



OPERATIONS & MAINTENANCE

Each EWP Phase II Financial Assistance (FA) agreement for project construction between the CWCB and the NRCS includes requirements for Operations and Maintenance (O&M) for a 3-year period. The CWCB then transfers these O&M responsibilities to the local project sponsor via the project agreement.

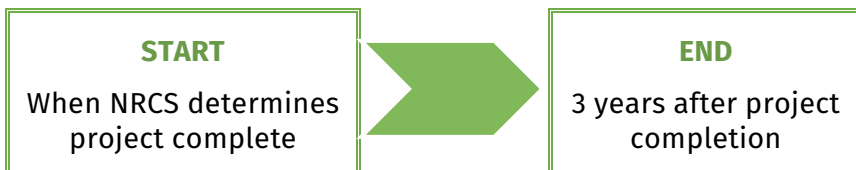
Purpose of O&M Requirements

The NRCS and CWCB require O&M agreements and plans for projects funded by the EWP program to protect the public's interest and safety and to ensure that projects are performing as designed.

Project Sponsor Responsibilities

- Obtain landowner permissions for access to carry out O&M
- Comply with all applicable federal, state, and local laws (specifically permit requirements)
- Collaborate on O&M plan development as part of project design process
- Submit O&M plan(s) with design documents for review by NRCS and CWCB
- Sign O&M agreement with CWCB prior to receiving funding for project construction
- Complete annual inspections and reports; submit to the NRCS
- Conduct any required maintenance in the project area to maintain project function per original design

Duration of Responsibilities



Local sponsors cannot pass on legal responsibility for O&M to individual landowners or other parties.

Cost Considerations

Depending on the size and complexity of the project, the CWCB recommends that project sponsors reserve the equivalent of 1-5% of total construction cost for each project for O&M. This should account for specific repairs, for addressing potential problems, and for staff time to conduct inspections and prepare reports. While not required, a comprehensive O&M plan should provide an estimate of O&M costs over the 3-year period.

Operations: Operations refers to the administration, management, and performance of non-maintenance activities necessary to keep a practice safe and functioning as planned.

Maintenance: Maintenance involves ensuring that individual components and structures of a project are achieving objectives in terms of function and safety. Maintenance consists of the recurring activities necessary to retain or restore a practice in a safe and functioning condition, including the management of vegetation, the control/removal of invasive vegetation, the repair or replacement of failed components, the prevention or treatment of deterioration, and the repair of damages caused by vandalism.

Monitoring: Monitoring activities evaluate each installed feature's ability to achieve the larger goals of a project and facilitate process-based outcomes over the long term. Monitoring recommendations for the EWP program will be released in June 2016. In the interim, reference the [CWCB Standard Operating Procedures for monitoring channel dimensions and location](#).

O&M Plans

Plans may be completed by the project design team or the local sponsor but should be developed collaboratively.

Plan Content

- ✓ Location, Date, Preparer
- ✓ General recommendations
- ✓ Specific practices for installations/elements at site
- ✓ Inspection schedule
- ✓ Records
- ✓ Estimate of cost

Refer to the attached example from NRCS.



Colorado Emergency Watershed Protection (EWP) Program

Sponsored by the Colorado Water Conservation Board (CWCB)
Administered by the Natural Resources Conservation Service (NRCS)

OPERATIONS & MAINTENANCE

When is Maintenance Required?

Maintenance is required when individual components or structures of a project are not achieving specific objectives related to function and safety and must be repaired. Examples include, but are not limited to, the following:

Examples of when maintenance is required:

Structure backfill is washing out. Backfill behind an in-channel or bank stabilizing structure will compromise the stabilizing function of the installed structure.



Boulders for an in-channel or bank stabilizing structure become dislodged or displaced. Displaced or failed portions of the structure could cause damage to the entire project reach.



Invasive species take over the disturbed area, outcompeting the native seeding, cuttings, and container plants that were installed at time of construction.



A property owner scavenges boulders from the in-channel structures for yard landscaping. All placed and installed features must remain intact throughout the duration of the O&M agreement.

Seeding and container plants do not survive due to circumstances outside the sponsor's control, for example extreme drought, fire, and/or high flows wash material away. Replacement of plant material that does not survive is highly recommended. Consult with an ecologist prior to replacement to confirm failure mechanism, timing, and planting strategies.

The river has compromised the function of the bioengineering or riprap.



Examples of when maintenance is NOT required

Sediment and wood debris are deposited on a floodplain bench. Benches are designed to capture and hold these materials.



Bankfull channel dimension changes and/or minor bank erosion occurs. Minor lateral migration of the bankfull channel is expected as stream channels adjust and natural stream processes occur. Adjustments that do not compromise the project goals do not warrant intervention.



A significant flood event occurs beyond the projects design parameters and undermines or causes failure of installed structures.





Inspections and Reporting

Project sponsors are required to complete inspections:

- Annually, and
- After significant flood events (as defined in the O&M plan) or other circumstances described in the O&M plan, to determine if each project is functioning as designed.

Sponsors must provide a written report of each annual inspection to the NRCS, which includes:

- Date of inspection and names of inspectors/participants
- Specific installations/elements inspected per the O&M plan
- Description of conditions and functionality observed, including photos
- Maintenance work required and a schedule to address needs

Contractor Warranty on Structures and Vegetation

For all construction contracts developed for EWP work, the project sponsor should include language regarding construction guarantees and warranty. In general, the language should note the following:

- Contractor shall guarantee all materials and equipment furnished and work performed for a period of one year from the date of final acceptance.
- Contractor shall further warrant and guarantee for a period of one year from the date of final acceptance that all work is free from any and all defects due to faulty materials and workmanship.

This language should specifically cover defective construction, e.g., improvements that failed due to poor construction practices or failure to follow construction document requirements. Plant materials are generally not included in this warranty, but should be in good health prior to final acceptance of the project. Specific contract language is available for project sponsors from the EWP Technical Assistance Team.

O&M activities must be in accordance with the [NRCS National Operations and Maintenance Handbook](#).

For more information on EWP program requirements, see the [National Emergency Watershed Protection Program Manual](#). Still have questions? Contact Jeff Sickles, RWP Program Manager at jsickles@engineuity-es.com, 303-872-9109.

Attachment: NRCS Example O&M Plan

OPERATION, INSPECTION, & MAINTENANCE PLAN
EWP STREAM RESTORATION PROJECT

Landowner or Local Sponsor:	Larimer County	County:	Larimer
Nearest Town:	Glen Haven, CO		
Prepared by:	Preparer	Date:	12/16/2015

OVERVIEW

A properly maintained streambank is an asset to your property. Estimated life span for this installation is at least 20 years. You can assure and usually increase the life span by effectively operating, inspecting, and maintaining the installation in a timely manner. This document is sometimes referred to as an O&M Plan or an OIM Plan.

GENERAL RECOMMENDATIONS

An effective operation, inspection, and maintenance program includes:

- Visually inspect the bank treatment and any installed structures at least annually, and after heavy rainfall occurs. Repair damages as soon as practical. Check in-stream structures from the bank or a dry location using digital photos and binoculars (if needed). You should not wade in stream or try to inspect the work from a raft or canoe.
- Check all banks, rock, wood, and structures for accelerated weathering, displacement, or significant changes since the original construction. Replace to original grades if necessary.
- Check for scour or excessive erosion of streambanks and stream crossings. Repair back to design grades and lines as soon as possible.
- Inspect vegetation and plantings more frequently during the first year after construction. During the first part of the growing season, check the vegetation every week or two. Maintaining good bank vegetation is important to the success of the project.
- Maintain vigorous growth of desirable vegetation. This includes reseeding, watering, weeding by hand, replanting, mulching, and removal of invasive plants when necessary.
- Investigate settlement or large cracks in the soil, streambanks, or structures to determine their cause and if repairs are needed.
- Maintain fences to control access (if applicable).

- Control livestock on unfenced areas. We recommend that you DO NOT allow animals to walk up and down streambanks or in the stream. If livestock needs water, consider alternate water sources.
- Remove debris that could cause damage to any installed structures or bank treatments.
- Control burrowing animals that are causing damage. Repair any damage caused by their activity.
- Repair any damages caused by vandalism, vehicles, erosion, or livestock.
- We recommend that you DO NOT mow or fertilize the vegetation within 35 feet of the edge of normal water flow.
- Take some photographs of the installation for your own records and to share with NRCS technical representatives. Your feedback will help NRCS improve future installations.
- Monitor the installation as required by permit conditions. Corps of Engineer permits may require you to submit monitoring information annually for a set time frame (sometimes up to 5-years after completion).

SPECIFIC RECOMMENDATIONS FOR YOUR INSTALLATION

Edit the following section for design or site-specific requirements.

- Follow the above general recommendations with emphasis on monitoring and maintaining all planted materials.
- For instream structures (weirs, vanes, J-hooks, deflectors, etc.), replace rocks that have dislodged or washed away. Repair any damage to the streambanks where structures tie-into bank.
- _____
- _____

REFERENCES:

O&M Plans from NRCS Offices in Colorado (2011), Vermont (2009), Oregon (1997), West Virginia, and Michigan.