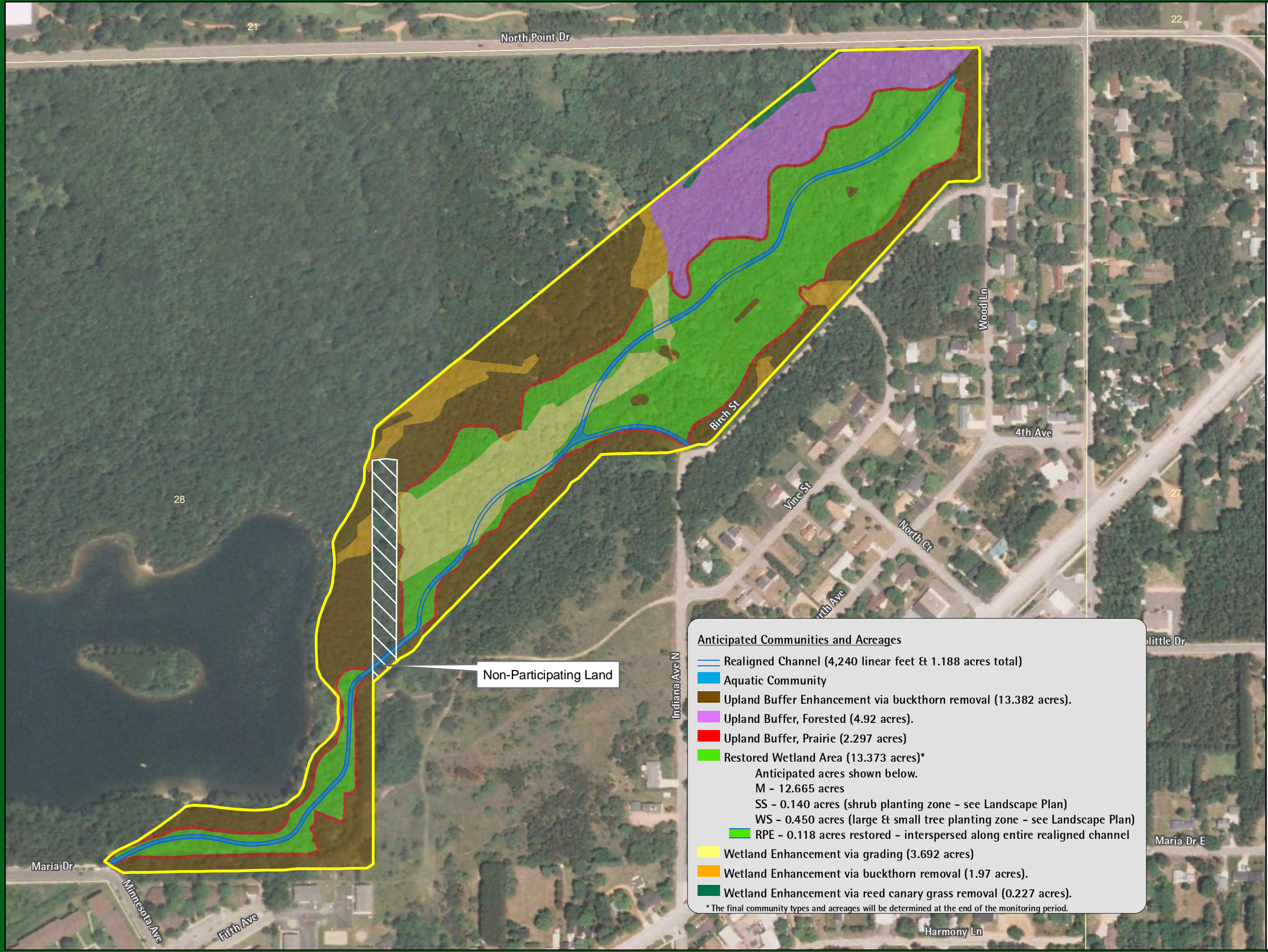
\*Reflects initial project boundary; current boundary shown on Figures 1-4.

**NRC**  
 Natural Resources Consulting, Inc.

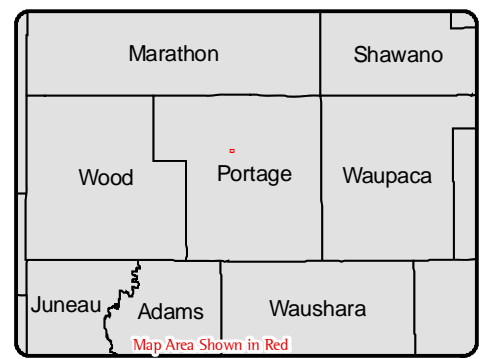
209 Commerce Parkway  
 P.O. Box 128  
 Cottage Grove, WI 53527-0128  
 phone: 608-839-1998  
 fax: 608-839-1995  
 www.nrcstaff.com



The information presented in this map document is advisory and is intended for reference purposes only.



**Anticipated Communities**  
**Moses Creek Wetland Mitigation**  
**DOT # 6351-01-04**



**Location**  
 Section 28, Township 24 North, Range 08 East,  
 City of Stevens Point, Portage County, WI

0 150 300 Feet

**Project Information**  
 NRC Project Number #: 008-0099-03  
 Modified May 7, 2010

**Legend**

- Project Limits (40.2 acres)
- Non-Participating Land
- Section Line

**Anticipated Communities and Acreages**

- Realigned Channel (4,240 linear feet & 1.188 acres total)
- Aquatic Community
- Upland Buffer Enhancement via buckthorn removal (13.382 acres).
- Upland Buffer, Forested (4.92 acres).
- Upland Buffer, Prairie (2.297 acres)
- Restored Wetland Area (13.373 acres)\*  
 Anticipated acres shown below.  
 M - 12.665 acres  
 SS - 0.140 acres (shrub planting zone - see Landscape Plan)  
 WS - 0.450 acres (large & small tree planting zone - see Landscape Plan)  
 RPE - 0.118 acres restored - interspersed along entire realigned channel
- Wetland Enhancement via grading (3.692 acres)
- Wetland Enhancement via buckthorn removal (1.97 acres).
- Wetland Enhancement via reed canary grass removal (0.227 acres).

\*The final community types and acreages will be determined at the end of the monitoring period.

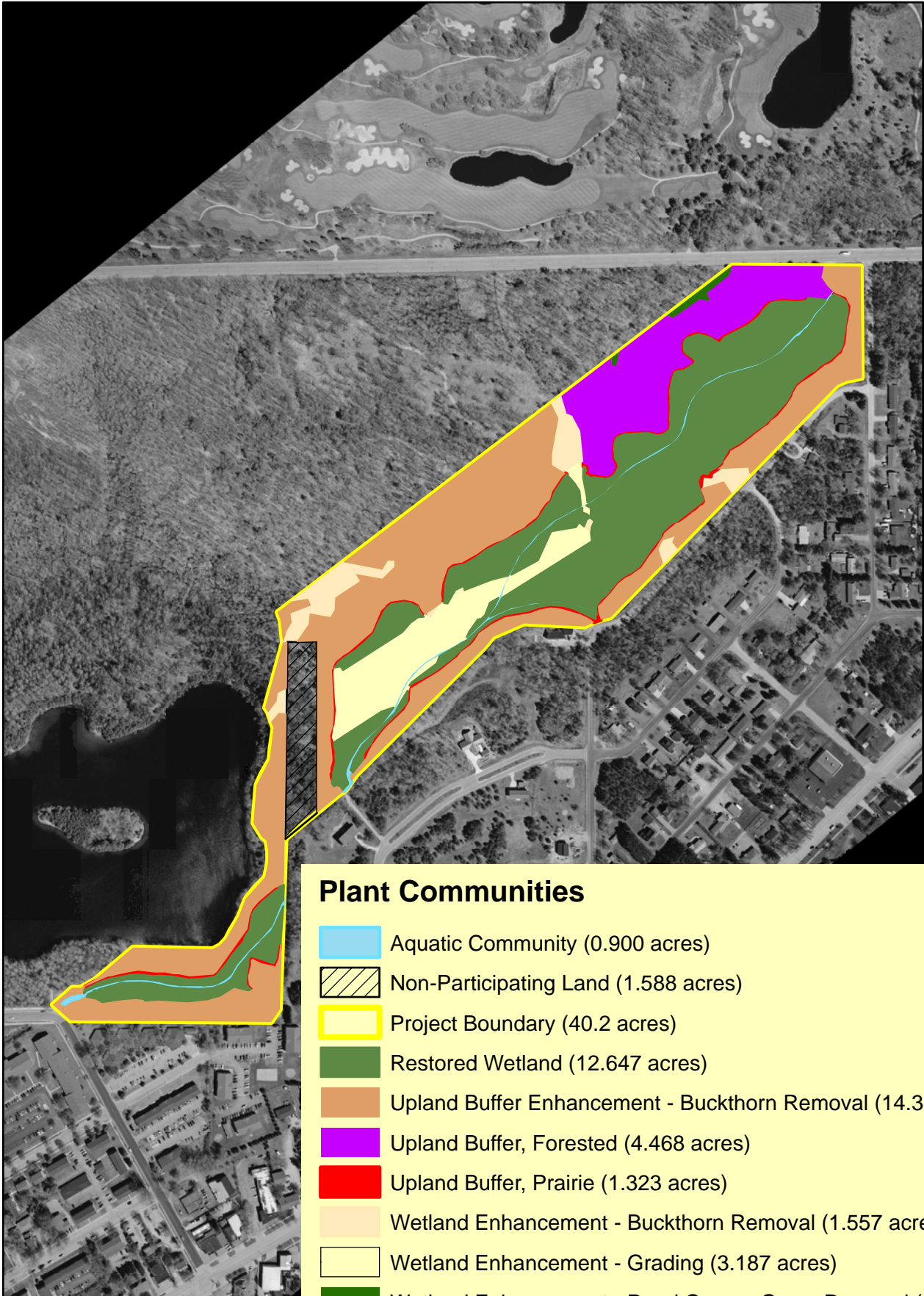
**NRC**  
 Natural Resources Consulting, Inc.

209 Commerce Parkway  
 P.O. Box 128  
 Cottage Grove, WI 53527-0128  
 phone: 608-839-1998  
 fax: 608-839-1995  
[www.nrcdifference.com](http://www.nrcdifference.com)

The information presented in this map document is advisory and is intended for reference purposes only.

# Moses Creek Post-Construction Plant Communities

2011



1:6,000

## **Appendix B**

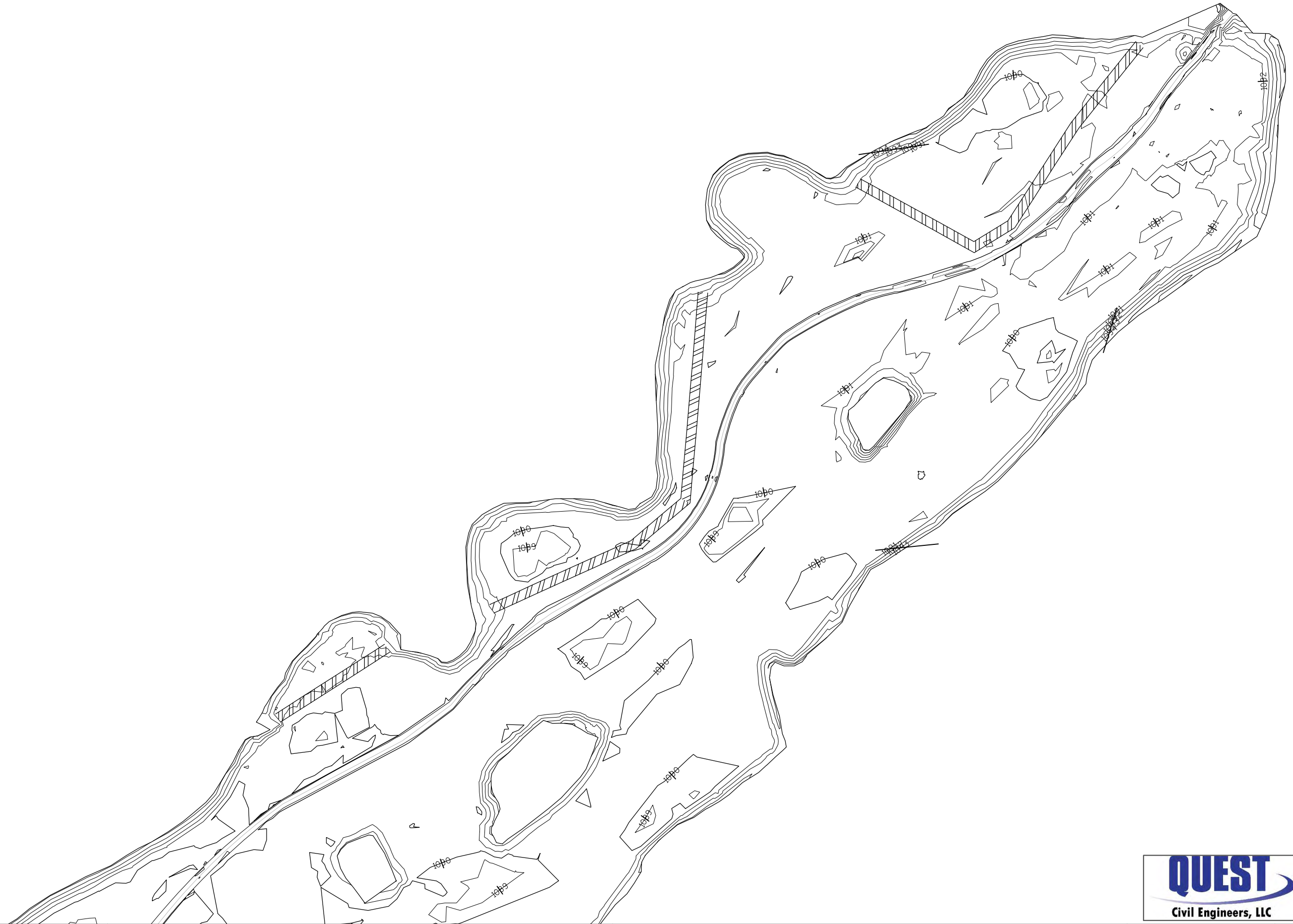
### **As-Built Summary**

- **As Built Plan and Changes**
- **Project Overview**
- **Landscape Plan**
- **Moses Creek Common Excavation**
- **Seeding Quantities**
- **Moses Creek Final Ground**

2



2



PROJECT NO:6351-01-74

HWY:MOSES CREEK MITIGATION

COUNTY:PORTAGE

1' CONTOURS

SHEET \_\_\_\_\_ E



2



2



PROJECT NO:6351-01-74

HWY:MOSES CREEK MITIGATION

COUNTY:PORTAGE

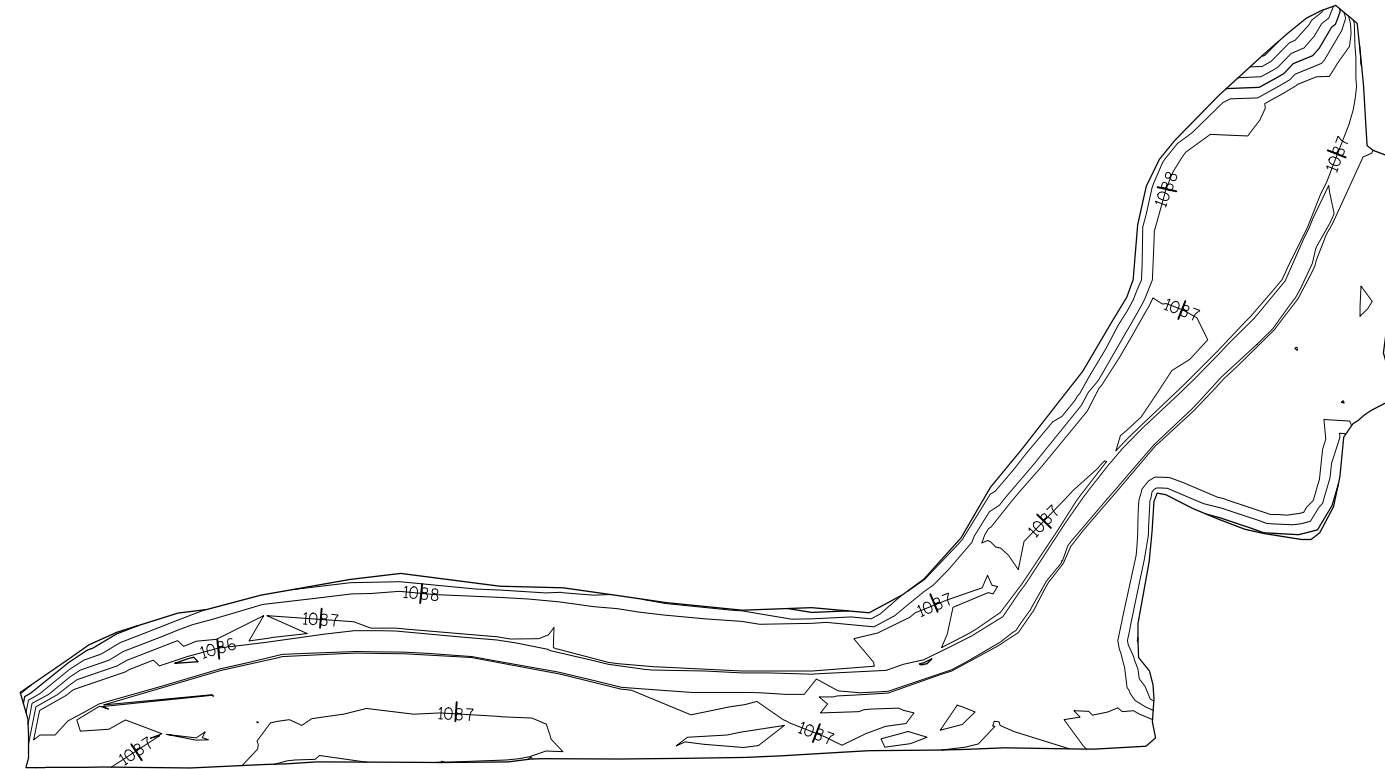
1' CONTOURS

SHEET \_\_\_\_\_ E

2



2



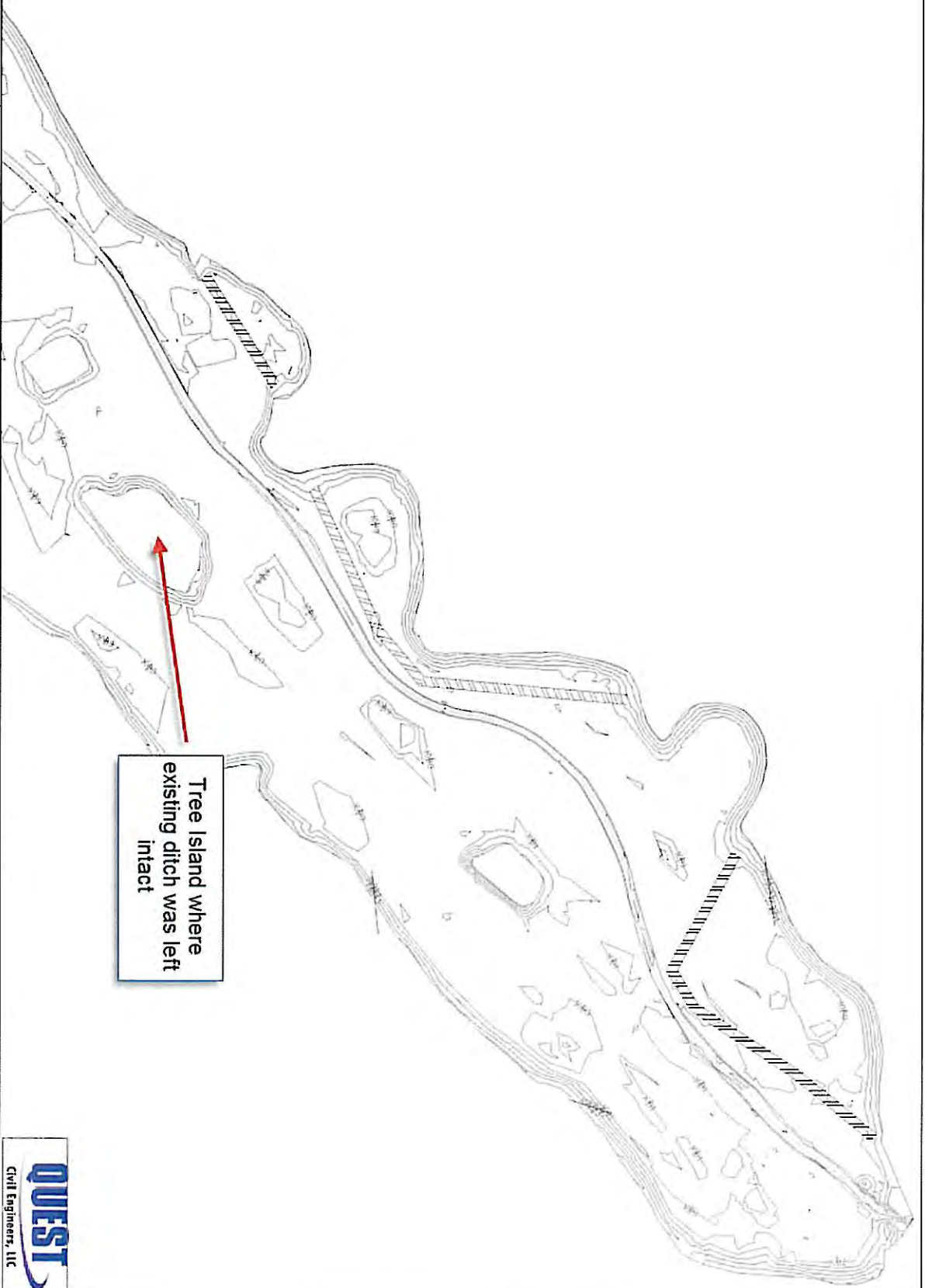
PROJECT NO:6351-01-74

HWY:MOSES CREEK MITIGATION

COUNTY:PORTAGE

1' CONTOURS

SHEET \_\_\_\_\_ E



Tree Island where  
existing ditch was left  
intact

PROJECT NO: 6351-01-74

HWY: MOSES CREEK MITIGATION

COUNTY: POPLAR

N CONTOURS

SHEET

E

FILE NAME: I:\PROJECTS\6351-01-74\MOSES\_CREEK\_MITIGATION\DWG\6351-01-74-01-01.dwg  
LIT DATE: 3/28/17 11:23 AM  
LIT BY: J. BERTHIAUME  
LIT NAME: E:\ADMIN\STAFF\J. BERTHIAUME  
LIT SCALE: 1:100 0.00 FT  
QUEST  
Civil Engineers, LLC  
PROJECT: 6351-01-74 SHEET 40



# Moses Creek Restoration Project

Schneeckle Reserve, November 2, 2010



MAIN RESTORATION AREA

Tree Island with existing left intact

New Moses Creek channel

South Fork channel

Scrapes

New boardwalk

Tree island

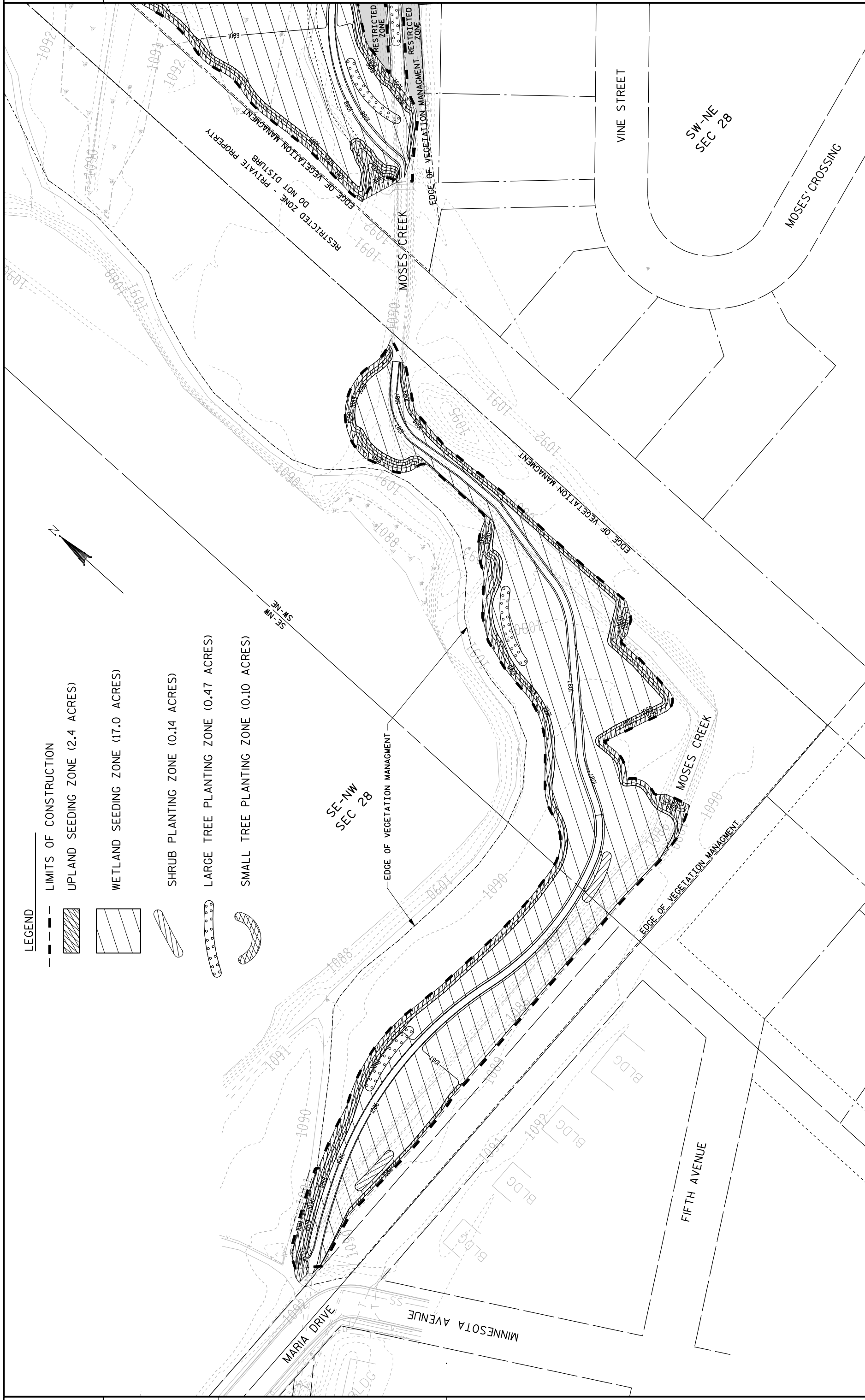
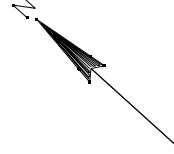
North Polar Drive



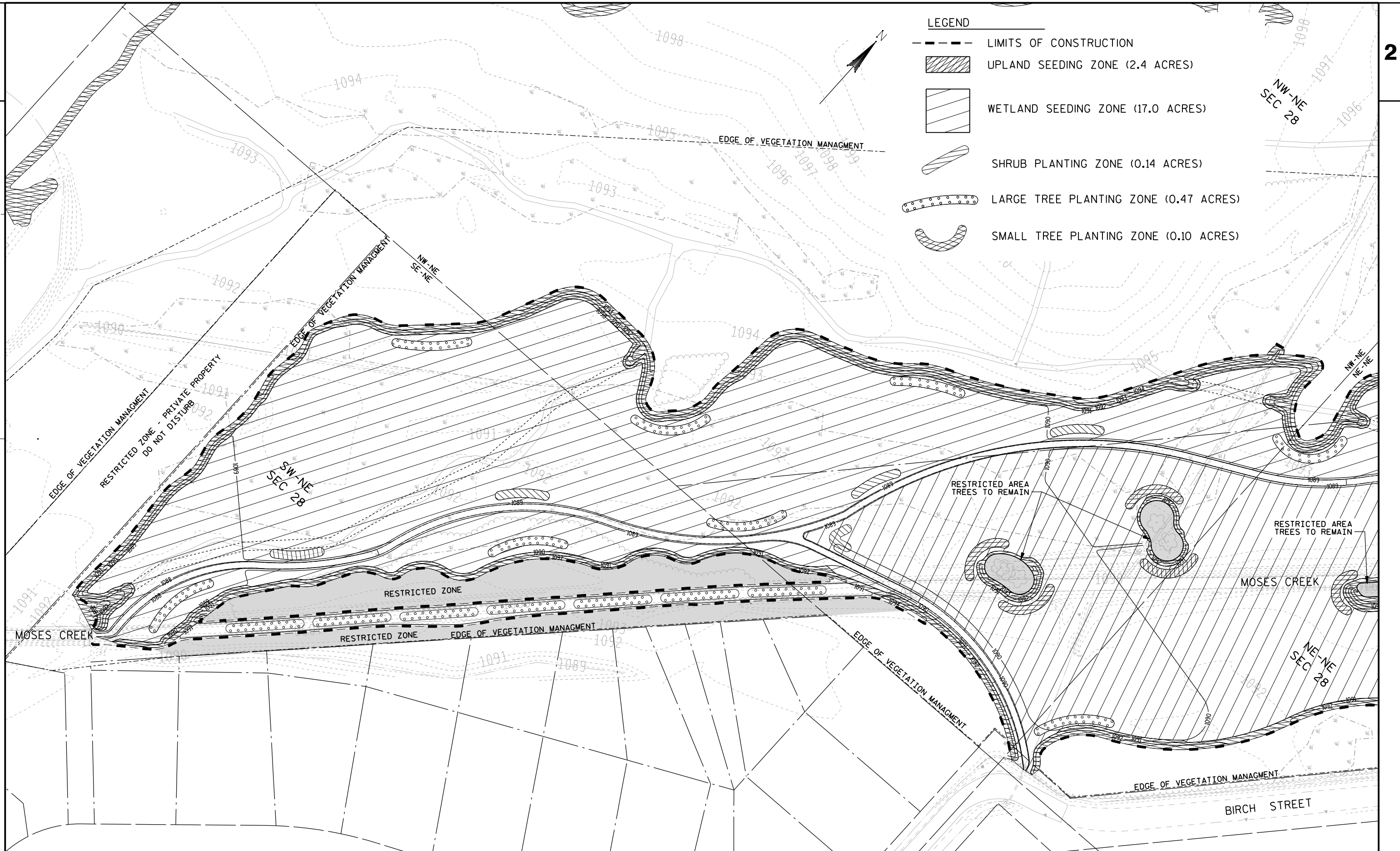
LEGEND

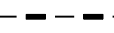
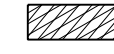
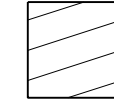

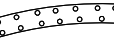

- EXISTING CONTOUR
- DIRECTION OF FLOW
- EXISTING R/W
- EXISTING EASEMENT
- EXISTING WOODS
- WATERS EDGE
- EXISTING WETLANDS
- WETLAND BOUNDARY
- RESTRICTED AREA TREES TO REMAIN
- SHALLOW SCRAPE
- NEW CHANNEL
- NEW CONTOUR
- NEW BOARDWALK
- NEW EARTH TRAIL
- TYPICAL SECTION LOCATION

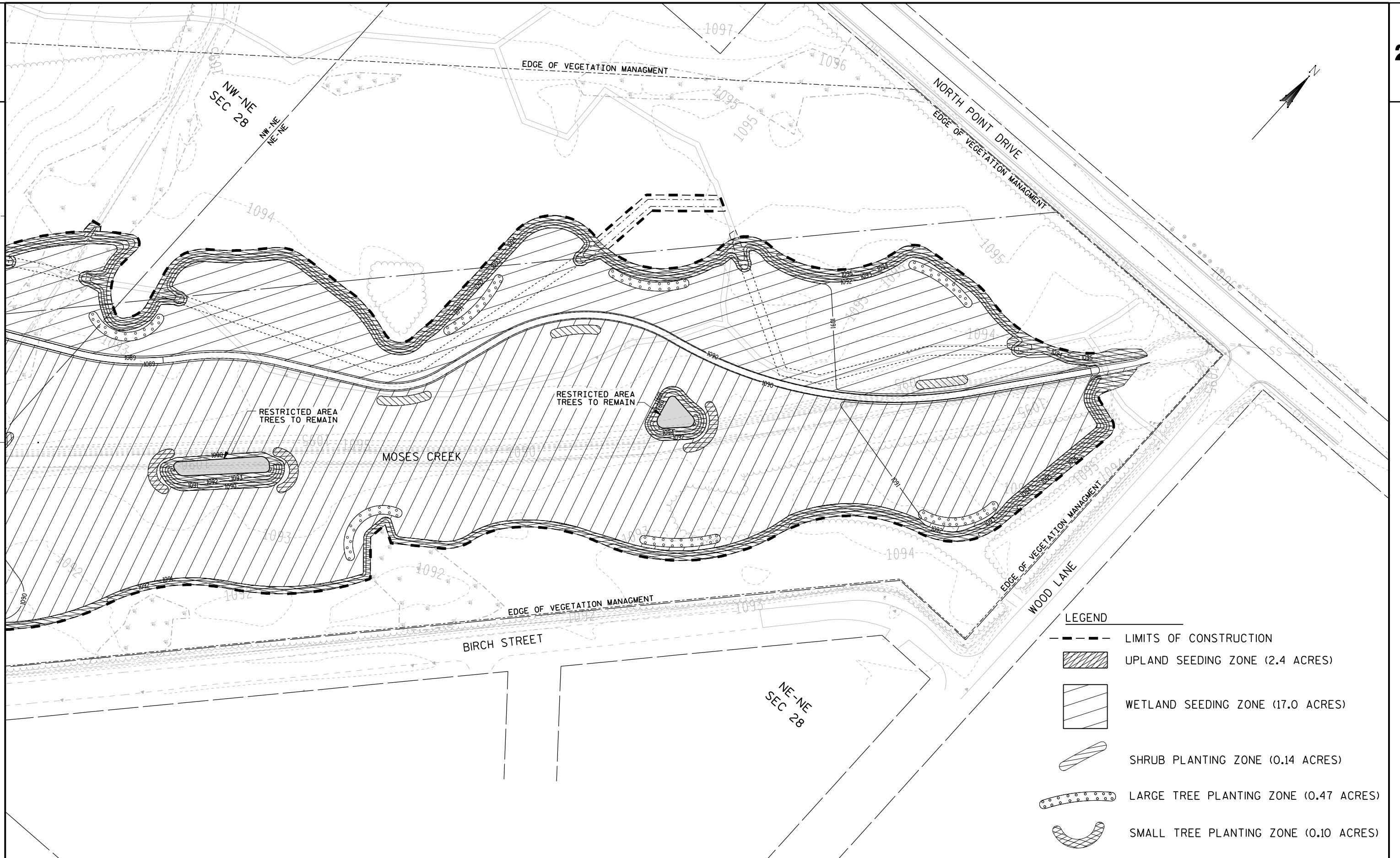
- LEGEND**
- LIMITS OF CONSTRUCTION
  - ▨ UPLAND SEEDING ZONE (2.4 ACRES)
  - ▧ WETLAND SEEDING ZONE (17.0 ACRES)
  - ◌ SHRUB PLANTING ZONE (0.14 ACRES)
  - ◌ LARGE TREE PLANTING ZONE (0.47 ACRES)
  - ◌ SMALL TREE PLANTING ZONE (0.10 ACRES)



PROJECT NO: 6351-01-74	COUNTY: PORTAGE	LANDSCAPE PLAN 1	SHEET
HWY: MOSES CREEK MITIGATION		E	



- LEGEND**
-  LIMITS OF CONSTRUCTION
  -  UPLAND SEEDING ZONE (2.4 ACRES)
  -  WETLAND SEEDING ZONE (17.0 ACRES)
  -  SHRUB PLANTING ZONE (0.14 ACRES)
  -  LARGE TREE PLANTING ZONE (0.47 ACRES)
  -  SMALL TREE PLANTING ZONE (0.10 ACRES)



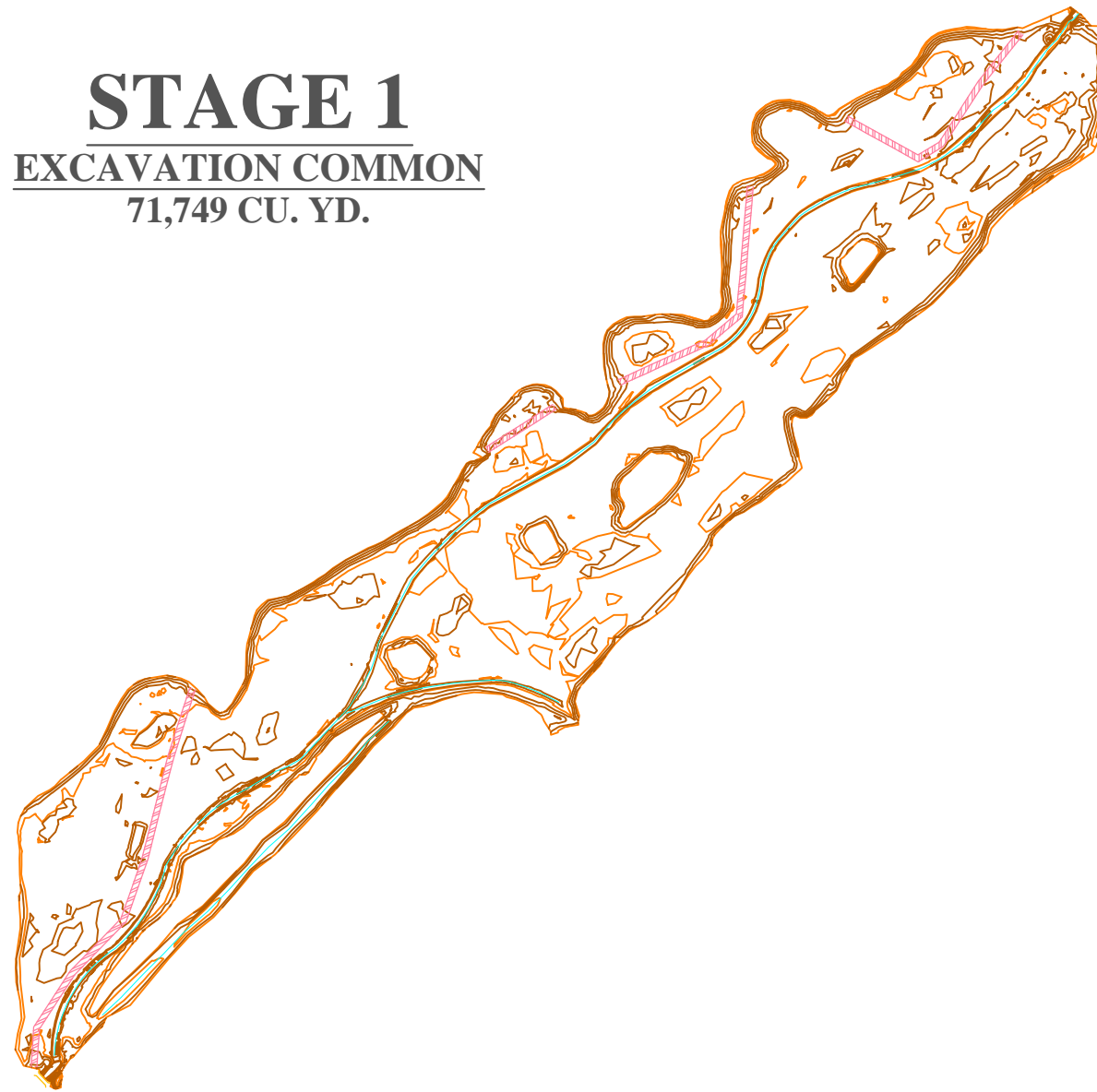
- LEGEND**
- LIMITS OF CONSTRUCTION
  - UPLAND SEEDING ZONE (2.4 ACRES)
  - WETLAND SEEDING ZONE (17.0 ACRES)
  - SHRUB PLANTING ZONE (0.14 ACRES)
  - LARGE TREE PLANTING ZONE (0.47 ACRES)
  - SMALL TREE PLANTING ZONE (0.10 ACRES)

2

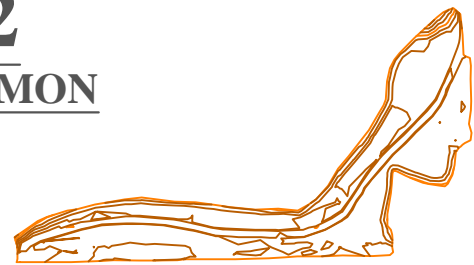
2



**STAGE 1**  
EXCAVATION COMMON  
 71,749 CU. YD.



**STAGE 2**  
EXCAVATION COMMON  
 6,265 CU. YD.



STAGE 1 = 71,749 CU. YD.  
 STAGE 2 = 6,265 CU. YD.  
**TOTAL = 78,014 CU. YD.**

1' CONTOURS



SURVEYED BY: ACR  
 METHOD: GPS  
 DATE: 12-14-2010  
 COMPUTED BY: KFS  
 METHOD: CIVIL 3D  
 DATE: 01-24-2011

**B.2.2 Wetland Seeding Zone Mix. Seed mix (17 total acres).**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Total Ounces</b>
<i>Andropogon gerardi</i>	Big Bluestem	758.0
<i>Calamagrostis canadensis</i>	Blue Joint Grass	6.0
<i>Elymus virginicus</i>	Virginia Wild Rye	90.0
<i>Glyceria grandis</i>	Reed Mana Grass	79.0
<i>Leersia oryzoides</i>	Rice Cutgrass	34.0
<i>Panicum virgatum</i>	Switch Grass	376.0
<i>Spartina pectinata</i>	Prairie Cord Grass	115.0
<i>Carex bebbii</i>	Bebb's Sedge	48.0
<i>Carex stipata</i>	Common Fox Sedge	116.0
<i>Carex vulpinoidea</i>	Brown Fox Sedge	42.0
<i>Juncus torreyi</i>	Torrey's Rush	5.0
<i>Scirpus atrovirens</i>	Dark-Green Bullrush	36.0
<i>Scirpus cyperinus</i>	Wool Grass	13.0
<i>Scirpus validus</i>	Softstem Bulrush	75.0
<i>Acorus calamus</i>	Sweet Flag	72.0
<i>Alisma subcordatum</i>	Mud Plantain	32.0
<i>Asclepias incarnata</i>	Marsh Milkweed	75.0
<i>Aster puniceus</i>	Red-Stemmed Aster	5.0
<i>Aster novae-angliae</i>	New England Aster	37.0
<i>Aster sagittifolius</i>	Arrow-Leaved Aster	25.0
<i>Eupatorium maculatum</i>	Spotted Joe Pye Weed	14.0
<i>Eupatorium perfoliatum</i>	Boneset	7.0
<i>Helenium autumnale</i>	Sneezeweed	18.0
<i>Lobelia siphilitica</i>	Great Blue Lobelia	2.0
<i>Lycopus americanus</i>	Water Horehound	12.0
<i>Monarda fistulosa</i>	Wild Bergamot	22.0
<i>Penthorum sedoides</i>	Ditch Stonecrop	1.0
<i>Pycnanthemum virginianum</i>	Mountain Mint	13.0
<i>Solidago graminifolia</i>	Grass-Leaved Goldenrod	3.0
<i>Verbena hastata</i>	Blue Vervain	25.0
<i>Vernonia fasciculata</i>	Ironweed	32.0
	<b>Nurse Crop</b>	<b>Total lbs</b>
<i>Avena sativa</i>	Common Oats	850
<i>Lolium sp.</i>	Annual Rye	85

**B.2.3 Upland Seeding Zone Mix (2.4 total acres).**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Total Ounces</b>
<i>Andropogon gerardi</i>	Big Bluestem	175.0
<i>Andropogon scoparius</i>	Little Bluestem	105.0
<i>Elymus canadensis</i>	Canada Wild Rye	260.0
<i>Panicum virgatum</i>	Switch Grass	87.0
<i>Sorghastrum nutans</i>	Indian Grass	163.0

<b>Scientific Name</b>	<b>Common Name</b>	<b>Total Ounces</b>
<i>Sporobolus cryptandrus</i>	Sand Dropseed	7.0
<i>Agastache foeniculum</i>	Lavender Hyssop	3.0
<i>Aster azureus</i>	Sky Blue Aster	4.0
<i>Aster novae-angliae</i>	New England Aster	4.0
<i>Heliopsis helianthoides</i>	Early Sunflower	40.0
<i>Monarda fistulosa</i>	Wild Bergamot	4.0
<i>Ratibida pinnata</i>	Yellow Coneflower	7.0
<i>Rudbeckia hirta</i>	Black-Eyed Susan	3.0
<i>Rudbeckia subtomentosa</i>	Sweet Black-Eyed Susan	6.0
<i>Rudbeckia triloba</i>	Brown Eyed Susan	15.0
<i>Solidago rigida</i>	Stiff Goldenrod	6.0
<i>Verbena stricta</i>	Hoary Vervain	10.0
<i>Vernonia fasciculata</i>	Ironweed	5.0
<i>Astragalus canadensis</i>	Canada Milk Vetch	15.0
<i>Cassia fasciculata</i>	Partridge Pea	80.0
<i>Petalostemum purpeum</i>	Purple Prairie Clover	11.0

	<b>Nurse Crop</b>	<b>Total lbs</b>
<i>Avena sativa</i>	Common Oats	119
<i>Lolium sp.</i>	Annual Rye	12

### **C (Vacant)**

### **D Measurement**

The department will measure Seed Mix, meeting the required PLS germination rate, by actual acres of native seed placed. Separate measurement will be made for Seeding Temporary under bid Item 630.0200.

### **E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

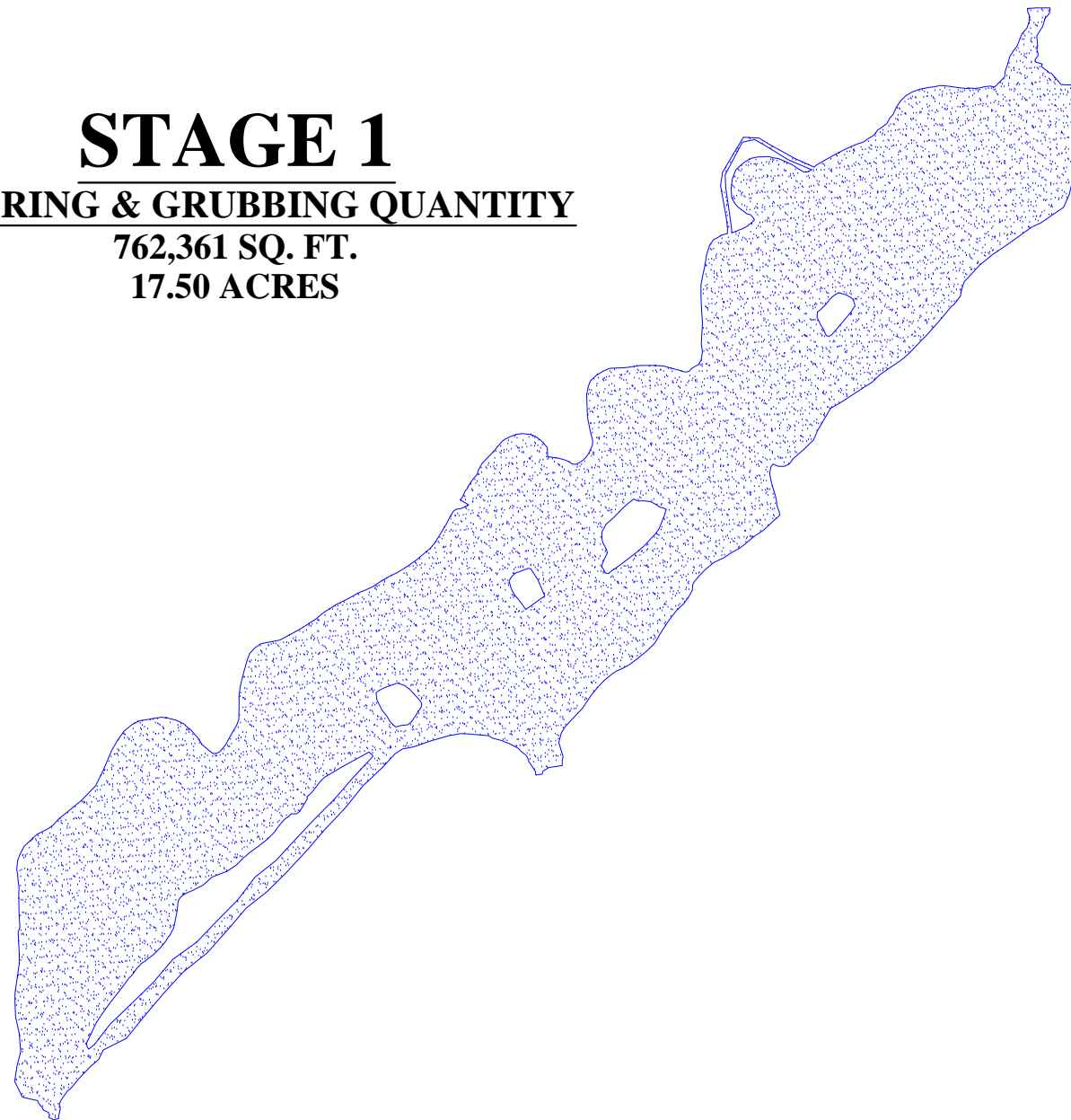
ITEM NUMBER	DESCRIPTION	UNIT
SPV.0005.02	Wetland Seeding Zone Mix	ACRE
SPV.0005.03	Upland Seeding Zone Mix	ACRE

Payment is full compensation for furnishing and delivering native seed and seeding temporary to the project site; providing seed samples and germination data; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the contract work.

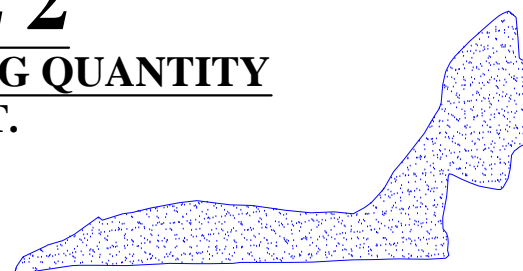




**STAGE 1**  
CLEARING & GRUBBING QUANTITY  
 762,361 SQ. FT.  
 17.50 ACRES



**STAGE 2**  
CLEARING & GRUBBING QUANTITY  
 88,698 SQ. FT.  
 2.04 ACRES



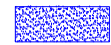
STAGE 1 = 17.50 ACRES  
 STAGE 2 = 2.04 ACRES

**TOTAL = 19.54 ACRES**

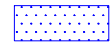


SURVEYED BY: ACR  
 METHOD: GPS  
 DATE: 12-14-2010  
 COMPUTED BY: KFS  
 METHOD: CIVIL 3D  
 DATE: 01-13-2011

# STAGE 1 SEEDING QUANTITIES



UPLAND SEEDING = 10,996 SQ. YD.  
= 2.27 ACRES

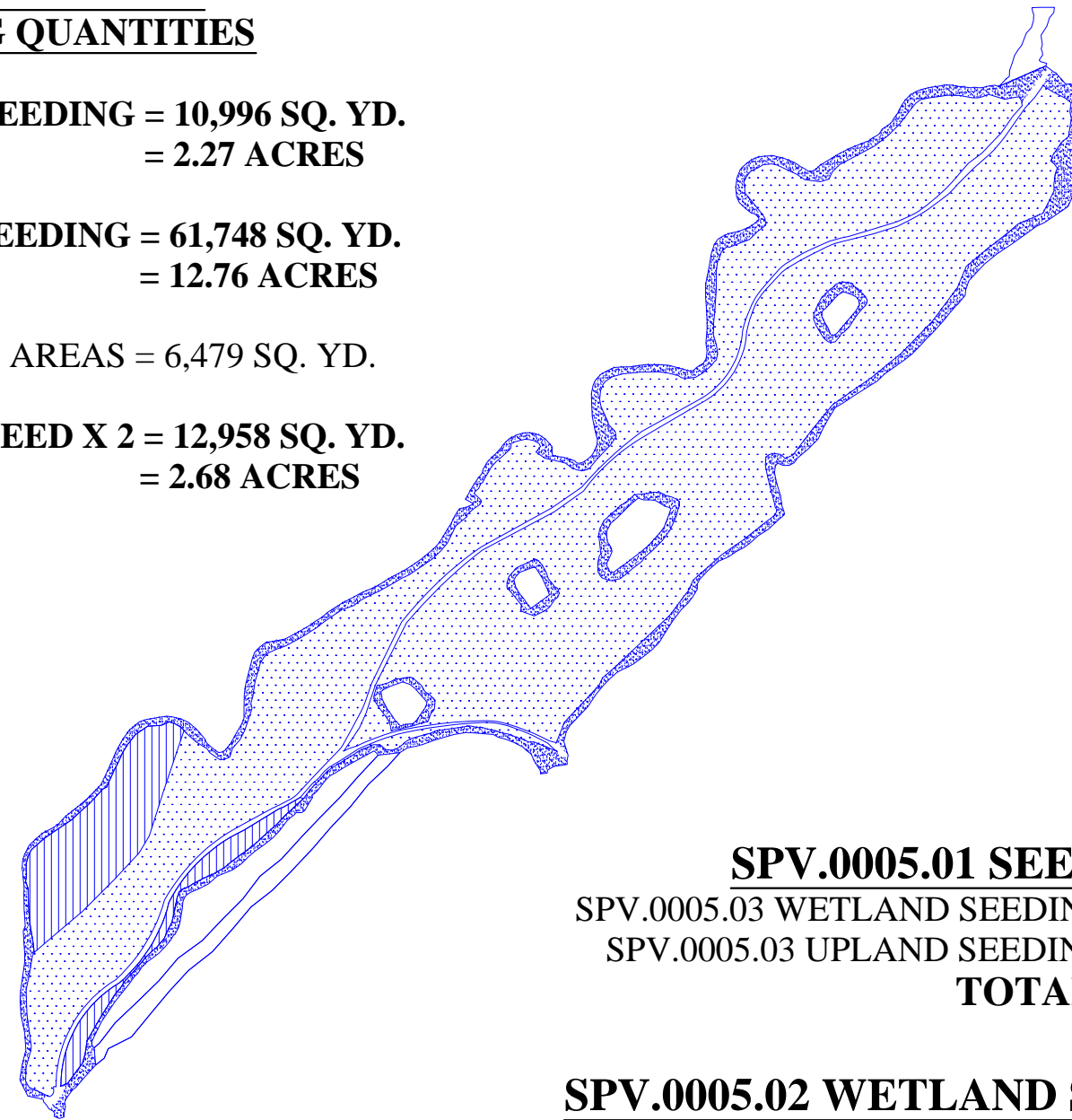


WETLAND SEEDING = 61,748 SQ. YD.  
= 12.76 ACRES



RE-SEEDED AREAS = 6,479 SQ. YD.

WETLAND RE-SEED X 2 = 12,958 SQ. YD.  
= 2.68 ACRES

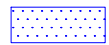


**NOTE:** ON 9-27-2010 KEVIN GARRIGAN (WISDOT PROJECT MANAGER) DIRECTED TO HAVE THE AREAS RE-SEEDED THAT HAD BEEN PREVIOUSLY SEEDED PRIOR TO THE 100 YEAR FLOOD ON 9-24-2010

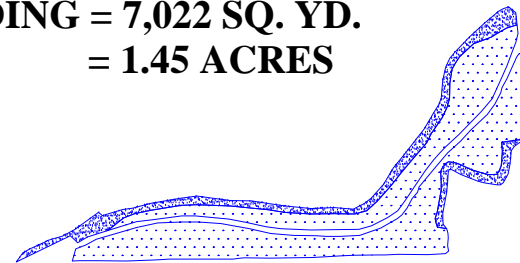
# STAGE 2 SEEDING QUANTITIES



UPLAND SEEDING = 1,728 SQ. YD.  
= 0.36 ACRES



WETLAND SEEDING = 7,022 SQ. YD.  
= 1.45 ACRES



## SPV.0005.01 SEEDING

SPV.0005.03 WETLAND SEEDING = 16.89 ACRES

SPV.0005.03 UPLAND SEEDING = 2.63 ACRES.

**TOTAL = 19.52 ACRES**

## SPV.0005.02 WETLAND SEEDING

STAGE 1 = 12.76 ACRES

RE-SEED X2 STAGE 1 = 2.68 ACRES

STAGE 2 = 1.45 ACRES

**TOTAL = 16.89 ACRES**

## SPV.0005.03 UPLAND SEEDING

STAGE 1 = 2.27 ACRES



STAGE 2 = 0.36 ACRES

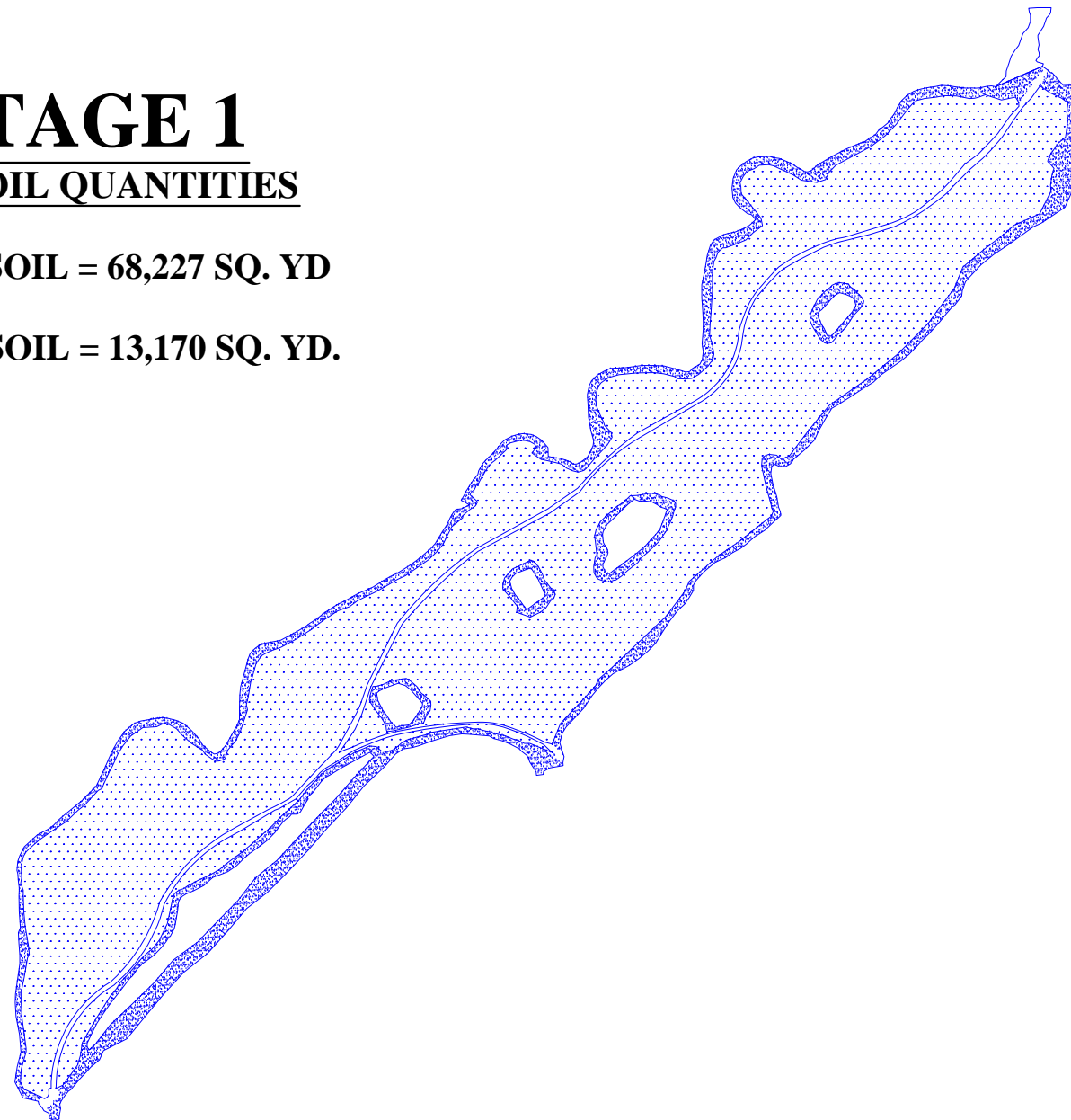
**TOTAL = 2.63 ACRES**



SURVEYED BY: ACR  
METHOD: GPS  
DATE: 12-14-2010  
COMPUTED BY: KFS  
METHOD: CIVIL 3D  
DATE: 01-18-2011

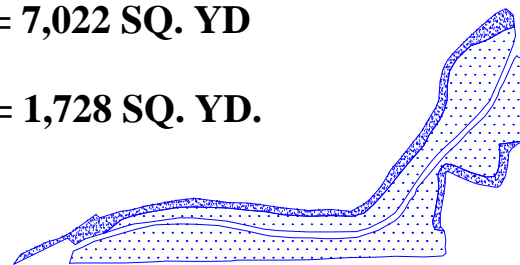
# STAGE 1 TOPSOIL QUANTITIES

-  10" TOPSOIL = 68,227 SQ. YD
-  6" TOPSOIL = 13,170 SQ. YD.



# STAGE 2 TOPSOIL QUANTITIES

-  10" TOPSOIL = 7,022 SQ. YD
-  6" TOPSOIL = 1,728 SQ. YD.



## 6" TOPSOIL QUANTITY

STAGE 1 = 13,170 SQ. YD.  
 STAGE 2 = 1,728 SQ. YD.  
**TOTAL = 14,898 SQ. YD.**

## 10" TOPSOIL QUANTITY

STAGE 1 = 68,227 SQ. YD.  
 STAGE 2 = 7,022 SQ. YD.  
**TOTAL = 75,249 SQ. YD.**



SURVEYED BY: ACR  
 METHOD: GPS  
 DATE: 12-14-2010  
 COMPUTED BY: KFS  
 METHOD: CIVIL 3D  
 DATE: 01-17-2011

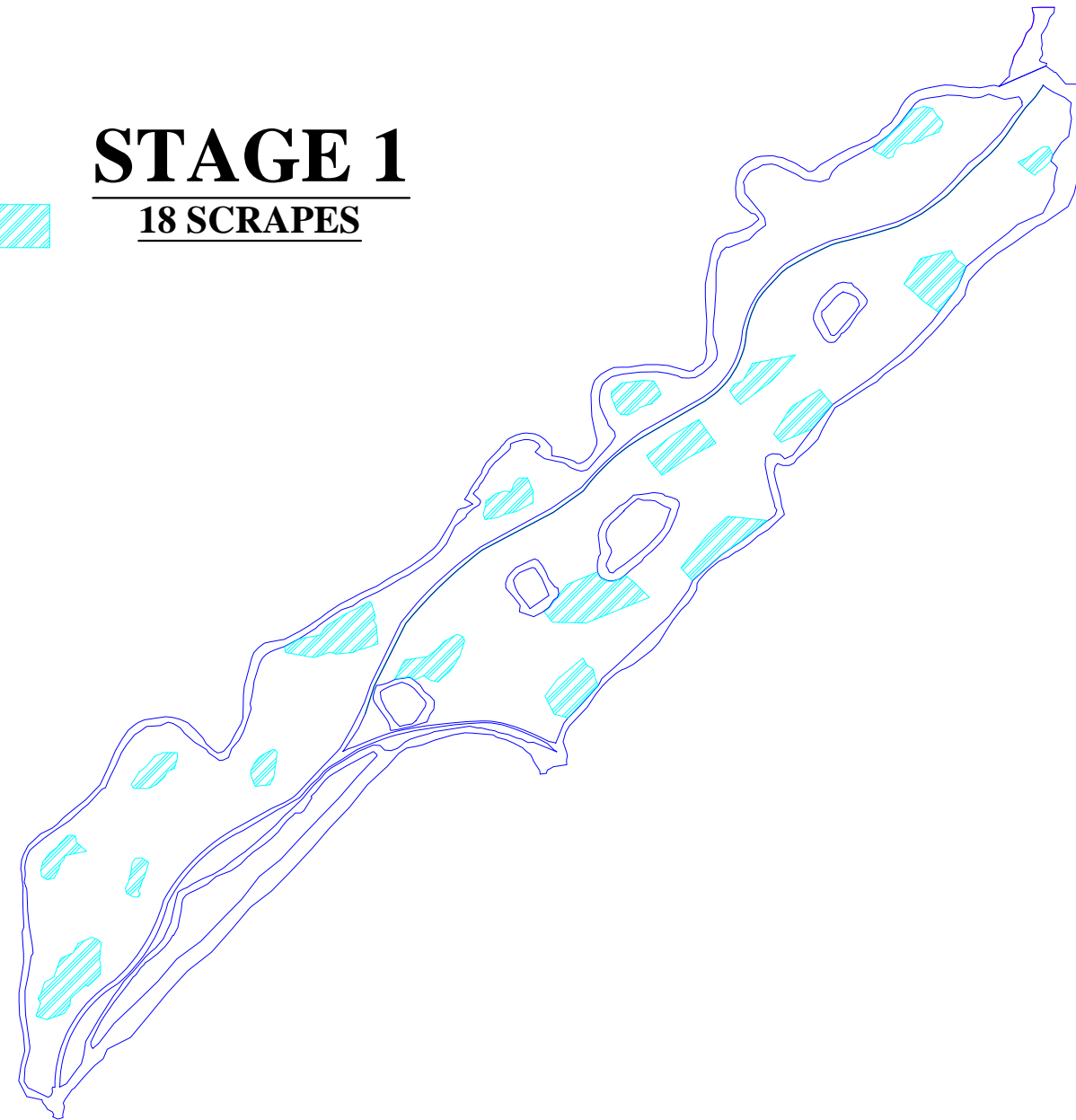
2

2



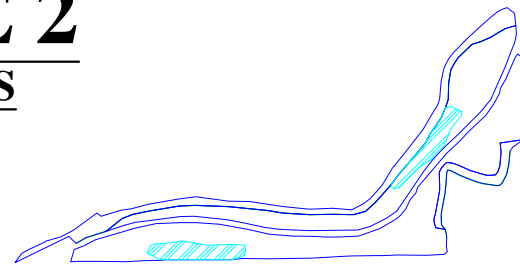
# STAGE 1

18 SCRAPES



# STAGE 2

2 SCRAPES



STAGE 1 = 18 SCRAPES  
STAGE 2 = 2 SCRAPES  
**TOTAL = 20 SCRAPES**



SURVEYED BY: ACR  
METHOD: GPS  
DATE: 12-14-2010  
COMPUTED BY: KFS  
METHOD: CIVIL 3D  
DATE: 01-13-2011

## **Appendix C**

### **Vegetation Data**

- **Comprehensive Plant Species List**
- **Vegetation Sample Plot Map**
- **Vegetation Monitoring Plot Data**
- **Floristic Quality Assessment Tables**

## Moses Creek Mitigation Site, 2011

### Comprehensive Plant Species List

Janet Smith, Kelsey Reimann, Rochelle Hayes, WisDOT

R. Freckman, J. Cook, M. Vine, UW-Stevens Point

Scientific Name	Common Name	Coefficient of Conservatism	Native
<i>Abutilon throprasti</i>	Velvetleaf		
<i>Acer rubrum</i>	Red maple	3	x
<i>Achillea millefolium</i>	Yarrow	1	x
<i>Agrostis gigantea</i>	Redtop		
<i>Agrostis hyemalis</i>	Winter bentgrass	4	x
<i>Alisma plantago-aquatica</i>	Northern water plantain	4	x
<i>Alisma subcordatum</i>	Water plantain	3	x
<i>Alnus incana</i>	Tag alder	4	x
<i>Alopecurus carolinianus</i>	Carolina foxtail		
<i>Amaranthus blitum</i>	Common amaranth		
<i>Ambrosia artemisiifolia</i>	Common ragweed	0	x
<i>Apocynum androsaemifolium</i>	Spreading dogbane	2	x
<i>Artemisia campestris</i>	Field wormwood	4	x
<i>Asclepias incarnata</i>	Marsh milkweed	5	x
<i>Aster novae-angliae</i>	New England aster	3	x
<i>Betula papyrifera</i>	Paper birch	3	x
<i>Bidens connatus</i>	Purple stemmed beggarticks	6	x
<i>Bidens frondosus</i>	Devil's beggarticks	1	x
<i>Calystegia sepium</i>	Bindweed	2	x
<i>Carex bebbii</i>	Bebb's sedge	4	x
<i>Carex pensylvanica</i>	Pennsylvania sedge	3	x
<i>Chamaecrista fasciculata</i>	Partridge pea	3	x
<i>Chenopodium album</i>	Lamb's quarters	0	x
<i>Cicuta maculata</i>	Spotted water hemlock	6	x
<i>Comptonia peregrina</i>	Sweet fern	4	x
<i>Conyza canadensis</i>	Canadian horseweed	0	x
<i>Cyperus strigosus</i>	False nut sedge	1	x
<i>Danthonia spicata</i>	Poverty oat grass	4	x
<i>Dicanthelium acuminatum</i>	Hairy panic grass	5	x
<i>Didiplis diandra</i>	Water purslane	5	x
<i>Digitaria sanguinalis</i>	Hairy crabgrass		
<i>Echinochloa crus-galli</i>	Barn yard grass		

<i>Eleocharis erythropoda</i>	Bald spike rush	3	x
<i>Eleocharis obtusa</i>	Blunt spike rush	3	x
<i>Epilobium ciliatum</i>	American willow herb	3	x
<i>Eragrostis minor</i>	Little lovegrass		
<i>Erechtites hieracifolia</i>	Burnweed	2	x
<i>Equisetum arvense</i>	Field horsetail	1	x
<i>Eupatorium maculatum</i>	Spotted Joe Pye weed	4	x
<i>Eupatorium perfoliatum</i>	Boneset	6	x
<i>Festuca arundinacea</i>	Annual rye grass		
<i>Fragaria virginiana</i>	Wild strawberry	1	x
<i>Gaultheria procumbens</i>	Wintergreen	6	x
<i>Gaylussacia baccata</i>	Black huckleberry	6	x
<i>Geranium carolinianum</i>	Carolina geranium	3	x
<i>Glyceria grandis</i>	American manna grass	6	x
<i>Gnaphalium obtusifolium</i>	Fragrant cudweed	3	x
<i>Gratiola neglecta</i>	Clammy hedge hyssop	5	x
<i>Helianthus sp.</i>	Sunflower	4	x
<i>Hieracium aurantiacum</i>	Orange hawkweed		
<i>Hieracium kalmii</i>	Canada hawkweed	5	x
<i>Hypericum canadense</i>	St. John's wort	7	x
<i>Hypericum majus</i>	Larger Canadian St. John's wort	5	x
<i>Impatiens capensis</i>	Jewelweed (Touch me not)	2	x
<i>Juncus brevicaudatus</i>	Narrow panicle rush	6	x
<i>Juncus canadensis</i>	Canada rush	7	x
<i>Juncus dudleyi</i>	Dudley's rush	4	x
<i>Juncus effusus</i>	Soft rush	4	x
<i>Juncus pelocarpus</i>	Brown fruited rush	8	x
<i>Juncus tenuis</i>	Path (Poverty) rush	1	x
<i>Juncus torreyi</i>	Torrey's rush	4	x
<i>Leersia oryzoides</i>	Rice cut grass	3	x
<i>Ludwigia palustris</i>	Marsh seedbox	4	x
<i>Lycopus americanus</i>	American water horehound	4	x
<i>Maianthemum canadense</i>	Canada mayflower	5	x
<i>Medicago lupulina</i>	Black medick		
<i>Menarda fistulosa</i>	Wild bergamot		x
<i>Mimulus ringens</i>	Monkey flower	6	x
<i>Mollugo verticillata</i>	Carpetweed		
<i>Onoclea sensibilis</i>	Sensitive fern	5	x
<i>Osmunda regalis</i>	Royal fern	7	x
<i>Oxalis corniculata</i>	Wood sorrell		
<i>Panicum longifolium</i>	Panic grass		x

<i>Panicum virgatum</i>	Switch grass	4	x
<i>Penthorum sedoides</i>	Ditch stonecrop	3	x
<i>Persicaria maculata</i>	Spotted (lady's thumb) smartweed		
<i>Persicaria punctatum</i>	Dotted smartweed	5	x
<i>Phalaris arundinacea</i>	Reed canary grass		
<i>Pilea pumila</i>	Canadian clearweed	3	x
<i>Pinus resinosa</i>	Red pine	7	x
<i>Pinus strobus</i>	White pine	5	x
<i>Plantago major</i>	Common plantain		
<i>Poa palustris</i>	Marsh bluegrass	5	x
<i>Poa pratensis</i>	Kentucky bluegrass		
<i>Polygala sanguinea</i>	Purple milkwort	5	x
<i>Polygonum amphibium</i>	Water smartweed	5	x
<i>Polygonum careyi</i>	Carey's knotweed	6	x
<i>Polygonum hydropiper</i>	Water pepper		
<i>Polygonum lapathifolium</i>	Dock leaved smartweed	2	x
<i>Polygonum pensylvanicum</i>	Pinkweed	1	x
<i>Polygonum sagittatum</i>	Arrow leaved tearthumb	6	x
<i>Polygonum scandens</i>	Climbing false buckwheat	3	x
<i>Polypogon monspeliensis</i>	Annual rabbit's foot grass		
<i>Populus deltoides</i>	Cottonwood	2	x
<i>Populus tremuloides</i>	Quaking aspen	2	x
<i>Portulaca oleracaea</i>	Purslane		
<i>Potentilla norvegica</i>	Norwegian cinquefoil	0	x
<i>Potentilla simplex</i>	Common cinquefoil	2	x
<i>Prunus serotina</i>	Black cherry	3	x
<i>Pteridium aquilinum</i>	Bracken fern	2	x
<i>Quercus alba</i>	White oak	7	x
<i>Quercus ellipsoidalis</i>	Pin oak	5	x
<i>Quercus macrocarpa</i>	Bur oak	5	x
<i>Quercus rubra</i>	Red oak	5	x
<i>Ranunculus pensylvanicus</i>	Bristly crowfoot	5	x
<i>Ratibida pinnata</i>	Pinnate prairie coneflower	4	x
<i>Rhamnus cathartica</i>	Common buckthorn		
<i>Rhamnus frangula</i>	Glossy buckthorn		
<i>Rorippa palustris</i>	Marsh cress	3	x
<i>Rubus allegheniensis</i>	Common blackberry	2	x
<i>Rubus hispidus</i>	Swamp dewberry	4	x
<i>Rubus idaeus</i>	Red raspberry	3	x
<i>Rudbeckia hirta</i>	Black eyed susan	4	x
<i>Rumex crispus</i>	Common sheep sorrel		

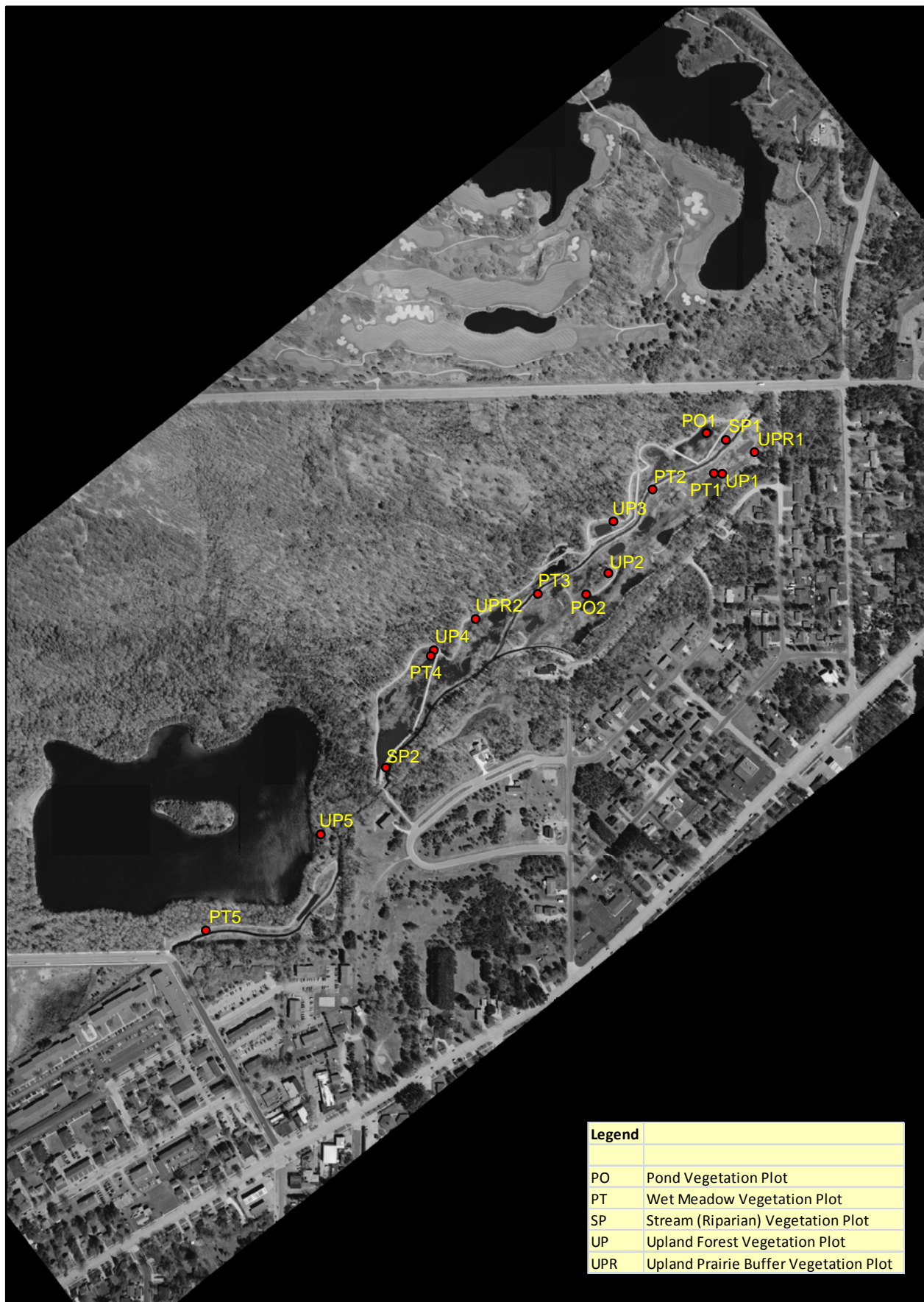


<i>Scirpus atrovirens</i>	Dark green bulrush	3	x
<i>Scirpus cyperinus</i>	Wool grass	4	x
<i>Scirpus validus</i>	Softstem bulrush		x
<i>Setaria faberi</i>	Nodding foxtail		
<i>Setaria glauca</i>	Yellow foxtail		
<i>Silene latifolia</i>	White campion		
<i>Siparis astrigesus</i>	Nutsedge		x
<i>Solidago canadensis</i>	Canada goldenrod	1	x
<i>Solidago graminifolia</i>	Grass leaved goldenrod		x
<i>Sporobolis cryptandrus</i>	Sand dropseed	3	x
<i>Stachys palustris</i>	Marsh hedge nettle	5	x
<i>Trientalis borealis</i>	Starflower	7	x
<i>Trifolium hybridum</i>	Alsike clover		
<i>Trifolium pratense</i>	Red clover		
<i>Trifolium procumbens</i>	Low hop clover		
<i>Trifolium repens</i>	White clover		
<i>Typha angustifolia</i>	Narrow leaved cattail		
<i>Typha latifolia</i>	Broad leaved cattail	1	x
<i>Ulmus americana</i>	American elm	3	x
<i>Vaccinium angustifolium</i>	Black huckleberry	4	x
<i>Verbena hastata</i>	Blue (Swamp) vervain	3	x
<i>Verbascum thapsis</i>	Common mullein		

<b><u>FQI Calculations</u></b>	<b>Native Species Only</b>	<b>All Species</b>
<b>Species Richness</b>	105	136
<b>Mean C Value</b>	3.57	2.76
<b>FQI</b>	36.58	28.28

# Moses Creek Vegetation Monitoring Points

2011



1:8,000





Department of Transportation Wetland Monitoring Sheet

Project Location & ID #: Moses Creek 6531-01-04/74 Date: 8/3/11

Observer(s): Rochelle Hayes, Kelsey Reimann, Janet Smith Weather Conditions: 75 degrees, sunny

Point Type & Number PT1 Sample Strategy 5' radius plot

Vegetation Sampling

Community	Genus	Species	Common Name	% Cover	Indicator Status
<b>Wet Meadow</b>					
Herbaceous	Juncus	tenuis	Path rush	60	FAC*
	Rorippa	palustris	Water cress	15	OBL
	Sporobolis	cryptandrus	Sand dropseed	8	FACU
	Scirpus	cyperinus	Wool grass	5	OBL
	Scirpus	atrovirens	Dark-green bulrush	2	OBL
	Ambrosia	artemesiifolia	Common ragweed	2	FACU
	Persicaria	punctatum	Dotted smartweed	2	OBL
	Persicaria	maculata	Lady's thumb	2	FACW
	Gratiola	neglecta	Clammy hedge-hyssop	2	OBL
	Leersia	oryzoides	Rice cutgrass	2	OBL
	Potentilla	norvegica	Norwegian cinquefoil	1	FAC
	Verbena	hastata	Blue vervain	1	FACW
	Amaranthus	blitum	Common amaranth	1	UPL
	Oxalis	corniculata	Wood sorrell	1	FACU
	Calystegia	sepium	Bindweed	1	FAC
	Echinochloa	crus-galli	Barnyard grass	1	FACW
	Plantago	major	Common plantain	1	FAC
	Aster	novae-angliae	New England aster	1	FACW
	Polygonum	careyi	Carey's knotweed	1	FACW
	Hypericum	canadense	St. John's wort	1	FACW
	Trifolium	repens	White clover	1	FACU
	Siparis	astrigesus	Nutsedge	1	FACW
	Asclepias	incarnata	Marsh milkweed	1	OBL
	Trifolium	procumbens	Low hop-clover	1	FACU
	Populus	tremuloides	Quaking aspen	1	FAC

\*= dominant species











Department of Transportation Wetland Monitoring Sheet

Project Location & ID #: Moses Creek 6531-01-04/74 Date: 8/3/11

Observer(s): Rochelle Hayes, Kelsey Reimann, Janet Smith Weather Conditions: 75 degrees, sunny

Point Type & Number SP1 Sample Strategy 3' x 10' long (rectangle along creek bank)

Vegetation Sampling

Community	Genus	Species	Common Name	% Cover	Indicator Status
RPE Stream Bank					
Herbaceous	Eleocharis	obtusa	Blunt spike-rush	50	OBL*
	Festuca	arundinacea	Annual rye grass	30	FACU*
	Didiplis	diandra	Water purslane	15	OBL
	Leersia	oryzoides	Rice cutgrass	15	OBL
	Typha	latifolia	Broad-leaved cattail	8	OBL
	Alisma	plantago-aquatica	Water plantain	4	OBL
	Scirpus	validus	Softstem bulrush	3	OBL
	Sporobolus	cryptandrus	Sand dropseed	2	FACU
	Carex	bebbii	Bebb's sedge	2	OBL
	Persecaria	hydropiper	Marsh pepper knotweed	2	OBL
	Bidens	connata	Wild purplestem beggarticks	1	OBL
	Mimuslus	ringens	Monkey flower	1	OBL
	Alnus	incana	Tag alder	1	FACW
	Bidens	frondosa	Devil's beggartick	1	FACW
	Juncus	tenuis	Path rush	1	FAC
	Epilobium	ciliatum	Purpleleaf willow herb	1	FACU
	Polygonum	amphibium	Water smartweed	1	OBL
	Juncus	dudleyi	Dudley's rush	1	FAC
	Ranunculus	pensylvanicus	Bristly crowsfoot	1	OBL

\*= dominant species















Project Location & ID #: Moses Creek 6531-01-04/74 Date: 8/9/11

Observer(s): Rochelle Hayes, Kelsey Reimann, Janet Smith Weather Conditions: 70 degrees, partly sunny

Point Type & Number UPR1 Sample Strategy 5' radius (upland prairie buffer)

**Herbaceous Vegetation Sampling**

Community	Genus	Species	Common Name	% Cover	Indicator Status
<b>Upland Prairie</b>					
Herbaceous	Trifolium	hybridum	Alsike clover	15	FAC*
	Ambrosia	artemesiifolia	Common Ragweed	15	FACU*
	Alopecurus	carolinianus	Foxtail spp.	5	FACW*
	Chamaecrista	fasciculata	Partridge Pea	4	FACU*
	Panicum	virgatum	Switchgrass	4	FAC*
	Solidago	canadensis	Canada Goldenrod	3	FACU*
	Chenopodium	album	Lamb's quarters	3	FAC*
	Medicago	lupulina	Black medick	3	FAC*
	Rorippa	palustris	Water cress	3	OBL*
	Panicum	longifolium	Panic grass	3	OBL*
	Plantago	major	Upland Plantain	2	FAC
	Echinochloa	crus-galli	Barnyardgrass	2	FACW
	Potentilla	simplex	Common cinquefoil	2	FACU
	Rudbeckia	hirta	Black-eyed susan	2	FACU
	Fragaria	virginiana	Strawberry	1	FAC
	Achillea	millefolium	Yarrow	1	FACU
	Hypericum	canadense	St. Johnswort	1	UPL
	Silene	latifolia	White campion	1	UPL
	Oxalis	corniculata	Wood sorrel	1	FACU
	Festuca	arundinacea	Annual rye grass	1	FACU
	Sporobolus	cryptandrus	Sand dropseed	1	UPL
	Eupatorium	perfoliatum	Boneset	1	FACW
	Conyza	canadensis	Canadian horseweed	1	FAC
	Lycopus	americanus	American Water hoarhound	1	OBL
	Mollugo	verticillata	Carpetweed	1	FAC
	Rhamnus	cathartica	Common buckthorn	1	FACU
	Polygonum	pennsylvanicum	Pinkweed	1	FACW
	Polygonum	hydropiper	Water pepper	1	OBL
	Trifolium	pratense	Red clover	1	FACU
	Aster	novae-angliae	New England Aster	1	FACW
	Menarda	fistulosa	Wild Bergamot	1	FACU
	Verbascum	thapsis	Common Mullein	1	FACU
	Juncus	tenuis	Path rush	1	FAC
	Epilobium	ciliatum	Narrow-leaf willow herb	1	FACU
	Comptonia	peregrina	Sweet fern	1	UPL

\*= dominant species



Vegetation Sample Plot Summary Table

Scientific Name	Common Name	Coefficient of Conservatism	Native	Mapped Comm. Community Type	Wetland Coefficient	PO1	PO2	PT1	PT2	PT3	PT4	PT5	SP1	SP2	UP1	UP2
						RPE	RPE	M	M	M	M	M	RPE	RPE	UPL	UPL
Abutilon throprasti	Velvetleaf			FACU												
Acer rubrum	Red maple	3	x	NI												1
Achillea millefolium	Yarrow	1	x	FACU												2
Agrostis gigantea	Redtop			NI												
Agrostis hyemalis	Winter bentgrass	4	x	FAC							1					
Alisma plantago-aquatica	Northern water plantain	4	x	OBL	2	2					1	4	1	2		
Alisma subcordatum	Water plantain	3	x	OBL												
Alnus incana	Tag alder	4	x	OBL												
Alopecurus carolinianus	Carolina foxtail			FACW												
Amaranthus blitum	Common amaranth			NI				1								
Ambrosia artemisiifolia	Common ragweed	0	x	FACU				1								
Apocynum androsaemifolium	Spreading dogbane	2	x	UPL												
Artemisia campestris	Field wormwood	4	x													
Asclepias incarnata	Marsh milkweed	5	x	OBL				1			1					
Aster novae-angliae	New England aster	3	x	FACW				1								
Betula papyrifera	Paper birch	3	x	FACU												1
Bidens connatus	Purple stemmed beggarticks	6	x	OBL									1			
Bidens frondosus	Devil's beggarticks	1	x	FACW												
Calystegia sepium	Bindweed	2	x	FAC				1				1				
Carex bebbii	Bebb's sedge	4	x	OBL		2			2	2	2	1				
Carex pensylvanica	Pennsylvania sedge	3	x	UPL												2
Chamaecrista fasciculata	Partridge pea	3	x	FACU												
Chenopodium album	Lamb's quarters	0	x	FAC												
Cicuta maculata	Spotted water hemlock	6	x	OBL												
Comptonia peregrina	Sweet fern	4	x													
Coryza canadensis	Canadian horseweed	0	x	FAC												
Cyperus strigosus	False nut sedge	1	x	FACW							1					
Danthonia spicata	Poverty oat grass	4	x	FACW												1
Dicanthelium acuminatum	Hairy panic grass	5	x	FAC												
Didiplis diandra	Water purslane	5	x	OBL									2			
Digitaria sanguinalis	Hairy crabgrass			FACU												
Echinochloa crus-galli	Barn yard grass			FACW				1			2	1		1		
Eleocharis erythropoda	Bald spike rush	3	x	OBL												
Eleocharis obtusa	Blunt spike rush	3	x	OBL		2				2			4			
Epilobium ciliatum	American willow herb	3	x	FACU									1			
Eragrostis minor	Little lovegrass															
Erechtites hieracifolia	Burnweed	2	x	FACU												
Equisetum arvense	Field horsetail	1	x	FAC												
Eupatorium maculatum	Spotted Joe Pye weed	4	x	OBL												
Eupatorium perfoliatum	Boneset	6	x	FACW					1	1						
Festuca arundinacea	Annual rye grass			FACU									3			
Fragaria virginiana	Wild strawberry	1	x	FAC												
Gaultheria procumbens	Wintergreen	6	x	FACU												
Gaylussacia baccata	Black huckleberry	6	x	FACU												2
Geranium carolinianum	Carolina geranium	3	x													
Glyceria grandis	American manna grass	6	x													
Gnaphalium obtusifolium	Fragrant cudweed	3	x													
Gratiola neglecta	Clammy hedge hyssop	5	x	OBL				1								
Helianthus sp.	Sunflower	4	x	FAC												
Hieracium aurantiacum	Orange hawkweed															
Hieracium kalmii	Canada hawkweed	5	x													
Hypericum canadense	St. John's wort	7	x	FACW				1	1	1	1	1				
Hypericum majus	Larger Canadian St. John's wort	5	x	FACW												
Impatiens capensis	Jewelweed (Touch me not)	2	x	FACW												
Juncus brevicaudatus	Narrow panicle rush	6	x	OBL		3		1	3	3	1					
Juncus canadensis	Canada rush	7	x	OBL						1	2					
Juncus dudleyi	Dudley's rush	4	x										1			
Juncus effusus	Soft rush	4	x	OBL					1							
Juncus pelocarpus	Brown fruited rush	8	x	OBL		1										
Juncus tenuis	Path (Poverty) rush	1	x	FAC		4	4	2	4	4	3	1	2			
Juncus torreyi	Torrey's rush	4	x	FACW					1							
Leersia oryzoides	Rice cut grass	3	x	OBL		1	1	1	3			2	2	1		
Ludwigia palustris	Marsh seedbox	4	x	OBL		1					1		2			
Lycopus americanus	American water horehound	4	x	OBL												
Maianthemum canadense	Canada mayflower	5	x	FAC												1
Medicago lupulina	Black medick			FAC												
Menarda fistulosa	Wild bergamot		x													
Mimulus ringens	Monkey flower	6	x	OBL								1				
Mollugo verticillata	Carpetweed			FAC												
Onoclea sensibilis	Sensitive fern	5	x	FACW												
Osmunda regalis	Royal fern	7	x	OBL												1
Oxalis corniculata	Wood sorrell			FACU				1								
Panicum longifolium	Panic grass		x	OBL					1		1					
Panicum virgatum	Switch grass	4	x	FAC												
Penthorum sedoides	Ditch stonecrop	3	x	OBL								1				
Persicaria maculata	Spotted (lady's thumb) smartweed			FACW				1			1	1				
Persicaria punctatum	Dotted smartweed	5	x	OBL				1						1		
Phalaris arundinacea	Reed canary grass			FACW												
Pilea pumila	Canadian clearweed	3	x	FACW												
Pinus resinosa	Red pine	7	x	FACU												
Pinus strobus	White pine	5	x	FACU												1
Plantago major	Common plantain			FAC				1								
Poa palustris	Marsh bluegrass	5	x	FACW												
Poa pratensis	Kentucky bluegrass			FAC												2
Polygala sanguinea	Purple milkwort	5	x	FACU												
Polygonum amphibium	Water smartweed	5	x	OBL									1			
Polygonum careyi	Carey's knotweed	6	x	FACW					1							
Polygonum hydropiper	Water pepper			OBL							1		1			
Polygonum lapathifolium	Dock leaved smartweed	2	x	FACW												
Polygonum pensylvanicum	Pinkweed	1	x	FACW												
Polygonum sagittatum	Arrow leaved tearthumb	6	x	OBL		1										
Polygonum scandens	Climbing false buckwheat	3	x	FAC												
Polypogon monspeliensis	Annual rabbit's foot grass			OBL												
Populus deltoides	Cottonwood	2	x	FAC												2
Populus tremuloides	Quaking aspen	2	x	FAC				1								
Portulaca oleracea	Purslane			FAC												
Potentilla norvegica	Norwegian cinquefoil	0	x	FAC				1								
Potentilla simplex	Common cinquefoil	2	x	FACU		1			1	1	1	1				

**Vegetation Sample Plot Summary Table**

Scientific Name	Common Name	Coefficient of Conservatism	Native	Wetland Coefficient	Mapped Comm.	PO1	PO2	PT1	PT2	PT3	PT4	PT5	SP1	SP2	UP1	UP2
					Community Type	RPE	RPE	M	M	M	M	M	RPE	RPE	UPL	UPL
Prunus serotina	Black cherry	3	x	FACU												
Pteridium aquilinum	Bracken fern	2	x	FACU											5	
Quercus alba	White oak	7	x	FACU												
Quercus ellipsoidalis	Pin oak	5	x	UPL												3
Quercus macrocarpa	Bur oak	5	x	FAC												
Quercus rubra	Red oak	5	x	FACU												
Ranunculus pensylvanicus	Bristly crowfoot	5	x	OBL								1				
Ratibida pinnata	Pinnate prairie coneflower	4	x													
Rhamnus cathartica	Common buckthorn			FACU												
Rhamnus frangula	Glossy buckthorn			FAC				1	1						2	1
Rorippa palustris	Marsh cress	3	x	OBL				2								
Rubus allegheniensis	Common blackberry	2	x	FACU												
Rubus hispidus	Swamp dewberry	4	x	FACW												
Rubus idaeus	Red raspberry	3	x	FACW												
Rudbeckia hirta	Black eyed susan	4	x	FACU												
Rumex crispus	Common sheep sorrel			FAC												2
Scirpus atrovirens	Dark green bulrush	3	x	OBL		1	1	1	1			2				
Scirpus cyperinus	Wool grass	4	x	OBL		4	2	1	3	2						
Scirpus validus	Softstem bulrush		x	OBL		1				1	2	1				
Setaria faberi	Nodding foxtail			FACU												
Setaria glauca	Yellow foxtail			FAC						1						
Silene latifolia	White campion															
Siparis astrigesus	Nutsedge		x	FACW			1									
Solidago canadensis	Canada goldenrod	1	x	FACU												
Solidago graminifolia	Grass leaved goldenrod		x													
Sporobolus cryptandrus	Sand dropseed	3	x	FACU			2			1		1				
Stachys palustris	Marsh hedge nettle	5	x	OBL												
Trientalis borealis	Starflower	7	x	FAC												1
Trifolium hybridum	Alsike clover			FAC												
Trifolium pratense	Red clover			FACU												
Trifolium procumbens	Low hop clover			FACU			1									
Trifolium repens	White clover			FACU			1									
Typha angustifolia	Narrow leaved cattail			OBL							2					
Typha latifolia	Broad leaved cattail	1	x	OBL	1							2	1			
Ulmus americana	American elm	3	x	FACW												
Vaccinium angustifolium	Black huckleberry	4	x	FACU												
Verbena hastata	Blue (Swamp) vervain	3	x	FACW			1									
Verbascum thapsis	Common mullein															

**TOTAL**

FQI Calculations	Native Species Only	All Species
Species Richness	105	136
Mean C Value	3.57	2.76
FQI	36.58	28.28

Native Species	PO1	PO2	PT1	PT2	PT3	PT4	PT5	SP1	SP2	UP1	UP2
Species Richness	2	13	17	9	11	15	15	14	6	3	10
Mean C Value	1.50	1.85	1.76	1.22	2.00	1.87	1.93	1.71	1.67	3.33	2.00
FQI	2.12	6.66	7.28	3.67	6.63	7.23	7.49	6.41	4.08	5.77	6.32

All Species	PO1	PO2	PT1	PT2	PT3	PT4	PT5	SP1	SP2	UP1	UP2
Species Richness	2	13	24	10	12	19	18	16	7	4	13
Mean C Value	1.50	1.85	1.25	1.10	1.83	1.47	1.61	1.50	1.43	2.50	1.54
FQI	2.12	6.66	6.12	3.48	6.35	6.42	6.84	6.00	3.78	5.00	5.55

Vegetation Sample Plot Summary Table

Scientific Name	Common Name	Coefficient of Conservatism	Native	Mapped Comm. Community Type	Wetland Coefficient	UP3	UP4	UP5	UPR1	UPR2
						UPL	UPL	UPL	UPL	UPL
Abutilon throphrastrum	Velvetleaf			FACU						
Acer rubrum	Red maple	3	x	NI	4	2				1
Achillea millefolium	Yarrow	1	x	FACU				1		
Agrostis gigantea	Redtop			NI						
Agrostis hyemalis	Winter bentgrass	4	x	FAC						
Alisma plantago-aquatica	Northern water plantain	4	x	OBL						
Alisma subcordatum	Water plantain	3	x	OBL						
Alnus incana	Tag alder	4	x	OBL						
Alopecurus carolinianus	Carolina foxtail			FACW				2		
Amaranthus blitum	Common amaranth			NI						
Ambrosia artemisiifolia	Common ragweed	0	x	FACU				2		
Apocynum androsaemifolium	Spreading dogbane	2	x	UPL		1				
Artemisia campestris	Field wormwood	4	x							
Asclepias incarnata	Marsh milkweed	5	x	OBL						
Aster novae-angliae	New England aster	3	x	FACW				1	1	
Betula papyrifera	Paper birch	3	x	FACU		1				
Bidens connatus	Purple stemmed beggarticks	6	x	OBL						
Bidens frondosus	Devil's beggarticks	1	x	FACW						
Calystegia sepium	Bindweed	2	x	FAC						
Carex bebbii	Bebb's sedge	4	x	OBL						
Carex pensylvanica	Pennsylvania sedge	3	x	UPL	1	2				
Chamaecrista fasciculata	Partridge pea	3	x	FACU				1	1	
Chenopodium album	Lamb's quarters	0	x	FAC				1		
Cicuta maculata	Spotted water hemlock	6	x	OBL						
Comptonia peregrina	Sweet fern	4	x					1		
Conyza canadensis	Canadian horseweed	0	x	FAC				1		
Cyperus strigosus	False nut sedge	1	x	FACW						
Danthonia spicata	Poverty oat grass	4	x	FACW						
Dicanthelium acuminatum	Hairy panic grass	5	x	FAC						
Didiplis diandra	Water purslane	5	x	OBL						
Digitaria sanguinalis	Hairy crabgrass			FACU						
Echinochloa crus-galli	Barn yard grass			FACW				1		
Eleocharis erythropoda	Bald spike rush	3	x	OBL						
Eleocharis obtusa	Blunt spike rush	3	x	OBL						
Epilobium ciliatum	American willow herb	3	x	FACU				1		
Eragrostis minor	Little lovegrass									
Erechtites hieracifolia	Burnweed	2	x	FACU						
Equisetum arvense	Field horsetail	1	x	FAC						
Eupatorium maculatum	Spotted Joe Pye weed	4	x	OBL						
Eupatorium perfoliatum	Boneset	6	x	FACW				1	1	
Festuca arundinacea	Annual rye grass			FACU				1		
Fragaria virginiana	Wild strawberry	1	x	FAC				1		
Gaultheria procumbens	Wintergreen	6	x	FACU		1				
Gaylussacia baccata	Black huckleberry	6	x	FACU		4				
Geranium carolinianum	Carolina geranium	3	x							
Glyceria grandis	American manna grass	6	x							
Gnaphalium obtusifolium	Fragrant cudweed	3	x							
Gratiola neglecta	Clammy hedge hyssop	5	x	OBL						
Helianthus sp.	Sunflower	4	x	FAC						
Hieracium aurantiacum	Orange hawkweed									
Hieracium kalmii	Canada hawkweed	5	x							
Hypericum canadense	St. John's wort	7	x	FACW				1	1	
Hypericum majus	Larger Canadian St. John's wort	5	x	FACW						
Impatiens capensis	Jewelweed (Touch me not)	2	x	FACW						
Juncus brevicaudatus	Narrow panicle rush	6	x	OBL						
Juncus canadensis	Canada rush	7	x	OBL						
Juncus dudleyi	Dudley's rush	4	x							
Juncus effusus	Soft rush	4	x	OBL						
Juncus pelocarpus	Brown fruited rush	8	x	OBL						
Juncus tenuis	Path (Poverty) rush	1	x	FAC				1	1	
Juncus torreyi	Torrey's rush	4	x	FACW						
Leersia oryzoides	Rice cut grass	3	x	OBL						
Ludwigia palustris	Marsh seedbox	4	x	OBL						
Lycopus americanus	American water horehound	4	x	OBL				1		
Maianthemum canadense	Canada mayflower	5	x	FAC		1				
Medicago lupulina	Black medick			FAC				1		
Menarda fistulosa	Wild bergamot		x					1	1	
Mimulus ringens	Monkey flower	6	x	OBL						
Mollugo verticillata	Carpetweed			FAC				1		
Onoclea sensibilis	Sensitive fern	5	x	FACW						
Osmunda regalis	Royal fern	7	x	OBL						
Oxalis corniculata	Wood sorrell			FACU				1	1	
Panicum longifolium	Panic grass		x	OBL				1	1	
Panicum virgatum	Switch grass	4	x	FAC				1		
Penthorum sedoides	Ditch stoneweed	3	x	OBL						
Persicaria maculata	Spotted (lady's thumb) smartweed			FACW						
Persicaria punctatum	Dotted smartweed	5	x	OBL						
Phalaris arundinacea	Reed canary grass			FACW						
Pilea pumila	Canadian clearweed	3	x	FACW						
Pinus resinosa	Red pine	7	x	FACU	1	1				
Pinus strobus	White pine	5	x	FACU	1					
Plantago major	Common plantain			FAC				1		
Poa palustris	Marsh bluegrass	5	x	FACW						
Poa pratensis	Kentucky bluegrass			FAC						
Polygala sanguinea	Purple milkwort	5	x	FACU						
Polygonum amphibium	Water smartweed	5	x	OBL						
Polygonum careyi	Carey's knotweed	6	x	FACW						
Polygonum hydropiper	Water pepper			OBL				1		
Polygonum lapathifolium	Dock leaved smartweed	2	x	FACW						
Polygonum pensylvanicum	Pinkweed	1	x	FACW				1		
Polygonum sagittatum	Arrow leaved tearthumb	6	x	OBL						
Polygonum scandens	Climbing false buckwheat	3	x	FAC						
Polypogon monspeliensis	Annual rabbit's foot grass			OBL						
Populus deltoides	Cottonwood	2	x	FAC						
Populus tremuloides	Quaking aspen	2	x	FAC	2	1				
Portulaca oleracea	Purslane			FAC						
Potentilla norvegica	Norwegian cinquefoil	0	x	FAC						
Potentilla simplex	Common cinquefoil	2	x	FACU				1	1	

**Vegetation Sample Plot Summary Table**

Scientific Name	Common Name	Coefficient of Conservatism	Native	Mapped Comm. Community Type	Wetland Coefficient	UP3	UP4	UP5	UPR1	UPR2
						UPL	UPL	UPL	UPL	UPL
Prunus serotina	Black cherry	3	x	FACU		1				1
Pteridium aquilinum	Bracken fern	2	x	FACU		2				
Quercus alba	White oak	7	x	FACU		1				
Quercus ellipsoidalis	Pin oak	5	x	UPL						
Quercus macrocarpa	Bur oak	5	x	FAC						
Quercus rubra	Red oak	5	x	FACU	1	3				
Ranunculus pensylvanicus	Bristly crowfoot	5	x	OBL						
Ratibida pinnata	Pinnate prairie coneflower	4	x							1
Rhamnus cathartica	Common buckthorn			FACU	1	1		1		
Rhamnus frangula	Glossy buckthorn			FAC			6		1	
Rorippa palustris	Marsh cress	3	x	OBL				1		
Rubus allegheniensis	Common blackberry	2	x	FACU		1				
Rubus hispidus	Swamp dewberry	4	x	FACW						
Rubus idaeus	Red raspberry	3	x	FACW		1				
Rudbeckia hirta	Black eyed susan	4	x	FACU				1	1	
Rumex crispus	Common sheep sorrel			FAC						
Scirpus atrovirens	Dark green bulrush	3	x	OBL						
Scirpus cyperinus	Wool grass	4	x	OBL						2
Scirpus validus	Softstem bulrush		x	OBL						
Setaria faberi	Nodding foxtail			FACU						
Setaria glauca	Yellow foxtail			FAC						
Silene latifolia	White campion							1		
Siparis astrigesus	Nutsedge		x	FACW						
Solidago canadensis	Canada goldenrod	1	x	FACU				1		
Solidago graminifolia	Grass leaved goldenrod		x							
Sporobolus cryptandrus	Sand dropseed	3	x	FACU				1		
Stachys palustris	Marsh hedge nettle	5	x	OBL						
Trientalis borealis	Starflower	7	x	FAC	1	1				
Trifolium hybridum	Alsike clover			FAC				2		
Trifolium pratense	Red clover			FACU				1		
Trifolium procumbens	Low hop clover			FACU						
Trifolium repens	White clover			FACU						
Typha angustifolia	Narrow leaved cattail			OBL						
Typha latifolia	Broad leaved cattail	1	x	OBL						
Ulmus americana	American elm	3	x	FACW		1				
Vaccinium angustifolium	Black huckleberry	4	x	FACU						
Verbena hastata	Blue (Swamp) vervain	3	x	FACW						
Verbascum thapsis	Common mullein							1		

**TOTAL**

<u>FQI Calculations</u>	Native Species Only	All Species
Species Richness	105	136
Mean C Value	3.57	2.76
FQI	36.58	28.28

Native Species	UP3	UP4	UP5	UPR1	UPR2
Species Richness	7	17	0	22	13
Mean C Value	1.71	1.53	NA	1.73	1.23
FQI	4.54	6.31	NA	8.10	4.44

All Species	UP3	UP4	UP5	UPR1	UPR2
Species Richness	8	18	1	35	15
Mean C Value	1.50	1.44	6.00	1.09	1.07
FQI	4.24	6.13	6.00	6.42	4.13

## **Appendix D**

### **Hydrology Data**

- **Stantec Hydrology Monitoring Memo**
- **Staff Gauge and Monitoring Well Map**
- **Staff Gauge Data**



## TECHNICAL MEMORANDUM

December 22, 2011

File: 193701234

To: Janet Smith, WisDOT-NCR

From: Nik Bertagnoli, Stantec

Copy: Jon Gumtow, Stantec

**Reference: 2011 Groundwater Hydrology Monitoring  
WisDOT Moses Creek Wetland Mitigation Site  
Stevens Point, Wisconsin  
WisDOT ID 6351-01-04/07**

This technical memorandum summarizes the results of the 2011 groundwater hydrology monitoring completed by Stantec at the Moses Creek Wetland Mitigation Site (the Site) located in Stevens Point, Wisconsin. This project was completed on behalf of the Wisconsin Department of Transportation (WisDOT) in accordance with our Proposal dated June 1, 2011.

### Background

WisDOT completed construction of the Moses Creek Wetland Mitigation Site in fall 2010. The Site consists of an approximate 40.2-acre site located within Schmeckle Reserve, which is owned by UWSP, in Stevens Point, Wisconsin. The mitigation area consists of approximately 17 acres of riparian emergent (RPE), scrub-shrub (SS), and riparian forested wetland (RPF), 2.4 acres of upland prairie buffer, 20.8 acres of upland buffer habitat, and 4,240 linear feet of naturalized stream habitat.

Stantec completed Year 1 hydrology monitoring activities on the Site in 2011. This report summarizes the 2011 groundwater monitoring methods and results for the Site.

### Methods

In summer 2011, Stantec installed four shallow groundwater monitoring wells and two staff gauges at the Moses Creek Mitigation Site. The wells were placed within the anticipated wet meadow community adjacent to Moses Creek and the staff gauges were placed in the Moses Creek channel (Figure 1). Following installation, the wells and staff gauges were surveyed by AECOM to locate the coordinates of each well and elevation datum of the top of well casing and adjacent ground surface per mean sea level (MSL) datum. Following installation, each monitoring well was fitted with a dedicated HOBO water level recorder set to record groundwater level measurements at 1-hour increments.



WisDOT authorized the 2011 hydrologic monitoring for this site in June 2011, therefore, the data loggers were installed on June 22, 2011 following the start of the growing season. Data loggers recorded water levels from June 22 until October 27, 2011. The summary statistics were computed with data truncated to reflect the data recorded during the growing season (June 22 – October 27, 2011).

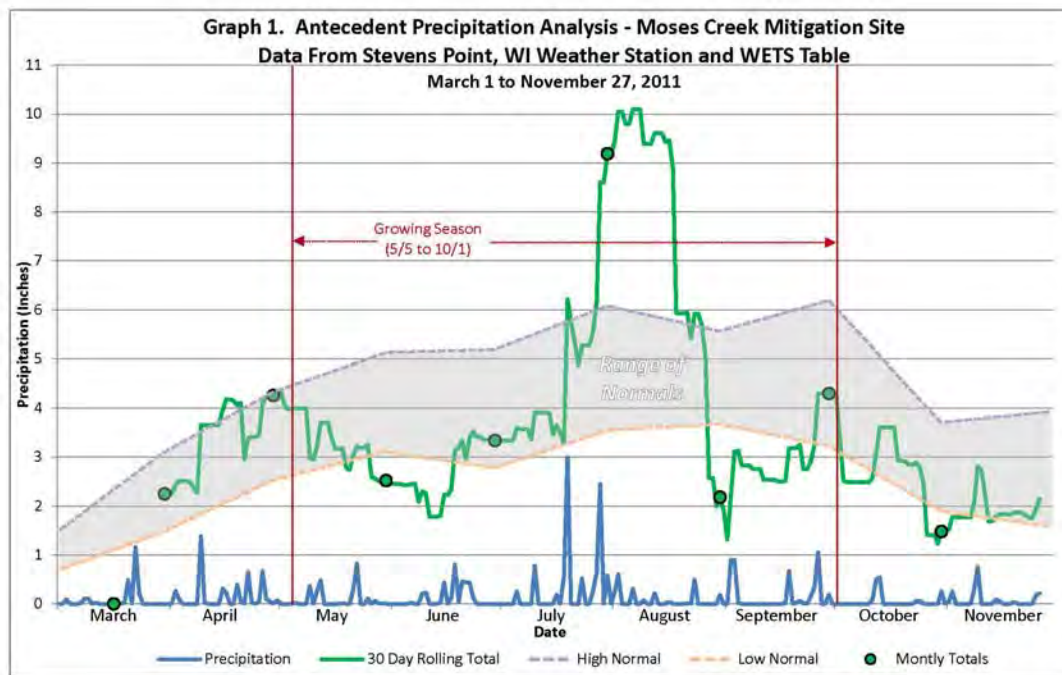
Precipitation and temperature data was obtained from a weather station at the Stevens Point Municipal Airport (478171) in Stevens Point, Wisconsin. A 30 Day Rolling Total Analysis (Sprecher and Warne 2000) was used to help determine whether precipitation values and hydrology observations were within the normal range during the monitoring period. The 2011 growing season near Stevens Point began on May 5, with the last spring frost, and ended on October 1, with the first fall frost (150 days). The average growing season, based on 1971 to 2000 averages, begins on May 6 and ends on October 1 (148 days).

The hydrology across the entire site is influenced by surface water and groundwater. The performance criteria for this site require that the established wetlands will be saturated within 12 inches of the soil surface for at least 14 days during the growing season in years of normal annual precipitation.

## Results

### Precipitation

Total precipitation for the growing season was slightly higher than average; however, precipitation was sporadic with dry conditions occurring in May, June, August and October. Above average rainfall events in July and September likely enhanced hydrologic conditions throughout the site (Graph 1) (Table 1).



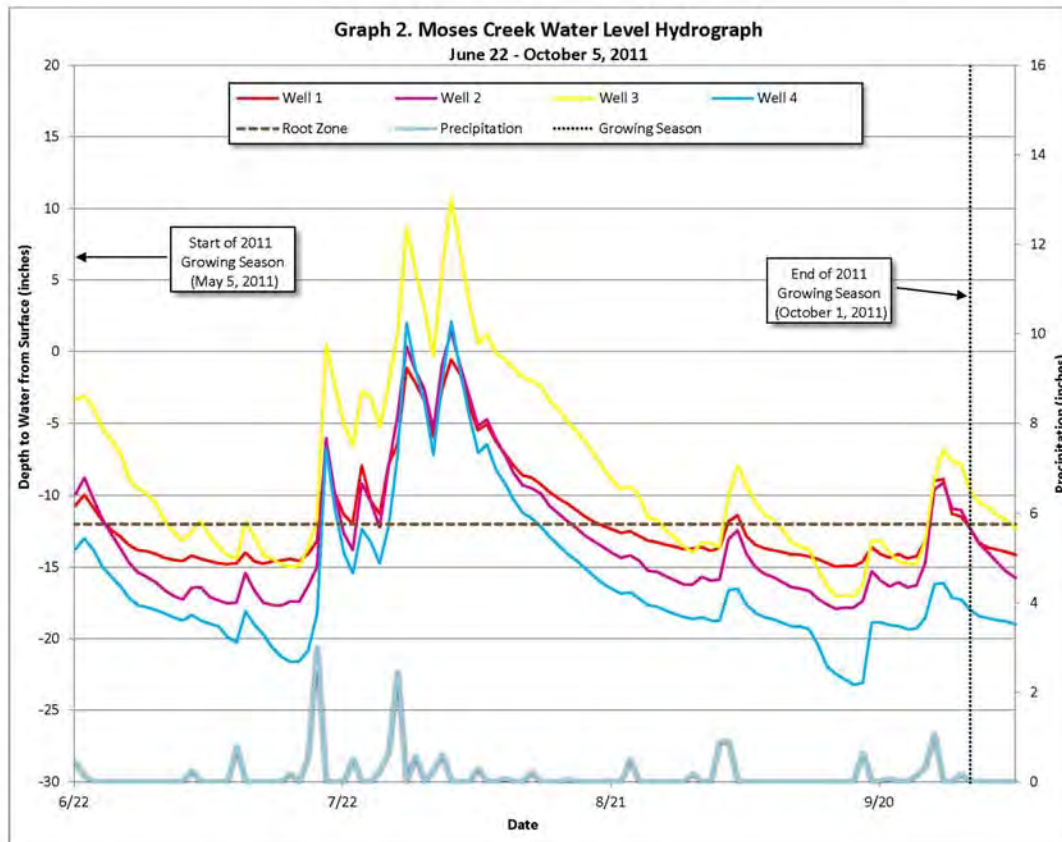
**Table 1.** Precipitation Data, May - October, 2011.

Month	Average Monthly Precipitation (in)	2011 Monthly Precipitation (in)	2011 Precipitation Difference from Average (in)
May	3.63	2.52	-1.11
June	3.66	3.34	-0.32
July	4.12	9.19	5.07
August	4.11	2.18	-1.93
September	3.78	4.3	0.52
October	2.31	1.48	-0.83
Totals	21.61	23.01	1.40

Source: Data obtained from the Stevens Point Municipal Airport, Portage County, WI.

Groundwater Monitoring

The four monitoring wells were analyzed together based on their proximity to each other and associated vegetation community type. Each of the four wells indicated soil saturation within 12 inches of the ground surface for greater than 14 days during the growing season (recorded between June 22, 2011 and October 1, 2011). The hydrographs for Wells 1, 2, 3, and 4 are illustrated in Graph 2. Groundwater level results for Wells 1, 2, 3, and 4 are presented in Tables 2 and 3.



The hydrology at all four wells appears to be influenced by antecedent precipitation and shallow groundwater levels. The hydrograph shows all four wells had relatively moderate fluctuations in water levels (Graph 2, Table 2). All four wells were saturated for greater than 14 consecutive days during the growing season, therefore, exceed the performance criteria for wetland hydrology (recorded between June 22, 2011 and October 1, 2011). Well 1 was not inundated during the growing season, however, Wells 2 and 4 were inundated for 2 percent of the growing season and Well 3 was inundated for 10.8 percent of the growing season (Table 3).

**Table 2.** Water Level Summary Statistics, June 22 – October 1, 2011<sup>1</sup>

Well ID	Mean (inches)	Median (inches)	Max (inches)	Min (inches)	Lower Quartile (inches)	Upper Quartile (inches)	Interquartile Range (inches)
Well 1	-11.6	-13.2	-0.6	-15.0	-14.1	-10.2	3.9
Well 2	-12.9	-14.6	1.4	-17.9	-16.4	-10.3	6.1
Well 3	-8.3	-9.9	10.8	-17.1	-13.3	-4.0	9.3
Well 4	-15.6	-17.7	2.1	-23.2	-18.9	-13.8	5.1

<sup>1</sup>Water levels are summarized as depth to water from the ground surface and expressed in inches.

Note: Negative values indicate depth below ground surface; positive values indicate depth above ground surface.

**Table 3.** Water Level Threshold Summary Statistics, June 22 – October 1, 2011

Well ID	Root Zone Saturation <sup>1</sup> Frequency <sup>4</sup>	Inundation <sup>3</sup> Frequency <sup>4</sup>	Max. Duration <sup>2</sup> of Root Zone Saturation <sup>1</sup> (days)	Number of Root Zone Saturation <sup>1</sup> Events with Durations <sup>2</sup> > 15 days	Max. Duration <sup>2</sup> of Inundation <sup>3</sup> (days)	Number of Inundation <sup>3</sup> Events with Durations <sup>2</sup> > 15 days
Well 1	40.2%	0.0%	31.0	1.0	0.0	0.0
Well 2	32.4%	2.0%	21.0	1.0	1.0	0.0
Well 3	62.7%	10.8%	39.0	1.0	6.0	0.0
Well 4	17.6%	2.0%	16.0	1.0	1.0	0.0

<sup>1</sup> Saturation (for the purpose of this evaluation) is the recorded presence of free water within 12 inches of the ground surface

<sup>2</sup> Max. duration is defined as the maximum, continuous length of time where water levels are at or above the specific threshold

<sup>3</sup> Inundation is defined as free water at or above the ground surface

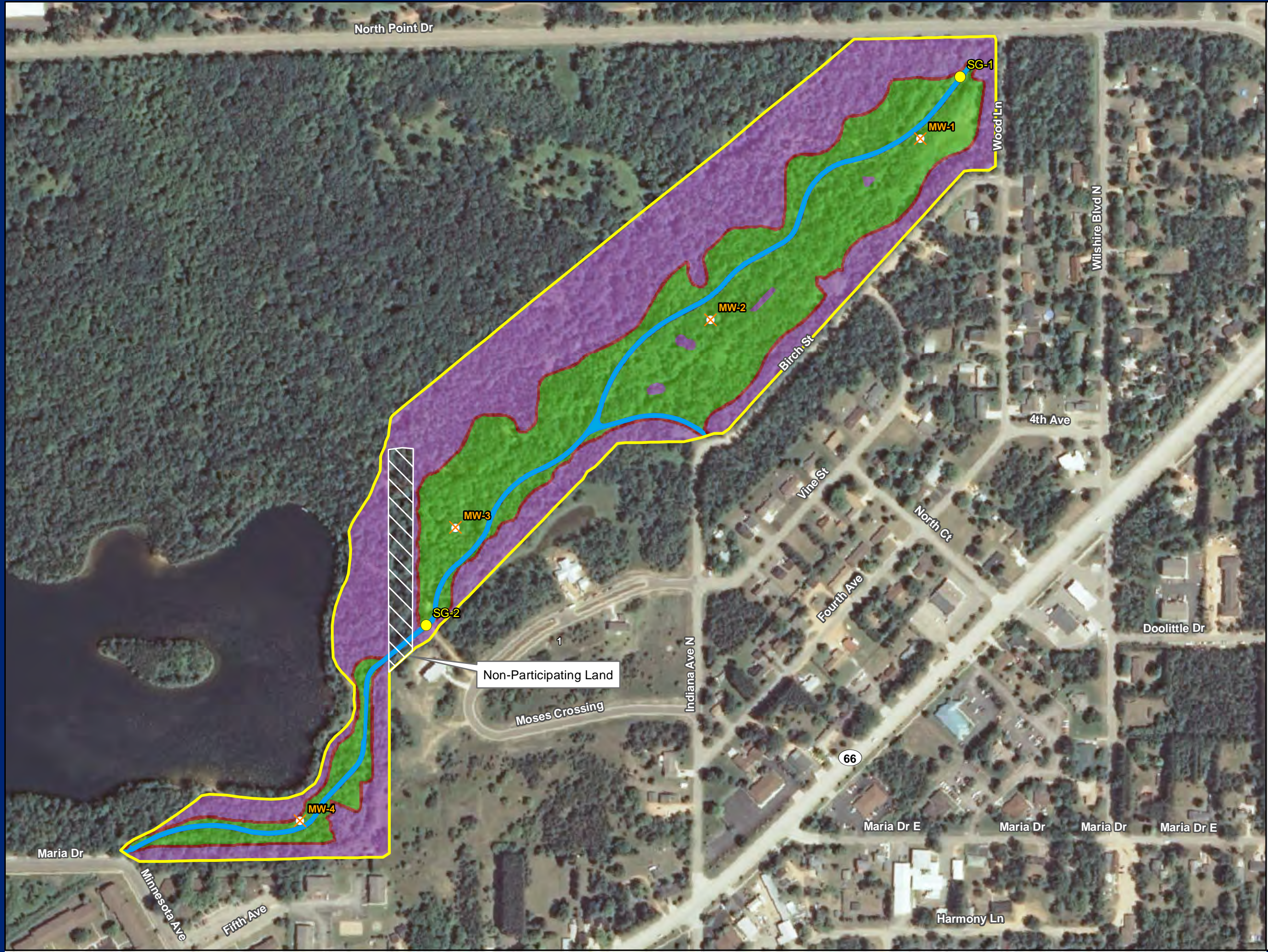
<sup>4</sup> Frequency is defined as the percentage of time water levels are at or above the specific threshold

## Conclusion

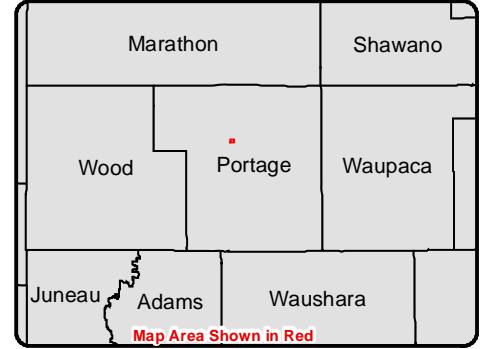
Stantec was retained by WisDOT in June 2011 to complete Year 1 hydrologic monitoring of the Moses Creek Wetland Mitigation Site in Stevens Point, Wisconsin. Four shallow groundwater monitoring wells were installed within the wet meadow wetland community and two staff gauges were installed within the Moses Creek channel. The wells were surveyed to obtain coordinate and elevation data of each well and staff gauge following installation. Dedicated water level recorders were placed in each well to measure water levels at 1 hour intervals. Staff gauge readings were obtained by WisDOT staff.

The results of the 2011 groundwater level monitoring indicate the site exceeded the established site-specific hydrology performance standards. The hydrographs show the four wells had relatively moderate fluctuations in water levels ranging from approximately 15 to 25 inches. The four wells also indicated soil saturation within the upper 12 inches for greater than 14 consecutive days during the growing season, therefore, exceeding the performance criteria for wetland hydrology. In addition, Wells 2, 3, and 4 experienced periodic inundation whereas Well 1 was not inundated.

In accordance with the approved monitoring plan for this site, Stantec recommends collecting additional hydrologic monitoring data for this site during 2012 growing season.



**Figure 1.**  
**Hydrology Monitoring Map**  
**Moses Creek Wetland Mitigation Site**  
**WisDOT # 6351-01-04/07**



**Location**  
 Section 28, Township 24 North, Range 08 East,  
 City of Stevens Point, Portage County, WI

0 150 300 Feet

**Project Information**  
 Project Number: 193700038  
 Modified December 21, 2011

**Legend**

- Staff Gauge
- ⊗ Monitoring Well
- Aquatic Community (4,240 linear feet)
- Upland Buffer, Forested (20.8 acres)
- Upland Buffer, Prairie (2.4 acres)
- Wet Meadow Community (17.0 acres)
- Project Limits (40.2 acres)

Data Sources include WDNR, WDOA, & WDOT.  
 Orthophotography: 2008

209 Commerce Parkway  
 P.O. Box 128  
 Cottage Grove, WI 53527-0128  
 phone: 608-839-1998  
 fax: 608-839-1995  
[www.stantec.com](http://www.stantec.com)

The information presented in this map document is advisory and is intended for reference purposes only.

# Moses Creek

## Staff Gauge Data, 2011

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Date	Stream Gauge 1 (SG1) in feet	Stream Gauge 2 (SG2) in feet
8/3/2011	2.18	2.60
8/23/2011	0.20	1.00
9/9/2011	0.20	1.00
10/17/2011	0.98	0.46
10/31/2011	0.98	0.46

**Table 1.** Staff gauge data for the stream in Moses Creek during a portion of the growing season. SG1 is located in the North portion of the mitigation site, just south of North Point Drive. SG2 is located in just north of the Milano-Sciarrone crossing.

## **Appendix E**

### **Soils Data**



Date: 8/15/11

Observer(s): Rochelle Hayes & Kelsey Reimann Weather Conditions: 80 degrees, partly cloudy

Point Number: SB1 General Location: Northeast side of Moses Creek

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type1	Loc2		
0-1	10 YR 2/1	100%					Sandy loam	
1-5	10 YR 2/1	98%	Gley 5/10 Y	2%	D	M	Loamy sand	Cemented sand inclusions
5-12	7.5 YR 4/4	100%					Sand	Different parent material

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

2Location: PL=Pore Lining, M=Matrix

**Notes:**

Water table at 6 inches

In layer 5-12 there was iron in the matrix

Zone of saturation was at 3 inches from the surface

Date: 8/18/11

Observer(s): Rochelle Hayes & Kelsey Reimann Weather Conditions: 78 degrees, partly sunny

Point Number: SB2 General Location: Upper Northwest side of Moses Creek

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-15	10 YR 2/1	100%					Sandy loam	Lots of wood debris

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

<sup>2</sup>Location: PL=Pore Lining, M=Matrix

**Notes:**

This soil bore, along with many of the others, was extremely difficult to dig up due to sticks/brush that was buried. The sticks and brush are probably from the original site in which the soil came from.

Project Location & ID #: Moses Creek 6531-01-04/74 Date: 8/9/11

Observer(s): Rochelle Hayes & Kelsey Reimann Weather Conditions: 84 degrees, sunny

Point Number: SB3 General Location: Northeast section of Moses Creek

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type1	Loc2		
1-4	10 YR 4/2	100%					Mucky sand	
4-8	10 YR 4/2	100%					Loamy sand	
8-13	10 YR 4/2	100%					Loamy sand	
13-18	10 YR 4/2	100%					Loamy sand	Transition zone
18+	10 YR 4/2	95%					Loamy sand	

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

2Location: PL=Pore Lining, M=Matrix

**Notes:**

Depth to water was 6 inches

Date: 8/15/11

Observer(s): Rochelle Hayes & Kelsey Reimann Weather Conditions: 83 degrees, mostly sunny

Point Number: SB4 General Location: Central east side of Moses Creek

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type1	Loc2		
1-4		100%					Loamy sand	
5-13	10 YR 2/1	95%	7.5 YR 5/4	4%	C	M	Gravelly sandy loam	Mottles begin (both depletions and concentrations)
			Gley 10Y 6/1	1%	D	M	Gravelly sandy loam	
13-16	10 YR 4/2	94%	5YR 5/8	2%	C	M	Silt loam	Clay mottle concentrations
			7.5 YR 4/6	4%	C	M	Sand	

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

2Location: PL=Pore Lining, M=Matrix

**Notes:**

No water table and no signs of soil saturation.

We were about 5 yards from a pond and there were signs of hydrology at one point due to the clay mottles.

Date: 8/9/11

Observer(s): Rochelle Hayes & Kelsey Reimann Weather Conditions: 84 degrees, sunny

Point Number: SB5 General Location: Southern central section of Moses Creek

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type1	Loc2		
0-3	10 YR 2/1	100%					Loamy sand	
3-12	10 YR 2/1  7.5 YR 4/6	80%  20%					Loamy sand	Transition Zone
12-16	10 YR 2/1	100%					Loamy sand	Smelly
16+	10 YR 4/3	100%					Sand	

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

2Location: PL=Pore Lining, M=Matrix

**Notes:**

No evidence of a water table.

Soil saturation at 16 inches.

Date: 8/15/11

Observer(s): Rochelle Hayes & Kelsey Reimann Weather Conditions: 80 degrees, partly cloudy

Point Number: SB6 General Location: West central portion of Moses Creek

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-8	10 YR 2/1	100%					Loamy sand	Large wood debris present
8-15	7.5 YR 3/2	100%					Sand	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

<sup>2</sup>Location: PL=Pore Lining, M=Matrix

**Notes:**

Water table is at 13 inches.

Saturation is within 12 inches.

Date: 8/23/11

Observer(s): Rochelle Hayes & Kelsey Reimann Weather Conditions: 78 degrees, sunny

Point Number: SB7 General Location: Southwest portion of Moses Creek

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-7	10 YR 2/1	100%					Loamy sand	
7-18	7.5 YR 4/4	100%					Loamy sand	Transition Zone
18+	7.5 YR 4/6	100%					sand	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

<sup>2</sup>Location: PL=Pore Lining, M=Matrix

**Notes:**

Smelled like sulfur (like cow manure) throughout transition zone.

This area was a slight microtopographic depression of approximately 4 inches.

There was saturation and a water table at 19 inches.

Large log with a 4 inch diameter was pulled from the pit.

Date: 8/23/11

Observer(s): Rochelle Hayes & Kelsey Reimann Weather Conditions: 78 degrees, sunny

Point Number: SB8 General Location: South of Lake Joanis

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type1	Loc2		
0-5	10 YR 2/2	100%					Loamy sand	smelly
5-10	7.5 YR 2.5/1	100%					Loamy sand	
14+	7.5 YR 4/6	100%					Sand	

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

2Location: PL=Pore Lining, M=Matrix

**Notes:**



## **Appendix F**

### **Wildlife Data**

## Moses Creek Wildlife Species List

2011

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<b>Species Identified</b>	<b>Scientific Name</b>
American Bullfrog	<i>Rana catesbeiana</i>
Black Bullhead Catfish	<i>Ameiurus melas</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Common Mudpuppy	<i>Necturus maculosus</i>
Garter Snake	<i>Thamnophis sp.</i>
Gray Tree Frog	<i>Hyla versicolor</i>
Green Frog	<i>Rana clamitans</i>
Green Heron	<i>Butoroides virescens</i>
Mallard Duck	<i>Anas platyrhynchos</i>
Northern Leopard Frog	<i>Rana pipiens</i>
Painted Turtle	<i>Chrysemys picta</i>
Spotted Sandpiper	<i>Actitis macularius</i>
White-tailed Deer	<i>Odocoileus virginianus</i>

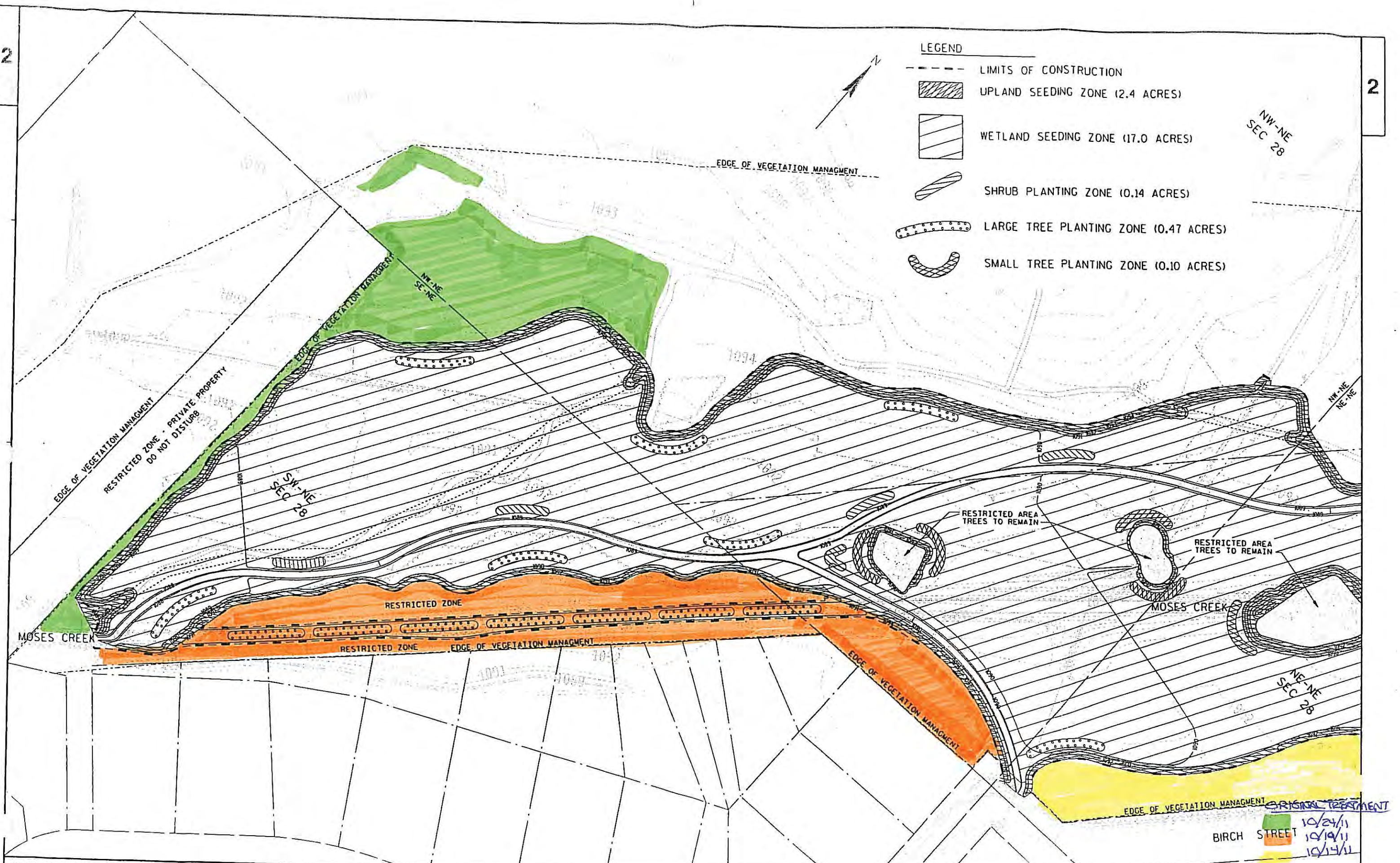
## **Appendix G**

### **Site Management and Maintenance**

- **Quest Vegetation Management Logs and Figures**
- **Quest Stream Erosion Control Management**
- **Tree and Shrub Survey**



- LEGEND**
- LIMITS OF CONSTRUCTION
  - [Hatched Box] UPLAND SEEDING ZONE (2.4 ACRES)
  - [Diagonal Lines Box] WETLAND SEEDING ZONE (17.0 ACRES)
  - [Elongated Oval] SHRUB PLANTING ZONE (0.14 ACRES)
  - [Dotted Line] LARGE TREE PLANTING ZONE (0.47 ACRES)
  - [Wavy Line] SMALL TREE PLANTING ZONE (0.10 ACRES)



ORIGINAL TREATMENT  
 10/24/11  
 10/19/11  
 10/14/11




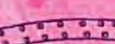



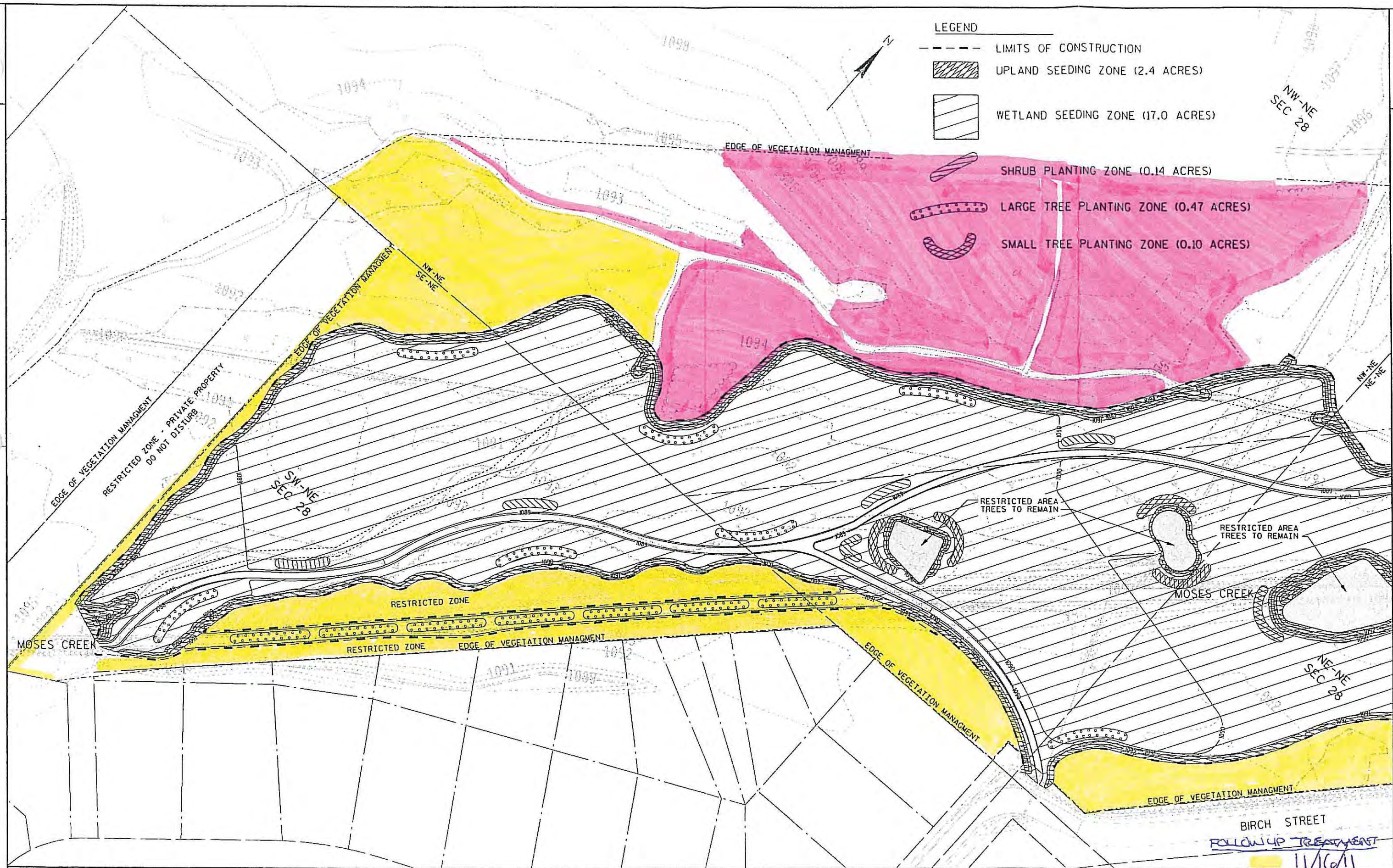
FOLLOW UP TREATMENT

11/16/11  
11/18/11

LEGEND

- LIMITS OF CONSTRUCTION
- [Hatched Box] UPLAND SEEDING ZONE (2.4 ACRES)
- [Diagonal Line Box] WETLAND SEEDING ZONE (17.0 ACRES)
- [Shrub Symbol] SHRUB PLANTING ZONE (0.14 ACRES)
- [Large Tree Symbol] LARGE TREE PLANTING ZONE (0.47 ACRES)
- [Small Tree Symbol] SMALL TREE PLANTING ZONE (0.10 ACRES)

- LEGEND**
- LIMITS OF CONSTRUCTION
  -  UPLAND SEEDING ZONE (2.4 ACRES)
  -  WETLAND SEEDING ZONE (17.0 ACRES)
  -  SHRUB PLANTING ZONE (0.14 ACRES)
  -  LARGE TREE PLANTING ZONE (0.47 ACRES)
  -  SMALL TREE PLANTING ZONE (0.10 ACRES)









**Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75**

**Vegetation Management – Weekly Update**

**Week Ending:** May 20, 2011

**Weekly Summary:** Weather was warm and sunny. Temperature was about 74 degrees. Herbicide treatment of Reed Canary Grass (RCG) was done with a 5% solution of Honcho Plus (glyphosate). Treatment was restricted to upland areas only and treatment area was an approximate 50' buffer immediately surrounding the Stage 1 excavated wetlands.

Reed Canary was approximately 10 to 14 inches in height.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.



Civil Engineers, LLC

### DAILY HERBICIDE TREATMENT LOG

Treatment Location: <u>MOSES CREEK</u>	
Project Number: <u>G351-00-74</u>	
Date: <u>5/20/11</u>	Weather: <u>CLEAR 74°</u>
Applicator(s): <u>BRIAN KRONSTEDT</u>	

Map ID # / WPT #	
Description Of Treatment Area: <u>UPLAND AROUND STAGE 1, REVIEWED &amp; SPRAYED AN APPROXIMATE 50' BUFFER AROUND THE WETLAND</u>	
GPS Coordinates:	
Target Species: <u>RCG</u>	Herbicide Used: <u>HONCHO PLUS (GLYPHOSATE)</u>
Comments: <u>RCG PRESENT BUT NOT REAL DOMINANT ON THESE ADJACENT UPLANDS</u>	

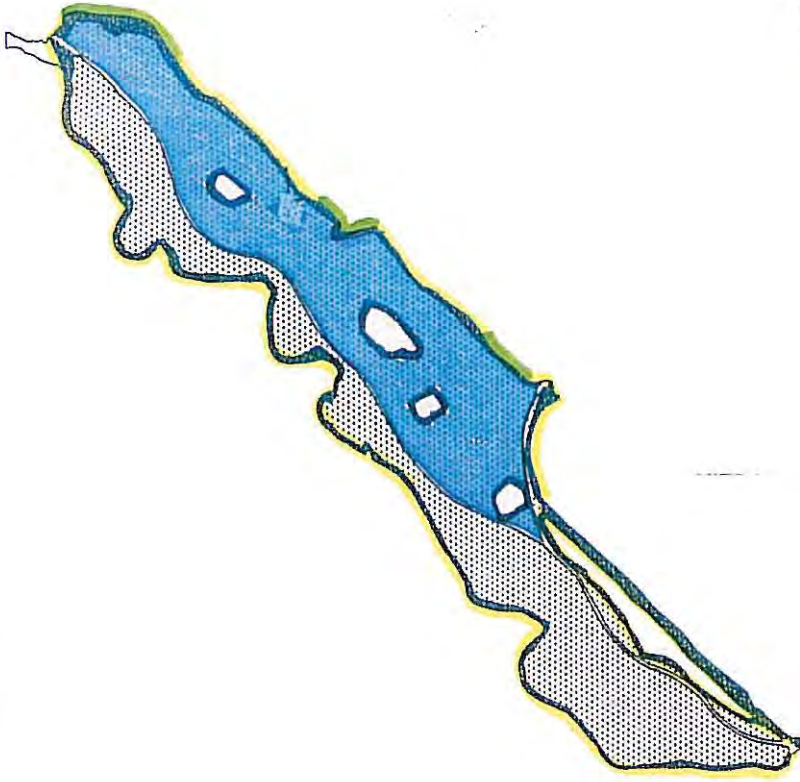
Map ID # / WPT #	
Description Of Treatment Area:	
GPS Coordinates:	
Target Species:	Herbicide Used:
Comments:	

Map ID # / WPT #	
Description Of Treatment Area:	
GPS Coordinates:	
Target Species:	Herbicide Used:
Comments:	

#### Daily Summary

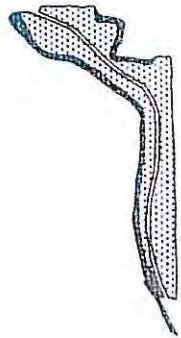
Herbicide Type(s)	Formulations	Gallons of Mix Used
1. <u>GLYPHOSATE</u>	<u>5%</u>	<u>6</u>
2.		
3.		

Additional Comments:



5/20/11

- TREATMENT/REVIEW AREA
- AREAS OF HIGHEST RCC CONCENTRATIONS



SURVEYED BY: ACK  
 METHOD: GPS  
 DATE: 12-14-2010  
 COMPUTED BY: KFS  
 METHOD: CIVIL 3D  
 DATE: 01-17-2011

PROJECT NO: 6351-01-74	HWY: MOSES CREEK MITIGATION	COUNTY: PORTAGE	PLOT NAME: TOPSOIL	PLOT BY: KOLBY SCERTZ	PLOT DATE: JANUARY 18, 2011	PLOT SCALE: 1 IN=300 FT	SHEET	E
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**Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75**

**Vegetation Management – Weekly Update**

**Week Ending:** June 11, 2011

**Weekly Summary:** Weather was partly. Temperature was about 75 degrees. A short and light drizzle occurred approximately 1 hour after final application was complete. Herbicide treatment of Reed Canary Grass (RCG) was done with a 5% solution of Aqua Neat(aquatic glyphosate). All excavated wetlands were investigated and any RCG found was treated. The upland areas surrounding the excavated wetlands were re-evaluated and any missed RCG was treated

Also treated the pre-existing RCG found on the tree islands.

Reed Canary was approximately 10 to 14 inches in height.

Planted seed mix was only +/- 2" tall and was in need of rain.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.



**Photo showing the die-back of RCG from the previous application.**



Civil Engineers, LLC

### DAILY HERBICIDE TREATMENT LOG

Treatment Location: <u>MOSES CREEK</u>	
Project Number: <u>G351-00-74</u>	
Date: <u>6/6/11</u>	Weather: <u>SUNNY 75° (SPRAYED IN AM)</u>
Applicator(s): <u>BRIAN KRONSTEDT</u>	

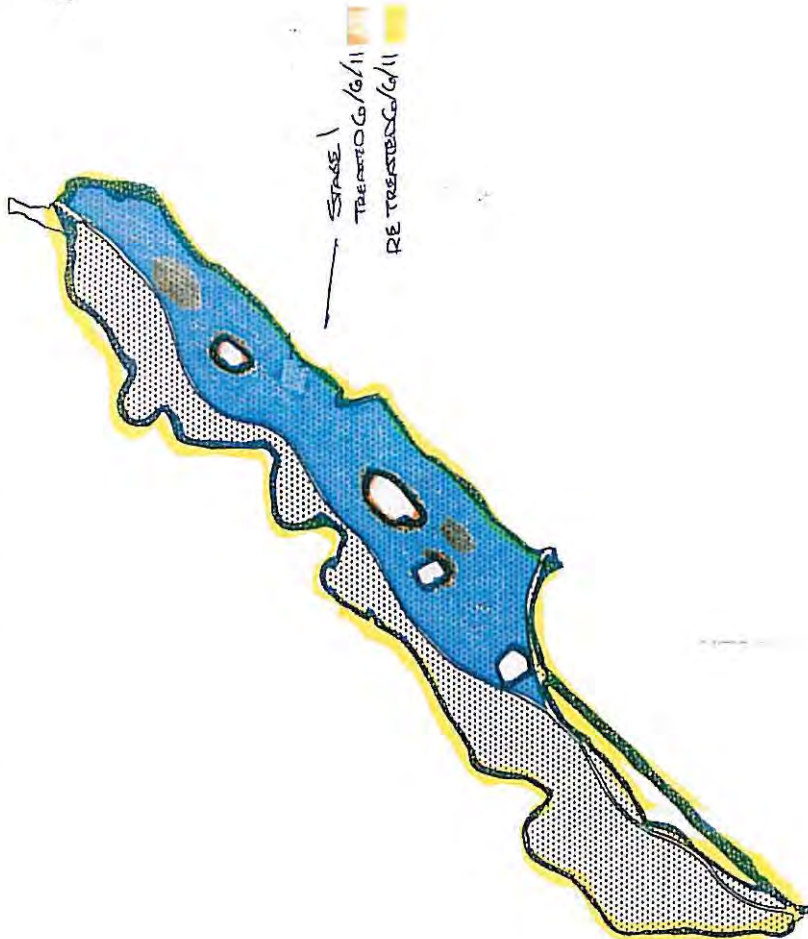
Map ID # / WPT # <u>STAGE 1</u>	
Description Of Treatment Area: <u>SOUTH SIDE OF STREAM</u>	
GPS Coordinates:	
Target Species: <u>RCG</u>	Herbicide Used: <u>AQUA NEAT</u>
Comments: <u>PLANTED SEED MIX WAS ONLY 1/2" TALL. RCG THAT WAS PRESENT APPEARS TO HAVE COME FROM ROOTS OF PLANTS FROM DITCH FILL. RCG WAS 8-10" TALL.</u>	
Map ID # / WPT # <u>SPRAYED THE PRE-EXISTING RCG ON TREE ISLANDS</u>	
Description Of Treatment Area: <u>&amp; RETREATED ENTIRE UPLAND BOUNDARY OF STAGE 1</u>	
GPS Coordinates:	
Target Species:	Herbicide Used:
Comments:	

Map ID # / WPT # <u>STAGE 2</u>	
Description Of Treatment Area: <u>UPLAND BUFFER &amp; ENTIRE EXCAVATED WETLAND WAS INVESTIGATED / TREATED</u>	
GPS Coordinates:	
Target Species: <u>RCG</u>	Herbicide Used: <u>AQUA NEAT</u>
Comments: <u>RCG WAS FOUND ENCRoACHING FROM EXISTING PLANTS ADJACENT TO EXCAVATED AREAS. NEW &amp; OLD PLANTS TREATED.</u>	

#### Daily Summary

Herbicide Type(s)	Formulations	Gallons of Mix Used
1.		
2.		
3.		

Additional Comments: PROVIDED SOMEKLE STAFF HERBICIDE INFORMATION SHEET FOR AQUA NEAT, SITE WAS VERY DRY.



QUEST  
Civil Engineers, LLC  
SURVEYED BY: ACR  
METHOD: GPS  
DATE: 12-14-2010  
COMPUTED BY: RFS  
METHOD: CIVIL 3D  
DATE: 01-17-2011

SHEET E

PROJECT NO: 6351-01-74  
 HWY: MOSES CREEK MITIGATION COUNTY: PORTAGE  
 PLOT DATE: JANUARY 18, 2011  
 PLOT BY: KOLBY SOERTZ  
 PLOT NAME: TOPSOIL  
 PLOT SCALE: 1"=300 FT

**Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75**

**Vegetation Management – Weekly Update**

**Week Ending:** July 7, 2011

**Weekly Summary:** Weather was partly cloudy. Temperature was about 83 degrees. A short rain occurred from approximately 12:30 -1:00pm. Spraying had been completed by 9:30a.m. Herbicide treatment of Reed Canary Grass (RCG) was done with a 5% solution of Aqua Neat(aquatic glyphosate). All excavated wetlands were investigated and any RCG found was treated. The upland areas surrounding the excavated wetlands were re-evaluated and any previously missed RCG was treated.

Also re-treated the RCG found on the tree islands.

There was a number of new Reed Canary plants that were only approximately 12 to14 inches in height. Due to the presence of these new RCG plants, I will check the site one more time in the next couple weeks to see if any new plants germinated. This is only possible due to the surrounding vegetation still being short and not very dense.

There was a disparity in the height of the planted seed mix. In some areas the vegetation was 10” to 15” in height and dense and in others, it was only 4”-6” tall. I believe this disparity was a result of some of these areas being under water longer than others and therefore some areas didn’t germinate as early.

A number of coniferous trees died in the past several weeks. I will document species and location for replanting efforts this fall.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.





Reed Canary mixed with water plantain and rushes.



Civil Engineers, LLC

### DAILY HERBICIDE TREATMENT LOG

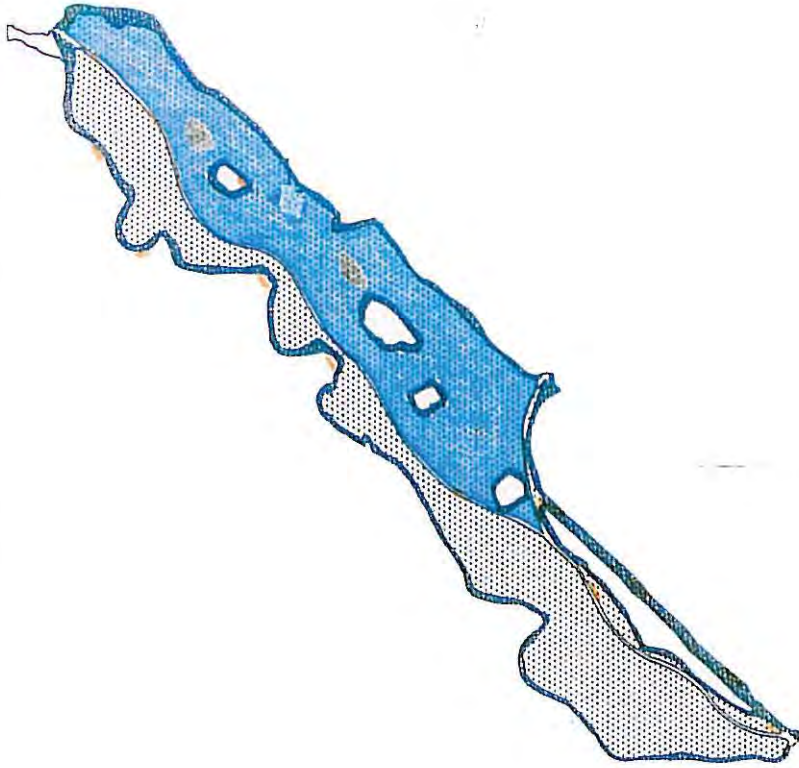
Treatment Location: <u>MOSES CREEK</u>	
Project Number: <u>0351-00-74</u>	
Date: <u>7/5/11</u>	Weather: <u>83° CALM PARTLY CLOUDY</u> <u>RAINED AT 12:30PM - 1:15PM</u>
Applicator(s): <u>BRIAN KRONSTEDT</u>	

Map ID # / WPT #	
Description Of Treatment Area: <u>STAGE 1</u>	
GPS Coordinates:	
Target Species: <u>RCG</u>	Herbicide Used: <u>AQUA NEAT</u>
Comments: <u>TREATED PREVIOUSLY MISSED RCG WHEREVER FOUND &amp; NEWLY</u> <u>SPROUTED RCG 1/2 - 10" TALL.</u>	
Map ID # / WPT #	
Description Of Treatment Area:	
GPS Coordinates:	
Target Species:	Herbicide Used:
Comments:	
Map ID # / WPT #	
Description Of Treatment Area:	
GPS Coordinates:	
Target Species:	Herbicide Used:
Comments:	

#### Daily Summary

Herbicide Type(s)	Formulations	Gallons of Mix Used
1. <u>AQUA NEAT</u>	<u>5%</u>	<u>3</u>
2.		
3.		

Additional Comments:



7/5/11  
TREATMENT AREAS



Civil Engineers, LLC  
SURVEYED BY: ACR  
METHOD: GPS  
DATE: 12-14-2010  
COMPUTED BY: KFS  
METHOD: CIVIL3D  
DATE: 01-17-2011

SHEET E

PLOT SCALE: 1 IN = 300 FT

PLOT MADE: TOPSOE

PLOT BY: KOLBY SOERTZ

PLOT DATE: JANUARY 18, 2011

COUNTY: PORTAGE

HWY: MOSES CREEK MITIGATION

PROJECT NO: 6351-01-74

D:\PROJECTS\6351-01-74\MOSES\_CREEK\_MITIGATION\DWG\6351-01-74\_FINAL\_GROUND.DWG

**Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75**

**Vegetation Management – Weekly Update**

**Week Ending:** October 14, 2011

**Weekly Summary:** Continued treating buckthorn in a southwesterly direction from where we had left off last week (approximately half way down Birch Street). Finished treating this area all the way to where Birch Street turns south.

Used a formulation of diesel fuel and 15% Element 4.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.



**Photo of buckthorn seedlings.**



Civil Engineers, LLC

### DAILY HERBICIDE TREATMENT LOG

Treatment Location:	
Project Number:	
Date: 10/14/11	Weather: 50° OVERCAST, WINDY
Applicator(s): BRIAN KRONSTEDT	

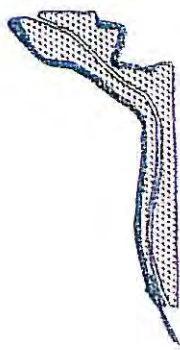
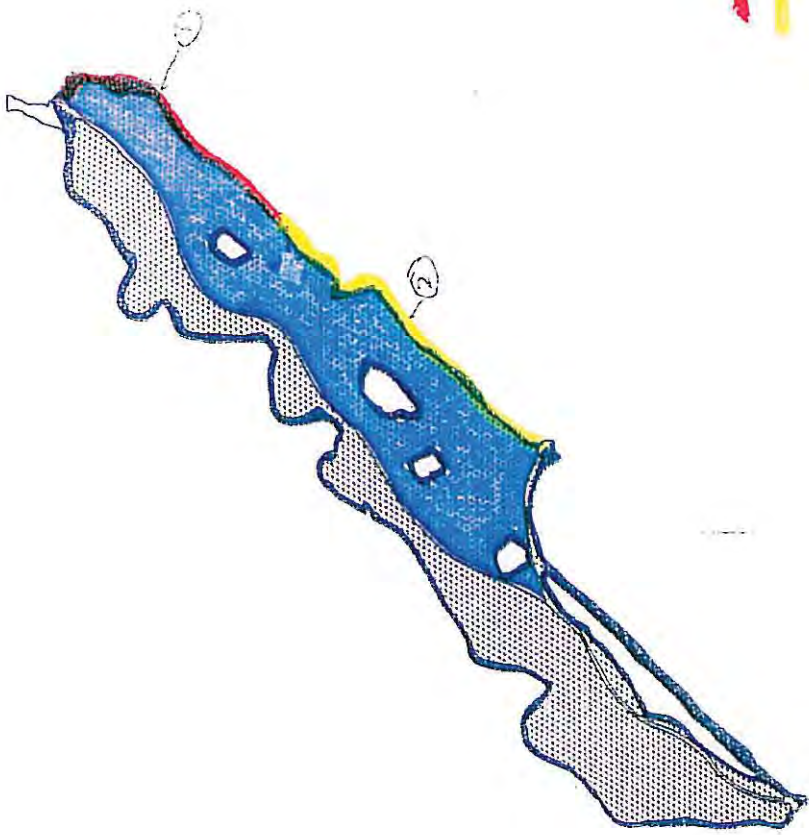
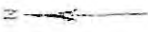
Map ID # / WPT #	#2 ON MAP ATTACHED TO 10/7 LOG		
Description Of Treatment Area:			
GPS Coordinates:			
Target Species:	BUCKTHORN	Herbicide Used:	ELEMENT 4
Comments:			
Map ID # / WPT #			
Description Of Treatment Area:			
GPS Coordinates:			
Target Species:		Herbicide Used:	
Comments:			
Map ID # / WPT #			
Description Of Treatment Area:			
GPS Coordinates:			
Target Species:		Herbicide Used:	
Comments:			

#### Daily Summary

Herbicide Type(s)	Formulations	Gallons of Mix Used
1. ELEMENT 4	15% MIXED WITH DIESEL	7
2.		
3.		

Additional Comments:

2



 - TREATED 10/1/11  
 - TREATED 10/1/11



SURVEYED BY: ACR  
 METHOD: GFS  
 DATE: 12-14-2010  
 COMPUTED BY: KFS  
 METHOD: CIVIL 3D  
 DATE: 01-17-2011

SHEET E

PROJECT NO: 6351-01-74  
 FILE NAME: S:\CONSTRUCTION\6351-01-74 MOSES CREEK\SLURVE\DWG\MITIGATION\MOSES CREEK\_FINAL\_GROUND.DWG  
 COUNTY: PORTAGE  
 HWY: MOSES CREEK MITIGATION  
 PLOT DATE: January 16, 2011  
 PLOT BY: KELBY SCHMITZ  
 PLOT MADE: TOPSOI  
 PLOT SCALE: 1 IN=50 FT

2

Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75

Vegetation Management – Weekly Update

**Week Ending:** October 22, 2011

**Weekly Summary:** Treated buckthorn in the southeast corner of Stage 1. Numerous wind fallen trees present. Effects of previous treatment was evident.

Used a formulation of diesel fuel and 20% Element 4.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.



**Photo of buckthorn seedlings.**

Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75

Vegetation Management – Weekly Update

**Week Ending:** October 29, 2011

**Weekly Summary:** Treated buckthorn on the north side of Stage 1. Numerous wind fallen trees present. Numerous seedlings present.

Used a formulation of diesel fuel and 20% Element 4.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.



**Photo of buckthorn seedlings.**



Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75

Vegetation Management – Weekly Update

**Week Ending:** November 12, 2011

**Weekly Summary:** Treated buckthorn on Stage 2. Numerous wind fallen trees present. More trees have fallen recently. Numerous seedlings present. Snow was present, but leaves seemed to still be present on the majority of the buckthorn.

Used a formulation of diesel fuel and 20% Element 4.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.



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Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75

Vegetation Management – Weekly Update

**Week Ending:** October 8, 2011

**Weekly Summary:** Began buckthorn treatment. Noted that some of the buckthorn that had been treated during construction had survived and some of it had resprouted near it's base. Numerous new seedlings are now present. A severe wind storm hit this area in July and resulted in quite a few windfalls. These downed trees make it difficult to navigate through the woods and also tend to harbor seedlings underneath them where they may not be as evident.

I used a mixture comprised of half water and half Element 3 to which 4% crop oil was added.

Treatment area was the buffer zone along Wood Lane and Birch Street. Treated from North Point Drive southwest approximately half way down Birch Street.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.



**Photo of downed trees.**



Civil Engineers, LLC

### DAILY HERBICIDE TREATMENT LOG

Treatment Location: <u>MOSES CREEK</u>	
Project Number: <u>0351-00-74</u>	
Date: <u>10/7/11</u>	Weather: <u>CLR, CALM 50-62°</u>
Applicator(s): <u>BRIAN KRONSTEDT</u>	

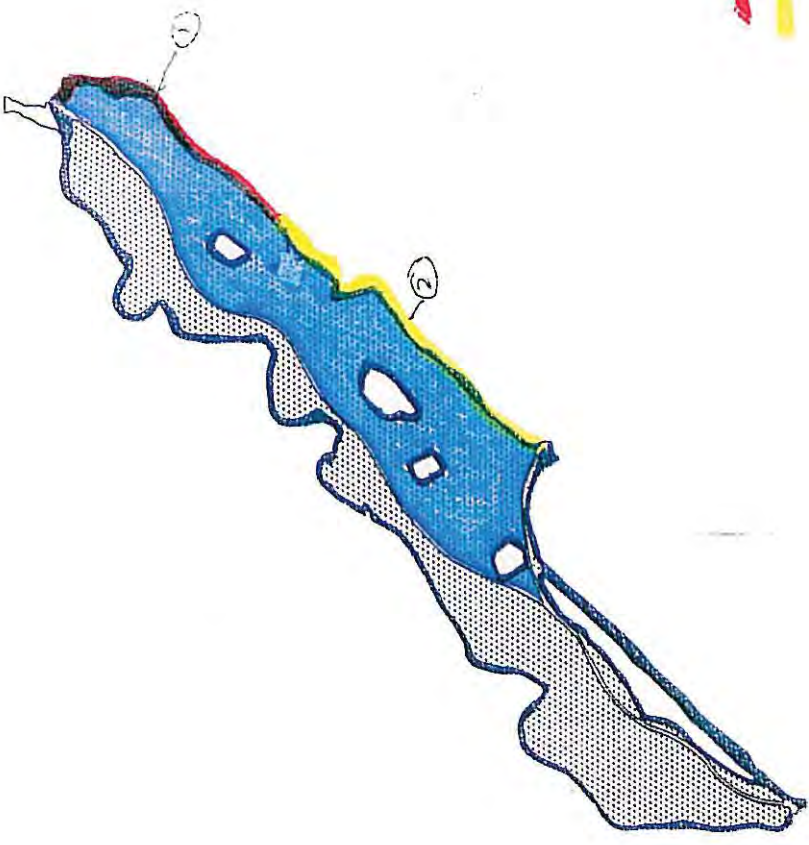
Map ID # / WPT # <u>AREA 1</u>	
Description Of Treatment Area: <u>BUFFER AREA ALONG WOOD &amp; BIRCH</u>	
GPS Coordinates:	
Target Species: <u>BUCKTHORN</u>	Herbicide Used: <u>TRICLOPYR 3 ELEMENT 3A</u>
Comments: <u>NUMEROUS YOUNG OF THE YEAR BUCKTHORN PLANTS WERE PRESENT IN SOME AREAS.</u>	
Map ID # / WPT #	
Description Of Treatment Area:	
GPS Coordinates:	
Target Species:	Herbicide Used:
Comments:	
Map ID # / WPT #	
Description Of Treatment Area:	
GPS Coordinates:	
Target Species:	Herbicide Used:
Comments:	

#### Daily Summary

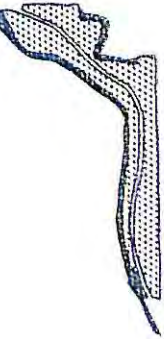
Herbicide Type(s)	Formulations	Gallons of Mix Used
1. <u>TRICLOPYR (ELEMENT 3A)</u>	<u>50/50 MIXED W/H<sub>2</sub>O</u>	<u>10</u>
2.	<u>4% CRP AL</u>	
3.		

Additional Comments:

2



 - TREATED 10/7/11  
 - TREATED 10/14/11



SURVEYED BY: ACR  
 METHOD: GPS  
 DATE: 12-14-2010  
 COMPUTED BY: RFS  
 METHOD: CIVIL 3D  
 DATE: 01-17-2011

SHEET

PLOT SCALE: 1 IN = 300 FT

PLOT MADE: TOPSOIL

PLOT BY: KQ BY SOLENTZ

PLOT DATE: January 18, 2011

COUNTY: PORTAGE

HWY: MOSES CREEK MITIGATION

PROJECT NO: 6351-01-74

FILE NAME: S:\CONSTRUCT\6351-01-74 MOSES CREEK SURVEY\DRAWINGS\MOSES CREEK ETAL GROUND.DWG

2

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Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75

Vegetation Management – Weekly Update

**Week Ending:** November 19, 2011

**Weekly Summary:** Retreated buckthorn on the entire Stage 1. Leaves have now fallen off the wind fallen trees making it much easier to see and treat seedlings beneath them. Evidence of die back from previous treatment was quite apparent. Loss of leaves on other species also made locating untreated seedlings easier. This follow up treatment should result in virtually all buckthorn present having been treated.

Used a formulation of diesel fuel and 20% Element 4.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.



**Photo of previously treated buckthorn seedlings.**

Moses Creek Wetland Mitigation Site  
Project ID 6351-00-75

Vegetation Management – Weekly Update

Week Ending: November 26, 2011

**Weekly Summary:** Treated buckthorn on the south side of Stage 2. Numerous seedlings present. Leaves were still on most plants. This is the last treatment to be performed this year.

Used a formulation of diesel fuel and 20% Element 4.

Additional information and maps showing areas of herbicide treatment are available in the attached Daily Log Entries.



Photo of buckthorn seedlings.

**From:** [Brian Kronstedt](#)  
**To:** [Smith, Janet - DOT;](#)  
**Subject:** Moses Creek Repair  
**Date:** Monday, August 29, 2011 1:32:22 PM  
**Attachments:** [IMG00201-20110829-1003.jpg](#)  
[IMG00202-20110829-1011.jpg](#)  
[IMG00204-20110829-1023.jpg](#)

---

Hi Janet,

I fixed the sloughing streambank at Moses Creek today. Picture 1 is the before, 2 shows the bank after flattening of the slope and 3 shows the finish product with some e-mat I scavenged nearby that was no longer serving any purpose and I also transplanted a few shovels full of adjacent vegetation. I will keep an eye on this to ensure it stays together.

Brian Kronstedt  
Environmental Specialist  
2811 8th Street South  
Suite 8  
Wisconsin Rapids, WI 54494  
(715) 423-3525 office  
(715) 423-3597 fax  
(715) 323-0320 mobile

**Stream Bank Restoration Photos**  
*Brian Kronstedt, Quest Civil Engineers, LLC*

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**Figure 1.** Eroded stream bank before repair in the North section of the stream in Moses Creek, 8/29/2011.

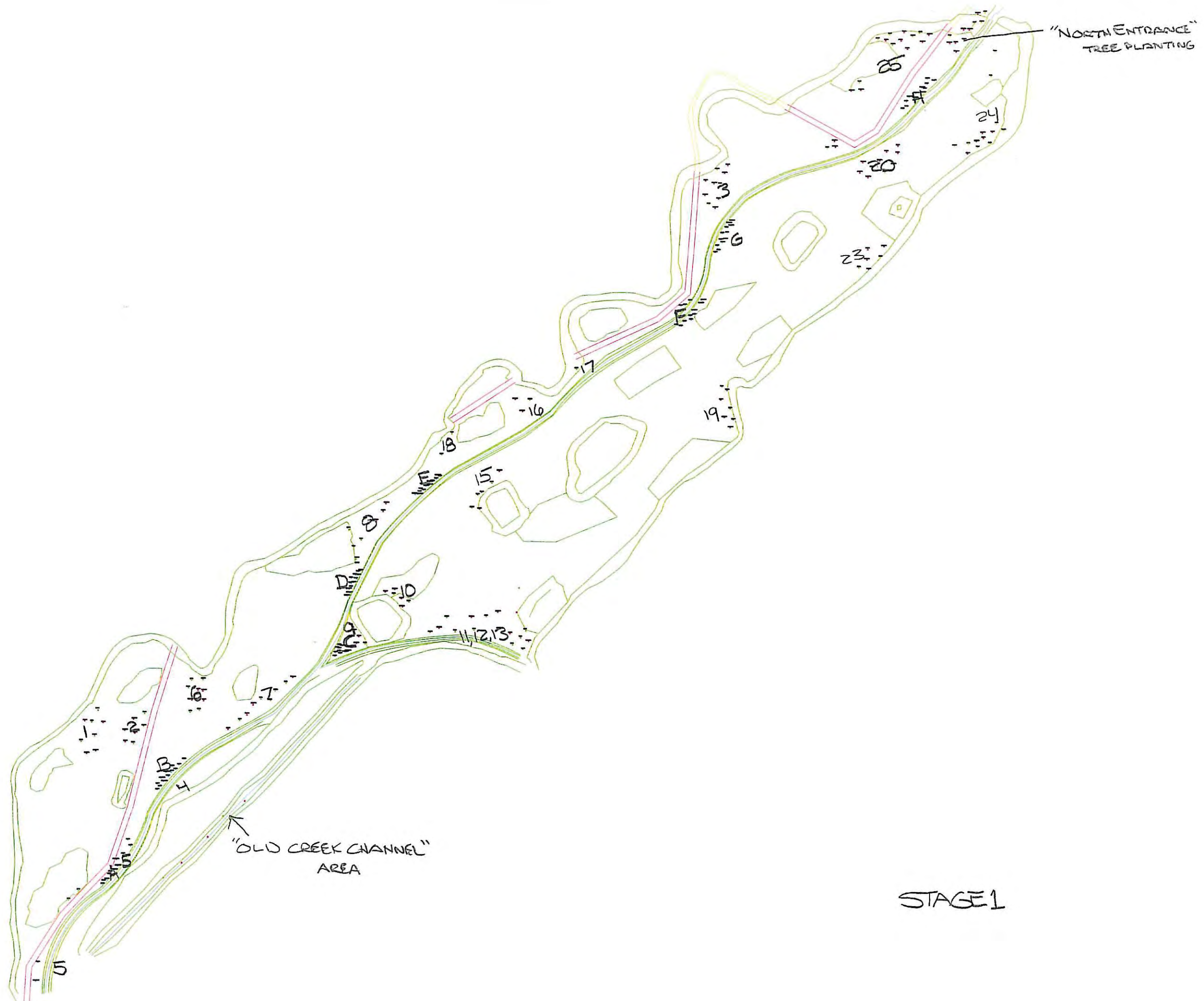


**Figure 2.** Flattened stream bank during repair on the North section of the stream in Moses Creek, 8/29/2011.

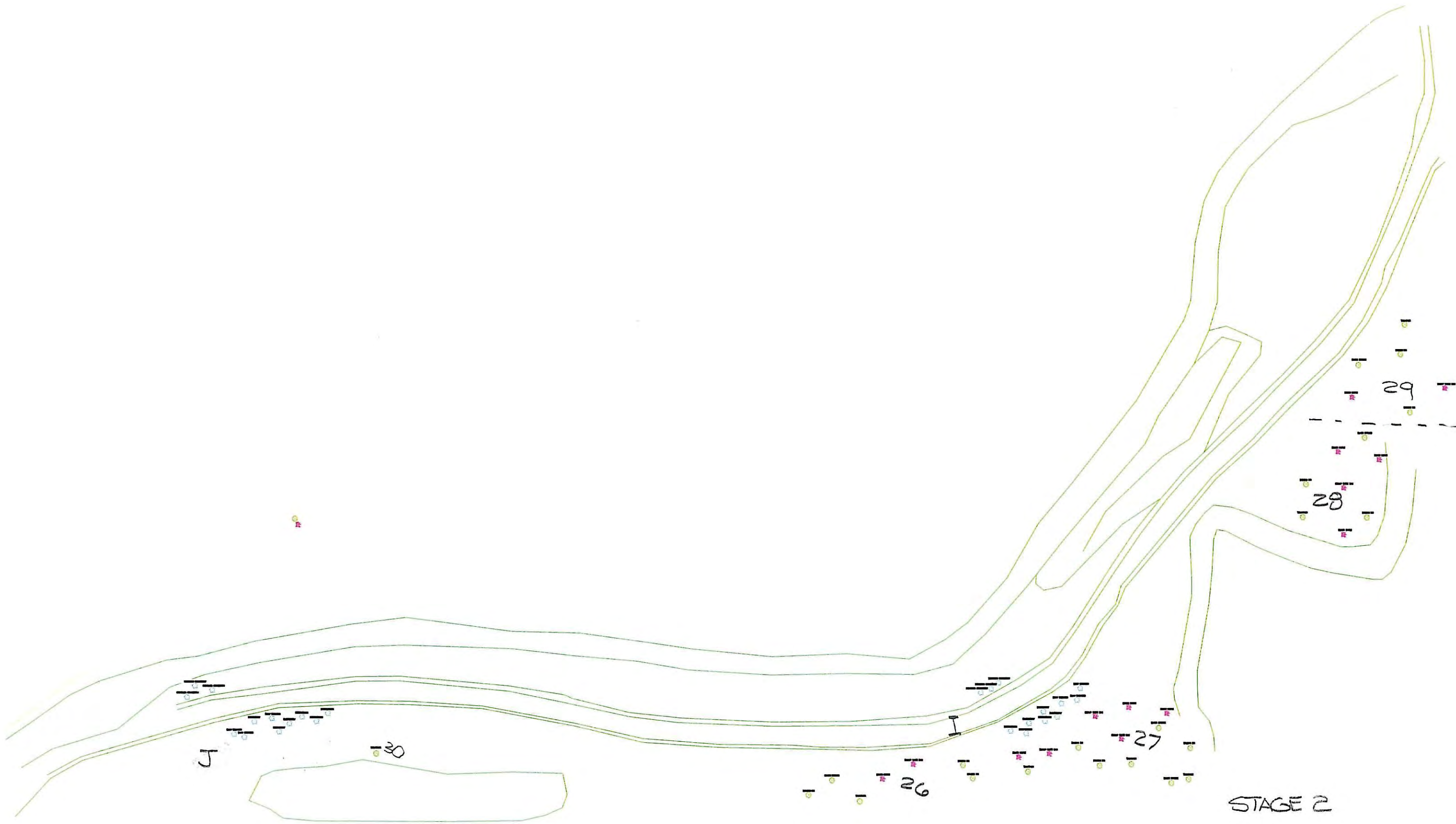




**Figure 3.** Repaired section of the North section of Moses Creek. A non-netted, biodegradable erosion mat was installed, 8/29/2011.



STAGE 1



STAGE 2

# QUEST

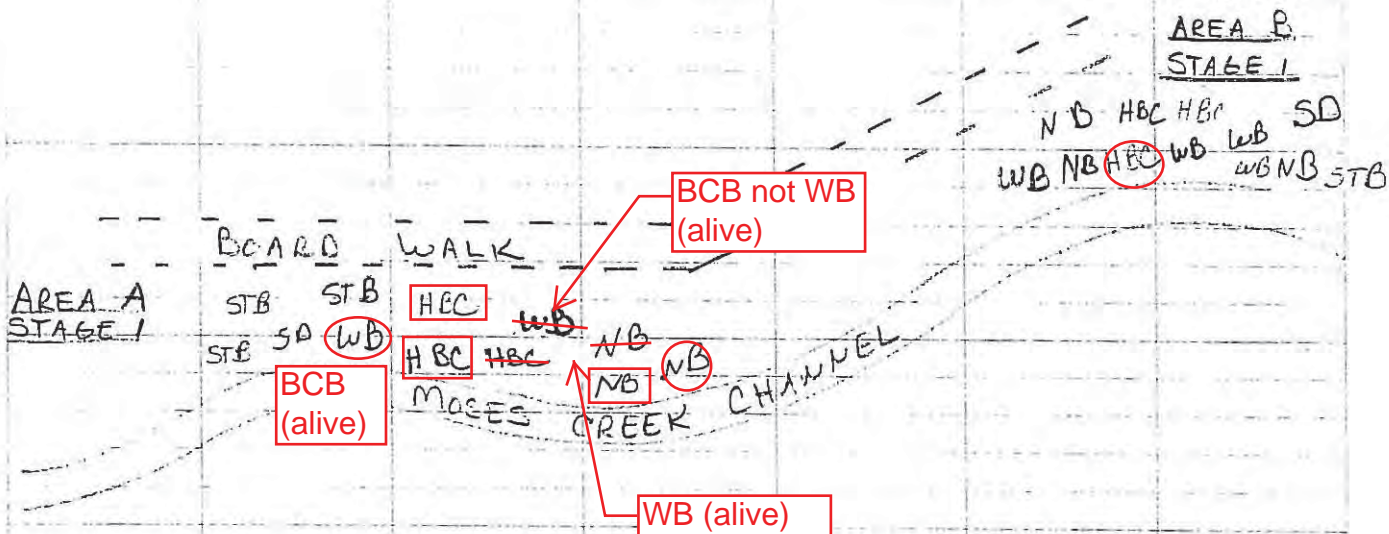
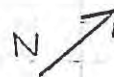
2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0201  
 PLANTING SHRUBS

- not actually there
- half-alive tree/shrub
- dead tree/shrub

COPYING NOT TO  
 SCALE  
 Direct Field Measure  
 By LKO  
 10-21-10



Key:	A	B
STB - Steeplebush	3	1
HBC - Highbush Cranberry	3	3
NB - Nannyberry	3	3
WB - Winterberry	2	4
SD - Silky Dogwood	1	1
BCB - BlackHoke Berry		
EB - Elderberry		
	12	12

Project No. 6351-01-71

Name of Road MOSES CREEK

Item 632.0201 Plantings

Highway

Comp. By LKO

Checked By

County PORTAGE

Sheet Of

Date 10-21-10

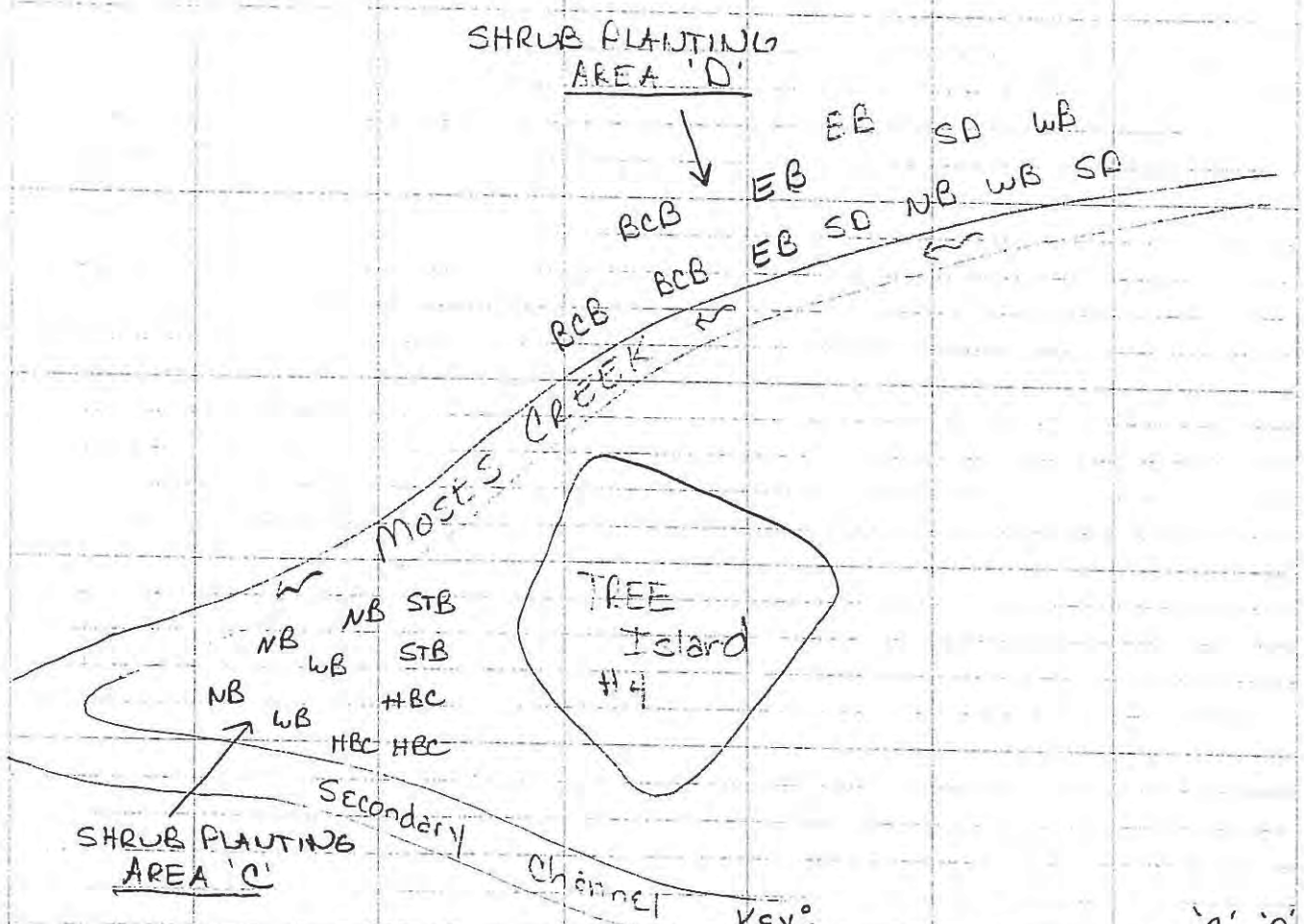
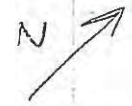
# QUEST

2811 8th Street South, Suite 8  
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 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0201  
 PLANTING SHEET

DRAWING NOT TO SCALE  
 Direct Measure E;  
 LKD 10-21-10



Key:

	'C'	'D'
STB - Steeple Bush	2	
HBC - High Bush Cranberry	3	
NB - nanny berry	3	1
WB - Winterberry	2	2
SD - Silky Dogwood		3
BCB - Black Choke Berry		3
EB - Elderberry		3
	10	12

Project No. 6351-01-74

Highway

County PORTAGE

Name of Road MOOSE CREEK

Comp. By LKD

Sheet OF

Item 632.0201 Planting

Checked By

Date 10-21-10

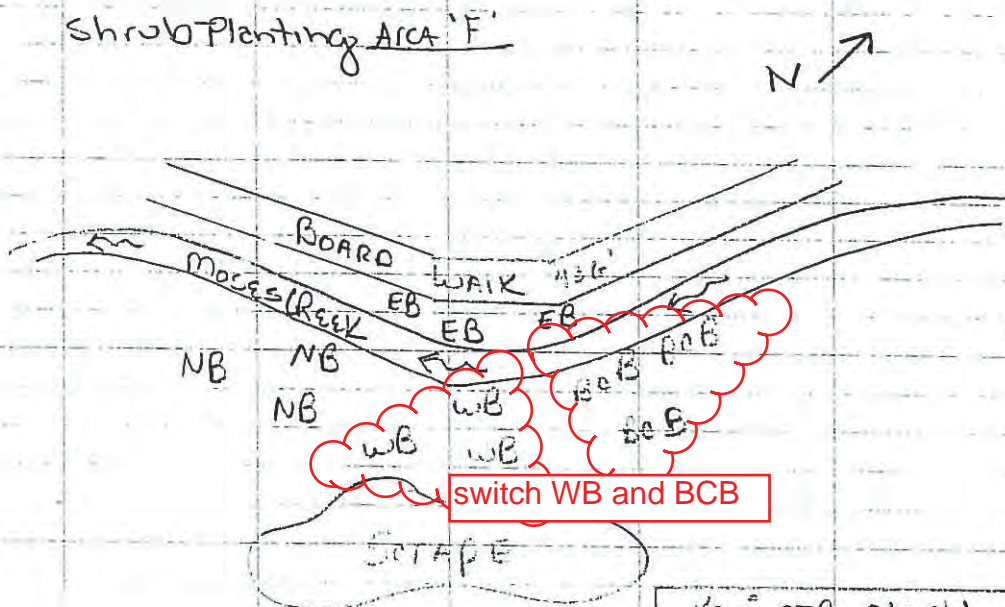
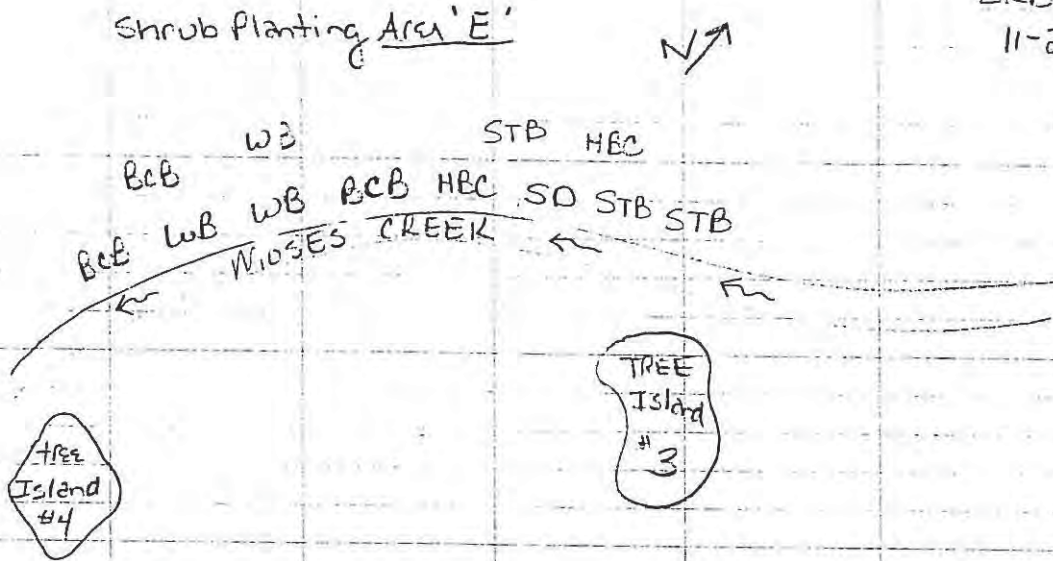
# QUEST

2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0201  
 Plantings Shrubs

Drawing NOT TO Scale  
 Direct Measure by  
 LKO  
 11-2-10



Key		E	F
STB	stripbush	3	
HBC	Highbush Cranberry	2	
NB	Nanny Berry	-	3
WB	Winter Berry	3	3
SD	Silky Dogwood	1	
BCB	Blackchoke Berry	3	3
EB	Elderberry	-	3
		12	12

Project No. 6351-01-74  
 Name of Road MOSES CREEK  
 Item 632.0201 Plantings

Highway  
 Comp. By LKO  
 Checked By

County PORTAGE  
 Sheet Of  
 Date 11-2-10

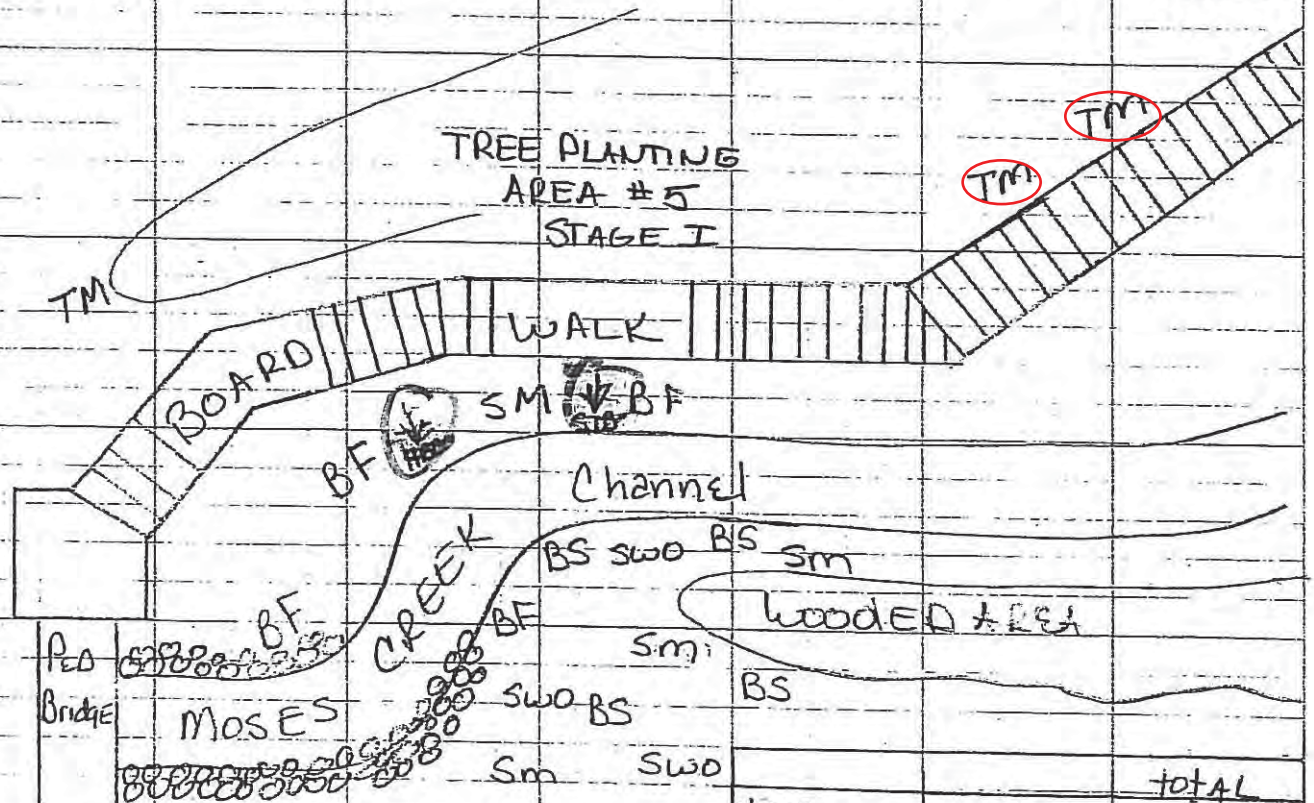
# QUEST

2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS

Plantings  
 632.0101 TREES  
~~632.0201 SHRUBS~~

DRAWING NOT TO SCALE  
 Direct MEASURE BY  
 LKD 10-19-10



KEY:		TOTAL
STB	STEEPLE BUSH	1
HBC	HIGH BUSH CRAWHERRY	1
		2

Project No. 6351-01-74	Highway	County PORTAGE
Name of Road MOSES CREEK	Comp. By LKD	Sheet OF
Item Plantings 632.0101 TREES <del>632.0201 SHRUBS</del>	Checked By	Date 10-19-10

# QUEST

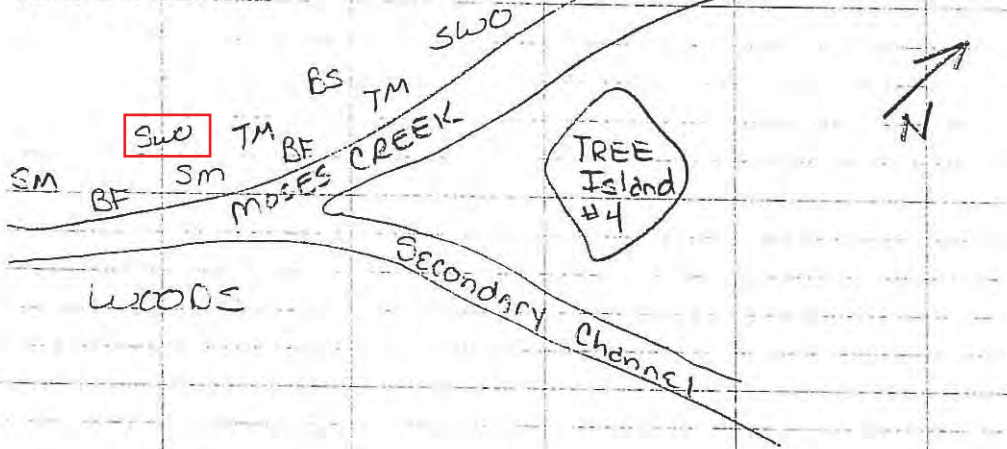
2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0101  
 Plantings TREES

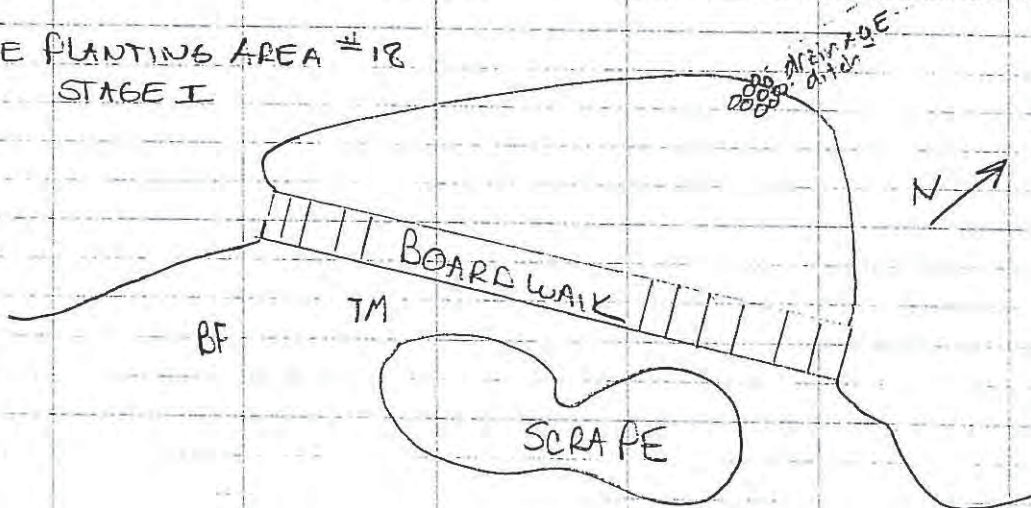
Drawing NOT TO SCALE  
 DIRECT MEASURE BY  
 LKD 10-21-10  
 +  
 11-3-10

PLANTING AREA #7 STAGE I  
 PLANTED 10-21-10



KEY:	#7	#18
SM - SILVER MAPLE	2	
TM - TAMARAC	2	1
BS - BLACKSPRUCE	1	
BF - BALSAM FIR	2	1
SWO - SWAMP WHITE OAK	2	
TOTAL	9	2

TREE PLANTING AREA #18  
 STAGE I



Project No. 6351-01-74

Name of Road MOSES CREEK

Item 632.0101 Plantings TREES

Highway

Comp. By LKD

Checked By

County PORTAGE

Sheet Of

Date 11-3-10



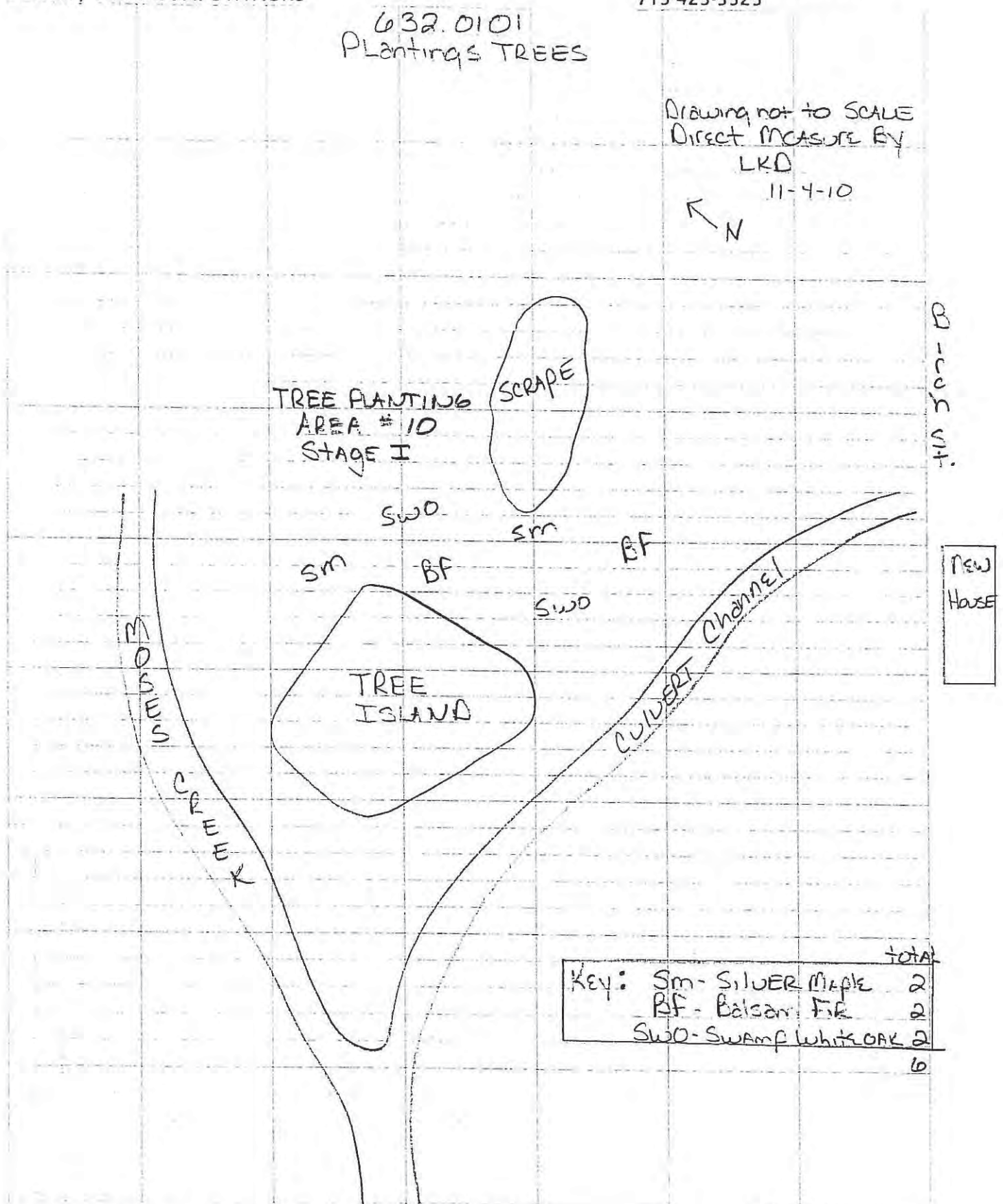
# QUEST

2811 8th Street South, Suite 8  
Wisconsin Rapids, WI 54494  
715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0101  
Plantings TREES

Drawing not to SCALE  
Direct MEASURE BY  
LKD  
11-4-10  
N



KEY:		TOTAL
SM	SILVER MAPLE	2
BF	BALSAM FIR	2
SWD	SWAMP WHITE OAK	2
		6

Project No. 6351-01-74

Highway

County PORTAGE

Name of Road MOSES CREEK

Comp. By LKD

Sheet Of

Item 632.0101 Plantings TREES

Checked By

Date 11-4-10

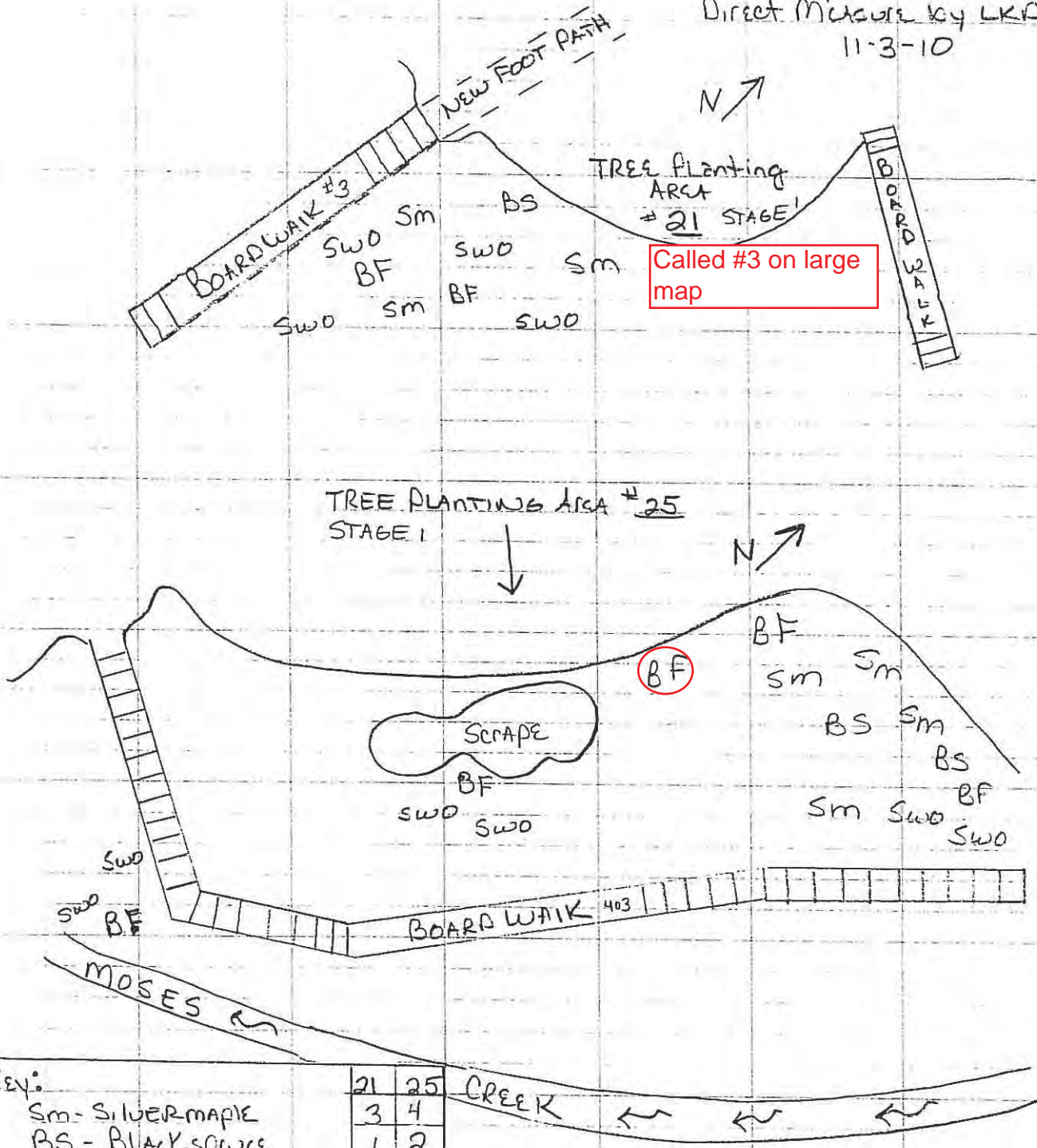
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2811 8th Street South, Suite 8  
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 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0101  
 Plantings TREES

DRAWING NOT TO SCALE  
 Direct Measure by LKD  
 11-3-10



KEY:

- Sm - SILVER MAPLE
- BS - BLACK SPRUCE
- BF - BALSAM FIR
- SWD - SWAMP WHITE OAK

21	25
3	4
1	2
2	5
4	6
TOTALS	10 17

Project No. 6351-01-74

Name of Road MOSES CREEK

Item 632.0101 Plantings TREES

Highway

Comp. By LKD

Checked By

County FOR AG E

Sheet Of

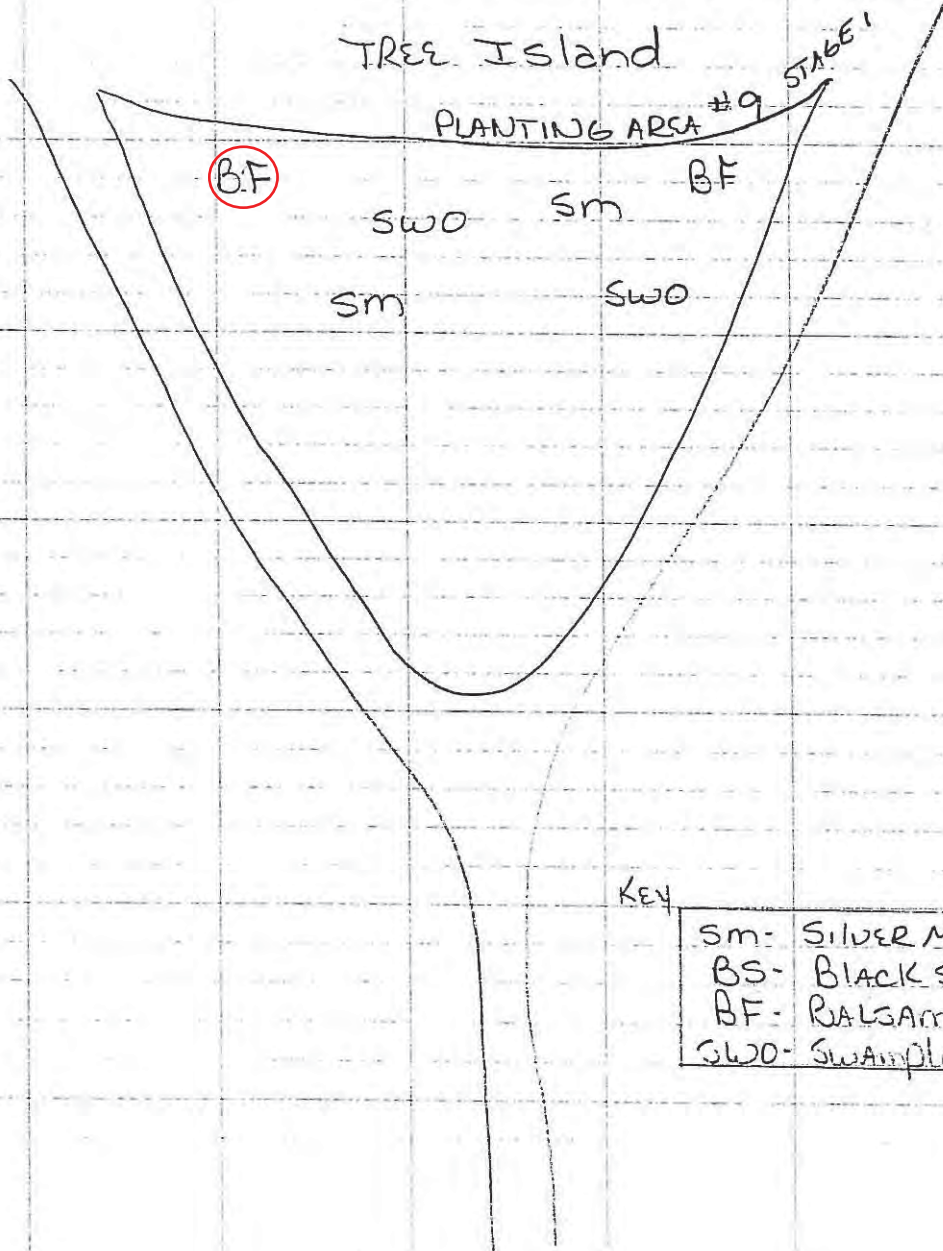
Date 11-3-10

DESIGN / FINAL COMPUTATIONS

632.0101  
Plantings TREES

Drawing NOT TO  
SCALE

DIRECT MEASURE  
By LKD 11-4-10



KEY	TOTALS
sm- SILVER MAPLE	2
BS- BLACK SPRUCE	1
BF- BALSAM FIR	2
SWO- SWAMP WHITE OAK	2
	6

Project No. 6351-01-74

Highway

County PORTAGE

Name of Road MOSES CREEK

Comp. By LKD

Sheet OF

Item 632.0101 Plantings  
TREES

Checked By

Date 11-4-10

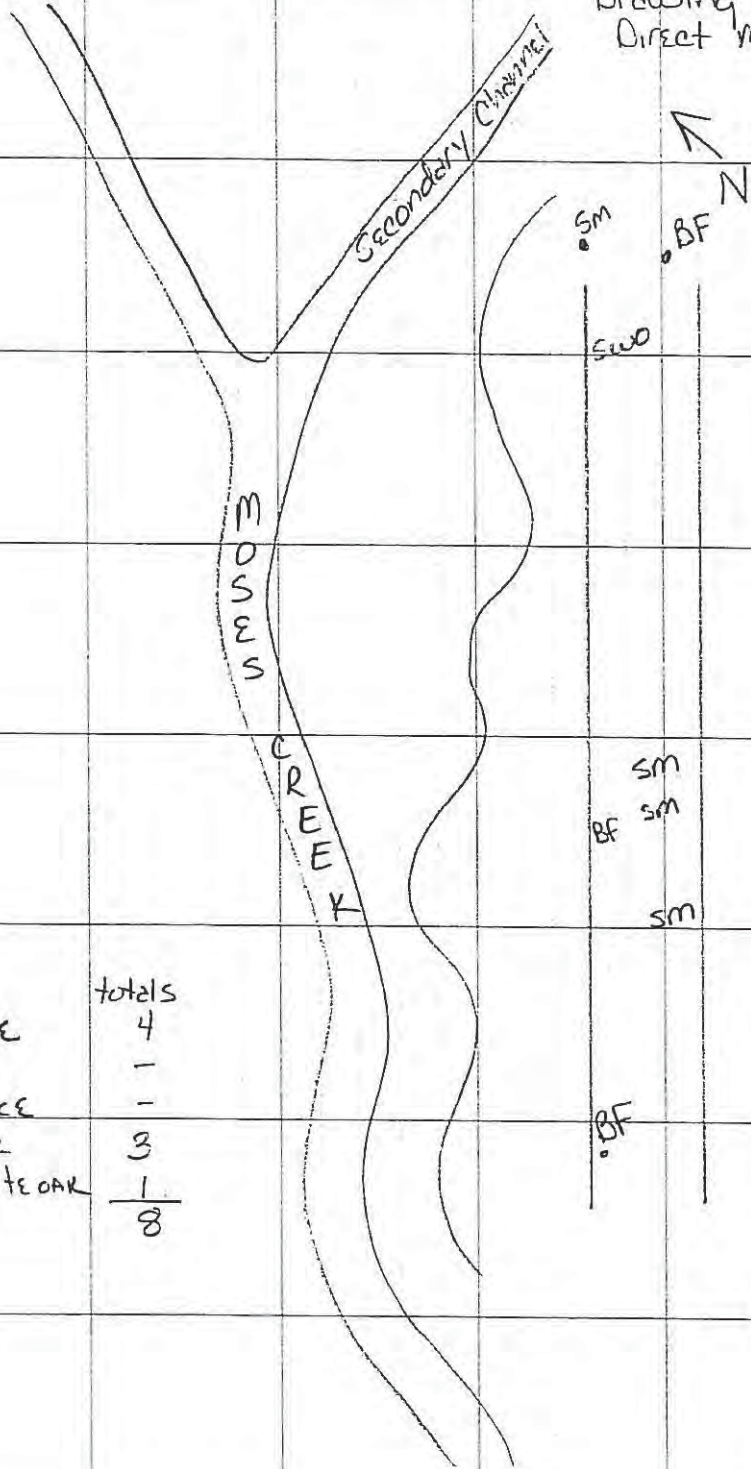
# QUEST

2811 8th Street South, Suite 8  
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DESIGN / FINAL COMPUTATIONS

632.0101  
 Plantings TREES

Drawing NOT TO SCALE  
 Direct MEASURE BY LKD  
 10-19-10  
 +  
 11-3-10



Key: Sm - SILVER MAPLE	totals
Tm - TAMARAC	4
BS - BLACK SPRUCE	-
Rf - REDMANN FIR	-
SwO - SWAMP WHITE OAK	3
	<u>1</u>
	8

Project No. 6351-01-74	Highway	County Portage
Name of Road MOSES CREEK	Comp. By LKD	Sheet Of
Item 632.0101 Plantings TREES	Checked By	Date 11-3-10

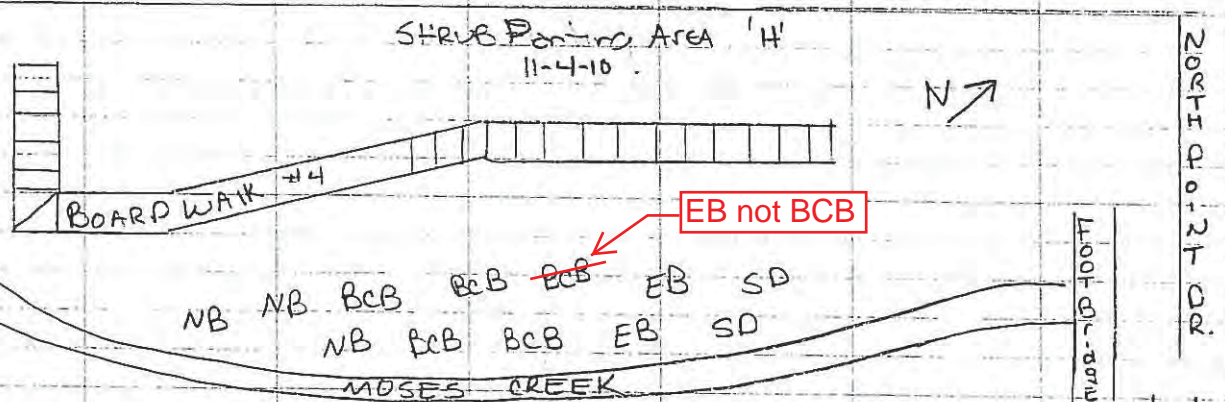
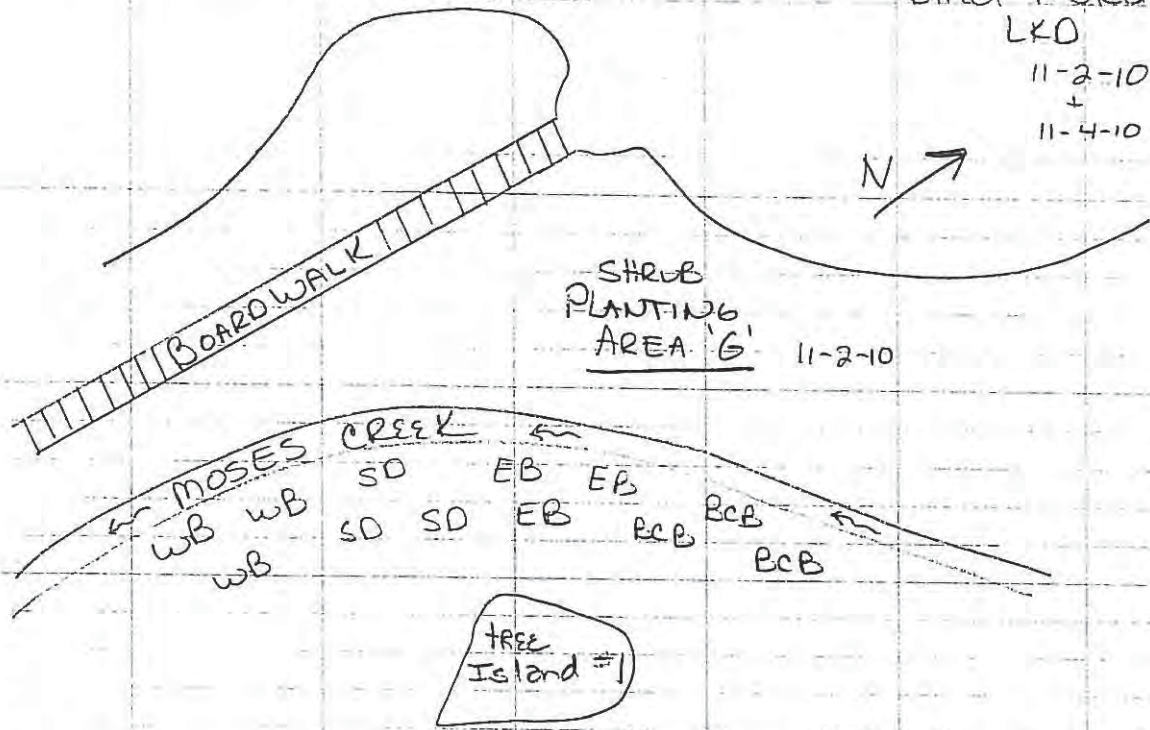
# QUEST

2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0201  
 Plantings Shrubs

Drawings not to scale  
 Direct Measure by  
 LKD  
 11-2-10  
 +  
 11-4-10



KEY:	
STB	Steeplesbush
HBC	Highbush Cran.
NB	Manny berry
WB	Winter berry
SD	Silky Dogwood
BCB	Black choke berry
EB	Elder berry

6	H
3	
3	2
3	5
3	2
12	12

Project No. 6351-01-74

Highway

County PORTAGE

Name of Road MOSES CREEK

Comp. By LKD

Sheet Of

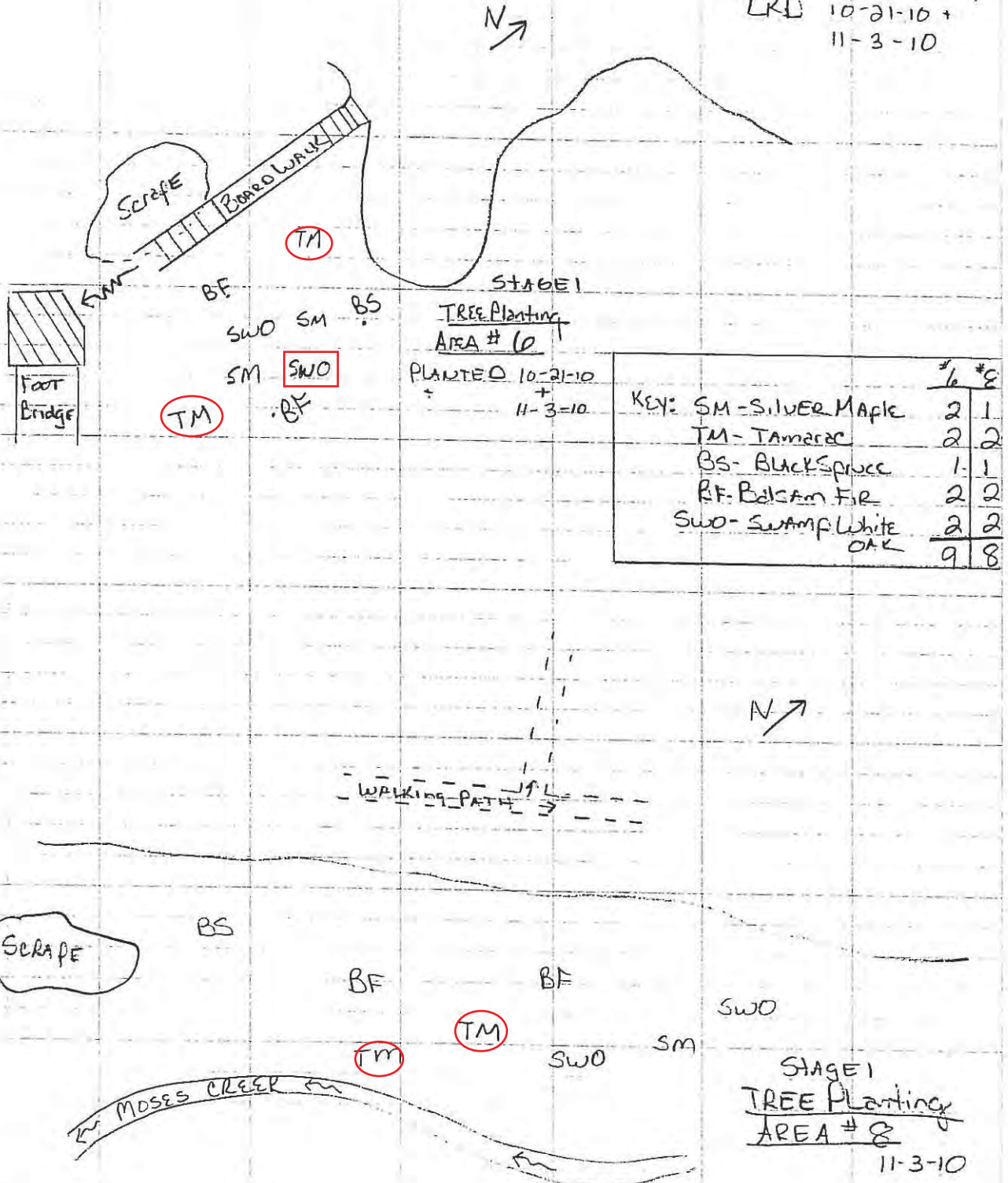
Item 632.0201. Plantings  
 October

Checked By

Date 11-2-10

632.0101  
 Plantings TREES

Drawing NOT TO SCALE  
 DIRECT MEASURE BY  
 LKD 10-21-10 +  
 11-3-10



TREE Planting  
 AREA # 10  
 PLANTED 10-21-10  
 +  
 11-3-10

KEY:		#	#
SM - SILVER MAPLE		2	1
TM - TAMARAC		2	2
BS - BLACK SPRUCE		1	1
BF - BALSAM FIR		2	2
SWO - SWAMP WHITE OAK		2	2
		<u>9</u>	<u>8</u>

STAGE 1  
 TREE Planting  
 AREA # 8  
 11-3-10

Project No. 6351-01-74

Name of Road MOSES CREEK

Item 632.0101 Plantings TREES

Highway

Comp. By LKD

Checked By

County FORTAGE

Sheet Of

Date 11-3-10

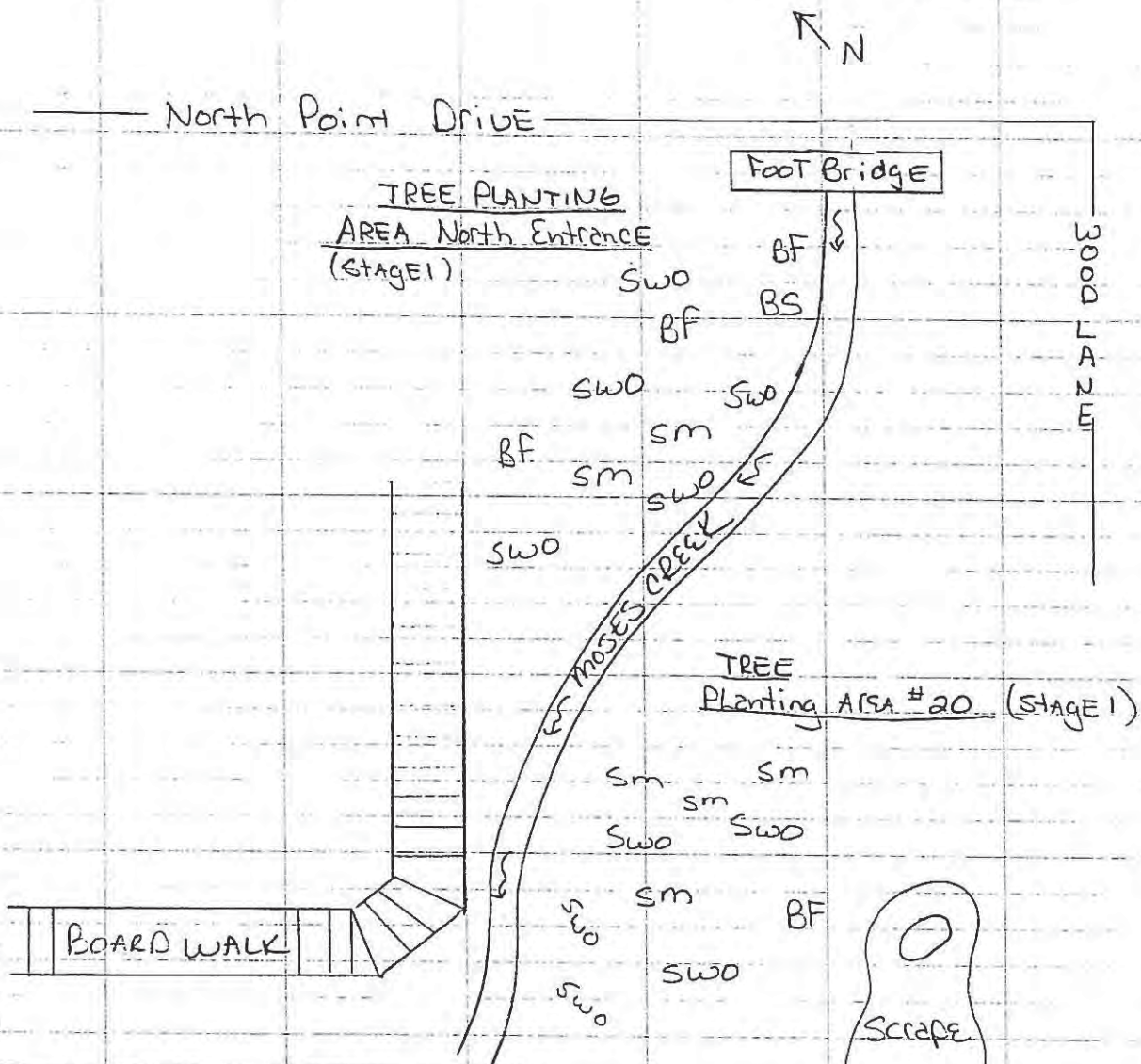
# QUEST

2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0101  
 Plantings TREES

Drawing NOT TO SCALE  
 Direct Measure By LKD  
 11-3-10



Key:	#20	N. ENT
Sm - SILVER MAPLE	4	2
TM - TAMARAC	-	-
BS - BLACK SPRUCE	-	1
BF - BALSAM FIR	1	3
SWO - SWAMP WHITE OAK	5	5
	10	11

Project No. 6351-01-74

Highway

County PORTAGE

Name of Road MOSES CREEK

Comp. By LKD

Sheet Of

Item 632.0101 Planting Trees

Checked By

Date 11-3-10

# QUEST

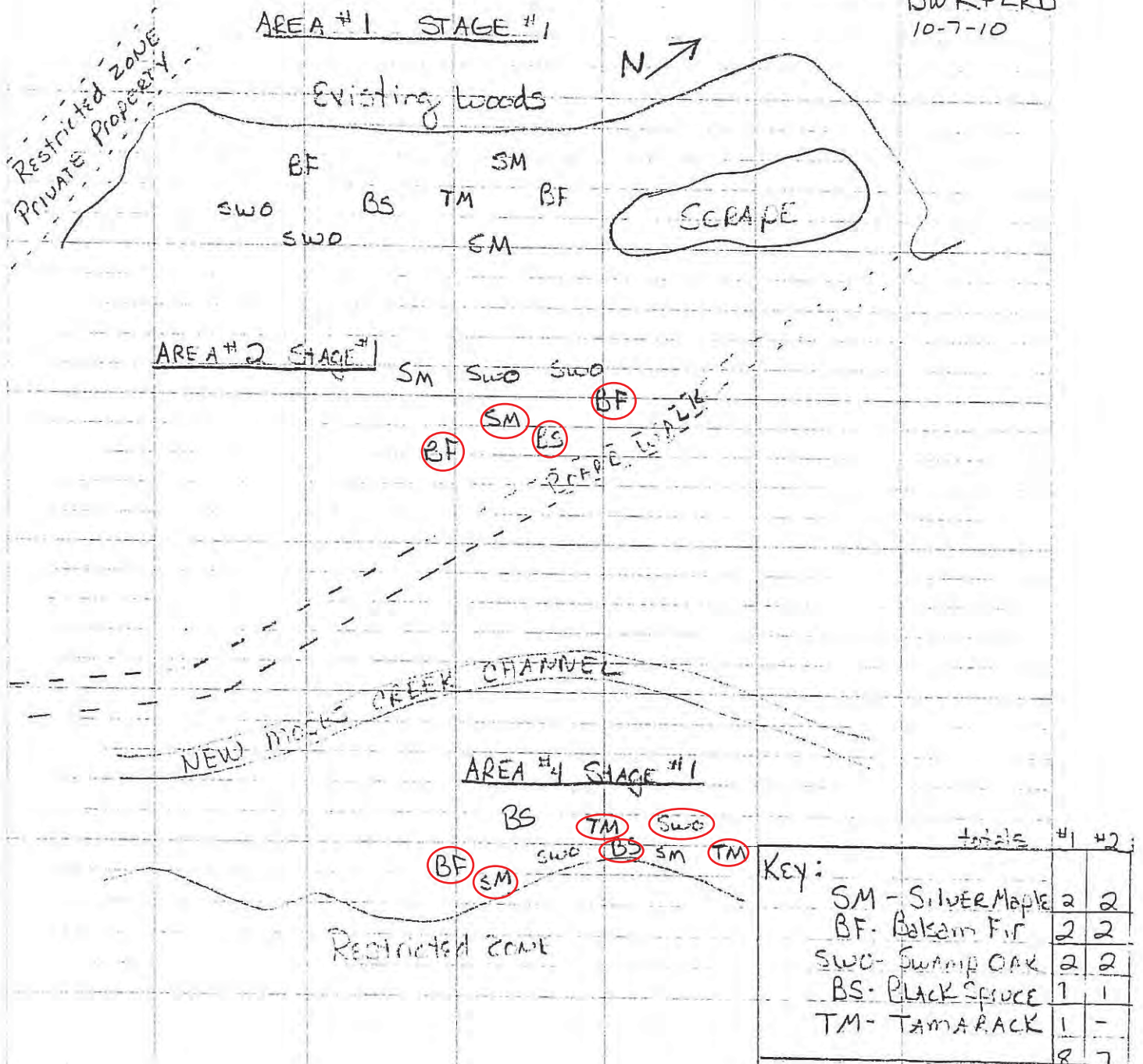
2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0101  
 Plantings TREES

Drawing NOT TO  
 SCALE

Direct Measure by  
 BWK+LKD  
 10-7-10



Project No. 6351-01-74

Highway

County FORTAGE

Name of Road MOSES CREEK

Comp. By LKD

Sheet OF

Item 632.0101 Plantings

Checked By

Date 10-7-10



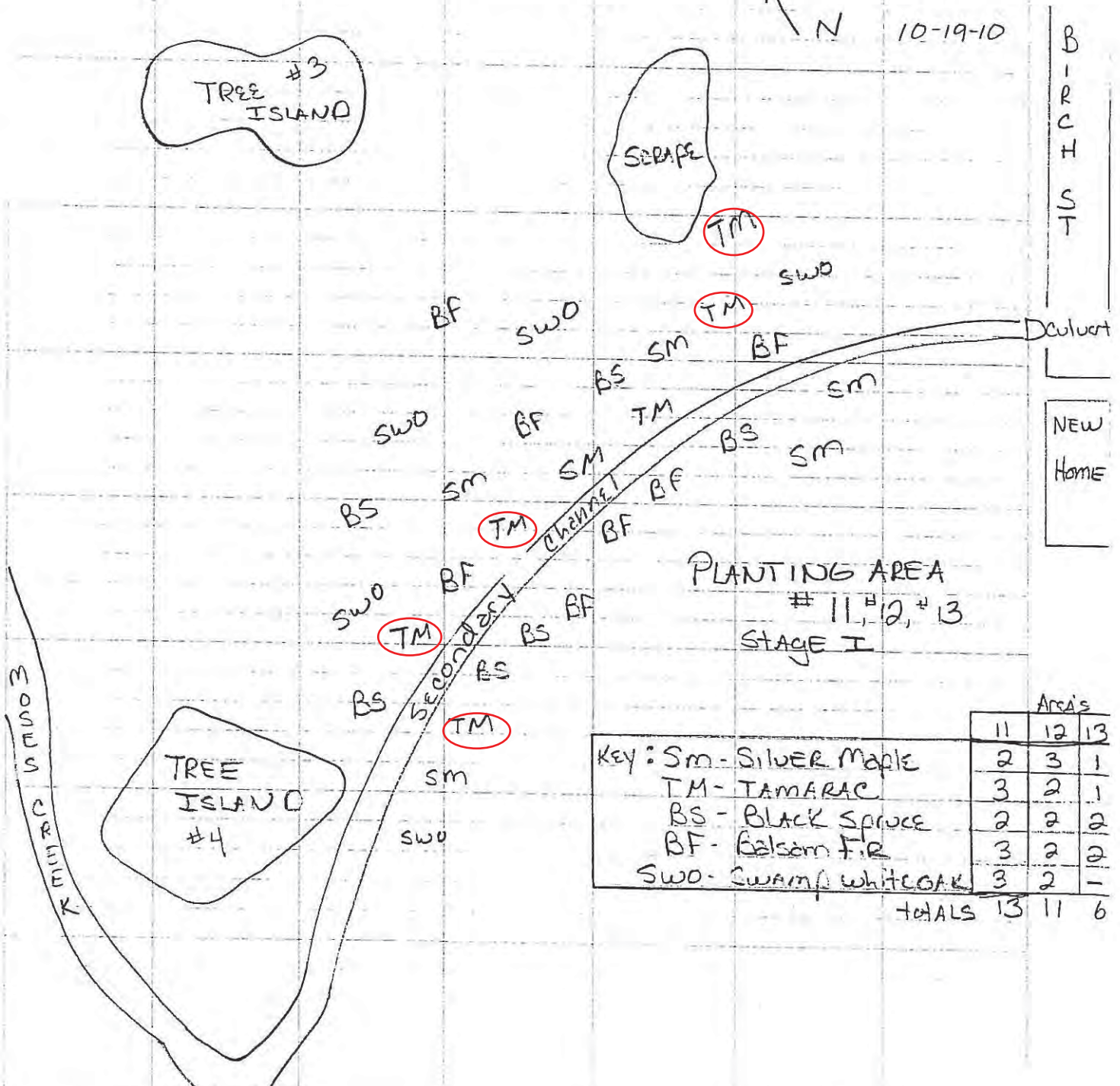
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2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0101  
 Plantings TREES

Drawing NOT TO SCALE  
 Direct MEASURE BY LKD  
 N  
 10-19-10



Key:	Area's		
	11	12	13
SM - SILVER MAPLE	2	3	1
TM - TAMARAC	3	2	1
BS - BLACK SPRUCE	2	2	2
BF - BALSAM FIR	3	2	2
SWO - SWAMP WHITE OAK	3	2	-
TOTALS	13	11	6

Project No. 6351-01-74  
 Name of Road MOSES CREEK  
 Item 632.0101 Plantings

Highway  
 Comp. By LKD  
 Checked By

County FOLTAGE  
 Sheet of  
 Date 10-19-10

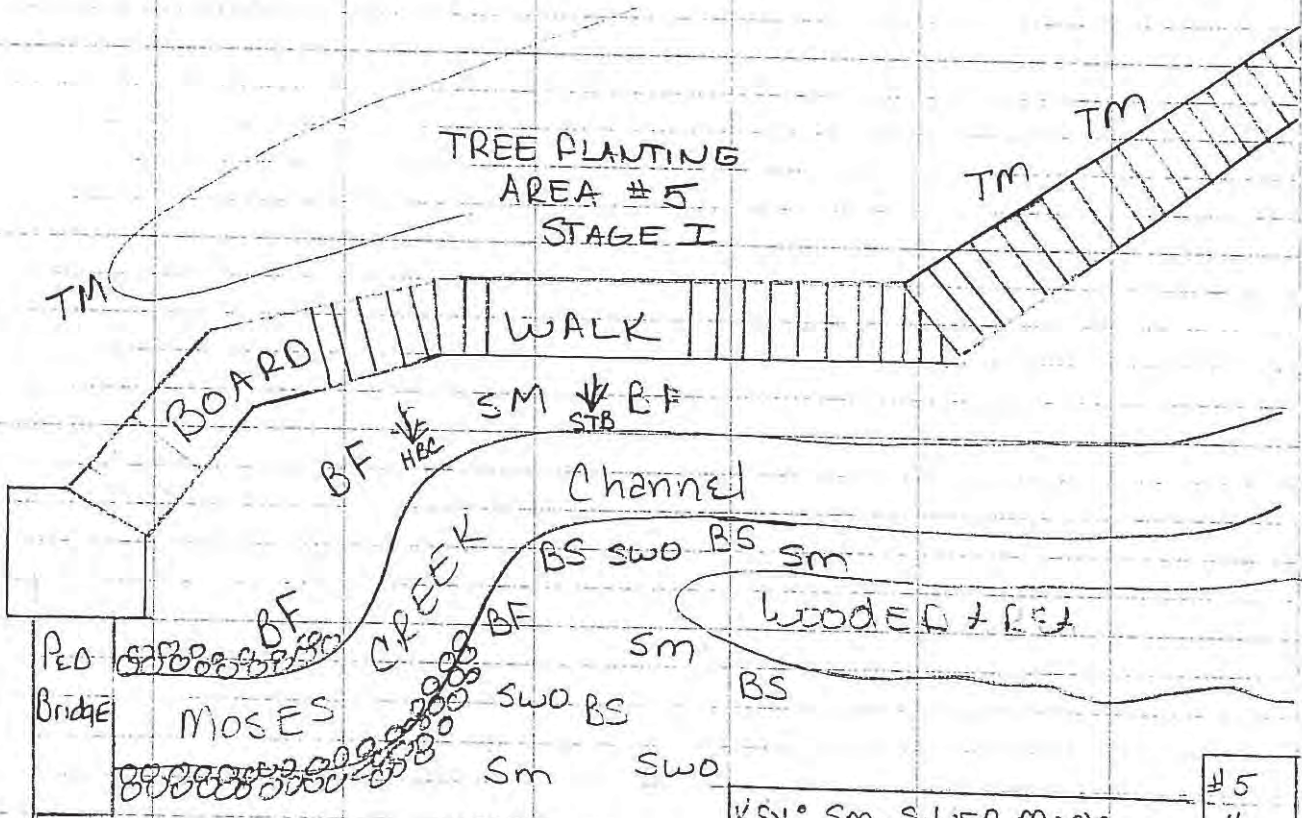
# QUEST

DESIGN / FINAL COMPUTATIONS

2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

Plantings  
 632.0101 TREES  
 632.0201 SHRUBS

DRAWING NOT TO SCALE  
 Direct MEASURE BY  
 LKD 10-19-10



KEY: SM - SILVER MAPLE	#5
TM - TAMARAC	4
BS - BLACK SPRUCE	3
BF - BALSAM FIR	4
SWO - SWAMP WHITE OAK	4
	3
	18

Project No. 6351-01-74

Highway

County PORTAGE

Name of Road MOSES CREEK

Comp. By LKD

Sheet Of

Item Plantings 632.0101 TREES Checked By

Date 10-19-10

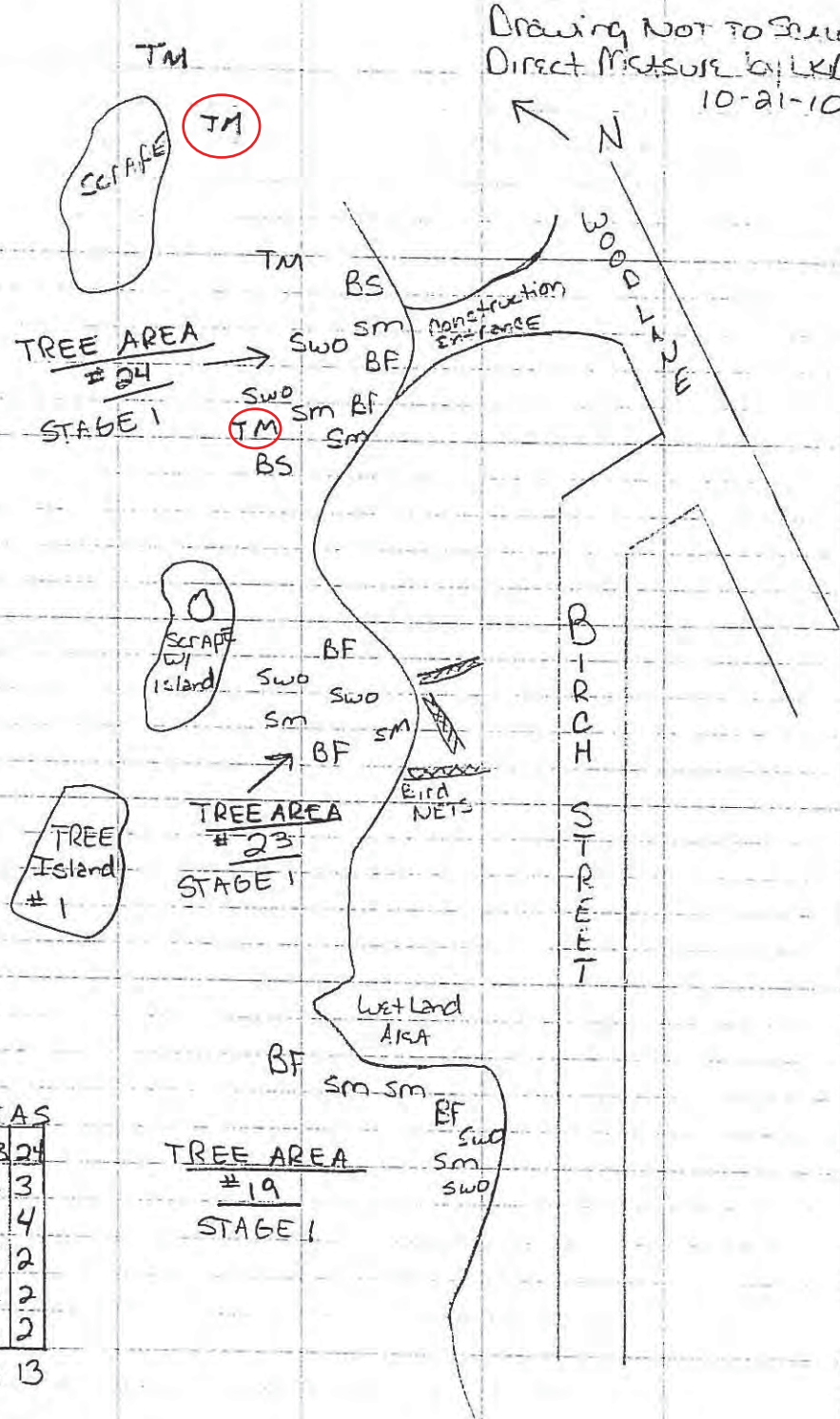
# QUEST

2811 8th Street South, Suite 8  
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DESIGN / FINAL COMPUTATIONS

632.0101  
 Plantings TREES

Drawing NOT TO SCALE  
 Direct Measure by LKD  
 10-21-10



Key:	totals	AREAS		
		19	23	24
Sm - Silver Maple	3	2	3	
TM - Tamarac	1	-	4	
BS - Black Spruce	1	-	2	
BF - Balsam Fir	2	2	2	
SwO - Swamp White Oak	2	2	2	
		7	6	13

Project No. 6351-01-74  
 Name of Road MOSES CREEK  
 Item 632.0101 Plantings

Highway  
 Comp. By LKD  
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County PORTAGE  
 Sheet Of  
 Date 10-21-10

# QUEST

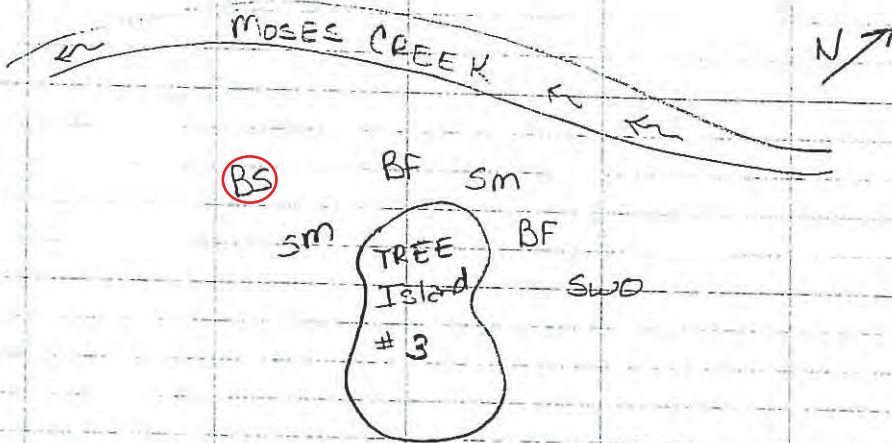
DESIGN / FINAL COMPUTATIONS

2811 8th Street South, Suite 8  
Wisconsin Rapids, WI 54494  
715-423-3525

632.0101  
Plantings TREES

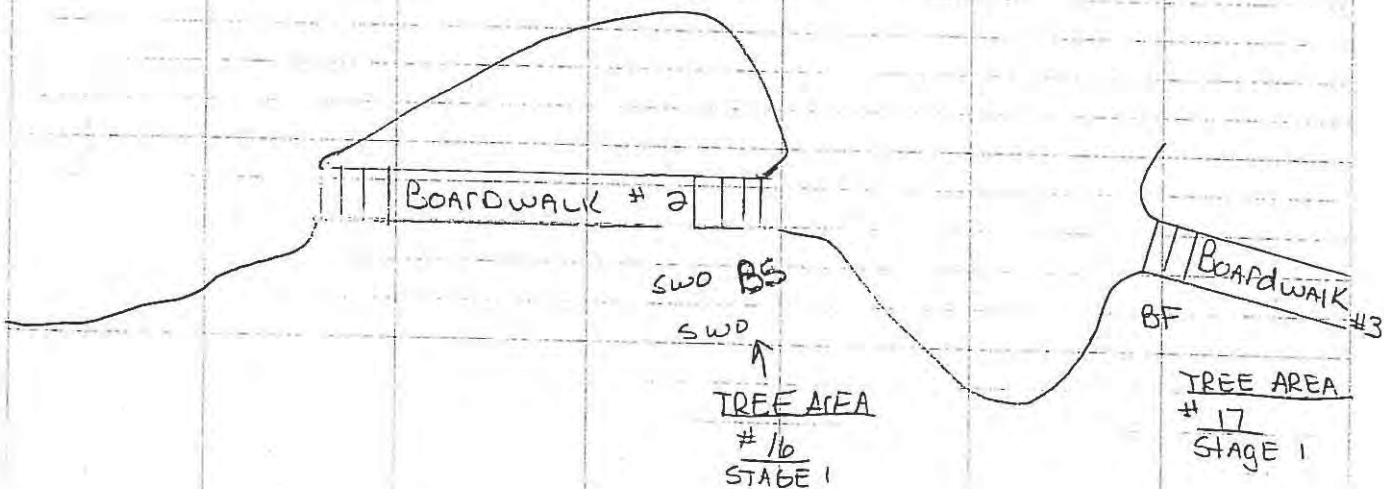
DRAWING NOT TO SCALE  
DIRECT MEASURE BY  
LKD 11-4-10

TREE PLANTING AREA #15  
STAGE I



Key:	#15	#16	#17
SM - SILVER MAPLE	2	-	
TM - TAMARAC	-	-	
BS - BLACK SPRUCE	1	1	
BF - BALSAM FIR	2	-	1
SWO - SWAMP WHITE OAK	1	2	
TOTAL	6	3	1

TREE PLANTING AREA #16 + #18 + #17  
STAGE I



Project No. 6351-01-74

Highway

County PORTAGE

Name of Road MOSES CREEK

Comp. By LKD

Sheet Of

Item 632.0101 Plantings

Checked By

Date 11-4-10

# QUEST

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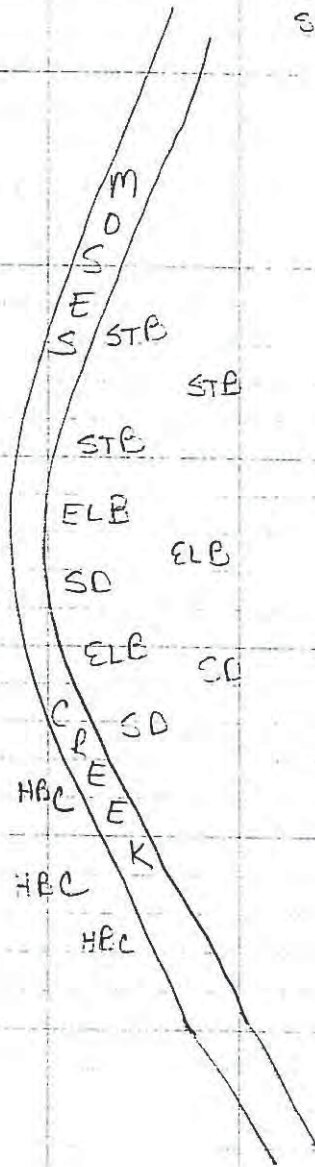
DESIGN / FINAL COMPUTATIONS

632.0201  
 PLANTINGS SHRUBS

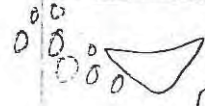
Drawing NOT TO SCALE

DIRECT MEASURE  
 BY LKD 10-20-10

SHRUB PLANTING AREA  
 "I"  
 STAGE II



Key:		Total
STB	- Steeple bush 632.0201.01	3
HBC	- High bush Cranberry 632.0201.02	3
SD	- Silky Dogwood 632.0201.05	3
ELB	- Elderberry 632.0201.07	3
		12



MISSISSIPPI AVE

Project No. 6351-01-114

Highway

County PORTAGE

Name of Road MISSISSIPPI AVE

Comp. By LKD

Sheet Of

Item 632.0201 Plantings

Checked By

Date 10-20-10

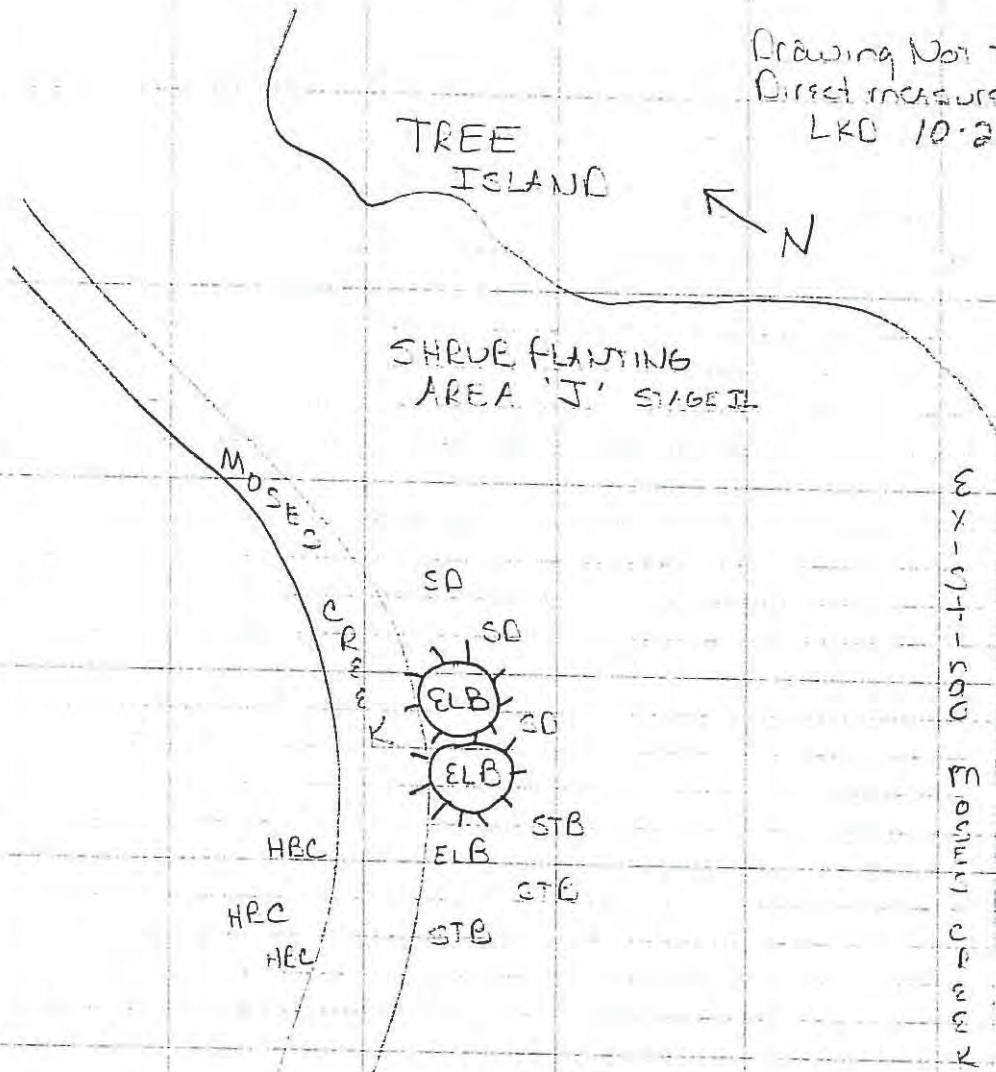
# QUEST

2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS


632.0201  
 PLANTING SHEET

Drawing Not to Scale  
 Direct measure by  
 LKD 10-20-10



Key STB - Steeplesbush 632.0201.01  
 HBC - High bush Cranberry 632.0201.02  
 SC - Silky Dogwood 632.0201.05  
 ELB - Elderberry 632.0201.07

TOTAL
3
3
3
3
12

NOTE:  These shrubs were DAMAGED from buck rubbing on them before shrub Browse was installed. 11-8-10 LKD

Project No. 6351-01-74

Name of Road MOSES CREEK

Item 632.0201 Planting

Highway

Comp. By LKD

Checked By

County PORTAGE

Sheet Of

Date 10-20-10

# QUEST

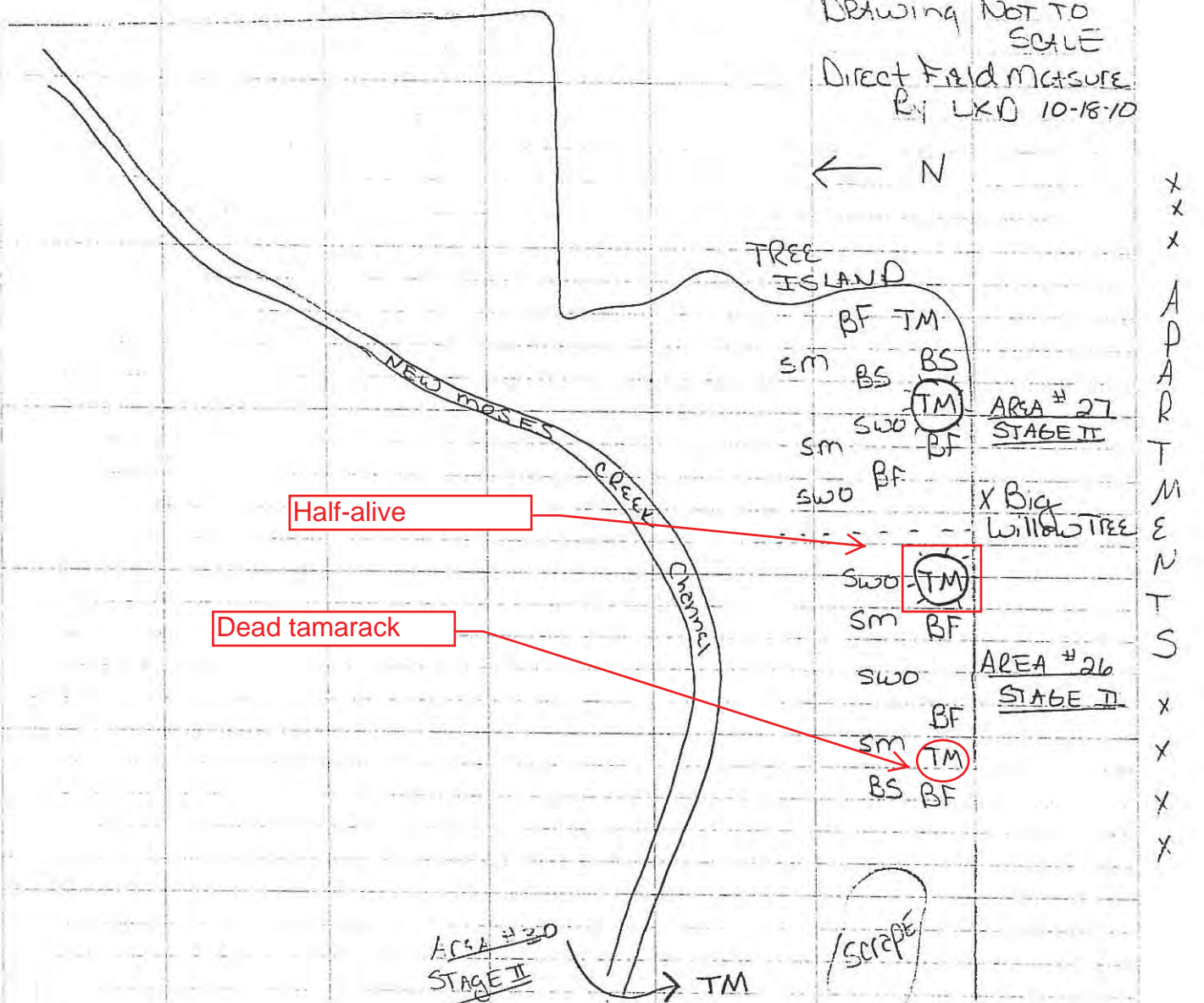
2811 8th Street South, Suite 8  
 Wisconsin Rapids, WI 54494  
 715-423-3525

DESIGN / FINAL COMPUTATIONS

632.0101  
 Plantings Trees

Drawing NOT TO SCALE  
 Direct Field Measure  
 By LKD 10-18-10

← N



Half-alive

Dead tamarack

AREA #30  
 STAGE II

KEY:	TOTALS		
	#26	#27	#30
SM - SILVER MAPLE	2	2	-
TM - TAMARAC	2	2	1
BS - BLACK SPRUCE	1	2	-
BF - BALCAM FIR	3	3	-
SWO - SWAMP WHITE OAK	2	2	-
	10	11	1

- These TAMARACS were Rubbed by Bucks before browse protection was installed LKD 11-8-10

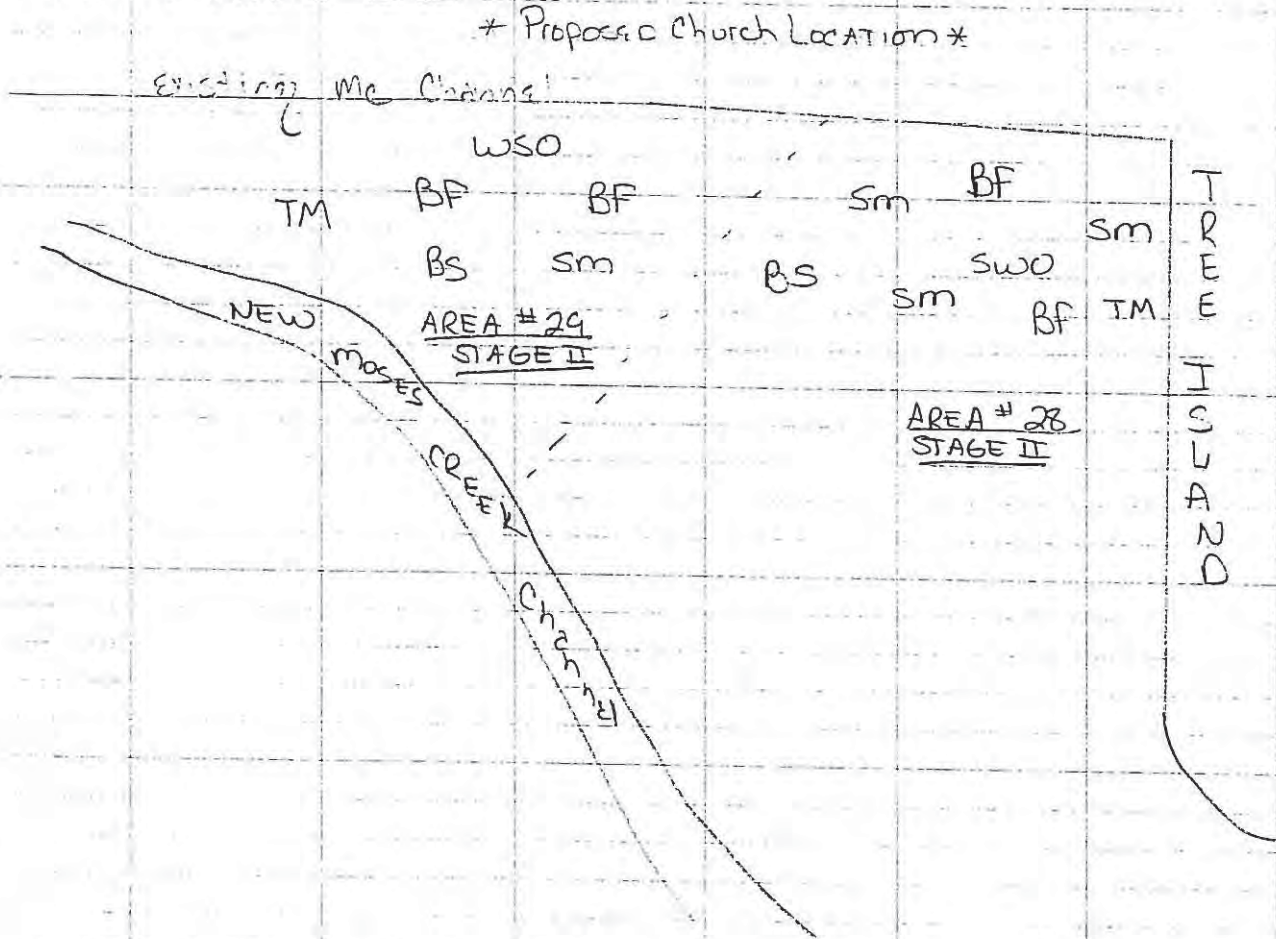
Project No. 6351-01-74  
 Name of Road MOSES CREEK  
 Item 632.0101 Plantings

Highway  
 Comp. By LKD  
 Checked By

County Portage  
 Sheet OF  
 Date 10-18-10

632.0101  
Plantings TREES

Drawing NOT TO  
SCALE  
Direct Field MEASURE  
By LKD 10-13-10



Key:	Totals	
	# 28	# 29
Sm - SILVER MAPLE	3	1
TM - TAMARAC	1	1
BS - BLACK SPICE	1	1
BF - BALSAM F.R.	2	2
SWO - SWAMP WHITE OAK	1	1
	8	6

Project No. 6351-01-74

Highway

County PORTAGE

Name of Road MOSES CREEK

Comp. By LKD

Sheet Of

Item 632.0101 Plantings  
TREES

Checked By

Date 10-13-10



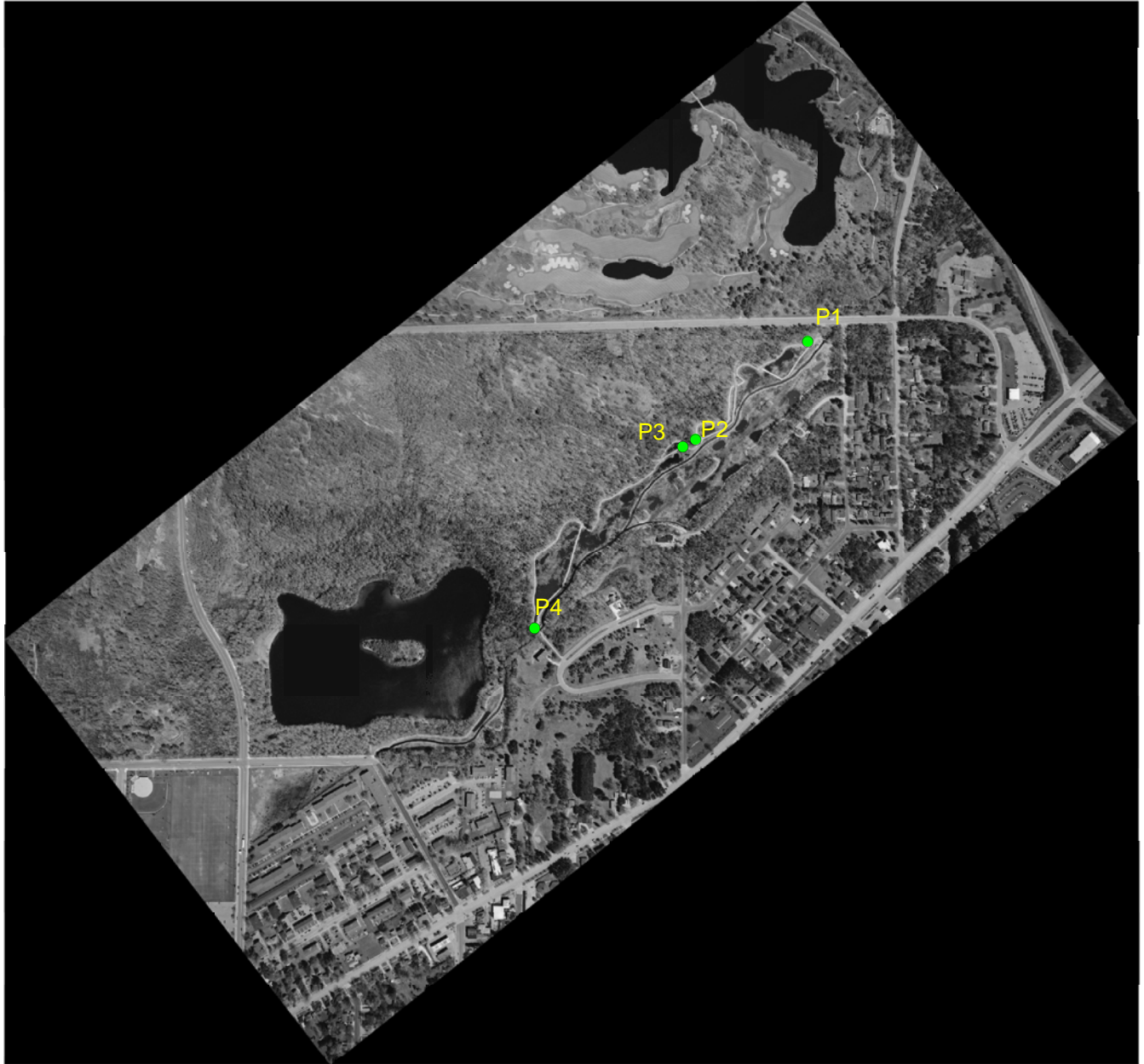
## **Appendix H**

### **Site Photographs**

- **Monitoring Photograph Map**
- **Monitoring Photographs**

# Moses Creek Photopoints

2011



1:12,000

## Legend

● Photopoint



# Moses Creek

*Monitoring Photopoints, 2011*

*Wisconsin Department of Transportation*

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**Figure 1.** Photopoint 1 from the North section of Moses Creek looking south.



**Figure 2.** Photopoint 2 midway through Moses Creek looking north.



**Figure 3.** Photopoint 2 midway through Moses Creek looking south.



**Figure 4.** Photopoint 3 midway through Moses Creek looking west.



Figure 5. Photopoint 3 midway through Moses Creek looking southeast.



Figure 6. Photopoint 4 at the Milano-Sciarrone crossing looking east.



**Figure 7.** Photopoint 4 at the Milano-Sciarrone crossing looking northeast.



**Figure 8.** Photopoint 4 at the Milano-Sciarrone crossing looking north.



**Figure 9.** Photopoint 4 at the Milano-Sciarrone crossing looking west.