

Statement of Findings for Wetlands

for Morefield Maintenance Area Mesa Verde National Park

Montezuma County, Colorado

Recommended: _____
Cliff Spencer, Superintendent, Mesa Verde National Park Date

Concurred: _____
Certification of Technical Adequacy and Servicewide Consistency Date
Chief, Water Resources Division

Approved: _____
John Wessels, Director, Intermountain Region Date

Introduction

On June 29, 1906 President Theodore Roosevelt signed Public Law 34-616. The act authorized the establishment of Mesa Verde National Park with its initial focus to “...*provide specifically for the preservation from injury or spoilation of the ruins and other works and relics of prehistoric or primitive man contained within said park...*”

For over a century, the park has been managed to study and conserve the remnants of the Ancestral Puebloan culture and provide the infrastructure necessary to support this mission and facilitate public access and education about the park’s resources. During the park’s first few decades, livestock grazing in the park and on private homesteads within the park continued to cause impacts to native park vegetation including wetlands and meadows in canyon bottoms such as in Morefield Canyon and Prater Canyon. The Morefield homestead site was selected for settlement because of the presence of water near the surface with plenty of green forage in the bottomland. A shallow well next to a wetland provided ample water for the homestead and later for park visitors. By the 1930s, the homesteads were returned to public ownership and vegetation was allowed to recover.

In 1964 a large public campground with public service and other support facilities, was established 1.5 miles up-canyon from the old Morefield homestead. In order to ensure proper treatment of the effluent from the campground, a large 3-stage evaporative sewage lagoon system was established just below the homestead site within a natural wetland. A sewage pipeline was trenched through upland and wetland sites in Morefield Canyon from the campground to the lagoons. These actions predated the National Environmental Policy Act, Clean Water Act, and Executive Order 11990 on wetlands protection.

In the meantime, the park’s maintenance program was slowly creating a growing presence between the campground and the lagoon cells a short distance south of the tunnel that connects Morefield Canyon and Prater Canyon. The original size and composition of an adjacent wetland was not recorded, but expansion of park operations here has diminished its size and integrity. The work site has grown to store and stage equipment and materials, and to corral and pasture horses used for horse patrol (Figure 4). The wetland has been filling in and drying out, and vehicular traffic has increased. Today the wetland, hereinafter referred to as “corral meadow wetland,” is degraded and has only a small amount of wetland vegetation growing through the compacted sediment.

Executive Order 11990 requires the National Park Service (NPS) and

other federal agencies to evaluate the likely impacts of actions in wetlands, even very small ones. NPS Director's Order #77-1: Wetland Protection and Procedural Manual, provides NPS procedures for complying with Executive Order 11990. This Statement of Findings documents compliance with the NPS wetland protection procedures related to the latest infrastructure improvement action being proposed in Morefield Canyon.

List of Figures and Photographs

Figure 1 shows the locations of the corral meadow wetland and the Prater wetland in relation to the Morefield campground and sewage lagoons.

Figure 2 shows the current layout of the development around the corral meadow wetland with the proposed sewer line.

Figure 3 shows the proposed 1.5 acre wetland mitigation site at the Morefield sewage lagoons.

Figure 4 shows the expansion of the park maintenance operation next to the corral meadow wetland over the past 20 years.

Photos 1 through 5 show the facilities and general condition of the soil and vegetation at the corral meadow wetland in relation to the maintenance operations located there during the summer of 2012.

Photo 6 shows part of the Prater wetland analog for the corral meadow wetland.

Proposed Action

In 2011, the park constructed a large but simple metal building (known as the Morefield sand shed) next to the corral meadow wetland in the middle of the filled and hardened surface of the maintenance facility south of the tunnel (PEPC project # 34204). The purpose of the building was to provide covered storage for snow plows and sand supplies used in keeping winter driving safe in the park and having these tools stationed closer to the park entrance where a new visitor facility was under construction. Although the building was to be located outside of the wetland as it existed prior to 2011, drainage off the building site could impact the wetland, so mitigating the post-construction drainage pattern was requested. This project in isolation was not judged to warrant the need for additional compliance under EO 11990.

In 2012, the park began enhancing and expanding the capacity of the new sand shed (PEPC project # 42983). This project amendment called for the following additional activities at the sand shed.

- Grading and compaction of the graveled surface of the fill pad surrounding the sand shed in preparation for applying hot asphalt pavement for this roadway and apron to ensure all-weather, year-round accessibility to the sand shed.
- Installation of a buried sewer line from the sand shed to the major sewer line from the campground to the lagoons (for the connection of an oil/water/sand separator) and a buried water access line tie-in (for a potential future water supply and future staff restroom in the sand shed). Installing buried utility conduits and tie-ins prior to the asphalt component of this project would minimize future damage to the paved apron for the separator sewer connection and if funding is available to pipe water to the sand shed from the campground.
- Installation of buried conduit for electrical connection and a future piped water supply to the Morefield horse corral and barn which could provide these utilities to that facility if funding is available. Installing these features now would avoid damage to the asphalt apron that will be placed around the sand shed in this project

The cumulative actions desired at and around the sand shed now and in the future include a documented action that would directly impact the corral meadow wetland. This entailed trenching a new sewage line from the sand shed to the existing main sewer line, which currently passes under the corral meadow wetland. This new sewage line would be placed through

the corral meadow wetland and would damage wetland vegetation there. This Statement of Findings addresses the trenching of the new sewage line and the placement and connection of the proposed pipeline segment and connection.

Construction of the paved surface around the sand shed, the pre-installation of electrical and water utility line tie-ins to the sand shed and the horse barn will have no direct impacts on the corral meadow wetland or waters of the United States. The trenching for the installation of a sewage line approximately 27.3 yards in length (82 feet) through the corral meadow wetland will damage approximately 400 square feet of degraded wetland vegetation. More will be impacted by the compaction from heavy machines. Mitigating this damage on-site would serve no purpose because the corral meadow wetland is already degraded and can expect to receive additional impacts in the years ahead from operation of the maintenance and patrol stock area.

The park has decided to allow the current maintenance footprint to remain here as a permanent status quo. In exchange for this permanent impact, a new and larger artificial wetland with significantly greater plant diversity and wildlife habitat value would be constructed at the sewage lagoons a half mile to the south. In 2009, the upper Morefield lagoon cell (cell 1) was decommissioned and abandoned due to the high groundwater levels under it. Ongoing NPS hydrological and biological studies at this site indicate that a self-sustaining mixed wetland of open water, emergent, riparian, and seasonally wet marsh could be constructed within most of abandoned lagoon cell. For the purposes of this Statement of Findings, the NPS addresses only wetlands included under the jurisdiction of the NPS Wetland Protection and Procedural Manual #77-1, which in this case only includes the corral meadow wetland.

Site Description

Wetlands

During the wetland survey, the following wetlands that reflect NPS jurisdiction were identified at the project site.

The corral meadow wetland is a seasonally wet, depressional (D1) palustrine wetland fed primarily from groundwater which saturates the soil near the surface from underneath. This wetland site remnant currently is composed of approximately 13,467 ft² (0.31 acres). Its original size is unknown. Because it is so degraded, it is not possible to properly classify this wetland; however, a substantial analog site is located in the Prater Canyon drainage immediately west of this site, including a 10.5 acre patch immediately south of the west end of the tunnel (Figure 1) where peat soil underlies the vegetation for almost a yard. The park has a total of about 36.1 acres of this seasonally wet marsh wetland type as derived in GIS from the latest park vegetation map. We will use the Prater wetland to help classify the corral meadow wetland.

Under the Cowardin system (Cowardin 1979), this dry marsh is classified as a palustrine emergent wetland. This system is dominated by Arctic rush (*Juncus arcticus* var. *balticus*) and two sedge species (*Carex* sp.). The degraded corral meadow wetland today is composed of sparse patches of Arctic rush and some other weedy herbaceous species. (See Appendix 1 for a more complete site description of the vegetation at the corral meadow wetland, Photos 1 through 5 to see its appearance, and Photo 6 to see the appearance of the Prater wetland analog.)

The upper part of Morefield Canyon is a valley with moderately steep, vegetated slopes and no streams. The canyon bottom does not typically experience surface flows. Surface water could puddle briefly at the corral meadow wetland after snow melt. The only flows ever witnessed in the upper parts of Morefield Canyon and adjacent Prater Canyon occurred within one year of the Bircher Fire of 2000, when a few post-wildfire flashflood events allowed ash, charcoal, plant debris, sand and soil to sheet-wash off the burned slopes and dump into the canyon bottoms. Otherwise no surface flows occur for the 1.86 miles from the wetland up to the canyon head and the approximately 4.35 miles down to where the canyon leaves the park. As a result, the proposed action does not involve jurisdictional waters of the United States so no Clean Water Act Section 404 permit is needed for this project.

Figure 1. Overall Project Area

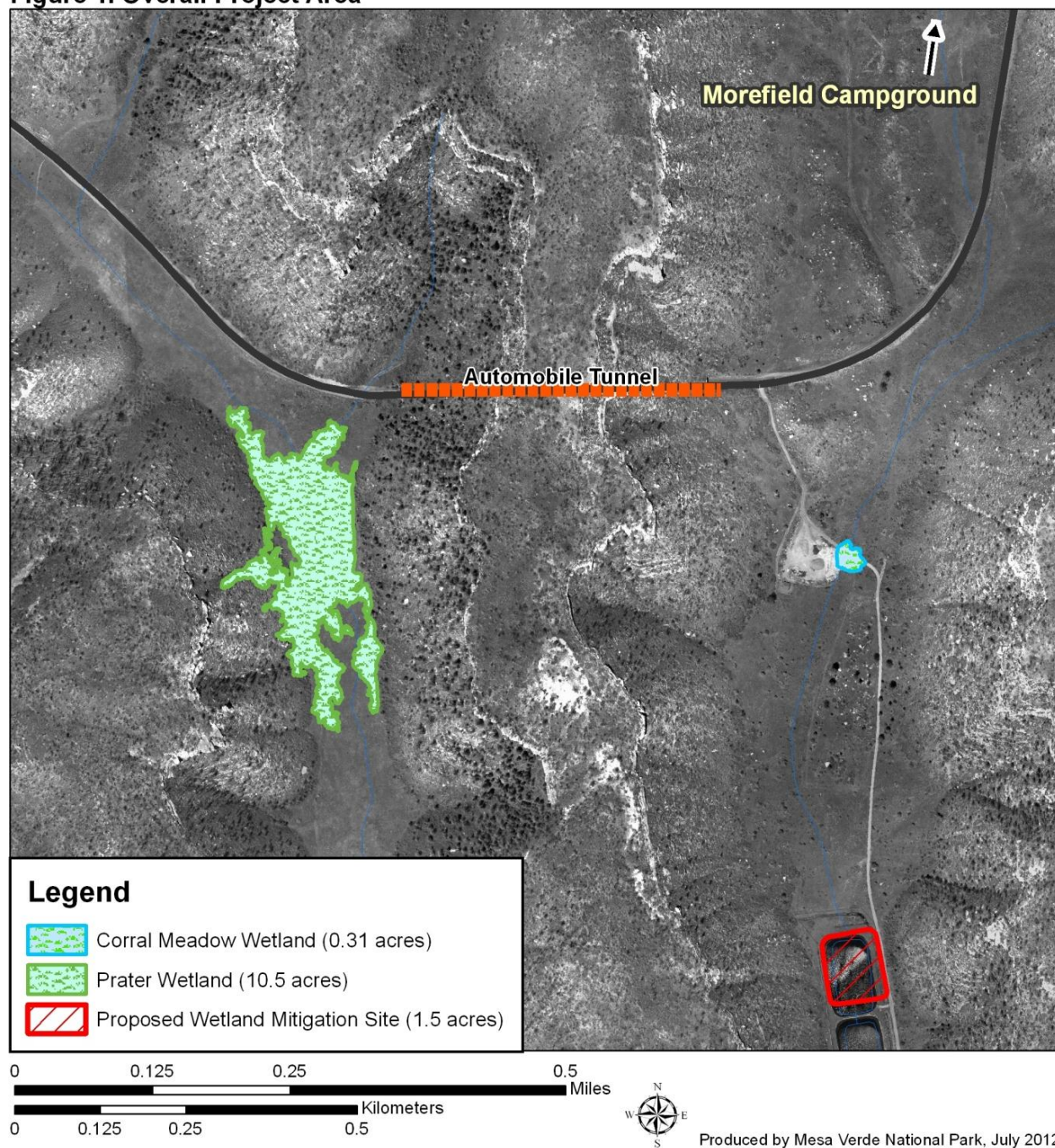


Figure 1. Overall project area including Morefield Campground, Morefield sewage lagoons, the park tunnel, and Prater Canyon along with the two wetlands. The blue lines depict the canyon bottom locations only. They do not represent surface water flows.

Figure 2. Corral Meadow Wetland and Morefield Sand Shed.



Figure 2. The current layout of the development around the corral meadow wetland is shown with the proposed sewer line access route which extends 27.3 yards into the remnant wetland.



Figure 3. Proposed Wetland Mitigation Site in Morefield Canyon.



Figure 3. The proposed 1.5 acre wetland mitigation site is shown within abandoned cell 1 of the Morefield sewage lagoons.



7/9/1993



9/15/2003



11/7/2010



10/6/2012

Figure 4. These aerial images show an expansion of the park maintenance fill pad and storage yard next to and into the corral meadow wetland from 1993 to after the sand shed's construction in 2012. (7/9/1993 and 10/6/2012 images obtained from Google Earth).

Wetlands Functional Values Assessment

The corral meadow wetland in 2012 was so small and in such poor condition that a full functional assessment was not useful. Instead, a cursory evaluation was performed by Mesa Verde's Natural Resource Manager and the Vegetation Ecologist using the Functional Assessment of Colorado Wetlands (FACwet) Method User Manual Version 2.0 (Johnson 2011) as a general guideline. The FACwet Method uses nine wetland health variables that are scored from high to low as follows:

- Reference Standard (pristine)
- Highly Functioning
- Functioning
- Functioning Impaired
- Non-functioning

After evaluating the environmental conditions and measuring wetland vegetation cover at the corral meadow wetland (See Appendix 1), we have listed below the general scores assigned to each variable.

1. Neighboring Wetland Habitat Loss: Score = Non-functioning
2. Barriers to Migration and Dispersal: Score = Functioning
3. Buffer Capacity: Score = Non-functioning
4. Water Source (groundwater): Score = Functioning
5. Water Distribution: Score = Functioning Impaired
6. Water Outflow (groundwater): Score = Functioning
7. Geomorphology: Score = Non-functioning
8. Water and Soil Chemical Environment: Score = Functioning Impaired
9. Vegetation Structure and Complexity: Score = Non-functioning

Although some of the scores reached the "Functioning" level (moderate function), the overall score is impaired (low function). The corral meadow wetland offers virtually no wildlife habitat in its current condition. There are no threatened and endangered species in the area, but fishes and amphibians are always species of special concern in semi-arid ecosystems. This wetland offers no habitat for fishes or amphibians. Its ability to retain flood flows and filter out sediments is negligible and, due to the significant amount of compacted sediment already affecting the site, it may actually become a source of sediment in a flashflood event. The corral meadow wetland has no known historical significance, unique cultural heritage, aesthetic, economic or scientific value, or recreational potential. The only indication that there is or was a wetland here is the sparse presence of remnant rush vegetation detected.



Photo 1. Center of the corral meadow wetland impacted by vehicle traffic and the piling of road maintenance supplies. Fill pad, storage yard, and sand shed are shown in the background.



Photo 2. Main part of the corral meadow wetland experiencing heavy sedimentation and compaction from park maintenance operations.



Photo 3. Morefield corral, barn, fill pad and storage yard next to the corral meadow wetland.



Photo 4. Patch 3 remnant rush wetland and weedy vegetation in the corral meadow wetland south of the access road in Morefield Canyon, affected by park maintenance operations.



Photo 5. The remnant patch 2 of rush wetland vegetation on the north side of the access road in Morefield Canyon, the side less affected by park maintenance operations.



Photo 6. Sample view of the seasonally wet marsh habitat in Prater Canyon.

Justification for Use of the Wetland

The purpose of this project has expanded in several directions. The original intent was to improve the park maintenance program's ability to support safe winter driving conditions for park visitors and staff in the northern part of the park. The addition of water, sewer, and electric capacity to the sand shed and horse barn while paving the road surface was not essential to this purpose, but is consistent with the development direction this site has been incrementally experiencing for many years. Because of the wetland's location directly between the main sewer pipeline and the new sand shed, avoidance and minimization are not practicable solutions. There is not enough integrity left in the wetland to justify attempts to protect it with alternative routing of the sewer line or with intensive site rehabilitation of the wetland. A far better approach is to compensate for the loss of the corral meadow wetland by creating a new, larger, and more diverse wetland a half mile down canyon at sewage lagoon cell 1 which was left uncovered and without any remediation after it was abandoned in 2009. Retroactively this also will help mitigate the loss of the wetland that existed at the Morefield sewage lagoons site prior to their construction in 1964.

Investigation of Alternative Sites and Designs

Different Location. Placement of a sand shed structure to house the snow plows for use in the northern end of the park was discussed in the previous decade with a selected site (clearing NEPA compliance through an Environmental Assessment and Finding of No Significant Impact) next to the water treatment plant at the park entrance. Solar voltaic panels were constructed there and the sand shed was constructed south of the tunnel in Morefield Canyon under a categorical exclusion. The ancillary utility tie-ins specified in this project were installed earlier in 2012 except for the sewage line connection that cuts through the wetland. Most of the other impacts from this project to the corral meadow wetland have already occurred. In addition, the large number of impacts from now established activities going back from a few years to several decades would not be abated by implementing any construction alternatives.

No Action. A viable alternative would be to not connect the retention vault (oil/water/sand separator) to the wastewater pipe to the lagoons. When the snow plows are parked in the sand shed bays, snow mixed with oily road grime and vehicle fluids will shed off of them onto the floor and drain

down into a retention vault (oil/water/sand separator model JP320-EE-SO). The capacity of this separator is oversized (320 liquid gallons) for the two vehicles to be parked inside the sand shed, but this is to ensure sufficient runoff contact inside the separator. This separator could be managed as a secondary containment in accordance with the park's Spill Prevention, Control and Countermeasures (SPCC) Plan. No day-lighting of these fluids into the wetland would occur due to the small amount of snow drip expected in any given year and if the vault did collect larger amounts of fluid it would be removed. However, there is another factor to consider. A restroom in the sand shed would be highly desirable for staff but adding the sewage line would not ensure that a restroom will be established here because there is no water pipeline that reaches the tie-ins. Even so, the sewage line for the oil/water/sand separator would be an ideal avenue to make a restroom sewer tie-in. As a result, having the sewage line connection can serve double duty.

No Mitigation. Currently there are no clear legal factors or funding mechanisms in place to compel mitigation for the degradation of either the corral meadow wetland, the wetland that was impacted when the sewage lagoons were constructed in the 1960s, or the recent abandonment of lagoon cell 1. This proposal provides that opportunity by directing interdivisional park resources to work together to create a diverse and self-sustaining wetland in Morefield Canyon. This alternative provides the best net benefit for wetlands and the national park environment.

Wetland Mitigation

Wetland mitigation in this case involves only compensation, planned for initiation with earthmoving in 2014 and planting in 2015. As described above, avoidance was a viable option but it likely would preclude the far greater benefit from compensation. Minimization was not a viable option.

General Approach. Given the relatively shallow depth of the local water table and the presence of several species of wetland plants growing nearby, it appears that the Morefield lagoon cell 1 site is an excellent candidate for restoring a diverse wetland environment (Martin and Wagner 2011) including seasonally wet rush meadow habitat.

Preliminary estimates of cut and fill volumes suggest that the material that will be generated by removal of cell 1's east levee (about 1,700 cubic yards) and removal of bentonite on the lagoon cell bottom (about 1,700 - 2,500 cubic yards) will fit in the area of the west levee, especially if the material is graded to match the elevation of the adjoining hillside.

The boundaries of the potential restoration site are delineated by surrounding physiographic features and infrastructure (Figure 3). On the north and east side of cell 1, the excavated ditch provides a well-defined boundary that already intersects the water table for a portion of the year. The west boundary of the project would ultimately be the existing hill slope. The southern extent of the project would be limited to some distance above cell 2, presently assumed to be the recently excavated cutoff ditch, which is about 50 feet north of cell 2's north levee. The actual footprint of the proposed wetland restoration includes the entire bottom area of cell 1 excluding the southern 50 feet or so, the entire east levee, and a portion of the north levee. The western levee, which grades into the existing hill slope, is identified as the disposal area for the excavated material. If an off-site disposal area or a different use for the excavated material is identified, then the actual wetland area could be expanded a little to include some of the footprint of the west levee.

The general approach to re-grading cell 1 to facilitate establishment of a wetland system (ponds, marshes, willow thickets) would involve the following steps:

- 1) Remove the east levee beginning near the inlet culvert and continue south to the end of the levee fill. The outer cut line (the east boundary) will begin at an elevation equal to the elevation of the ditch bottom and continue westward, matching design grade with the cell bottom (approximately 12" – 18" below present grade).
- 2) Remove approximately 12" – 18" of material (primarily bentonite) from the bottom of cell 1.
- 3) Reshape the top and side of the north levee creating topography conducive to willow and other riparian/wetland species establishment.
- 4) Place cut material on top of west levee matching grade with hillside.

Net Results. Approximately two acres of disturbed land currently infested with non-native invasive plants will be reclaimed including construction of a self-sustaining 1.5-acre diverse wetland community in compensation for abandonment of the 1/3-acre corral meadow wetland remnant. Park staff will continue to measure groundwater levels at monitoring wells retained after construction. Staff also will set up a monitoring protocol to determine whether wetland plant establishment goals are being met and invasive weed population reduction goals are being met. Three times each growing season, vegetation management crews will enter the restoration area and determine how well progress is being made. Simple line intercept measurements along a measuring tape would provide enough data to determine species cover values. Weeds in dryer wetland sites will be treated with an Aminopyralid herbicide (such as "Milestone®") while sites with the water table closer to the surface or too close to open water will have aquatic labeled Glyphosate (such as "Rodeo®") or Imazipyr

(such as “Habitat®”) applied according to label instructions. At the mitigation site, within five years of construction and reclamation, native plant cover will exceed 75 percent in non-inundated areas. Residual non-native plant cover will be less than 5 percent. Total annual herbicide volume used to treat invasive plants will be reduced 50 to 75 percent. The site will exhibit far greater native wetland-plant diversity, amphibian diversity, and bird diversity than the existing waste area of the abandoned lagoon cell.

Compliance

Clean Water Act Section 404

The proposed action does not involve jurisdictional waters of the United States, therefore, no Section 404 compliance is needed for this project. This determination was confirmed through personal communications with the Durango, Colorado office of the U.S. Army Corps of Engineers (USACE). When USACE received concurrence from the Environmental Protection Agency office in Denver on September 10, 2012, an official jurisdiction determination was made by the USACE district office in Sacramento, California on September 11, 2012 confirming that no jurisdictional waters are involved.

National Environmental Policy Act

This project, PEPC project # 42983, was covered under a NEPA categorical exclusion **C. 19**, “Construction or rehabilitation in previously disturbed or developed areas, required to meet health or safety regulations, or to meet requirements for making facilities accessible to the handicapped.” This justification related to providing a sewer connection for the oil/water/sand separator compliant with 40 CFR Part 112, Spill Prevention, Control and Countermeasure Plan. The impact to the corral meadow wetland was judged to be minor or less; therefore, a separately identifiable Wetlands Statement of Findings provides sufficient compliance documentation for this project. The original proposal to construct the sand shed, PEPC project # 34204, also was covered under a NEPA categorical exclusion, **C. 18**, “Construction of minor structures, including small improved parking lots, in previously disturbed or developed areas.” This justification related to maintaining safe winter driving conditions.

This Statement of Findings will complete the NEPA requirements for this project. No Statement of Findings Exceptions apply. However, a separate PEPC project environmental screening form will be started in 2014 to document the wetland restoration/mitigation process under a different NEPA categorical exclusion, **E. 2**, “Restoration of noncontroversial native

species into suitable habitats within their historic range and elimination of exotic species.”

Conclusion

The proposed action was modified to include compensation for existing impacts to a wetland. The total area of 1/3-acre at the corral meadow wetland will be compensated with 1.5 acres of constructed wetland a half mile to the south. The creation and restoration of a wetland area will be accomplished in-house during 2014 and 2015 with park staff (performing the earth moving, seed collecting, and transplanting of wetland species along with monitoring and weed control work in out years) and volunteers (assisting with plantings). Funding will include park base funds and landscape restoration funds derived from entrance fee receipts. It is anticipated that the planted areas of emergent wetlands will take two to five growing seasons to fill in. The planted areas will be monitored during this time to ensure that the plants are acclimating.

The NPS finds that this proposed action is consistent with the policies and procedures of NPS Director’s Order #77-1: Wetland Protection, including the “no-net-loss of wetlands” policy.

References

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Appendix 1.

Wetland Characteristics and Impacts at the Morefield Canyon Sand Shed Site

- Degraded wet meadow bisected by a road, approximately 13,667 ft² total area by GPS.
- Residual wetland vegetation persists in three patches.
- Two patches south of the road (patch 1 at 623 ft² and patch 3 at 801 ft² on attached map):
 - *Juncus arcticus* var. *balticus* and *Bromus inermis*
 - Vegetation too sparse to sample in the patches, perhaps 25% plant cover and the rest was bare dirt.
 - Extremely degraded.
 - Growing through fill material and fines from adjacent gravel and soil piles.
 - Subjected to heavy equipment traffic.
- One patch north of the road (patch 2 on attached map at 1,833 ft²):
 - Retains more wetland characteristics than patches 1 and 3.
 - Moderately impacted by fines from the gravel road and adjacent soil pile.
 - Plant cover (mean of two 1-m² plots):
 - *Juncus arcticus* var. *balticus*: 60%
 - Dead *J. arcticus* thatch: 30%
 - *Cirsium arvense*: 1%
 - Unknown Poaceae seedlings: 1%
 - For comparison, plant cover was assessed from two 1-m² plots in the adjacent upland field:
 - *Pascopyrum smithii*: 40%
 - Litter/thatch: 30%
 - Bare ground: 10%
 - *Bromus inermis*: 5%
 - *Artemisia ludoviciana*: 5%
 - *Artemisia dracunculoides*: 3%
 - *Lactuca serriola*: 3%
 - *Carduus nutans*: 1%
 - *Tragopogon dubium*: <1%

