**ADDENDUM**

**SUPPLEMENTAL INFORMATION REQUESTED FOR QAPP APPROVAL**

**(A response to information requested by Louis Blume/R5/USEPA/US; email below)**

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To: Elizabeth Laplante/R5/USEPA/US@EPA
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Date: 03/05/2012 01:25 PM
Subject: FW: GL00E00462-0 "Ashland/Chequamegon Bay Shoreline
Restoration Project"- QAPP --Approved Subject to Follow-up
to Technical Comments 1,2, and 3 of January 9, 2012 review
memo

Liz,
Attached is the approved cover page of the QAPP signed by all parties.[attachment ContingentlyAprpovedcoverpaeMarch52012.pdf" deleted by Elizabeth Laplante/R5/USEPA/US]

Please note although the QAPP is contingently approved we would like some follow-up or feed back on the following 3 items:

1. Section A6 Project/Task Description: Restoration Installation - The QAPP is unclear in describing the actual installation of restoration features. For instance, rain gardens are mentioned on page 31 as part of the erosion and sediment control features. Is site grading or earth disturbance being proposed as part of this installation? If so, the project design team should be aware of any earth disturbance and storm water discharge permits that may be required especially when working in close proximity to wetlands.*

**RESPONSE:**

**Primary restoration features include plantings of eighteen species of native trees (total: 2,119), thirteen species of shrubs (total: 1,306), and twenty nine species of herbaceous plants (total: 13,290) for a grand total of 16,715 native plants installed as result of this restoration effort. In the final report we will list species identification and total numbers per species planted through 2012. During this time, site preparation included the removal of approximately 15 loads (about 200 cubic yards) of invasive trees, shrubs, and ground cover from the study sites 2010-2012. This control effort does cause minor soil disturbance as result of pulling plants out by roots and/or by worker activity on slopes, however the total impact of this effort is considered an insignificant contributor of sediment run-off.**

**It was anticipated that erosion-control fabric would be added, however additional site assessment in the spring/summer of 2011 indicated that multiple layers of geo-textile fabric existed within the soil matrix at the Memorial Park restoration site, likely as result of a previous U.S. highway 2 expansion and installation of storm-water conduits. The existing non-native plants were well established throughout the restoration area and as result, the site would not have benefited by adding additional erosion-control fabric.**

**The project concept included installation of 3 rain gardens to mitigate storm-water runoff; one at Memorial Park and two at Bayview Park. The rain garden installation at Memorial Park was contingent upon cooperation by the adjacent landowner (Hotel Chequamegon) who had agreed to the installation during the planning phase, but later withdrew. During a subsequent planning meeting with the City of Ashland, it was determined by project staff that City management and park-use at Bayview Park would result in an unsuccessful rain garden installation as result of park mowing and foot trampling by the public during special events.**

**No site grading or substantive earth disturbance was performed at either restoration site that warranted special permitting.** *2. Section A7 Quality Objectives & Criteria for Measurement Data*

 *a. Data quality objectives (DQO) are not provided for this project or for the long-term goal in restoring shore land in the Chequamegon basin. Without an established quantitative objective for this restoration and subsequent monitoring, it is difficult to evaluate the adequacy of the design or methods. Perhaps the authors could consider an overall DQO such as estimating the proportion of shore land (± 5%) in the study areas that show a gain of at least 20% in native species (or decline of invasive species) abundance with 95% confidence. This is just an example, additional guidance on establishing DQOs is available from the document entitled "Guidance on Systematic Planning using the Data Quality Objectives Process" (EPA QA/G-4) and is available at the following website:* [*http://www.epa.gov/QUALITY/qs-docs/g4-final.pdf*](http://www.epa.gov/QUALITY/qs-docs/g4-final.pdf)*.*

**RESPONSE:**

**The project data quality objectives (DQO) include a study design that produces metrics that predict restoration success (or shoreland habitat/buffer establishment) on the basis of conducting vegetation surveys (shrub, tree, plant densities and species diversity) on a transect of 10m x 10m plots to generate annual site-level metrics that represent relative abundance estimates of native vs. non-native plant species to compare active restoration sites to control sites that receive no restoration effort. Measures will include the change in proportion of area considered dominated by woody invasive shrubs. These metrics will be estimated annually to year 3 and again at year 5, 7, and year 10 post-restoration initiations. We are also incorporating DQO’s that measure the wildlife response associated with establishing native shoreland buffers using transect surveys to compare relative significant change in abundance and species diversity of breeding birds and small mammals between restored sites and control sites. In addition, we are in process of conducting a true experimental assessment on the effects of shoreland restoration on terrestrial insect fauna, surface water runoff, and carbon sequestration among high, low, and no planting treatment plots (N=12, t=3, df=3) following a random complete block design. To date, we have implemented three sampling episodes quantifying surface water runoff across all 12 plots. The terrestrial insect (arthropod primarily) and carbon sequestration components will begin in 2013.**

**The surface water runoff measures estimate seasonal (spring-summer-fall) non-point discharge of 6 water quality parameters (ammonia nitrogen, nitrate+nitrite, total K nitrogen, total P, total dissolved P, and total suspended sediments) in a Randomized Complete Block Design (3 treatments with 4 replicates each) to assess the effect of establishing native vegetation buffers on non-point source inputs to Chequamegon Bay. In this design, ANCOVA will be used to compare the mean and variance of each parameter across the treatment types and experimental block. We anticipate that data collected during 2012 will largely reflect site-disturbance and nutrient input associated with planting greenhouse-propagated trees and shrubs and the actions necessary to control non-native plants. In subsequent years we expect survey results to produce measures associated with narrower variance and that reflect actual treatment (and block) differences.**

**All of these methods are currently described in the QAPP in the associated appendices.***b. Once a DQO has been established, the authors need to consider measurement quality objectives (MQOs) needed to achieve this DQO. For example, would 90% accuracy in species identification be adequate? Or, is 95% accuracy needed? A decision on this topic may depend on the overall DQO selected and the abilities of the cooperating monitoring scientists and volunteers. Once selected, the MQOs can be used in training, certification, and evaluation of field crews.

It is, therefore, recommended that the authors establish MQOs for each of their measurements and include these objectives in the QAPP.*

**RESPONSE:**

**For each DQO and its associated protocol, we consider measurement quality objectives (MQO) to include the definition of target measurement classes that minimize experimental (measurement) error. Data quality objectives that require species identification (plants and animals) involve requirements that all species are identified to species taxonomic or group class identification with a 95% or greater accuracy. We consider this an essential aspect of our investigation as we develop the metrics of relative abundance and species diversity (vascular plants, birds, small mammals, terrestrial arthropods). All native plants installed are identified to species with 100% accuracy. Although pre-existing trees and shrubs are difficult to identify to species when at seedling stage, they are identified to genus with a minimum 95% accuracy which is sufficient to compare native vs. non-native plant abundance comparisons. Additional DQO’s relating to habitat measures include: stem density and crown height and % canopy cover, herbaceous plant species % relative cover and species richness. Herbaceous plants that do not consistently provide vegetative structures to accurately identify to species are assigned to a standardized management or functional class (e.g., lawn, old-field, moss, graminoid or grass-like, unknown seedling). For these measures, MQO’s as presented in each respective protocol require instrument calibration, observer training on methodology and complete sampling of all plots where and when feasible.**

**In our wildlife surveys, the bird surveys will include measures that cannot be claimed to be 100% accurate. With this expectation, we have integrated paired observers that collect (measure) bird observations simultaneously at each survey transect. It is our hope that this added level of measurement redundancy that includes observer consensus of survey results at the end of each survey, that error associated with misidentification will be relative across both the treatment and control transects. Data Quality Assurance (and analysis) techniques include determining the effective accuracy of species identification and transcription or measurement error assessment. Review of field data will aid determination of minimum/maximum levels of accuracy for estimators used in relative site comparisons.**

*3. Section B1 Sampling Process Design (Experimental Design)*

 *a. Vegetative sampling - Page 20 of the QAPP states that "a portion of each shoreland restoration site will be divided into 50 m segments." How large of a portion will be divided for the sampling purposes in order to ensure representativeness of the entire restoration site? Please provide additional detail regarding the sampling/monitoring of restoration efforts.*

**RESPONSE:**

**At the Memorial Park restoration site, we have treated approximately 1,800 feet of narrow shoreline (5-10m wide) for woody invasive shrub control. This narrow stretch of shoreline area is separated from the remaining restoration area by a retention basin and a paved bike path that receives regular mowing as part of City Park management. The core restoration area includes a length of approximately 1,050 feet of which 300 meters (985 feet) or 93% is divided into 25 and 50 meter intervals as part of our site-level transect surveys for a total of 11 subplots per transect.**

*b. Ten years of monitoring will allow for adequate documentation of the project sites' maturation. However, the QAPP does not call for any follow-up invasive species control after the initial year nor does it address the possibility of additional plantings if monitoring events uncover high mortality rates of plants installed during the restoration installation. The authors may want to consider these post-restoration activities. If post-restoration activities are not part of the scope of the grant or are being performed by another entity then it may be beneficial for the QAPP to indicate as such.*

**RESPONSE:**

**We will be conducting post-installation invasive plant control efforts in addition to ecological monitoring annually to year 3, then in year 5, 7, and 10 as funding permits. Invasive woody shrub control will be the primary objective to insure restoration success. This objective is addressed in the project’s “Invasive Plants Management Plan” that is now in under a second revision and is being developed following a full site assessment during the 2011 and 2012 control seasons. This document will be included in the appendix of the revised Project QAPP, including selected excerpts as related to DQO’s and MQO’s as part of evaluating the effectiveness of the control efforts.**