



MEMORANDUM

TO: Matt Hynson, USACE Baltimore District
DATE: February 1, 2022
FROM: Jim Morris and Jeremy Koser, JMT
PROJECT: Eccleston Mitigation Site
RE: Revised Monitoring Program

This memorandum details alterations to the Eccleston monitoring program as previously permitted to accommodate new standards and agency requests. These alterations were discussed with MDE and USACE in January 2022, and include addition of monitoring of representative riffle heads to determine stability in Monitoring Year 1, monitoring of invasive species specifically in Monitoring Year 1, and the addition of a revised hydrologic monitoring approach to replace the groundwater monitoring stipulated in the October 2020 Ecological Performance Standards and Monitoring Protocol for Permittee-Responsible Nontidal Wetland Mitigation Sites in Maryland approved by MDE and the USACE Baltimore District. The results of the Year 1 riffle and invasive monitoring items in this memo will be provided as a Year 1 Monitoring memorandum, which will detail only these elements and is separate from the monitoring reports detailed in the monitoring plan and permit requirements. The hydrologic monitoring will take place on the schedule stipulated in the October 2020 Performance Standards and will be discussed in the standard monitoring reports.

Riffle Monitoring

USACE requested that the heads of riffles be monitored on the project to evaluate entrenchment and any loss of grade control issues which may develop, with the reasoning that if degradation is captured early, minimal impact to the surrounding reaches of stream will occur.

As part of Year 1 monitoring, JMT will:

- Visually assess all riffles in the project site. Degradation is easy to visually recognize as there is no associated drop with stream structures anywhere on the proposed design, so steepening of pools, drops at structures, and lessening of pool depths will be evident.
- Survey all riffles that appear degraded.
- Following as-built submittal to the agencies, representative stream reaches will be defined for monitoring purposes. This will include higher gradient tributary reaches and the mainstem.
- Within each representative reach, monumented cross-sections will be placed within 100 linear feet of the upstream and downstream extent of each representative reach as well as three riffles within the reach. The maximum distance between monumented sections



will be 300 feet. Surveying all riffles on the project site is impractical due to the large number of riffles proposed.

- Monumented sections will be surveyed with total station with end pins permanently set (steel or similar survey-grade control device).
- Compare all surveyed riffles (degraded and representative) to their appropriate design and as-built parameters. JMT does not propose to monument additional riffles outside of those described earlier in this section.
- Survey downstream point(s) to determine observed riffle slope of the surveyed riffles.
- Evaluate any perceived fish blockages which may be associated with riffles, due to degradation, flow depth, or slope.

JMT recognizes that light aggradation or minute degradation may occur at riffle heads, and will support all visual observations with photo documentation and analysis to determine if there is a developing issue or if the riffles are performing within design parameters.

Year 1 Invasive Species Monitoring

USACE requested that invasive species be evaluated as part of Monitoring Year 1 efforts in addition to the detailed wetland and invasive species monitoring which occurs in subsequent years. JMT will meet this request through a modified monitoring approach for Monitoring Year 1:

- Visually assess the entire site, including uplands and buffers, but not preservation areas, for invasive species presence. This may be augmented through a drone flight and imagery. JMT proposes conduct the visual assessment in July or August of Monitoring Year 1 so invasive species are large enough to be easily identified, but early enough prior to the end of the growing season to treat them.
- GPS map any significant stands of observed invasive vegetation.
- Compare invasive species data to sample plot data which includes assessment of invasive species within the sample plots.
- Develop a scheme for invasive species control and treat that vegetation (mechanical or chemical controls).
- Report on this as part of the monitoring report, noting invasive species locations for future control efforts as part of regular maintenance and adaptive management.
- Further update and evaluate through detailed wetland monitoring and sample plot analysis in future monitoring years.

This approach will limit the initial foothold of invasive species and should allow native species to gain a competitive advantage over them, provided herbicide and mechanical removal approaches are precise and do not incur significant collateral damage to desirable species.

It is important to note that while eradication has been mentioned as a desirable management technique for the site, management of invasive species within the permissible thresholds established within the permit is likely a more realistic technique, because of the extensive reservoir of invasive species adjacent to and within the site (preservation areas, for example, are

not managed for invasive species). In the event of wetlands exceeding the permit thresholds, functions and values assessments will be utilized to determine the impact of those species on the desired wetland system in areas of exceedance, and an appropriate adaptive management plan will be developed to meet project goals.

Hydrologic Monitoring

Monitoring standards developed through the inter-agency review process prior to Eccleston's transition to a permittee-responsible site did not include shallow piezometers or monitoring wells. USACE and MDE requested that monitoring wells be installed within wetland restoration and enhancement locations within the mitigation site per the October 2020 standards. The monitoring guidance is explicit in the number of wells and conditions of their monitoring. The Eccleston site, however, has special conditions which warrant a modified approach, including:

- A confining layer of dense matrix supported gravel will be typically within 1 foot of the proposed ground surface in floodplain wetlands, due to the native geology of the site. This means wells will typically only be 1 foot below ground surface. Provisions on well depth are included in the 2020 monitoring standards.
- Existing hydric soil will be utilized in-situ for floodplain wetlands. Therefore, the soil record shows a clear and sustainable saturation within proposed wetland restoration and enhancement locations within the floodplain.
- A pre-construction data collection of trenches, test pits and other site observations support the hydrology of floodplain-connected wetlands, whose elevation will be within six inches of the bankfull elevation for almost all circumstances; this is also within six inches of the typical water surface for streams at average daily discharge.
- These wetlands will be monitored with a higher density of iris tubes than the monitoring well guidance dictates; therefore, there will be strong evidence of hydrology through tube observation in these floodplain wetland locations.

For these reasons, JMT will rely on other types of data collection to fulfill wetland hydrology monitoring requirements. After the as-built survey has been completed, JMT will evaluate what wetland locations fall outside the approximate ten-year floodplain limits (which, due to the design, look very similar to the 100-year floodplain limits) and install shallow groundwater monitoring wells at a rate of one per wetland cell outside of the floodplain wetland limit. Preliminary estimates indicate this would not be more than five monitoring wells. JMT will monitor them using HOBOT monitoring devices and record daily data through the year, which exceeds the protocol monitoring standards for data frequency.

JMT will investigate the usage of drone aerial photography with infrared capability to monitor hydrology on a site-wide basis, similar to how JMT utilizes existing color infrared data to evaluate potential for wetland restoration and aide in complex wetland delineations, should floodplain wetland conditions not be met or demonstrated through iris tubes or other means. JMT anticipates that this will be cost effective and provide a useful tool in evaluating hydrology for adaptive



management purposes, should other parameters indicate this level of effort is warranted. Should wetland sample points indicate a lack of or loss of hydrology, JMT will utilize as part of adaptive management, if required, drone photography tools such as this to determine extents and magnitude of hydrologic deficiencies. As discussed with MDE and USACE, this protocol may include the following, as warranted:

- One flight of infrared imagery during the growing season and “normal” rainfall conditions. It is likely this flight would occur in April or May, while vegetation is still short enough that topography can be successfully flown as part of the infrared imagery. Rainfall prior to the month should be within 20% of historic ten-year averages for that month and the flight should occur not within 5 days of the last rainfall event. Other parameters may be determined through coordination.
- Processing and evaluation of data as compared to known hydrologic performance reference areas as determined through other customary monitoring.
- Installation of correlating wells which could accompany this effort and validate aerial imagery.

If this scenario is required, JMT will work with MDE and USACE to determine the best protocols to implement, and develop a standard operating procedure with the agencies.