Monitoring SUEZ Production Well Performance

2016 AWWA PNWS Conference

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May 6, 2016

Well efficiency decline is obviously a bad thing…

Increased pump lift

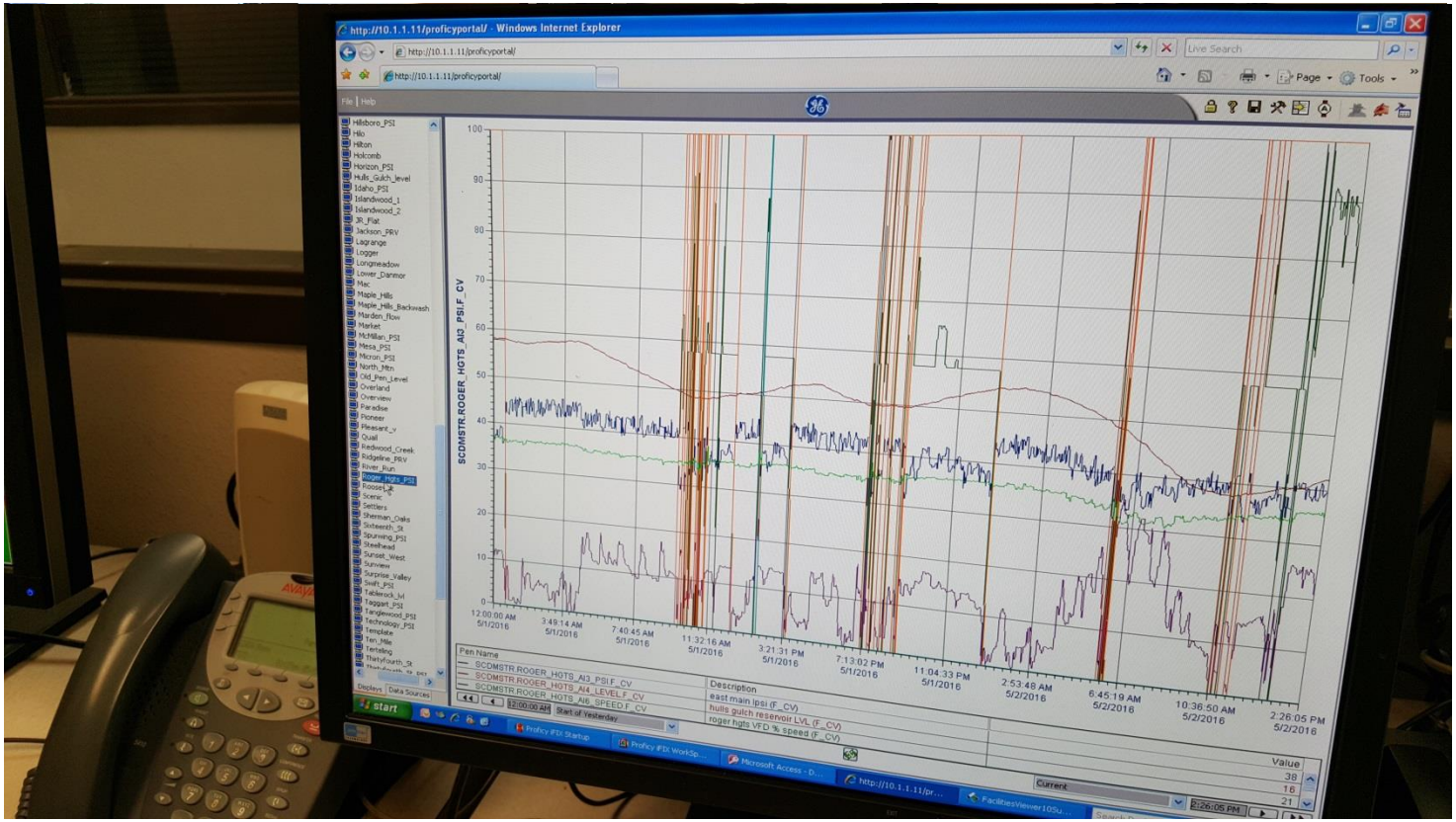
Pump design becomes “wrong”

wasted energy

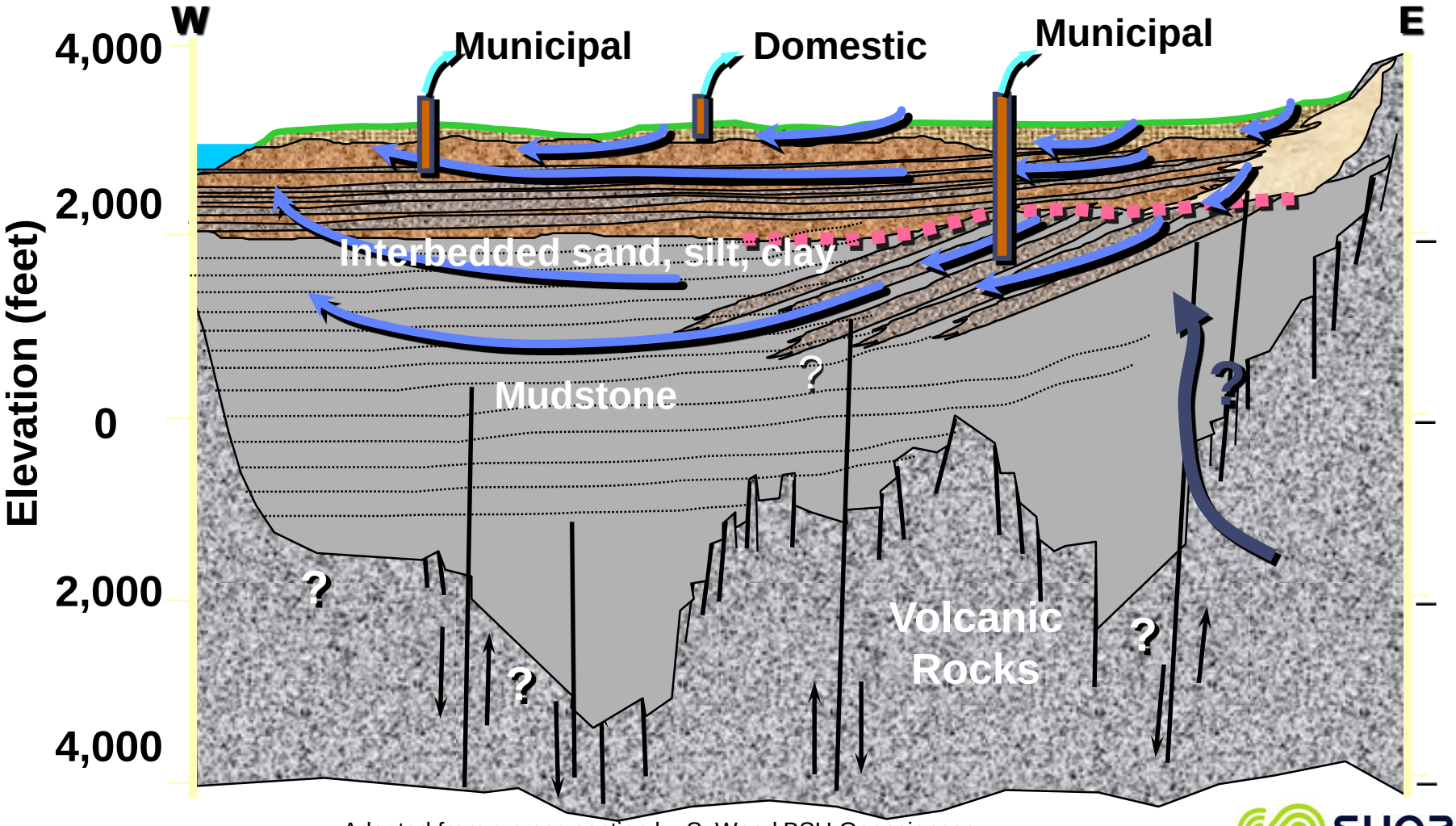
lowered ability to meet demand

may become “permanent”

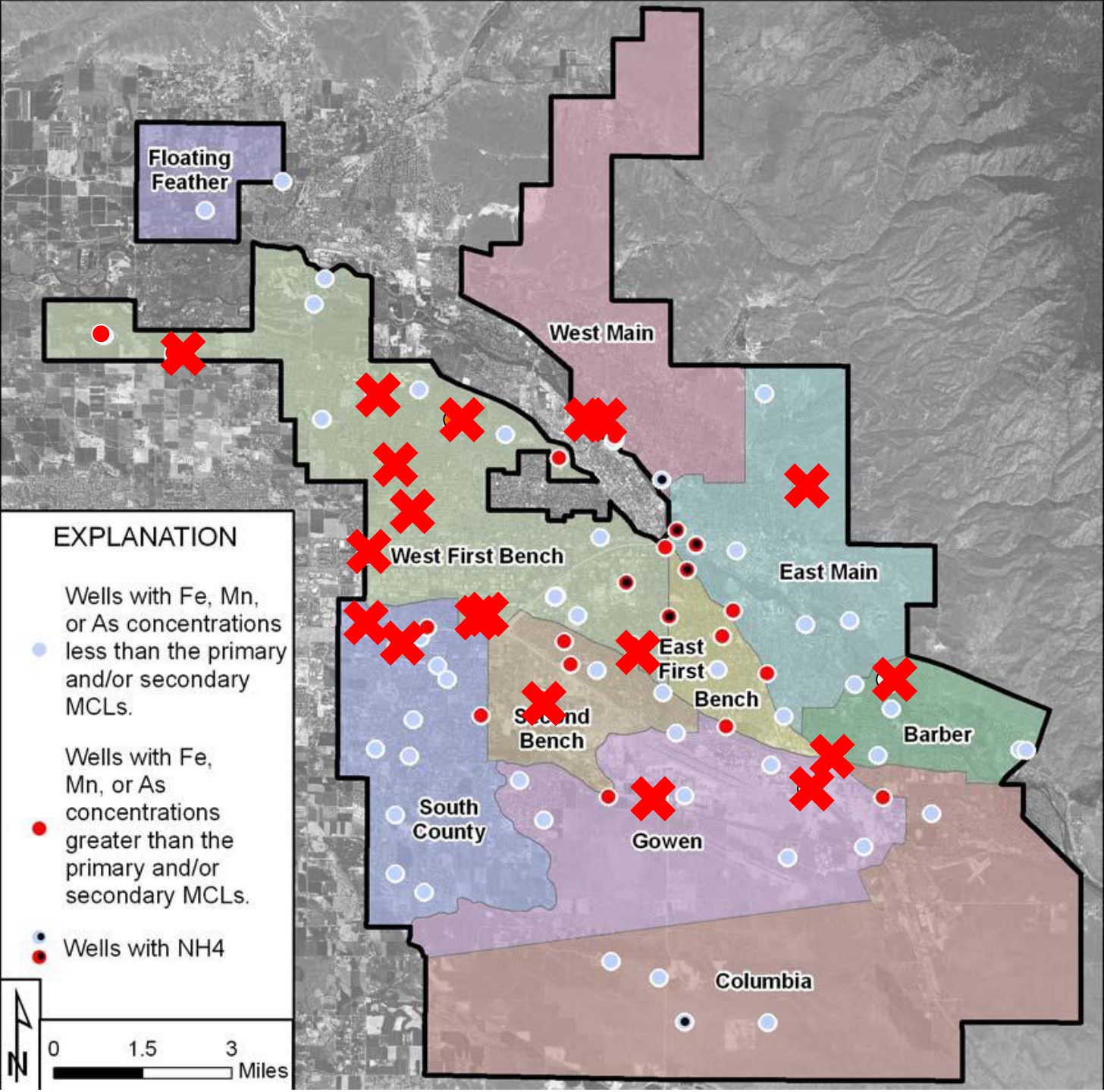
Monitoring well performance



Conceptual Cross-Section (Regional Scale)



Adapted from a cross section by S. Wood BSU Geosciences

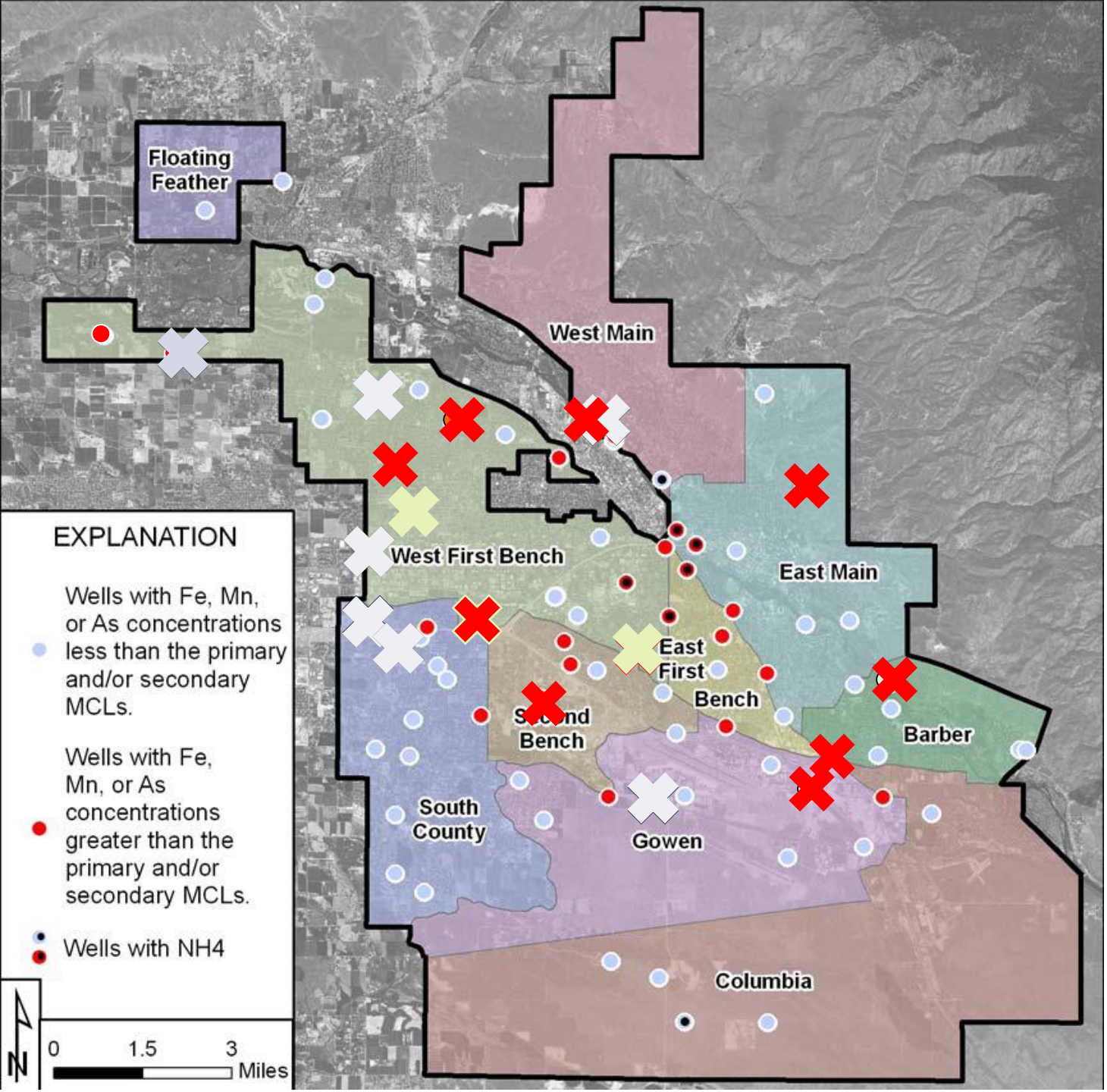


Concentration > Primary MCL

- Uranium
- Arsenic

✖ = "not useful"

suez

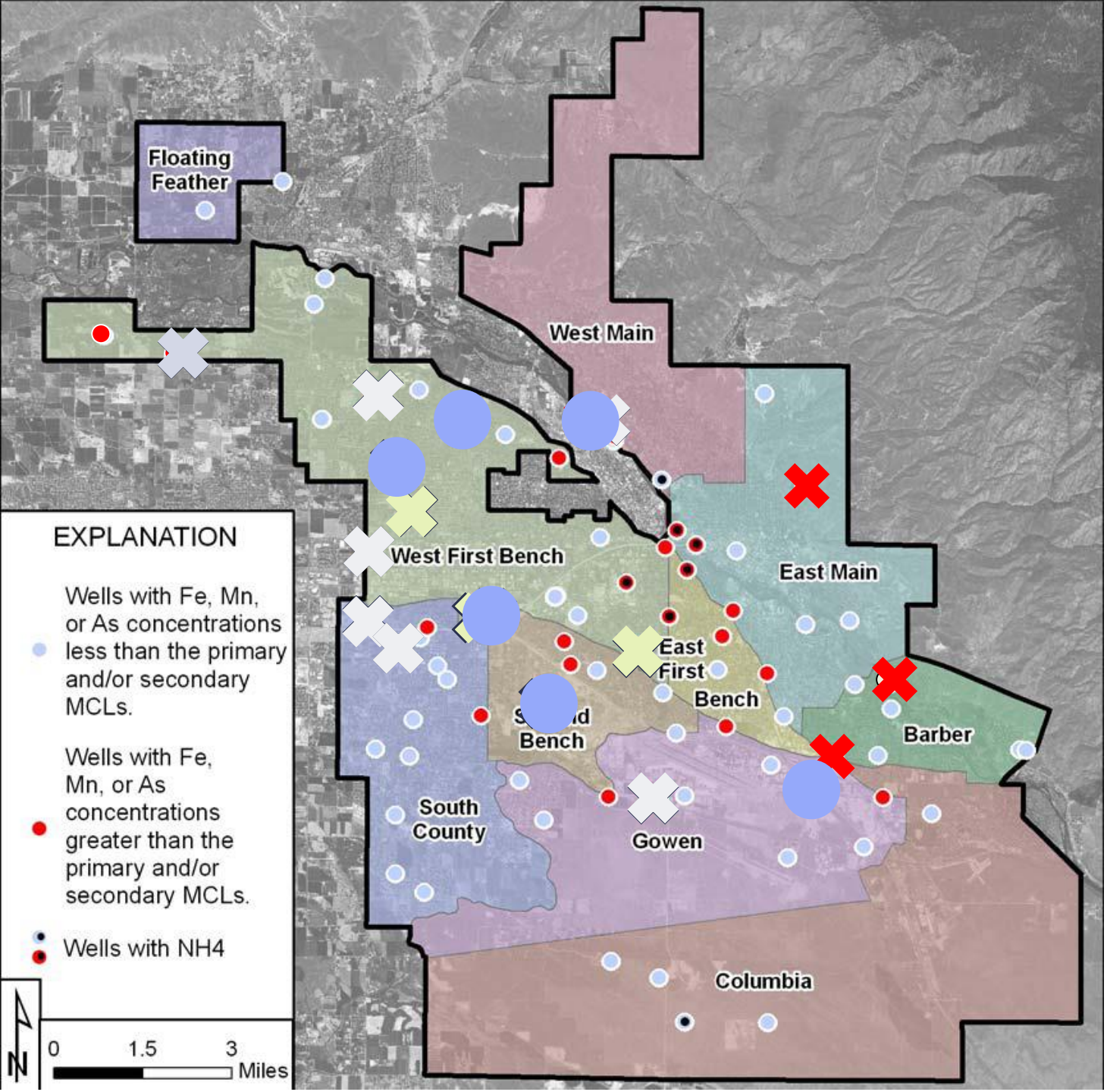


Decommission

Treat Fe/Mn

Re-drill

suez



Decommission

Treat Fe/Mn

Re-drill

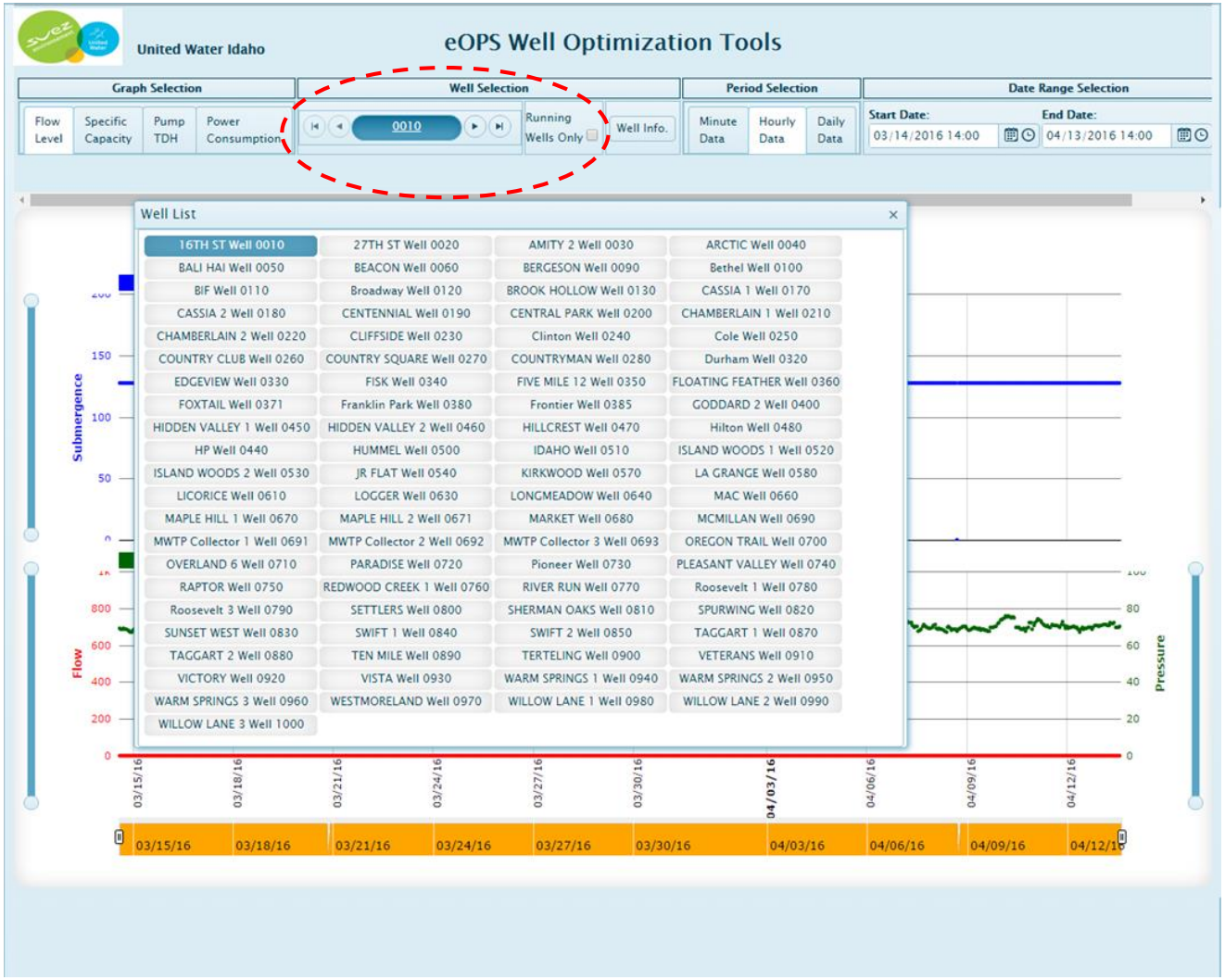
ASR

suez

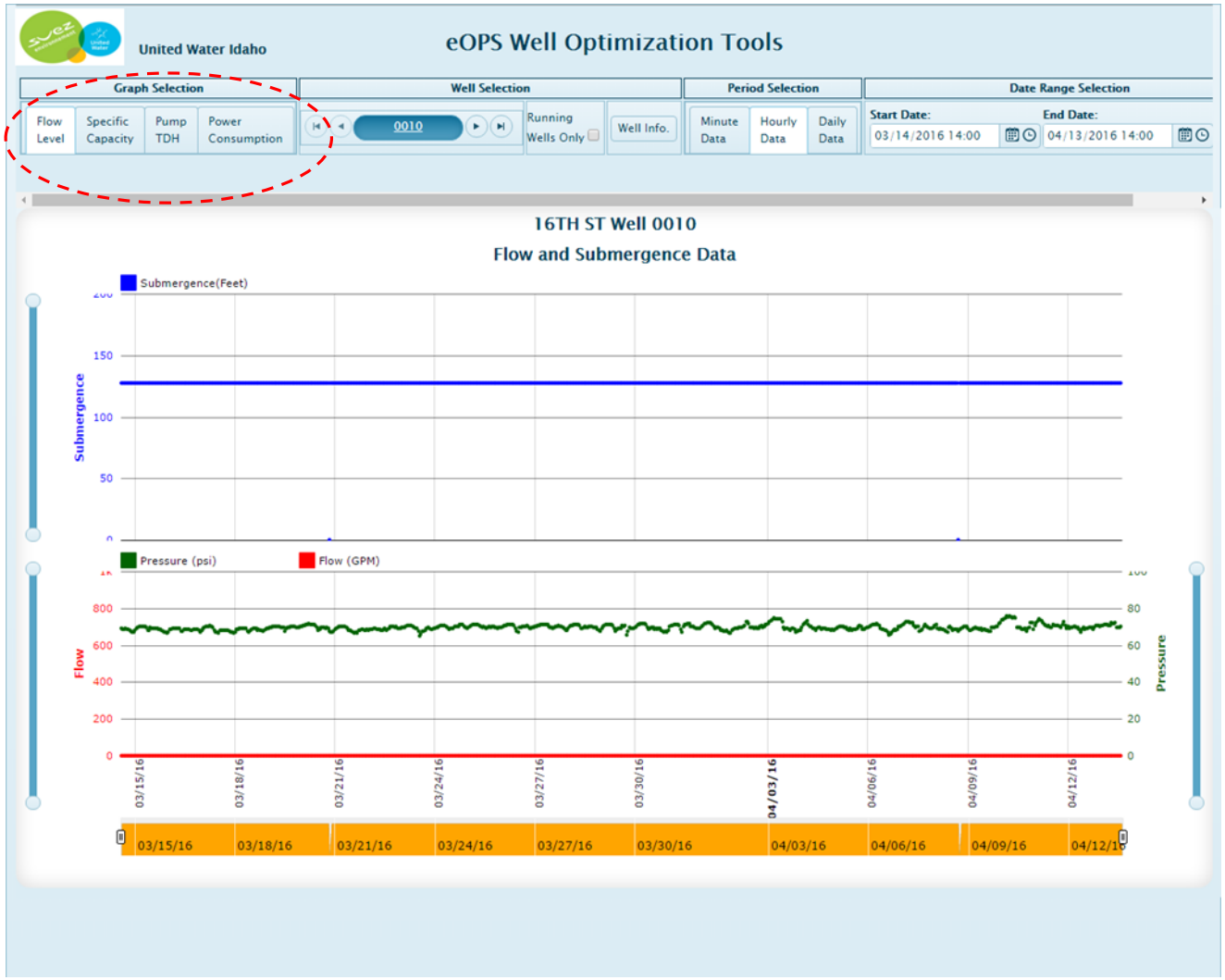
SUEZ “Well Op” tool helps us evaluate well performance

- SUEZ utility in New York modeled Well Op tool on original version of “Well Watch” software developed under SUEZ R + i Alliance
- Well Op tool creates easily scalable graphs of SCADA system data
- Allows comparison of current/ recent well performance to previous performance

Well Op tool


United Water Idaho
eOPS Well Optimization Tools
Graph Selection
Flow Level
Specific Capacity
Pump TDH
Power Consumption
Well Selection
0010
Running Wells Only
Well Info.
Period Selection
Minute Data
Hourly Data
Daily Data
Date Range Selection
Start Date:
03/14/2016 14:00
End Date:
04/13/2016 14:00
Well List
16TH ST Well 0010
27TH ST Well 0020
AMITY 2 Well 0030
ARCTIC Well 0040
BALI HAI Well 0050
BEACON Well 0060
BERGESON Well 0090
Bethel Well 0100
BIF Well 0110
Broadway Well 0120
BROOK HOLLOW Well 0130
CASSIA 1 Well 0170
CASSIA 2 Well 0180
CENTENNIAL Well 0190
CENTRAL PARK Well 0200
CHAMBERLAIN 1 Well 0210
CHAMBERLAIN 2 Well 0220
CLIFFSIDE Well 0230
Clinton Well 0240
Cole Well 0250
COUNTRY CLUB Well 0260
COUNTRY SQUARE Well 0270
COUNTRYMAN Well 0280
Durham Well 0320
EDGEVIEW Well 0330
FISK Well 0340
FIVE MILE 12 Well 0350
FLOATING FEATHER Well 0360
FOXTAIL Well 0371
Franklin Park Well 0380
Frontier Well 0385
GODDARD 2 Well 0400
HIDDEN VALLEY 1 Well 0450
HIDDEN VALLEY 2 Well 0460
HILLCREST Well 0470
Hilton Well 0480
HP Well 0440
HUMMEL Well 0500
IDAHO Well 0510
ISLAND WOODS 1 Well 0520
ISLAND WOODS 2 Well 0530
JR FLAT Well 0540
KIRKWOOD Well 0570
LA GRANGE Well 0580
LICORICE Well 0610
LOGGER Well 0630
LONGMEADOW Well 0640
MAC Well 0660
MAPLE HILL 1 Well 0670
MAPLE HILL 2 Well 0671
MARKET Well 0680
MCMILLAN Well 0690
MWTP Collector 1 Well 0691
MWTP Collector 2 Well 0692
MWTP Collector 3 Well 0693
OREGON TRAIL Well 0700
OVERLAND 6 Well 0710
PARADISE Well 0720
Pioneer Well 0730
PLEASANT VALLEY Well 0740
RAPTOR Well 0750
REDWOOD CREEK 1 Well 0760
RIVER RUN Well 0770
Roosevelt 1 Well 0780
Roosevelt 3 Well 0790
SETTLERS Well 0800
SHERMAN OAKS Well 0810
SPURWING Well 0820
SUNSET WEST Well 0830
SWIFT 1 Well 0840
SWIFT 2 Well 0850
TAGGART 1 Well 0870
TAGGART 2 Well 0880
TEN MILE Well 0890
TERTELING Well 0900
VETERANS Well 0910
VICTORY Well 0920
VISTA Well 0930
WARM SPRINGS 1 Well 0940
WARM SPRINGS 2 Well 0950
WARM SPRINGS 3 Well 0960
WESTMORELAND Well 0970
WILLOW LANE 1 Well 0980
WILLOW LANE 2 Well 0990
WILLOW LANE 3 Well 1000
Submergence
Flow
Pressure
03/15/16
03/18/16
03/21/16
03/24/16
03/27/16
03/30/16
04/03/16
04/06/16
04/09/16
04/12/16

Well Op tool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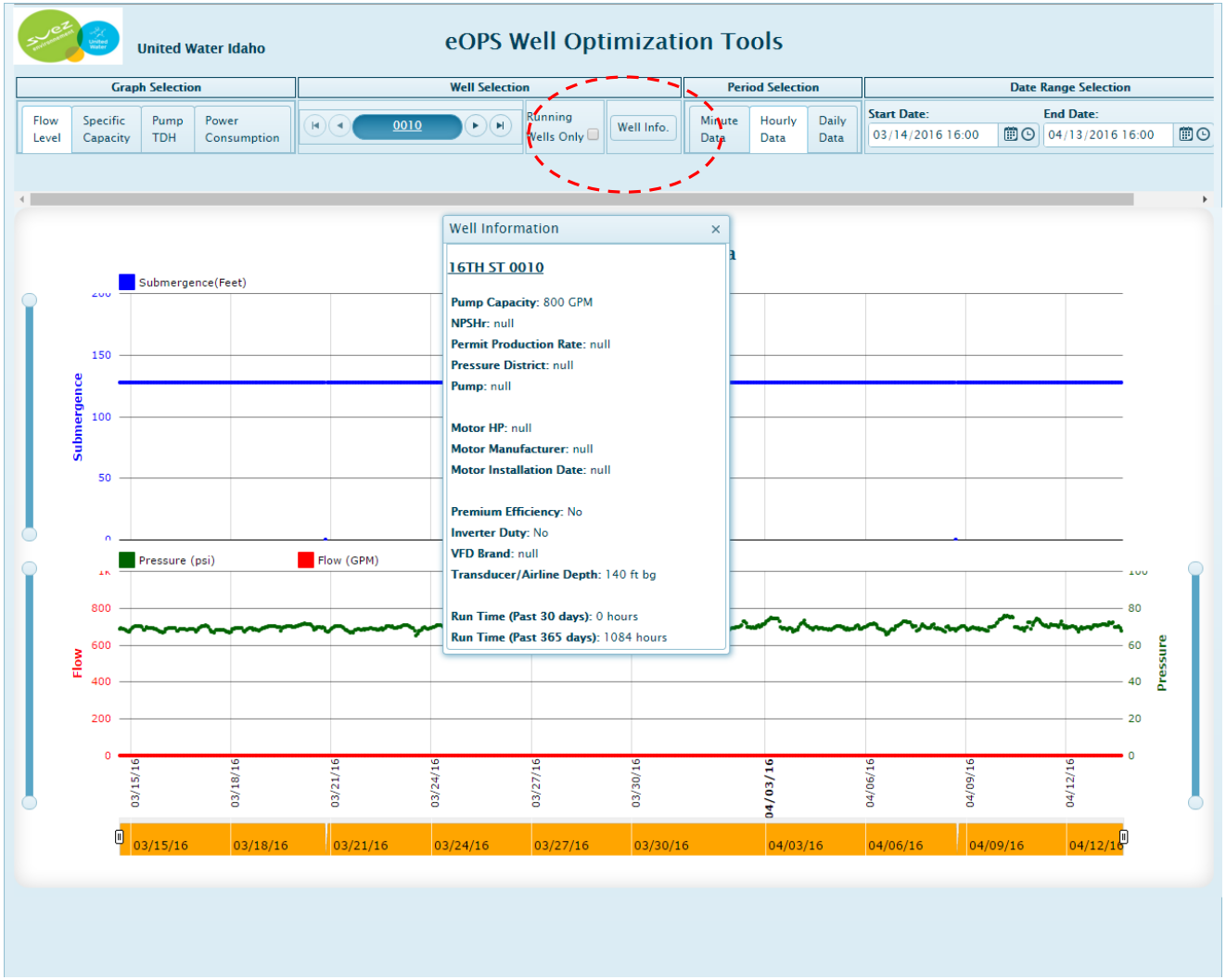
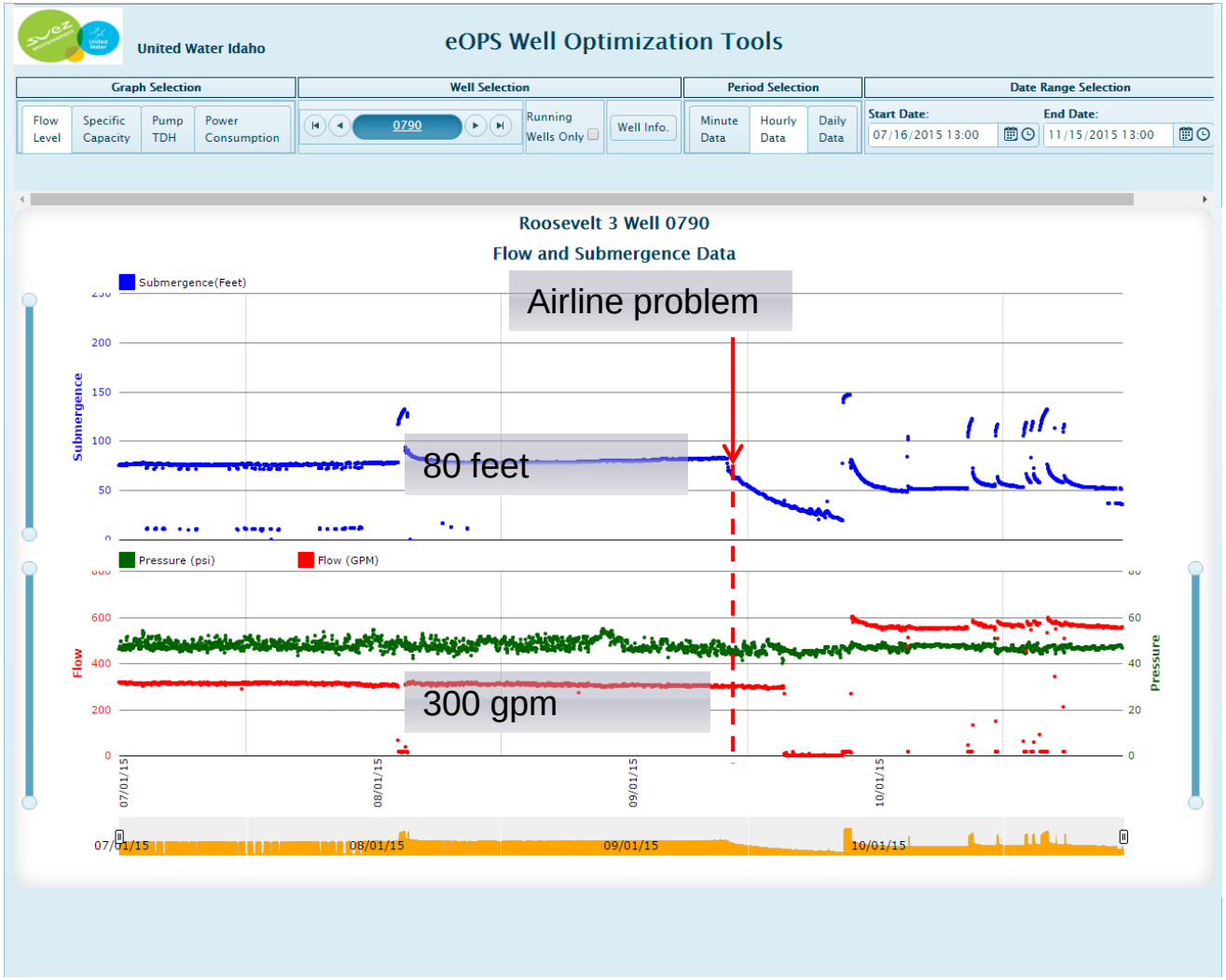
Graph Selection
Flow Level
Specific Capacity
Pump TDH
Power Consumption
Well Selection
0010
Running Wells Only
Well Info.
Period Selection
Minute Data
Hourly Data
Daily Data
Date Range Selection
Start Date:
03/14/2016 14:00
End Date:
04/13/2016 14:00
16TH ST Well 0010
Flow and Submergence Data
Submergence(Feet)
Submergence
Pressure (psi)
Flow (GPM)
Flow
Pressure
03/15/16
03/18/16
03/21/16
03/24/16
03/27/16
03/30/16
04/03/16
04/06/16
04/09/16
04/12/16

Well Op tool


United Water Idaho
eOPS Well Optimization Tools
Graph Selection
Flow Level
Specific Capacity
Pump TDH
Power Consumption
Well Selection
0010
Running Wells Only
Well Info.
Period Selection
Minute Data
Hourly Data
Daily Data
Date Range Selection
Start Date:
03/14/2016 16:00
End Date:
04/13/2016 16:00
Well Information
16TH ST 0010
Pump Capacity: 800 GPM
NPSHr: null
Permit Production Rate: null
Pressure District: null
Pump: null
Motor HP: null
Motor Manufacturer: null
Motor Installation Date: null
Premium Efficiency: No
Inverter Duty: No
VFD Brand: null
Transducer/Airline Depth: 140 ft bg
Run Time (Past 30 days): 0 hours
Run Time (Past 365 days): 1084 hours
Submergence(Feet)
Submergence
Pressure (psi)
Flow (GPM)
Flow
Pressure
03/15/16
03/18/16
03/21/16
03/24/16
03/27/16
03/30/16
04/03/16
04/06/16
04/09/16
04/12/16

Reviewing well operation



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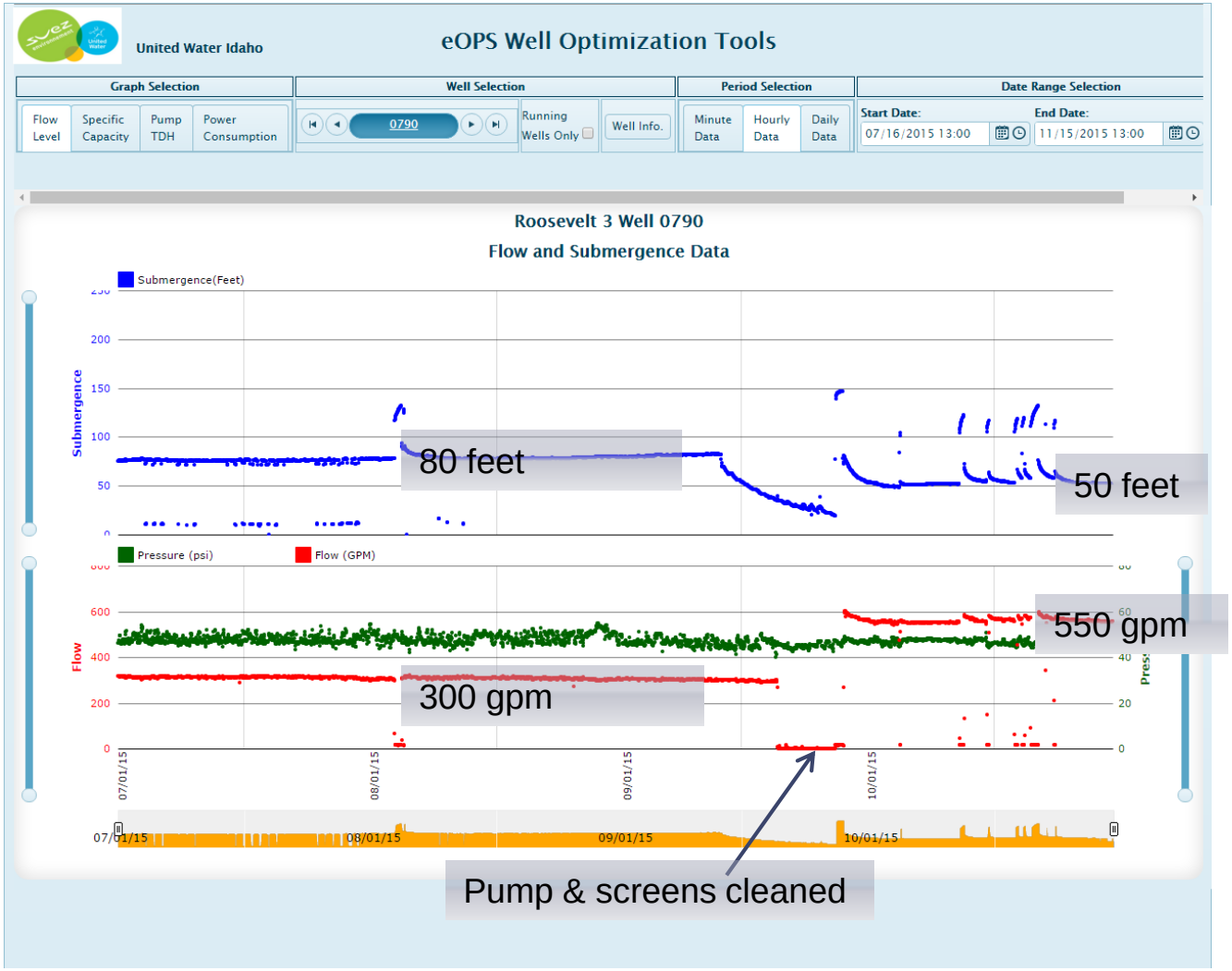
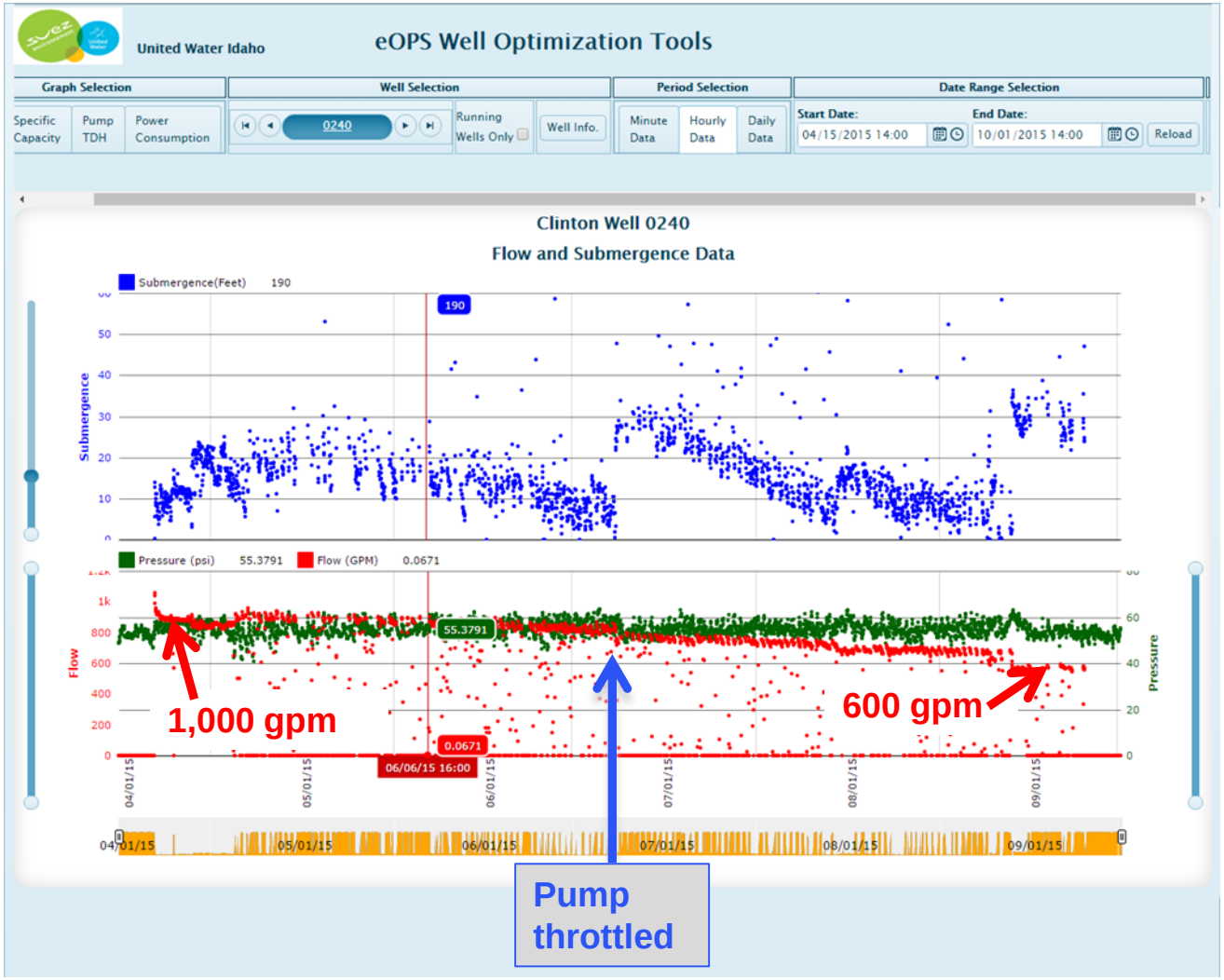


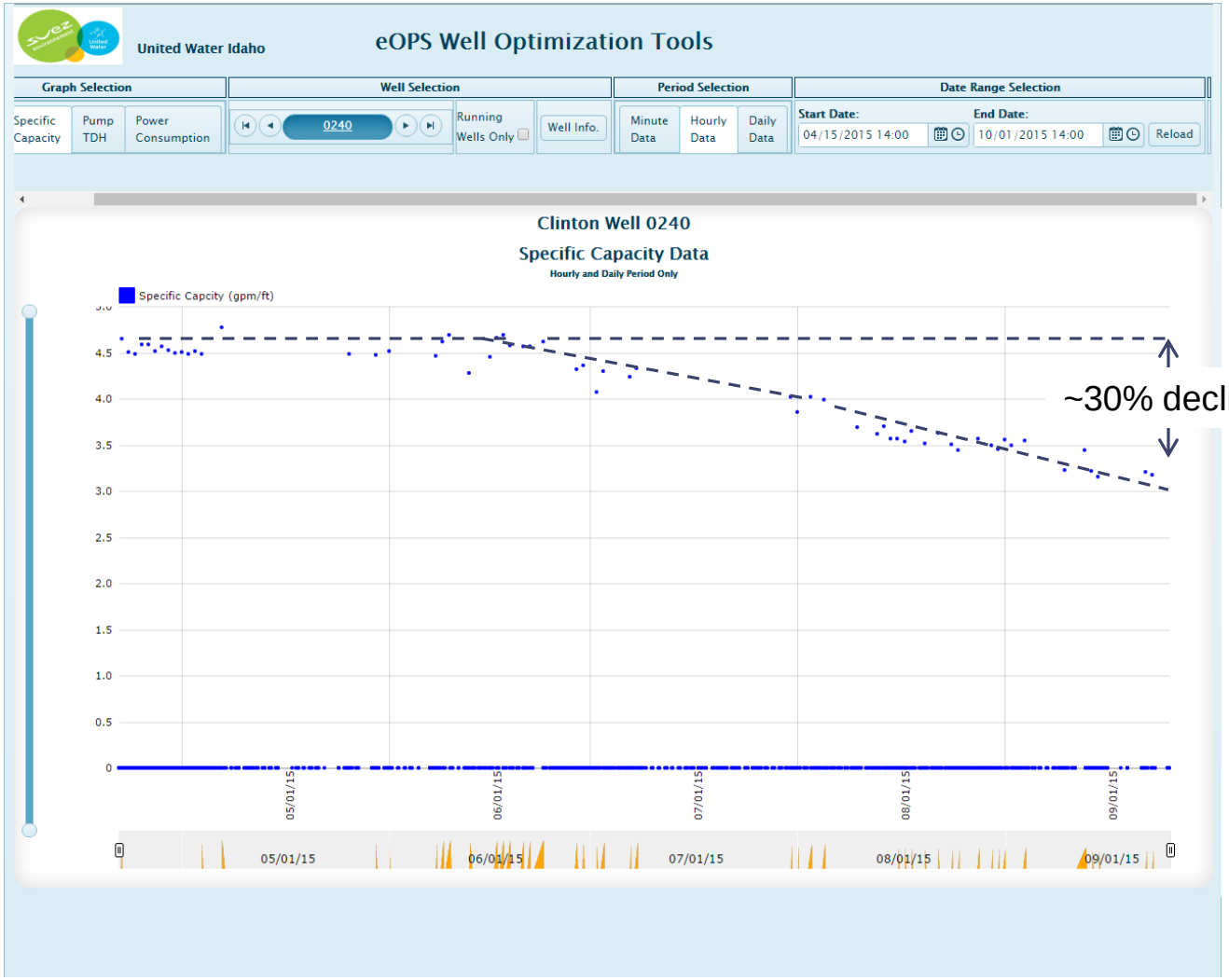
Tracking well performance decline

SUEZ Clinton well

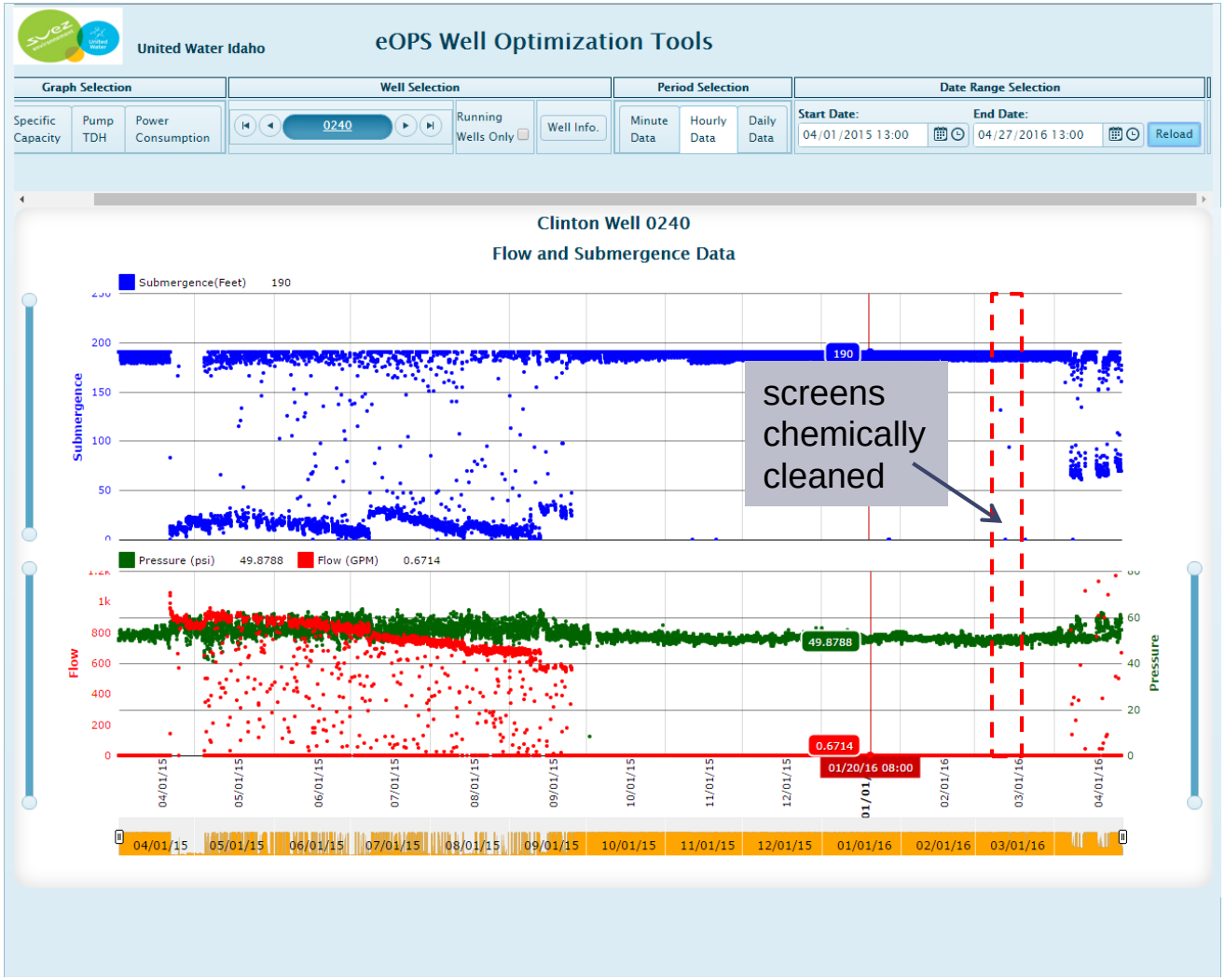
Tracking well performance decline



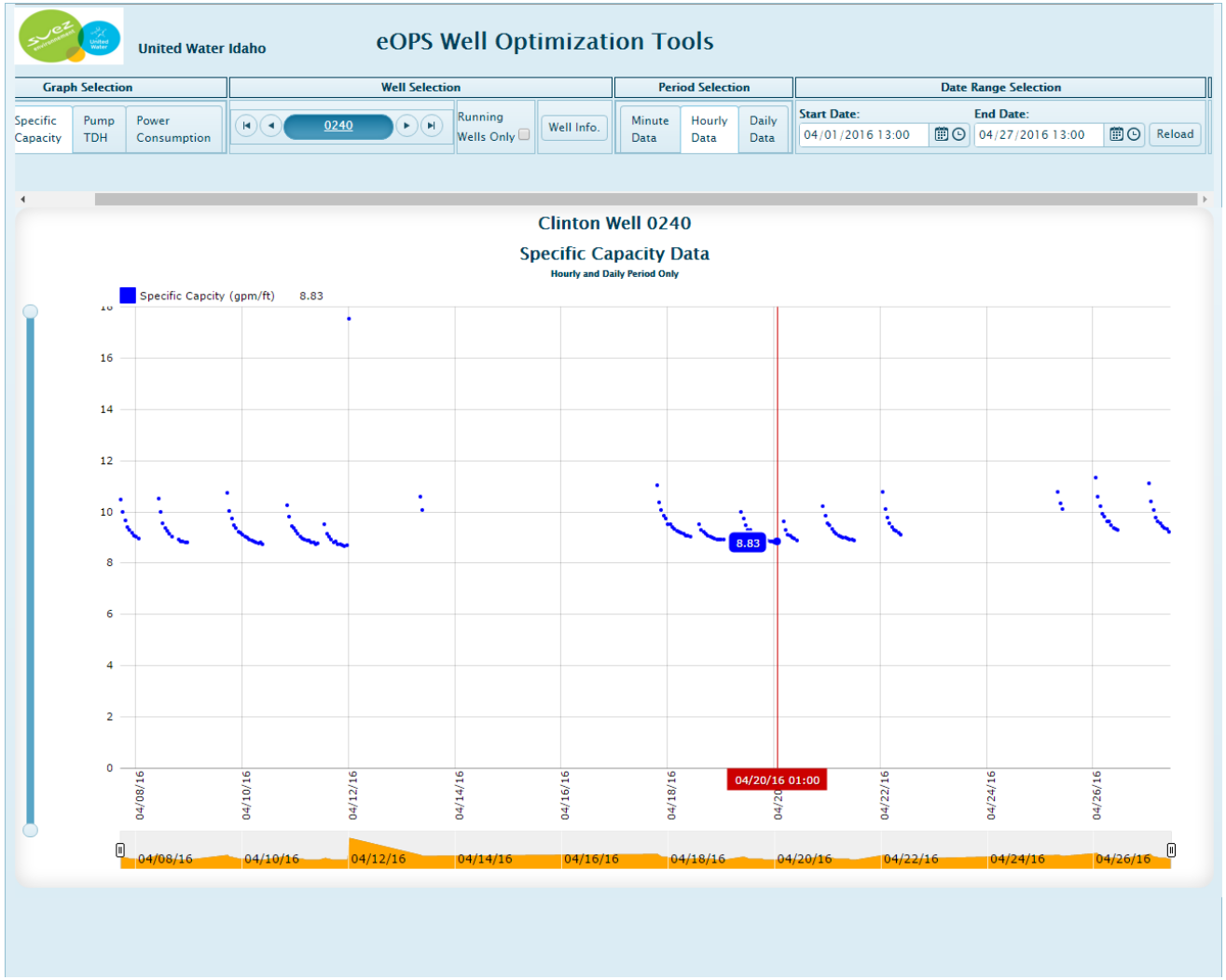
Tracking well performance decline



Evaluating effectiveness of maintenance



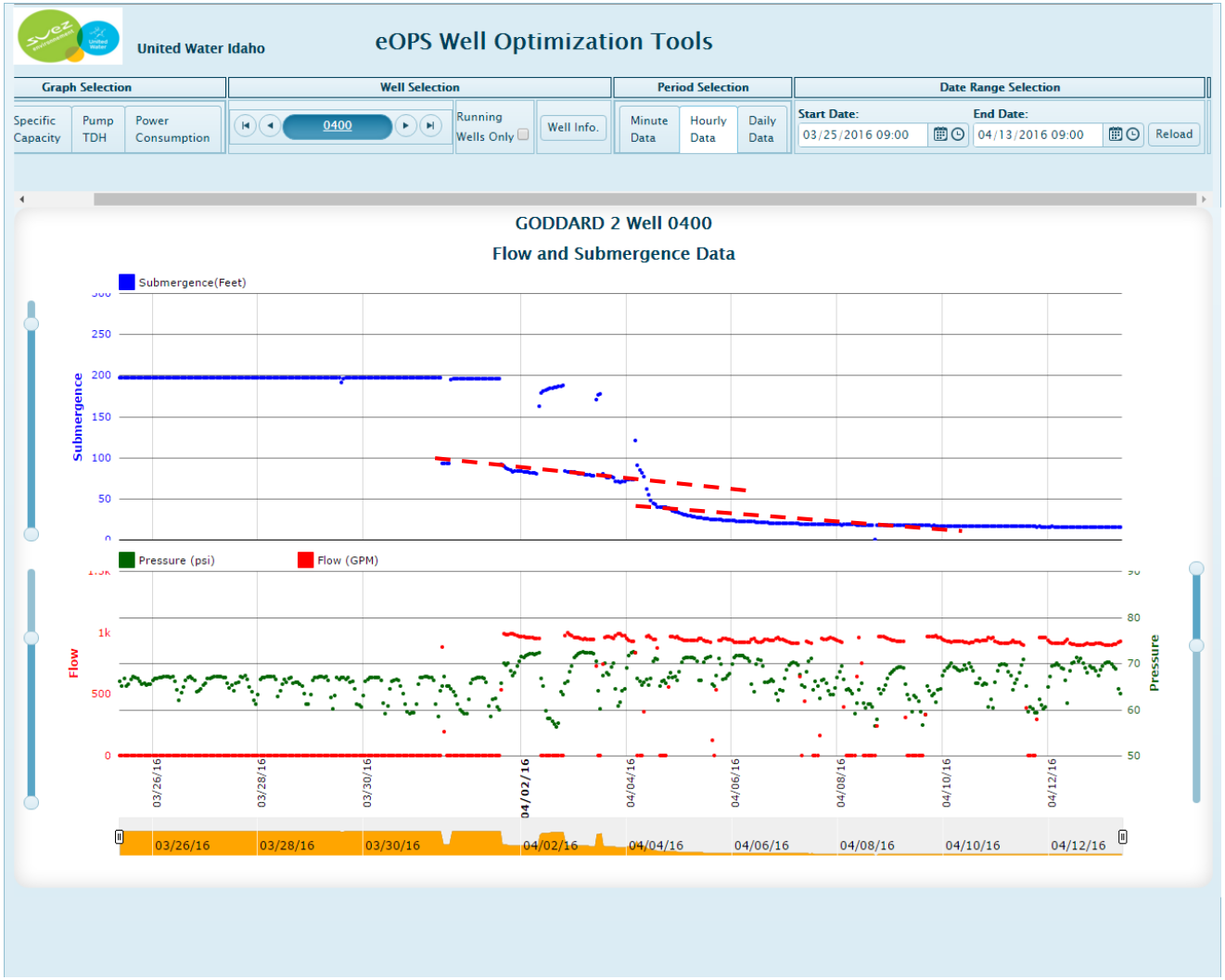
Evaluating effectiveness of maintenance



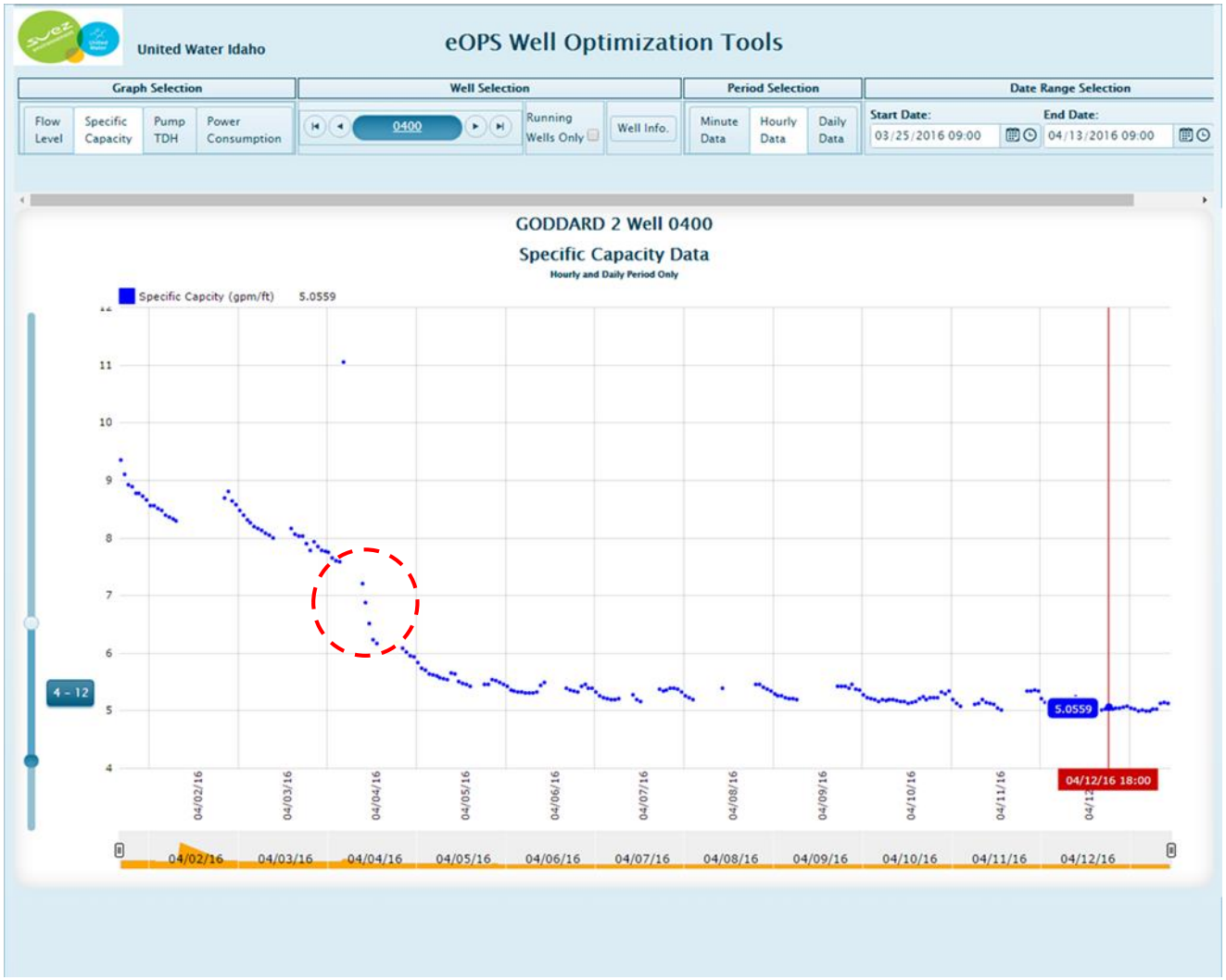
Identification of impacts from pumping wells

SUEZ Goddard well

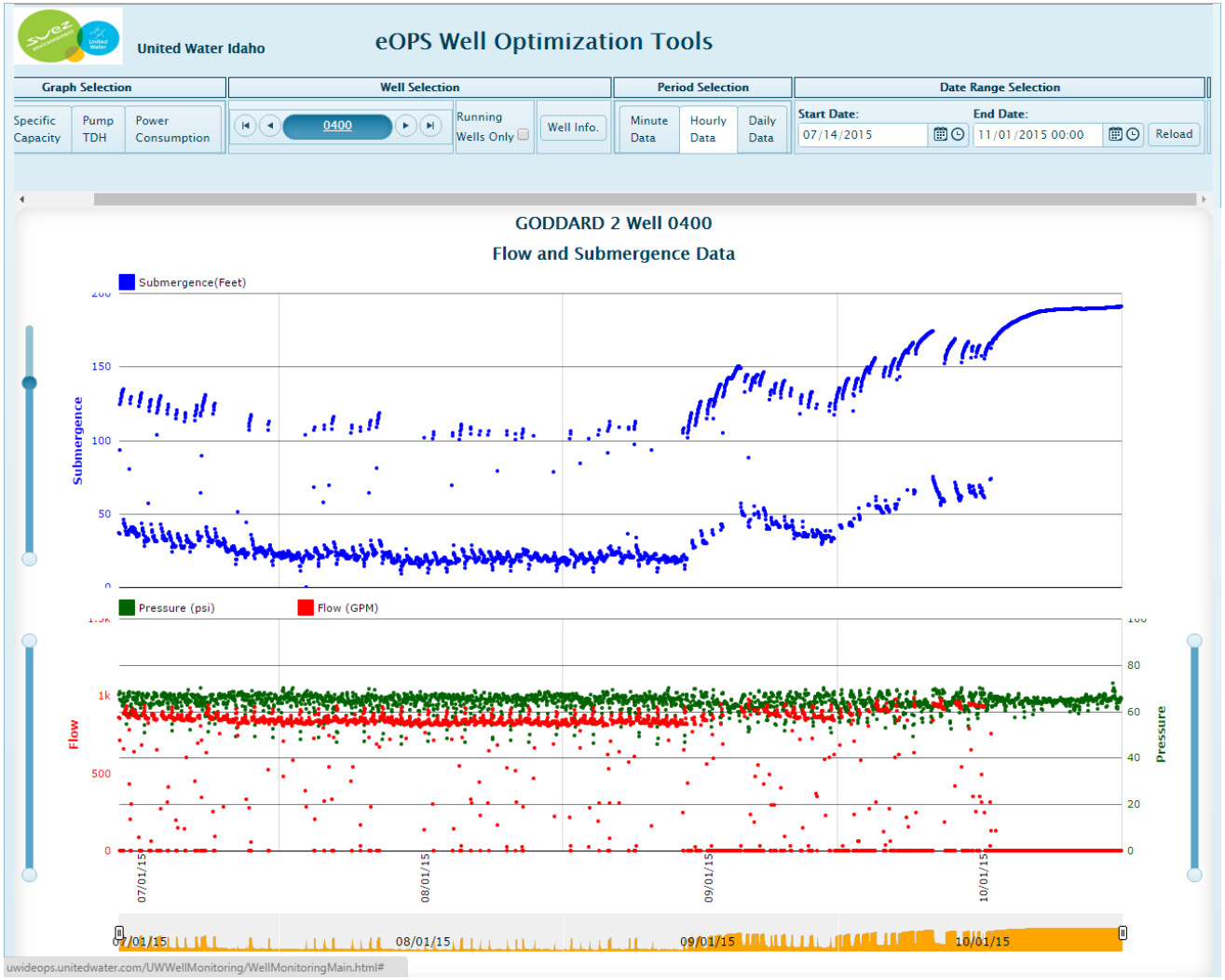
Identification of well interference effects



Reduction in specific capacity due to influence of another pumping well



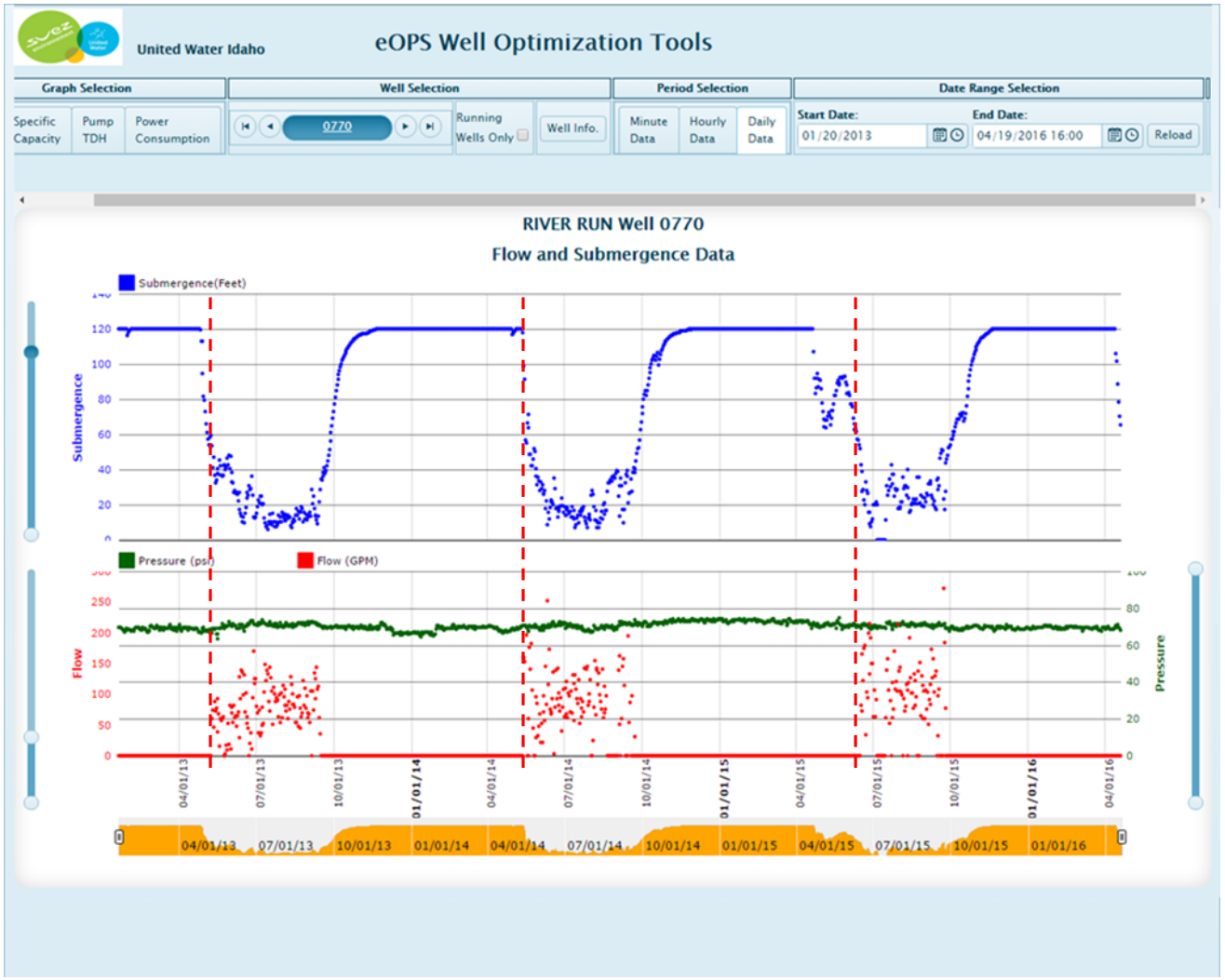
Well interference



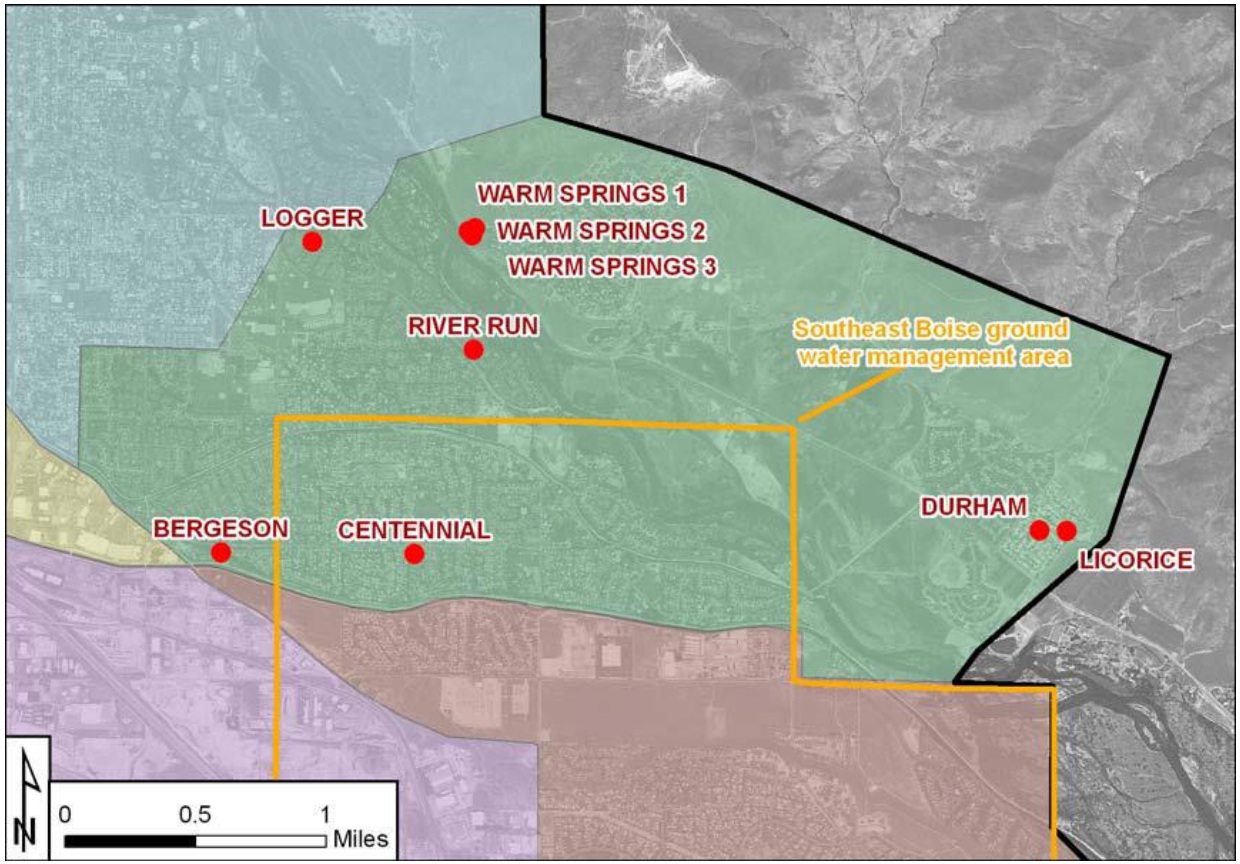
Another example

SUEZ River Run well

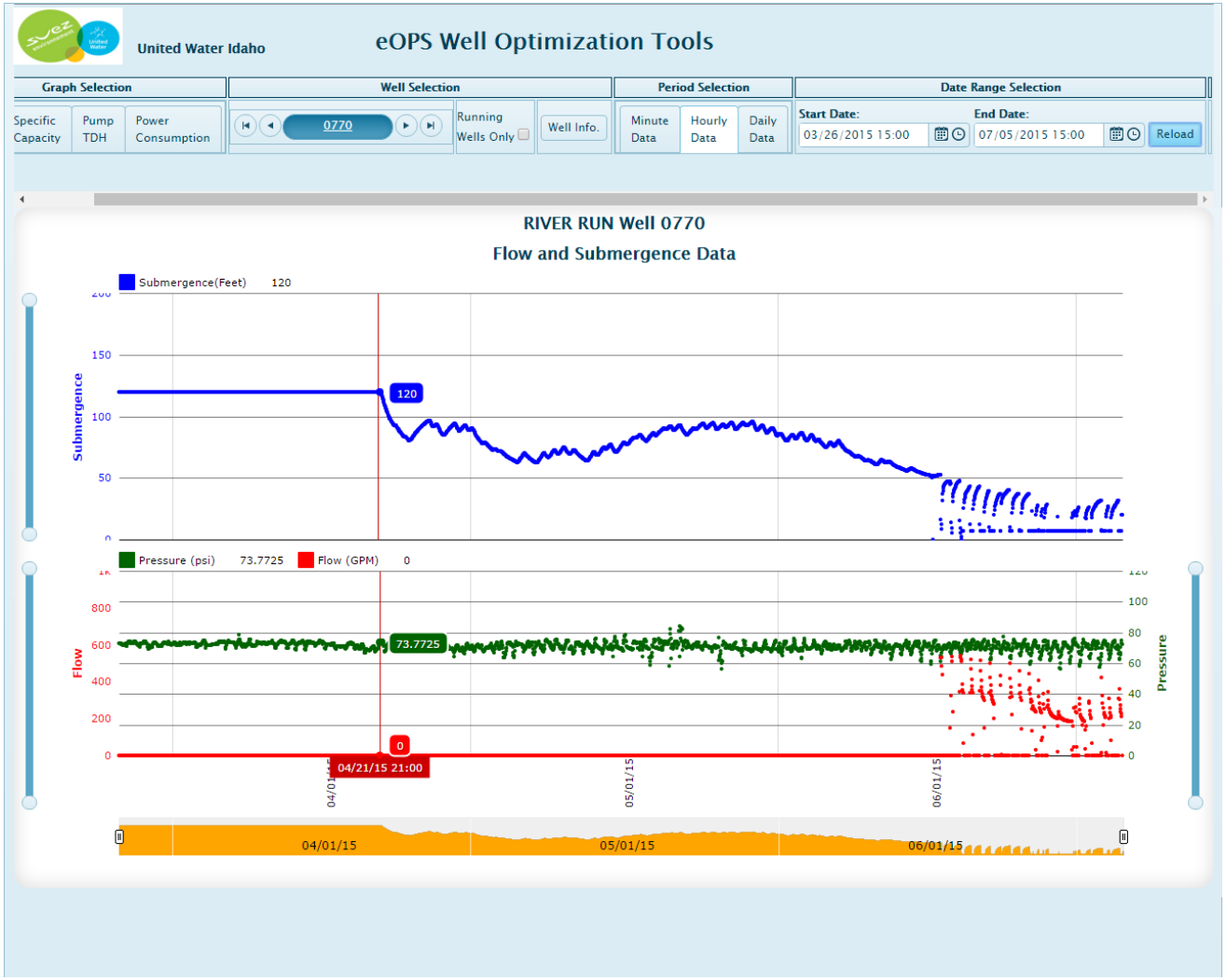
Another example



Another example



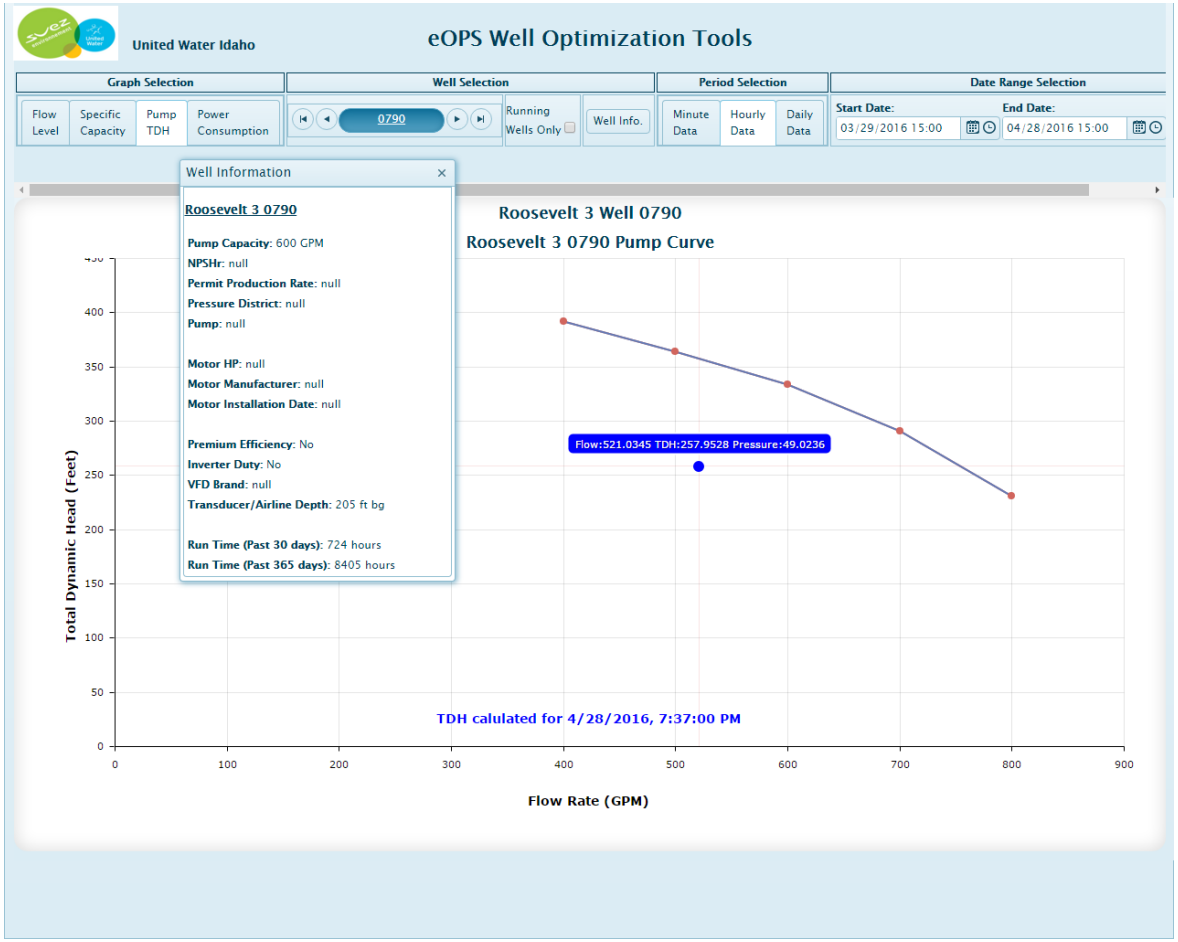
Another example



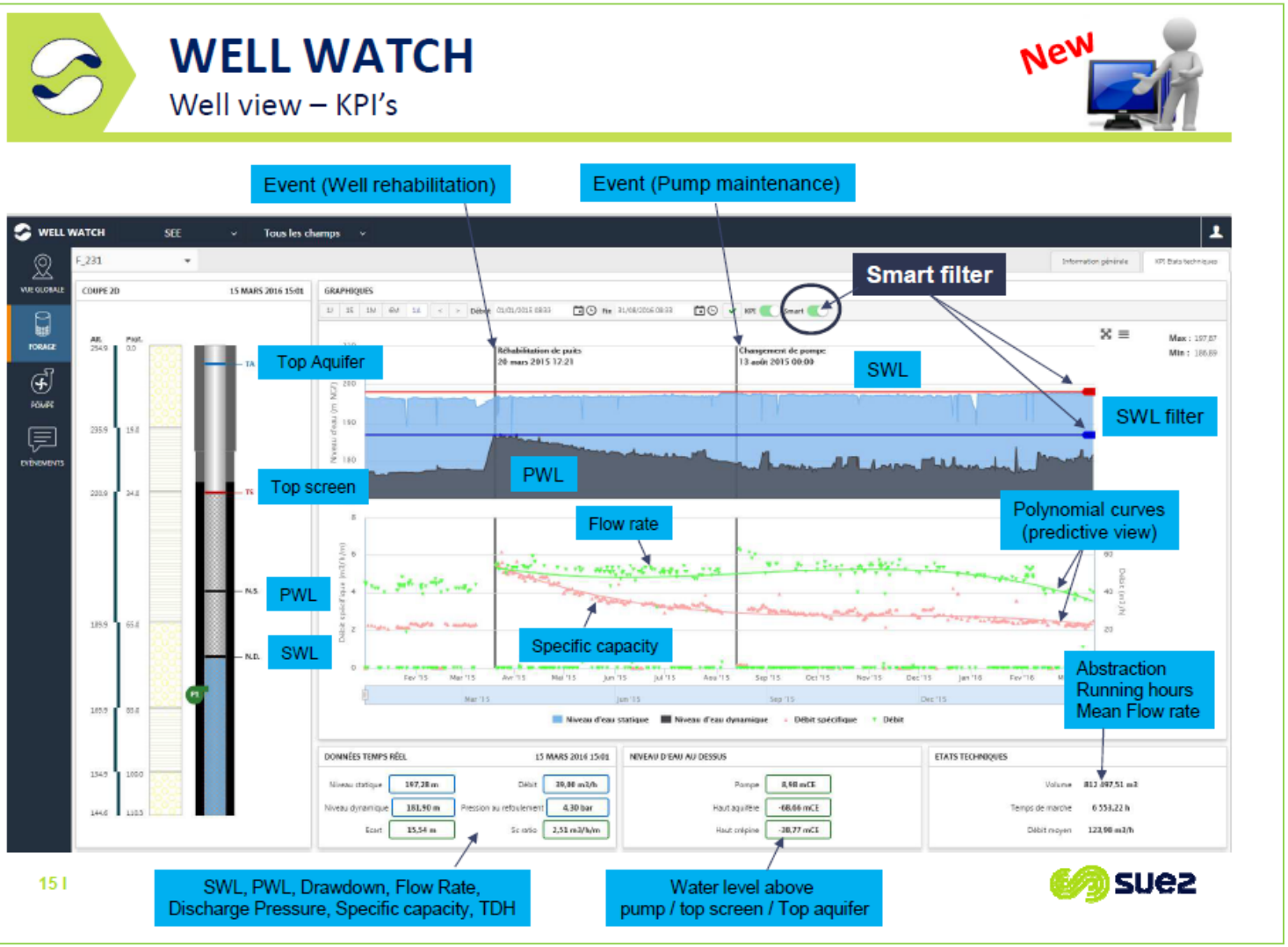
Summary

- Well Op tool allows for an easy comparison of current to historic well performance
- Can be more confident of need to perform well, pump, and monitoring equipment maintenance
- Currently working to translate observations from Well Op Tool into work orders in GIS-based asset management system
- In a nut shell: Current tool use = we look for a problem to fix

Always room for improvement



More advanced tool will be available soon



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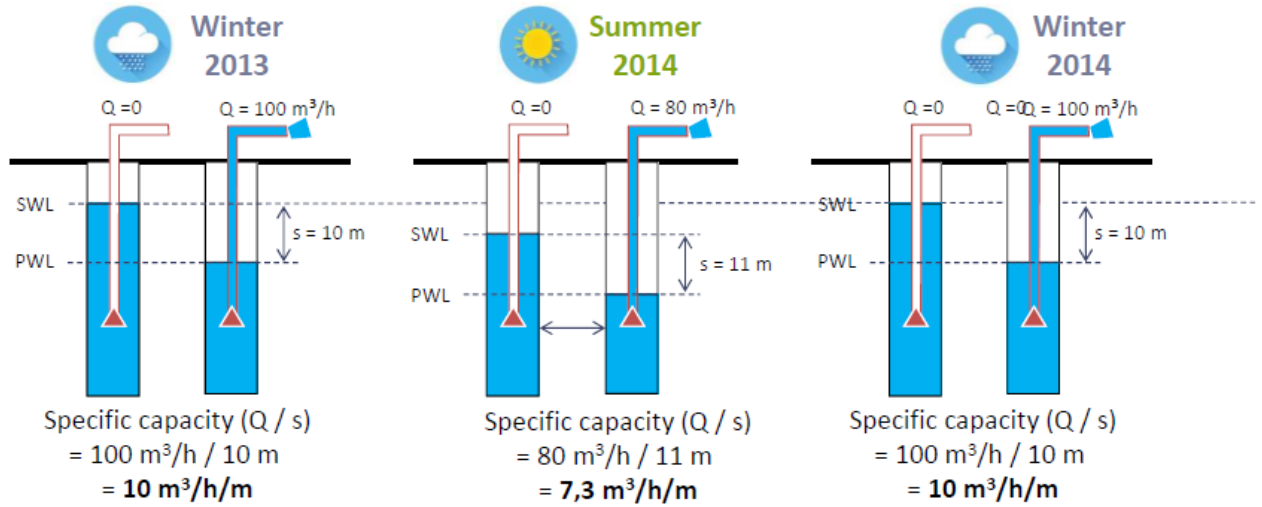
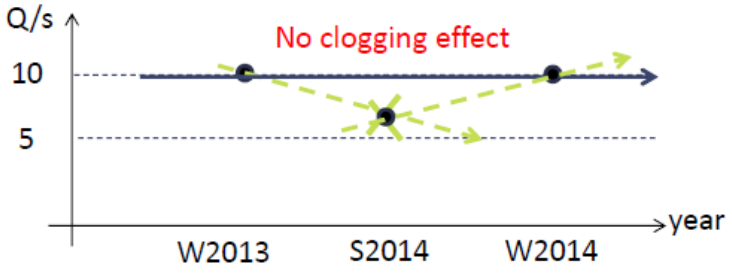
> Focus on « Smart filter » button



Specific capacity (Q / s)
= 100 m³/h / 10 m
= **10 m³/h/m**

Specific capacity (Q / s)
= 80 m³/h / 11 m
= **7,3 m³/h/m**

Specific capacity (Q / s)
= 100 m³/h / 10 m
= **10 m³/h/m**



If you look Q/s evolution between W2013 and S2014, you can think that a clogging effect appeared, but in fact, this evolution is linked with a low SWL (summer).

SMART FILTER permit to compare Q/s point with the same SWL > in that case, you can compare Q/s point

Thank you