

Clean Water Service Provider Guidance Document

Chapter 8 – Data Management

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Background

The purpose of this chapter is to outline the process and requirements for tracking and reporting clean water project data managed under Water Quality Restoration Formula Grants (Formula Grants) awarded to Clean Water Service Providers (CWSPs). Formula Grants are intended to fund implementation of non-regulatory actions that will help meet pollutant reduction goals. The goals are based on action required to reach pollution reduction targets identified by applicable total maximum daily loads (TMDLs). Clean water project data are collected by state agencies, federal partners, and local clean water funding administrators/recipients (including CWSPs) and reported to the Vermont Department of Environmental Conservation (DEC) Clean Water Initiative Program (CWIP). These data are compiled into the *Clean Water Initiative Annual Performance Report* to communicate results of state investments in clean water and progress towards TMDL targets. DEC procedures relating to tracking and accounting for pollutant reductions are addressed in DEC's *Standard Operating Procedures (SOPs) for Tracking and Accounting of Phosphorus Reductions*.¹ The Watershed Projects Database (WPD) is a Vermont DEC database that is used to track, review, screen, prioritize, and report on clean water projects identified through DEC Tactical Basin Plans and/or funded through DEC programs.

Responsibilities

CWSPs are responsible for tracking and reporting clean water project data, in coordination with project implementers, for all projects that receive funding under Formula Grants. CWSPs may delegate data tracking and reporting responsibilities to project implementers or other partners as needed. CWSP project data tracking and reporting responsibilities include:

- Ensuring all Formula Grant-funded project data are accurate and up-to-date in WPD
- Using the reporting templates and tools provided by DEC to complete required project data reporting on a regular basis, at least once per quarter
- Communicating project tracking and reporting expectations, data standards, and requirements to sub-grantees

To facilitate CWSP project data tracking and reporting, DEC responsibilities include:

- Hosting and maintaining WPD for project data tracking
- Providing guidance and tools necessary for CWSPs and project implementers to meet the project data tracking and reporting obligations including trainings and instruction resources to support use of required reporting tools and templates.
- Developing and generating database reports and queries to support quarterly and annual reporting and quality assurance/quality control (QA/QC) procedures

¹ View adopted Standard Operating Procedures (SOPs) for tracking and accounting of phosphorous reductions here: <https://dec.vermont.gov/water-investment/cwi/projects/tracking-accounting#SOP>

Project Tracking

Reference to the CWSP Rule - § 39-403 Clean Water Projects. (c) All clean water projects proposed for Formula Grant funding shall be entered into the Agency's watershed projects database.

The following section provides guidance for clean water project tracking, including the junctures that require information to be entered or updated in the DEC's WPD. The scope of tracking activities undertaken by CWSPs consists of managing proposed, funded, and completed project data for projects funded by Formula Grants. A graphic depicting the workflow of WPD tracking activities is presented below:

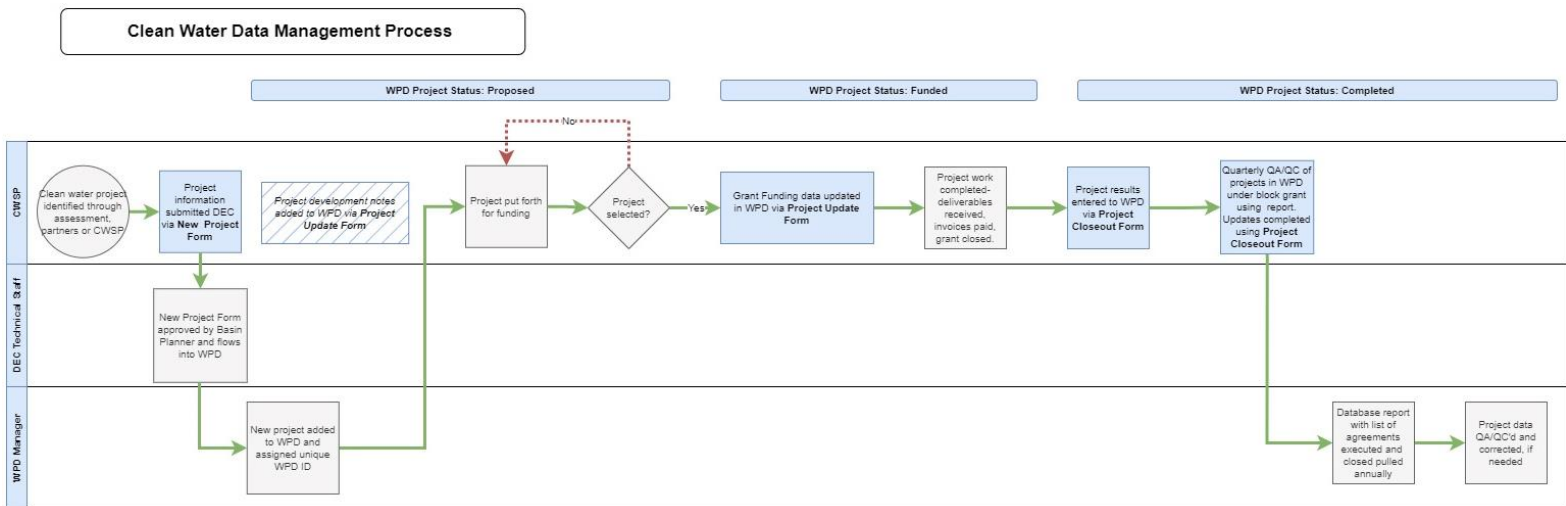


Figure 1: Clean water project data management process under Formula Grants. This process diagram outlines the components of data management expected for an individual project in WPD from identification through project closeout and who is held accountable for that data. This process applies to each phase of a project, from preliminary design to final design to implementation. Blue shaded boxes indicate data entry points, hashed shading and dotted arrows indicate optional elements. While CWSPs are accountable for much of the data entry, tracking, and QA/QC, it is acceptable to designate others (e.g., project implementers, BWQCs, or other partners) to complete this work.

Newly Identified or Proposed Projects

Newly identified clean water projects should be added to WPD at the time of identification. Projects identified through planning or assessment phase work shall be entered into WPD as a deliverable prior to completion of the planning or assessment project. Clean water projects identified outside of a planning or assessment phase project shall be entered into WPD as soon as practicable, but at least prior to applying for Formula Grant funding. Each project entered into WPD is representative of a single project phase, meaning there will be a different WPD entry (and WPD ID number assigned) for preliminary design, final design, and implementation of a project.²

² Data related to operations and maintenance (O&M) of installed clean water projects will be tracked within the implementation phase WPD entry. Guidance on data collection and reporting procedures related to project inspection, verification, operation & maintenance activities will be outlined in the Operation & Maintenance chapter of Act 76 Guidance.

All newly identified clean water projects shall be entered into WPD using the “Clean Water Project – New Project Form” (New Project Form) available through the [ANR Online portal](#).³ New project information may be entered by a CWSP, project manager, or project implementer. Data entered in this form will be reviewed by a Watershed Planner and, upon approval, create a new project entry in WPD. Each new project entered into WPD is assigned a unique identification number (WPD ID). New projects are automatically assigned a status of “proposed” in WPD.

Table 1 includes data fields and definitions required for submission of the New Project Form to establish a record in WPD for a newly identified clean water project. For information on how to use the Clean Water Project Forms in ANR Online, refer to the Clean Water Project Form User Guide (available here: <https://dec.vermont.gov/water-investment/cwi/grants/resources>).

Funded Projects

CWSPs are responsible for tracking and reporting to DEC funding information for clean water projects that are selected to receive Formula Grant funding.⁴ CWSPs should require applicable WPD ID(s) be submitted as part of a funding proposal to facilitate tracking of funding at the project level.

At least once per quarter, CWSPs must ensure:

- All clean water projects selected for funding have a status of either “selected for funding” or “funded” in WPD. The status of a project that has been chosen to receive funding under the Formula Grant, but does not yet have an executed sub-agreement, must be “selected for funding.” The status of a project that has a signed sub-agreement in place must be “funded”.
- Funding amount for all projects with a status of “selected for funding” is representative of the best available budget estimate at the time of project selection.
- Funding amount for all projects with a status of “funded” is representative of total awarded dollars, including any adjustments made via amendment if applicable.
- All clean water projects selected for funding/funded are linked as child projects to the Formula Grant parent project.

The “Clean Water Project – Project Update Form” (Project Update Form) shall be used to enter project funding information and update the status of a project from “proposed” to “selected for funding” or “funded”. The Project Update Form is also used to link a project to a parent project in WPD and to update the dollar amount of an existing agreement in the case of an amendment. Once a project has been selected for funding, DEC recommends that the Project Update Form be used to link follow-on project phases as child projects under the Formula Grant if already in WPD (see Project Relationships in WPD for more information on how and why relationships are tracked in WPD).

Table 2 includes data fields and definitions for information that must be tracked and entered into WPD via the Project Update Form for projects that have been selected for funding or funded. For detailed information on

³ The New Project Form has been developed to replace the use of the Batch Import File (BIF).

⁴ In this chapter, all references to project selection for Formula Grant funding imply selection through the project prioritization and selection process outlined in Chapter 6 of guidance.

how to use the Clean Water Project Forms in ANR Online, refer to the User Guide (available here: <https://dec.vermont.gov/water-investment/cwi/grants/resources>).

Terminated Projects

Occasionally, projects may need to be terminated or only partially completed due to unforeseen circumstances. A WPD project status should be updated from “funded” to “terminated” if a grant agreement was executed but the project scope of work could not move forward, and there are no results to report in WPD.⁵ Project development may be completed during or between project identification and design phases. If project development efforts result in determination that a project is unsuitable to progress to the next phase, any following phases of the project that are already entered into WPD should be updated from a “proposed” to a “terminated” status in WPD. The “terminated” status is reserved for projects that are expected to never move forward due to some type of a fatal flaw (unable to secure permit, unavoidable natural resource conflict identified, etc.).

Project termination is expected to occur infrequently. In the case that a project that was selected for funding under a Formula Grant must be terminated, the CWSP shall inform DEC of the termination circumstances such that DEC can update the project record in WPD. Projects cannot be terminated through the use of the Clean Water Project Forms.

Alternatively, if a grant agreement was executed but the scope of work was only partially completed and there are still results to report, the project should follow project closeout process (see Completed Projects) to update the status to “completed”. In addition, if a project has gone through development efforts and the circumstances that currently prevent the project from moving forward could change in the future, the project should remain with a status of “proposed” and notes can be added to the project record in WPD via the Project Update Form to indicate the current circumstances and a date the project should be reconsidered.

Completed Projects

The “Clean Water Project – Project Closeout Form” (Project Closeout Form) shall be used to report required project data at project completion. Submission of the Project Closeout Form will update the project status in WPD to “pending closeout”. At least once per quarter, CWSPs shall review all projects linked to their Formula Grant that reflect the “pending closeout” status in WPD to ensure records are accurate based on available documentation of the project. CWSPs are responsible for verifying all project closeout information is submitted using the Project Closeout Form and reflected in WPD. Once per quarter, DEC will update the status of projects from “pending closeout” to “completed” in WPD once the CWSP has verified project information is complete, all final deliverables have been received and filed by the CWSP, and the final payments have been issued (see Data Quality Assurance/Quality Control & Verification section for more information on this process.)

Appendix A: Project Data Requirements lists all fields required to be tracked throughout a project and reported to DEC upon project completion. *Note:* the data required to account for estimated phosphorous reduction varies by project type and is listed for Formula Grant eligible project types in Table 4 - Table 8. Final estimated phosphorous reduction will be calculated by DEC using the methods outlined in the *Standard*

⁵ In this case, “results” refers to achieved performance measures and/or achieved phosphorous reductions.

Operating Procedures (SOPs) for Tracking and Accounting of Phosphorus Reductions.⁶ Data required to calculate estimated phosphorus reductions shall be submitted via the Project Closeout Form (when available). If the Project Closeout Form is unavailable, closeout information including final funding information, performance measures achieved, and data required to calculate phosphorus reductions, shall be submitted via a completed copy of the Water Quality Restoration Formula Grant Project Data Tracking Tool.⁷

In addition to tracking project data, the CWSP will be responsible for maintaining files and deliverables associated with clean water projects selected for funding under their Formula Grants. Milestones and deliverables required for each project type are listed in the CWIP Funding Policy Appendix B Project Types Table.⁸ The files listed below shall be submitted as attachments to the Project Closeout Form. All other files associated with the project shall be stored by the CWSP according to their records retention schedule and available to the public upon request.

- Signed or draft O&M plan/agreements
- Preliminary, final, or as-built design(s), if applicable
- Final report(s) from project manager (CWSP, subcontractor, or subgrantee)
- Before and after pictures (implementation phase projects only)
- Documentation of the parameters required to calculate estimated phosphorus reduction, if applicable. Data shall be entered directly into the Project Closeout Form (when available). If the Project Closeout Form is unavailable, a completed copy of the Water Quality Restoration Formula Grant Project Data Tracking Tool will be accepted.

Project Relationships in WPD

CWIP tracks several types of project relationships to link related WPD project entries to each other. Linking projects that are “related” to one another in WPD is useful to easily access information about project phases, identification, and funding. Parent and child project relationships are relative, such that a single WPD entry may be a parent to one or more other projects and also a child to one or more other projects. There are three types of relationships that link projects in WPD: funding relationship, phase relationship, and identification/development relationship. Figure 2 illustrates the possible parent/child relationships tracked in WPD. Not every project will have every relationship.

Funding Relationship: individual projects funded under a block grant (Formula Grants are a block grant) are linked as child projects to the WPD entry for the block grant. In this type of relationship, the block grant WPD entry is the parent project to all projects that are funded under the block grant. A funding relationship may be between the block grant and any other eligible project phase (assessment, project development, preliminary design, final design, implementation). Funding relationships are a one-to-many relationship.

Phase Relationship: project phases are linked with a chain of parent/child relationships to track project progression through phases. For example, this type of relationship links a preliminary design (as parent) to a

⁶ Standard Operating Procedures for Tracking and Accounting of Phosphorus Reductions: <https://dec.vermont.gov/water-investment/cwi/projects/tracking-accounting#SOP>

⁷ The Water Quality Restoration Formula Grant Project Data Tracking Tool is available to download here: <https://dec.vermont.gov/water-investment/statuses-rules-policies/act-76/law-rule-guidance>

⁸ The CWIP Funding Policy and associated appendices are available at the following link: <https://dec.vermont.gov/water-investment/cwi/grants/resources>

final design (as child), and also a final design (as parent) to implementation (as child). Phase relationships are a one-to-one relationship.

Identification/Development Relationship: individual projects that are identified through assessment or planning phase work are linked as child projects to the WPD entry for the assessment. The assessment or planning phase project becomes the parent to all projects that are identified through completion of the project. Projects identified through an assessment most often include preliminary design and final design phase projects, but may in some cases identify implementation phase projects when a design is not required (ex: riparian buffer planting). In the case that project development is funded as a standalone project (as opposed to project development efforts being completed as part of design phase work) and added as an entry in WPD, all projects that are developed through completion of the project development project are linked as children to the project development parent project. Identification/development relationships are a one-to-many relationship.

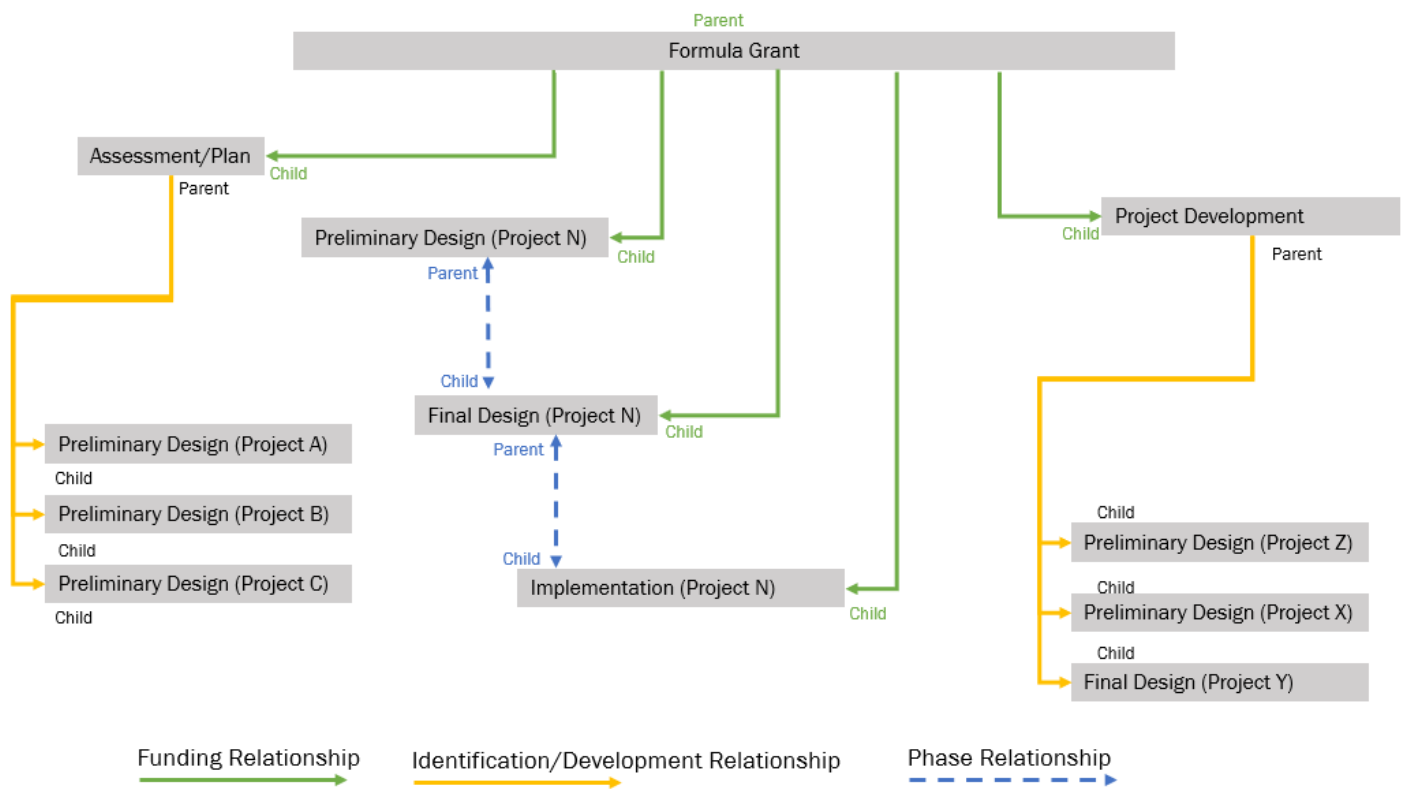


Figure 2: Project Relationships in WPD. This diagram illustrates the three types of project relationships – funding, phase, identification/development – that may be tracked in WPD and how projects might be linked to one another. Not all projects will have all relationships.

Data Quality Assurance/Quality Control & Verification

Each CWSP has a Formula Grant project in WPD (with an assigned WPD ID) that will serve as the parent project for all projects selected for funding under their Formula Grant. The parent project structure will allow all projects selected for funding under the Formula Grant to be linked as child projects and grouped together under the Formula Grant parent project.

Using the WPD Search tool, or other established queries, CWSP can track all child projects connected to their Formula Grant. To access a summary of all projects linked to the Formula Grant, visit the WPD Search tool, search the Formula Grant WPD ID using the “Project ID” field, then click the “Block Grant Summary” button.⁹ The Block Grant Summary lists all child projects linked to the Formula Grant project, including individual WPD ID, status, project name, project type, funding amount, and total estimated phosphorus reduction for the project lifespan (implementation phase projects only). The information in the Block Grant Summary function can be reviewed in a web browser or exported to Excel. A link to detailed information for each child project is available in the Block Grant Summary and can be used to check individual project status, funding amount, funding execution date, location, and project description.

CWSPs will perform Quality Assurance/Quality Control (QA/QC) reviews of project data on a quarterly basis as a component of required quarterly reporting. Each quarter, CWSPs will review all projects linked to their Formula Grant parent project to verify:

- Projects that have been selected for funding under a Formula Grant but do not have executed agreements have a “selected for funding” status. Funding amount reflected in WPD is representative of best available budget estimate.
- Projects that have executed sub-agreements have a status of “funded” and funding amount reflected in WPD is representative of amount awarded by the sub-agreement.
- Projects that have been completed and closed out in the last quarter have a “pending closeout” status. For each project with a status of “pending closeout”:
 - Total project funding recorded in WPD is reflective of actual amount of Formula Grant funds invoiced and paid out at project close, includes any match if applicable, and is consistent with CWSP financial records.
 - Details of individual project entries are accurate and complete (ex: project name and description are representative, project location is within the CWSP basin, etc.)
 - All final deliverables are complete and have been submitted to the CWSP and filed. Required deliverables have been uploaded to WPD.
 - Performance measures have been recorded and are representative of the project outputs.
 - Phosphorus reduction calculation is reasonable (based on estimated phosphorus reduction at time of project proposal and known changes to project from proposal to implementation), and supporting data used to estimate phosphorus reduction is recorded/uploaded to WPD.
 - Outputs and outcomes of the project at completion are represented by the information contained in WPD and meet DEC’s project data standards.

⁹ WPD Search tool is available here: <https://anrweb.vt.gov/DEC/cleanWaterDashboard/WPDSearch.aspx>

Following this quarterly QA/QC process, DEC will update the status of projects verified by the CWSP from “pending closeout” to “complete” in WPD.

CWSPs will also conduct an annual QA/QC review of the Formula Grant parent project data representing all projects funded under their Formula Grant to ensure accurate data reporting in the *Clean Water Initiative Annual Performance Report*.

The annual QA/QC process will require CWSPs to verify, at minimum:

- Total funding awarded to all projects funded under Formula Grant matches CWSP financial records.
- Number of projects with “funded” and “completed” status is reflective of CWSP Formula Grant funding awarded to date.
- Total estimated phosphorus reduction achieved through projects with “completed” status matches CWSP expectations based on projects as proposed and implemented.

Appendix A: Project Data Requirements

The following section defines the project level data requirements that shall be maintained by the CWSP and submitted through quarterly and annual reporting to facilitate determination of clean water project outcomes achieved and pollutant reduction credit awarded. Individual project type and practice type eligibility is subject to the eligibility screening requirements outlined in the CWIP Funding Policy and Chapter 6 of Act 76 Guidance.

Project Information

At minimum, each project shall be recorded in the WPD to reflect the following information prior to being selected to receive Formula Grant funding. Any project level reporting shall be associated with the assigned WPD ID for the project.

Table 1: Project Information Requirements

| Field | Description |
|---|---|
| WPD ID | Assigned project identification number, which can be found using the Watershed Project Database search: https://anrweb.vt.gov/DEC/cleanWaterDashboard/WPDSearch.aspx |
| Project Manager or Sub-Grantee | Recipient of the project funding, sub-contractor, or project manager on the project (limited to 200 characters). |
| Project Name | Descriptive title that indicates something distinctive about the project, include project type/phase and location (e.g., West Windsor Town Forest Riparian Buffers) (limited to 200 characters) |
| Project Type | Select the most representative project type. A list of project types is available in Table 4 - Table 8. |
| Project Description | Briefly describe the reason for the project and project goals (1-3 sentences). |
| Latitude in Decimal Degrees | If this project has a specific location, enter the latitude for the center point of the project in Decimal Degrees (e.g., 44.35347). Lat/lon not required for townwide or regionally focused projects. |
| Longitude in Decimal Degrees | If this project has a specific location, enter the longitude in Decimal Degrees, this should be a negative value (e.g., -72.89561). Lat/lon not required for townwide or regionally focused projects. |
| Town, County, Region | Town(s), county(ies), or region(s) the project is located in. Only highest resolution representative spatial scale location data is required. For example, if a project location is within a single town, do not also record the county. |
| Watershed Subbasin (Watershed Boundary ID) | Projects may fall into one watershed or multiple watersheds. Do not enter multiple levels of location data. For example, if a project is located in the "8 – Upper Mad River Tributaries (VT08-20)", do not also enter "8 – Winooski River Basin (VT08-00)" or "Lake Champlain Basin". The Water Quality Screening Tool can be used to identify the subbasin of a project: https://anrweb.vt.gov/DEC/cleanWaterDashboard/ScreeningTool.aspx |

Funding Information

Once a project has been selected for Formula Grant funding, the following data points should be tracked for each selected project, and applicable information added to each project record in WPD.

Table 2: Funding Information Requirements

| Field | Description |
|---|---|
| Sub-Grant Agreement ID number | Agreement number for the project or sub-grant agreement. |
| Date Project Selected for Funding | The date the project was selected for funding based on BWQC meeting/approval date, if available. |
| Date Sub-Grant Agreement Executed | Date of sub-grant agreement execution. |
| Formula Grant Funding Amount Awarded | Total dollar amount provided in the sub-grant or contract for the project. This amount can be updated at project closeout to the actual amount spent. |

For projects that are not selected to receive funding, notes may be added to the project description in WPD via the Project Update Form to detail the reasoning the project was not selected.

Closeout Information

Upon project completion, each project must report on performance measures achieved, project completion date, and data required to calculate pollution reduction (if applicable). Data required for closeout varies by project type. Table 4 – Table 8 provide specific performance measures and pollutant reduction data requirements for each project type that is eligible to receive Formula Grant funding.

Table 3: Closeout Information Requirements

| Field | Description |
|---|---|
| Formula Grant Funds Expended | Total eligible project costs incurred, invoiced, and paid out. |
| Match/Leverage Amount | Final amount of leveraged funds, match or in-kind contribution to the project, if any. |
| Match/Leverage Source | Indicated the source of any reported leveraged funds, match or in-kind contribution. |
| Date Project Completed | Date of receipt and/or approval of all final deliverables. |
| Performance Measure(s) Achieved | See Table 4 – Table 8 for performance measure(s) applicable to each project type. |
| Performance Measure(s) Value(s) | See Table 4 – Table 8 for performance measure(s) applicable to each project type. |
| Data Required to Calculate Pollutant Reduction | Required for implementation phase projects only , see Table 4 – Table 8 for data requirements applicable to each project type/practice type. |

Project and Practice Type Data Requirements^{10,11}

Table 4: Cross-Sector Project Types and Data Requirements

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Pollutant Reductions |
|---------------------|---------------|---|--|--|
| Project Development | N/A | Scoping work on any non-regulatory project type to determine feasibility, constraints, and overall suitability for implementing the project. This typically includes reviewing site assessments or other project identification tools and prioritized plans, conducting site visits, refining project scope and phasing, developing conceptual maps and drawings, estimating pollutant reduction benefits, confirming landowner/municipal interest, identification of – and possible engagement with – other stakeholders, partners, and likely concerned parties (e.g., neighbors, funders, regulators), identifying the prospective responsible operations and maintenance party, consulting with DEC staff, and determining project budget and permit needs (local, state and federal), natural and cultural resource constraints, co-benefits, and other project considerations, site constraints and feasibility factors (e.g., rights-of-way, infrastructure, invasive species presence, hazardous materials concerns) in advance of design or between design phases. | Number of projects explored for design and/or implementation | N/A |

¹⁰ Please refer to the accompanying Water Quality Restoration Formula Grant Project Data Tracking Tool for practice level data format requirements.

¹¹ All possible performance measures for each project type are listed. Not all may be required for any single project.

Table 5: Developed Lands Project Types and Data Requirements

Note: to be eligible for Formula Grant funding, projects implemented on developed lands must be non-regulatory. Please see Chapter 6 of Act 76 Guidance for more details on funding eligibility.

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Pollutant Reductions |
|---|---------------|--|--|--|
| Stormwater Master Plan | N/A | <p>Assessment of a geographic area (sub watershed or town) to determine where stormwater pollution is generated, and identify where it can be captured and removed efficiently by stormwater management practices that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from hard surfaces associated with developed/urban/suburban areas. Identified practices should be a listed Tier 1 or 2 practice in the most updated Stormwater Management Manual. Work includes identification and prioritization of practices to target cost effective actions that address/mitigate stormwater runoff, while preserving natural features and functions, with an emphasis on low impact green stormwater infrastructure. Prioritization must include use of Vermont's unified scoring matrix for Stormwater Master Plans. Focus must be on non-regulatory project opportunities.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Permitinformation/2017%20VSMM Rule and Design Guidance 04172017.pdf) https://dec.vermont.gov/water-investment/cwi/solutions/developed-lands/municipal-stormwater)</p> | <p>Acres assessed/covered by plan</p> <p>Number of projects identified</p> | N/A |
| Stormwater – Preliminary Engineering Design | N/A | <p>Preliminary design of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from hard surfaces associated with developed/urban/suburban areas. Work must result in at least 30% design of project. Refer to most updated Vermont Stormwater Management Manual for more information on Tier 1 and Tier 2 practices.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Permitinformation/2017%20VSMM Rule and Design Guidance 04172017.pdf)</p> | <p>Number of preliminary (30%) designs completed</p> | N/A |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Pollutant Reductions |
|---------------------------------------|-------------------------|---|--|---|
| Stormwater – Final Engineering Design | N/A | <p>Final design of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from hard surfaces associated with developed/urban/suburban areas. Work includes preparing permit application(s) and documentation of operation and maintenance plan(s). Refer to most updated Vermont Stormwater Management Manual for more information on Tier 1 and Tier 2 practices.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Permitinformation/2017%20VSMM Rule and Design Guidance 04172017.pdf)</p> | Number of final (100%) designs completed | N/A |
| Stormwater – Implementation | Infiltration Trench | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides storage of runoff using the void spaces within the soil, sand, gravel mixture within the trench for infiltration into the surrounding soils.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> <p>Infiltration rate</p> |
| Stormwater – Implementation | Subsurface Infiltration | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides storage of runoff using the combination of storage structures and void spaces within the washed stone within the system for infiltration into the surrounding soils.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> <p>Infiltration rate</p> |
| Stormwater – Implementation | Surface Infiltration | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides storage of runoff through surface ponding (e.g., basin or swale) for subsequent infiltration into the underlying soils.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> <p>Infiltration rate</p> |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Pollutant Reductions |
|-----------------------------|---|--|--|---|
| Stormwater – Implementation | Rain Garden, Bioretention (no underdrains) | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides storage of runoff through surface ponding and possibly void spaces within the soil, sand, washed stone mixture that is used to filter runoff prior to infiltration into underlying soils.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> <p>Infiltration rate</p> |
| Stormwater – Implementation | Rain Garden, Bioretention (with underdrain) | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides storage of runoff by filtering through an engineered soil media. The storage capacity includes void spaces in the filter media and temporary ponding at the surface. After runoff passes through the filter media it discharges through an under-drain pipe.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> |
| Stormwater – Implementation | Gravel Wetland | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides surface storage of runoff in a wetland cell that is routed to an underlying saturated gravel internal storage reservoir (ISR). Outflow is controlled by an orifice that has its invert elevation equal to the top of the ISR layer and provides retention of at least 24 hours.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> |
| Stormwater – Implementation | Porous Pavement (with infiltration) | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides filtering of runoff through a filter course and temporary storage of runoff within the void spaces of a subsurface gravel reservoir prior to infiltration into subsoils.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> <p>Infiltration rate</p> |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Pollutant Reductions |
|-----------------------------|--|--|--|---|
| Stormwater – Implementation | Porous Pavement (with impermeable underlining or underdrain) | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides filtering of runoff through a filter course and temporary storage of runoff within the void spaces prior to discharge by way of an underdrain.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> <p>Filter course depth</p> |
| Stormwater – Implementation | Sand Filter (with underdrain) | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides filtering of runoff through a sand filter course and temporary storage of runoff through surface ponding and within void spaces of the sand and washed stone layers prior to discharge by way of an underdrain.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> |
| Stormwater – Implementation | Wet Pond | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides treatment of runoff by routing through permanent pool.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> |
| Stormwater – Implementation | Extended Dry Detention Basin | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Provides temporary detention storage for the design storage volume to drain in 24 hours through multiple outlet controls.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> |
| Stormwater – Implementation | Grass Conveyance Swale | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Conveys runoff through an open channel vegetated with grass. Primary removal mechanism is infiltration.</p> | <p>Acres of existing impervious surface treated</p> <p>Acres of impervious surface removed (if applicable)</p> | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> <p>Storage volume</p> |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Pollutant Reductions |
|---|--------------------------------|--|---|--|
| Stormwater – Implementation | Hydrodynamic (Swirl) Separator | <p>Implementation of high priority Tier 1 or Tier 2 stormwater management practice(s) that collect, store, infiltrate, and filter runoff that contains nutrient, sediment and/or other contaminant pollution from existing impervious, hard (e.g., paved) surfaces associated with developed/urban/suburban areas.</p> <p>Devices designed to improve quality of stormwater runoff by physically removing sediment and nutrients. Must be a stand-alone practice to receive P reduction credit, if included as pretreatment for another practice, no additional credit is given.</p> | Acres of existing impervious surface treated | <p>Latitude, longitude</p> <p>Developed impervious acres treated</p> <p>Developed pervious acres treated</p> |
| Road Project – Preliminary Engineering Design | N/A | <p>Preliminary design of high priority road-related erosion and drainage treatment practices to divert, collect, store, infiltrate, and/or filter runoff from transportation infrastructure (e.g., ditches, turnouts, check dams, culvert armoring). Practices should be located on hydrologically connected gravel and/or paved road segments not/partially meeting Municipal Roads General Permit (MRGP) standards. Practices should be listed in the MRGP and designed to make the road segment(s) meet MRGP standards. Work must result in at least 30% design of project. Note that if a roads project includes a stream crossing improvement, the Floodplain/Stream Restoration project type should also be followed including applicable definitions, milestones, deliverables, and programmatic reviews.</p> <p>More information: https://dec.vermont.gov/watershed/stormwater/permit-information-applications-fees/municipal-roads-program</p> | Number of preliminary (30%) designs completed | N/A |
| Road Project – Final Engineering Design | N/A | <p>Final design of high priority road-related erosion and drainage treatment practices to divert, collect, store, infiltrate, and/or filter runoff from transportation infrastructure (e.g., ditches, turnouts, check dams, culvert armoring). Practices should be located on hydrologically connected gravel and/or paved road segments not/partially meeting Municipal Roads General Permit (MRGP) standards. Practices should be listed in the MRGP and designed to make the road segment(s) meet MRGP standards. Work includes preparing permit application(s) and documentation of operation and maintenance plan(s.) Note that if a roads project includes a stream crossing improvement, the Floodplain/Stream Restoration project type should also be followed including applicable definitions, milestones, deliverables, and programmatic reviews.</p> <p>More information: https://dec.vermont.gov/watershed/stormwater/permit-information-applications-fees/municipal-roads-program</p> | Number of final (100%) designs completed | N/A |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Pollutant Reductions |
|--------------------------------|---|--|--|---|
| Road Project – Implementation | Road Erosion Remediation on Gravel and Paved Open Drainage (Uncurbed) Roads | <p>Implementation of high priority road-related erosion and drainage treatment practices to divert, collect, store, infiltrate, and/or filter runoff from transportation infrastructure (e.g., ditches, turnouts, check dams, culvert armoring). Practices should be located on hydrologically connected gravel and/or paved road segments not/partially meeting Municipal Roads General Permit (MRGP) standards. Practices should be listed in the MRGP and designed to make the road segment(s) meet MRGP standards. Road segments identified and improved in the absence of a local road erosion inventory (REI) must perform a pre and post segment assessment using the REI protocols. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction. Note that if a roads project includes a stream crossing improvement, the Floodplain/Stream Restoration project type should also be followed including applicable definitions, milestones, deliverables, and programmatic reviews.</p> <p>More information: https://dec.vermont.gov/watershed/stormwater/permit-information-applications-fees/municipal-roads-program</p> | <p>Number of drainage structures installed/repaired¹²</p> <p>Linear feet of road drainage improved</p> | <p>Road segment ID (if available)</p> <p>Road type (paved, unpaved, class 1-4 equivalent)</p> <p>Road slope</p> <p>Project length</p> <p>Midpoint latitude, longitude</p> <p>Municipal Roads General Permit compliance status (or equivalent for private roads) before and after implementation</p> |
| Road/Stormwater Gully – Design | N/A | <p>Preliminary and final design of high priority practices that stabilize an eroding stormwater gully from outlet through a flow path to connection with a surface water. Outlet and gully stabilization projects restore eroding channels to a state where sediment loss is minimized or eliminated. Restoration techniques include but are not limited to rock aprons, plunge pools, riprap, step pools, check dams, armored turnouts, outlet headwalls, seeding/mulching, and vegetated or structural bank and slope stabilization techniques. Stormwater and road outlet gully channels must be caused or exacerbated by human activity that concentrates stormwater flow onto steep slopes and channels must not otherwise be considered intermittent or perennial streams by the DEC Rivers Program. Project must address upstream stormwater flow for in-gully work to be eligible. Work includes preparing permit application(s) and documentation of operation and maintenance plan(s).</p> | <p>Number of preliminary (30%) designs completed (if applicable)</p> <p>Number of final (100%) designs completed</p> | |

¹² This refers to smaller erosion control structures/retrofits such as culvert headers (stabilize where water enters/leaves existing culverts) and water bars. This does not include upgrades/replacements of road drainage culverts or stream culverts. Watershed crews may use this measure.

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Pollutant Reductions |
|--|---------------|---|--------------------------------------|--|
| Road/Stormwater Gully – Implementation | N/A | Implementation of high priority practices that stabilize an eroding stormwater gully from outlet through a flow path to connection with a surface water. Outlet and gully stabilization projects restore eroding channels to a state where sediment loss is minimized or eliminated. Restoration techniques include but are not limited to rock aprons, plunge pools, riprap, step pools, check dams, armored turnouts, outlet headwalls, seeding/mulching, and vegetated or structural bank and slope stabilization techniques. Stormwater and road outlet gully channels must be caused or exacerbated by human activity that concentrates stormwater flow onto steep slopes and channels must not otherwise be considered intermittent or perennial streams by the DEC Rivers Program. Project must address upstream stormwater flow for in-gully work to be eligible. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction. | Cubic feet of gully erosion restored | Latitude, longitude Volume of gully erosion Estimated age of gully erosion |

Table 6: Natural Resources Project Types and Data Requirements

Note: natural resource projects implemented on jurisdictional farms or farmland are subject to eligibility review by the Agency of Agriculture Farms and Markets. Please see Chapter 6 of Act 76 Guidance for more details on funding eligibility.

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Quantify Pollutant Reductions |
|--|---------------------------------------|---|---|--|
| Dam Removal – Preliminary Engineering Design | N/A | Preliminary design of a high priority dam removal project to restore hydrologic connectivity of surface waters. May involve alternatives analysis. Work must result in at least 30% design of project. | Number of preliminary (30%) designs completed | N/A |
| Dam Removal – Final Engineering Design | N/A | Final design of high priority dam removal project to restore hydrologic connectivity of surface waters. Work includes preparing permit application(s) and documentation of operation and maintenance plan(s). | Number of final (100%) designs completed | N/A |
| Dam Removal – Implementation | N/A | Implementation of high priority dam removal project to restore hydrologic connectivity of surface waters. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction. | Acres of floodplain restored Linear feet of stream restored Stream miles reconnected for stream equilibrium /aquatic organism passage | See Table 7 |
| Floodplain/ Stream Restoration – Preliminary Engineering Design | N/A | Preliminary design of high priority stream/river and floodplain restoration projects to restore the stream/river to least erosive condition (i.e., equilibrium condition) and improve habitat. Restoration work includes channel/floodplain modification to improve equilibrium dimensions/connections OR removal/retrofit of river corridor/floodplain encroachments or instream structures. Work must result in at least 30% design of project. | Number of preliminary (30%) designs completed | N/A |
| Floodplain/ Stream Restoration – Final Engineering Design | N/A | Final design of high priority stream/river and floodplain restoration projects to restore the stream/river to least erosive condition (i.e., equilibrium condition) and improve habitat. Restoration work includes channel/ floodplain modification to improve equilibrium dimensions/ connections OR removal/ retrofit of river corridor/ floodplain encroachments or instream structures. Work includes preparing permit application(s) and documentation of operation and maintenance plan(s). | Number of final (100%) designs completed | N/A |
| Floodplain/ Stream Restoration – Implementation | Floodplain/Stream Channel Restoration | Implementation of high priority stream/river and floodplain restoration projects to restore the stream/river to least erosive condition (i.e., equilibrium condition) and improve habitat. Restoration work includes channel/ floodplain modification to improve equilibrium dimensions/ connections. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction. | Acres of floodplain reconnected/restored Linear feet of stream restored Acres of riparian buffer restored | See Table 7 |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Quantify Pollutant Reductions |
|--|--|---|--|---|
| Floodplain/ Stream Restoration – Implementation | In-stream Culvert or Encroachment Retrofit/Removal | Implementation of high priority stream/river and floodplain restoration projects to restore the stream/river to least erosive condition (i.e., equilibrium condition) and improve habitat. Restoration work includes removal/ retrofit of river corridor/ floodplain encroachments or instream structures. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction. | Stream miles reconnected for stream equilibrium/aquatic organism passage Number of river corridor/ floodplain encroachments removed or retrofitted | See Table 7 |
| Forestry – Design | N/A | Final design of high priority Acceptable Management Practices (AMPs) to address legacy forest erosion from forest and logging roads, trails, and/or stream crossing to control nutrient and sediment pollution at prioritized locations. Work includes preparing permit application(s) and documentation of operation and maintenance plan(s). More information: (https://fpr.vermont.gov/forest/managing-your-woodlands/acceptable-management-practices) | Number of final (100%) designs completed | N/A |
| Forestry – Implementation | Forest Road and Trail Erosion Control | Implementation of high priority Acceptable Management Practices (AMPs) to address legacy forest erosion from forest and logging roads, trails, and/or stream crossing to control nutrient and sediment pollution at prioritized locations. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction. More information: (https://fpr.vermont.gov/forest/managing-your-woodlands/acceptable-management-practices) | Linear feet of road/trail drainage improved Number of stream crossings improved Stream miles reconnected for stream equilibrium/aquatic organism passage | Latitude, longitude Forest Road Type Length of road remediated Road Average Slope (%) Road Erosion Inventory (REI) score pre- and post- restoration |
| Lake Wise Assessment – Project Identification | N/A | Property-level assessments of lake shorelands to identify areas with the highest levels of nutrient/sediment pollution and habitat degradation for targeting pollution prevention and natural resources restoration projects. Work includes project identification and prioritization to target cost effective actions. Identified structural practices should be listed in the Vermont Bioengineering Manual or otherwise have support from the Vermont DEC Lakes and Ponds Program. More information: (https://dec.vermont.gov/sites/dec/files/documents/BioEngineeringManual_Final.pdf) | Acres assessed/covered by plan Number of projects identified | N/A |
| Lake Watershed Action Plan | N/A | Lake watershed-scale assessment to identify the highest stressors that are resulting in water quality and habitat degradation. LWAP results in a prioritized list of projects and strategies to address the sources of pollution and habitat degradation identified in the assessment. | Acres assessed/covered by plan Number of projects identified | N/A |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Quantify Pollutant Reductions |
|--|---------------------|--|---|--|
| Lake Shoreland – Preliminary Engineering Design | N/A | <p>Preliminary design of high priority lake shoreland habitat restoration projects and/or lakeshore nutrient/sediment pollution reduction structural practices at priority locations within 250 feet of a lake shore. Designed practices must be listed in the Vermont Bioengineering Manual, or otherwise have support from the Vermont DEC Lakes and Ponds Program. Work must result in at least 30% design of project.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/documents/BioEngineeringManual_Final.pdf </p> | Number of preliminary (30%) designs completed | N/A |
| Lake Shoreland – Final Engineering Design | N/A | <p>Final design of high priority lake shoreland habitat restoration projects and/or lakeshore nutrient/sediment pollution reduction structural practices at priority locations within 250 feet of a lake shore. Work includes preparing permit application(s) and documentation of operation and maintenance plan(s). Designed practices must be listed in the Vermont Bioengineering Manual or otherwise have support from the Vermont DEC Lakes and Ponds Program.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/documents/BioEngineeringManual_Final.pdf </p> | Number of final (100%) designs completed | N/A |
| Lake Shoreland – Implementation | Native Revegetation | <p>Implementation of high priority lake shoreland habitat restoration projects and/or lakeshore nutrient/sediment pollution reduction structural practices at priority locations, within 250 feet of a lake shore. Practices must be listed in the Vermont Bioengineering Manual or otherwise have support from the Vermont DEC Lakes and Ponds Program. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/documents/BioEngineeringManual_Final.pdf </p> <p>Conversion of developed pervious (e.g., lawns) land uses to native vegetation by the implementation of “no mow” zones or native shrub plantings. Over time, natural succession will allow the area to return to vegetative cover consisting of a mix of trees, shrubs, saplings, and groundcover.</p> | Acres of native revegetation | Acres of native revegetation TMDL drainage area |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Quantify Pollutant Reductions |
|--|---------------------------------------|--|---|--|
| Lake Shoreland – Implementation | Tree Canopy Expansion | <p>Implementation of high priority lake shoreland habitat restoration projects and/or lakeshore nutrient/sediment pollution reduction structural practices at priority locations, within 250 feet of a lake shore. Practices must be listed in the Vermont Bioengineering Manual or otherwise have support from the Vermont DEC Lakes and Ponds Program. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/documents/BioEngineeringManual_Final.pdf)</p> <p>Tree plantings on developed land (pervious or impervious) that result in an increase in tree canopy but are not intended to result in forest-like conditions. Trees do not need to be planted contiguously and there is no minimum density requirement. The trees cannot be part of a forested riparian buffer or structural stormwater BMP, and the replacement of existing trees is not eligible for credit.</p> | Number of trees planted | <p>Number of trees planted</p> <p>TMDL drainage area</p> |
| Lake Shoreland – Implementation | Stormwater BMPs | <p>Implementation of high priority lake shoreland habitat restoration projects and/or lakeshore nutrient/sediment pollution reduction structural practices at priority locations, within 250 feet of a lake shore. Practices must be listed in the Vermont Bioengineering Manual or otherwise have support from the Vermont DEC Lakes and Ponds Program. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/documents/BioEngineeringManual_Final.pdf)</p> <p>Implementation of stormwater BMP projects and/or nutrient/sediment pollution reduction practices at priority locations on lake shoreland.</p> | Refer to applicable stormwater BMPs above | Refer to applicable stormwater BMPs above |
| Lake Shoreland – Implementation | Bioengineered Shoreline Stabilization | <p>Implementation of high priority lake shoreland habitat restoration projects and/or lakeshore nutrient/sediment pollution reduction structural practices at priority locations, within 250 feet of a lake shore. Practices must be listed in the Vermont Bioengineering Manual or otherwise have support from the Vermont DEC Lakes and Ponds Program. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/documents/BioEngineeringManual_Final.pdf)</p> <p>Implementation of shoreline stabilization practices using a combination of biodegradable materials and vegetative plantings to naturally stabilize slopes.</p> | Linear feet of lake shoreline restored | <p>Length of shoreline stabilized</p> <p>Average bank height prior to restoration</p> <p>Average shoreline recession rate prior to restoration</p> |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Quantify Pollutant Reductions |
|---|---------------------|---|---|--|
| Lake Shoreland – Implementation | Drainage Structures | <p>Implementation of high priority lake shoreland habitat restoration projects and/or lakeshore nutrient/sediment pollution reduction structural practices at priority locations, within 250 feet of a lake shore. Practices must be listed in the Vermont Bioengineering Manual or otherwise have support from the Vermont DEC Lakes and Ponds Program. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.</p> <p>More information: https://dec.vermont.gov/sites/dec/files/documents/BioEngineeringManual_Final.pdf)</p> <p>Implementation of lake shoreland restoration projects and/or lakeshore nutrient/sediment pollution reduction practices that are not considered stormwater BMPs at priority locations on lake shoreland.</p> | Number of drainage structures installed/repaired | N/A |
| Stream Geomorphic Assessment Phase 1 | N/A | Remote sensing assessment of rivers/streams at the watershed scale to divide rivers/streams into reaches and provide an initial review of stream reach condition. May involve utilization of the Functioning Floodplains Initiative Tool. | Stream miles assessed/covered by plan | N/A |
| Stream Geomorphic Assessment Phase 2 | N/A | Field based assessments of stream reaches to determine current geomorphic and habitat conditions and to determine potential management needs and strategies to restore stream to least erosive form over time (i.e., equilibrium). Could be done in conjunction with a Phase 1 Stream Geomorphic Assessment . Work includes project identification and prioritization to target cost effective actions. | Stream miles assessed/covered by plan Number of projects identified | N/A |
| River Corridor / Wetland Easement – Design | N/A | Evaluation of potential river corridor easement projects identified in an assessment that will remediate river instability that is responsible for erosion conflicts, increased sediment and nutrient loading, and a reduction in river habitat. Work includes determining landowner interest, site/design considerations, and overall suitability for participation in the River Corridor Easement Program. | Acres of river corridor and/or wetland scoped for easement Number of projects identified | N/A |
| River Corridor / Wetland Easement – Implementation | N/A | Protection in perpetuity of a high priority river corridor and wetlands. River Corridor Easements (RCEs) allow for passive restoration of channel stability by allowing natural erosive forces of the river to establish its least erosive form over time (i.e., equilibrium condition). Wetland Easements (WEs) allow for passive restoration and protection of wetlands that are currently or previously impacted by land use activities, or of high quality, to ensure long term protection. Requires implementation of land use practices promoting water quality and encouraging flood resilience; landowner sells channel management rights; no new structures/development can occur within the corridor; a 50-foot river buffer of native woody vegetation is established that moves with the river. | Acres of riparian corridor and/or wetland conserved Linear feet of riparian corridor conserved | See Table 7 |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Quantify Pollutant Reductions |
|---|---------------|---|--|---|
| Riparian Buffer Planting | N/A | Planting of native woody trees and shrubs within buffer area of rivers/streams, wetlands, and/or lakes. Planting results in a minimum average buffer width of 35-feet and a minimum density of 300 stems per acre. Buffer supports restoration of river corridor/floodplain, wetland and/or lakeshore, filters nutrient and sediment pollution from runoff, and provides habitat benefits. Includes riparian plantings on agricultural lands. Work includes site identification, planting plan development, materials sourcing, site preparation, and planting installation. Sites will be selected for their benefits to water quality and must meet approval of the State (local DEC River Scientist and Basin Planner). Sites will be stable, proximate to water, and high-priority. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to planting. | Acres of riparian corridor buffer planted/restored Linear feet of riparian corridor buffer planted/restored | Latitude, longitude Land use conversion credit: Buffer planting area (acres) Buffer planting area prior land use Overland flow treatment credit: Land use(s) of upland drainage area (drainage area = 5*buffer planting area) Stream stability credit: See Table 7 |
| Wetland Restoration – Preliminary Engineering Design | N/A | Preliminary design of wetland and buffer area restoration and protection projects to promote water quality benefit, encourage flood resiliency, and provide habitat benefits. Work must result in at least 30% design of project. | Number of preliminary (30%) designs completed | N/A |
| Wetland Restoration – Final Engineering Design | N/A | Final design of wetland and buffer area restoration and protection projects to promote water quality benefit, encourage flood resiliency, and provide habitat benefits. Work may include securing permit(s) and operation and maintenance plan agreements, and final stewardship agreement(s). | Number of final (100%) designs completed | N/A |
| Wetland Restoration – Implementation | N/A | Implementation of high priority wetland and buffer area restoration and protection projects to promote water quality benefit, encourage flood resiliency, and provide habitat benefits. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction. | Acres of wetland restored | See Table 7 |

Table 7: Data Required to Calculate Phosphorus Reductions for Floodplain and Stream Restoration Project Types.

Note: Not all projects will require every data point. Please consult with DEC technical staff to ensure appropriate project level data collection. Use the [Water Quality Project Screening Tool](#) to find the contact information for the appropriate technical staff based on the location of the project.

| Component | Data Requirement | Description |
|-------------------------|--|--|
| Floodplain Connectivity | River Corridor ID(s) | Identification number based on the Vermont Stream Geomorphic data network codes |
| | Unconstrained River Corridor Area (acres) | The proposed area of the river corridor that is free to flood without damage to property or infrastructure. This value should not exceed the total river corridor area. |
| | Robust Protection Area (acres) | The additional area of robust protections such as river corridor easements due to project implementation. This value is typically positive to indicate an increase in robust protection area. |
| | Moderate Protection Area (acres) | The change in area of land with moderate protections. |
| | Low Protection Area (acres) | The change in area of land with low protections. This value is typically negative to indicate a reduction in low protection land. |
| | No Protection Area (acres) | The change in area of no protections due to project implementation. This value is typically negative to indicate a reduction in non-protected land. |
| | River Corridor Area (acres) | Sum of robust, moderate, low and no protection areas should not exceed total river corridor area minus existing unconstrained river corridor area. |
| | Naturally Vegetated Buffer Area (acres) | The proposed area of additional woody vegetation being added as a result of project implementation. Value should not exceed 50-ft riparian buffer area minus existing naturally vegetated buffer area. |
| | River Corridor Incision Ratio | The proposed incision ratio after project implementation. Value should not be less than 1 or more than existing incision ratio. |
| | Area with Vertical Change (acres) | The proposed area where incision ratio change will improve vertical connectivity. Value should not exceed total river corridor area minus existing unconstrained river corridor area. |
| Floodplain Storage | Reach Connectivity | Existing lateral meander connectivity score (high, medium, low). |
| | Project Area Connectivity | Anticipated post-project connectivity (high, medium, low). Ex: if post-implementation incision ratio is less than 1.2, post-project connectivity should be "high". |
| | Project Acres | Area of added floodplain storage resulting from project implementation. |
| Stream Connectivity | Stream ID | Identification number based on the Vermont Stream Geomorphic data network codes |
| | Road Disconnection in Project (miles) | The length of road that is proposed to be disconnected from the hydrologic flow path due to project implementation. |
| | Agricultural Land Disconnection in Project (acres) | The area of agricultural fields that is proposed to be disconnected from the hydrologic flow path due to project implementation. |
| | Stream Segment Incision Ratio | Enter the anticipated incision ratio after project implementation. Value should not be less than 1 or greater than existing incision ratio. |

Table 8: Agricultural Project Types and Data Requirements

Note: agricultural projects are only eligible for Formula Grant funding if implemented on non-jurisdictional (not subject to the Required Agricultural Practices) farms or farmland. Please see Chapter 6 of Act 76 Guidance for more details on funding eligibility.

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Phosphorus Reductions |
|---|---------------|--|---|---|
| Agricultural Pollution Prevention - Preliminary Design | N/A | <p>Design of high priority agricultural best management practices, in alignment with NRCS Practice Standards (if applicable), that reduce pollutants (e.g., nutrients, pathogens, sediment) and improve soil health. Excludes riparian plantings on agricultural lands and annual agronomic practices. Project eligibility is limited to land where owner or operator is not required to meet the Required Agricultural Practices (RAPs). Work includes preparing permit application(s) and documentation of operation and maintenance plan(s.)</p> <p>More information: https://www.nrcs.usda.gov/resources/guides-and-instructions/field-office-technical-guides) https://agriculture.vermont.gov/rap</p> | Number of preliminary (30%) designs completed | NA |
| Agricultural Pollution Prevention - Final Design | N/A | <p>Design of high priority agricultural best management practices, in alignment with NRCS Practice Standards (if applicable), that reduce pollutants (e.g., nutrients, pathogens, sediment) and improve soil health. Excludes riparian plantings on agricultural lands and annual agronomic practices. Project eligibility is limited to land where owner or operator is not required to meet the Required Agricultural Practices (RAPs). Work includes preparing permit application(s) and documentation of operation and maintenance plan(s.)</p> <p>More information: https://www.nrcs.usda.gov/resources/guides-and-instructions/field-office-technical-guides) https://agriculture.vermont.gov/rap)</p> | Number of final designs (100%) completed | NA |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Phosphorus Reductions |
|---|-------------------------------------|--|---|--|
| Agricultural Pollution Prevention - Implementation | Barnyard/Production Area Management | <p>Implementation of high priority agricultural best management practices, in alignment with NRCS Practice Standards (if applicable), that reduce pollutants (e.g., nutrients, pathogens, sediment) and improve soil health. Excludes riparian plantings on agricultural lands and annual agronomic practices. Project eligibility is limited to land where owner or operator is not required to meet the Required Agricultural Practices (RAPs). Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.</p> <p>More information: https://www.nrcs.usda.gov/resources/guides-and-instructions/field-office-technical-guides) https://agriculture.vermont.gov/rap)</p> <p>Exclusion of clean water runoff from the production area and management of the remaining runoff in a way that minimizes its pollution. Production area includes barnyards, heavy-use areas, waste storage, feed storage, and access roads. Production areas must divert clean water runoff and manage the remaining runoff in a way that minimizes pollution. This involves complete containment and/or control and management of all wastes, including covered barnyards and/or diversion of runoff/silage waste to manure storage facilities. To be assessed via AAFM inspections.</p> | Number of barnyard/production area management practices installed | N/A |
| Agricultural Pollution Prevention - Implementation | Livestock Exclusion | <p>Implementation of high priority agricultural best management practices, in alignment with NRCS Practice Standards (if applicable), that reduce pollutants (e.g., nutrients, pathogens, sediment) and improve soil health. Excludes riparian plantings on agricultural lands and annual agronomic practices. Project eligibility is limited to land where owner or operator is not required to meet the Required Agricultural Practices (RAPs). Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.</p> <p>More information: https://www.nrcs.usda.gov/resources/guides-and-instructions/field-office-technical-guides) https://agriculture.vermont.gov/rap)</p> <p>Exclusion of livestock from surface waters by installing fence or another barrier. May include acceptable alternatives such as structures providing limited access for watering or fencing to limit access for livestock stream crossing.</p> | Acres of livestock excluded | Latitude, longitude Acres of pasture excluded HUC12 watershed location Field HSG (optional) Field average slope (optional) |

| Project Type | Practice Type | Definition and Minimum Standards to Quantify Pollutant Reductions | Performance Measures | Data Required to Estimate Phosphorus Reductions |
|---|---------------------------------|--|---|---|
| Agricultural Pollution Prevention - Implementation | Forage and Biomass, Corn to Hay | <p>Implementation of high priority agricultural best management practices, in alignment with NRCS Practice Standards (if applicable), that reduce pollutants (e.g., nutrients, pathogens, sediment) and improve soil health. Excludes riparian plantings on agricultural lands and annual agronomic practices. Project eligibility is limited to land where owner or operator is not required to meet the Required Agricultural Practices (RAPs). Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.</p> <p>More information: https://www.nrcs.usda.gov/resources/guides-and-instructions/field-office-technical-guides) https://agriculture.vermont.gov/rap)</p> <p>Conversion of cropland to hay. Typical Forage and Biomass duration 5 years.</p> | Acres of agricultural land treated | Latitude, longitude Field land use (default cropland) Practice acres HUC12 watershed location Field HSG type (optional) Field average slope (optional) |
| Agricultural Pollution Prevention - Implementation | Grassed Waterways | <p>Implementation of high priority agricultural best management practices, in alignment with NRCS Practice Standards (if applicable), that reduce pollutants (e.g., nutrients, pathogens, sediment) and improve soil health. Excludes riparian plantings on agricultural lands and annual agronomic practices. Project eligibility is limited to land where owner or operator is not required to meet the Required Agricultural Practices (RAPs). Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.</p> <p>More information: https://www.nrcs.usda.gov/resources/guides-and-instructions/field-office-technical-guides) https://agriculture.vermont.gov/rap)</p> <p>Stabilizing areas prone to field gully erosion by establishing grass-lined swales.</p> | Acres of agricultural land treated by grassed waterways | Latitude, longitude Field land use Practice acres HUC12 watershed location Field HSG type (optional) Field average slope (optional) |