Information Management System for Water Right Mitigation Compliance – City of North Bend

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North Bend applied for a new water right in 1992 to meet existing and projected future demand.

- Diverted 2.3 times the annual quantity allowed under its water right (336 acre-feet) in 2006.
- 50 year projected demand was 9 times the water right.
Project Background

Instream Flow Control Points

**Issue:**
- The proposed new groundwater source for North Bend was an aquifer that is hydraulically connected to the Snoqualmie River.
- The river is subject to minimum instream flow requirements in the basin.

There were concerned stakeholders in the basin.
- Washington State Department of Ecology (Ecology)
- Multiple tribes (Snoqualmie, Tulalips)
- Environmental groups (CELP)
Project Background

**Solution:** Mitigate (add water to the river from another source) for the impacts to the river from pumping the well on **days** when the minimum instream flow requirements are not met.
Mitigation Requirement

Example of the impact from a single day of pumping
Daily Mitigation Operations Model

North Bend obtained its new water right in 2008, subject to daily operational constraints.

1. Record Water System Information
2. Determine Mitigation Requirement
3. Minimum Instream Flow Met?
   - No: Determine Mitigation Requirement
   - Yes: Update Daily Report
Determine Mitigation Requirement

Maximum impact to the stream from pumping record

Upper Bound = ~ 90% by day 4

Lower Bound = ~ 60% by day 4

Range of uncertainty in stream impact

Well NB-3 (Production Source)
North Bend obtained its new water right in 2008, subject to **daily** operational constraints.
Determine Mitigation Source

Hobo Springs

Hobo Springs

Available

Sallal Water Need

Sallal Water Need

Month

Flow (mgd)
Daily Mitigation Operations Model

North Bend obtained its new water right in 2008, subject to daily operational constraints.

Record Water System Information

Minimum Instream Flow Met?

No

Yes

Developed an online tool that calculates the city’s daily mitigation requirement with the click of a button.

Determine Mitigation Requirement

Determine Mitigation Source

Update Daily Report

Mitigate Stream Impact
Municipal Water Mitigation System (MWMS)

Create or View a Report

Calculate Today’s Mitigation Requirement

Create an Event Report

Administration

Emergency Data Entry

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Operator clicks…
“Calculate today’s mitigation requirement”

SCADA System
20 inputs

MWMS
Over 50 output variables

1. Is mitigation needed?
   ➢ Use of water from the new water right
   ➢ Are minimum instream flows met at each of the 3 gauges?

2. If mitigation is needed…
   ➢ Is there adequate Hobo Springs flow?
   ➢ If needed, is there adequate Sallal water?

USGS Website
3 gages; 24 hrs of 15-min flows
Operator reviews results, edits if necessary and recalculates, accepts today’s report, and prints the report.

Operator goes to the SCADA system and sets the Hobo Springs Valve and the Sallal Wells Intertie to the rates identified in the daily report.
Deployment

- MWMS database is on North Bend’s server, behind the city’s firewalls
- Subject to City’s internal back-up procedures
- Accessible from any computer with an Internet connection
- User training manual
- Training session
- Golder staff provide support as needed
Applicability and Benefits

- **Decision tool**
  - Dynamic/real-time
  - Management decisions on daily, monthly, yearly time-frame
  - Review and edit data (audit trail)

- **Data management and storage tool**
  - Automate routine report generation
  - Automate retrieval of data from outside sources
  - Stakeholder access to data

- **Benefits**
  - Quickly integrates multiple data streams
  - Streamlined compliance with regulatory requirements
  - Cost-effective in the long-term
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