



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

*PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000*

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TO: Brandi Lubliner, Stormwater Action Monitoring Coordinator, Water Quality Program  
Dale Norton, Western Operations Section Manager, Environmental Assessment Program

FROM: Christopher Moore, Environmental Systems Support Unit Supervisor, Information Technology Services Office

**SUBJECT: Redevelopment of the Watershed Health Monitoring Data Management System – Deliverable 3 Completion Memorandum**

## **Background**

Ecology's IT Services Office had previously developed a comprehensive data management system for Watershed Health Monitoring (WHM), including: mobile e-forms, physical habitat tables integrated with the agency's Environmental Information Management (EIM) System, automatic metric calculation (refreshed nightly), and a web user interface that pulls from and integrates multiple data sources. Two of Ecology's programs use the WHM data management system: the Environmental Assessment Program (EAP) and the Water Quality Program (WQP) via the Stormwater Action Monitoring (SAM) program which is part of the municipal stormwater permits.

## **Executive Summary**

The WHM data management system required a redevelopment to the underlying framework for the WHM editor, enhancements to the user experience, and ongoing maintenance to keep it viable. While ongoing maintenance in the WHM data management system is covered by EAP, the significant rework of the 'WHM Editor' for the framework upgrade and user experience enhancements required additional funds and effort. This memo documents the completion of work achieved with that additional funding and the resulting benefits realized.

## Results

The project Steering Committee, Product Owner, and Business Team have reviewed the final results from this project and have approved its completion.

### **Schedule:**

*Projected*

1/1/2019 – 6/26/2019

*Actual*

1/1/2019 – 7/10/2019

### *Reasons for variance*

The new system was live 14 days later than originally estimated due to scheduling conflicts for an open production deployment window.

### **Benefits:**

- User Experience:
  - o Alignment of WHM Editor user interface with the existing mobile e-forms (mobile e-forms were not modified as part of this project).
  - o Alignment of WHM Editor ‘staging’ and ‘final’ data display.
  - o Accessibility improvements across the application.
- Efficiency/Accuracy:
  - o Speed of data review through the interface due to navigation and display enhancements.
  - o Increased accuracy of data quality assurance review due to consistent display of required information for related data review.
  - o Speed of data becoming available on the externally accessible EIM Search interface.
  - o Applied data integrity checks within WHM Editor that already existed on the mobile e-forms to ensure data quality when entering/editing data.
- Technical:
  - o Moved from Web Forms to MVC web application which improves security and longevity of the application.
  - o Implementation of modern Kendo UI toolkit.
  - o Removed old service architecture, which was increasing the difficulty of database/field change requests, making future enhancements more efficient.

## Lessons Learned

This project was a success story; the list below highlights reasons why:

- Agile (Scrum) framework allowed for flexibility and responsive development cycles, as well as, ongoing business engagement.
- Well laid out and defined project roles and responsibilities.

- Individual team member skillset and motivation throughout the project.
- Appropriately sized and well defined scope of work.
- Realistic task estimation from the Development Team.

What could we have done better:

- There was a point in the project where a portion of work had to be re-worked. That re-work may have been avoided by providing a working prototype of the functionality and going through an iteration of testing prior to implementing it across a larger portion of the application.

## Funding

WHM is not an agency enterprise system, therefore, funds for the WHM editor rebuild need to come from WHM users. The users are EAP, WQP, and SAM. The Stormwater Work Group approved the WHM rebuild ‘fair share’ expense from the SAM status and trends account in April 2016. Stormwater Work Group also approved three years of ‘fair share’ expenses from an active SAM effectiveness study (Redmond Years 1-3). The Redmond contract extension is planned for in early 2018, and a ‘fair share’ expense at the rate of \$7,030 per year is anticipated.

Program	Funding source	Amount	MIC(s)	Note
WQP	SAM small streams	\$ 42,530	F92AA500	
	Option 2 Permittees	\$ 7,030	NA	WQP will direct fund EAP, no code
	Redmond <sup>1</sup> Effectiveness Study Years 1 – 3	\$20,565	F92AE500	3 years of \$21,090 is obligated in Redmond contract for WHM support
	Redmond Effectiveness Study Years 4 – 5 <sup>2</sup>	\$ 14,060	F92AE500	Future contract amendment
EAP	EPA 319	\$116,000	DWB21020	

1= Total available reflects charges of \$525 by EAP in year 1 to setup the Redmond Effectiveness study.

2= These funds are not yet authorized formally for the WHM editor rebuild from this project, because the contract extension will be done in late 2017 or early 2018.

SAM account expenses totaled \$40,096 through June 30, 2019 under the F92AA account. Minimal charges were accrued during the July roll out. The project was completed under budget.

Cc: Annette Hoffmann, EAP Program Manager  
 Gary Koshi, EAP Budget Planner  
 Rebecca Pittman, WQP Budget Planner  
 Mark Solie, ITSO EBTS Section Manager  
 Vincent McGowan, WQP PDS Section Manager  
 Jessica Archer, EAP SC Section Manager