Natural Resources Consulting, Inc.



PRELIMINARY WETLAND MITIGATION PLAN

MOSES CREEK MITIGATION SITE
WISDOT PROJECT I.D. 6351-01-04/74

City of Stevens Point

Portage County, Wisconsin

NRC Project No. 008-0099-02
October 2009

PREPARED FOR:

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Regulatory and Scientific Expertise – Wetlands, Soils, Ecology, Restoration

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UWSP, SCHMEEKLE RESERVE, CITY OF STEVENS POINT
PORTAGE COUNTY, WISCONSIN

October 12, 2009

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INTRODUCTION AND BACKGROUND

The Wisconsin Department of Transportation (WisDOT) North Central Region (NCR) proposes to construct a wetland mitigation site to compensate for unavoidable wetland impacts from the Wood County portion of the United States Highway 10 (USH 10) Stevens Point Bypass project (Project I.D. 6351-01-04/74). The Moses Creek Wetland Mitigation Site will consist of approximately 25-acres within Schmeekle Reserve, which is owned by the University of Wisconsin-Stevens Point (UWSP) (see Project Location and Overview Map, Appendix A). The project area is currently a complex of drained wetland and adjacent upland plant communities. Schmeeckle Reserve is recognized as a regionally important passive recreational and educational facility that is operated by UWSP staff and students.

Schmeeckle Reserve staff has been acquiring land with a vision of restoring the Moses Creek channel and riparian wetlands. Partnering with WisDOT will fulfill this vision.

The goal of this project is to restore approximately 20 acres of riparian emergent (RPE), scrub-shrub (SS), and riparian forested (RPF) wetland plant communities, approximately 5 acres of upland buffer habitat, and 4930 linear feet of naturalized stream habitat. The site will be seeded following construction with native upland and wetland species, and a portion of the site will be landscaped with shrubs and trees to facilitate establishment of woody vegetation. WisDOT has also committed resources to implement a post-construction maintenance plan to control invasive species, including glossy buckthorn, which is prevelant within Schmeeckle Reserve.

This mitigation plan presents the latest project-specific information and design plans. This plan is considered a working document and will be modified as the project requires through the final design, based on technical and regulatory requirements. Design modifications and final design plans will be submitted to the U. S. Army Corps of Engineers (USACE) and the Wisconsin Department of Natural Resources (WDNR) for review in accordance with the Cooperative Agreement.

The type of work required to complete this project includes naturalizing the existing Moses Creek channel and excavating an adjacent riparian wetland to create a mix of riparian emergent (RPE), wet meadow (M), and riparian forest (RPF) plant communities (see Landscape Plan, Appendix A).

Site ownership will be maintained by UWSP, but maintenance easements will be placed on the site to allow for continued maintenance and monitoring by WisDOT.

SITE LOCATION/OWNERSHIP

The site is located in the City of Stevens Point, between the intersection of North Point Drive and Wood Lane (north limits), and Maria Drive (south limits) (see Project Overview and Location Map, Appendix A). The total length of the project from the southwest extent to the northeast extent is approximately 0.72 miles (3,800 ft). The site is located within Sec 28, T24N, R8E, City of Stevens Point, Portage County, Wisconsin.

The site is part of Schmeekle Reserve and is primarily forested land. An extensive trail system, including a portion of the Green Circle Trail, traverses the site. A channelized portion of Moses Creek flows southwest along the Project's south boundary, and an unnamed tributary to Moses Creek flows south through its center. This segment of Moses Creek has become separated from its historic floodplain due to dredging and the spreading of dredge spoils along the stream's banks. Moses Creek continues flowing offsite through a triangular shaped parcel owned by the City of Stevens Point, then into the City's storm

sewer system, which discharges into the Wisconsin River. This portion of the creek has also been channelized, and the City historically graded this area to provide floodwater storage during periods of high flow.

SITE CONDITIONS AND REFERENCE SITE INFORMATION

As part of the feasibility analysis for this project, field data from the project site and a reference site were collected. The reference site is located upstream of the project, near the headwaters of Moses Creek (see Overview Map, Appendix A). Data for the project site and reference site are provided in this section.

Land Use

Project Site

The site is currently forested and provides passive recreation and educational opportunities to UWSP and local residents. The site was historically drained by the channelization of Moses Creek. Historically the site was farmed and used for pasture.

The surrounding land use includes recreational (Sentry World Golf Course and the Green Circle Trail), institutional (UWSP and Sentry Insurance), residential, wetland, and woodland. To the north, the site is bounded by North Point Drive, Sentry, and wooded wetland. A large wetland complex associated with Moses Creek is located northeast of these lands. This wetland complex was used as a reference wetland for the restoration site. To the east the site is bounded by Wood Lane, residences, and woodland. To the south, the site is bounded by residences and Maria Drive. To the west, the site is bounded by Schmeeckle Reserve.

Reference Site

The land use near the reference site is primarily undeveloped wetland and woodlands within a scattered rural residential setting.

Topography

Project Site

The topography of the site is generally flat, with a gradient to the southwest. As part of the project design, AECOM completed a 1-foot contour interval topographic survey of the site (see Grading Limits, Appendix A). The survey located property boundaries, existing drainage ditches, existing culverts, and spoil piles. Surface elevations range from approximately 1,094 MSL on the north side to 1,090 feet MSL on the south side. The channelized segment of Moses Creek was excavated at depths between approximately 3 to 4 feet to facilitate site drainage.

Local topography determines general drainage patterns and influences surface water runoff rates, for example, surface runoff from the site collects in natural swales and manmade drainage ditches. Runoff flows north to south and eventually discharges into the Wisconsin River in downtown Stevens Point via a large diameter culvert.

Reference Site

The topography of the reference site is generally flat with a gradient to the southwest. The topography in this area has not been significantly altered, but Moses Creek has been channelized into a shallow ditch.

Soil

On-site

According to the *Soil Survey of Portage County, Wisconsin*, the site is mapped as either Meehan loamy sand or Roscommon muck. Meehan loamy sand is a somewhat poorly drained soil that formed on sand plains and river terraces. Roscommon muck is a poorly drained soil located in drainageways and depressions on sand plains. Generally speaking, the soils observed on-site match the descriptions of these two soil types.

Based on the well logs and data collected during the wetland delineation, top soil depths ranged from 19 inches near W-6 to 1 inch along the shores of Lake Joanis, with most top soil depths ranging from 10 to 14 inches. Most upland areas within the project had a top soil comprised of sandy loam, while underlying soils were mostly loamy sand or sand. Some drained muck areas were encountered, primarily between Moses Creek and Birch Street. These areas meet hydric soil requirements, but were not classified as wetland because they did not have sufficient hydrology. The wetlands on site contained a mucky mineral surface layer, or a muck surface layer with either a sandy loam or loamy sand subsoil.

Reference Site

According to the *Soil Survey of Portage County, Wisconsin*, the reference sites are mapped as having very poorly drained soils, including Markey muck and Roscommon muck. Generally speaking, the soils observed at the reference sites match the descriptions of these soils.

Soil borings showed organic soils overlying sandy subsoils. Topsoil depths ranged from 9 to 12 inches.

Wetlands

Project Site

Eight wetlands were identified and delineated on the project site in May 2008. Wetlands consist of wet meadow (WM), scrub-shrub (SS), and hardwood swamp (WS). For the most part, the adjacent uplands are forested. A combined total of approximately 7.24 acres of wetlands were identified within the project site. Copies of the delineation report were submitted to the USACE and WDNR for review and concurrence.

The wetlands on site are considered degraded from historic drainage and the presence of invasive species, predominantly glossy buckthorn and reed canary grass. Many areas not delineated as wetlands on the project site contain drained hydric soil remnants, resulting in excellent wetland restoration potential for this site.

Reference Site

Wetlands were not delineated at the reference site. The reference site is located in a minimally disturbed wetland complex along Moses Creek, approximately 1.6 miles upstream of the project. Plant

communities present at the reference site include wet meadow (RPE) and tall shrub wetlands (RPF). The plant communities at the reference site all have a high degree of ecological integrity.

Surface Water

Project Site

The site is located in the Moses Creek watershed, which discharges to the Wisconsin River via a storm water pipe located south of the project limits (see Location Map, Appendix A). Historic aerial photographs from 1938, show that a large segment of Moses Creek was channelized on site and on adjacent parcels. Spoil from channelization was used to construct perimeter levees, which separated the creek from its flood plain. The channelization of the creek and its tributaries quickly removes surface water from the area, and lowers local groundwater levels. Staff gage monitoring indicates the stream channel has an intermittent base flow that is supplied by groundwater discharge.

The existing channel has not been maintained, consequently it has become overgrown with vegetation and has accumulated debris. The channel ranges from approximately 10 to 15 feet wide. Observations from the City, Schmeeckle Reserve, and local residents report that periodic flooding occurs in this area, primarily during spring runoff following snow melt. Lack of maintenance to the existing channel facilitates ice dams that lead to flooding of adjacent lands.

Hydrology observations were performed by UWSP students from May 19, 2008 through August 17, 2009 at three staff gage locations (see See Stage Data, Appendix B). Water level measurements were collected two to three times per week using direct readings. Staff gage locations and elevations were surveyed by AECOM.

The highest stream stage occurred near the end of April, 2009. Highest stage elevations were 1092.8 at Gage 1, 1092.7 at Gage 2, and 1087.3 at Gage 3. Median stage elevations from the beginning of May through the end of June over the two year monitoring period are 1091.7 for Gage 1, 1091.2 at Gage 2, and 1086.4 at Gage 3. The stream became dry in early August in 2008 and early September 2009.

Climatic conditions varied over the 2008 growing season (see Precipitation Analysis, Appendix B). A 30 Day Rolling Total Analysis indicates that abnormally high amounts of rainfall were recorded for all of April and most of June, but abnormally low amounts of rainfall were recorded from the end of July until the start of October. In 2009 rainfall values were mostly in the normal range from the beginning of March through the end of June, with an abnormally dry period occurring during July.

The USGS' Waterwatch indicates that in 2008 stream flows in Portage County were higher than normal in April, in their normal range from May through July, and lower than normal from August through November. In 2009 stream flows were lower than normal in April, normal in May and June, dry in July, and normal in August.

Reference Site

Stream morphology was analyzed from a reference reach located approximately 1 mile north the project site (see Reference Reach Report, Appendix C). The reference reach consists of a channelized stream with extensive riparian wetlands surrounded by large wooded tracts. North of the reference reach, near the creek's headwaters, the channel becomes diffuse and is not distinguishable within the wetland

complex.

Field observations show that Moses Creek's channel within the reference reach contains intermittent flows that were dry in August 2008. The average width of the channel at the reference site is 5 feet and the estimated water depth is approximately 3 inches. Spoil piles from historic channelization are present along the reference reach.

Groundwater

Project Site

Groundwater levels on the site were monitored using four on-site monitoring wells. Wells 1, 2 and 3 are located in the northeast portion of the project and are perpendicular to Moses Creek, whereas Well 4 is located in the south portion of the site. Groundwater observations were performed by UWSP students from May 19, 2008 through August 17, 2009 at the four well locations. Water level measurements were collected two to three times per week using direct readings. Monitoring well locations and elevations were surveyed by AECOM.

These data have provided a representation of groundwater elevations across the site, and provide information related to seasonal groundwater fluctuations (see Monitoring Well Data, Appendix B). The groundwater elevation is highest in the north portion of the site. Highest water table elevations observed at monitoring Wells 1, 2, and 3 were approximately 1092.3, with Well 1 having slightly higher elevations and Well 3 slightly lower. Median water elevations from the beginning of May through the end of June over the two year monitoring period was 1091.2 at Well 2 and 1090.7 at Well 3. Well 4 had a high ground water elevation of 1090.7, with a median May through June value of 1089.5.

Reference Site

Direct groundwater monitoring was not performed at the reference sites, but groundwater observations were recorded within soil borings completed in August 2008. During the August site visit, the water table at the reference site was 27 to 36 inches below surface.

Vegetation Community Results

Vegetation data was collected using a meander survey to characterize the vegetation communities and gather a plant species list, both within the project and at the reference site, from August 25 through August 28, 2008. Vegetation communities were differentiated by dominant species. Community boundaries were mapped and digitized onto aerial photography using GIS technology.

All species identified within the communities were noted, and general descriptions on dominant species and community integrity were taken. Metrics analyzed within each plant community included plant species richness and percent of exotic species. Plant species richness is the number of species identified within each community. The percent of exotic species was calculated within each community by dividing the number of exotic species into the total number of species and multiplying by 100.

Project Site

A total of 14 different stands from 9 distinct communities were identified within the Project (see On-Site Plant Communities, Appendix A). Plant communities identified within the Project included: 1) Northern-Mesic/Dry-Mesic Forest, 2) Glossy Buckthorn Woodland, 3) Savanna/Prairie Restoration, 4) Drained

Muck Field/Old Field, 5) Wet Meadow, 6) Forested/Drained Wet Meadow, 7) Wooded Wetland, 8) Wet-Mesic Forest, and 9) Forested Wet Depression/Ephemeral Pond. A summary of each stand is provided below.

Community 1 is a northern-mesic/dry-mesic forest. It is the matrix community of Schmeekle Reserve. A total of 68 species were identified within this community, 21% of which are exotic. Dominant tree species include red maple (*Acer rubrum*), paper birch (*Betula papyriera*), quaking aspen (*Populus tremuloides*), Hill's oak (*Quercus ellipsoidalis*), northern red oak (*Quercus rubra*), and jack pine (*Pinus banksiana*). Other dominant species include swamp dewberry (*Rubus hispidus*), American starflower (*Trientalis borealis*), Pennsylvania sedge (*Carex pensylvanica*), and glossy buckthorn. Although this community has a high amount of exotic species, its ecological integrity level was considered moderate due to its species richness and structural diversity.

Community 2A is woodland stand dominated by glossy buckthorn that is located in the northeast portion of the project. A total of 14 species were identified within this community, 9% of which are exotic. Tree species such as wild black cherry (*Prunus serotina)* and quaking aspen (*Populus tremuloides*) cover approximately 60% of this stand. Black cherry is also a major component of the shrub layer, but glossy buckthorn is the most widespread shrub, having an areal coverage of approximately 75%. Glossy buckthorn seedlings also dominate the herbaceous layer, with an estimated areal coverage of 100%. This community was considered ecologically degraded due to the prevalence of glossy buckthorn within it.

Community 2B is a woodland stand dominated by glossy buckthorn that is located in the central portion of the project area. A total of 25 species were identified within this community, 16% of which are exotic. Tree species such as quaking aspen and paper birch cover approximately 60% of the stand. Glossy buckthorn is the dominant plant in the shrub and herbaceous layers, with areal coverages of 80% and 100%, respectively. This community was considered ecologically degraded due to the prevalence of glossy buckthorn.

Community 3 is a small savanna/ prairie restoration located in the north-central portion of the project area. A total of 29 species were identified within this community, 17% of which are exotic. This community is dominated by native prairie grasses such as big blue-stem and yellow Indian grass (*Sorghastrum nutans*); as well as woodland species such as Pennsylvania sedge and bracken fern (*Pteridium aquilinum*). Dominant trees include Hill's oak and northern red oak, while northern dewberry is the most common shrub. This community's ecological community integrity level was considered moderate, as it is relatively free of exotic species and has a diverse plant community.

Community 4 is an old field community with drained muck soil that is located in the northeast portion of the project. A total of 52 species were identified within this community, 35% of which are exotic. This community is dominated by Canada thistle (*Cirsium arvense*), Morrow's honeysuckle (*Lonicera morrowii*), reed canary grass, Kentucky blue grass, and common goldenrod. This community was considered ecologically degraded due to the amount of exotic species and the prevalence of Canada thistle, Morrow's honeysuckle, reed canary grass, and Kentucky blue grass.

Community 5 is a wet meadow located in the northeast portion of the project area. A total of 16 species were identified within this community, 13% of which are exotic. Dominant species include blue-joint grass, common tussock sedge (*Carex stricta*), wool-grass (*Scirpus cyperinus*), and steeplebush (*Spiraea*

tomentosa). This community's ecological community integrity level was considered moderate, as it is relatively free of exotic species.

Community 6A is a drained wet meadow with a canopy cover of quaking aspen and paper birch that covers approximately 40% of the area. A total of 16 species were identified within this community, 6% of which are exotic. This community is located in the northeast portion of the project area. Glossy buckthorn is the dominant shrub, with an areal coverage of approximately 50%. The most common herbaceous species is interrupted fern (*Osmunda claytonia*). This community was considered ecologically degraded due to the prevalence of glossy buckthorn.

Community 6B is a drained wet meadow with a canopy cover of quaking aspen (approximately 10% areal cover) located in the central portion of the project. A total of 22 species were identified within this community, 23% of which are exotic. Glossy buckthorn is the dominant shrub and reed canary grass is dominant in the herbaceous layer. This community was considered ecologically degraded due to the amount of exotic species and the prevalence of glossy buckthorn and reed canary grass.

Community 7 is a small wooded wetland located in the east-central portion of the project area. A total of 16 species were identified within this community, 13% of which are exotic. Quaking aspen and paper birch were the dominant trees, with an estimated canopy cover of 50%. The shrub layer is dominated by glossy buckthorn, with an estimated areal coverage of 50%. Dominant herbaceous plants include, common lake sedge (*Carex lacustris*), interrupted fern (*Osmunda claytoniana*), and reed canary grass. This community was considered ecologically degraded due to the prevalence of glossy buckthorn and reed canary grass.

Community 8A is a wet-mesic forest located in the central portion of the project area. A total of 30 species were identified within this community, 7% of which are exotic. Dominant tree species include red maple and eastern white pine (*Pinus strobus*). The shrub layer is dominated by glossy buckthorn and the herbaceous layer is dominated by reed canary grass. Many wet meadow species, such as rattlesnake grass (*Glyceria canadensis*), steeplebush, arrow-leaved tear-thum (*Polygonum sagittatum*), common rush (*Juncus effusus*), and wool-grass were observed within 13A, suggesting that it had a wetter hydrologic regime at one time. Although this community includes a high amount of glossy buckthorn and reed canary grass, its ecological integrity level was considered moderate due to its species richness and structural diversity.

Community 8B is a wet-mesic forest located in the north-central portion of the project. A total of 17 species were identified within this community, 6% of which are exotic. It is dominated by red maple in the tree canopy and American starflower in the herbaceous layer. This community's ecological community integrity level was considered moderate, as it is relatively free of exotic species.

Community 8C is a wet-mesic forest located in the central portion of the project area. A total of 25 species were identified within this community, 12% of which are exotic. This community is dominated by red maple with scattered clusters of jack pine, white pine, and quaking aspen. The most abundant shrub is wild black cherry (*Prunus serotina*), while the herbaceous layer is sparsely populated. This community's ecological community integrity level was considered moderate, as it is relatively free of exotic species and has a diverse plant community.

Community 8D is a wet-mesic forest located in the northwest portion of the project area. A total of 25 species were identified within this community, 16% of which are exotic. This community is dominated by red maple in the tree canopy, and by blue-joint grass and reed canary grass in the herbaceous layer. Although this community has a high amount of reed canary grass, its ecological integrity level was considered moderate due to its species richness and structural diversity.

Community 9 is a small forested wet depression located in the northern portion of the project area. A total of 16 species were identified within this community, 13% of which are exotic. Dominant species includes quill sedge (*Carex tenera*), reed canary grass, wild black cherry, and swamp dewberry (*Rubus hispidus*). This community was considered ecologically degraded due to the prevalence of reed canary grass.

Reference Site

Three reference plant communities (R1, R2, and R3) were evaluated along Moses Creek. The plant communities at the reference sites are minimally disturbed and have a high degree of ecological integrity. A summary of each reference site is provided below.

R1 - Wet Meadow: A total of 31 species were identified within this community, none of which are exotic. Trees and shrubs were a minor component of the community (<5% and 10% respectively). Dominant plants included species typically found in bogs, such as three-seeded sedge (*Carex trisperma*; 50% cover), steeplebush (50% cover) sphagnum moss (60% cover) and bog goldenrod (*Solidago uliginosa*, 10% cover) , as well as wet meadow species such as blue-joint grass (20% cover). This community's ecological community integrity level was considered high, as it is free of exotic species, has a diverse plant community, and appears to have undergone very little anthropogenic disturbances.

R2 – Wet Meadow: A total of 19 species were identified within this community, none of which are exotic. This community is a wet meadow dominated by blue-joint grass (40% cover), common tussock sedge (60% cover), slender willow (25% cover), and steeplebush (30% cover). Blue-joint grass and tussock sedge form the matrix of this community, with steeplebush dispersed throughout. Slender willow clones create distinct "shrub islands" within the wet meadow matrix. Although not a dominant species based on its areal coverage, bog goldenrod is probably the most visually distinctive plant within R2, due to its striking colors and upright habit. This community's ecological community integrity level was considered high, as it is free of exotic species, has a diverse plant community, and appears to have undergone very little anthropogenic disturbances.

R3 – Scrub/Shrub and Alder Thicket: A total of 35 species were identified within this community, none of which are exotic. The scrub/shrub component is dominated by slender willow (70% cover), blue-joint grass (60% cover), common tussock sedge (40% cover), common lake sedge (10% cover), and northern bog aster (*Aster borealis*; 10% cover). The alder thicket component is dominated by swamp alder (85% cover), rattlesnake grass (25% cover), sensitive fern (20% cover), royal fern (*Osmunda regalis*; 10% cover), and greater bladder sedge (*Carex intumescens*; 50% cover). A small tree component was also present in the alder thicket (<5% cover). This community's ecological community integrity level was considered high, as it is free of exotic species, has a diverse plant community, and appears to have undergone very little anthropogenic disturbances.

In summary, the plant communities located in the Project are biologically degraded or have a moderate level of biological integrity. None of the communities within the Project have a high level of biological integrity due to the presence of exotic species. The plant communities at all three reference wetlands have a high level of biological integrity, as they are comprised of a diverse assemblage of native plants and do not house any exotic species.

Wetland Functional Values Assessment

A wetland functional values assessment was completed for five wetlands using the Minnesota Rapid Assessment Technique (MN Ram). The MN Ram was completed at two upstream reference sites (R2 and R3), two wetlands located within the project (W-1 and W-6), and one wetland located downstream of the project (W-9) (Appendix D). W-1 and W-6 were chosen for the MN Ram because they have features that are representative of the other wetlands located within the Project (W-1), or are representative of communities that were likely found within the Project prior to the ditching of Moses Creek (W-6).

To be more specific, W-1 is similar to Wetlands W-3, W-4, and W-5. W-6 is located on organic soils directly adjacent to the drained muck soils found north of Birch Street; therefore it was assumed that its current condition is similar to those that existed at the wetlands along Moses Creek prior to its channelization.

W-9, a historic wetland area that has been converted to a stormwater storage area, was evaluated because of its close proximity to the project and because it has a similar vegetative structure to the reference wetlands (ie: a combination of wet meadow and tall shrub communities).

Project Site

MN Ram gave W-1 the following ratings:

- Medium: vegetative diversity/integrity, flood attenuation, and wildlife habitat, likelihood of successful restoration.
- High: hydrologic importance within the sub-watershed, water quality functions provided to downstream resources, and water quality within the wetland.
- Exceptional: value as an aesthetic/recreational/educational/cultural resource.
- No ratings were assigned for shoreline protection, maintenance of fish habitat, amphibian breeding/overwintering habitat, or commercial use.

MN Ram gave W-6 the following ratings:

- Medium: vegetative diversity/integrity, and flood attenuation, likelihood of successful restoration.
- High: hydrology importance within the sub-watershed, water quality functions provided to downstream resources, water quality within the wetland, and wildlife habitat.
- Exceptional: value as an aesthetic/recreational/educational/cultural resource.

- No ratings were assigned for shoreline protection, maintenance of fish habitat, amphibian breeding/overwintering habitat, or commercial use.

MN Ram gave W-9 the following ratings:

- Low: vegetative diversity/integrity, hydrology characteristics, wildlife habitat, and potential amphibian habitat
- Medium: flood attenuation, water quality within the wetland, and aesthetics-recreation-education-cultural resource
- High: downstream water quality

No ratings were assigned for shoreline protection, fish habitat, or commercial use.

Reference Sites

MN Ram gave R2 the following ratings:

- Medium: flood attenuation, amphibian breeding/overwintering habitat, and value as an aesthetic/recreational/educational/cultural resource.
- High: vegetative diversity/integrity, hydrologic importance within the sub-watershed, water quality functions provided to downstream resources, water quality within the wetland, wildlife habitat, and maintenance of fish habitat.
- No ratings were assigned for shoreline protection, restoration potential, or commercial use.

MN Ram gave R3 the following ratings:

- Medium: vegetative diversity/integrity, flood attenuation, amphibian breeding/overwintering habitat, and value as an aesthetic/recreational/educational/cultural resource.
- High: hydrologic importance within the sub-watershed, water quality functions provided to downstream resources, water quality within the wetland, wildlife habitat, and maintenance of fish habitat.
- No ratings were assigned for shoreline protection, restoration potential, or commercial use.

In summary, the biggest difference between the on-site wetlands (W-1 and W-6) and the reference wetlands were in vegetative diversity/integrity, potential amphibian breeding/overwintering habitat, potential fish habitat, and use as an aesthetic/recreational/educational/cultural resource. MN Ram gave the reference sites higher scores than the on-site wetlands for vegetative integrity, potential amphibian habitat, and potential fish habitat. The on-site wetlands (W-1 and W-6) were given a ranking of Exceptional for their use as an aesthetic/ recreational/educational/cultural resource because they are located within Schmeekle Reserve. Generally speaking, W-9 has the lowest functional values scores, indicating that it is degraded and should not be used as a reference site.

WETLAND MITIGATION GOALS AND OBJECTIVES

The goal of this mitigation design is to maximize the wetland mitigation acreage and develop a diverse, high quality complex of self sustaining wetland, stream, and upland habitats using techniques that require low construction, operation, and maintenance costs. The objectives of this wetland mitigation site include the following:

1. Restore approximately 20 acres of M, RPF, and RPE wetlands on this drained site.

2. Naturalize approximately 4,930 linear feet of stream channel capable of sustaining aquatic life suitable to intermittent flow regimes, similar to existing conditions.

3. Reduce flooding potential by removing spoil piles adjacent to the existing Moses Creek channel, create conditions that minimize the potential for future ice dams, and hydraulically connect the stream channel with restored riparian areas to create additional flood storage.

4. Specific native plant species and varying water saturation depths will create a diverse complex of wetland species, thereby promoting floristic diversity. This will result in enhanced wetland functions with respect to wildlife and aesthetic values, thus increasing the biodiversity of the local area.

5. Enhance 5-acres of existing wetlands by controlling invasive species to improve habitat diversity and control the spread of invasive species on the project site.

6. Enhance 5 acres of adjacent upland buffers (approximately 100 foot wide buffer) by controlling invasive species to improve habitat diversity and control the spread of invasive species on the project site.

7. The proposed wetland mitigation site, contiguous to a large existing wetland area to the north, will enhance aquatic and wildlife habitat within the local watershed.

8. Protecting the site from development in perpetuity will help sustain wildlife habitat in the local area.

9. Incorporate public access to the site by accommodating connecting the site with the Green Circle Trail.

10. Implement a maintenance and monitoring plan to promote floristic diversity and control of invasive species.

DESIGN CONCEPTS

Historically, the primary hydrologic source for wetlands in this area was groundwater. Restoring wetlands on the site will require lowering the site's grades to intercept the groundwater table and store floodwaters. Shallow excavated areas will also be completed across the site to bring the topography closer to predicted groundwater levels, creating heterogeneous hydrologic regimes and plant communities (see Landscape Plan, Appendix A).

Because of adjacent urbanized land uses, raising of the groundwater table is not anticipated by the project design. Regular maintenance of the stream channel, to control woody vegetation and remove debris, will be required to maintain a functional channel design.

Site construction will require removal of soil from the site using designated ingress/egress locations and haul routes. Excavated material will be used on site to fill the existing Moses Creek channel. Excess soil generated by the project will be disposed at off-site upland locations designated by the selected contractor.

The site will remain forested prior to construction. To minimize the spread of oak wilt, oak trees that need to be removed within the project area will be harvested in winter 2010 by staff from Schmeeckle Reserve. Prior to construction, erosion control measures (i.e., silt fences, turbidity barriers, and temporary sedimentation basins) will be installed to minimize runoff from the site. The construction zone will be cleared and grubbed of woody vegetation prior to site grading. Disturbed areas will be top-dressed with a minimum of 8 inches of salvaged topsoil, and seeded with a temporary cover crop and native species.

CONSTRUCTION SCHEDULE AND SEQUENCE

The current project schedule is:

- October 1, 2009 - 60% preliminary design report submittal
- October 31, 2009 - Agency review and comments of preliminary design.
- December 1, 2009 - 90% design submittal to WisDOT
- January 2010 – Removal of oak trees
- February 2010 - PS&E
- May 2010 - Project Let
- August 2010 to November 2010 – Project Construction (site grading)
- Spring 2011 – Monitor water levels
- Summer 2011 – Final grading and landscaping

The sequence for this project is:

- Remove oak trees
- Erosion control installation
- Remove and stockpile topsoil
- Construct new stream channel and revegetate
- Rough grade site
- Fill Moses Creek Channel and divert water
- Monitor groundwater levels
- Final grading and seeding
- Remove erosion control following site stabilization

SITE HYDROLOGY

Similarities were observed between the staff gage data and monitoring well data during 2008 and 2009, indicating that Moses Creek's water levels are influenced by groundwater discharge (see Hydrology Data, Appendix B). Median groundwater elevations from May through the end of June range from about

1091.7 in the northeast corner of the Project to about 1086.4 in the southwest corner. Well 4, located in the central portion of the Project, has a median groundwater elevation of 1089.5 from May through June. Based on these data, the groundwater elevation's gradient is to the southwest at approximately -0.2% (-0.002). Using this information, the site will be designed to undergo periods of inundation as well as saturation within 6 inches of the soil surface. Inundation will occur through flooding in addition to seasonal high groundwater levels, and likely will not exceed 1 foot in depth during typical growing seasons. Saturation within 6 inches of the soil surface is expected to occur for the first two to three months of the growing season.

SITE RE-VEGETATION

Site re-vegetation will focus on native plants indigenous to the Tension Zone of the Central Wisconsin eco-region (Northern Hardwood Province and Prairie-Forest Province (Plant Hardiness Zone 4)). The anticipated plant communities for this site include M, RPE, and RPF, and native prairie upland buffer. The Landscape Plan found in Appendix A shows the location of anticipated plant communities for the site, including a wet meadow zone and a woody vegetation zone that consists of native trees and shrubs adapted to anaerobic conditions. Vegetation data obtained from the project site and reference area will be used to develop a site specific re-vegetation species list.

Site re-vegetation will be completed immediately following site grading, including direct seeding a cover crop of annual rye and Canada wild rye to stabilize the soil with a mixture of native wetland grasses, sedges, and forbs. Planting native tree and shrub species will be used to re-vegetate small areas of the site to establish a component of woody species. The trees and shrubs will be protected from herbivore predation (i.e., fence, spray, tree protectors, etc.). Plant/seed quantities will be displayed in the mitigation plan's final specs.

SUCCESS CRITERIA AND MONITORING

WisDOT will monitor this site in conjunction with the USACE and the WDNR requirements to evaluate the ongoing success of the mitigation project. Vegetation and hydrologic monitoring will be completed annually by WisDOT and the data summarized in an annual report. Since the anticipated plant communities on this site consist of the establishment of forested cover types, the anticipated monitoring and maintenance period is 10 years. WisDOT intends to submit a Monitoring and Maintenance Plan for this site under separate cover which will provide a summary of monitoring and maintance activities as well as establish performance standards. Initial success criteria for this site will include achieving the following:

1. Restoring approximately 20 acres of jurisdictional wetlands as defined in the 1987 USACE Wetland Delineation Manual

2. Creating approximately 4,930 linear feet of stream habitat.

3. Establishing wetland and upland buffer habitats with a predominance of native species.

4. Meet 75% survival rate of planted trees and shrubs.

5. Maintaining less than 25 percent aerial coverage of reed canary grass and glossy buckthorn on restored wetland areas.

Failure to meet the wetland mitigation design goals may result in implementing corrective actions to achieve a successful restoration. Corrective actions may include additional hydrologic manipulations, adjusting site grades, or re-vegetation of desired species.

LONG-TERM OWNERSHIP

The ultimate success of the Moses Creek Wetland Mitigation Site will require long-term stewardship in conjunction with UWSP and Schmeeckle Reserve. UWSP and Schmeeckle Reserve will maintain ownership and long-term stewardship of the site, while WisDOT is responsible for monitoring and maintenance during the mitigation site's monitoring period.

APPENDIX A

REPORT FIGURES

- Location Map
- Project Overview
- Existing Plant Communities
- Grading Limits
- Landscape Plan

Project Overview
Moses Creek

Location

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

0 1,000 2,000 Feet

N

Project Information

Project Number : 008-0099-01
Modified October 12, 2009

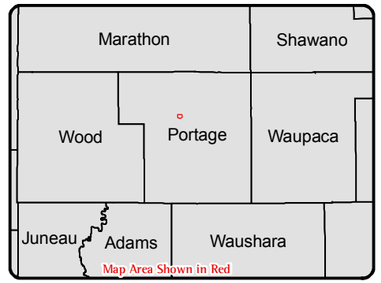
Legend

- Approximate Project Boundary
- Reference Plant Communities

Data Sources include USGS 7.5' Quadrangle; Stevens Point

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

Location Map
Moses Creek



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 October 12, 2009

Legend

- Approximate Project Boundary
- Private Property
- Section Line

DNR 24k Hydrography

- Perennial Stream
- Intermittent Stream
- Waterbody

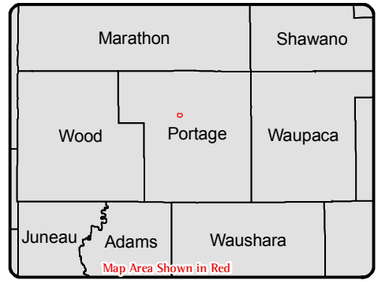
Data Sources include WDNR, WDOA, & WDOT. Orthophotography: 2005

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

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

On-Site Plant Communities
Moses Creek



Community Type

- 1 = Northern Mesic / Dry Mesic Forest
- 2 = Glossy Buckthorn Woods
- 3 = Savanah / Prairie Restoration
- 4 = Drained Muck Field / Old Field
- 5 = Wet Meadow
- 6 = Forested, Drained Wet Meadow
- 7 = Wooded Wetland
- 8 = Wet Mesic Forest
- 9 = Forested Wet Depression

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 October 12, 2009

Legend

- Approximate Project Boundary
- Private Property
- Section Line

DNR 24k Hydrography

- Perennial Stream
- Intermittent Stream
- Waterbody

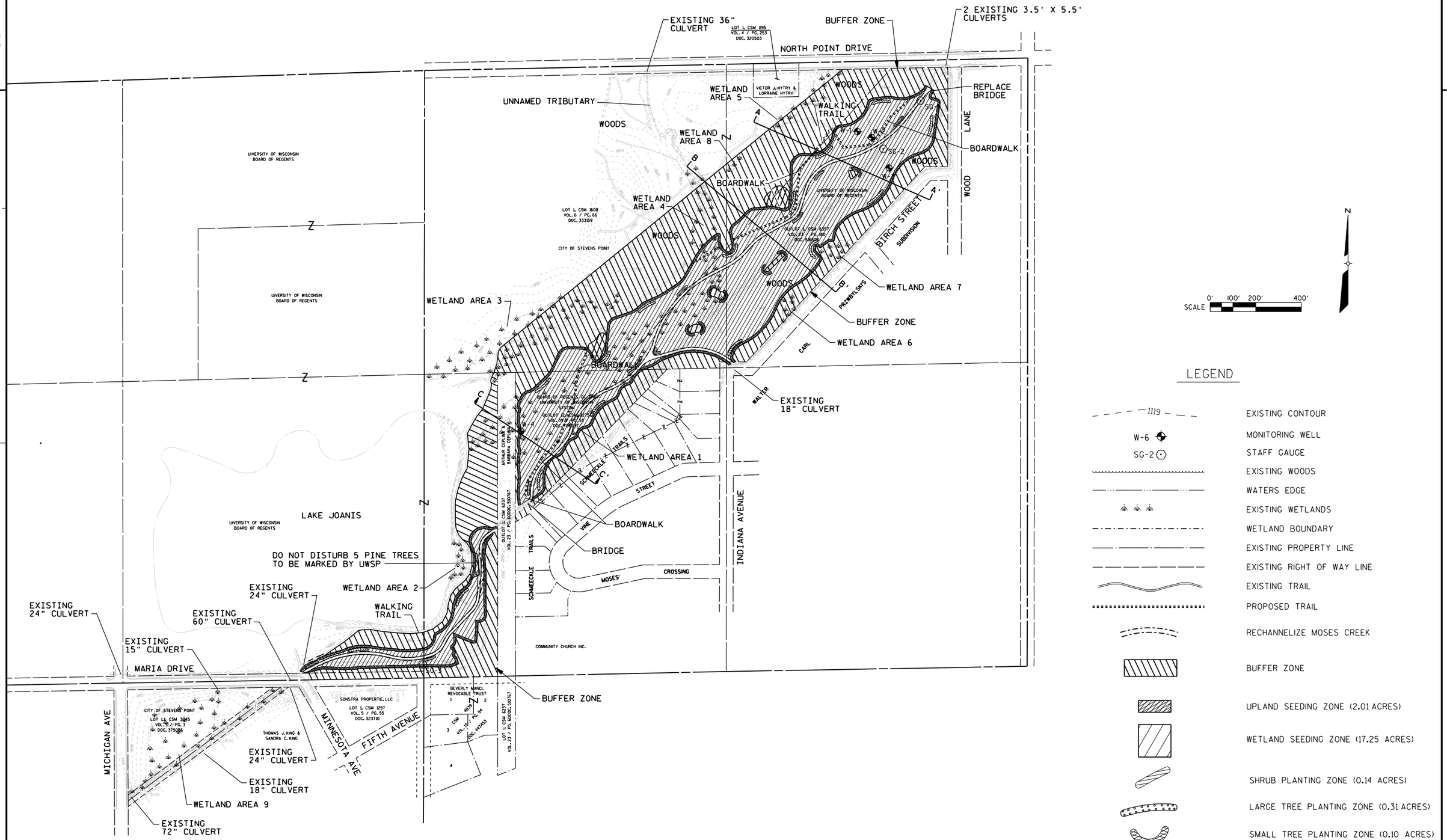
Data Sources include WDNR, WDOA, & WDOT. Orthophotography: 2005

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

PROJECT NO: 6351-01-04	HWY: MOSES CREEK MITIGATION	COUNTY: PORTAGE	GRADING LIMITS	SHEET	E

FILE NAME : L:\work\Projects\105248\gra\preferred_alt.dgn PLOT DATE : 10/15/2009 PLOT BY : $$...plotuser...$$ PLOT NAME : PLOT SCALE : 1:400
WISDOT/CADDS SHEET 42

2



PROJECT NO: 6351-01-04	HWY: MOSES CREEK MITIGATION	COUNTY: PORTAGE	LANDSCAPE PLAN	SHEET	E

APPENDIX B

HYDROLOGY DATA

- Stream Gage Data
- Monitoring Well Data
- Precipitation Analysis

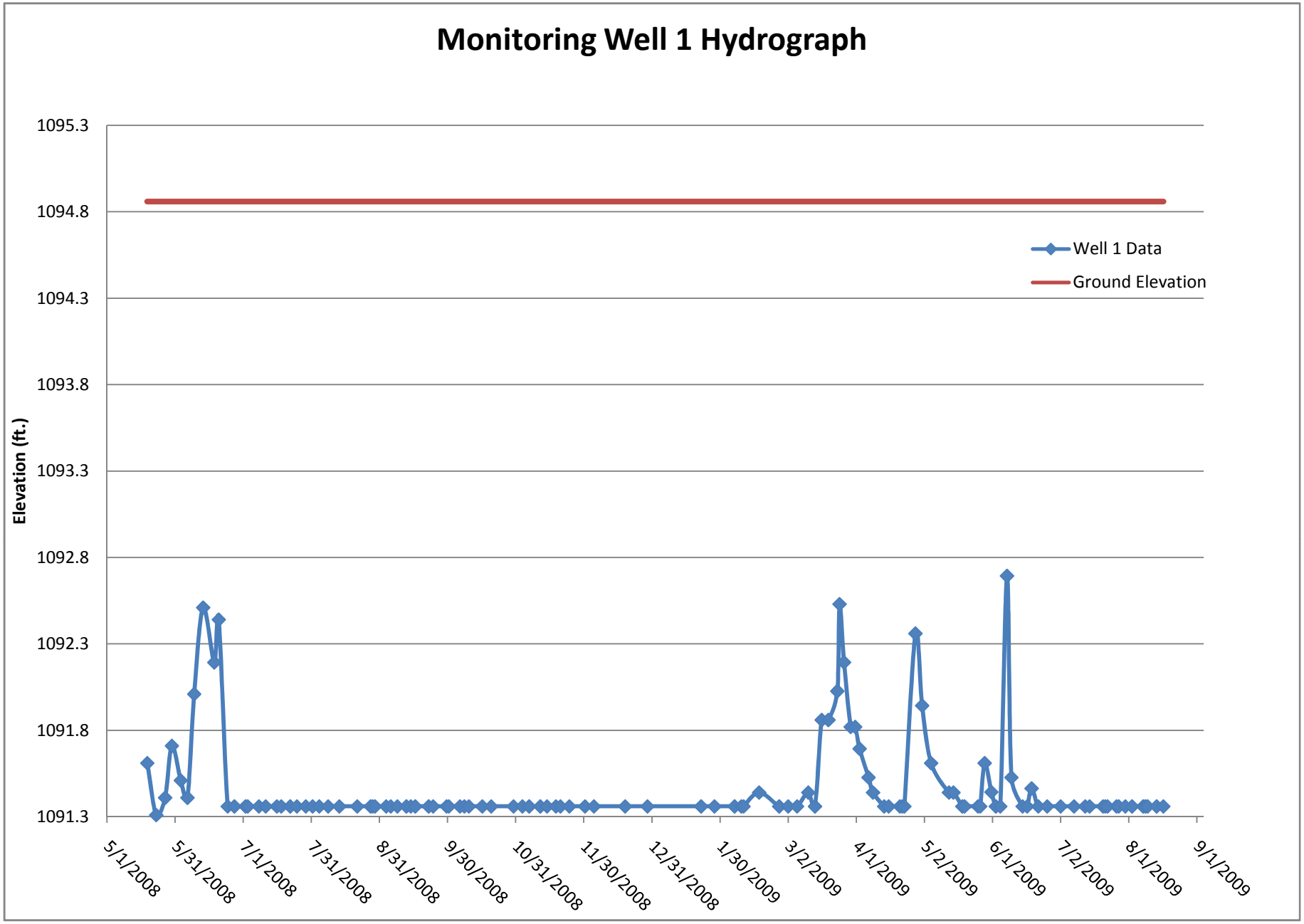
Monitoring Well Data

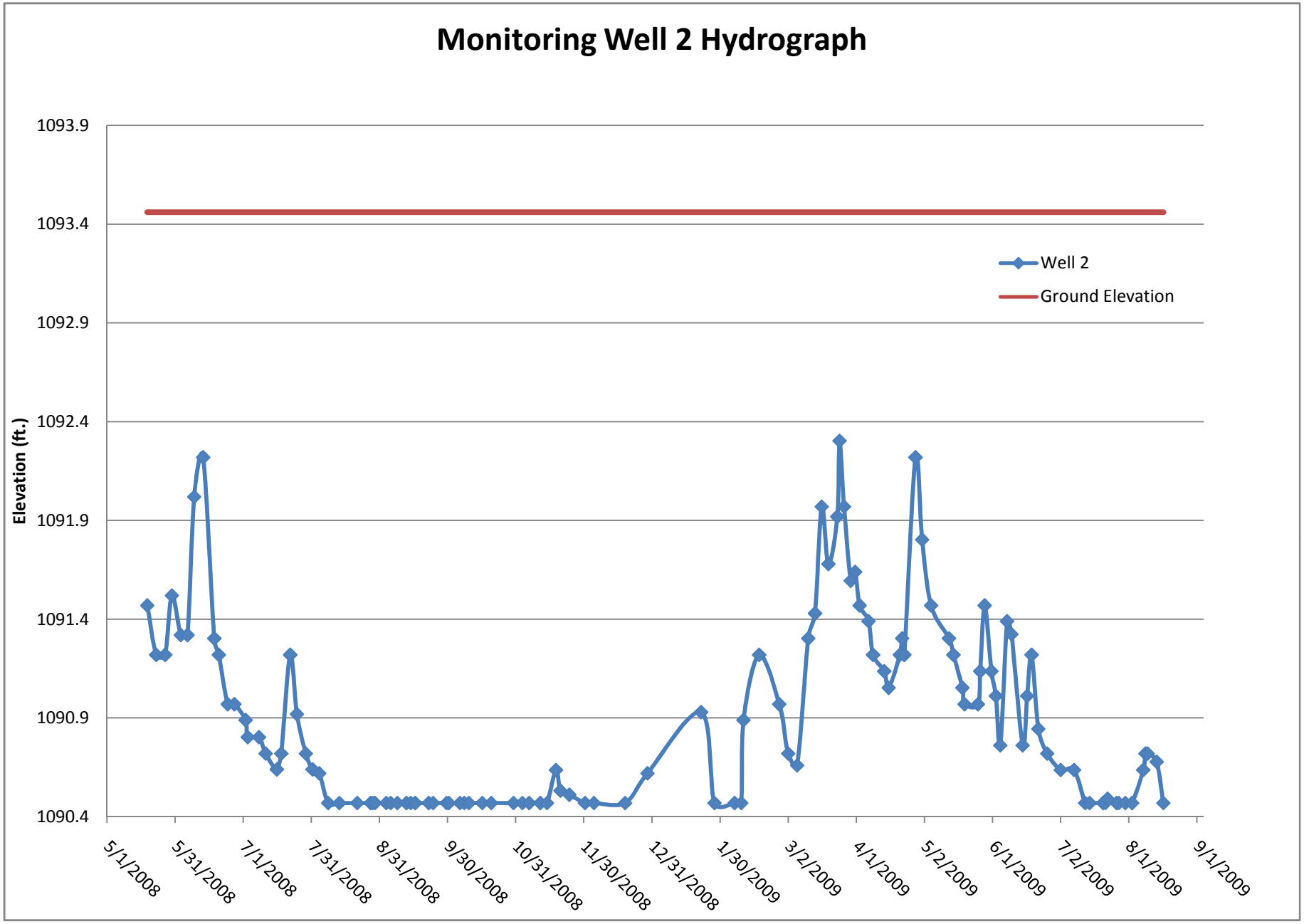
5/12/2008
7/11/2008
9/9/2008
11/8/2008
1/7/2009
3/8/2009
5/7/2009
7/6/2009
9/4/2009

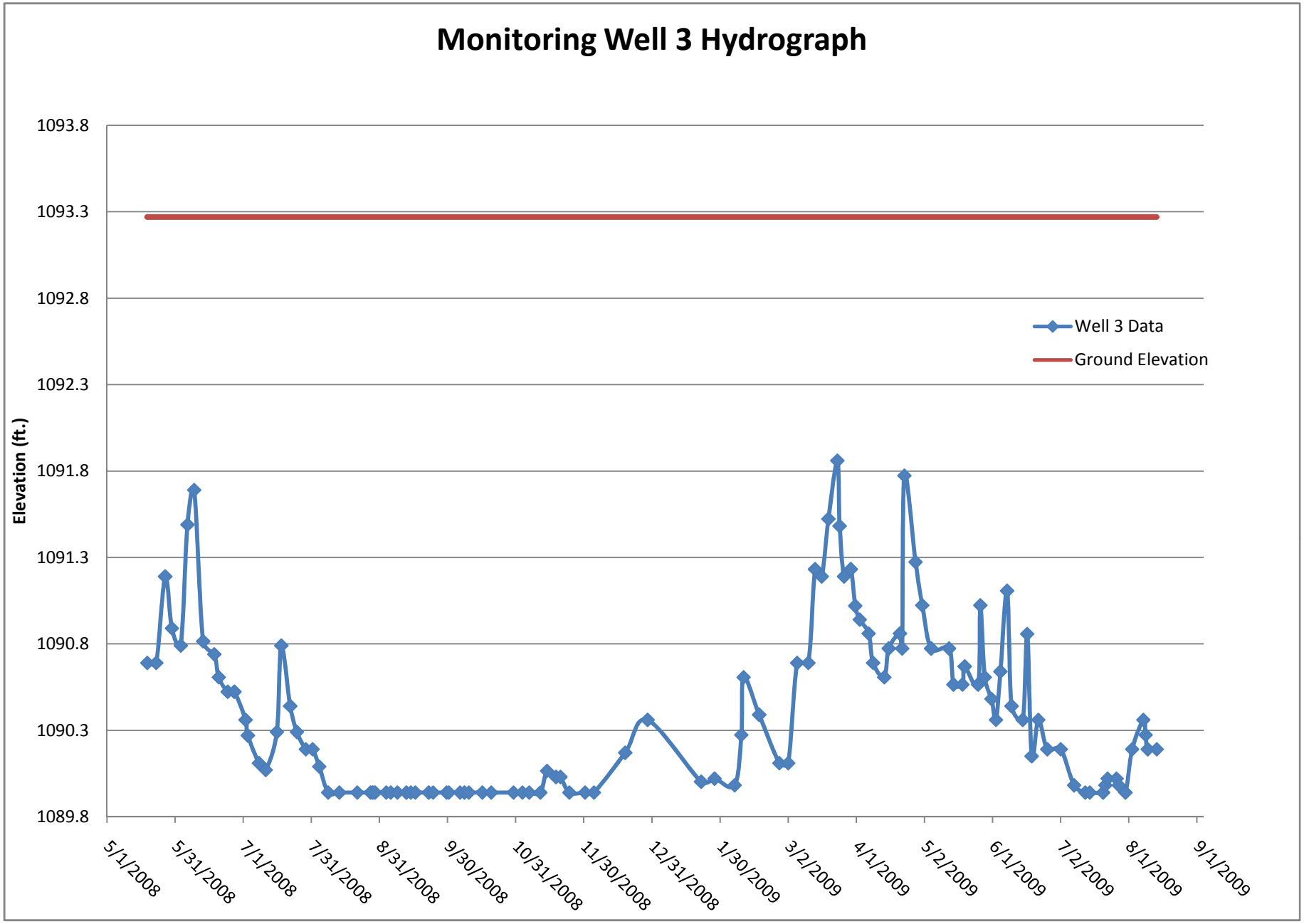
Depth Below Soil Surface (ft.)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

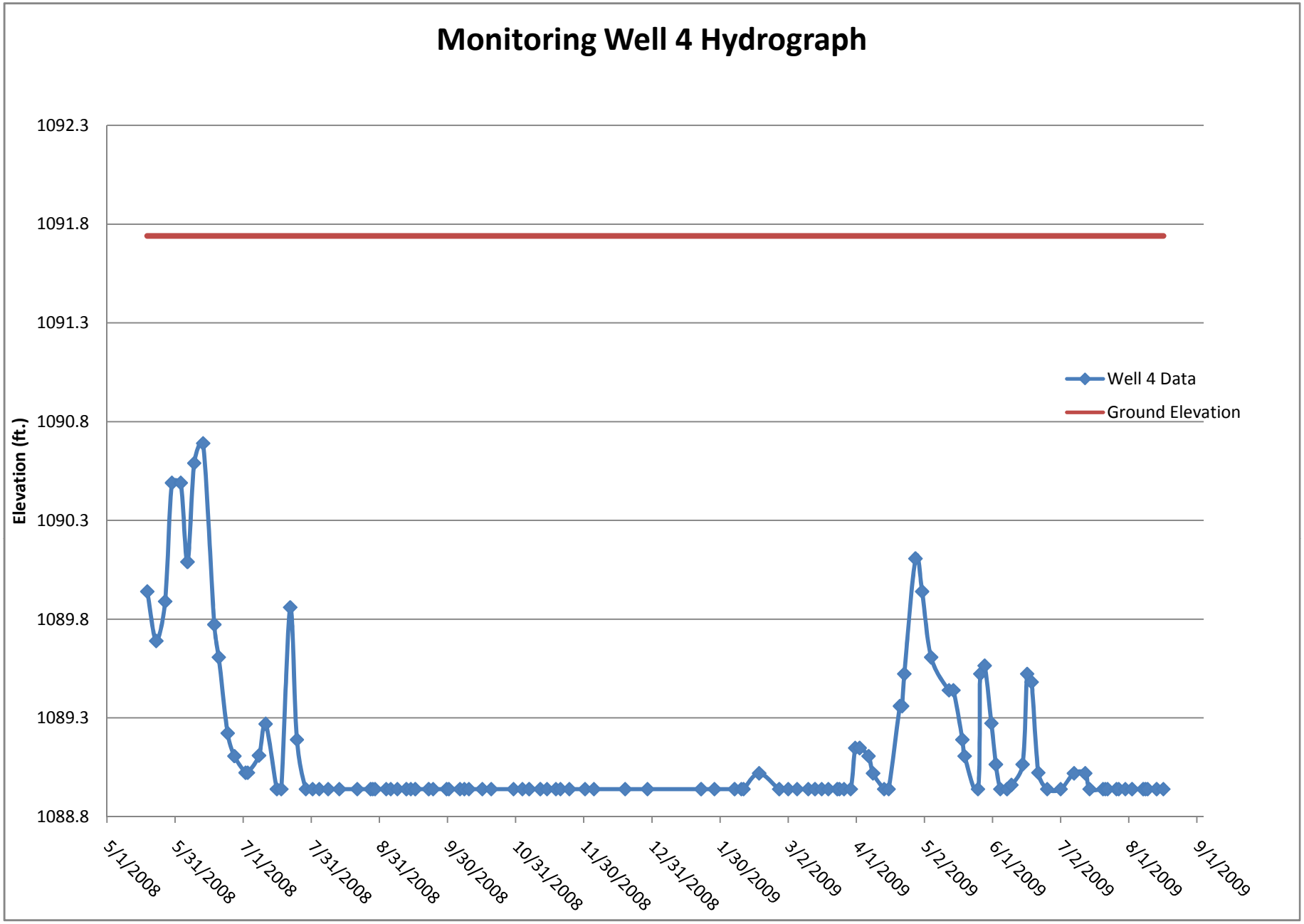
Precipitation Between Monitoring Observations (inches)
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0

Well 1 Data
Well 2 Data
Well 3 Data
Well 4 Data
Precip


Monitoring Well 1 Hydrograph
Elevation (ft.)
1095.3
1094.8
1094.3
1093.8
1093.3
1092.8
1092.3
1091.8
1091.3
Well 1 Data
Ground Elevation
5/1/2008
5/31/2008
7/1/2008
7/31/2008
8/31/2008
9/30/2008
10/31/2008
11/30/2008
12/31/2008
1/30/2009
3/2/2009
4/1/2009
5/2/2009
6/1/2009
7/2/2009
8/1/2009
9/1/2009


Monitoring Well 2 Hydrograph
Elevation (ft.)
1093.9
1093.4
1092.9
1092.4
1091.9
1091.4
1090.9
1090.4
Well 2
Ground Elevation
5/1/2008
5/31/2008
7/1/2008
7/31/2008
8/31/2008
9/30/2008
10/31/2008
11/30/2008
12/31/2008
1/30/2009
3/2/2009
4/1/2009
5/2/2009
6/1/2009
7/2/2009
8/1/2009
9/1/2009


Monitoring Well 3 Hydrograph
Elevation (ft.)
1093.8
1093.3
1092.8
1092.3
1091.8
1091.3
1090.8
1090.3
1089.8
Well 3 Data
Ground Elevation
5/1/2008
5/31/2008
7/1/2008
7/31/2008
8/31/2008
9/30/2008
10/31/2008
11/30/2008
12/31/2008
1/30/2009
3/2/2009
4/1/2009
5/2/2009
6/1/2009
7/2/2009
8/1/2009
9/1/2009


Monitoring Well 4 Hydrograph
Elevation (ft.)
1092.3
1091.8
1091.3
1090.8
1090.3
1089.8
1089.3
1088.8
Well 4 Data
Ground Elevation
5/1/2008
5/31/2008
7/1/2008
7/31/2008
8/31/2008
9/30/2008
10/31/2008
11/30/2008
12/31/2008
1/30/2009
3/2/2009
4/1/2009
5/2/2009
6/1/2009
7/2/2009
8/1/2009
9/1/2009

Well 1 Data

Install Date:	Soils:	Ground Elevation:	Top of Casing:
5/19/2008	0-6 10YR 3/2, Sandy Loam	1094.81	1096.31
	6-19 10YR 3/4 Loamy Sand		
	19-35 7.5YR 4/6 Sand		
	35-43+ 10YR 5/3 Sand		

*Popper Corretion = 0.25 feet'

Date	Depth to Water (ft)	Riser (Ft.)	Depth Below Ground	Elev. (ft)
5/19/2008	4.50	1.5	3.3	1091.6
5/23/2008	4.80	1.5	3.6	1091.3
5/27/2008	4.70	1.5	3.5	1091.4
5/30/2008	4.40	1.5	3.2	1091.7
6/3/2008	4.60	1.5	3.4	1091.5
6/6/2008	4.70	1.5	3.5	1091.4
6/9/2008	4.10	1.5	2.9	1092.0
6/13/2008	3.60	1.5	2.4	1092.5
6/18/2008	3.92	1.5	2.7	1092.1
6/20/2008	3.67	1.5	2.4	1092.4
6/24/2008	4.75	1.5	3.5	1091.3
6/27/2008	4.75	1.5	3.5	1091.3
7/2/2008	4.75	1.5	3.5	1091.3
7/3/2008	4.75	1.5	3.5	1091.3
7/8/2008	4.75	1.5	3.5	1091.3
7/11/2008	4.75	1.5	3.5	1091.3
7/16/2008	4.75	1.5	3.5	1091.3
7/18/2008	4.75	1.5	3.5	1091.3
7/22/2008	4.75	1.5	3.5	1091.3
7/25/2008	4.75	1.5	3.5	1091.3
7/29/2008	4.75	1.5	3.5	1091.3
8/1/2008	4.75	1.5	3.5	1091.3
8/4/2008	4.75	1.5	3.5	1091.3
8/8/2008	4.75	1.5	3.5	1091.3
8/13/2008	4.75	1.5	3.5	1091.3
8/21/2008	4.75	1.5	3.5	1091.3
8/27/2008	4.75	1.5	3.5	1091.3
8/28/2008	4.75	1.5	3.5	1091.3
8/29/2008	4.75	1.5	3.5	1091.3
9/3/2008	4.75	1.5	3.5	1091.3
9/5/2008	4.75	1.5	3.5	1091.3
9/8/2008	4.75	1.5	3.5	1091.3
9/12/2008	4.75	1.5	3.5	1091.3
9/14/2008	4.75	1.5	3.5	1091.3
9/16/2008	4.75	1.5	3.5	1091.3
9/22/2008	4.75	1.5	3.5	1091.3
9/24/2008	4.75	1.5	3.5	1091.3
9/30/2008	4.75	1.5	3.5	1091.3
10/1/2008	4.75	1.5	3.5	1091.3
10/6/2008	4.75	1.5	3.5	1091.3
10/8/2008	4.75	1.5	3.5	1091.3
10/10/2008	4.75	1.5	3.5	1091.3
10/16/2008	4.75	1.5	3.5	1091.3
10/20/2008	4.75	1.5	3.5	1091.3
10/30/2008	4.75	1.5	3.5	1091.3
11/3/2008	4.75	1.5	3.5	1091.3
11/6/2008	4.75	1.5	3.5	1091.3
11/11/2008	4.75	1.5	3.5	1091.3
11/14/2008	4.75	1.5	3.5	1091.3
11/18/2008	4.75	1.5	3.5	1091.3
11/20/2008	4.75	1.5	3.5	1091.3
11/24/2008	4.75	1.5	3.5	1091.3
12/1/2008	4.75	1.5	3.5	1091.3
12/5/2008	4.75	1.5	3.5	1091.3
12/19/2008	4.75	1.5	3.5	1091.3
12/29/2008	4.75	1.5	3.5	1091.3
1/22/2009	4.75	1.5	3.5	1091.3
1/28/2009	4.75	1.5	3.5	1091.3
2/6/2009	4.75	1.5	3.5	1091.3
2/9/2009	4.75	1.5	3.5	1091.3
2/10/2009	4.75	1.5	3.5	1091.3
2/17/2009	4.67	1.5	3.4	1091.4
2/23/2009	4.71	1.5	3.5	1091.4
2/26/2009	4.75	1.5	3.5	1091.3
3/2/2009	4.75	1.5	3.5	1091.3
3/6/2009	4.75	1.5	3.5	1091.3
3/11/2009	4.67	1.5	3.4	1091.4
3/14/2009	4.75	1.5	3.5	1091.3
3/17/2009	4.25	1.5	3.0	1091.8
3/20/2009	4.25	1.5	3.0	1091.8
3/24/2009	4.08	1.5	2.8	1092.0
3/25/2009	3.58	1.5	2.3	1092.5
3/27/2009	3.92	1.5	2.7	1092.1
3/30/2009	4.29	1.5	3.0	1091.8
4/1/2009	4.29	1.5	3.0	1091.8
4/3/2009	4.42	1.5	3.2	1091.6
4/7/2009	4.58	1.5	3.3	1091.5
4/9/2009	4.67	1.5	3.4	1091.4
4/14/2009	4.75	1.5	3.5	1091.3
4/16/2009	4.75	1.5	3.5	1091.3
4/21/2009	4.75	1.5	3.5	1091.3
4/22/2009	4.75	1.5	3.5	1091.3
4/23/2009	4.75	1.5	3.5	1091.3
4/28/2009	3.75	1.5	2.5	1092.3
5/1/2009	4.17	1.5	2.9	1091.9
5/5/2009	4.50	1.5	3.3	1091.6
5/13/2009	4.67	1.5	3.4	1091.4
5/15/2009	4.67	1.5	3.4	1091.4
5/19/2009	4.75	1.5	3.5	1091.3
5/20/2009	4.75	1.5	3.5	1091.3
5/26/2009	4.75	1.5	3.5	1091.3
5/27/2009	4.75	1.5	3.5	1091.3
5/29/2009	4.50	1.5	3.3	1091.6
6/1/2009	4.67	1.5	3.4	1091.4
6/3/2009	4.75	1.5	3.5	1091.3
6/5/2009	4.75	1.5	3.5	1091.3
6/8/2009	3.42	1.5	2.2	1092.6
6/10/2009	4.58	1.5	3.3	1091.5
6/15/2009	4.75	1.5	3.5	1091.3
6/17/2009	4.75	1.5	3.5	1091.3
6/19/2009	4.65	1.5	3.4	1091.4
6/22/2009	4.75	1.5	3.5	1091.3
6/26/2009	4.75	1.5	3.5	1091.3
7/2/2009	4.75	1.5	3.5	1091.3
7/8/2009	4.75	1.5	3.5	1091.3
7/13/2009	4.75	1.5	3.5	1091.3
7/15/2009	4.75	1.5	3.5	1091.3
7/21/2009	4.75	1.5	3.5	1091.3
7/22/2009	4.75	1.5	3.5	1091.3
7/23/2009	4.75	1.5	3.5	1091.3
7/27/2009	4.75	1.5	3.5	1091.3
7/28/2009	4.75	1.5	3.5	1091.3
7/31/2009	4.75	1.5	3.5	1091.3
8/3/2009	4.75	1.5	3.5	1091.3
8/8/2009	4.75	1.5	3.5	1091.3
8/9/2009	4.75	1.5	3.5	1091.3
8/10/2009	4.75	1.5	3.5	1091.3
8/14/2009	4.75	1.5	3.5	1091.3
8/17/2009	4.75	1.5	3.5	1091.3

Well 2 Data

Install Date:	Soils:	Ground Elevation:	Top of Casing:
5/19/2008	0-16 10YR 2/1, Muck	1093.46	1095.47
	16-19 10YR 4/2 Loamy Sand		
	19-26 10YR 5/3 Sand		
	26-42+ 10YR 5/4 Coarse Sand		

Popper Corretion = 0.25 feet

Date	Depth to Water (ft)	Riser (Ft.)	Depth Below Ground	Elev. (ft)
5/19/2008	3.75	2.01	2.0	1091.5
5/23/2008	4.00	2.01	2.2	1091.2
5/27/2008	4.00	2.01	2.2	1091.2
5/30/2008	3.70	2.01	1.9	1091.5
6/3/2008	3.90	2.01	2.1	1091.3
6/6/2008	3.90	2.01	2.1	1091.3
6/9/2008	3.20	2.01	1.4	1092.0
6/13/2008	3.00	2.01	1.2	1092.2
6/18/2008	3.92	2.01	2.2	1091.3
6/20/2008	4.00	2.01	2.2	1091.2
6/24/2008	4.25	2.01	2.5	1091.0
6/27/2008	4.25	2.01	2.5	1091.0
7/2/2008	4.33	2.01	2.6	1090.9
7/3/2008	4.42	2.01	2.7	1090.8
7/8/2008	4.42	2.01	2.7	1090.8
7/11/2008	4.50	2.01	2.7	1090.7
7/16/2008	4.58	2.01	2.8	1090.6
7/18/2008	4.50	2.01	2.7	1090.7
7/22/2008	4.00	2.01	2.2	1091.2
7/25/2008	4.30	2.01	2.5	1090.9
7/29/2008	4.50	2.01	2.7	1090.7
8/1/2008	4.58	2.01	2.8	1090.6
8/4/2008	4.60	2.01	2.8	1090.6
8/8/2008	4.75	2.01	3.0	1090.5
8/13/2008	4.75	2.01	3.0	1090.5
8/21/2008	4.75	2.01	3.0	1090.5
8/27/2008	4.75	2.01	3.0	1090.5
8/28/2008	4.75	2.01	3.0	1090.5
8/29/2008	4.75	2.01	3.0	1090.5
9/3/2008	4.75	2.01	3.0	1090.5
9/5/2008	4.75	2.01	3.0	1090.5
9/8/2008	4.75	2.01	3.0	1090.5
9/12/2008	4.75	2.01	3.0	1090.5
9/14/2008	4.75	2.01	3.0	1090.5
9/16/2008	4.75	2.01	3.0	1090.5
9/22/2008	4.75	2.01	3.0	1090.5
9/24/2008	4.75	2.01	3.0	1090.5
9/30/2008	4.75	2.01	3.0	1090.5
10/1/2008	4.75	2.01	3.0	1090.5
10/6/2008	4.75	2.01	3.0	1090.5
10/8/2008	4.75	2.01	3.0	1090.5
10/10/2008	4.75	2.01	3.0	1090.5
10/16/2008	4.75	2.01	3.0	1090.5
10/20/2008	4.75	2.01	3.0	1090.5
10/30/2008	4.75	2.01	3.0	1090.5
11/3/2008	4.75	2.01	3.0	1090.5
11/6/2008	4.75	2.01	3.0	1090.5
11/11/2008	4.75	2.01	3.0	1090.5
11/14/2008	4.75	2.01	3.0	1090.5
11/18/2008	4.58	2.01	2.8	1090.6
11/20/2008	4.69	2.01	2.9	1090.5
11/24/2008	4.71	2.01	2.9	1090.5
12/1/2008	4.75	2.01	3.0	1090.5
12/5/2008	4.75	2.01	3.0	1090.5
12/19/2008	4.75	2.01	3.0	1090.5
12/29/2008	4.60	2.01	2.8	1090.6
1/22/2009	4.29	2.01	2.5	1090.9
1/28/2009	4.75	2.01	3.0	1090.5
2/6/2009	4.75	2.01	3.0	1090.5
2/9/2009	4.75	2.01	3.0	1090.5
2/10/2009	4.33	2.01	2.6	1090.9
2/17/2009	4.00	2.01	2.2	1091.2
2/23/2009	4.13	2.01	2.4	1091.1
2/26/2009	4.25	2.01	2.5	1091.0
3/2/2009	4.50	2.01	2.7	1090.7
3/6/2009	4.56	2.01	2.8	1090.7
3/11/2009	3.92	2.01	2.2	1091.3
3/14/2009	3.79	2.01	2.0	1091.4
3/17/2009	3.25	2.01	1.5	1092.0
3/20/2009	3.54	2.01	1.8	1091.7
3/24/2009	3.30	2.01	1.5	1091.9
3/25/2009	2.92	2.01	1.2	1092.3
3/27/2009	3.25	2.01	1.5	1092.0
3/30/2009	3.63	2.01	1.9	1091.6
4/1/2009	3.58	2.01	1.8	1091.6
4/3/2009	3.75	2.01	2.0	1091.5
4/7/2009	3.83	2.01	2.1	1091.4
4/9/2009	4.00	2.01	2.2	1091.2
4/14/2009	4.08	2.01	2.3	1091.1
4/16/2009	4.17	2.01	2.4	1091.1
4/21/2009	4.00	2.01	2.2	1091.2
4/22/2009	3.92	2.01	2.2	1091.3
4/23/2009	4.00	2.01	2.2	1091.2
4/28/2009	3.00	2.01	1.2	1092.2
5/1/2009	3.42	2.01	1.7	1091.8
5/5/2009	3.75	2.01	2.0	1091.5
5/13/2009	3.92	2.01	2.2	1091.3
5/15/2009	4.00	2.01	2.2	1091.2
5/19/2009	4.17	2.01	2.4	1091.1
5/20/2009	4.25	2.01	2.5	1091.0
5/26/2009	4.25	2.01	2.5	1091.0
5/27/2009	4.08	2.01	2.3	1091.1
5/29/2009	3.75	2.01	2.0	1091.5
6/1/2009	4.08	2.01	2.3	1091.1
6/3/2009	4.21	2.01	2.4	1091.0
6/5/2009	4.46	2.01	2.7	1090.8
6/8/2009	3.83	2.01	2.1	1091.4
6/10/2009	3.90	2.01	2.1	1091.3
6/15/2009	4.46	2.01	2.7	1090.8
6/17/2009	4.21	2.01	2.4	1091.0
6/19/2009	4.00	2.01	2.2	1091.2
6/22/2009	4.38	2.01	2.6	1090.8
6/26/2009	4.50	2.01	2.7	1090.7
7/2/2009	4.58	2.01	2.8	1090.6
7/8/2009	4.58	2.01	2.8	1090.6
7/13/2009	4.75	2.01	3.0	1090.5
7/15/2009	4.75	2.01	3.0	1090.5
7/21/2009	4.75	2.01	3.0	1090.5
7/22/2009	4.75	2.01	3.0	1090.5
7/23/2009	4.73	2.01	3.0	1090.5
7/27/2009	4.75	2.01	3.0	1090.5
7/28/2009	4.75	2.01	3.0	1090.5
7/31/2009	4.75	2.01	3.0	1090.5
8/3/2009	4.75	2.01	3.0	1090.5
8/8/2009	4.58	2.01	2.8	1090.6
8/9/2009	4.50	2.01	2.7	1090.7
8/10/2009	4.50	2.01	2.7	1090.7
8/14/2009	4.54	2.01	2.8	1090.7
8/17/2009	4.75	2.01	3.0	1090.5

Well 3 Data

Install Date:	Soils:	Ground Elevation:	Top of Casing:
5/23/2008	0-8 10YR 2/1, Fine Sandy Loam 8-14 10YR 4/3 Sand 14-46+ 10YR 4/6 Sand	1093.27	1094.94

Popper Corretion = 0.25 feet

Date	Depth to Water (ft)	Riser (Ft.)	Depth Below Ground	Elev. (ft)
5/23/2008	4.00	1.67	2.6	1090.7
5/27/2008	4.00	1.67	2.6	1090.7
5/30/2008	3.50	1.67	2.1	1091.2
6/3/2008	3.80	1.67	2.4	1090.9
6/6/2008	3.90	1.67	2.5	1090.8
6/9/2008	3.20	1.67	1.8	1091.5
6/13/2008	3.00	1.67	1.6	1091.7
6/18/2008	3.88	1.67	2.5	1090.8
6/20/2008	3.95	1.67	2.5	1090.7
6/24/2008	4.08	1.67	2.7	1090.6
6/27/2008	4.17	1.67	2.7	1090.5
7/2/2008	4.17	1.67	2.7	1090.5
7/3/2008	4.33	1.67	2.9	1090.4
7/8/2008	4.42	1.67	3.0	1090.3
7/11/2008	4.58	1.67	3.2	1090.1
7/16/2008	4.62	1.67	3.2	1090.1
7/18/2008	4.40	1.67	3.0	1090.3
7/22/2008	3.90	1.67	2.5	1090.8
7/25/2008	4.25	1.67	2.8	1090.4
7/29/2008	4.40	1.67	3.0	1090.3
8/1/2008	4.50	1.67	3.1	1090.2
8/4/2008	4.50	1.67	3.1	1090.2
8/8/2008	4.60	1.67	3.2	1090.1
8/13/2008	4.75	1.67	3.3	1089.9
8/21/2008	4.75	1.67	3.3	1089.9
8/27/2008	4.75	1.67	3.3	1089.9
8/28/2008	4.75	1.67	3.3	1089.9
8/29/2008	4.75	1.67	3.3	1089.9
9/3/2008	4.75	1.67	3.3	1089.9
9/5/2008	4.75	1.67	3.3	1089.9
9/8/2008	4.75	1.67	3.3	1089.9
9/12/2008	4.75	1.67	3.3	1089.9
9/14/2008	4.75	1.67	3.3	1089.9
9/16/2008	4.75	1.67	3.3	1089.9
9/22/2008	4.75	1.67	3.3	1089.9
9/24/2008	4.75	1.67	3.3	1089.9
9/30/2008	4.75	1.67	3.3	1089.9
10/1/2008	4.75	1.67	3.3	1089.9
10/6/2008	4.75	1.67	3.3	1089.9
10/8/2008	4.75	1.67	3.3	1089.9
10/10/2008	4.75	1.67	3.3	1089.9
10/16/2008	4.75	1.67	3.3	1089.9
10/20/2008	4.75	1.67	3.3	1089.9
10/30/2008	4.75	1.67	3.3	1089.9
11/3/2008	4.75	1.67	3.3	1089.9
11/6/2008	4.75	1.67	3.3	1089.9
11/11/2008	4.75	1.67	3.3	1089.9
11/14/2008	4.75	1.67	3.3	1089.9
11/18/2008	4.63	1.67	3.2	1090.1
11/20/2008	4.66	1.67	3.2	1090.0
11/24/2008	4.66	1.67	3.2	1090.0
12/1/2008	4.75	1.67	3.3	1089.9
12/5/2008	4.75	1.67	3.3	1089.9
12/19/2008	4.75	1.67	3.3	1089.9
12/29/2008	4.52	1.67	3.1	1090.2
1/22/2009	4.33	1.67	2.9	1090.4
1/28/2009	4.69	1.67	3.3	1090.0
2/6/2009	4.67	1.67	3.3	1090.0
2/9/2009	4.71	1.67	3.3	1090.0
2/10/2009	4.42	1.67	3.0	1090.3
2/17/2009	4.08	1.67	2.7	1090.6
2/23/2009	4.13	1.67	2.7	1090.6
2/26/2009	4.30	1.67	2.9	1090.4
3/2/2009	4.58	1.67	3.2	1090.1
3/6/2009	4.58	1.67	3.2	1090.1
3/11/2009	4.00	1.67	2.6	1090.7
3/14/2009	4.00	1.67	2.6	1090.7
3/17/2009	3.46	1.67	2.0	1091.2
3/20/2009	3.50	1.67	2.1	1091.2
3/24/2009	3.17	1.67	1.7	1091.5
3/25/2009	2.83	1.67	1.4	1091.9
3/27/2009	3.21	1.67	1.8	1091.5
3/30/2009	3.50	1.67	2.1	1091.2
4/1/2009	3.46	1.67	2.0	1091.2
4/3/2009	3.67	1.67	2.3	1091.0
4/7/2009	3.75	1.67	2.3	1090.9
4/9/2009	3.83	1.67	2.4	1090.9
4/14/2009	4.00	1.67	2.6	1090.7
4/16/2009	4.08	1.67	2.7	1090.6
4/21/2009	3.92	1.67	2.5	1090.8
4/22/2009	3.83	1.67	2.4	1090.9
4/23/2009	3.92	1.67	2.5	1090.8
4/28/2009	2.92	1.67	1.5	1091.8
5/1/2009	3.42	1.67	2.0	1091.3
5/5/2009	3.67	1.67	2.2	1091.0
5/13/2009	3.92	1.67	2.5	1090.8
5/15/2009	3.92	1.67	2.5	1090.8
5/19/2009	4.13	1.67	2.7	1090.6
5/20/2009	4.13	1.67	2.7	1090.6
5/26/2009	4.02	1.67	2.6	1090.7
5/27/2009	4.13	1.67	2.7	1090.6
5/29/2009	3.67	1.67	2.2	1091.0
6/1/2009	4.08	1.67	2.7	1090.6
6/3/2009	4.21	1.67	2.8	1090.5
6/5/2009	4.33	1.67	2.9	1090.4
6/8/2009	4.05	1.67	2.6	1090.6
6/10/2009	3.58	1.67	2.2	1091.1
6/15/2009	4.25	1.67	2.8	1090.4
6/17/2009	4.33	1.67	2.9	1090.4
6/19/2009	3.83	1.67	2.4	1090.9
6/22/2009	4.54	1.67	3.1	1090.2
6/26/2009	4.33	1.67	2.9	1090.4
7/2/2009	4.50	1.67	3.1	1090.2
7/8/2009	4.50	1.67	3.1	1090.2
7/13/2009	4.71	1.67	3.3	1090.0
7/15/2009	4.75	1.67	3.3	1089.9
7/21/2009	4.75	1.67	3.3	1089.9
7/22/2009	4.75	1.67	3.3	1089.9
7/23/2009	4.71	1.67	3.3	1090.0
7/27/2009	4.67	1.67	3.3	1090.0
7/28/2009	4.67	1.67	3.3	1090.0
7/31/2009	4.71	1.67	3.3	1090.0
8/3/2009	4.75	1.67	3.3	1089.9
8/8/2009	4.50	1.67	3.1	1090.2
8/9/2009	4.33	1.67	2.9	1090.4
8/10/2009	4.42	1.67	3.0	1090.3
8/14/2009	4.50	1.67	3.1	1090.2
8/17/2009	4.50	1.67	3.1	1090.2

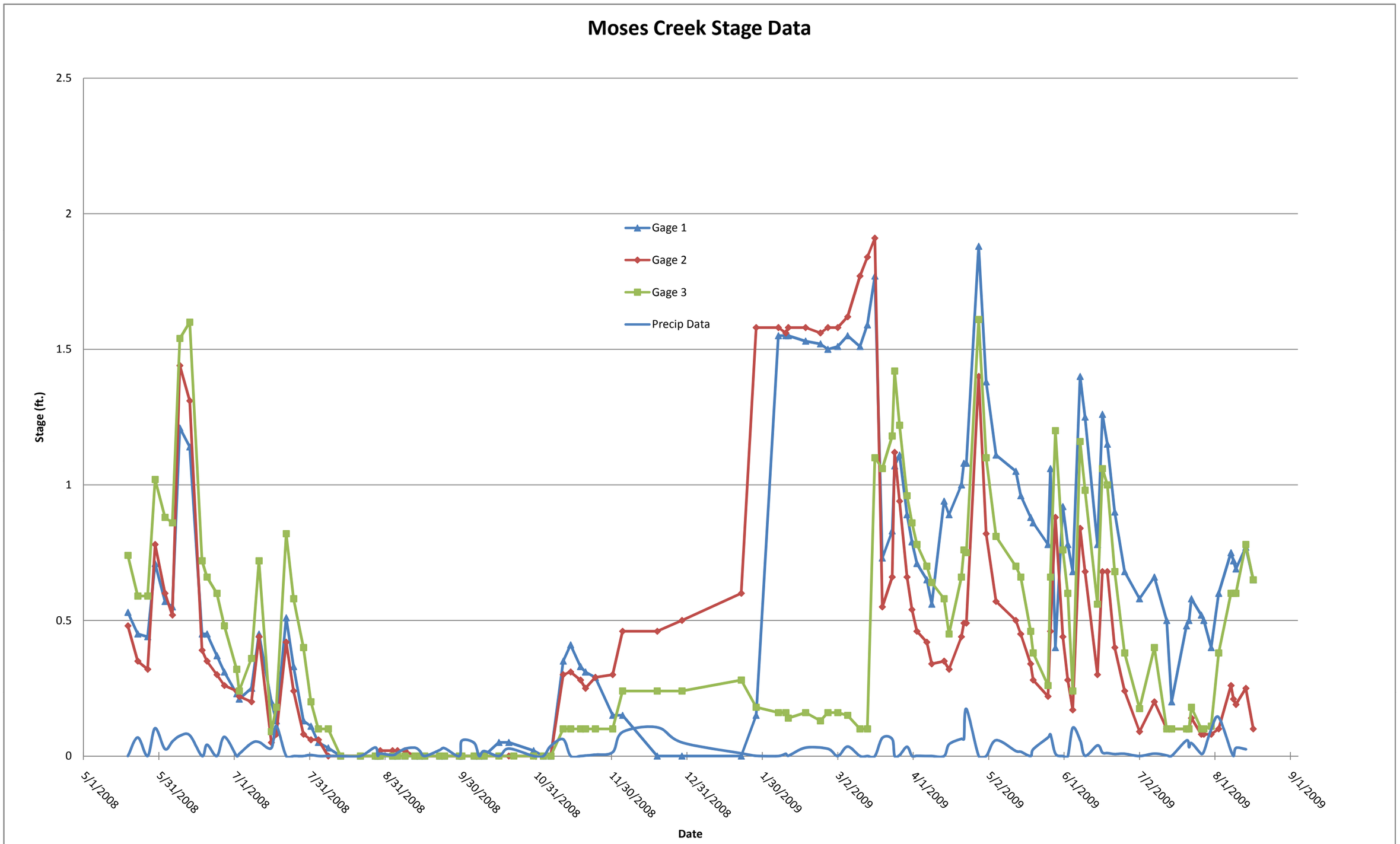
Well 4 Data

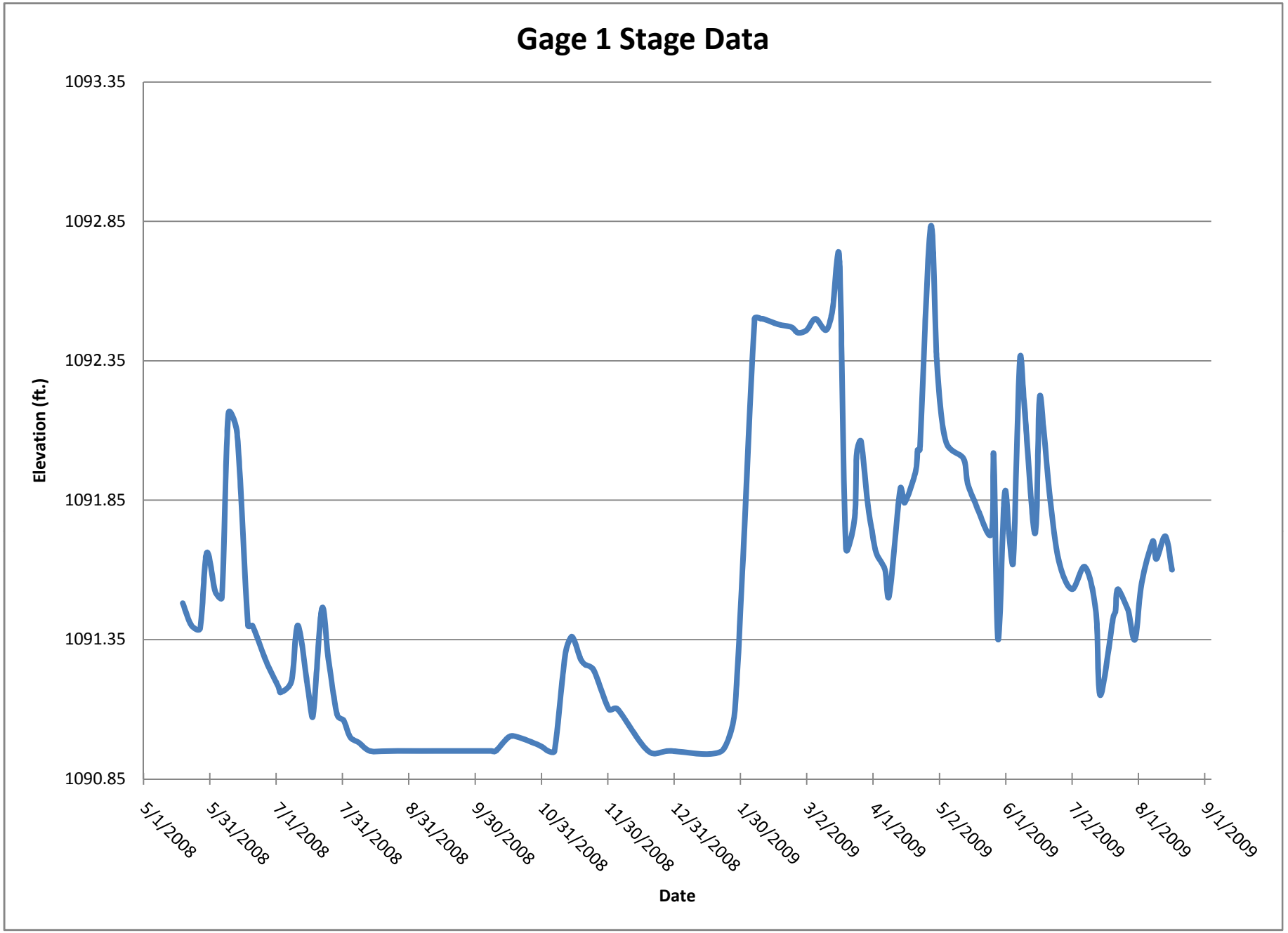
Install Date:	Soils:	Ground Elevation:	Top of Casing:
5/19/2008	0-6 10YR 2/1, Sandy Loam	1091.7	1093.94
	6-13 10YR 5/2 Sand		
	13-20 7.5YR 3/3 Sand		
	20-33+ 10YR 4/2 Sand		

Popper Corretion = 0.25 feet

Date	Depth to Water (ft)	Riser (Ft.)	Depth Below Ground	Elev. (ft)
5/19/2008	3.75	2.2	1.8	1089.9
5/23/2008	4.00	2.2	2.1	1089.7
5/27/2008	3.80	2.2	1.9	1089.9
5/30/2008	3.20	2.2	1.3	1090.5
6/3/2008	3.20	2.2	1.3	1090.5
6/6/2008	3.60	2.2	1.7	1090.1
6/9/2008	3.10	2.2	1.2	1090.6
6/13/2008	3.00	2.2	1.1	1090.7
6/18/2008	3.92	2.2	2.0	1089.8
6/20/2008	4.08	2.2	2.1	1089.6
6/24/2008	4.47	2.2	2.5	1089.2
6/27/2008	4.58	2.2	2.6	1089.1
7/2/2008	4.67	2.2	2.7	1089.0
7/3/2008	4.67	2.2	2.7	1089.0
7/8/2008	4.58	2.2	2.6	1089.1
7/11/2008	4.42	2.2	2.5	1089.3
7/16/2008	4.75	2.2	2.8	1088.9
7/18/2008	4.75	2.2	2.8	1088.9
7/22/2008	3.83	2.2	1.9	1089.9
7/25/2008	4.50	2.2	2.6	1089.2
7/29/2008	4.75	2.2	2.8	1088.9
8/1/2008	4.75	2.2	2.8	1088.9
8/4/2008	4.75	2.2	2.8	1088.9
8/8/2008	4.75	2.2	2.8	1088.9
8/13/2008	4.75	2.2	2.8	1088.9
8/21/2008	4.75	2.2	2.8	1088.9
8/27/2008	4.75	2.2	2.8	1088.9
8/28/2008	4.75	2.2	2.8	1088.9
8/29/2008	4.75	2.2	2.8	1088.9
9/3/2008	4.75	2.2	2.8	1088.9
9/5/2008	4.75	2.2	2.8	1088.9
9/8/2008	4.75	2.2	2.8	1088.9
9/12/2008	4.75	2.2	2.8	1088.9
9/14/2008	4.75	2.2	2.8	1088.9
9/16/2008	4.75	2.2	2.8	1088.9
9/22/2008	4.75	2.2	2.8	1088.9
9/24/2008	4.75	2.2	2.8	1088.9
9/30/2008	4.75	2.2	2.8	1088.9
10/1/2008	4.75	2.2	2.8	1088.9
10/6/2008	4.75	2.2	2.8	1088.9
10/8/2008	4.75	2.2	2.8	1088.9
10/10/2008	4.75	2.2	2.8	1088.9
10/16/2008	4.75	2.2	2.8	1088.9
10/20/2008	4.75	2.2	2.8	1088.9
10/30/2008	4.75	2.2	2.8	1088.9
11/3/2008	4.75	2.2	2.8	1088.9
11/6/2008	4.75	2.2	2.8	1088.9
11/11/2008	4.75	2.2	2.8	1088.9
11/14/2008	4.75	2.2	2.8	1088.9
11/18/2008	4.75	2.2	2.8	1088.9
11/20/2008	4.75	2.2	2.8	1088.9
11/24/2008	4.75	2.2	2.8	1088.9
12/1/2008	4.75	2.2	2.8	1088.9
12/5/2008	4.75	2.2	2.8	1088.9
12/19/2008	4.75	2.2	2.8	1088.9
12/29/2008	4.75	2.2	2.8	1088.9
1/22/2009	4.75	2.2	2.8	1088.9
1/28/2009	4.75	2.2	2.8	1088.9
2/6/2009	4.75	2.2	2.8	1088.9
2/9/2009	4.75	2.2	2.8	1088.9
2/10/2009	4.75	2.2	2.8	1088.9
2/17/2009	4.67	2.2	2.7	1089.0
2/26/2009	4.75	2.2	2.8	1088.9
3/2/2009	4.75	2.2	2.8	1088.9
3/6/2009	4.75	2.2	2.8	1088.9
3/11/2009	4.75	2.2	2.8	1088.9
3/14/2009	4.75	2.2	2.8	1088.9
3/17/2009	4.75	2.2	2.8	1088.9
3/20/2009	4.75	2.2	2.8	1088.9
3/24/2009	4.75	2.2	2.8	1088.9
3/25/2009	4.75	2.2	2.8	1088.9
3/27/2009	4.75	2.2	2.8	1088.9
3/30/2009	4.75	2.2	2.8	1088.9
4/1/2009	4.54	2.2	2.6	1089.1
4/3/2009	4.54	2.2	2.6	1089.1
4/7/2009	4.58	2.2	2.6	1089.1
4/9/2009	4.67	2.2	2.7	1089.0
4/14/2009	4.75	2.2	2.8	1088.9
4/16/2009	4.75	2.2	2.8	1088.9
4/21/2009	4.33	2.2	2.4	1089.4
4/22/2009	4.33	2.2	2.4	1089.4
4/23/2009	4.17	2.2	2.2	1089.5
4/28/2009	3.58	2.2	1.6	1090.1
5/1/2009	3.75	2.2	1.8	1089.9
5/5/2009	4.08	2.2	2.1	1089.6
5/13/2009	4.25	2.2	2.3	1089.4
5/15/2009	4.25	2.2	2.3	1089.4
5/19/2009	4.50	2.2	2.6	1089.2
5/20/2009	4.58	2.2	2.6	1089.1
5/26/2009	4.75	2.2	2.8	1088.9
5/27/2009	4.17	2.2	2.2	1089.5
5/29/2009	4.13	2.2	2.2	1089.6
6/1/2009	4.42	2.2	2.5	1089.3
6/3/2009	4.63	2.2	2.7	1089.1
6/5/2009	4.75	2.2	2.8	1088.9
6/8/2009	4.75	2.2	2.8	1088.9
6/10/2009	4.73	2.2	2.8	1089.0
6/15/2009	4.63	2.2	2.7	1089.1
6/17/2009	4.17	2.2	2.2	1089.5
6/19/2009	4.21	2.2	2.3	1089.5
6/22/2009	4.67	2.2	2.7	1089.0
6/26/2009	4.75	2.2	2.8	1088.9
7/2/2009	4.75	2.2	2.8	1088.9
7/8/2009	4.67	2.2	2.7	1089.0
7/13/2009	4.67	2.2	2.7	1089.0
7/15/2009	4.75	2.2	2.8	1088.9
7/21/2009	4.75	2.2	2.8	1088.9
7/22/2009	4.75	2.2	2.8	1088.9
7/23/2009	4.75	2.2	2.8	1088.9
7/27/2009	4.75	2.2	2.8	1088.9
7/28/2009	4.75	2.2	2.8	1088.9
7/31/2009	4.75	2.2	2.8	1088.9
8/3/2009	4.75	2.2	2.8	1088.9
8/8/2009	4.75	2.2	2.8	1088.9
8/9/2009	4.75	2.2	2.8	1088.9
8/10/2009	4.75	2.2	2.8	1088.9
8/14/2009	4.75	2.2	2.8	1088.9
8/17/2009	4.75	2.2	2.8	1088.9

Moses Creek Stage Data




Gage 1 Stage Data
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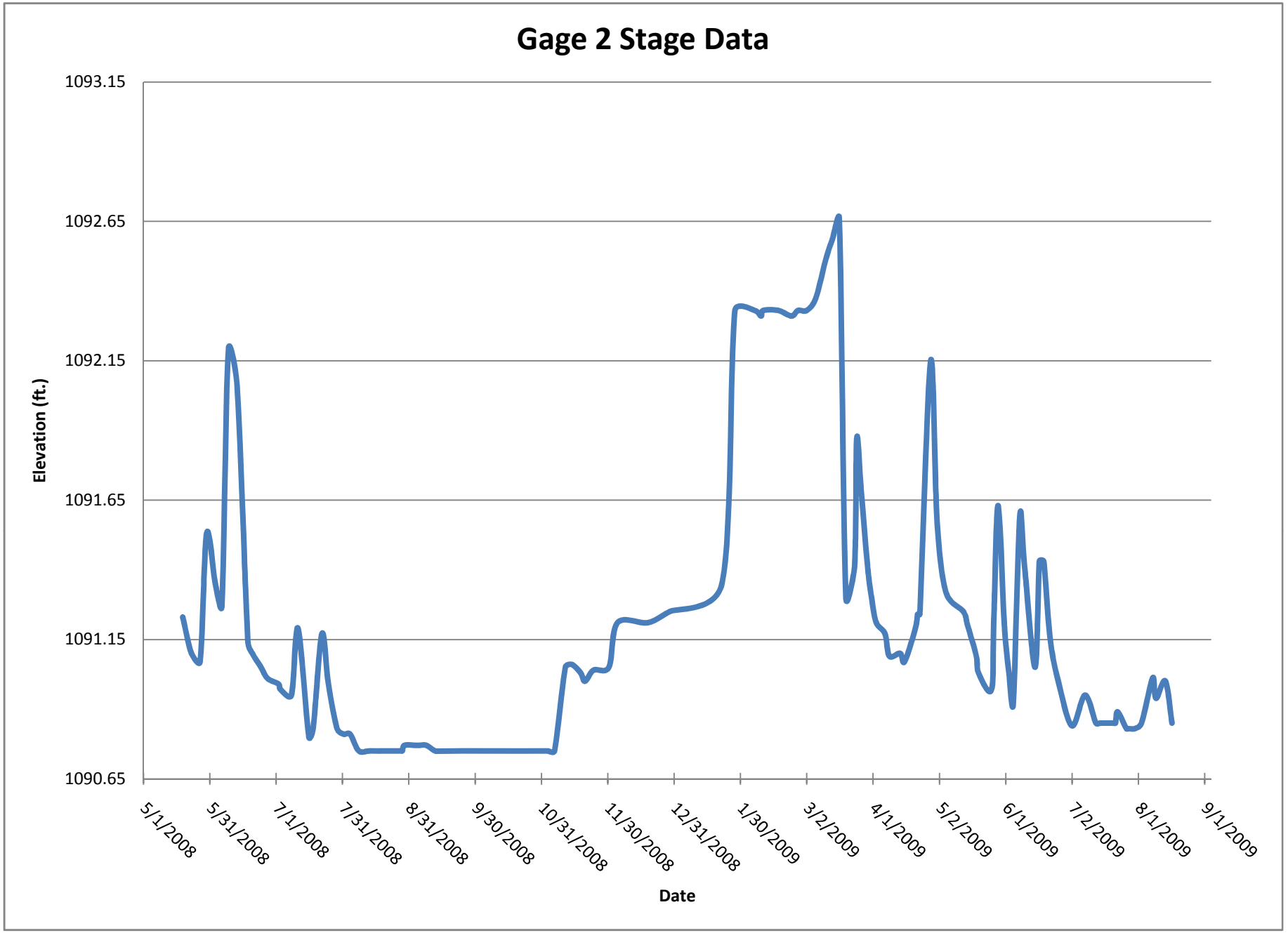
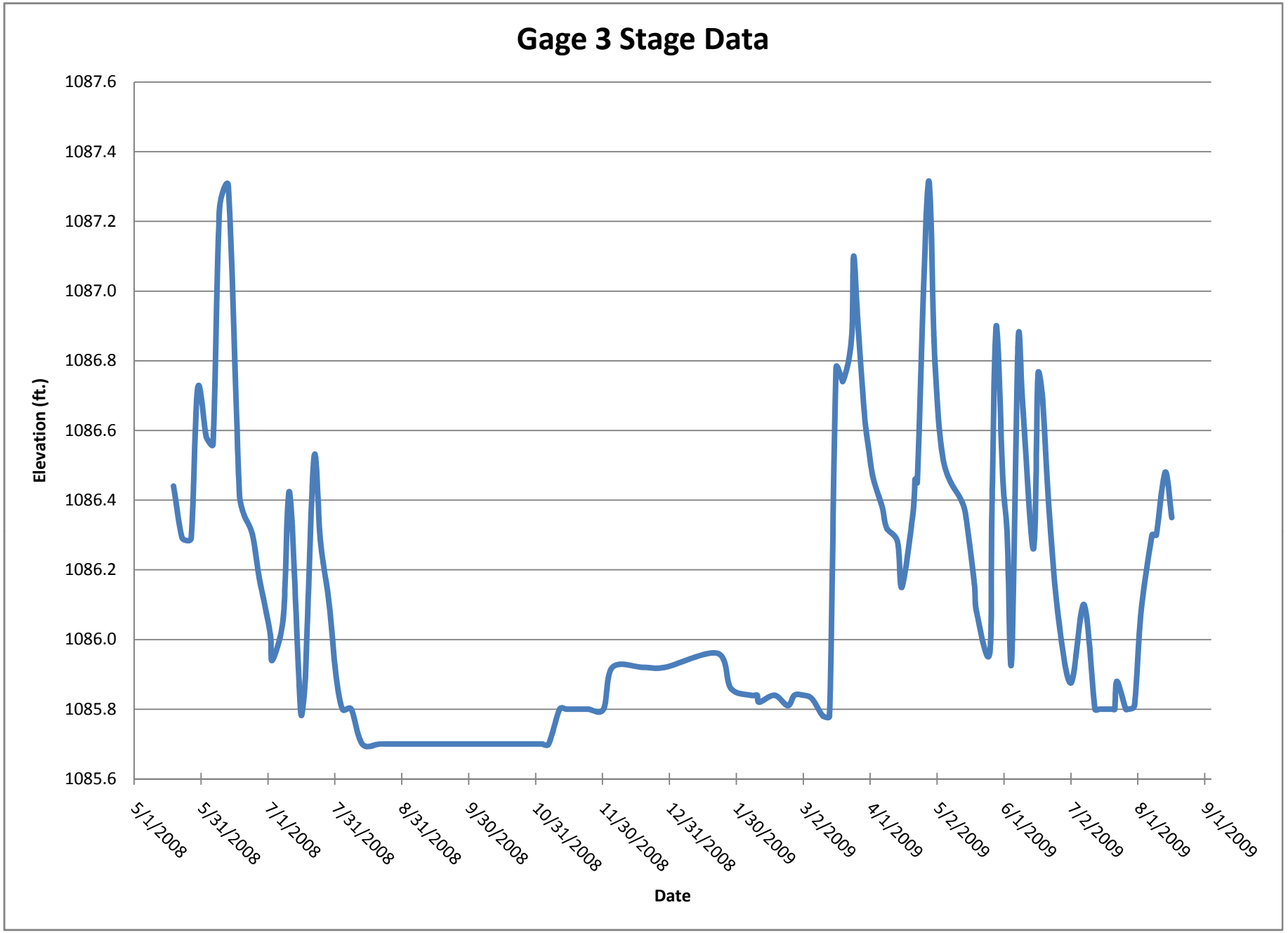
1092.35
1091.85
1091.35
1090.85
Elevation (ft.)
5/1/2008
5/31/2008
7/1/2008
7/31/2008
8/31/2008
9/30/2008
10/31/2008
11/30/2008
12/31/2008
1/30/2009
3/2/2009
4/1/2009
5/2/2009
6/1/2009
7/2/2009
8/1/2009
9/1/2009
Date


Gage 2 Stage Data
1093.15
1092.65
1092.15
1091.65
1091.15
1090.65
Elevation (ft.)
5/1/2008
5/31/2008
7/1/2008
7/31/2008
8/31/2008
9/30/2008
10/31/2008
11/30/2008
12/31/2008
1/30/2009
3/2/2009
4/1/2009
5/2/2009
6/1/2009
7/2/2009
8/1/2009
9/1/2009
Date


Gage 3 Stage Data
Elevation (ft.)
1087.6
1087.4
1087.2
1087.0
1086.8
1086.6
1086.4
1086.2
1086.0
1085.8
1085.6
5/1/2008
5/31/2008
7/1/2008
7/31/2008
8/31/2008
9/30/2008
10/31/2008
11/30/2008
12/31/2008
1/30/2009
3/2/2009
4/1/2009
5/2/2009
6/1/2009
7/2/2009
8/1/2009
9/1/2009
Date

Gage 1

Bed Elevation: **1090.95**

Date	Ht (ft.)	Elevation (ft.)
5/19/2008	0.53	1091.48
5/23/2008	0.45	1091.4
5/27/2008	0.44	1091.39
5/30/2008	0.71	1091.66
6/3/2008	0.57	1091.52
6/6/2008	0.55	1091.5
6/9/2008	1.21	1092.16
6/13/2008	1.14	1092.09
6/18/2008	0.45	1091.4
6/20/2008	0.45	1091.4
6/24/2008	0.37	1091.32
6/27/2008	0.31	1091.26
7/2/2008	0.23	1091.18
7/3/2008	0.21	1091.16
7/8/2008	0.25	1091.2
7/11/2008	0.45	1091.4
7/16/2008	0.2	1091.15
7/18/2008	0.13	1091.08
7/22/2008	0.51	1091.46
7/25/2008	0.33	1091.28
7/29/2008	0.13	1091.08
8/1/2008	0.11	1091.06
8/4/2008	0.05	1091
8/8/2008	0.03	1090.98
8/13/2008	0	1090.95
8/21/2008	0	1090.95
8/27/2008	0	1090.95
8/28/2008	0	1090.95
8/29/2008	0	1090.95
9/3/2008	0	1090.95
9/5/2008	0	1090.95
9/8/2008	0	1090.95
9/12/2008	0	1090.95
9/14/2008	0	1090.95
9/16/2008	0	1090.95
9/22/2008	0	1090.95
9/24/2008	0	1090.95
9/30/2008	0	1090.95
10/1/2008	0	1090.95
10/6/2008	0	1090.95
10/8/2008	0	1090.95
10/10/2008	0	1090.95
10/16/2008	0.05	1091
10/20/2008	0.05	1091
10/30/2008	0.02	1090.97
11/3/2008	0	1090.95
11/6/2008	0	1090.95
11/11/2008	0.35	1091.3
11/14/2008	0.41	1091.36
11/18/2008	0.33	1091.28
11/20/2008	0.31	1091.26
11/24/2008	0.29	1091.24
12/1/2008	0.15	1091.1
12/5/2008	0.15	1091.1
12/19/2008	0	1090.95
12/29/2008	0	1090.95
1/22/2009	0	1090.95
1/28/2009	0.15	1091.1
2/6/2009	1.55	1092.5
2/9/2009	1.55	1092.5
2/10/2009	1.55	1092.5
2/17/2009	1.53	1092.48
2/23/2009	1.52	1092.47
2/26/2009	1.5	1092.45
3/2/2009	1.51	1092.46
3/6/2009	1.55	1092.5
3/11/2009	1.51	1092.46
3/14/2009	1.59	1092.54
3/17/2009	1.77	1092.72
3/20/2009	0.73	1091.68
3/24/2009	0.83	1091.78
3/25/2009	1.07	1092.02
3/27/2009	1.11	1092.06
3/30/2009	0.89	1091.84
4/1/2009	0.79	1091.74
4/3/2009	0.71	1091.66
4/7/2009	0.65	1091.6
4/9/2009	0.56	1091.51
4/14/2009	0.94	1091.89
4/16/2009	0.89	1091.84
4/21/2009	1	1091.95
4/22/2009	1.08	1092.03
4/23/2009	1.08	1092.03
4/28/2009	1.88	1092.83
5/1/2009	1.38	1092.33
5/5/2009	1.11	1092.06
5/13/2009	1.05	1092
5/15/2009	0.96	1091.91
5/19/2009	0.88	1091.83
5/20/2009	0.86	1091.81
5/26/2009	0.78	1091.73
5/27/2009	1.06	1092.01
5/29/2009	0.4	1091.35
6/1/2009	0.92	1091.87
6/3/2009	0.78	1091.73
6/5/2009	0.68	1091.63
6/8/2009	1.4	1092.35
6/10/2009	1.25	1092.2
6/15/2009	0.78	1091.73
6/17/2009	1.26	1092.21
6/19/2009	1.15	1092.1
6/22/2009	0.9	1091.85
6/26/2009	0.68	1091.63
7/2/2009	0.58	1091.53
7/8/2009	0.66	1091.61
7/13/2009	0.5	1091.45
7/15/2009	0.2	1091.15
7/21/2009	0.48	1091.43
7/22/2009	0.5	1091.45
7/23/2009	0.58	1091.53
7/27/2009	0.52	1091.47
7/28/2009	0.5	1091.45
7/31/2009	0.4	1091.35
8/3/2009	0.6	1091.55
8/8/2009	0.75	1091.7
8/9/2009	0.72	1091.67
8/10/2009	0.69	1091.64
8/14/2009	0.77	1091.72
8/17/2009	0.65	1091.6

Gage 2
Bed Elevation: 1090.75

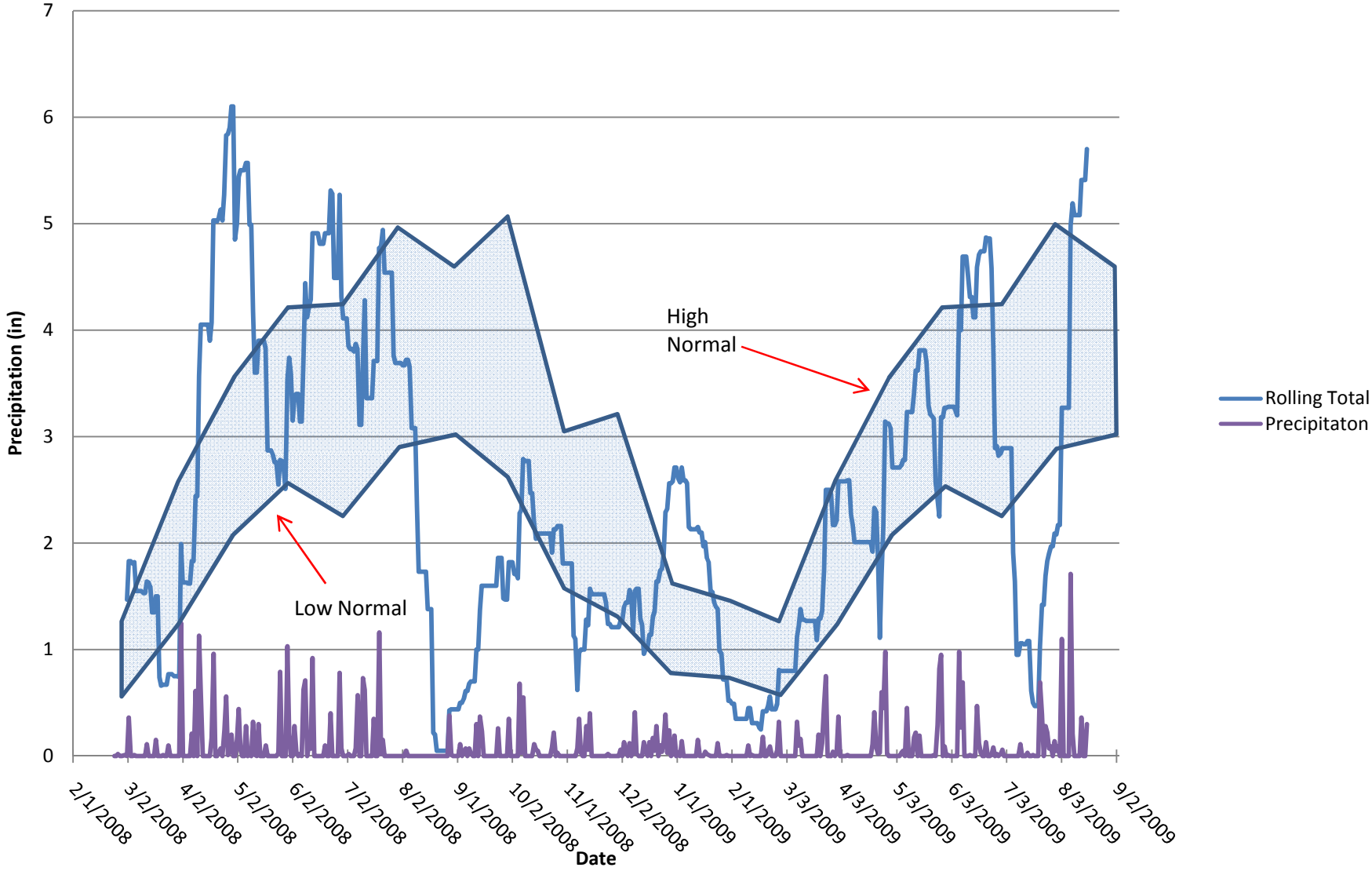
Date	Ht. (ft.)	Elevation (ft.)
5/19/2008	0.48	1091.23
5/23/2008	0.35	1091.1
5/27/2008	0.32	1091.07
5/30/2008	0.78	1091.53
6/3/2008	0.6	1091.35
6/6/2008	0.52	1091.27
6/9/2008	1.44	1092.19
6/13/2008	1.31	1092.06
6/18/2008	0.39	1091.14
6/20/2008	0.35	1091.1
6/24/2008	0.3	1091.05
6/27/2008	0.26	1091.01
7/2/2008	0.24	1090.99
7/3/2008	0.22	1090.97
7/8/2008	0.2	1090.95
7/11/2008	0.44	1091.19
7/16/2008	0.05	1090.8
7/18/2008	0.08	1090.83
7/22/2008	0.42	1091.17
7/25/2008	0.24	1090.99
7/29/2008	0.08	1090.83
8/1/2008	0.06	1090.81
8/4/2008	0.06	1090.81
8/8/2008	0	1090.75
8/13/2008	0	1090.75
8/21/2008	0	1090.75
8/27/2008	0	1090.75
8/28/2008	0	1090.75
8/29/2008	0.02	1090.77
9/3/2008	0.02	1090.77
9/5/2008	0.02	1090.77
9/8/2008	0.02	1090.77
9/12/2008	0	1090.75
9/14/2008	0	1090.75
9/16/2008	0	1090.75
9/22/2008	0	1090.75
9/24/2008	0	1090.75
9/30/2008	0	1090.75
10/1/2008	0	1090.75
10/6/2008	0	1090.75
10/8/2008	0	1090.75
10/10/2008	0	1090.75
10/16/2008	0	1090.75
10/20/2008	0	1090.75
10/30/2008	0	1090.75
11/3/2008	0	1090.75
11/6/2008	0	1090.75
11/11/2008	0.3	1091.05
11/14/2008	0.31	1091.06
11/18/2008	0.28	1091.03
11/20/2008	0.25	1091
11/24/2008	0.29	1091.04
12/1/2008	0.3	1091.05
12/5/2008	0.46	1091.21
12/19/2008	0.46	1091.21
12/29/2008	0.5	1091.25
1/22/2009	0.6	1091.35
1/28/2009	1.58	1092.33
2/6/2009	1.58	1092.33
2/9/2009	1.56	1092.31
2/10/2009	1.58	1092.33
2/17/2009	1.58	1092.33
2/23/2009	1.56	1092.31
2/26/2009	1.58	1092.33
3/2/2009	1.58	1092.33
3/6/2009	1.62	1092.37
3/11/2009	1.77	1092.52
3/14/2009	1.84	1092.59
3/17/2009	1.91	1092.66
3/20/2009	0.55	1091.3
3/24/2009	0.66	1091.41
3/25/2009	1.12	1091.87
3/27/2009	0.94	1091.69
3/30/2009	0.66	1091.41
4/1/2009	0.54	1091.29
4/3/2009	0.46	1091.21
4/7/2009	0.42	1091.17
4/9/2009	0.34	1091.09
4/14/2009	0.35	1091.1
4/16/2009	0.32	1091.07
4/21/2009	0.44	1091.19
4/22/2009	0.49	1091.24
4/23/2009	0.49	1091.24
4/28/2009	1.4	1092.15
5/1/2009	0.82	1091.57
5/5/2009	0.57	1091.32
5/13/2009	0.5	1091.25
5/15/2009	0.45	1091.2
5/19/2009	0.34	1091.09
5/20/2009	0.28	1091.03
5/26/2009	0.22	1090.97
5/27/2009	0.46	1091.21
5/29/2009	0.88	1091.63
6/1/2009	0.44	1091.19
6/3/2009	0.28	1091.03
6/5/2009	0.17	1090.92
6/8/2009	0.84	1091.59
6/10/2009	0.68	1091.43
6/15/2009	0.3	1091.05
6/17/2009	0.68	1091.43
6/19/2009	0.68	1091.43
6/22/2009	0.4	1091.15
6/26/2009	0.24	1090.99
7/2/2009	0.09	1090.84
7/8/2009	0.2	1090.95
7/13/2009	0.1	1090.85
7/15/2009	0.1	1090.85
7/21/2009	0.1	1090.85
7/22/2009	0.1	1090.85
7/23/2009	0.14	1090.89
7/27/2009	0.08	1090.83
7/28/2009	0.08	1090.83
7/31/2009	0.08	1090.83
8/3/2009	0.1	1090.85
8/8/2009	0.26	1091.01
8/9/2009	0.21	1090.96
8/10/2009	0.19	1090.94
8/14/2009	0.25	1091
8/17/2009	0.1	1090.85

Gage 3

Bed Elevation: 1085.7

Date	Ht. (ft.)	Elevation (ft.)
5/19/2008	0.74	1086.4
5/23/2008	0.59	1086.3
5/27/2008	0.59	1086.3
5/30/2008	1.02	1086.7
6/3/2008	0.88	1086.6
6/6/2008	0.86	1086.6
6/9/2008	1.54	1087.2
6/13/2008	1.6	1087.3
6/18/2008	0.72	1086.4
6/20/2008	0.66	1086.4
6/24/2008	0.6	1086.3
6/27/2008	0.48	1086.2
7/2/2008	0.32	1086.0
7/3/2008	0.24	1085.9
7/8/2008	0.36	1086.1
7/11/2008	0.72	1086.4
7/16/2008	0.09	1085.8
7/18/2008	0.18	1085.9
7/22/2008	0.82	1086.5
7/25/2008	0.58	1086.3
7/29/2008	0.4	1086.1
8/1/2008	0.2	1085.9
8/4/2008	0.1	1085.8
8/8/2008	0.1	1085.8
8/13/2008	0	1085.7
8/21/2008	0	1085.7
8/27/2008	0	1085.7
8/28/2008	0	1085.7
8/29/2008	0	1085.7
9/3/2008	0	1085.7
9/5/2008	0	1085.7
9/8/2008	0	1085.7
9/12/2008	0	1085.7
9/14/2008	0	1085.7
9/16/2008	0	1085.7
9/22/2008	0	1085.7
9/24/2008	0	1085.7
9/30/2008	0	1085.7
10/1/2008	0	1085.7
10/6/2008	0	1085.7
10/8/2008	0	1085.7
10/10/2008	0	1085.7
10/16/2008	0	1085.7
10/22/2008	0	1085.7
10/30/2008	0	1085.7
11/3/2008	0	1085.7
11/6/2008	0	1085.7
11/11/2008	0.1	1085.8
11/14/2008	0.1	1085.8
11/18/2008	0.1	1085.8
11/20/2008	0.1	1085.8
11/24/2008	0.1	1085.8
12/1/2008	0.1	1085.8
12/5/2008	0.24	1085.92
12/19/2008	0.24	1085.92
12/29/2008	0.24	1085.92
1/22/2009	0.28	1085.96
1/28/2009	0.18	1085.86
2/6/2009	0.16	1085.84
2/9/2009	0.16	1085.84
2/10/2009	0.14	1085.82
2/17/2009	0.16	1085.84
2/23/2009	0.13	1085.81
2/26/2009	0.16	1085.84
3/2/2009	0.16	1085.84
3/6/2009	0.15	1085.83
3/11/2009	0.1	1085.78
3/14/2009	0.1	1085.78
3/17/2009	1.1	1086.78
3/20/2009	1.06	1086.74
3/24/2009	1.18	1086.86
3/25/2009	1.42	1087.1
3/27/2009	1.22	1086.9
3/30/2009	0.96	1086.64
4/1/2009	0.86	1086.54
4/3/2009	0.78	1086.46
4/7/2009	0.7	1086.38
4/9/2009	0.64	1086.32
4/14/2009	0.58	1086.3
4/16/2009	0.45	1086.2
4/21/2009	0.66	1086.4
4/22/2009	0.76	1086.5
4/23/2009	0.75	1086.5
4/28/2009	1.61	1087.3
5/1/2009	1.1	1086.8
5/5/2009	0.81	1086.5
5/13/2009	0.7	1086.4
5/15/2009	0.66	1086.4
5/19/2009	0.46	1086.2
5/20/2009	0.38	1086.1
5/26/2009	0.26	1086.0
5/27/2009	0.66	1086.4
5/29/2009	1.2	1086.9
6/1/2009	0.76	1086.5
6/3/2009	0.6	1086.3
6/5/2009	0.24	1085.9
6/8/2009	1.16	1086.9
6/10/2009	0.98	1086.7
6/15/2009	0.56	1086.3
6/17/2009	1.06	1086.8
6/19/2009	1	1086.7
6/22/2009	0.68	1086.4
6/26/2009	0.38	1086.1
7/2/2009	0.175	1085.9
7/8/2009	0.4	1086.1
13-Jul	0.1	1085.8
7/15/2009	0.1	1085.8
7/21/2009	0.1	1085.8
7/22/2009	0.1	1085.8
7/23/2009	0.18	1085.9
7/27/2009	0.1	1085.8
7/28/2009	0.1	1085.8
7/31/2009	0.11	1085.8
8/3/2009	0.38	1086.1
8/8/2009	0.6	1086.3
8/9/2009	0.6	1086.3
8/10/2009	0.6	1086.3
8/14/2009	0.78	1086.5
8/17/2009	0.65	1086.4

Figure 7. 30 Day Rolling Total Analysis Using Stevens Point NWS Station and WETS Data



APPENDIX C

REFERENCE REACH REPORT

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September 5, 2008

To: Jon Gumtow, NRC

From: John Wiater, Northern Environmental

Subject: WisDOT Moses Creek
Stream Reference Reach Summary

On August 29, 2008, a Northern Environmental stream restoration specialist visited the Moses Creek watershed north of the INT 39 corridor. The purpose of this visit was to examine the watershed and obtain reference reach data for this portion of the stream. The resulting data will be used to design and construct a native stream channel corridor within the proposed Moses Creek Wetland Mitigation site located within the north western portion of the Schmeekle Reserve in Stevens Point, Wisconsin.

METHODOLOGY

Stream morphology data was collected on Moses Creek using the guidelines set forth in "Applied River Morphology" by David Rosgen. Specifically, a reference reach was set-up to collect various parameters that will be used to design the stream channel within the mitigation site. Parameters that were collected include, but were not limited to, stream width, bank height, channel cross sectional area, longitudinal profile, channel slope and bankfull height.

The stream channel was walked from Wojcik Memorial Drive south to the INT 39 embankment. Data was collected on the stream channel in order to document the variable nature of the channel. The resulting data is summarized in figure format in Attachment A.

Due to the disappearing nature of the stream channel, and the fact that most of the channel in the lower 2,500 feet is excavated, only one permanent reference reach was surveyed. The reference reach is located roughly 800 feet west of the dead-end on Whitetail Drive. This area was chosen because it was the most representative portion of the stream and it is easily accessible from Whitetail Drive.

RESULTS

At the time of the visit, Reference Reach 1 (MC-RR-1) was dry and considerable native vegetation was growing in the stream channel. There were obvious signs of prior flow in the form of debris dams and sediment deposits. The banks are well vegetated with a mixture of sedges and brush species as well as an intermittent wetland tree species. Substrate in this reach appeared to be comprised mainly of a highly organic muck, but areas of well sorted sand were observed throughout the reach. Because there was no baseflow at the time of the visit, no macroinvertebrate or fish observations were made, however, several species of adult dragonflies, damselflies, caddis flies and mayflies were observed flying throughout the site. The channel cross section and longitudinal profile was surveyed using a laser level set at an arbitrary elevation of 100 feet. A figure showing the location of MC-RR-1 is presented in attachment A.

At MC-RR-1, the stream has an average width of about 5 feet and average bankfull height of 4.1 inches. Based on the watermarks on the nearby vegetation, it is estimated that when the channel contains water, the average depth is around 3 inches. The channel cross sectional area was calculated to be 6.19 sq. ft. with an

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entrenchment ratio (bankfull width/width of flood-prone area) of 4.2. A summary graph of the channel cross section data is presented in Attachment B.

A longitudinal profile of MC-RR-1 was completed by surveying 141 linear feet of stream channel in the upper Moses Creek watershed. The elevation of the stream channel thalweg, top of bank and bankfull height were taken at roughly 10 foot intervals along the entire length of the reference reach. The resulting data yielded a channel slope of 0.0025 and a bankfull slope of 0.0021. Channel sinuosity is estimated at 1.10 for the portion of the stream from Wojcik memorial Driver to White Pine Drive. A summary graph of the longitudinal profile data is presented in Attachment B. Photos of MC-RR-1 are presented in Attachment C.

Roughly 2,500 linear feet of the lower Moses Creek channel has been excavated and straightened. The channelization begins at the road embankment of INT 39 and continues in a mainly northeast direction. Spoils piles were observed on the banks of the stream at all locations surveyed during the site visit. At the time of the visit, minimal water was observed in the channel with no flow, and several large debris dams were noted. In-stream habitat in the excavated areas is minimal with deeper pools and detritus making up the majority of potential habitat. The channel is roughly 15 feet wide with banks averaging 3-4 feet high. Substrate in this area is comprised of sand, mud and some areas of larger gravel. Upstream from the channelized portion, the stream disappears into an alder thicket and is not readily visible until roughly 1,000 feet south of reference reach.

SUMMARY AND CONCLUSIONS

The majority of the upper Moses Creek watershed is comprised of undeveloped native wet meadow and scrub/shrub communities. The channel is small (average width of 5 ft.) and disappears occasionally due to lack of flow and heavy vegetation growth. In several areas, the channel is barely visible under an overgrown tag alder swamp. In the lower 2,500 feet the channel has been excavated with the spoil piles placed on the nearby banks. All the native stream characteristics are gone and the stream currently flows in a straight-line, trapezoidal ditch. No reference reach locations were placed in this region due to the ditched nature of the channel.

Although there was no flow in the channel at the time of visit, and it disappears at various locations, it is highly likely that this channel provides significant hydrologic benefits to the wetland community and the watershed. It is a conveyance of water at different times of the year, and may support macroinvertebrate and fish populations when the channel is flowing. The vegetation within the channel and the banks could provide ideal spawning habitat for various species of fish, including northern pike. Additionally, the vegetation and substrate likely support several species of invertebrates as evidenced by the observed adults flying nearby the site.

The design of the new channel should incorporate some of the parameters measured in the reference reach. It is important to attempt to maintain the channel cross section and slope in the final design. Additional stream habitat work should be incorporated in the form of bank logs and other forms of overhead cover. Due to the mitigation site being lower in the watershed, population of spawning fish from the Wisconsin River could potentially use the new stream channel for spawning and year-round residence.

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Please feel free to contact me at (920) 592-8400 or by e-mail with any questions regarding this summary memo.

Sincerely,
Northern Environmental
Technologies, Incorporated

John D. Wiater
Project Scientist

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ATTACHMENT A

Site Location Map and Stream Morphology Mapping

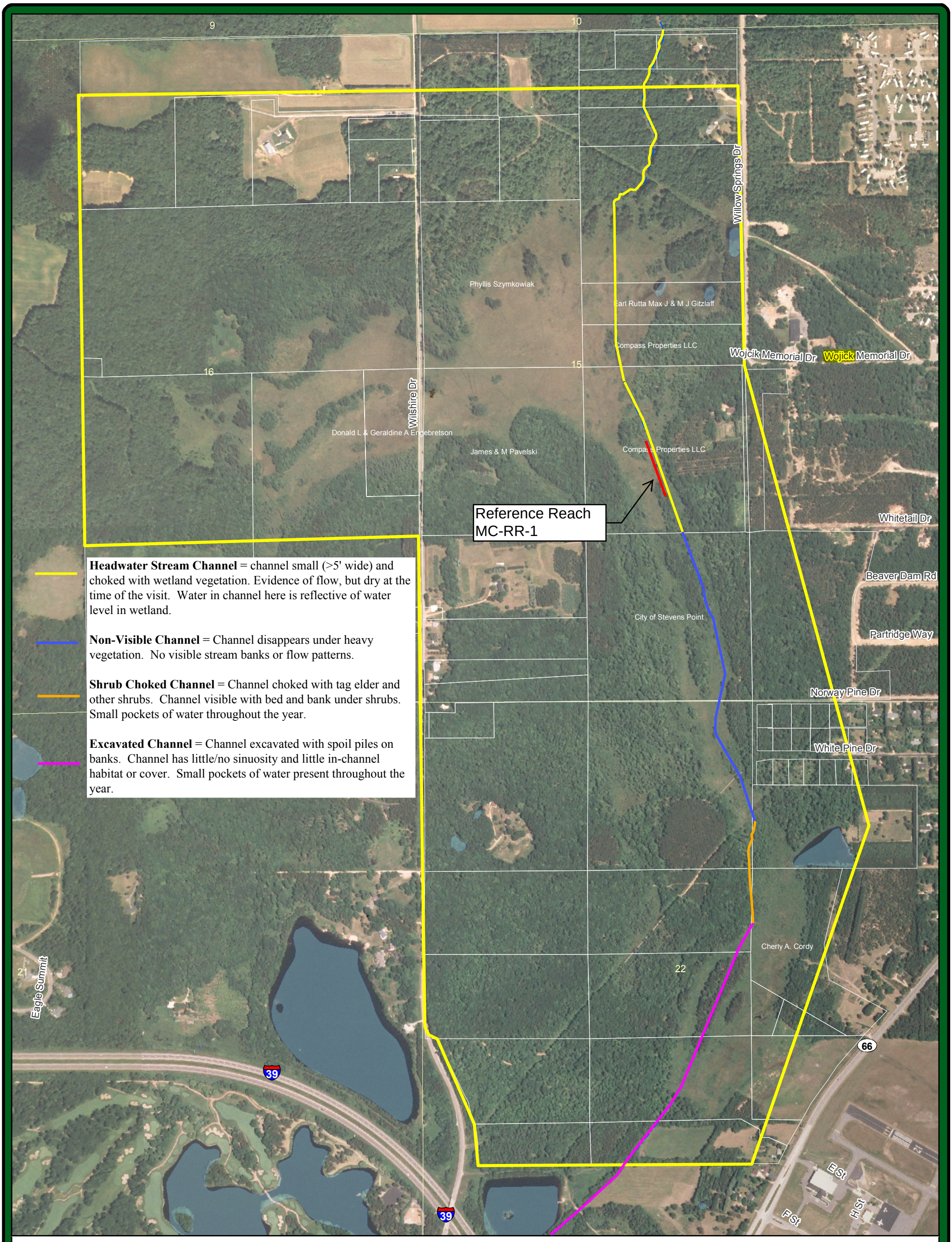
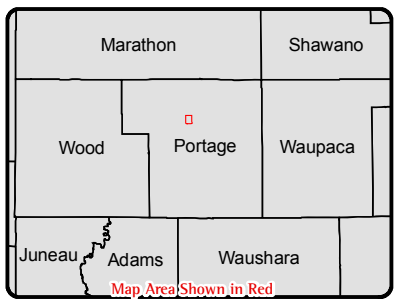


Figure 1. Potential Mitigation Area and Orthophotography
Moses Creek



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

0 350 700 Feet

N

Project Information
Project Number : 008-0099-01
Modified August 05, 2008

Legend
Potential Mitigation Area
Parcels
Section Line
DNR 24k Hydrography
Perrenial Stream
Intermittent Stream
Waterbody

Data Sources include WDNR, USFWS, USGS, WDOA, & WDOT.
Orthophotography: 2005

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

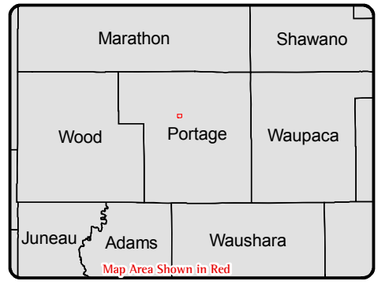
Headwater Stream Channel = channel small (>5' wide) and choked with wetland vegetation. Evidence of flow, but dry at the time of the visit. Water in channel here is reflective of water level in wetland.

Non-Visible Channel = Channel disappears under heavy vegetation. No visible stream banks or flow patterns.

Shrub Choked Channel = Channel choked with tag elder and other shrubs. Channel visible with bed and bank under shrubs. Small pockets of water throughout the year.

Excavated Channel = Channel excavated with spoil piles on banks. Channel has little/no sinuosity and little in-channel habitat or cover. Small pockets of water present throughout the year.

Figure 1.
Soil Boring Map
Moses Creek Wetland Mitigation Site



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 August 18, 2008

Legend

- Approximate Project Boundary
- Private Property
- Field Delineated Wetland
- Wetland Bound. - Prev. Concurrance
- Topsoil depths in inches
- Staff Gauge
- Monitoring Well
- Section Line

DNR 24k Hydrography

- Perrenial Stream
- Intermittent Stream
- Waterbody

Data Sources include WDNR, WDOA, & WDOT. Orthophotography: 2005

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ATTACHMENT B

Channel Cross Section and Longitudinal Profile Summary Diagrams

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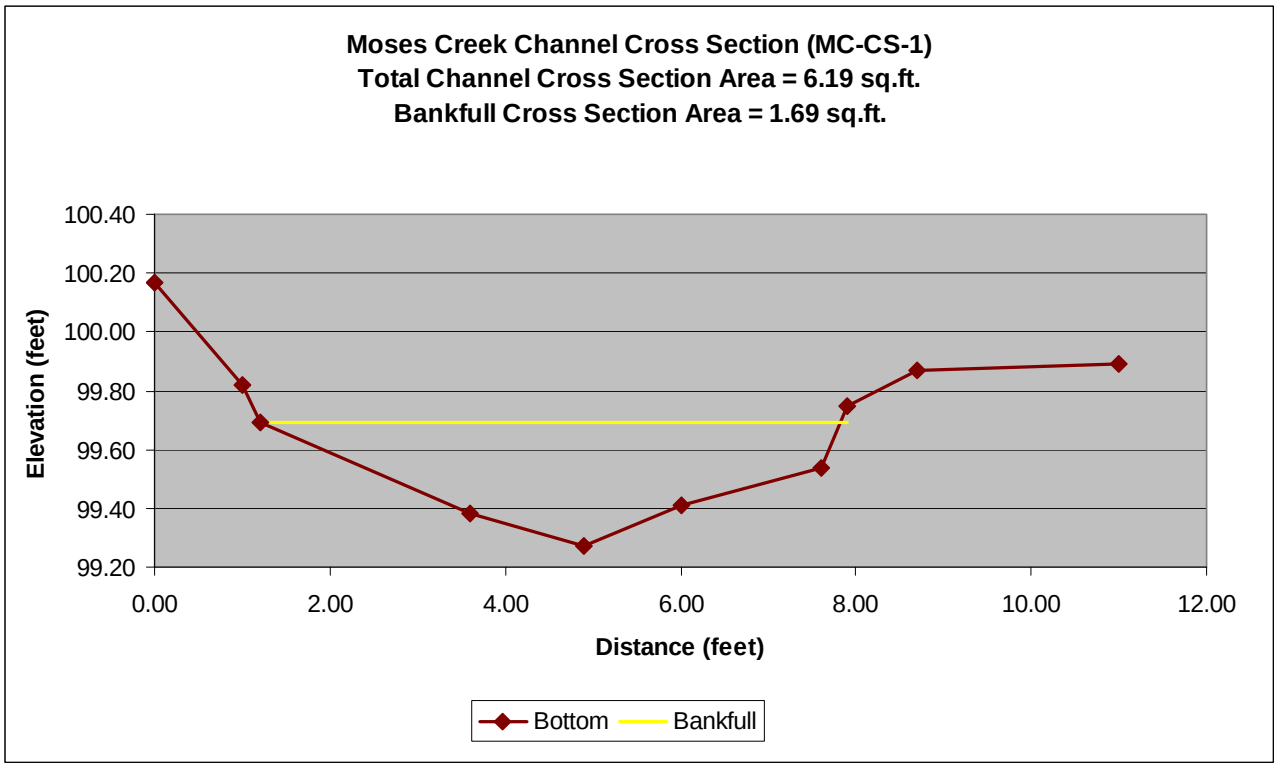

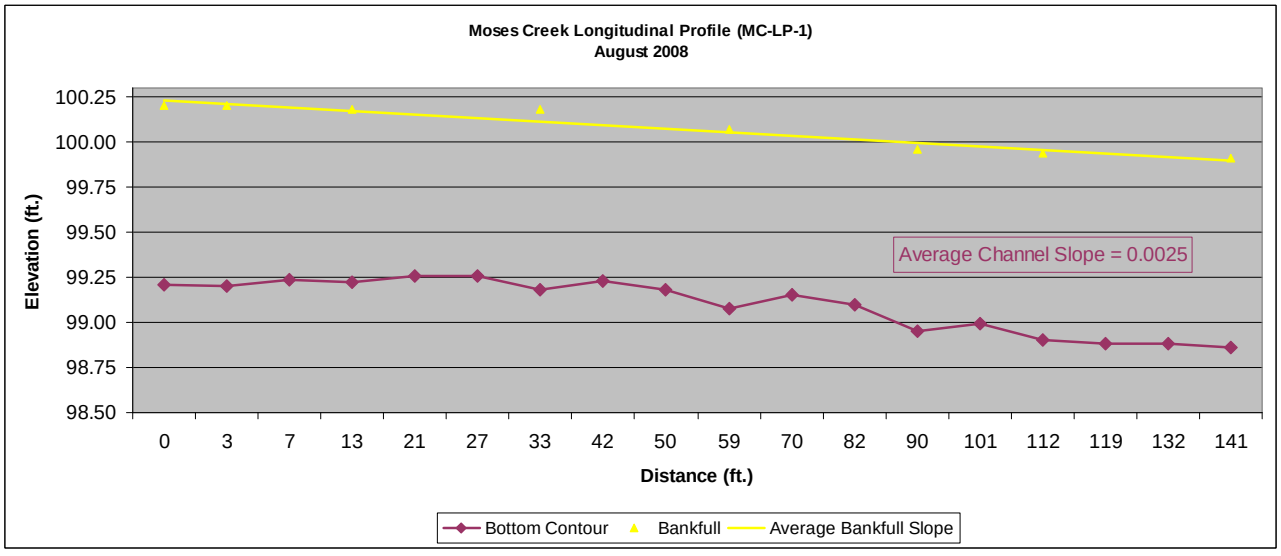

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ATTACHEMNT C

Site Photos

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Reference site MC-RR-1 and channel cross section

Longitudinal profile looking south

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Moses Creek channel choked with tag elder. Photo taken looking north roughly 3,000 feet north of INT 39.

APPENDIX D

MN RAM RESULTS

MnRAM 3.2

FOR EVALUATING WETLAND FUNCTIONS

MnRAM 3.2 is designed to help assess functions and values associated with Minnesota wetlands. The Comprehensive Guidance document (available at www.bwsr.state.mn.us) contains explanations, references, definitions, and a ranking formula for each function. After using this tool, the Management Classification Reference will help to organize the results for managing local wetland resources.

GENERAL INFORMATION:

Project Number or Name: Moses Creek	Wetland Number:W1
Location: Portage County; Section 28; Township 24N, Range 8E	
Major Watershed: Wisconsin River:	City: Stevens Point
Evaluator(s): Tom Nedland	Date of Site Visit: May 14 & 15, 2008

SCOPE AND LIMITATIONS:

1. Note unusual climatic conditions experienced during this assessment due to seasonal considerations and/or unusual existing hydrologic and climatologic conditions:

2. Describe the **purpose** of this assessment:
inventory/planning/monitoring/regulatory/classification___Permitting _____

SUMMARY TABLE

ACTUAL CONDITIONS	FUNCTIONAL INDEX*		
FUNCTIONS (and Related Values)	N/A	Functional Index Score	Comments
Vegetative Diversity/Integrity** Wet Meadow		0.1 - Low	Dominated by exotics
Shrub - Carr		0.1 - Low	Dominated by exotics
Hardwood Swamp		0.5 - Medium	
Maintenance of Characteristic Hydrologic Regime		1.0 - High	
Flood/Stormwater/Attenuation		0.5 – Medium	
Downstream Water Quality		0.8 - High	
Maintenance of Wetland Water Quality		0.83 - High	
Shoreline Protection	X		
Maintenance of Characteristic Wildlife Habitat Structure		0.64 - Medium	
Maintenance of Characteristic Fish Habitat	X		
Maintenance of Characteristic Amphibian Habitat	X		
Aesthetics/Recreation/Education/Cultural		2 - Exceptional	
Commercial Uses	X		
Groundwater Interaction		Intermediate	
Additional Information			
Wetland Restoration Potential		0.53 - Medium	

	Date	W1		Wetland name / ID		Wetland name / ID		Wetland name / ID	
	Special Features (from list, p.2--enter letter/s)	f	Public park, forest, trail, or re	-	____	-	____	-	____
#1	Community Number (circle each community which represents at least 10% of the wetland)	3A, **3B**, 4A, 4B, 7A, 7B, 8A, **8B**, 10A, 13A, 13B, 12B, 14A, 15A, **15B**, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B	
#2 & #3	~ Describe each community type individually below ~					~ Describe each community type individually below ~			
Plant Community #1	Community Type (wet meadow, marsh)	15B	Fresh(wet) Meadow	-	-	-	-	-	-
	Community Proportion (% of total)		10%						
	Dominant Vegetation / Cover Class	Phalaris arundinacea/H							
		Rhamnus frangula/Sh							
		Spraea alba/Sh							
		Populus tremuloides/T							
		Betula papyrifera/T							
	Invasive/exotic Vegetation / Cover Class	Phalaris arundinacea/H							
		Rhamnus frangula/Sh							
	Community Quality (E, H, M, L)	L	0.1		0		0		0
Plant Community #2	Community Type (wet meadow, marsh)	8B	Shrub-Carr	-	-	-	-	-	-
	Community Proportion (% of total)		10%						
	Dominant Vegetation / Cover Class	Rhamnus frangula/H							
		Impatiens capensis/H							
		Rhamnus frangula/Sh							
		Acer rubrum/T							
		Prunus serotina/T							
		Betula papyrifera/T							
	Invasive/exotic Vegetation / Cover Class	Rhamnus frangula/H							
		Rhamnus frangula/Sh							
	Community Quality (E, H, M, L)	L	0.1		0		0		0
Plant Community #3	Community Type (wet meadow, marsh)	3B	Hardwood Swamp	-	-	-	-	-	-
	Community Proportion (% of total)		80%						
	Dominant Vegetation / Cover Class	Phalaris arundinacea/H							
		Acer rubrum/Sh							
		Rhamnus frangula/Sh							
		Acer rubrum/T							
		Rhamnus frangula/H							
		Trientalis borealis/H							
		Glyceria striata/H							
	Invasive/exotic Vegetation / Cover Class	Rhamnus frangula/Sh							
		Rhamnus frangula/H							
	Community Quality (E, H, M, L)	M	0.5		0		0		0
Plant Community #4*	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)	-	0		0		0		0
	Circular 39 Types (primary <TAB> others)								
	Cowardin Types								
	Photo ID								
Highest rated community veg. div./integ:		0.5	Medium	0	-	0	-	0	-
Average vegetative diversity/integrity:		0.23	Low	-	-	-	-	-	-
Weighted Average veg. diversity/integrity:		0.42	Medium	0.00	-	0.00	-	0.00	-
#4	Listed, rare, special plant species?	n	Y N		Y N		Y N		Y N
#5	**Rare community or habitat?**	**n**	**Y N**		**Y N**		**Y N**		**Y N**
#6	Pre-European-settlement conditions?	n	Y N		Y N		Y N		Y N

Floodplain Forest [1A, 2A, 3A] * Hardwood Swamp [3B] * Coniferous Bog [2A, 4B] * Coniferous Swamp [4B] * Open Bog [1B, 5A, 5B, 6A, 7A, 9A, 10A] * Calcareous Fen [7B, 11B, 14A] * Shrub Swamp [6B] * Alder Thicket [8A] * Shrub-carr [8B] * Sedge Meadow [10B, 11A, 12A, 13A] * Shallow Marsh [13B] * Deep Marsh [12B] * Wet to Wet-Mesic Prairie [14B, 15A] * Fresh (Wet) Meadow [15B] * Shallow, Open Water [9B, 16A] * Seasonally Flooded Basin [16B]

*If there are more than four plant community types, use the next column over to enter the rest and do not rely on the automatic average

Cover Class	Class Range
1	0 - 3%
2	3 - 10%
3	10 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

MnRAM 3.2 Digital Worksheet, Side 2

		Question Description	User entry	Rating										
	1	Veg. Table 2, Option 4		0.42										
		TOTAL VEG Rating	0.42	Medium										
	4	Listed, rare, special plant species?	n	next										
	5	Rare community or habitat?	n	next										
	6	Pre-European-settlement conditions?	n	next										
	7	hydrogeo & topo	I	Depressional/Isolated										
	8	Water depth (inches)	1											
		Water depth (% inundation)	75%											
	9	Local watershed/immedita drainage (acres)												
	10	Existing wetland size	3.97											
	11	SOILS: Up/Wetland (survey classification + site)	lineation report											
Digital worksheet, section I	12	Outlet characteristics for flood retention	B	0.5										
	13	Outlet characteristics for hydrologic regime	A	1										
	14	Dominant upland land use (within 500 ft)	A	1	0.1									
	15	Soil condition (wetland)	A	1										
	16	Vegetation (% cover)	80%	H	1									
	17	Emerg. veg. flood resistance	A	1										
	18	Sediment delivery	A	1										
	19	Upland soils (based on soil group)	A	0.1										
	20	Stormwater runoff pretreatment & detention	C	0.1	1									
	21	Subwatershed wetland density	B	0.5										
	22	Channels/sheet flow	B	0.5										
	23	Adjacent naturalized buffer average width (feet)	>50	H	WQ	1	H	1						
	24	Adjacent Area Management: % Full	100%	1	1	**1**								
		adjacent area mgmt: % Manicured		0										
		adjacent area mgmt: % Bare		0										
	25	Adjacent Area Diversity & Structure: % Native	70%	0.7	3	**0.81**								
		adjacent area diversity: % Mixed	20%	0.1										
		adjacent area diversity: % Sparse/Inv./Exotic	10%	0.01										
	26	Adjacent Area Slope: % Gentle	100%	1	1	**1**								
		adjacent area slope: % Moderate		0										
		adjacent area slope: % Steep		0										
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1										
	28	Nutrient loading	A	1										
	29	Shoreline wetland?	N	N										
	30	Rooted shoreline vegetation (%cover)		Enter a percentage										
	31	Wetland in-water width (in feet, average)		Enter a percentage										
	32	Emergent vegetation erosion resistance		Enter valid choice										
	33	Shoreline erosion potential		Enter valid cho										
	34	Bank protection/upslope veg.		Enter valid choice										
	35	Rare Wildlife	N	N										
	36	Scarce/Rare/S1/S2 local community	N	N										
	37	Vegetation interspersion cover (see diagram 1)	N/A	N/A	N/A									
	38	Community interspersion (see diagram 2)	2	M	0.5				0					
	39	Wetland detritus	B	0.5										
	40	Wetland interspersion on landscape	B	0.5	0.5									
	41	Wildlife barriers	B	0.5										
	42	Amphibian breeding potential-hydroperiod	I	0										
	43	Amphibian breeding potential--fish presence	B	0.5										
	44	Amphibian & reptile overwintering habitat	N/A	0										
	45	Wildlife species (list)	White tailed deer, Gray Squirrel											
	46	Fish habitat quality	N/A	N/A										
	47	Fish species (list)	N/A											
	48	Unique/rare educ./cultural/rec.opportunity	Y	Y										
	49	Wetland visibility	B	0.5										
	50	Proximity to population	Y	1										
	51	Public ownership	A	1										
	52	Public access	A	1										
	53	Human influence on wetland	B	0.5										
	54	Human influence on viewshed	A	1										
	55	Spatial buffer	C	0.1										
	56	Recreational activity potential	A	1										
	57	Commercial crop--hydrologic impact	N/A	N/A										

This comes in from Side 1 automatically using the weighted average. To use the highest rated veg. Community rating, please manually overwrite that value (shown to the right) into the field at E5.

Highest-rated: 0.5

Enter data starting here. Yellow boxes are used in calculations.

Scroll down to answer more questions and see formula calculations

Additional questions

58	*GW - Wetland soils*	R	R or D	0.1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	R	R or D	0.1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding	Y	Y or N	3.3
65	*Landowners affected by restoration*	a	*E a b c*	1
66A	*Existing wetland size (acres) [from #10]*	3.97	__ acres	
66B	Total wetland restoration size (acres)	3.97	__ acres	0.5
66C	(Calculated) Potential New Wetland Area [B-A]	0	__ acres	% effectively drained: 0%
67	Average width of naturalized upland buffer (poten	50	__ feet	1 value: 0.1
68	Likelihood of restoration success	c	a b c	0.1
69	Hydrologic alteration type	nc, wtrsh	Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater	E	E a b c	
72	Additional stormwater treatment needs	A	a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category
Vegetative Diversity/Integrity		0.42	Med
Hydrology - Characteristic		1.00	High
Flood Attenuation		0.55	Med
Water Quality--Downstream		0.80	High
Water Quality--Wetland		0.83	High
Shoreline Protection		N/A	N/A
Characteristic Wildlife Habitat Structure	0.64	0.64	Med
Maintenance of Characteristic Fish Habitat	######	N/A	N/A
Maintenance of Characteristic Amphibian Habitat		0.00	N/A
Aesthetics/Recreation/Education/Cultural	0.76	2	Exc
Commercial use		N/A	N/A

Formula shown to the right.

0

Special Features listing: f Public park, forest, trail, or recreation area

Groundwater Interaction: indeterminate GW source

Groundwater Functional Index: no special indicators

Restoration Potential (draft formula): 0.53 Med

Stormwater Sensitivity (not active)

MnRAM 3.2

FOR EVALUATING WETLAND FUNCTIONS

MnRAM 3.2 is designed to help assess functions and values associated with Minnesota wetlands. The Comprehensive Guidance document (available at www.bwsr.state.mn.us) contains explanations, references, definitions, and a ranking formula for each function. After using this tool, the Management Classification Reference will help to organize the results for managing local wetland resources.

GENERAL INFORMATION:

Project Number or Name: Moses Creek	Wetland Number:W6
Location: Portage County; Section 28; Township 24N, Range 8E	
Major Watershed: Wisconsin River:	City: Stevens Point
Evaluator(s): Tom Nedland	Date of Site Visit: May 19, 2008

SCOPE AND LIMITATIONS:

1. Note unusual climatic conditions experienced during this assessment due to seasonal considerations and/or unusual existing hydrologic and climatologic conditions:

2. Describe the **purpose** of this assessment:
inventory/planning/monitoring/regulatory/classification___Permitting _____

SUMMARY TABLE

ACTUAL CONDITIONS	FUNCTIONAL INDEX*		
FUNCTIONS (and Related Values)	N/A	Functional Index Score	Comments
Vegetative Diversity/Integrity** Sedge Meadow		0.5 - Medium	
Maintenance of Characteristic Hydrologic Regime		0.88 - High	
Flood/Stormwater/Attenuation		0.55 – Medium	
Downstream Water Quality		0.69 - High	
Maintenance of Wetland Water Quality		0.78 - High	
Shoreline Protection	X		
Maintenance of Characteristic Wildlife Habitat Structure		0.81 - High	
Maintenance of Characteristic Fish Habitat	X		
Maintenance of Characteristic Amphibian Habitat	X		
Aesthetics/Recreation/Education/Cultural		2 - Exceptional	
Commercial Uses	X		
Groundwater Interaction		Discharge	
Additional Information			
Wetland Restoration Potential		0.62 - Medium	

	Date	W6	Wetland name / ID	Wetland name / ID	Wetland name / ID
	Special Features (from list, p.2--enter letter/s)	f Public park, forest, trail, or re	- ____	- ____	- ____
#1	Community Number (circle each community which represents at least 10% of the wetland)	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, **15B**, 16A, 16B	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B
#2 & #3	~ Describe each community type individually below ~		~ Describe each community type individually below ~		
Plant Community #1	Community Type (wet meadow, marsh)	13a Sedge Meadow	- -	- -	- -
	Community Proportion (% of total)	100%			
	Dominant Vegetation / Cover Class	Calamagrostis canasensis/H			
		Spiraea tomentosa/Sh			
		Scirpus cyperinus/H			
		Carex stricta/H			
	Invasive/exotic Vegetation / Cover Class	Rhamnus frangula/1			
		Phalaris arundinacea/2			
	Community Quality (E, H, M, L)	M 0.5	0	0	0
Plant Community #2	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #3	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	0	0	0	0
Plant Community #4*	Community Type (wet meadow, marsh)	- -	- -	- -	- -
	Community Proportion (% of total)				
	Dominant Vegetation / Cover Class				
	Invasive/exotic Vegetation / Cover Class				
	Community Quality (E, H, M, L)	- 0	0	0	0
	Circular 39 Types (primary <TAB> others)				
	Cowardin Types				
	Photo ID				
Highest rated community veg. div./integ:		0.5 Medium	0 -	0 -	0 -
Average vegetative diversity/integrity:		0.50 Medium	- -	- -	- -
Weighted Average veg. diversity/integrity:		0.50 Medium	0.00 -	0.00 -	0.00 -
#4	Listed, rare, special plant species?	n Y N	Y N	Y N	Y N
#5	**Rare community or habitat?**	**n Y N**	**Y N**	**Y N**	**Y N**
#6	Pre-European-settlement conditions?	n Y N	Y N	Y N	Y N

Floodplain Forest [1A, 2A, 3A] * Hardwood Swamp [3B] * Coniferous Bog [2A, 4B] * Coniferous Swamp [4B] * Open Bog [1B, 5A, 5B, 6A, 7A, 9A, 10A] * Calcareous Fen [7B, 11B, 14A] * Shrub Swamp [6B] * Alder Thicket [8A] * Shrub-carr [8B] * Sedge Meadow [10B, 11A, 12A, 13A] * Shallow Marsh [13B] * Deep Marsh [12B] * Wet to Wet-Mesic Prairie [14B, 15A] * Fresh (Wet) Meadow [15B] * Shallow, Open Water [9B, 16A] * Seasonally Flooded Basin [16B]

*If there are more than four plant community types, use the next column over to enter the rest and do not rely on the automatic average

Cover Class	Class Range
1	0 - 3%
2	3 - 10%
3	10 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

MnRAM 3.2 Digital Worksheet, Side 2

		Question Description	User entry	Rating										
	1	Veg. Table 2, Option 4		0.50										Highest-rated: 0.5
		TOTAL VEG Rating	0.5	Medium										
	4	Listed, rare, special plant species?	n	next										
	5	Rare community or habitat?	n	next										
	6	Pre-European-settlement conditions?	n	next										
	7	hydrogeo & topo	FT	Depress'l/Flow-through										
	8	Water depth (inches)	<1											
		Water depth (% inundation)	100%											
	9	Local watershed/immedita drainage (acres)												
	10	Existing wetland size	0.23											
	11	SOILS: Up/Wetland (survey classification + site)												
Digital worksheet, section I	12	Outlet characteristics for flood retention	B	0.5										
	13	Outlet characteristics for hydrologic regime	A	1										
	14	Dominant upland land use (within 500 ft)	B	0.5	0.5									
	15	Soil condition (wetland)	A	1										
	16	Vegetation (% cover)	100%	H	1									
	17	Emerg. veg. flood resistance	B	0.5										
	18	Sediment delivery	A	1										
	19	Upland soils (based on soil group)	A	0.1										
	20	Stormwater runoff pretreatment & detention	C	0.1	1									
	21	Subwatershed wetland density	B	0.5										
	22	Channels/sheet flow	B	0.5										
	23	Adjacent naturalized buffer average width (feet)	>50	H	WQ	1	H		1					
	24	Adjacent Area Management: % Full	95%	0.95	2	**0.955**								
		adjacent area mgmt: % Manicured		0										
		adjacent area mgmt: % Bare	5%	0.005										
	25	Adjacent Area Diversity & Structure: % Native	80%	0.8	3	**0.88**								
		adjacent area diversity: % Mixed	15%	0.075										
		adjacent area diversity: % Sparse/Inv./Exotic	5%	0.005										
	26	Adjacent Area Slope: % Gentle	100%	1	1	**1**								
		adjacent area slope: % Moderate		0										
		adjacent area slope: % Steep		0										
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1										
	28	Nutrient loading	A	1										
	29	Shoreline wetland?	N	N										
	30	Rooted shoreline vegetation (%cover)		Enter a percentage										
	31	Wetland in-water width (in feet, average)		Enter a percentage										
	32	Emergent vegetation erosion resistance		Enter valid choice										
	33	Shoreline erosion potential		Enter valid cho										
	34	Bank protection/upslope veg.		Enter valid choice										
	35	Rare Wildlife	N	N										
	36	Scarce/Rare/S1/S2 local community	N	N										
	37	Vegetation interspersion cover (see diagram 1)	N/A	N/A	N/A									
	38	Community interspersion (see diagram 2)	N/A	N/A	N/A						0			
	39	Wetland detritus	B	0.5										
	40	Wetland interspersion on landscape	A	1	0.5									
	41	Wildlife barriers	A	1										
	42	Amphibian breeding potential-hydroperiod	I	0										
	43	Amphibian breeding potential--fish presence	A	1										
	44	Amphibian & reptile overwintering habitat	N/A	0										
	45	Wildlife species (list)	White tailed deer											
	46	Fish habitat quality	N/A	N/A										
	47	Fish species (list)	N/A											
	48	Unique/rare educ./cultural/rec.opportunity	Y	Y										
	49	Wetland visibility	C	0.1										
	50	Proximity to population	Y	1										
	51	Public ownership	Y	ter valid choice										
	52	Public access	B	0.5										
	53	Human influence on wetland	A	1										
	54	Human influence on viewshed	A	1										
	55	Spatial buffer	C	0.1										
	56	Recreational activity potential	B	0.5										
	57	Commercial crop--hydrologic impact	N/A	N/A										

This comes in from Side 1 automatically using the weighted average. To use the highest rated veg. Community rating, please manually overwrite that value (shown to the right) into the field at E5.

Enter data starting here. Yellow boxes are used in calculations.

Scroll down to answer more questions and see formula calculations

Additional questions

58	*GW - Wetland soils*	D	R or D	1
59	*GW - Subwatershed land use*	D	R or D	1
60	*GW - Wetland size and soil group*	D	R or D	1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	D	R or D	1
64	Restoration potential w/o flooding	Y	Y or N	5.1
65	*Landowners affected by restoration*	c	*E a b c*	0.1
66A	*Existing wetland size (acres) [from #10]*	0.23	__ acres	
66B	Total wetland restoration size (acres)	10	__ acres	1
66C	(Calculated) Potential New Wetland Area [B-A]	9.77	__ acres	% effectively drained: 98%
67	Average width of naturalized upland buffer (poten	>50	__ feet	1 value: 1
68	Likelihood of restoration success	C	a b c	0.1
69	Hydrologic alteration type	Ditch	Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater	A	E a b c	
72	Additional stormwater treatment needs		a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category
Vegetative Diversity/Integrity		0.50	Med
Hydrology - Characteristic		0.88	High
Flood Attenuation		0.55	Med
Water Quality--Downstream		0.69	High
Water Quality--Wetland		0.78	High
Shoreline Protection		N/A	N/A
Characteristic Wildlife Habitat Structure	0.81	0.81	High
Maintenance of Characteristic Fish Habitat	######	N/A	N/A
Maintenance of Characteristic Amphibian Habitat		0.00	N/A
Aesthetics/Recreation/Education/Cultural	######	2	Exc
Commercial use		N/A	N/A

Formula shown to the right.

0

Special Features listing: f Public park, forest, trail, or recreation area

Groundwater Interaction	discharge	
Groundwater Functional Index		no special indicators
Restoration Potential (draft formula)	0.62	Med
Stormwater Sensitivity (not active)		

MnRAM 3.2

FOR EVALUATING WETLAND FUNCTIONS

MnRAM 3.2 is designed to help assess functions and values associated with Minnesota wetlands. The Comprehensive Guidance document (available at www.bwsr.state.mn.us) contains explanations, references, definitions, and a ranking formula for each function. After using this tool, the Management Classification Reference will help to organize the results for managing local wetland resources.

GENERAL INFORMATION:

Project Number or Name: Moses Creek	Wetland Number:W9
Location: Portage County; Section 28; Township 24N, Range 8E	
Major Watershed: Wisconsin River:	City: Stevens Point
Evaluator(s): Tom Nedland	Date of Site Visit: May 23, 2008

SCOPE AND LIMITATIONS:

1. Note unusual climatic conditions experienced during this assessment due to seasonal considerations and/or unusual existing hydrologic and climatologic conditions:

2. Describe the **purpose** of this assessment:
inventory/planning/monitoring/regulatory/classification___Permitting _____

SUMMARY TABLE

ACTUAL CONDITIONS	FUNCTIONAL INDEX*		
FUNCTIONS (and Related Values)	N/A	Functional Index Score	Comments
Vegetative Diversity/Integrity** Alder Thickett		0.1- Low	Exotics Dominant
Shallow Marsh		0.1 - Low	Exotics/Invasives Dominant
Wet Mesic Prairie Planting		0.5 - Medium	
Maintenance of Characteristic Hydrologic Regime		0.2- Low	Drained and Filled
Flood/Stormwater/Attenuation		0.58 – Medium	
Downstream Water Quality		0.78 - High	
Maintenance of Wetland Water Quality		0.44 - Low	Receives runoff from roads and parking
Shoreline Protection	X		
Maintenance of Characteristic Wildlife Habitat Structure		0.3 - Low	
Maintenance of Characteristic Fish Habitat	X		
Maintenance of Characteristic Amphibian Habitat		0.08 - Low	
Aesthetics/Recreation/Education/Cultural		0.43 - Medium	
Commercial Uses	X		
Groundwater Interaction		Recharge	
Additional Information			
Wetland Restoration Potential		0.45 - Medium	

	Date	W9		Wetland name / ID		Wetland name / ID		Wetland name / ID	
	Special Features (from list, p.2--enter letter/s)	n	Floodplain area identified in	-	____	-	____	-	____
#1	Community Number (circle each community which represents at least 10% of the wetland)	3A, 3B, 4A, 4B, 7A, 7B, **8A**, 8B, 10A, 13A, **13B**, 12B, 14A, **15A**, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B	
#2 & #3	~ Describe each community type individually below ~					~ Describe each community type individually below ~			
Plant Community #1	Community Type (wet meadow, marsh)	8A	Alder Thicket	-	-	-	-	-	-
	Community Proportion (% of total)		20%						
	Dominant Vegetation / Cover Class	Alnus rugosa (sh)							
		Rhamnus frangula (sh)							
		Onoclea sensibilis (h)							
		Phalaris arundinacea (h)							
		Solidago canadensis (h)							
	Invasive/exotic Vegetation / Cover Class	Rhamnus frangula/3							
		Phalaris arundinacea/4							
	Community Quality (E, H, M, L)	L	0.1		0		0		0
Plant Community #2	Community Type (wet meadow, marsh)	13B	Shallow Marsh	-	-	-	-	-	-
	Community Proportion (% of total)		70%						
	Dominant Vegetation / Cover Class	Calamagrostis canadenesis (h)							
		Onoclea sensibilis (h)							
		Phragmites australis (h)							
		Spartina pectinata (h)							
		Typha x gluauca (h)							
		Eleocharis sp. (h)							
		Salix petiolaris (sh)							
	Invasive/exotic Vegetation / Cover Class	Typha x glauca/3							
		Phragmites australis/3							
	Community Quality (E, H, M, L)	L	0.1		0		0		0
Plant Community #3	Community Type (wet meadow, marsh)	15A	Wet to Wet-Mesic Prairie	-	-	-	-	-	-
	Community Proportion (% of total)		10%						
	Dominant Vegetation / Cover Class	Andropogon gerardii (h)							
		Onoclea sensibilis (h)							
		Panicum virgatum (h)							
		Rudbeckia hirta (h)							
		Solidago canadensis (h)							
		Spartina pectinata (h)							
	Invasive/exotic Vegetation / Cover Class	Rhamnus frangula/1							
		Phalaris arundinacea/1							
	Community Quality (E, H, M, L)	M	0.5		0		0		0
Plant Community #4*	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)	-	0		0		0		0
	Circular 39 Types (primary <TAB> others)								
	Cowardin Types								
	Photo ID								
Highest rated community veg. div./integ:		0.5	Medium	0	-	0	-	0	-
Average vegetative diversity/integrity:		0.23	Low	-	-	-	-	-	-
Weighted Average veg. diversity/integrity:		0.14	Low	0.00	-	0.00	-	0.00	-
#4	Listed, rare, special plant species?	n	Y N		Y N		Y N		Y N
#5	**Rare community or habitat?**	**n**	**Y N**		**Y N**		**Y N**		**Y N**
#6	Pre-European-settlement conditions?	n	Y N		Y N		Y N		Y N

Floodplain Forest [1A, 2A, 3A] * Hardwood Swamp [3B] * Coniferous Bog [2A, 4B] * Coniferous Swamp [4B] * Open Bog [1B, 5A, 5B, 6A, 7A, 9A, 10A] * Calcareous Fen [7B, 11B, 14A] * Shrub Swamp [6B] * Alder Thicket [8A] * Shrub-carr [8B] * Sedge Meadow [10B, 11A, 12A, 13A] * Shallow Marsh [13B] * Deep Marsh [12B] * Wet to Wet-Mesic Prairie [14B, 15A] * Fresh (Wet) Meadow [15B] * Shallow, Open Water [9B, 16A] * Seasonally Flooded Basin [16B]

*If there are more than four plant community types, use the next column over to enter the rest and do not rely on the automatic average

Cover Class	Class Range
1	0 - 3%
2	3 - 10%
3	10 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

MnRAM 3.2 Digital Worksheet, Side 2

		Question Description	User entry	Rating								
	1	Veg. Table 2, Option 4		0.14								
		TOTAL VEG Rating	0.14	L								
	4	Listed, rare, special plant species?	n	next								
	5	Rare community or habitat?	n	next								
	6	Pre-European-settlement conditions?	n	next								
	7	hydrogeo & topo	FT	Depress'l/Flow-through								
	8	Water depth (inches)	<1									
		Water depth (% inundation)	100%									
	9	Local watershed/immedita drainage (acres)										
	10	Existing wetland size	1.8									
	11	SOILS: Up/Wetland (survey classification + site)										
Digital worksheet, section I	12	Outlet characteristics for flood retention	N\A	N/A								
	13	Outlet characteristics for hydrologic regime	C	0.1								
	14	Dominant upland land use (within 500 ft)	B	0.5	0.5							
	15	Soil condition (wetland)	C	0.1								
	16	Vegetation (% cover)	100%	H	1							
	17	Emerg. veg. flood resistance	A	1								
	18	Sediment delivery	A	1								
	19	Upland soils (based on soil group)	A	0.1								
	20	Stormwater runoff pretreatment & detention	A	1	0.1							
	21	Subwatershed wetland density	B	0.5								
	22	Channels/sheet flow	C	0.1								
	23	Adjacent naturalized buffer average width (feet)	40	M	WQ	0.5	L	0.1				
	24	Adjacent Area Management: % Full	50%	0.5	2	**0.55**						
		adjacent area mgmt: % Manicured		0								
		adjacent area mgmt: % Bare	50%	0.05								
	25	Adjacent Area Diversity & Structure: % Native	0%	0	2	**0.3**						
		adjacent area diversity: % Mixed	50%	0.25								
		adjacent area diversity: % Sparse/Inv./Exotic	50%	0.05								
	26	Adjacent Area Slope: % Gentle	100%	1	1	**1**						
		adjacent area slope: % Moderate		0								
		adjacent area slope: % Steep		0								
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	B	0.5								
	28	Nutrient loading	B	0.5								
	29	Shoreline wetland?	N	N								
	30	Rooted shoreline vegetation (%cover)		Enter a percentage								
	31	Wetland in-water width (in feet, average)		Enter a percentage								
	32	Emergent vegetation erosion resistance		Enter valid choice								
	33	Shoreline erosion potential		Enter valid cho								
	34	Bank protection/upslope veg.		Enter valid choice								
	35	Rare Wildlife	N	N								
	36	Scarce/Rare/S1/S2 local community	N	N								
	37	Vegetation interspersion cover (see diagram 1)	2	L	0.1							
	38	Community interspersion (see diagram 2)	2	M	0.5					0		
	39	Wetland detritus	B	0.5								
	40	Wetland interspersion on landscape	A	1	0.5							
	41	Wildlife barriers	C	0.1								
	42	Amphibian breeding potential-hydroperiod	A	1								
	43	Amphibian breeding potential--fish presence	B	0.5								
	44	Amphibian & reptile overwintering habitat	N/A	0								
	45	Wildlife species (list)	White tailed deer									
	46	Fish habitat quality	N/A	N/A								
	47	Fish species (list)	N/A									
	48	Unique/rare educ./cultural/rec.opportunity	N	N								
	49	Wetland visibility	A	1								
	50	Proximity to population	Y	1								
	51	Public ownership	A	1								
	52	Public access	B	0.5								
	53	Human influence on wetland	C	0.1								
	54	Human influence on viewshed	C	0.1								
	55	Spatial buffer	B	0.5								
	56	Recreational activity potential	C	0.1								
	57	Commercial crop--hydrologic impact	N/A	N/A								

This comes in from Side 1 automatically using the weighted average. To use the highest rated veg. Community rating, please manually overwrite that value (shown to the right) into the field at E5.

Highest-rated: 0.5

Enter data starting here. Yellow boxes are used in calculations.

Additional questions

58	*GW - Wetland soils*	R	R or D	0.1
59	*GW - Subwatershed land use*	R	R or D	0.1
60	*GW - Wetland size and soil group*	R	R or D	0.1
61	GW - Wetland hydroperiod	R	R or D	0.1
62	GW - Inlet/Outlet configuration	D	R or D	1
63	GW - Surrounding upland topographic relief	R	R or D	0.1
64	Restoration potential w/o flooding	Y	Y or N	1.5
65	*Landowners affected by restoration*	A	*E a b c*	1
66A	*Existing wetland size (acres) [from #10]*	1.8	__ acres	
66B	Total wetland restoration size (acres)	3.5	__ acres	0.5
66C	(Calculated) Potential New Wetland Area [B-A]	1.7	__ acres	% effectively drained: 49%
67	Average width of naturalized upland buffer (poten	10	__ feet	0.1 value: 0.5
68	Likelihood of restoration success	C	a b c	0.1
69	Hydrologic alteration type	Wtrshd D	Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)	1	1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater	b	E a b c	
72	Additional stormwater treatment needs	a	a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category
Vegetative Diversity/Integrity		0.14	L
Hydrology - Characteristic		0.20	Low
Flood Attenuation		0.58	Med
Water Quality--Downstream		0.78	High
Water Quality--Wetland		0.44	Med
Shoreline Protection		N/A	N/A
Characteristic Wildlife Habitat Structure	0.30	0.30	Low
Maintenance of Characteristic Fish Habitat	######	N/A	N/A
Maintenance of Characteristic Amphibian Habitat		0.08	Low
Aesthetics/Recreation/Education/Cultural	0.43	0.43	Med
Commercial use		N/A	N/A

Formula shown to the right.

0

Special Features listing: n Floodplain area identified in a zonining ordinance or map

Groundwater Interaction	recharge	
Groundwater Functional Index		no special indicators
Restoration Potential (draft formula)	0.45	Med
Stormwater Sensitivity (not active)		

MnRAM 3.2

FOR EVALUATING WETLAND FUNCTIONS

MnRAM 3.2 is designed to help assess functions and values associated with Minnesota wetlands. The Comprehensive Guidance document (available at www.bwsr.state.mn.us) contains explanations, references, definitions, and a ranking formula for each function. After using this tool, the Management Classification Reference will help to organize the results for managing local wetland resources.

GENERAL INFORMATION:

Project Number or Name: Moses Creek	Wetland Number:R2
Location: Portage County; Section 22; Township 24N, Range 8E	
Major Watershed: Wisconsin River:	City: Stevens Point
Evaluator(s): Tom Nedland	Date of Site Visit: August 28, 2008

SCOPE AND LIMITATIONS:

1. Note unusual climatic conditions experienced during this assessment due to seasonal considerations and/or unusual existing hydrologic and climatologic conditions:

2. Describe the **purpose** of this assessment:
inventory/planning/monitoring/regulatory/classification___Inventory_____

SUMMARY TABLE

ACTUAL CONDITIONS	FUNCTIONAL INDEX*		
FUNCTIONS (and Related Values)	N/A	Functional Index Score	Comments
Vegetative Diversity/Integrity** Sedge Meadow		1.0- High	
Maintenance of Characteristic Hydrologic Regime		1.0- High	
Flood/Stormwater/Attenuation		0.37 – Medium	
Downstream Water Quality		0.71 - High	
Maintenance of Wetland Water Quality		1.0 - High	
Shoreline Protection	X		
Maintenance of Characteristic Wildlife Habitat Structure		1.0 - High	
Maintenance of Characteristic Fish Habitat		0.83 - High	Potential Spawning Habitat
Maintenance of Characteristic Amphibian Habitat		0.42 - Medium	
Aesthetics/Recreation/Education/Cultural		0.49 - Medium	
Commercial Uses	X		
Groundwater Interaction		Discharge	
Additional Information			
Wetland Restoration Potential	X		

	Date __R2			_____		_____		**Wetland name / ID** _____	
	Special Features (from list, p.2--enter letter/s)	r	Sensitive ground-water area	-	____	-	____	-	____
#1	Community Number (circle each community which represents at least 10% of the wetland)	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, **13A**, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B	
#2 & #3	~ Describe each community type individually below ~					~ Describe each community type individually below ~			
Plant Community #1	Community Type (wet meadow, marsh)	13a	Sedge Meadow	-	-	-	-	-	-
	Community Proportion (% of total)		100%						
	Dominant Vegetation **/** Cover Class	Carex stricta/5							
		Calamagrostis canadensis/4							
	Invasive/exotic Vegetation **/** Cover Class	N/A							
	Community Quality (E, H, M, L)	H	1		0		0		0
Plant Community #2	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation **/** Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)		0		0		0		0
Plant Community #3	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation **/** Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)		0		0		0		0
Plant Community #4*	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation **/** Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)	-	0		0		0		0
	Circular 39 Types (primary <TAB> others)								
	Cowardin Types								
	Photo ID								
Highest rated community veg. div./integ:		1.0	High	0	-	0	-	0	-
Average vegetative diversity/integrity:		1.00	High	-	-	-	-	-	-
Weighted Average veg. diversity/integrity:		1.00	High	0.00	-	0.00	-	0.00	-
#4	Listed, rare, special plant species?	n	Y N		Y N		Y N		Y N
#5	**Rare community or habitat?**	**n**	**Y N**		**Y N**		**Y N**		**Y N**
#6	Pre-European-settlement conditions?	n	Y N		Y N		Y N		Y N

Floodplain Forest [1A, 2A, 3A] * Hardwood Swamp [3B] * Coniferous Bog [2A, 4B] * Coniferous Swamp [4B] * Open Bog [1B, 5A, 5B, 6A, 7A, 9A, 10A] * Calcareous Fen [7B, 11B, 14A] * Shrub Swamp [6B] * Alder Thicket [8A] * Shrub-carr [8B] * Sedge Meadow [10B, 11A, 12A, 13A] * Shallow Marsh [13B] * Deep Marsh [12B] * Wet to Wet-Mesic Prairie [14B, 15A] * Fresh (Wet) Meadow [15B] * Shallow, Open Water [9B, 16A] * Seasonally Flooded Basin [16B]

*If there are more than four plant community types, use the next column over to enter the rest and do not rely on the automatic average

Cover Class	Class Range
1	0 - 3%
2	3 - 10%
3	10 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

MnRAM 3.2 Digital Worksheet, Side 2

		Question Description	User entry	Rating									
	1	Veg. Table 2, Option 4		1.00									Highest-rated: 1
		TOTAL VEG Rating	1	High									
Digital worksheet, section I	4	Listed, rare, special plant species?	n	next									
	5	Rare community or habitat?	n	next									
	6	Pre-European-settlement conditions?	n	next									
	7	hydrogeo & topo	Ft	Depress'l/Flow-through									
	8	Water depth (inches)											
		Water depth (% inundation)											
	9	Local watershed/immedita drainage (acres)											
	10	Existing wetland size	1200+										
	11	SOILS: Up/Wetland (survey classification + site)											
	12	Outlet characteristics for flood retention	C	0.1									
	13	Outlet characteristics for hydrologic regime	A	1									
	14	Dominant upland land use (within 500 ft)	A	1	0.1								
	15	Soil condition (wetland)	a	1									
	16	Vegetation (% cover)	100%	H	1								
	17	Emerg. veg. flood resistance	B	0.5									
	18	Sediment delivery	a	1									
	19	Upland soils (based on soil group)	a	0.1									
	20	Stormwater runoff pretreatment & detention	c	0.1	1								
	21	Subwatershed wetland density	c	0.1									
	22	Channels/sheet flow	c	0.1									
	23	Adjacent naturalized buffer average width (feet)	>50	H	WQ	1	H	1					
	24	Adjacent Area Management: % Full	100%	1	1	**1**							
		adjacent area mgmt: % Manicured		0									
		adjacent area mgmt: % Bare		0									
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**							
		adjacent area diversity: % Mixed		0									
		adjacent area diversity: % Sparse/Inv./Exotic		0									
	26	Adjacent Area Slope: % Gentle	100%	1	1	**1**							
		adjacent area slope: % Moderate		0									
		adjacent area slope: % Steep		0									
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	A	1									
	28	Nutrient loading	A	1									
	29	Shoreline wetland?	N	N									
	30	Rooted shoreline vegetation (%cover)		Enter a percentage									
	31	Wetland in-water width (in feet, average)		Enter a percentage									
	32	Emergent vegetation erosion resistance		Enter valid choice									
	33	Shoreline erosion potential		Enter valid cho									
	34	Bank protection/upslope veg.		Enter valid choice									
	35	Rare Wildlife	Y	Y									
	36	Scarce/Rare/S1/S2 local community	N	N									
	37	Vegetation interspersion cover (see diagram 1)	N/A	N/A	N/A								
	38	Community interspersion (see diagram 2)	3	H	1				0				
	39	Wetland detritus	A	1									
	40	Wetland interspersion on landscape	A	1	1								
	41	Wildlife barriers	A	1									
	42	Amphibian breeding potential-hydroperiod	a	1									
	43	Amphibian breeding potential--fish presence	b	0.5									
	44	Amphibian & reptile overwintering habitat	N/A	0									
	45	Wildlife species (list)	no notes taken										
	46	Fish habitat quality	b	0.5									
	47	Fish species (list)	none observed due to time of year										
	48	Unique/rare educ./cultural/rec.opportunity	n	N									
	49	Wetland visibility	b	0.5									
	50	Proximity to population	n	0.1									
	51	Public ownership	c	0.1									
	52	Public access	c	0.1									
	53	Human influence on wetland	a	1									
	54	Human influence on viewshed	a	1									
	55	Spatial buffer	c	0.1									
	56	Recreational activity potential	a	1									
	57	Commercial crop--hydrologic impact	N/A	N/A									

This comes in from Side 1 automatically using the weighted average. To use the highest rated veg. Community rating, please manually overwrite that value (shown to the right) into the field at E5.

Enter data starting here. Yellow boxes are used in calculations.

Scroll down to answer more questions and see formula calculations

Additional questions

58	*GW - Wetland soils*	d	R or D	1
59	*GW - Subwatershed land use*	d	R or D	1
60	*GW - Wetland size and soil group*	d	R or D	1
61	GW - Wetland hydroperiod	r	R or D	0.1
62	GW - Inlet/Outlet configuration	d	R or D	1
63	GW - Surrounding upland topographic relief	d	R or D	1
64	Restoration potential w/o flooding	n	Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	1200+	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	######	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater	e	E a b c	
72	Additional stormwater treatment needs	a	a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category
Vegetative Diversity/Integrity		1.00	High
Hydrology - Characteristic		1.00	High
Flood Attenuation		0.37	Med
Water Quality--Downstream		0.71	High
Water Quality--Wetland		1.00	High
Shoreline Protection		N/A	N/A
Characteristic Wildlife Habitat Structure	1.00	1.00	High
Maintenance of Characteristic Fish Habitat	0.83	0.83	High
Maintenance of Characteristic Amphibian Habitat		0.42	Med
Aesthetics/Recreation/Education/Cultural	0.49	0.49	Med
Commercial use		N/A	N/A

Formula shown to the right.

0

Special Features listing: r Sensitive ground-water area

Groundwater Interaction	discharge	
Groundwater Functional Index		no special indicators
Restoration Potential (draft formula)	N/A	N/A
Stormwater Sensitivity (not active)		

MnRAM 3.2

FOR EVALUATING WETLAND FUNCTIONS

MnRAM 3.2 is designed to help assess functions and values associated with Minnesota wetlands. The Comprehensive Guidance document (available at www.bwsr.state.mn.us) contains explanations, references, definitions, and a ranking formula for each function. After using this tool, the Management Classification Reference will help to organize the results for managing local wetland resources.

GENERAL INFORMATION:

Project Number or Name: Moses Creek	Wetland Number:R3
Location: Portage County; Section 22; Township 24N, Range 8E	
Major Watershed: Wisconsin River:	City: Stevens Point
Evaluator(s): Tom Nedland	Date of Site Visit: August 28, 2008

SCOPE AND LIMITATIONS:

1. Note unusual climatic conditions experienced during this assessment due to seasonal considerations and/or unusual existing hydrologic and climatologic conditions:

2. Describe the **purpose** of this assessment:
inventory/planning/monitoring/regulatory/classification___Inventory_____

SUMMARY TABLE

ACTUAL CONDITIONS	FUNCTIONAL INDEX*		
FUNCTIONS (and Related Values)	N/A	Functional Index Score	Comments
Vegetative Diversity/Integrity** Alder Thickett		0.5 - Medium	
Shrub – Carr		0.5 - Medium	
Maintenance of Characteristic Hydrologic Regime		1.0- High	
Flood/Stormwater/Attenuation		0.40 – Medium	
Downstream Water Quality		0.74 - High	
Maintenance of Wetland Water Quality		0.86 - High	
Shoreline Protection	X		
Maintenance of Characteristic Wildlife Habitat Structure		0.83 - High	
Maintenance of Characteristic Fish Habitat		0.83 - High	Potential Spawning Habitat
Maintenance of Characteristic Amphibian Habitat		0.42 - Medium	
Aesthetics/Recreation/Education/Cultural		0.49 - Medium	
Commercial Uses	X		
Groundwater Interaction		Discharge	
Additional Information			
Wetland Restoration Potential	X		

	Date	R3		Wetland name / ID		Wetland name / ID		Wetland name / ID	
	Special Features (from list, p.2--enter letter/s)	r	Sensitive ground-water area	-		-		-	
#1	Community Number (circle each community which represents at least 10% of the wetland)	3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B		3A, 3B, 4A, 4B, 7A, 7B, 8A, 8B, 10A, 13A, 13B, 12B, 14A, 15A, 15B, 16A, 16B	
#2 & #3	~ Describe each community type individually below ~					~ Describe each community type individually below ~			
Plant Community #1	Community Type (wet meadow, marsh)	8a	Alder Thicket	-	-	-	-	-	-
	Community Proportion (% of total)		55%						
	Dominant Vegetation / Cover Class	Alnus rugosa/6							
		Carex intumescens/5							
		Glyceria canadensis/4							
		Onoclea sensibilis/3							
		Osmunda regalis/2							
	Invasive/exotic Vegetation / Cover Class	N/A							
	Community Quality (E, H, M, L)	m	0.5		0		0		0
Plant Community #2	Community Type (wet meadow, marsh)	8b	Shrub-Carr	-	-	-	-	-	-
	Community Proportion (% of total)		45%						
	Dominant Vegetation / Cover Class	Salix petiolaris/5							
		Calamagrostis canadensis/5							
		Carex stricta/4							
		Carex lacustris/2							
		Aster borealis/2							
	Invasive/exotic Vegetation / Cover Class	N/A							
	Community Quality (E, H, M, L)	m	0.5		0		0		0
Plant Community #3	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)		0		0		0		0
Plant Community #4*	Community Type (wet meadow, marsh)	-	-	-	-	-	-	-	-
	Community Proportion (% of total)								
	Dominant Vegetation / Cover Class								
	Invasive/exotic Vegetation / Cover Class								
	Community Quality (E, H, M, L)	-	0		0		0		0
	Circular 39 Types (primary <TAB> others)								
	Cowardin Types								
	Photo ID								
Highest rated community veg. div./integ:		0.5	Medium	0	-	0	-	0	-
Average vegetative diversity/integrity:		0.50	Medium	-	-	-	-	-	-
Weighted Average veg. diversity/integrity:		0.50	Medium	0.00	-	0.00	-	0.00	-
#4	Listed, rare, special plant species?	n	Y N		Y N		Y N		Y N
#5	**Rare community or habitat?**	**n**	**Y N**		**Y N**		**Y N**		**Y N**
#6	Pre-European-settlement conditions?	n	Y N		Y N		Y N		Y N

Floodplain Forest [1A, 2A, 3A] * Hardwood Swamp [3B] * Coniferous Bog [2A, 4B] * Coniferous Swamp [4B] * Open Bog [1B, 5A, 5B, 6A, 7A, 9A, 10A] * Calcareous Fen [7B, 11B, 14A] * Shrub Swamp [6B] * Alder Thicket [8A] * Shrub-carr [8B] * Sedge Meadow [10B, 11A, 12A, 13A] * Shallow Marsh [13B] * Deep Marsh [12B] * Wet to Wet-Mesic Prairie [14B, 15A] * Fresh (Wet) Meadow [15B] * Shallow, Open Water [9B, 16A] * Seasonally Flooded Basin [16B]

*If there are more than four plant community types, use the next column over to enter the rest and do not rely on the automatic average

Cover Class	Class Range
1	0 - 3%
2	3 - 10%
3	10 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

MnRAM 3.2 Digital Worksheet, Side 2

		Question Description	User entry	Rating										
	1	Veg. Table 2, Option 4		0.50										
		TOTAL VEG Rating	0.5	Medium										
	4	Listed, rare, special plant species?	n	next										
	5	Rare community or habitat?	n	next										
	6	Pre-European-settlement conditions?	n	next										
	7	hydrogeo & topo	ft	Depress'l/Flow-through										
	8	Water depth (inches)												
		Water depth (% inundation)												
	9	Local watershed/immedita drainage (acres)												
	10	Existing wetland size	1200+											
	11	SOILS: Up/Wetland (survey classification + site)												
Digital worksheet, section I	12	Outlet characteristics for flood retention	c	0.1										
	13	Outlet characteristics for hydrologic regime	a	1										
	14	Dominant upland land use (within 500 ft)	a	1	0.1									
	15	Soil condition (wetland)	a	1										
	16	Vegetation (% cover)	100%	H	1									
	17	Emerg. veg. flood resistance	a	1										
	18	Sediment delivery	a	1										
	19	Upland soils (based on soil group)	a	0.1										
	20	Stormwater runoff pretreatment & detention	c	0.1	1									
	21	Subwatershed wetland density	c	0.1										
	22	Channels/sheet flow	c	0.1										
	23	Adjacent naturalized buffer average width (feet)	>50	H	WQ	1	H	1						
	24	Adjacent Area Management: % Full	100%	1	1	**1**								
		adjacent area mgmt: % Manicured		0										
		adjacent area mgmt: % Bare		0										
	25	Adjacent Area Diversity & Structure: % Native	100%	1	1	**1**								
		adjacent area diversity: % Mixed		0										
		adjacent area diversity: % Sparse/Inv./Exotic		0										
	26	Adjacent Area Slope: % Gentle	100%	1	1	**1**								
		adjacent area slope: % Moderate		0										
		adjacent area slope: % Steep		0										
Digital worksheet, section II	27	Downstream sensitivity/WQ protection	a	1										
	28	Nutrient loading	a	1										
	29	Shoreline wetland?	n	N										
	30	Rooted shoreline vegetation (%cover)		Enter a percentage										
	31	Wetland in-water width (in feet, average)		Enter a percentage										
	32	Emergent vegetation erosion resistance		Enter valid choice										
	33	Shoreline erosion potential		Enter valid cho										
	34	Bank protection/upslope veg.		Enter valid choice										
	35	Rare Wildlife	y	Y										
	36	Scarce/Rare/S1/S2 local community	n	N										
	37	Vegetation interspersion cover (see diagram 1)	N/A	N/A	N/A									
	38	Community interspersion (see diagram 2)	2	M	0.5				0					
	39	Wetland detritus	a	1										
	40	Wetland interspersion on landscape	a	1	1									
	41	Wildlife barriers	a	1										
	42	Amphibian breeding potential-hydroperiod	a	1										
	43	Amphibian breeding potential--fish presence	b	0.5										
	44	Amphibian & reptile overwintering habitat	N/A	0										
	45	Wildlife species (list)	no notes taken											
	46	Fish habitat quality	b	0.5										
	47	Fish species (list)	none observed											
	48	Unique/rare educ./cultural/rec.opportunity	n	N										
	49	Wetland visibility	b	0.5										
	50	Proximity to population	n	0.1										
	51	Public ownership	c	0.1										
	52	Public access	c	0.1										
	53	Human influence on wetland	a	1										
	54	Human influence on viewshed	a	1										
	55	Spatial buffer	c	0.1										
	56	Recreational activity potential	a	1										
	57	Commercial crop--hydrologic impact	N/A	N/A										

This comes in from Side 1 automatically using the weighted average. To use the highest rated veg. Community rating, please manually overwrite that value (shown to the right) into the field at E5.

Highest-rated: 0.5

Enter data starting here. Yellow boxes are used in calculations.

Scroll down to answer more questions and see formula calculations

Additional questions

58	*GW - Wetland soils*	d	R or D	1
59	*GW - Subwatershed land use*	d	R or D	1
60	*GW - Wetland size and soil group*	d	R or D	1
61	GW - Wetland hydroperiod	r	R or D	0.1
62	GW - Inlet/Outlet configuration	d	R or D	1
63	GW - Surrounding upland topographic relief	d	R or D	1
64	Restoration potential w/o flooding	n	Y or N	5.1
65	*Landowners affected by restoration*		*E a b c*	Enter valid choice
66A	*Existing wetland size (acres) [from #10]*	1200+	__ acres	
66B	Total wetland restoration size (acres)		__ acres	0.1
66C	(Calculated) Potential New Wetland Area [B-A]	######	__ acres	% effectively drained: ####
67	Average width of naturalized upland buffer (poten	0	__ feet	0.1 value: ####
68	Likelihood of restoration success		a b c	Enter valid choice
69	Hydrologic alteration type		Outlet, Tile, Ditch, GW pump, Wtrshd div., Filling	
70	Potential wetland type (Circ. 39)		1, 2, 3, 4, 5, 6, 7, 8	
71	Wetland sensitivity to stormwater	e	E a b c	
72	Additional stormwater treatment needs	a	a b c	

Functional Rating Summaries

Function Name	Raw score	Final Rating	Rating Category
Vegetative Diversity/Integrity		0.50	Med
Hydrology - Characteristic		1.00	High
Flood Attenuation		0.40	Med
Water Quality--Downstream		0.74	High
Water Quality--Wetland		0.86	High
Shoreline Protection		N/A	N/A
Characteristic Wildlife Habitat Structure	0.83	0.83	High
Maintenance of Characteristic Fish Habitat	0.83	0.83	High
Maintenance of Characteristic Amphibian Habitat		0.42	Med
Aesthetics/Recreation/Education/Cultural	0.49	0.49	Med
Commercial use		N/A	N/A

Formula shown to the right.

0

Special Features listing: r Sensitive ground-water area

Groundwater Interaction	discharge	
Groundwater Functional Index		no special indicators
Restoration Potential (draft formula)	N/A	N/A
Stormwater Sensitivity (not active)		