



R & E Grant Application 13 Biennium

Project #:
13-052

Nehalem Hatchery Energy Conservation Program

Project Information

R&E Project Request: \$68,883.00
Match Funding: \$30,000.00
Total Project: \$98,883.00
Start Date: 6/1/2014
End Date: 6/30/2015
Project Email: Joseph.c.watkins@state.or.us
Project Biennium: 13 Biennium
Organization: ODFW - North Nehalem River Hatchery

Applicant Information

Name: Josephc Watkins
Address: 36751 fish hatchery ln.
 36788 fish hatchery ln
 Nehalem, OR 97131
Telephone: 503-368-6828
Telephone 2: 503-440-5020
Fax: 503-368-5348
Email: Joseph.c.watkins@state.or.us

Past Recommended or Completed Projects

Number	Name	Status
05-044	Trask Early Rearing and Stroage Building	Completed
03-053	Construction Portable Anesthetic Tank	Completed
03-051	Trask Hatchery Plumbing	Completed
01-033	Nehalem Hatchery Disabled Platform and Restroom	Completed
05-133	Nehalem Hatchery Backhoe Replacement	Completed
09-023	Trask Hatchery ForkLift	Completed
09-206	Life Cycle Monitoring Hatchery Fish Lift	Completed
09-064	Nehalem Hatchery Restoration Bundle	Completed
09-205	NCWD Hatcheries Digital Microscope Project	Completed
11-013	Life Cycle Monitoring Hatchery Fish Lift	Approved
11-073	Nehalem Hatchery emergency generator replacement	Approved

Project Summary

This project is NOT part of ODFW's 25 Year Angling Plan.

Activity Type: Hatchery Maintenance - ODFW
Summary: This project addresses both the Governor's energy conservation directive and the

ODFW Hatchery Efficacy Strategy. This project upgrades the soft-start pump motor drives at Nehalem Hatchery with energy efficient Variable Frequency Drives. Variable frequency drives will allow the facility to adjust the pump flow output by regulating the motor RPM to the most energy efficient point possible while maintaining adequate flows through the fish rearing ponds. This project will substantially lower electrical consumption and increase pump life.

Objectives:

- 1 Replace the soft-start motor drives. The life expectancy for soft start drives is 15 years; these soft starts have been in service since December 5th 1988 which is over 25 years. We are past due for a failure.
2. Energy conservation. The Variable Frequency Drives (VFD'S) will significantly reduce energy consumption at Nehalem Hatchery and increase pump life.
3. Enable the fish hatchery to manipulate water flows on an "as need basis" throughout the rearing cycle of the fish. Reduce water withdrawal from the NF Nehalem River and provide the facility with a safe means of controlling withdrawal to insure the facility stays within the facilities water right.

- Fishery Benefits:** Recreational and commercial fisheries will benefit from this project because it will lower the amount of money the hatchery spends on pumping cost both for electricity and maintenance. This efficient approach will make money available to help cover the inflationary cost associated with all of the other aspects of operating a fish hatchery. As these costs escalate our only options for covering them are to raise the cost to the consumer by raising licenses and tag fees. This option has an adverse effect on total license sales which also lowers the department's share of the federally allocated sport fish restoration fund. The other approach is to demand propagation programs operate as efficiently as possible. This project helps to address hatchery efficiencies by reducing the electrical cost associated with pumping water for fish rearing purposes.
- Watershed Benefits:** This project will not have an added benefit to the NF Nehalem watershed but it will reduce the amount of electricity used by the facility which may influence the amount of water that is used for hydro-generation. Less water going through the turbines means more water available for spill. This project most likely will have a beneficial effect on inland watersheds which support the regions hydro-generation projects such as the Willamette, Deschutes, Columbia and Snake River systems.
- Current Situation:** The current situation at the facility is that the facility is operating the pumps on soft starts that are well past due for a failure. The facility spent \$84,126.00 on electricity during the 11-13 biennium. By upgrading the soft starts motor controls with VFDs we expect to shave our electrical consumption by between 12% and 20%. This will save the program between \$10,000 and \$18,000 a biennium in electrical charges.
- Alternatives:** We could replace the soft starts with soft starts at a much less up-front cost, but the end result would be to have the same electrical consumption rate and the same time frame between pump rebuilds. The move to VFD controlled pumps, reduces over-all cost to the agency and helps the environment. This is green technology.
- Designer:** This is a design build project that will consist of component purchase and installation.
ODFW engineering will develop specifications and complete the bid package.

Methods: ODFW engineering and procurement will provide a bid packet and scope of work. The project will be advertised on ORPIN. Once the bids are awarded the project will move forward with component purchase, motor purchase and motor and component installation.

Inspector: ODFW- Nehalem manager,

Funding Elements: The purchase of services and supplies to purchase and install the VFDs and for the purchase and installation of the pump motors. Engineering will assign one engineer to develop the specifications and bid packages.

Partners:

Yes

ODFW fish propagation- provides a portion of the funding.
Tillamook PUD will monitor success of project and provide an incentive based upon the level of success.

Existing Plan: No

Affected Contacted: Yes

Affected Supportive: Yes

Affected Comments: Tillamook PUD has been an active participant in this project and supports the projects for its energy conservation merits.

Project Schedule/Participants/Funding

Activity	Date	Participants
Prepair bid package	5/1/2014	ODFW Engineering
Award Bids	5/30/2014	ODFW procurment
Take Delivery of components	6/30/2014	Nehalem Hatchery
Installation of components	9/1/2014	Contractors
Electrical Permit	9/1/2014	contractor
Maintenance	9/1/2014	ODFW- Nehalem Hatchery

Affected Species: Chinook Salmon
Coho Salmon
Rainbow Trout
Steelhead

Project Permits

This project has no permits.

Project Monitoring

Organization	Address	Activity	Frequency
ODFW Nehalem Hatchery	36751 Fish Hatchery In Nehalem, OR 97131	effectiveness of the VFDs and daily adjustments when warrented	daily

Project Maintenance

This project has no maintenance plans.

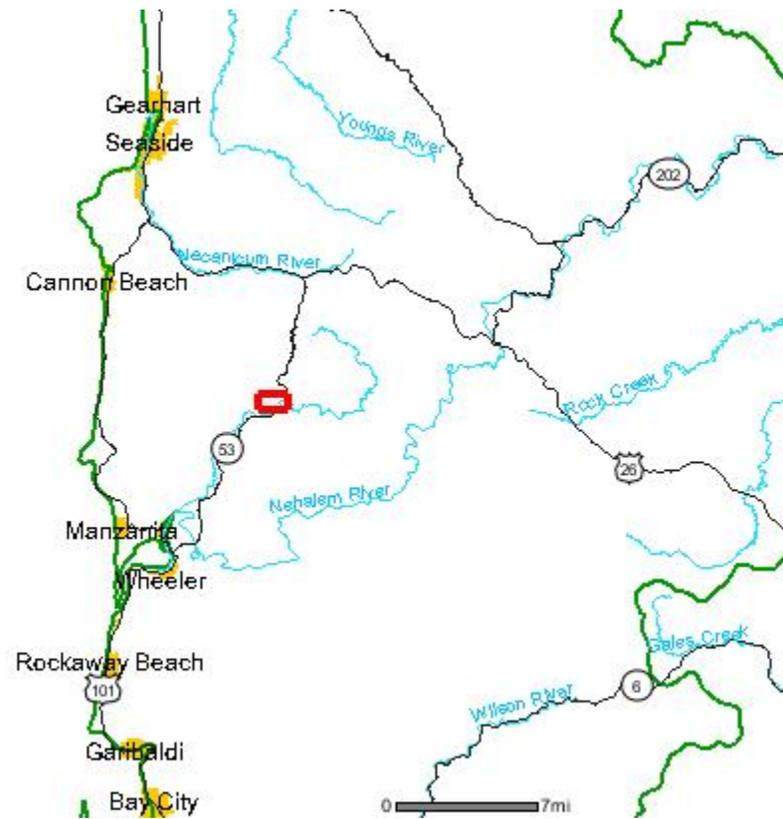
Project Match Funding

Funding Source	Cash	In-Kind	Other	Description	Total	Secured?	Conditions?	Comments
R&E Request	\$68,883.00	\$0.00	\$0.00		\$68,883.00	No	No	
ODFW fish propagation	\$30,000.00	\$0.00	\$0.00	money is from PUD incentive and predicted cost savings	\$30,000.00	No	No	
				Total Match Funding:	\$98,883.00			

Project Budget

Item	Item Type	Units	Unit Cost	R&E Funds	Match Funds	Total
4 VFD compliant pump motors	Equipment	4	\$4,880.75	\$13,608.00	\$5,915.00	\$19,523.00
ODFW Engineering services	Personnel	1	\$4,000.00	\$0.00	\$4,000.00	\$4,000.00
contingency @5%	Production Costs	1	\$4,708.00	\$0.00	\$4,708.00	\$4,708.00
Installation of VFD Components	Supplies/Materials /Services	1	\$32,485.00	\$22,642.00	\$9,843.00	\$32,485.00
purchase of VFD equipment	Supplies/Materials /Services	1	\$29,667.00	\$26,708.00	\$2,959.00	\$29,667.00
removal of old and installation of new motors	Supplies/Materials /Services	1	\$8,500.00	\$5,925.00	\$2,575.00	\$8,500.00
					Total Budget:	\$98,883.00

Project Map



Additional Files

Click a link to view that particular file.

[cascade controls](#)

[Conrey Electric](#)

[District letter of support](#)

[engineering letter of support](#)

[engineering work order](#)

[RMS pump 1](#)

[signature authorization page](#)

[team electric](#)



Oregon

John A. Kitzhaber, MD, Governor

Department of Fish and Wildlife

North Coast Watershed District

4907 Third Street

Tillamook OR 97141

(503) 842-2741

FAX (503) 842-8385

www.dfw.state.or.us



December 10, 2013

R&E Board
c/o ODFW
4034 Fairview Industrial Drive SE
Salem, OR 97302

Dear Board Members:

The Oregon Department of Fish and Wildlife's (ODFW) Tillamook District staff has reviewed the R&E project proposal submitted by ODFW's Nehalem Hatchery. The project proposal is for funding needed to upgrade the hatchery pumping system.

Nehalem Hatchery is a vital part of fish management in the Tillamook District of the North Coast Watershed District. The hatchery provides winter steelhead, coho, fall chinook and rainbow trout to local streams and lakes that support substantial freshwater recreational fisheries. Some species also contribute to ocean recreational and commercial fisheries. The hatchery relies on a system of pumps to supply water to the facility. While necessary for the operation of the hatchery, the system is subject to ongoing wear and tear, and is expensive. Having a reliable, efficient pumping system will minimize risks to hatchery production. The added potential of substantial cost savings over the long term makes this project even more attractive in a time of increasingly scarce resources. For these reasons, the Tillamook District supports this project and believes it is extremely worthy of your consideration for funding.

Sincerely,

Robert Bradley
Assistant District Fish Biologist





MEMORANDUM

Oregon Department of Fish and Wildlife

Date: December 9th, 2013

To: Joseph Watkins, Nehalem Hatchery Manager

From: Ryan McCormick, P.E., M.S.C.E., Acting Chief Engineer

Subject: **VFD Upgrade Project for Nehlaem Hatchery**

Greetings Joe,

Thank you for the opportunity to review your proposal for a VFD upgrade to the hatchery intake pumps at Nehalem Hatchery. After reviewing the submitted documentation, it appears the proposal will be of great financial benefit to your hatchery. The use of VFD's can provide significant cost savings for operation and decrease wear and tear on the pump motors. From the submitted analysis, the potential of saving \$18,000.00 for a year of operation, in my opinion, warrants implementation as soon as possible.

The Engineering Section is in complete support and recommends you begin searching for funding sources to purchase VFD's for your hatchery intake pumps.



OREGON DEPARTMENT OF FISH & WILDLIFE
Fish Division, Engineering

WORK ORDER

<input checked="" type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> REPAIR	NUMBER
<input type="checkbox"/> IMPROVEMENT	<input type="checkbox"/> OTHER	

FACILITY Nehalem
DESCRIPTION VFD installation specification and bid package

TENT. START DATE: June 14	TENT. COMPL. DATE: Jul 15	WORK TO BE DONE BY:
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COST ESTIMATE ITEM	FUND	COST CENTER	ACCT CLASS	AMOUNT	PROJECT NO.
FA LABOR-PERM					
FA LABOR-TEMP					
MILIAGE					
MEALS & LODGING					
BLDG MATLS					
EQUIP RENTAL					
EQUIP PURCHASE					
ENGINEERING				\$4000.00	
CONTRACT					

ESTIMATOR TOTAL	COST
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APPROVALS

ORIGINATOR	REGION/SECTION	ENGINEERING REC.	ENGINEERING FWD.
DATE:	DATE:	DATE: 12/11/13	DATE:
REGION/SECTION	DIVISION	FISCAL-ACCTANT	FISCAL PROP. ACCT.
DATE:	DATE:	DATE:	DATE:

COMMENTS

ODFW Engineering Section have been actively working with Joe on this project and are fully aware of its scope and intent. I recommend this proceeding forward with this project as a proposal for R&E.

COMPLETION (Describe when project needs to be completed by and why.)



19785 NE SAN RAFAEL ST
Portland OR 97230

P: 503-702-1603
F: 503-252-3372

E: bhowell@cascade-nw.com
W: www.cascade-nw.com

The system will be comprised of four variable frequency drive (VFD) control panels and a radio control system. The VFD's will be designed to maintain a constant flow based on individual feed-back signals from the Pump 1-4 flow meters. 4-20mA signals from each of the flow meters will be re-transmitted via a 900mZ radio from the individual flow meter signal converters to their corresponding VFD controller.

A potentiometer and 2-position selector switch will be added to pump's control section door that will allow individual adjustment of the VFD's flow set-point (when the selector is in the "Auto" position) or the actual speed of the pump (when the selector is in the "Auto" position). Each VFD's controller will be mounted through its control section door that will display the pump's set-point, the actual flow meter feedback, the pump speed, power usage, and current.

In the event that a VFD fails, an existing keyed selector switch can be used to isolate the VFD from service and start the pump across-the-line.

All of the major components will be preassembled on a fabricated back panel that will mount into the existing pumps control section of the motor control center. The back panel will also come with terminals for interfacing with the existing control section door, low voltage, and pump motor connections. The only existing components that will be utilized are the individual circuit breaker disconnects, control transformers, and existing alarm circuitry.

The motor control center will be protected from transient voltage spikes by the installation of a surge arrester that will be shipped loose for field installation in the Main Disconnect section of the MCC.

The individual motor control sections will be modified with the following:

- 20" x 48" galvanized back panels
- Danfoss FC202 variable frequency drive with door mounted interface
- 100A semiconductor VFD fusing
- Mechanically interlocked contactors & overload relay for emergency bypass operation
- Phase loss & power quality monitor
- Selector switches & speed potentiometer for door installation
- Integrated DV/DT filter for enhanced motor protection
- Exhaust fan (shipped loose for field installation in the buss section above each VFD)
- Filtered inlet louvers (shipped loose for field installation in the bottom of the door of each VFD)

The panel for the flow meter end of the radio/analog interface will include:

- 12" x 12" x 8" NEMA 12 wall mount control enclosure
- 120V, 5A fused incoming power
- 24vdc power supply
- Banner DX80, 4 channel analog radio node
- Terminals for flow meter interface

The panel for the VFD end of the radio/analog interface will include:

- 12" x 12" x 8" NEMA 12 wall mount control enclosure
- 120V, 5A fused incoming power
- 24vdc power supply
- Banner DX80, 4 channel analog radio gateway
- Terminals for VFD reference interface

YOUR BUDGET PRICE FOR THE ABOVE PACKAGE WILL BE: \$29,667.00
Includes startup services

Signature Authorization Page

I hereby make an application for financial assistance under the terms and conditions of the R&E Program as described in my project application.

I understand that if my project is approved for funding, the following will apply:

- All project sponsors must sign a grant agreement containing the terms and conditions on which funding will be released.
- Project expenses which occur before the grant agreement is signed or after the expiration date will not be paid by the R&E Program.
- Copies of all necessary permits must be submitted to the R&E Program.
- Project sponsors must certify compliance with local, state, and federal regulations and laws.
- Landowner, monitoring and maintenance agreements must be submitted to the R&E Program.
- Regular progress reports may be required, and at the end of each project a Completion Report must be submitted.
- Educational products resulting from projects are public domain.
- All information submitted to either party under this application is subject to the federal Freedom of Information Act.

Project: Nehalem Hatchery Energy Conservation Program

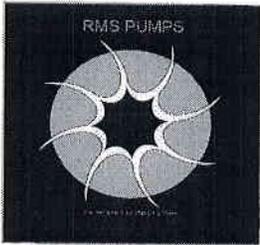
Applicant: Joe C Watkins

Date: December 11, 2013



Regional Hatchery Coordinator:

Date: December 11, 2013



RMS Pump, Inc.

3026 SE 85th Ave
Portland, OR 97266
Phone: 503-788-9349
Fax: 503-774-2714

QUOTE

CCB #173135
UBI #602 651 292
LPI Electrical #153CPI

To JOE WATKINS
Company: NEHALEM HATCHERY
From: LARRY

Date: 12-12-13
Fax/E-mail
Pages: 1

ESTIMATED QUOTE TO REMOVE EXISTING MOTOR'S AND
INSTALL NEW MOTOR'S.

OUR LABOR RATE IS \$75.00 HR. I WILL BE SENDING (3) MEN
TO SITE, TRAVEL TIME TO SITE AND BACK TO SHOP WITH
(3) MEN 12 HRS, 3 HOURS EACH MOTOR, 3 MEN 36 HOURS,
BOOM TRUCK \$500.00.

IF WE HAVE TO MAKE NEW HEAD SHAFTS AND INSTALL
THEM \$3200.00. I'M FIGURING \$200.- FOR ELECTRICAL
FITTINGS AND SUPPLIES.

FOR BUDGET FIGURE USE \$8,500.00

THANK YOU LARRY

This message is intended for the sole use of the individual and entity to which it is addressed, and may contain information that is privileged and confidential. If you are not the intended addressee, nor authorized to receive for the intended addressee, you are hereby notified that you may not use, copy, disclose or distribute to anyone the message or any information contained in the message. If you have received this message in error, please immediately advise the sender by calling 503-788-9349.

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