
General Information

Project Title	Rody Creek Channel Stabilization (Between 80th and 72nd ST E)
Project Short Description	<p>The proposed project is located between 80th ST E and 72nd ST E (west of 62nd AVE E). The primary goal of the project is to stabilize eroding slopes and reverse channel incision in Rody Creek. Slash and wood bed-control structures will be constructed to slow instream velocity and reverse channel incision. This will allow sediment to settle in a more stable and natural profile. The project will be designed to address Clarks Creek TMDL water quality sediment goals, more specific to DO deficiency.</p>
Project Long Description	<p>Pierce County Surface Water Management (PCSWM) is proposing approximately 2,580 linear feet of channel bed and bank stabilization work for Rody Creek (.). The ravine channel is incised between five to eight feet in depth relative to its historic conditions. This erosion has led to excess sediment transport to both Rody and Clarks Creeks. This is adversely impacting water quality and aquatic health. The destabilized condition is self-reinforcing, causing more rapid incision and bank erosion throughout the project reach. SWM is seeking this grant to secure partial funding necessary to construct the project in a single phase and season.</p> <p>This project will restore natural stream processes and function, while reducing erosion and allowing the stream to return to a healthier profile. It will also provide measurable results, confirmed through ongoing monitoring after construction. These outcomes will significantly reduce the adverse impacts of sediment to the receiving Clarks Creek system.</p> <p>In 1997, PCSWM constructed an in-line, regional stormwater detention pond in the upper headwaters of Rody Creek. The pond provides flow control during larger flow events with water quality treatment measures for the downstream reaches. This facility has not fully alleviated channel incision and bank erosion in the lower reaches of Rody Creek. SWM retained the services of Natural Systems Design Consultants (NSD) to investigate, analyze, identify, develop and design measures to address the incision and erosion problem in the Rody Creek Ravine. The proposed measures include bioengineered bed and bank control structures, as well as riparian plantings within disturbed construction areas. Specific measures include wood timber frame matrices, channel spanning log structures, wood slash matrices placed along the channel bed, and wood bank protection features. Wood timber frames will be placed at locations along the channel bank (near the ravine toe of slope) where the most severe erosion has been identified. The channel spanning log features will be placed where the channel bed grade drops abruptly, to help provide channel stabilization. The entire channel bed and bank within the project area will be lined with wood slash matrix material to slow water velocity and retain mobilized sediment.</p>

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

General Information

There is a large, existing concrete catch basin drop structure which intercepts Rody Creek and directs it through a 54-inch diameter culvert, crossing under south 72nd ST E. The drop structure will be improved with upgraded trash racks and modified inlet elevations to more efficiently transfer Rody Creek flows.

Total Cost \$906,927.00 **Total Eligible Cost** \$721,381.00

Effective Date 7/1/2021 **Expiration Date** 7/1/2024

Project Category

- ✓ Nonpoint Source Activity
- Onsite Sewage System
- Stormwater Activity
- Stormwater Facility
- Wastewater Facility

Will Environmental Monitoring Data be collected? Yes

Ecology Program Water Quality

Overall Goal Ecology issued Pierce County an Administrative Order (AO) on July 31, 2019. The AO describes the Sediment Waste Load Allocation compliance crediting system for nonpoint control projects located within the stream channel. The Rody Creek Project is listed in the Clarks Creek Total Maximum Daily Loading (TMDL) Implementation Plan (2017). Modeling estimates indicate the project will provide a sediment load reduction of 32.16 tons of sediment per year. The project will restore natural stream functions by reducing channel bed erosion respective to channel aggradation. Reduced sideslope erosion will result from the placement of engineered woody structures. The project will provide measurable results, confirmed through ongoing monitoring and onsite inspections. The goal is to stabilize Rody Creek ravine and reduce sediment delivery to Clarks Creek. The channel reach located downstream of 72nd St. E will be addressed by a separate project, which is currently at 30 percent design.

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

WQC-2022-PiCoPW-00035

Project Characterization

Project Themes

Select a primary and secondary theme that best describes the work to be achieved during this project.

Primary Theme: Nonpoint Source Pollution
Secondary Theme(s): TMDL Support
Riparian/Wetland Restoration
Watershed Management Plans

Project Website

If your project has a website, please enter the web address below. After entering a website and saving, another blank row will appear. Up to three websites may be provided.

Website Title/Name	Web Address
Pierce County Rody Creek	https://www.co.pierce.wa.us/1835/Rody-Creek-Restoration
Pierce County Clarks Creek TMDL	https://www.co.pierce.wa.us/5488/Clarks-Creek-TMDL-Project-02/

Recipient Contacts

Project Manager

Randy Brake

Contact Information

Randy Brake
Civil Engineer 2
2702 South 42nd St, Suite 201
Tacoma, Washington 98409-7322
(253) 798-4656

randy.brake@piercecountywa.gov

Authorized Signatory

Toby Rickman

Contact Information

Toby Rickman
Deputy Director
2702 South 42nd St, Suite 109
Tacoma, Washington 98409-7322
(253) 798-2426

toby.rickman@piercecountywa.gov

Billing Contact

Mallory Sashko

Contact Information

Mallory Sashko
Grant Accountant
2702 South 42nd St, Suite 109
Tacoma, Washington 98409-7322

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

WQC-2022-PiCoPW-00035

Recipient Contacts

(253) 798-2426

mallory.sashko@piercecountywa.
gov

Other recipient signatures on printed agreement

Name

Title

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

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Funding Request- Nonpoint Project

Total Eligible Cost: \$721,381

Grant Request: \$500,000

Match Required: \$166,667

IMPORTANT NOTICE. Grants for nonpoint projects require a 25% match. Projects with cash-only match are eligible for up to \$500,000 in grant. Projects with a mix of funds for match are eligible for up to \$250,000 in grant. Cash match includes any eligible project costs paid for directly by the recipient that are not reimbursed by the Ecology grant or another third party. Donations that become the long-term property of the recipient are considered cash match. Loan money provided through the CWSRF is also considered cash match. In-kind contributions are considered non-cash match. More information on match requirements can be found in the Water Quality Combined Financial Assistance Guidelines which are available for download on the Application Menu.

Will your match be cash-only? Yes No

Are you requesting or will you accept loan funds for part or all of the eligible project costs or to meet your match requirement? Yes No

What is the loan amount you are requesting or willing to accept?

What loan term do you prefer? 5 years 20 years 30 years

IMPORTANT NOTICE. Ecology may provide special loan funding for nonpoint projects in the following case: (1) projects that meet the criteria for "green project reserve" may receive up to 25% forgivable loan. Ecology will determine eligibility for special funding when developing funding packages.

Do you want your project to be considered for GPR subsidy under the CWSRF program? Yes No

NOTE: Projects are only eligible if they meet EPA's GPR criteria, and applicants accept a CWSRF loan.

Do you have any secured funds committed to this project? Yes No

If Yes, complete the Secured Funds Table, and include any secured matching funds if known.

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

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Funding Request- Nonpoint Project

Source	Type	Amount Committed
State/Federal agency:		
State/Federal agency:		
State/Federal agency:		
Interlocal contributions:		
Interlocal contributions:		
Interlocal contributions:		
Local agency: Pierce County Surface Water Management Utility Fees	Cash	\$406,927.00
Local agency:		
Local agency:		
In-kind contributions:		
In-kind contributions:		
In-kind contributions:		
Other		
Other		
Other		

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

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Scope of Work - Task 1 Grant and Loan Administration: 1

Task Number 1

Task Title Grant and Loan Administration

Task Cost \$16,600.00

IMPORTANT NOTICE. The cost of this task should not exceed 15% of the Total Eligible Costs you entered on the General Information form.

Task Description

A. The RECIPIENT shall carry out all work necessary to meet ECOLOGY grant or loan administration requirements. Responsibilities include, but are not limited to: Maintenance of project records; submittal of requests for reimbursement and corresponding backup documentation; progress reports; the EAGL (Ecology Administration of Grants and Loans) recipient closeout report; and a two-page outcome summary report (including photos, if applicable). In the event that the RECIPIENT elects to use a contractor to complete project elements, the RECIPIENT shall retain responsibility for the oversight and management of this funding agreement.

B. The RECIPIENT shall keep documentation that demonstrates the project is in compliance with applicable procurement, contracting, and interlocal agreement requirements; permitting requirements, including application for, receipt of, and compliance with all required permits, licenses, easements, or property rights necessary for the project; and submittal of required performance items. This documentation shall be available upon request.

C. The RECIPIENT shall maintain effective communication with ECOLOGY and maintain up-to-date staff contact information in the EAGL system. The RECIPIENT shall carry out this project in accordance with any completion dates outlined in this agreement.

Task Goal Statement Properly managed and fully documented project that meets ECOLOGY's grant or loan administrative requirements.

Task Expected Outcomes

- * Timely and complete submittal of requests for reimbursement, quarterly progress reports, Recipient Closeout Report, and two-page outcome summary report.
- * Properly maintained project documentation.

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

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Scope of Work - Task 1 Grant and Loan Administration: 1

Recipient Task Coordinator Randy Brake, Project Manager

Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	Latitude (expressed in decimals)	Longitude (expressed in decimals)	Location Address
1.1	Progress Reports that include descriptions of work accomplished, project challenges or changes in the project schedule. Submitted at least quarterly.	3/31/2022					
1.2	Recipient Closeout Report (EAGL Form)	6/30/2023					
1.3	Two-page Outcome Summary Report	3/31/2023					

Scope of Work - FOR APPLICATION

How many tasks do you want to appear?

Task #: 2

Task Title: Design Plans, Specifications and Bid Package

Task Cost: \$6,896.00

Expected Start Date: 1/17/2022

Expected Finish Date: 4/15/2022

Describe the work that will be billed to this task. (char 3,500)

- A. The RECIPIENT will coordinate preparation and submittal of all applicable federal , state and local permit documentation for the project. The RECIPIENT will be responsible for the application of, receipt of, and compliance with all permits and licenses necessary for the Project.
- B. Prior to any ground-disturbing activities, the RECIPIENT will submit a DAHP EZ-1 form, along with any supplemental cultural resources documentation, to ECOLOGY’s Project Manager.
- C. The RECIPIENT will develop and submit two hard copies and one digital copy of a complete Design Report for ECOLOGY review . Only ECOLOGY-approved manuals may be used as the basis for project design, unless site-specific justification for alternate design has been pre-approved by ECOLOGY.
- D. Prior to advertising for contractor bids, the RECIPIENT will submit two hard copies and one digital copy of the 90% Design Plans and Specifications to ECOLOGY’s Project Manager for review. The plans must include ECOLOGY’s Bid Specification Clauses (found at <https://ecology.wa.gov/Asset-Collections/Doc-Assets/Water-quality/Grants-and-Loans/Facility-Resources/S standard-Contract-Clauses>). ECOLOGY will provide the RECIPIENT with comments within 45 days of receipt.
- E. The RECIPIENT will submit to ECOLOGY a current updated construction cost estimate and project schedule , along with each subsequent plan and specification submittal.

Deliverables

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When done, click the **SAVE** button

To Delete a Row

In the row you want to delete, remove the information in all of the textboxes
When done, click the **SAVE** button

Scope of Work - FOR APPLICATION

After SAVE a new row will appear
Repeat these steps for each deliverable

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Deliverables Table (Deliverables are documents that can be uploaded into EAGL to show that work was completed; deliverables should align with the detailed budget provided on the Task Costs and Budget Form and the project schedule uploaded on the Project Planning and Schedule Form.)

Deliverables Description	Deliverable Date	Deliverable Budget
Final Design Plans, Specifications including Permitting	1/17/2022	\$3,936.00
Final Bid Package	5/31/2022	\$2,960.00
		Total Deliverable Budget: \$6,896
		Total Task Costs:

Task #: 3

Task Title: Construction Management

Task Cost: \$12,620.00

Expected Start Date: 6/15/2022

Expected Finish Date: 3/20/2023

Describe the work that will be billed to this task. (char 3,500)

- A. The RECIPIENT will provide construction oversight and management for the Project.
- B. The RECIPIENT will submit a detailed construction quality assurance plan to ECOLOGY prior to the start of construction . This plan will describe how adequate and competent construction oversight and inspection will be performed.
- C. The RECIPIENT will provide a copy of the construction contract proposal and a copy of the executed contract (upon contract award to a contractor), prior to commencement of construction.
- D. The RECIPIENT will conduct a Pre-Construction meeting with the contractor, in which ECOLOGY will be invited to attend.
- E. The RECIPIENT will submit to ECOLOGY an updated Project Schedule with projected cash flow to ECOLOGY within 30 days of the start of construction. The Project Schedule will be updated and/or revised whenever major changes occur, or at a minimum of every 3 months. The

Scope of Work - FOR APPLICATION

RECIPIENT will submit these updates along with the quarterly report, and will include an updated cash flow projection whenever changes to the construction schedule affect previous cash flow estimates.

F. Prior to execution, the RECIPIENT will submit any eligible change orders that are a significant deviation from the ECOLOGY -accepted plans and specifications in writing to ECOLOGY for review. All change orders that impact grant-eligible activities must have ECOLOGY approval prior to implementation. All other change orders must be reviewed by ECOLOGY for technical merit and should be submitted within 30 days after execution. Change orders are to be signed by the contractor, the engineer (if appropriate) and the RECIPIENT prior to submission for ECOLOGY approval.

G. The RECIPIENT will operate and maintain the Project to ensure it meets performance obligations. The RECIPIENT will develop and submit an operations and maintenance plan for the proposed channel stabilization treatment measures. The operation and maintenance plan will describe how the RECIPIENT will ensure project success consistent with the design manual used. This includes long term activities to assure ongoing pollutant removal, in accordance with the ECOLOGY-approved design manual.

H. Upon completion of construction, the RECIPIENT will provide to ECOLOGY:

1. A Stormwater Construction Completion Form indicating that the Project was completed in accordance with the plans, specifications, and major change orders approved by ECOLOGY’s Project Engineer and as shown on record drawings.
2. GIS-compatible project area data in an ECOLOGY-approved format (.zip file) as applicable.

Deliverables

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Deliverables Description	Deliverable Date	Deliverable Budget
Construction Contract	2/15/2022	\$2,960.00
Construction Inspection and Documentation	3/31/2023	\$7,440.00
Construction Completion Documentation	4/17/2023	\$2,220.00
		Total Deliverable Budget: \$12,620.00

Scope of Work - FOR APPLICATION

Task #: 4

Task Title: Construction of Contract Proposal

Task Cost: \$685,265.00

Expected Start Date: 6/15/2022

Expected Finish Date: 2/28/2023

Describe the work that will be billed to this task. (char 3,500)

- A. The RECIPIENT will, in accordance with ECOLOGY-accepted plans and specifications, ensure complete construction of the Project.
- B. The RECIPIENT will provide timely and complete construction progress reports and associated photographs in quarterly reporting .
- C. The RECIPIENT will establish construction access and staging areas, traffic controls, and construction erosion/water pollution control measures per ECOLOGY-accepted plans and specifications.
- D. In order to stabilize the existing Rody Creek banks and streambed, and to arrest incoming sediment to help re-establish the natural stream grade, the following structures will be constructed within the project area:
 1. 20 to 25 timber frame structures will be installed at key locations to stabilize banks and toe areas along the vulnerable slopes. These structures will be anchored in place, and will provide armoring against erosion from peak streamflows while holding the existing sediments in place. Sediment in these structures will also be augmented with slash and revegetated to increase root cohesion and further reduce erosion over time.
 2. About 2,400 feet of the Rody Creek incised stream channel bed will be treated with bed-control log-slash matrix features. The matrix features employ 12 - 18" diameter logs and slash material arranged in layers, forming a grid-like matrix that armors the streambed against further incision. The slash forms a mesh that slows the flow of water, protecting the matrix structure by reducing the stream's velocity force . The mesh also provides storage, sequestering mobilized sediments and allowing the streambed to aggrade naturally over time.
 3. Repair of an existing culvert outlet pipe. Cobble and boulder streambed armoring will be placed immediately downstream of the 80 th ST E outfall to reduce splash erosion and prevent culvert failure during peak-flow events.
 4. Five Channel Spanning Log Structures will be placed at various locations along the stream channel bed. The Channel Spanning Structure provide greater sediment sequestration, channel bottom grade management and stabilizes the log slash matrix feature from shifting and movement.
 5. Approximately 125' of Bank Protection Treatment will be placed along and within the channel at the downstream end , just upstream of the existing catch basin drop structure. This will help to raise the channel bed grade to the modified invert inlet elevation of the catch basin structure.
 6. The Bank Protection Treatment will also help to stabilize erosion along the channel and toe of the steep hillside slope , to further sequester

Scope of Work - FOR APPLICATION

sediment from transporting downstream. The Bank Protection Treatment consists of 12” - 18” diameter logs, slash matrix and tethered boulders for anchoring. The existing Catch Basin will be modified and retrofitted with new trash racks for the top opening as well as the north and south inlet openings. The south inlet invert elevation will also be modified to accommodate the Bank Protection Treatment feature and to help accelerate channel bed aggradation at the catch basin.

7. All existing native vegetation (outside of the active project footprint and access areas) will be preserved. The RECIPIENT will also plant native riparian vegetation along the entire stream channel banks that are disturbed from construction activity, as shown on the plans. Infill planting will also be employed to augment sparse areas of existing native vegetation within areas disturbed by construction.

Deliverables

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 Repeat these steps for each deliverable

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Deliverables Description	Deliverable Date	Deliverable Budget
Completed Construction of Project	4/3/2023	\$685,265.00
		Total Deliverable Budget: \$685,265.00

Task #: 5

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Scope of Work - FOR APPLICATION

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Task #: 6

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Scope of Work - FOR APPLICATION

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Task #: 7

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Scope of Work - FOR APPLICATION

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Task #: 8

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Deliverables Description

Deliverable Date

Deliverable Budget

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

WQC-2022-PiCoPW-00035

Scope of Work - FOR APPLICATION

Total Deliverable Budget: \$0

Task #: 9

Task Title:

Task Cost:

Expected Start Date:

Expected Finish Date:

Describe the work that will be billed to this task. (char 3,500)

Deliverables

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Deliverables Description

Deliverable Date

Deliverable Budget

Total Deliverable Budget: \$0

Total Task Costs: \$721,381

Task Costs and Budget

Describe the process used to estimate the cost of the project. If your process included reviewing similar projects, describe how this review affected your estimate.

The original project cost estimate was provided by Natural Systems Design Consultants (NSD) at the delivery of 30 percent design. Cost estimates for the Rody Creek 90 percent design plans and construction phase were prepared by Pierce County. The latest 90 percent design level cost estimate further refined NSD's estimate and reflected all proposed design features/measures. Latest estimates also use actual costs for specific bid-items constructed in similar, recently completed projects, including both the Clarks Creek Stabilization project and Diru Creek Channel Stabilization project. The Clarks Creek Channel Stabilization construction cost was \$2.7 million for 2,200 feet of channel treatment (includes 1,400 feet of main channel and 800 feet of a side channel tributary). The Diru Creek project has an estimated construction cost of \$1.7 Million for 2,850 feet of channel treatment.

Bid pay items from the other projects were compared for unit quantity, unit cost, total pay item cost and context. Unit costs from the two previous projects were averaged, and an inflationary factor was added to account for past and current market costs (typically 1.5 percent to 2.5 percent depending on the given year). The latest construction estimate may be further refined as the project progresses closer to contracting and contract proposal advertising. Bid tabulation summary items from other Pierce County projects and WSDOT bid item tabulations are also referred to for comparison of similar pay items, respective to unit cost, quantities and timeframe. These bid tabulations help with determining unit and total cost for each individual pay item that are a part of the contract proposal and design plan set.

Has the proposed project been demonstrated to be the lowest cost solution to the problem?

If the proposed project is not the lowest cost, describe the other benefits or considerations such as feasibility, community acceptance, or coordination with other projects that influenced the decision making process.

The Rody Creek Channel Stabilization Project (between 80th and 72nd St E) originally emerged as a limited scale, in-stream improvement project for the Clarks Creek Basin Plan (Pierce County, 2006). The project's original design was developed through a multi-reach inventory, project area prioritization and alternatives analysis process. The development of the following Plans were the basis for the project's repeated public vetting and stakeholder review. As stated, the project was initially identified in the Clarks Creek Basin Plan. A more limited scaled version of the project was then described in the Clarks Creek Sediment Reduction Action Plan (Puyallup Tribe of Indians, 2013). The current, more comprehensively scaled version of the project was officially adopted by the Pierce County Council as a high priority for the County's Clarks Creek TMDL Implementation Plan (2017). The proposed project is the preferred alternative because it provides the greatest opportunity for achieving the TMDL's requirements for reducing the instream sediment loads originating from the Rody Creek ravine. The project's comprehensive scale makes it the most feasible for mobilization, access and construction. The project's current scale also gives it the greatest opportunity for creating long-term sediment reduction over its 20+ year lifecycle. The proposed project provides the greatest cost to benefit opportunity for complying with the requirements of the County's Sediment Waste Load Allocation. Positive channel response to the proposed treatments are expected to begin immediately post-construction. Sideslopes will stabilize and channel bed incision will begin to reverse and transition to an aggradation process, sequestering much of the sediment being generated in the Rody Creek ravine. The proposed project is not the least expensive of the 3 design

Task Costs and Budget

alternatives that were evaluated. However, the proposed project is the County’s preferred alternative because it incorporates a total channel bed and sideslope stabilization strategy throughout the entire reach of the Rody Creek ravine. Our analysis indicates the preferred alternative will result in greater long-term stabilization of the Rody Creek channel, and the maximum reduction of sediment loads to Clarks Creek. The selected treatments use environmentally beneficial bioengineering techniques instead of the more traditional rock armoring methods (e.g. using larger woody materials to achieve sideslope stabilization and smaller wood assemblies to achieve channel bed aggradation). The adjacent landowners voiced support for the County’s preferred channel stabilization strategy because they believe the steeper parts of their properties will benefit geotechnically over time. The adjacent property owners have stated their support for bio-stabilization techniques since a few of them have attempted to stabilize the channel by planting small container plants and trees at a couple of locations that are failing and quite eroded.

Upload a detailed budget for the project and any supporting documentation, including engineers estimates, cost analysis, etc.

Upload Documents

Click the Browse button

Select your file

Click Save, your file will appear in the List of uploaded documents

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

https://ecyeagl/IntelliGrants_BASE/_Upload/151895_925650-WDOEGrantCostandShareTempl.xlsx

WDOE Cost Template D190 Rody Creek

https://ecyeagl/IntelliGrants_BASE/_Upload/151895_925650_2-WDOE2022D190RodyCreekGrantCostEstimate.xlsx

Cost Estimate and WDOE Eligible Items

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Project Team

Fill out the following table to describe your Project Team, including staff, contractors, and partner agencies:

Team Member Name/and or Title	Agency/ Company Name	Key Responsibilities	Qualifications/ Experience	Estimated Total Hours Devoted to the Project	Who will take over the person's responsibilities if they are unable to work on the project?
Randy Brake, Project Manager	Pierce County Planning and Public Works	Managing project, design, prepare project specifications, manage grant, manage consultant and construction.	Over 25 years of project design and project management in addition to managing major floodplain riverine restoration and connection projects.	120.0 0	Four other qualified Project Managers are available, should the need arise.
Patrick Stone, Civil Engineer 1, Design Engineer	Pierce County Planning and Public Works	Engineering design, support, analysis, plan preparation and cost estimating.	Over 20 years of engineering design for transportation capital improvement projects including stormwater, pond, water quality treatment systems and other related design work.	60.00	Five other qualified design engineers are available should the need arise.
Mike Sloan, Engineering Tech 3, Inspector	Pierce County Planning and Public Works	Construction Inspection, construction pay estimates and billings.	Over 25 years of engineering construction inspection projects for both WSDOT and Pierce County.	160.0 0	Two other qualified construction inspectors are available should the need arise.
Matt Barnhart, Biologist	Pierce County Planning and Public Works	Biologist and Environmental Permitting Lead. Obtaining permits, ensuring compliance with permit conditions and requirements, assist with design and monitoring of completed capital	Over 20 years of experience in fisheries biology and research, wetlands and permitting. Work experience with WDFW, NMFS, and local government.	80.00	Five other qualified biologists are available should the need arise.

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WQC-2022-PiCoPW-00035

Project Team

Tim Hagan, Senior Water Quality Planner	Pierce County Planning and Public Works	improvement projects. Water quality planning and studies involving NPDES and TMDL requirements, obligations and compliance.	Over 24 years of public and private sector experience working with Clean Water Act driven programs and requirements.	40.00	Tom Kantz, Water Quality Supervisor at SWM.
Rocky Hrachovec, P.E. Principle Engineer	Natural Systems Design Consultants	Investigation, design, analysis and consultation in the field of stream and riverine restoration and stabilization specialty.	NSD and their staff are highly qualified and experienced in river and stream restoration and stabilization projects. They have worked on numerous projects ranging from dam removal, riverine restoration and stream stabilization using innovative state of the art methods and techniques. NSD has pioneered many measures and features utilized on such applications and systems.	140.00	NSD has professional staff resources as needed.
Mallory Sashko, Grant Accountant		Track grant expenditures and prepare grant reimbursement request with supporting documentation.	Over 10 years experience in various accounting work including grant accounting work from other public agencies.	30.00	Planning and Public Works has four other accountants who can perform the job should the need arise.
Construction Contract (To be retained)	Outside Construction Contractor	Construct the contract proposal in accordance with the final stamped	The contract will be advertised in which qualified contractors will	480.00	Contractor is required to provide a performance bond and liability insurance.

Project Team

<p>engineering design plans, specifications, contract documents, WSDOT Standard Specifications, contract general and special provisions and amendments.</p>	<p>have the opportunity to submit a formal bid proposal to construct the proposal. The lowest qualified contractor's bid proposal will be awarded the contract.</p>
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Describe similar projects that your project team or organization has completed. Note any deviations from the original proposal in scope, budget, or schedule and briefly describe project success and lessons learned. If the project was funded by Ecology, include the Ecology grant or loan number.

In 2018, Natural Systems Design (NSD) completed the upper Clarks Creek Channel Stabilization project for the City of Puyallup. The upper reaches of Clarks Creek suffered from the same streambed incision and sideslope mass-wasting problems as seen on Diru Creek and Rody Creek. These two tributaries of Clarks Creek have similar ravine geomorphology. Pierce County, joined by staff from Ecology, Puyallup Tribe, Muckleshoot Tribe, USACE, WDFW, DNR and the Pierce Conservation District have inspected the upper Clarks Creek and Diru Creek project areas many times. These field tours were organized to demonstrate how NSD’s bioengineering techniques work to stabilize the channel bed and adjacent sideslopes. The construction cost for the upper Clarks Creek project was \$2.7m for treating 1,000 feet of channel. NSD used the design developed for the upper Clarks Creek project to inform its methods and approach for the Diru Creek Channel Stabilization project (which is supported by PiCoPW-00006 and going to construction in 2021). County engineers designed the Rody Creek Channel Stabilization project based on NSD’s analysis and design recommendations. Pierce County has received grant funding from DOE over the past 10 years (~\$4.4 million). This funding helped implement a number of water quality improvement and floodplain restoration projects. SWM has a proven track record of implementing instream (non-point control) restoration projects that achieve the objectives required by the grant funding. Each of these projects were implemented in a cost-effective manner and were constructed on schedule and within budget. Examples include: 1). Pierce County Septic Repair small loan program (G1400568 - \$314,706 & G0700322/L0700022 - \$433,735) resulted in water quality improvements throughout Pierce County and it exceeded the target for systems repaired (73 septic systems were repaired); 2) The Ball Creek Floodplain Restoration project (G1500021, \$1,925,000) was completed on time and under budget in 2018. It included 0.5 mile of stream, and 10.4 Ac of floodplain restoration. Average daily flow for Ball Creek is 3-CFS; 3) Woodland Creek Water Quality Facility (WQC-2018-PiCoSW-00077, \$1,717,000) built a stormwater treatment wetland to reduce sediment and attenuate peak flows into Woodland Creek. The facility treats runoff from 446-Ac project area. The WQ treatment flow rate is 9.8-CFS and the pond volume is 23 Ac-Ft. The pond regulates flow from 4.7 to 1.3-CFS.

Project Planning and Schedule

Project Start Date

1/3/2022

The date the actual work will start, or if interim refinance, the date the work started.

List and describe the criteria you used to determine the value and feasibility of the project.

Examples: useful life, installation cost, site suitability, and environmental justice.

Pierce County has a number of technical reports and engineering analyses at its disposal that have focused on Rody Creek, and in particular, the Rody Creek Ravine. The current Rody Creek Channel Stabilization Project has evolved due to a long history of geomorphic inventories, and engineering and design alternatives analyses. The Rody Creek Project was originally conceived and evaluated as an in-stream capital improvement project for the Clear and Clarks Creek Basin Plan (Pierce County, 2006). That document identified the Rody Creek Ravine as the most geomorphically unstable setting in the drainage, and the location responsible for generating the greatest amount of sediment. The original version of the project as described in the Basin Plan was publicly-vetted and received significant stakeholder review. The project was then officially endorsed by the Pierce County Council through the adoption of the Clarks Creek Basin Plan .

In 2010, the Rody Creek Channel Stabilization Project was again evaluated by the Puyallup Tribe of Indians (PTI) and Brown and Caldwell. This report identified the Rody Creek Project as a Tier 1 priority project for achieving sediment load reductions in the Rody Creek Ravine. The projects new design was developed through a multi-reach inventory, sediment transport modeling, project area prioritization process, and alternatives analysis. The Project's design, engineering and sediment load reduction benefits are described and quantified in the Clarks Creek Sediment Reduction Action Plan (Brown and Caldwell 2013).

The Puyallup Tribe's Sediment Reduction Action Plan evaluated a number of suitable locations for constructing sediment reduction projects . Each was technically evaluated using a pair of linked models, including the Hydrologic Simulation Program-Fortran (HSPF) and the Hydrologic Engineering Centers River Analysis System (HEC-RAS). The HEC-RAS model was supported by a magnitude-frequency analysis spreadsheet and the development of an effective work index based on flow duration curves , stream channel hydraulics and sediment gradient surveys. The Clarks Creek Initiative (CCI) stakeholder group relied on this modeling analysis to help their formulation and evaluation of feasible project alternatives. The CCI stakeholder group determined that the Rody Creek project provided the greatest cost-to-benefit for achieving significant sediment reductions by addressing an area of historic geomorphic instability.

In 2014, Ecology issued the Clarks Creek TMDL (publication 14-10-030) to Pierce County. Many of the capital projects listed in the PTI Sediment Reduction Action Plan were identified in the Clarks Creek TMDL report. The Rody Creek Channel Stabilization Project is identified in the TMDL report as being a suitable instream project capable of helping the County meet the requirements of its sediment Waste Load Allocation . The Project was therefore listed and described again by the County in the Clarks Creek TMDL Implementation Plan (2017), which was approved by Ecology in 2019. Once the County's Plan was approved, this project was listed in the Clarks Creek TMDL Administrative Order (AO No. 16589). The Rody Creek Channel Stabilization Project and its sediment reduction benefit is cited in Elements 3, 4 and 6 of the AO.

A number of factors were evaluated and considered in order to determine the County's preferred design for the current rendition of the project , these included construction cost reviews, area of disturbance analysis, access location and easement availability assessments, public outreach, constructability and mobilization options, and the quantification sediment reduction benefits.

Project Planning and Schedule

The Project has been significantly enhanced in its engineering and design since it was first described in the County's Basin Plan or PTI's Sediment Reduction Action Plan. The geomorphic and engineering consultant Natural Systems Design (NSD) was retained by Pierce County to guide the project's design and engineering, and to confirm the sediment reduction benefits at the project scale. The NSD report discussed how the Sediment Reduction Action Plan identified the primary sediment sources came from moderate incision and channel bank failures in the upper 500 feet of the project area, and mass hillslope wasting in the lower 500 feet. However, the sources of sediment production identified in NSD's more recent geomorphic field assessment were substantially larger than previously described, and include the observation and measurement of incision, bank erosion, and mass wasting throughout the 2,580' project reach (80th Street E and 72nd Street E).

The NSD analysis helped determine that the more comprehensive project design being submitted with this application is the most cost-effective engineering solution for achieving sediment reduction in the Rody Creek Ravine. The expanded project area in combination with a customized design using state of the art bioengineering techniques will result in a more durable instream treatment for reducing the sediment loads originating from within the Rody Creek Ravine. The project's life cycle is expected to be 20 years or greater given the commitments prescribed by the Rody Creek Channel Stabilization Project's Annual Instream Inspection Protocol and Maintenance Plan (see Attachment). The Project's design also provides additional ecosystem benefits to Rody Creek Ravine; including greater riparian shade, enhanced woody material recruitment, and improved fish habitat.

Briefly describe all project alternatives (including the preferred alternative) considered, and explain how each alternative met or failed to meet the criteria listed above.

Use one line for each alternative and click "save" to enter additional alternatives.

Description of Alternative

Alternative 1: Alternative 1: Traditional Approach
 Incorporates rock spalls, rip rap and boulder cobbles for channel bed and bank slopes treatments, plantings and culvert end erosion treatment.

Alternative 1: Alternative 2: Structural Bio-Engineering (Preferred Recommend Alternative) - Incorporates Wood Bio-stabilization features both structural and soft touch including plantings and culvert end treatment

Alternative 1: Alternative 3: Soft Touch
 Incorporate loose logs and woody slash material that is placed in the channel bed at certain eroded and incised

Criteria

Medium Cost; Highest Disturbance; Acceptable Constructability; Immediate Effectiveness, however prone to failure and frequent maintenance.

Highest Cost; High Disturbance; Acceptable Constructability; Immediate Effective while increasing over time and little maintenance.

Lowest Cost; Lowest Disturbance; Challenging Constructability due to hand placement methods; Longer Term Effectiveness with moderate

Project Planning and Schedule

locations along the channel reach.

maintenance.

List project stakeholders and provide documentation showing key stakeholders have been identified and will support the project.

The Rody Creek Channel Stabilization Project has been thoroughly vetted and reviewed by a number of different stakeholders. In 2012, the Clarks Creek Initiative (CCI) Stakeholder Group was organized to serve as the first interagency and public stakeholder group to review the development of the Clarks Creek TMDL Report (Ecology 2014). The CCI was instrumental in assessing capital project alternatives for listing in the final TMDL report. This group specifically endorsed the Rody Creek Project as among the top cost-to-benefit projects for achieving instream restoration and sediment source reduction to Clarks Creek.

In 2014, Ecology issued the Clarks Creek TMDL to Pierce County. Many of the capital projects listed in the Puyallup Tribe of Indians (PTI) Clarks Creek Sediment Reduction Action Plan (2013) were recommended by CCI and included in the Clarks Creek TMDL report. The Rody Creek Channel Stabilization Project is identified in the PTI Action Plan and Ecology's TMDL report. Both documents identify the Rody Creek project as being a suitable instream restoration project capable of helping the County meet its sediment Waste Load Allocation. The Project was therefore listed and described again by the County in its Clarks Creek TMDL Implementation Plan, which was formally approved by the Pierce County Council in 2017, and the Dept of Ecology in 2019.

In 2017, the CCI was reorganized into the Clarks Creek TMDL Implementation Stakeholder Group. This Group continues to meet biannually to track the construction of the County's capital projects, and to be updated on the implementation of other programs described in the County's TMDL Implementation Plan. The Clarks Creek Stakeholder Group has voiced ongoing support for the construction of the Rody Creek Channel Stabilization Project as an important capital project associated with the County's TMDL implementation commitments.

The CCI, and the Clarks Creek TMDL Implementation Stakeholder Group are comprised of many local citizens who have been long standing participants; along with following agencies, the Puyallup Tribe of Indians (PTI), the City of Puyallup, Pierce Conservation District, WA Department of Fish and Wildlife, and the Dept of Ecology. The WA Department of Fish and Wildlife has supported this project with valuable review and guidance through the Hydraulic Project Approval (HPA) process. The Pierce Conservation District, the City of Puyallup, and the Puyallup Tribe of Indians have also provided letters of support supporting the projects construction (see attachments).

The Clarks Creek TMDL Implementation Plan's Technical Advisory Committee (TAC) also serves to guide the implementation of the capital projects listed in the County's Plan. This group is composed of the County and its three partner entities (Ecology, EPA and PTI). All participating entities on the TAC are supportive of the Rody Creek project's construction.

The Puyallup Tribe of Indians are key stakeholders in this Project. Clark's Creek passes through their reservation, providing important cultural significance to its ongoing restoration. The Rody Creek and Diru Creek (a neighboring tributary) Channel Stabilization projects have received the committed support of the Tribe. As mentioned earlier, they are both projects that were vetted and listed in the Tribe's Clarks Creek Sediment Reduction Action Plan (PTI 2013).

Lastly, significant public review was associated with the Pierce County Council's adoption of the Clarks Creek Basin Plan (2006) and the Clarks Creek TMDL Implementation Plan (2017). In particular, the County Council closely reviewed the scope and cost of the capital project commitments listed with these two plans during a public meeting. The Rody Creek project was identified and vetted as a priority project in both

Project Planning and Schedule

documents. In a later action, the County Council gave their approval to Surface Water Management's (SWM) staff to develop this Centennial 319 Grant application. Their intent was to endorse the pursuit of additional funding to support the implementation of this project. And finally, the County Council through a public process, also approved the 2019-2024 Surface Water Improvement Program (SWIP), which included a detailed description of the Rody Creek project. The SWIP is the primary budget workplan for SWM's capital improvement program (projects) and as such receives close attention by a number of citizens and stakeholders. This budget document allocates over \$500,000 in funding for the Rody Creek Channel Stabilization Project (please see page 14 of the SWIP).

Describe the steps you have taken to be ready to start the project by May 1, 2021. Provide detailed information and documentation on project elements such as status of designs, permits, interlocal agreements, landowner agreements, easements, other secured funding, staff, or agency approvals.

The Project has updated its 90 percent design plans and specifications. The Project's final design permits and construction documents will be completed and in-place prior to the grant award date. If funded, the County will provide Ecology with copies of the 100 percent design reports to solicit a final review. The County's project engineer will incorporate all of Ecology's comments to ensure the project meets the goals of the grant. The proposed budget includes time for County staff to incorporate Ecology feedback into the final design and construction documents. The County submitted its updated 90 percent design plans and specifications for a perfunctory review by Ecology's engineering staff. The County's project engineer received an email from Ecology on September 30, 2020 providing comments that were addressed prior to applications submittal.

The property easement acquisitions necessary for the project are well underway. This project is inherently a collaboration between five landowners and the County (as noted above). The easements include a permanent perpetual easement along the entire Rody Creek channel having an average width of 20-ft. The specific permanent easement width varies for each of the properties. The easements also include an additional 35 ft riparian easement width that will remain in effect for ten years. Attached to this application is a typical easement acquisition proposal and purchase document along with a County easement acquisition plan. The County's Right-of-Way department expects all of the easements required for the Project will be complete and in-place well before the project's construction commencement date, currently scheduled for the summer of 2022. One easement from a single family residential landowner has been fully executed and has been acquired. The property owner of the Crestview Mobile Home Park has agreed to an easement proposal and offer in is now in the process of finalizing the recorded documents. This easement is expected to be fully executed and acquired by November 1, 2021. Three landowner easements remain to be acquired and ongoing discussions with Northwest Cascade Land have commenced, and progress is being made to reach a timely agreement.

Permits for the Project are on schedule and will be completed prior to commencement of the construction phase and its associated activities. The US Army Corps of Engineers has issued their Nationwide Permit, which is valid through 2022. Consultation with DAHP, SHPO and the Tribes will occur through 05-05 consultation, which is now close to complete. Upon final landowner acknowledgement, the application for a Hydraulic Project Approval (HPA) will confirm the Rody Creek Channel Stabilization Project as a Fish Habitat Enhancement project, thereby eliminating the need for SEPA and further local review.

Project Planning and Schedule

Pierce County will commit \$500,000 to manage, administer, design and construct the project. The County Council has reviewed and approved the Project’s scope and funding requirements in detail. County engineers, biologists and planners have already been assigned to oversee the project’s management, construction, and monitoring. The selected staff have all participated in on-going site visits to the Upper Clarks Creek Bank Stabilization Project in Puyallup and they have all been involved with the development of the Diru Creek Channel Stabilization Project, which means they are all quite familiar with this type of project and its novel construction approach.

(1) For stormwater facility and wastewater facility projects: Do you own or have clear control over the entire project area?

Yes No Not Applicable

Please explain why you selected not applicable: Project does not apply to stormwater and wastewater facility category.

(2) For stormwater facility and wastewater facility projects requiring road cuts: When was the last time the road was resurfaced or reconstructed? This is for informational purposes; no points are associated with this question.

Date:

(3) Has initial cultural resources review been conducted for the area of potential effect (APE) (for example, review of the APE in the WISARRD database)? This is for informational purposes; no points are associated with this question.

Yes No Not Applicable

Upload a project schedule that includes all tasks necessary to complete the project, including tasks that are not part of the funding request.

Upload any other supporting documentation.

Upload Documents

https://ecyeagl/IntelliGrants_BASE/_Upload/152102_925655-AlternativesAnalysisMemo-RodyCreek-REVISED22Dec2017-v2.pdf

NSD Alternatives Analysis Report

https://ecyeagl/IntelliGrants_BASE/_Upload/152102_925655_2-CityofPuyallupLetterofSupport.pdf

City of Puyallup Letter of Support

https://ecyeagl/IntelliGrants_BASE/_Upload/152102_925655_3-PTILetterofSupport_Rody_PC319.doc

Puyallup Tribe Of Indians Letter of Support

Project Planning and Schedule

https://ecyeagl/IntelliGrants_BASE/_Upload/152102_925655_4-PierceConservationDistrict_LetterofSupport_RodyCreek.pdf

Pierce Conservation District Letter of Support

https://ecyeagl/IntelliGrants_BASE/_Upload/152102_925655_5--D190RodyCreekSchedule.pdf

Project Schedule

https://ecyeagl/IntelliGrants_BASE/_Upload/152102_925655_6-revisedRodyPropertyAcquisitionPlan.pdf

Easement Acquisition Plan - Includes 35-Ft Riparian Buffer

https://ecyeagl/IntelliGrants_BASE/_Upload/152102_925655_7-CrestviewCommunity_OfferLetter_Signed.pdf

Typical Easement Acquisition Offer Letter

https://ecyeagl/IntelliGrants_BASE/_Upload/152102_925655_8-CrestviewCommunity_LandownerAgreement.pdf

Typical Land Owner Agreement

Water Quality and Public Health Improvements

To go to the Water Quality Atlas, follow this link: <https://fortress.wa.gov/ecy/waterqualityatlas/StartPage.aspx>.

Name the specific water body(ies) this project will improve or protect and the parameters it will address.

The proposed project will improve water quality conditions in Rody Creek, a tributary to Clarks Creek. Four separate planning documents support the prioritization of the Rody Creek Project, providing justification for all the capital work planned for in the Clarks Creek watershed. The documents are as follows:

- 1) Clarks Creek Dissolved Oxygen and Sediment Total Maximum Daily Load Report (Ecology 2014).
- 2) Clarks Creek Restoration Plan (aka Pierce County TMDL Implementation Plan, 2017).
- 3) Puyallup Tribe of Indians (PTI) Clarks Creek Sediment Reduction Action Plan (2013).
- 4) Clear Creek and Clarks Creek Basin Plan (Pierce County 2006).

Is the project planning, implementation, or a combination?

Planning

Implementation

✓ Planning/Implementation

What type of plan or regulatory requirement does this project address?

✓ TMDL/TMDL Alternative (approved or in development)/Straight to Implementation

Wastewater Engineering Report/Sewer Plan

Permit

Salmon Recovery Plan

✓ Watershed Plan

Shoreline Master Plan

✓ Administrative Order or Other Legal Action

✓ Capital Improvement Plan

✓ Puget Sound Action Plan

Mitigation

Other

Not Applicable

If your project is addressing a TMDL, select at least one from the dropdown list.

To select multiple TMDLs, hold down the control key as you select

TMDL Name

Clarks Creek Watershed DO TMDL (Approved)

Enter the implementation action and plan reference in the Action Table. If this is a planning-only project, you may enter, "Not applicable, planning-only".

To add multiple implementation actions:

Enter the implementation action and plan reference.

When done, click the **SAVE** button.

After SAVE a new row will appear.

Repeat these steps for each implementation action.

Action Table

Action	Reference the document that describe the action, including page numbers and where a copy can be obtained.
Clarks Crk Administrative Order Credit Requirements	Clarks Creek TMDL Administrative Order (Ecology, 2019): Elements 3, 4 and 6 address the sediment reduction credit requirements for the Rody Creek and Diru Creek Channel Stabilization Projects (see attached document)
Clear/Clarks Basin Plan Implementation	Clarks Creek Watershed Dissolved Oxygen and Sediment TMDL (Publication no. 14-10-030), Ecology, 2014 - Pg. 128 requires the implementation of the Clarks/Clear Creek Basin Plan (2006) / Pg. 136 requires Pierce County to implement the projects in Clarks Creek Sediment Reduction Action Plan.
Clarks Crk Sediment Reduction Action Plan	Clarks Creek Sediment Reduction Action Plan, Puyallup Tribe of Indians (2013) - Section 4: Action Plan - Rody Creek Channel Stabilization Project - Pp 4.1, 4.2; (PC SWM has a copy of the plan and is not uploaded since the file is too large - available upon request).
Clarks Creek Restoration Plan	Clarks Creek Restoration Plan (Pierce County TMDL Implementation Plan, 2017) - Section 4.5.6 - Rody Creek Bank and Channel Stabilization Project - Pp 58 - 60 (see attached plan).

Did you discuss this project with Ecology staff? If yes, provide the name of the staff and the last date of contact.

Yes, Leanne Whitesell was contacted on September 10, 2020. County staff discussed last year's application process comments. The updated 90% plan set was forwarded to Tony Whiley for his review prior to the October submittal. County staff met with Leanne Whitesell and Donovan Gray on September 4, 2019 to discuss the Scope of Work and the terms and conditions that will apply to the Rody Creek project. County staff met with Leanne Whitesell and Donovan Gray on October 28, 2020. This meeting discussed the riparian buffer requirements associated with the 319

Water Quality and Public Health Improvements

Grant requirements. County staff met with Donovan Gray, Chis Montague and Angela Vincent in August 2019 to evaluate the sediment reduction credit for the Rody and Diru creek projects. Both projects are required by the County's Administrative Order. On February 28th, 20019 County staff met with Steve Hood PE to confirm the sediment reduction credit calculation for the instream projects listed in the County's Administrative Order.

Describe how the project drainage area connects to the water body.

Examples: surface flow, ditch, pipe, groundwater, infiltration, and path/distance to outfall/discharge.

The project area is located along the middle reach of Rody Creek between 80th St E and 72nd St E, approximately 4,300-ft upstream from its confluence with lower Clarks Creek. Rody Creek drains a one square mile watershed. Streamflow magnitudes for the 2-year and 100-year storm events are estimated to be 24 cubic feet per second (cfs), and 80 cfs respectively.

The Rody Creek ravine project area is 2,580-ft long and is located along a reach where the channel begins its descent north off of South Hill to where channel intersects with the ancient alluvial sediments of the Clarks Creek-Puyallup River floodplain. At the downstream end of Rody Creek project area there is a large concrete catch basin drop inlet structure that intercepts Rody Creek and conveys it through a 54-inch diameter culvert under 72nd St E. Instream flows continue north through the lower channeled reaches of Rody Creek as it descends through its final run to the toe of South Hill. The creek continues north under Pioneer Way East via twin 36-inch culverts. The channel is somewhat braided through this depositional reach, where there are splayed gravel patches and fan deposits that influence the channel's routing and work to split the single channel flow into smaller parallel braided channels. (This reach of Rody Creek is slated for a Channel Restoration Project and is currently at 30 percent design) Rody Creek then continues north through active agricultural land before it discharges into lower Clarks Creek. The lower section of the creek was reengineered in the distant past to be a straightened channel, more fit to accommodate that era's agricultural and drainage practices. This reach of Rody creek was re-aligned from its original meander pattern as it historically migrated through the ancient alluvial sediments of the Clarks Creek-Puyallup River floodplain. Attached is a map exhibit that shows how Rody Creek connects with the downstream receiving waters of Clarks Creek and the Puyallup River. Clarks Creek confluences with the Puyallup River about 1.3 miles downstream from the mouth of Rody Creek.

Describe the measure and method that will be used to determine the water quality benefit and overall success of the project.

If you need help determining a water quality metric, please refer to the Funding Guidelines for suggested metrics by project type.

The project area is the Rody Creek Ravine (located between 80th St. E to 72nd St. E). Brown and Caldwell and NSD have confirmed the mechanism of sediment production in Rody Creek comes from channel incision and sideslope failure. Both consultants concluded the incision was caused by land use change in the upper watershed. At present, episodic pulses of sediment migrate downstream and out of the project area to deposit in the channel reach located between 72nd St. E and Pioneer Way E. This reach will be addressed in the future by a separate yet similar project, which is currently at 30 percent design. The Rody Creek project has been designed to stabilize the sediment sources generated from within the project reach, and to store the sediment load moving through the project reach. The NSD design balances the use of instream

Water Quality and Public Health Improvements

structures to stabilize sideslope sediment delivery with the design of channel bed treatments that will retain sediment. Starting in September 2019, there has been ongoing water quality and stream flow monitoring conducted on Rody Creek at 96th St E, 84th St E and Pioneer Way E. The upstream monitoring data confirms that all but the largest storm events generate more than a moderate flow to exit from the Rody Creek Flood Detention Pond and Water Quality Cell located at 90th St. E. This large in-line County-owned facility has significant volumetric capacity (5 acre ft.) along with excessively well-drained soils. The facility attenuates the flow coming in from upper Rody Creek, along with treating all the runoff coming-in from the surrounding subdivision. Any sediment load that enters the project at 80th St. E will be limited by the wide-ranging ability of this facility to attenuate flows and capture sediment coming from upstream of 90th St. E. Given this effect, the discharge for the 100 yr. event has been calculated by NSD to be 80 cfs. The modest flow associated with this storm event fails to create the erosive energy required to exacerbate bed incision, nor does it create the applied pressure necessary to dislodge the instream wooden structures associated with this project's design. Volumetric sediment load production rates from within the project reach were developed by Brown and Caldwell (2013) and NSD (2018). Both analyses distinguish the volume of material associated with channel incision from the volume generated by sideslope mass-wasting. NSD estimated sediment reduction by combining the channel bed sediment storage with the sideslope sediment stabilization estimates at selected treatment locations within the Rody Creek ravine. NSD did not provide a load reduction estimate for treating the entire channel length of the proposed project area. County engineers decided to apply the NSD treatments throughout the entire length of the project area to maximize the opportunity to stabilize the entirety of the Rody Creek ravine as a geomorphic landscape.

Channel Bed Stabilization Method - Wood and cobble matrix structures will be installed in the channel to provide roughness that increase flow resistance and creates storage areas for trapping sediment. A coarse layer of cobble, within the woody matrices, will dissipate energy and armor the channel bed where flow exits the woody matrices. Bed logs between wood and cobble matrices will lower shear stress and reduce sediment transport capacity.

Streambank and Hillslope Stabilization Method - The design treats over-steepened streambanks and adjacent hillslope areas through the installation of timber frame structures. These large structures are constructed with a combination of coir fabric, plants, heavy log frames and ground anchors. All disturbed areas will be revegetated to increase root cohesion and hold sediment in-place. Vegetation will also be planted within the timber frame structures, and throughout the riparian corridor to within 25' of the channel toe.

Sediment Source Reduction Estimation Method - The sediment reduction was estimated using a ratio of the surface area treated through stabilization measures relative to the surface area of eroding areas delineated through a geomorphic field assessment. Post construction, NSD will be retained again to calculate the sediment reduction benefit for the total area treated over the entire 2,580 ft. project reach. NSD will assume that their structures will effectively (in reality) stabilize 75 percent to 90 percent of the area being treated. The treated area includes all of the eroding areas including buffers. Brown and Caldwell estimated a 6.4 tons of sediment per year for a 500-ft Rody Creek project. NSD was retained in 2018 to conduct an updated geomorphic field assessment of the Rody Creek Ravine. The results from the NSD analysis convinced the County to increase the treatment length of the project from 500 to 2,580 ft. The expanded treatment area of 2,580 ft will proportionally increase the sediment reduction benefit to approximately 32.16 tons per year over the project's 20 year.

Water Quality and Public Health Improvements

Using the method described above, estimate the water quality and public health benefits that will be achieved by the project.

The County originally used the cross-sectional channel surveys for Rody Creek and HEC-RAS modeling results developed by Brown and Caldwell and described in the Puyallup Tribe's Clarks Creek Sediment Reduction Action Plan (2013, p 2-8). Brown and Caldwell estimated a 6.4 tons of sediment per year for a 500-ft long Rody Creek project. In 2019, Natural Systems Design (NSD) was retained by the County to conduct an updated geomorphic field assessment of the Rody Creek Ravine. The results from the NSD analysis convinced the County to increase the treatment length of the project from 500 ft. to 2,580 feet. The expanded treatment area of 2,580 ft will proportionally increase the sediment reduction benefit to approximately 32.16 tons per year over the project's 20 year. This quantified sediment reduction benefit is a cited project performance requirement described in the Clarks Creek TMDL Administration Order (Ecology 2019), and the County's Phase I Permit (Appendix II). Post construction, NSD will be retained again to calculate the sediment reduction benefit for the total area treated over the entire 2,580 ft. project reach. NSD will assume that their structures will effectively (in reality) stabilize 75 percent to 90 percent of the area being treated. The NSD analysis was augmented by new cross-sectional channel surveys and updated HEC-RAS modeling to reevaluate the potential for sediment generation and delivery in the Rody Creek Ravine. The sediment reduction benefit associated with the NSD design (i.e. the preferred project alternative) was estimated by a computational method that uses the ratio of the surface area treated relative to the surface area of eroding areas as delineated through the geomorphic assessment.

The water quality benefit provided by this channel stabilization project directly relates to the ability of the proposed bioengineered structures to trap and store mobilized sediments originating from within the project area (Rody Creek Ravine). The project's sediment sequestering benefit is in addition to the internal sediment source reduction (stabilizing) provided by the channel bank and sideslope stabilization structures. The timber slash matrix and timber frame structures work together to create the interstitial (void) storage space needed to sequester sediment. A typical timber frame structure will be constructed using approximately 4 cubic yards of uncompacted timber slash.

Based on discussions with NSD and the engineer who managed a similar channel stabilization project in upper Clarks Creek (Paul Marrinan PE, City of Puyallup), the timber frame and wood slash structures work together to create a quantifiable increase in inter-structural void space. Using NSD's computational method, the project structures are expected to provide a yet to be computed cubic yards of sediment storage, which can be converted to tons of created sediment storage (using a unit conversion factor of 100 lbs./ft³, which was referenced from Brown and Caldwell and used by NSD in their analysis). Because these engineered structures will be built in-place, their physical placement will vary depending upon the site specific conditions found within the Rody Creek Ravine at the time of construction.

The existing condition of the riparian corridor in the Rody Creek Ravine is moderate to good. The riparian out-plantings associated with the timber frame installations, and the supplemental out-plantings planned for the channel toe buffers will enhance the bank stabilization throughout the channel (i.e. by increasing the soils internal angle of friction). The high root area ratios associated with subsurface rooty structure of the selected riparian species being planted serve to increase the geotechnical stability of the channel bank soil. Over time, lower rates of surface erosion and bank slumping will occur due to plant and root growth maturity. Upon senescence, the planted riparian and conifer trees will continue to serve the goals of the project by providing large woody recruitment to maintain the restored channel's stability and profile. The project benefits, once confirmed post-construction through annual inspections and continuous monitoring, will contribute significantly to stabilizing the sediment load originating from the Rody Creek Ravine.

Water Quality and Public Health Improvements

The sediment reduction benefits of the Rody Creek project will provide public health benefits by lowering the potential for downstream flooding , sedimentation and catastrophic hillslope failure (property damage) within the Rody Creek Ravine.

How long will the project provide benefits after the funding assistance ends? Who will be responsible for maintaining the benefits during its useful life?

The Floodplain and Watershed Services Section and the Capital Improvement Program have reserved funding in their biennial County budget , and their 5-year Surface Water Infrastructure Plan to support the ongoing inspections and maintenance needed to assure the project's functionality over time. PCSWM has committed to funding an ongoing program of inspection and maintenance in order to produce the sediment reduction credits necessary to demonstrate compliance with its Waste Load Allocation (WLA). The expected lifecycle of the structural components of the project will be at least 20 years; however, the stream health benefits of the channel stabilization and sediment sequestration treatments could easily be 50 years or longer.

Verification of the initial post-construction and long-term performance of the project is required by Elements 3, 4 and 6 of County's Administrative Order (AO). The Clarks Creek TMDL Administrative Order describes the expectations of the sediment WLA compliance crediting system for instream nonpoint source control projects. The Rody Creek Project's Annual Instream Inspection Protocol and Maintenance Plan was developed to satisfy Elements 3, 4 and 6 of the AO. (see Attachment). Project scale sediment reduction crediting requires annual inspections and periodic maintenance to provide a year-to-year guarantee of the functional gain (quantifiable lift) the project was designed to provide. While this Inspection and Maintenance Plan focuses on the Rody Creek project, it is part of a multi-project watershed-wide capital effort to comply with the requirements of the sediment WLA, and the re-attainment of water quality standards in Clarks Creek.

After construction, annual credit inspections will occur every year between June and September (and after 25 year or greater storm events). The inspection team will include Pierce County's project engineer, permit biologist, and TMDL program manager along with Ecology's reviewing engineer. This team will closely inspect all of the structures in the project area. GPS coordinates will establish each inspection station and photographs will be recorded for each structure. Any relevant field observations or engineering notes will be logged. The initial first- year's inspection will establish the post-construction benchmark. The Inspection team should be able to complete the inspection of the 22 timber frame structures, 5 channel spanning log structures, and 2,366 linear feet of channel slash treatment structures in a single day.

During subsequent year's inspections, each GPS coordinate (inspection station) will be revisited, and the instream structure will be reexamined against the post-construction photographic benchmark. A new photograph of each structure will be taken at each station each year. Any significant damage or structural failure will be descriptively noted and contrasted against the post-construction benchmark photograph. A case by case determination of each structure's functionality will be assessed during the first 5 years of inspections. The determination of functional failure will be made in coordination with Ecology's reviewing engineer.

Not all settling and/or movement of a structure will warrant a determination of functional failure. These instream structures are designed to flex and adjust in response to significant storm flow and sediment depositing events. Each structure will be assessed as to its stability and compared to the as-built condition. If no significant structural deficiencies are found, then it will be assumed that each structure is functioning and on track to

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reduce sediment loading downstream. When significant damage has occurred, it will be rated as low, moderate or severe and will be photographed from 3 different locations (upstream, downstream and left/right bank). A maintenance referral will be completed based on the information recorded. The maintenance referral will be forwarded to County's Maintenance and Operations Division or the Washington Conservation Crews (WCC) for scheduling and coordination. Timing of the corrections will be scheduled to assure annual crediting can be justified for the NPDES Permit's Appendix II compliance report due April 1st of each year. Maintenance referrals for structural corrections will only be issued when a fixed, instream structure has been lost or substantively compromised in its function. Attempts will be made to resolve the maintenance issue the same year during the construction window for instream work. Ecology's reviewing engineer will be notified of the corrective maintenance request and the schedule for repairs. Other smaller maintenance issues such as compromised log pins, bed control anchors or planting failures will be recorded. These observations will be rated by the inspectors based on the risk for compromising the overall function of the structure. A decision will be made amongst the inspection team on what maintenance needs should be initiated .

How will greenhouse gas emissions be reduced or mitigated under this project? And what policies or measures has your organization put in place to reduce greenhouse gas emissions apart from this project?

This grant, if awarded, will allow the County to construct the Project in its entirety as a single- entry effort. This preferred option will avoid the multi-year mobilization and construction activity associated with a phased implementation approach. A single project effort to construct the entire project at once will certainly reduce greenhouse gases due to less repeated traffic , less staging and less equipment activity.

In 2010, Pierce County became an ENERGY STAR partner, which was a declaration of our commitment to reducing energy consumption. Through this partnership we have pledged to consistently benchmark our energy performance, implement a plan or policy to reduce energy use, and educate Pierce County staff about energy conservation .

Pierce County has also signed on to the International Facilities Management Association's (IFMA) Energy Challenge, which is a national call-to-action for a reduction in energy use of 15%. To further support energy reduction Pierce County has also taken the Northwest Plug Load Pledge that demonstrates their commitment to procuring energy efficient products and reducing negative environmental impacts . The County is working with the Puget Sound Clean Air Agency and State Department of Ecology on the development of a greenhouse gas emissions inventory and regional directions on reducing greenhouse gas emissions. Additional work will include updating the Regional Emissions Analysis, recalibrating the Four-Part Greenhouse Gas Strategy and expanding on the region's Climate Adaptation/Resiliency Work Program. County Greenhouse Policy requires purchases to contain recycled content where possible. The County is also looking to strengthen its Environmental Purchasing Policy to look at life cycle costs. The County Policy encourages its employees to conserve water in their daily practices. Regarding Greenhouse Gas Emission Reductions: all employees receive education on what creates greenhouse gas. County buildings are now using 12 percent less energy than previous years based on practical conservation and replacement measures (i.e. energy efficient lighting).

Water Quality and Public Health Improvements

Reducing energy use means the County is committed through its Policy to offset harmful greenhouse gas emissions that are caused by generating energy at County owned facilities. In consequence, window replacement projects on County buildings have reduced heat loss by more than 10 percent. Energy Efficiency has also been improved with a reportable reduction of 15% in electricity and natural gas use in County facilities over January 2010 levels. All new County facilities are built to a LEED Silver or better standard. At least 50% of the County's office products purchased have recycled content. And it continues to strive to meet a total reduction in the amount of landfill waste by 30%. 50% of Pierce County's general use fleet is hybrid/electric/alternative fuel vehicles. 25% of Pierce County employee commute trips are by public transit, carpool/van pool, bicycle, walk, drive electric vehicles, telecommute or by use of a compressed work week schedule.

Are you aware of any Category I or Category II wetlands on the site or downstream from the site? This is for informational purposes; no points are associated with this question.

Yes No Not Applicable

Upload a map that shows an aerial view of the project area, an estimated direction of flow for the project area, potential locations for the proposed facility or activity, and how the project connects to the water body named above.

The map does not need to be precise, but it should help reviewers with a general understanding of the area. If access to GIS software is not available, screen shots or snips from Google Maps with arrows and text added using a paint program may be used.

Upload Documents

Click the Browse button

Select your file

Click Save, your file will appear in the List of uploaded documents

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

https://ecyeagl/IntelliGrants_BASE/_Upload/151899_925654-RodyWaterBodyMap.pdf Rody Creek Water Body Connection Map

https://ecyeagl/IntelliGrants_BASE/_Upload/151899_925654_2-RodyCrkProjectSiteMapOverall.pdf Rody Creek Project Site Map

https://ecyeagl/IntelliGrants_BASE/_Upload/151899_925654_3-PierceCountyInstreamCreditingAdministrativeOrder16589_ClarksCreekTMDL_073119.pdf Pierce County Administrative Order

https://ecyeagl/IntelliGrants_BASE/_Upload/151899_925654_4-RodyCreekChannelStabilizationProject_InspctionandMaintenancePlan_091120_.docx Rody Creek Maintenance and Inspection Plan

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

WQC-2022-PiCoPW-00035

Water Quality and Public Health Improvements

https://ecyeagl/IntelliGrants_BASE/_Upload/151899_925654_5-ClarksCreekRestorationPlan_ApprovedFinalSubmittal_030217_PierceCounty.docx

Clarks Creek Restoration Plan

[https://ecyeagl/IntelliGrants_BASE/_Upload/151899_925654_6-ClarksCreekWatershedDissolvedOxygenandSedimentTMDL\(Publication14-10-030\),Ecology,2014.pdf](https://ecyeagl/IntelliGrants_BASE/_Upload/151899_925654_6-ClarksCreekWatershedDissolvedOxygenandSedimentTMDL(Publication14-10-030),Ecology,2014.pdf)

Clarks Creek Dissolved Oxygen and Sediment TMDL

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

WQC-2022-PiCoPW-00035

Environmental and Cultural Resources Documentation

For all Water Quality Combined Funding Program projects, regardless of funding source or project category.

Cultural Review Final Determination

Date of Final Determination:

DAHP Letter of Concurrence

Completed activity/location specific Inadvertent Discovery Plan (IDP). An IDP is not associated with consultation and is required in the event of a discovery during ground disturbance.

If you are applying for or have received a loan from the CWSRF, when applicable upload the following documents.

NEPA Environmental Assessment or Impact Statement

SEPA Checklist

SEPA Threshold Determination

SEPA Environmental Impact Statement

Affidavit of Publication of SEPA Threshold Determination

Public Meeting documents

SERP Coversheet

SERP Checklist (Ecology Project Manager completes this document)

SERP Determination

Memo justifying use of an exemption under NEPA or SEPA

Other supporting environmental documentation as requested by Ecology

If you have a stormwater facility project, and you are applying for or have received state funding via SFAP and no federal funds under CWSRF, when applicable upload the following documents.

SEPA Checklist

SEPA Threshold Determination

Affidavit of Publication of SEPA Threshold Determination

Upload Documents

Click the browse button

Select your file

Click Save, your file will appear in the list of uploaded documents

Repeat for each file

To Delete a file, select the Delete checkbox next to the file and click SAVE

Description

WDAHP Consultation

Correspondence

WDAHP Consultation Process
and Discovery Plan

Attachments

https://ecyeagl/IntelliGrants_BASE/_Upload/153682_926359-DAHPProject2020-04-03067REConsultationprocessforD190Rody.pdf

https://ecyeagl/IntelliGrants_BASE/_Upload/153682_926359_2-DAHPConsultationProcessforD190RodyCrk.pdf

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

WQC-2022-PiCoPW-00035

Environmental and Cultural Resources Documentation

WATER QUALITY COMBINED FINANCIAL ASSISTANCE

Organization: Pierce County - Public Works and Utility Department

WQC-2022-PiCoPW-00035

Uploads

Description

Rody Creek Channel Stabilization

Project Site Map

Rody Creek Overall System Map

Rody Creek Water Body Map

Design Plans 90 Percent

Attachments

[https://ecyeagl/IntelliGrants_BASE/_Upload/153683_884773-RodyC
rkProjectSiteMap.pdf](https://ecyeagl/IntelliGrants_BASE/_Upload/153683_884773-RodyC
rkProjectSiteMap.pdf)

[https://ecyeagl/IntelliGrants_BASE/_Upload/153683_884825-RodyO
verallSystemMap.pdf](https://ecyeagl/IntelliGrants_BASE/_Upload/153683_884825-RodyO
verallSystemMap.pdf)

[https://ecyeagl/IntelliGrants_BASE/_Upload/153683_884823-RodyW
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aterBodyMap.pdf)

[https://ecyeagl/IntelliGrants_BASE/_Upload/153683_884823_2-D19
0_90Percent_Version2_Compressed.pdf](https://ecyeagl/IntelliGrants_BASE/_Upload/153683_884823_2-D19
0_90Percent_Version2_Compressed.pdf)