



# **JOLLYVILLE TRANSMISSION MAIN: Environmental Commissioning Monthly Report**

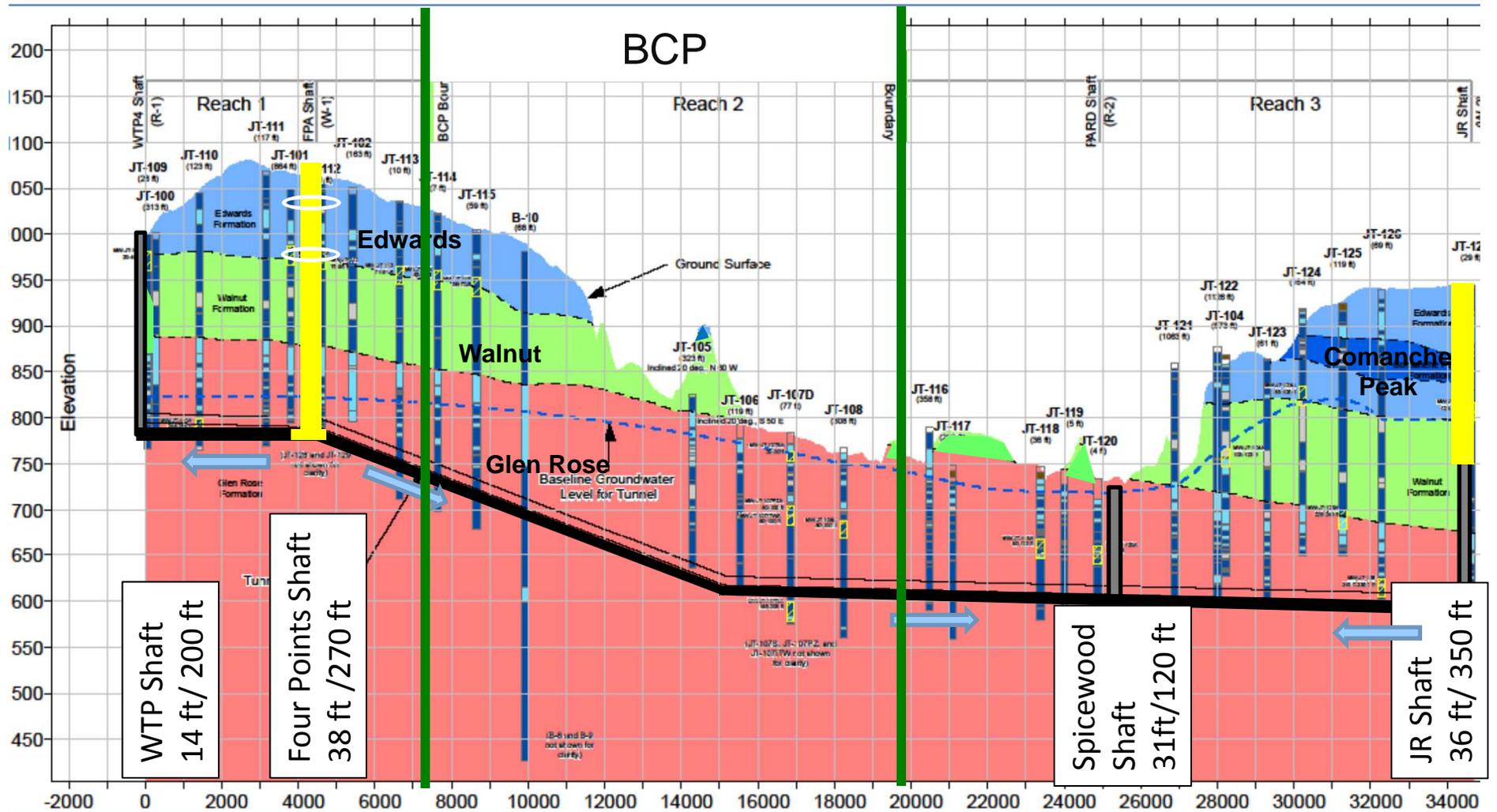
Presented to the Austin Environmental Board  
April 4, 2012

Thais Perkins, Watershed Protection Department  
David Johns, Watershed Protection Department  
John Pickens, INTERA

# Jollyville Transmission Main Project Status

= progress

- Four Points shaft complete. Now excavating starter and tail tunnel.
- Jollyville Reservoir Shaft past Edwards/Walnut contact (198 ft).
- Spicewood shaft E/S controls are laid and archaeological evaluation complete.





## JVTM Timeline

- Jan 27<sup>th</sup> 2012 Four Points shaft hydrophobic grouting installed/ tested with water injection and dye
  - Feb 6 2012 Archaeological excavation at Spicewood shaft
  - Feb 8 2012 Start of tunneling via hoe-ram for Reach 1 (Four Points to Plant).
  - March 27 2012 TBM has arrived and is being assembled in tunnel.
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- Mid-April 2012 Anticipate beginning of TBM tunneling Reach #1 (4P to plant) mid-April.
  - April 16 2012 Excavation of WTP shaft (drilling)
  - April-May 2012 Repair of monitoring well JT-128 (4Points) & abandonment of old JT120 well (Spicewood Shaft)
  - May 2012 Turn-under into tunnel Reach 3 (Jollyville Reservoir to Spicewood)
  - Late spring TBA Mobilization at Spicewood shaft
  - May 2014 Project completion
  - TBD Age dating of groundwater



# Environmental Commissioning Cost Summary

Initial INTERA Contract Amount	\$ 1,713,814
Total Amount Billed to Date (Dec 2012)	\$1,192,750
<b>Total Remaining</b>	<b>\$521,063</b>

Amount Billed for Four Points 24/7 shaft inspections: \$60,076.50

Other projected costs for age dating, Glen Rose  
groundwater level analysis, hydrophobic grout analysis TBD



# Environmental Commissioning Activities - JVTM

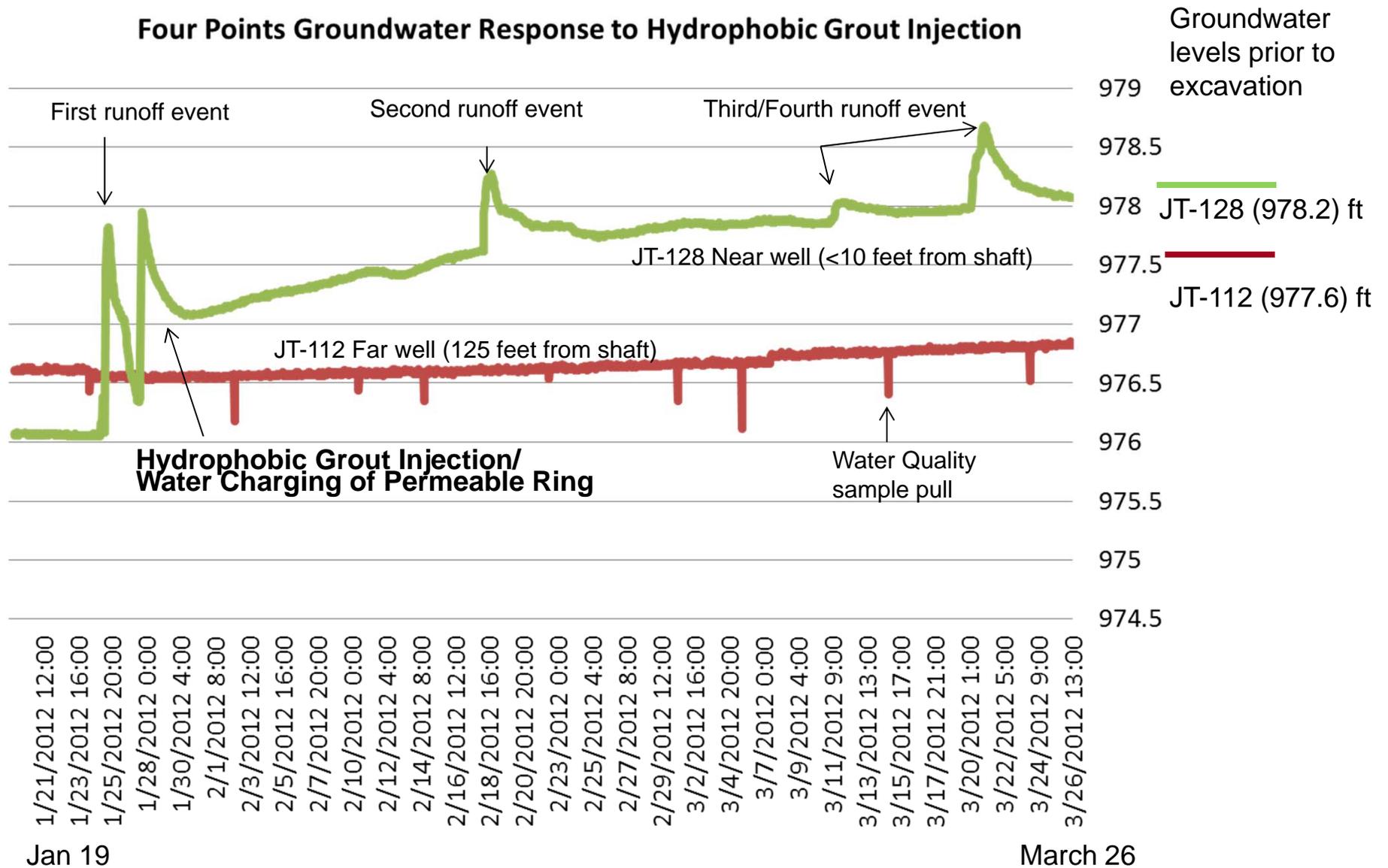
- Monthly shaft site (surface) visits now concurrent with plant site visits
- Weekly shaft/tunnel visits
- Biweekly meetings of the Environmental Commissioning Coordination Group (**ECCG**; WPD, PWD and Project Team along with Construction-Manager-at-Risk and Design Engineers) to resolve possible issues
- Continuing to monitor and analyze results of Environmental Monitoring Program
  - *Weekly monitoring for polyurethane grout compounds; none detected. Anticipate moving to monthly monitoring after 8 samples taken.*
  - *Rise in Glen Rose groundwater*
  - *Sudden drop in groundwater at JT-127*
- Developing work plan for age dating of deep vs. shallow groundwater systems along tunnel alignment



# Environmental Commissioning Issues/Resolutions - JVTM

Issue	Resolution
Lack of recovery in Four Points monitoring wells	Both wells at Four Points shaft showing signs of steady recovery at this time.

## Four Points Groundwater Response to Hydrophobic Grout Injection

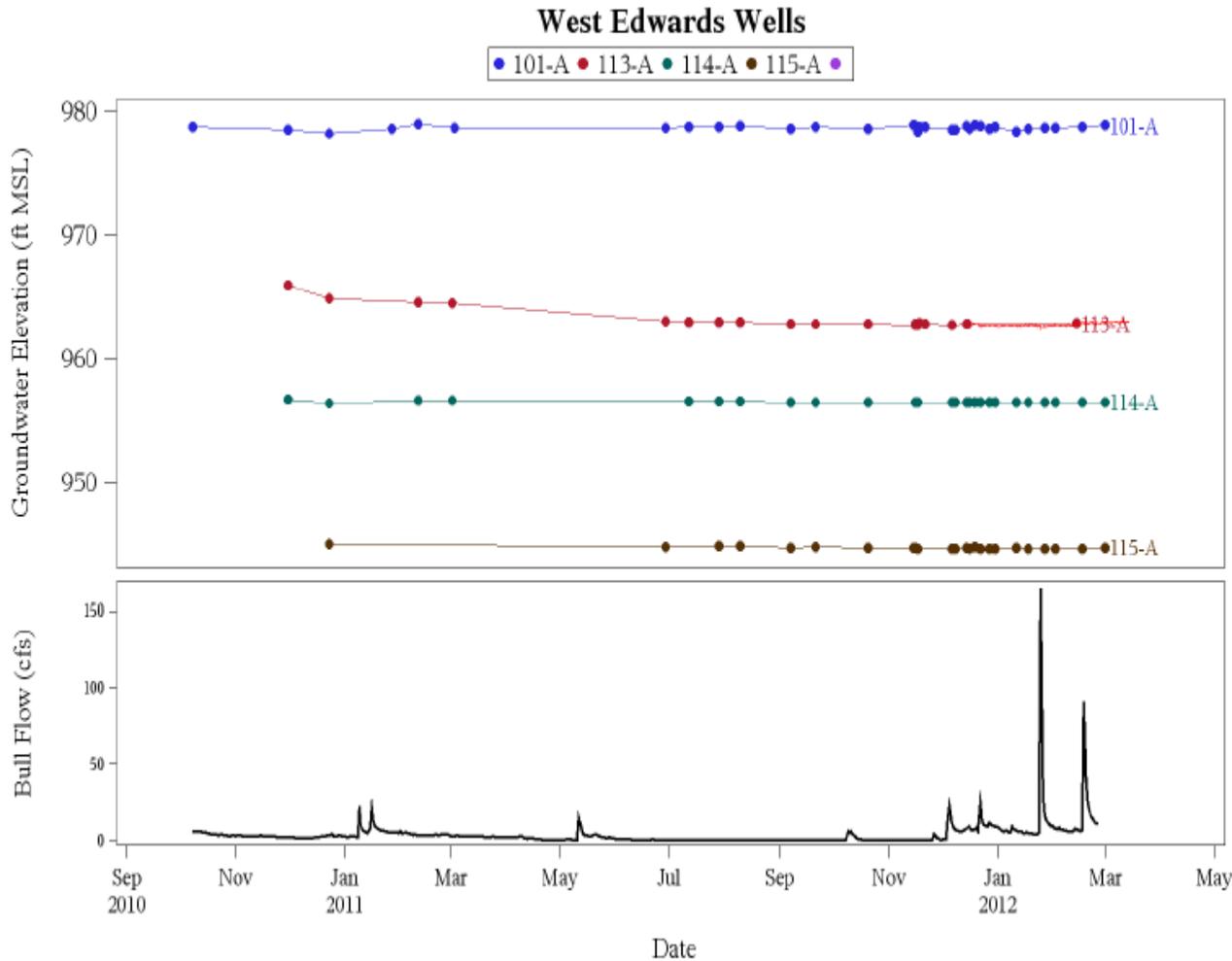


Near well (JT-128) shows recovery to 978.1 ft MSL (within 0.1 ft of pre-excavation level); Far well (JT-112) to 976.8 ft MSL (within 0.8 ft of pre-excavation level)

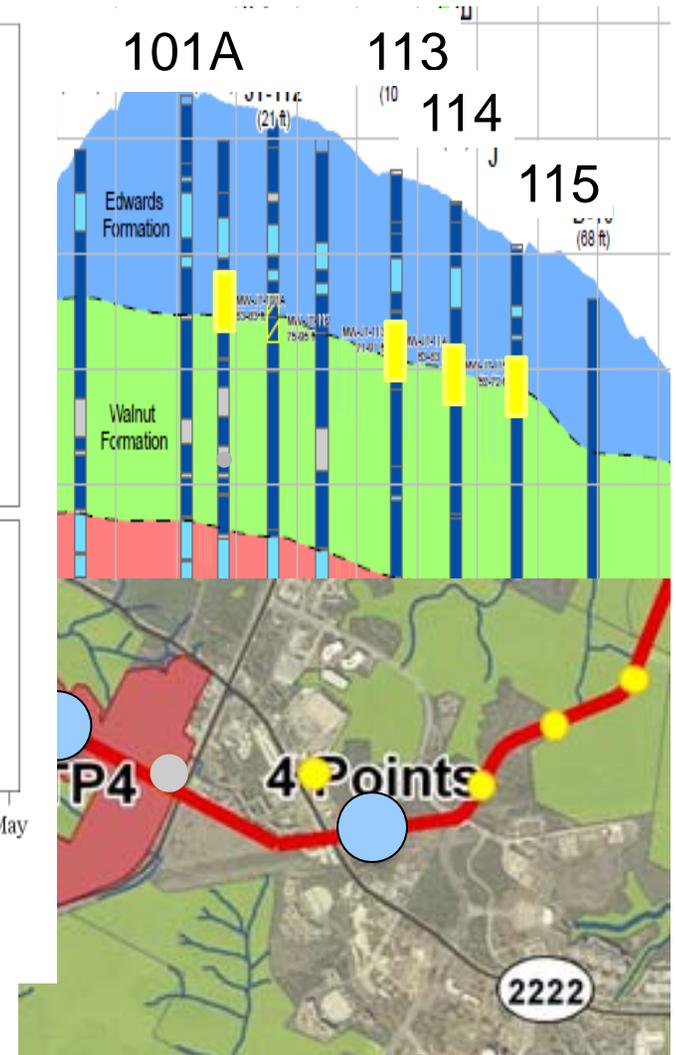
# Environmental Monitoring

09:31 Thursday, March 15, 2012 82

## Update – Four Points wells



City of Austin DRAFT: QA/QC review pending





# Environmental Commissioning Issues/Resolutions - JVTM

Issue	Resolution
Lack of recovery in Four Points monitoring wells	Both wells at Four Points shaft showing signs of recovery at this time.
Possible leaching of di-n-butyl phthalate in grout compound into groundwater	Monitoring for organic compounds proceeding weekly at JT-112 and Gaas Spring. 6 samples so far; none detected.



# Environmental Commissioning Issues/Resolutions - JVTM

Issue	Resolution
Lack of recovery in Four Points monitoring wells	Both wells at Four Points shaft showing signs of recovery at this time.
Possible leaching of di-n-butyl phthalate in grout compound into groundwater	Monitoring for organic compounds proceeding weekly at JT-112 and Gaas Spring. 5 samples so far; none detected.
Shaft water outflow measurements	Meters at Four Points and Jollyville Reservoir now recording daily inflow/outflow. EC working with Project Team to fine-tune recordkeeping in preparation for tunneling operations.



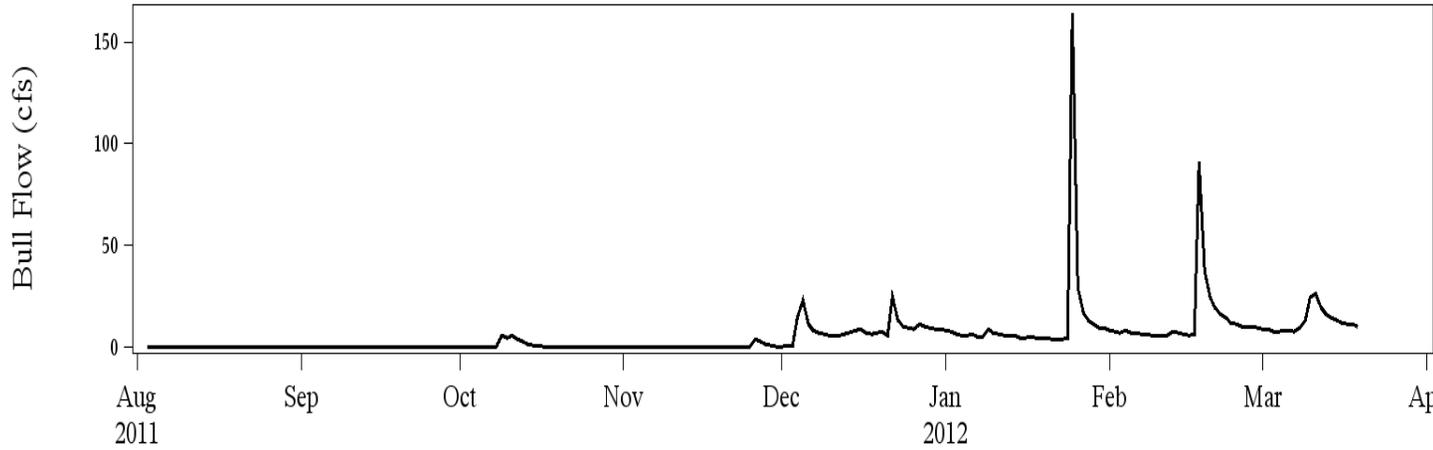
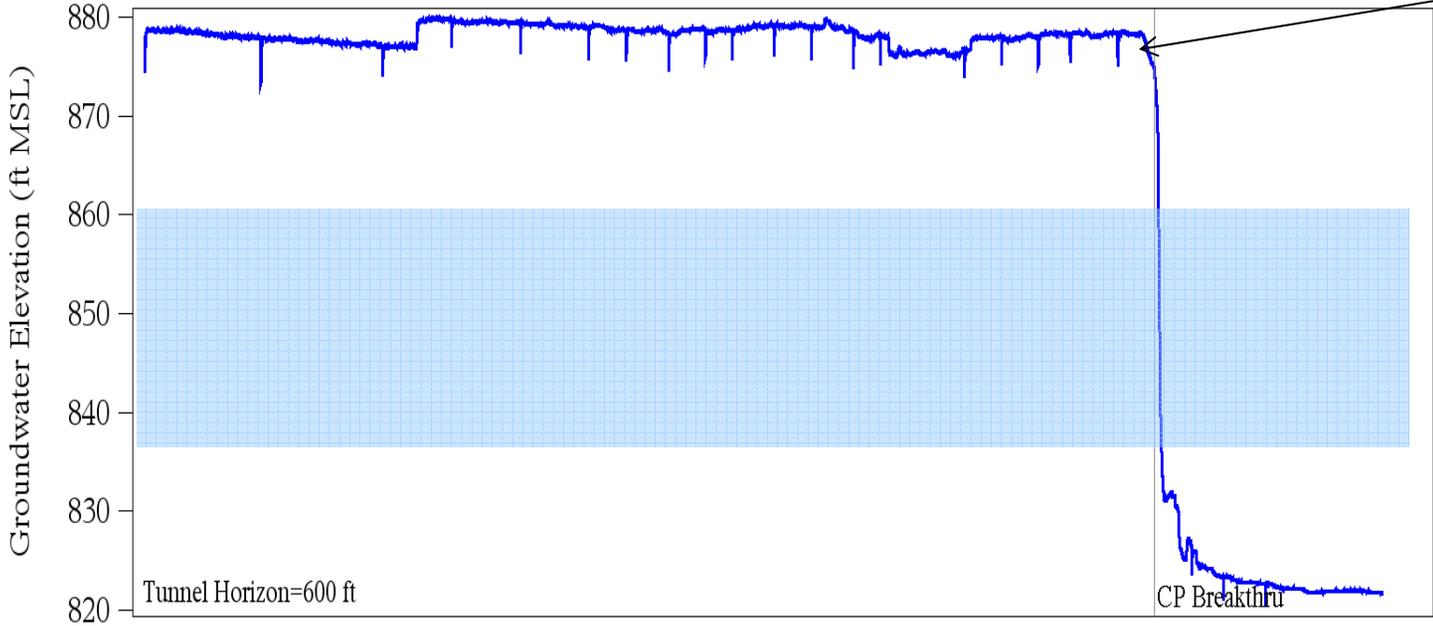
# Environmental Commissioning Issues/Resolutions - JVTM

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Shaft water outflow measurements	Meters at Four Points and Jollyville Reservoir now recording daily inflow/outflow. EC working with Project Team to fine-tune recordkeeping in preparation for tunneling operations.
Rapid water level rise in JT128 after storms on 1/25 and 2/18 and modest rise after 3/10 and 3/20 rains	EC working with Project Team to prevent further flooding of well. EC recommending adding water to nearby karst feature to document possible connection to the well. Well will be repaired by licensed driller contracted through B&V.

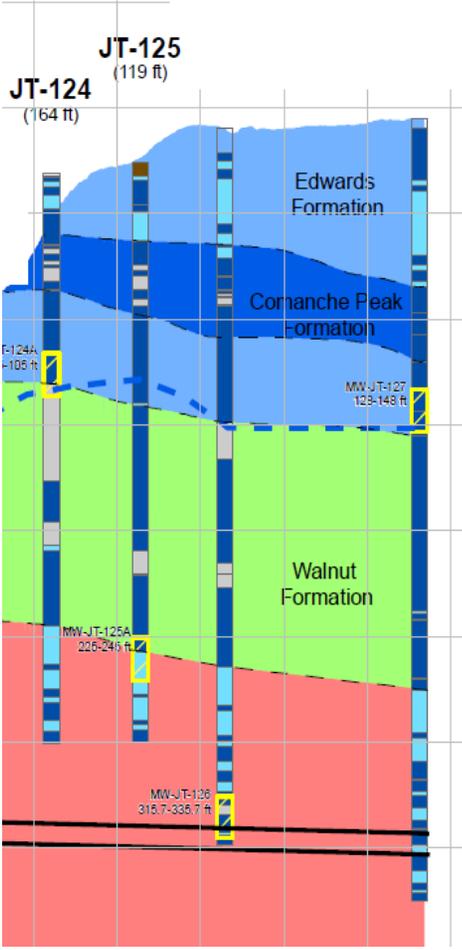
Comanche Peak/ Edwards contact breached in Jollyville Reservoir shaft

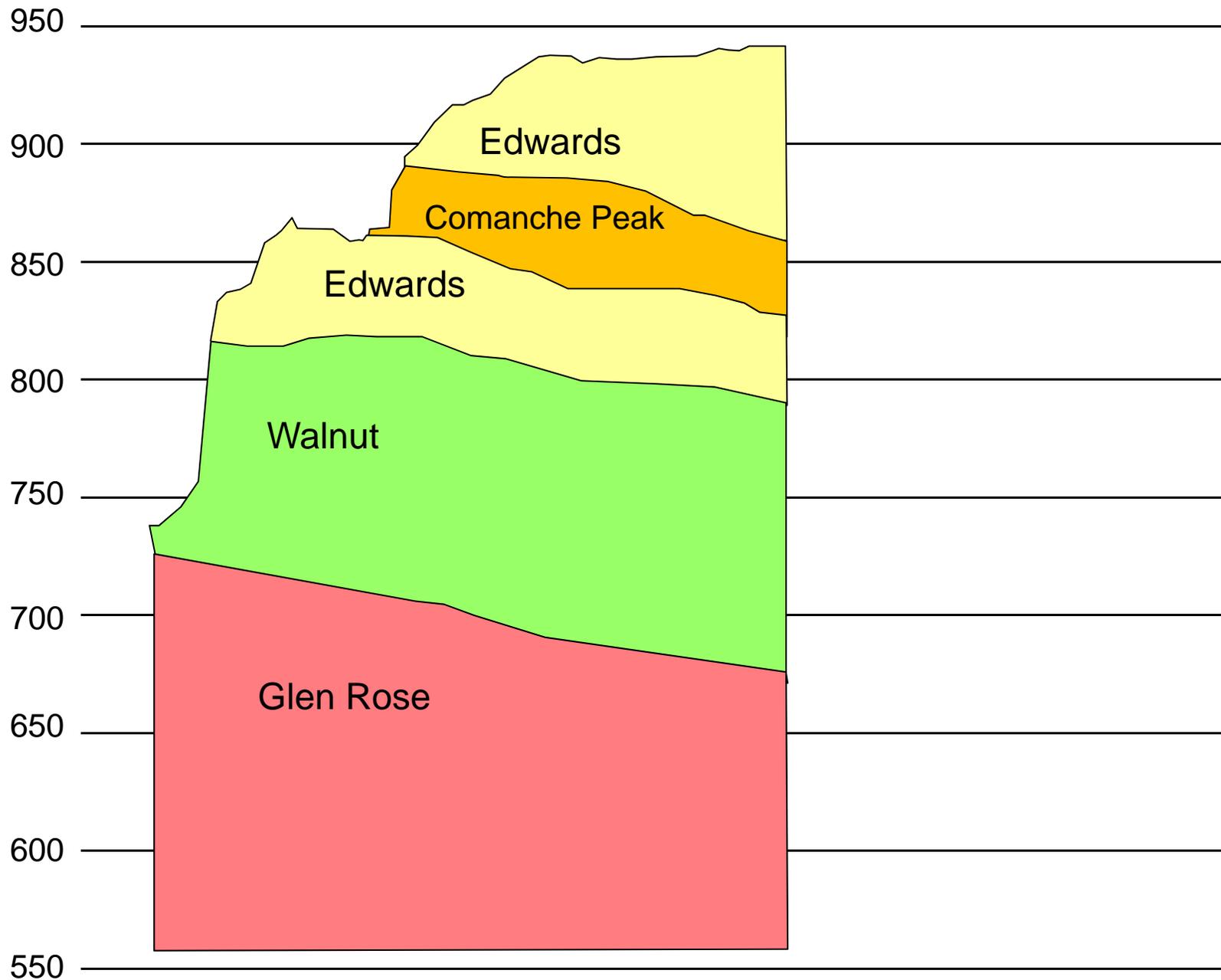
### Well JT127, Troll

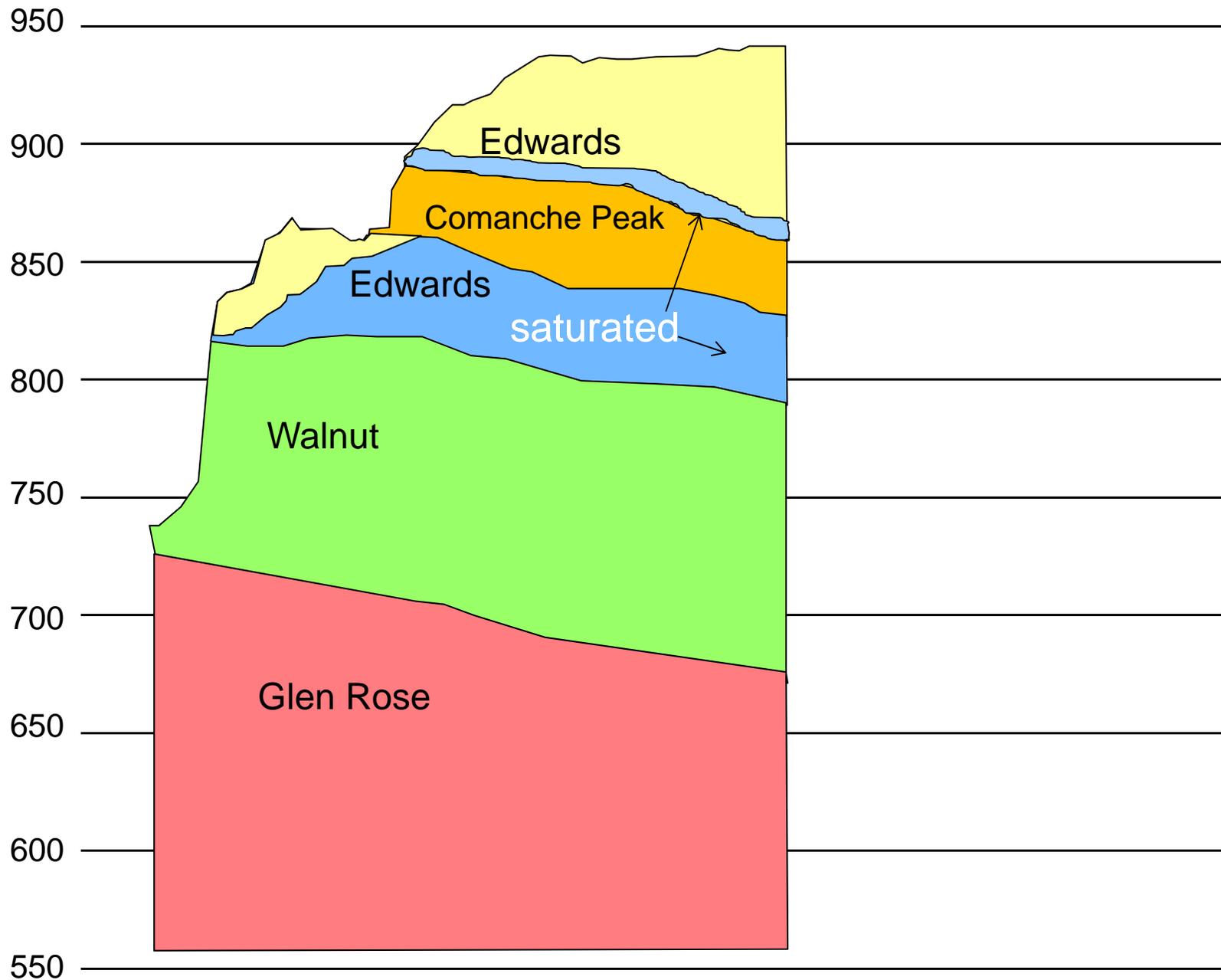
— GW Elevation



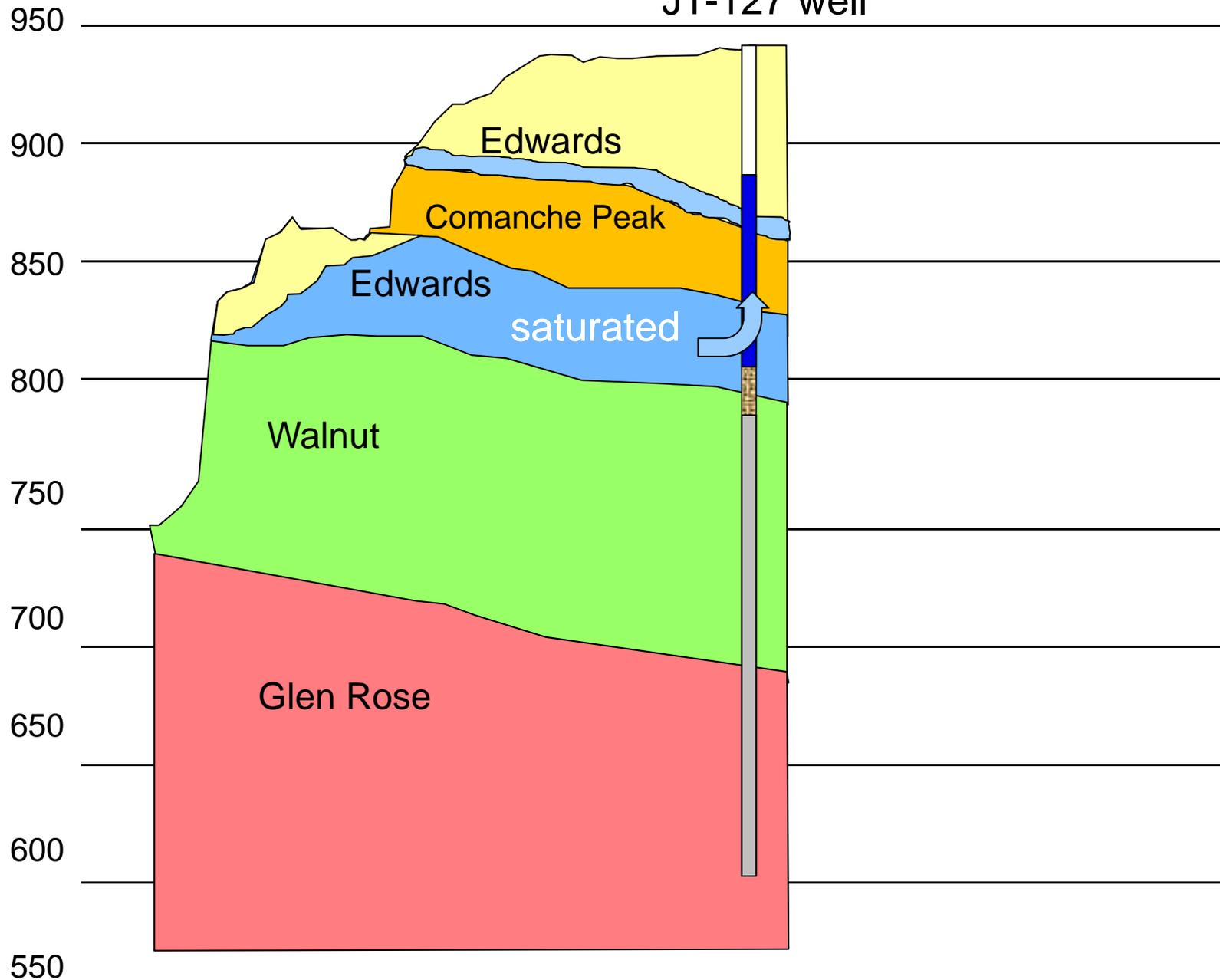
Date



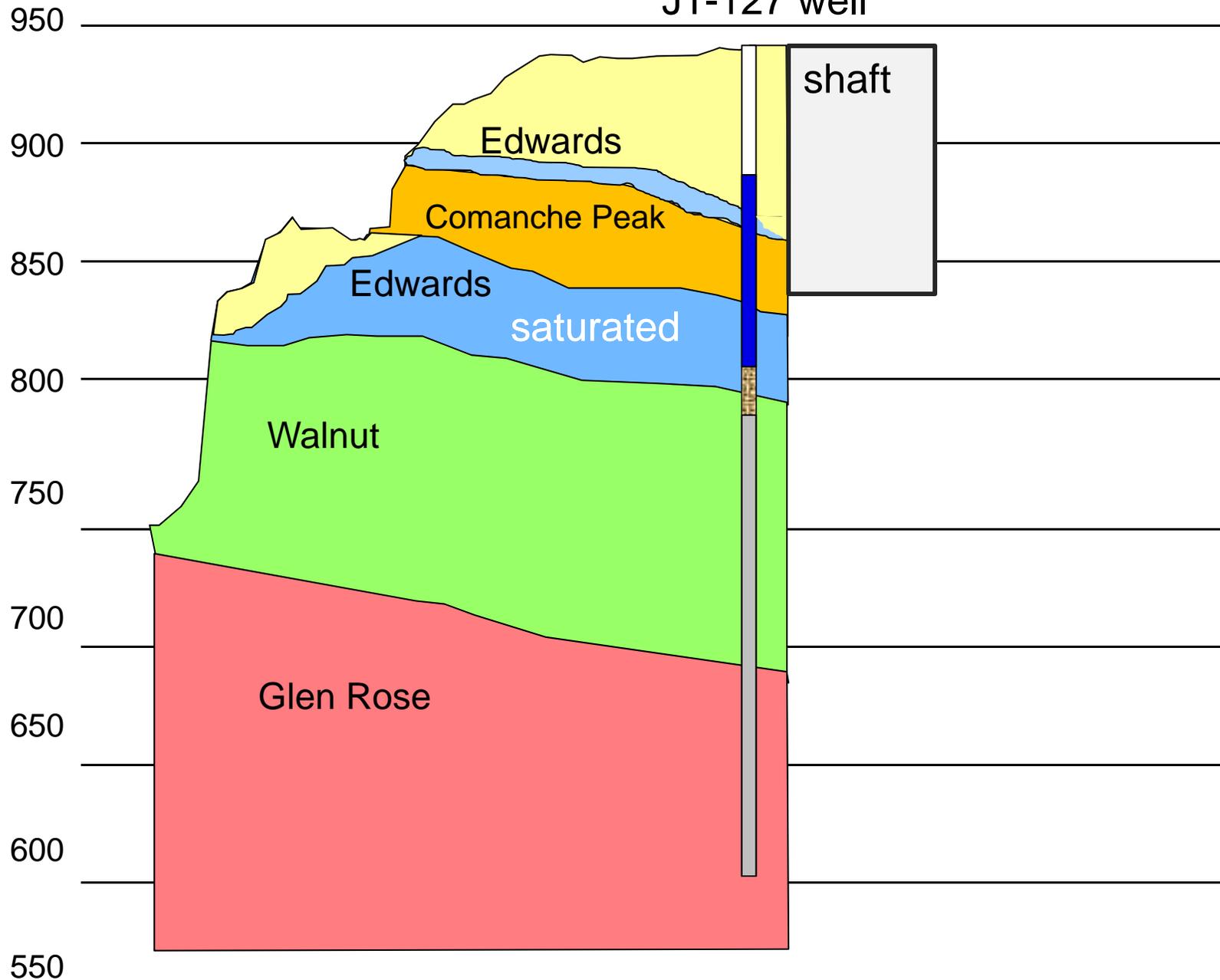




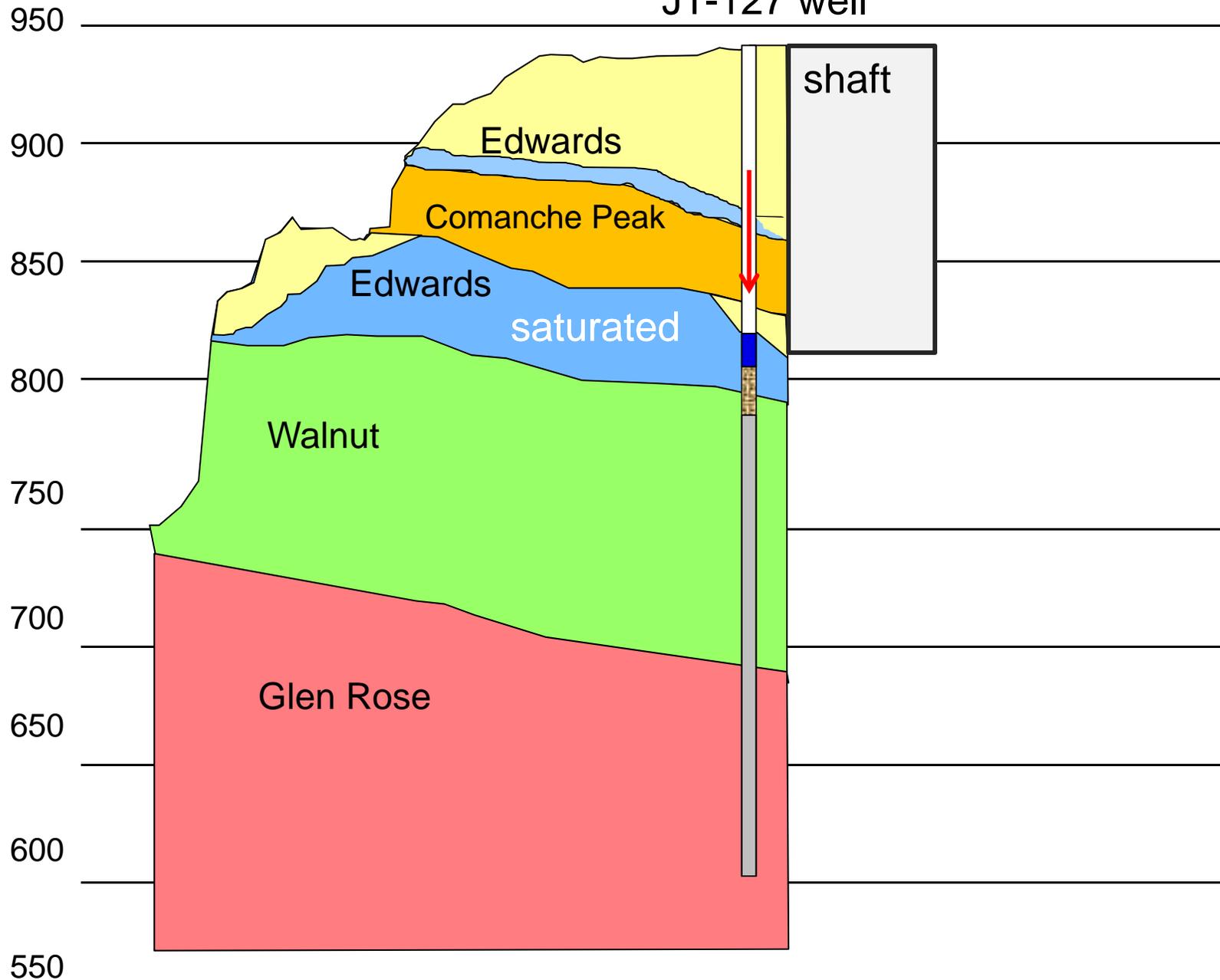
# JT-127 well



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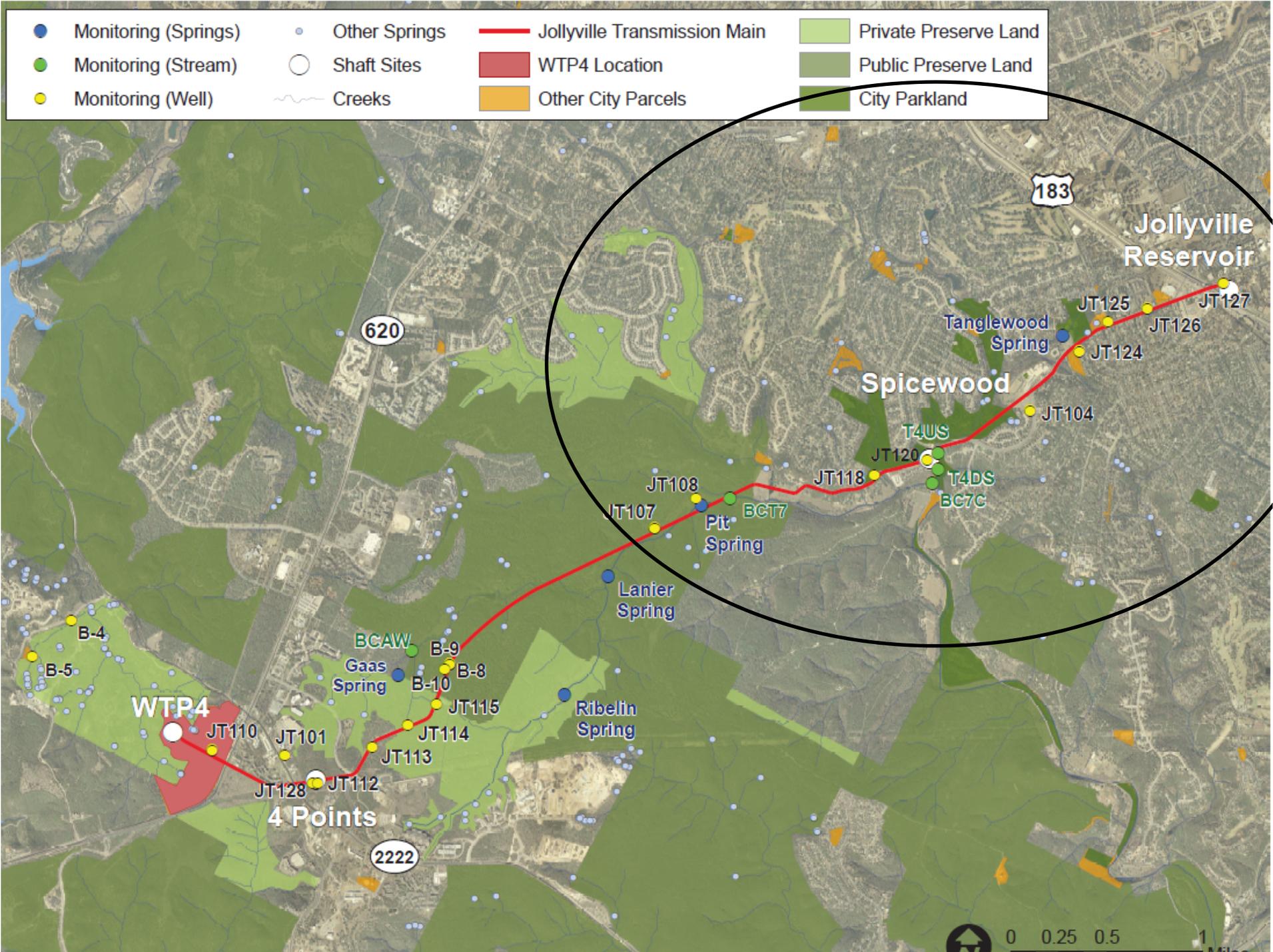
# Environmental Commissioning Issues/Resolutions - JVTM

Issue	Resolution
Rapid drop in JT-127 groundwater level	Analysis underway. Possible explanations include Comanche Peak formation operating as a confining layer, resulting in pressure drop when Comanche-Edwards contact mined through.

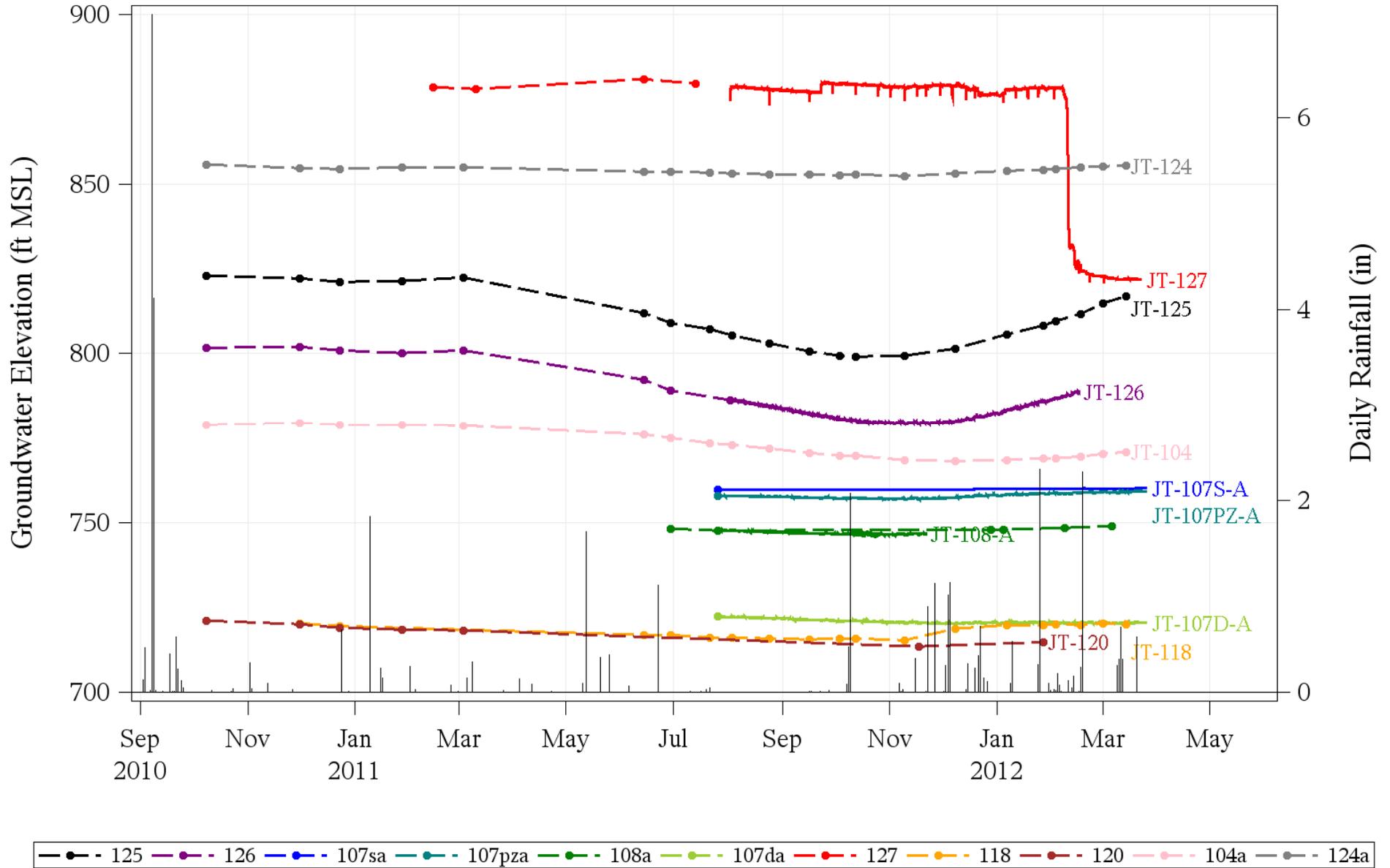


# Environmental Commissioning Issues/Resolutions - JVTM

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Sudden drop in JT-127 groundwater level	Analysis underway. Possible explanations include Comanche Peak formation operating as a confining layer, resulting in pressure drop when Comanche-Edwards contact mined through.
Rise in Glen Rose groundwater levels at east end of project alignment.	Evaluation indicates response of GR wells is consistent with effect of pumping GR water for golf course irrigation, and is unlikely to be the result of rainfall infiltration. Simulated hydraulic conductivities are consistent with those in 2010 Groundwater Assessment.



# Hydrographs for Eastern Area





# Evaluation of Glen Rose Groundwater Level Response

- The water-level recoveries observed in Glen Rose wells JT-125A and JT-126 are not a result of recharge from precipitation events in late 2011 and early 2012 through the Edwards.
- The water-level changes of several feet observed in Glen Rose wells within and immediately east of the BCP could not have transmitted through the Glen Rose to produce the much larger (greater than 20 ft) water-level changes observed in Glen Rose wells JT-125A and JT-126.
- The water-level declines and recoveries observed in Glen Rose wells JT-125A and JT-126 do not indicate greater hydraulic conductivity in the Glen Rose than was measured using packer tests.
- The observed differences in water-level elevation and magnitude of change during 2011 and early 2012 between the Edwards and Glen Rose wells indicate relatively poor hydrologic connection between the Edwards and the Glen Rose.
- The pumping of irrigation wells at golf courses in the vicinity of the eastern end of JVTM appears to be a plausible cause for the water-level declines observed in Glen Rose wells JT-125A and JT-126 in summer 2011 and the subsequent recoveries after pumping cessation.



# Environmental Commissioning Issues/Resolutions - JVTM

Issue	Resolution
Sudden drop in JT-127 groundwater level	Analysis underway. Possible explanations include Comanche Peak formation operating as a confining layer, resulting in pressure drop when Comanche-Edwards contact mined through.
Rise in groundwater in Glen Rose near tunnel horizon	Evaluation indicates response of GR wells is consistent with effect of pumping deep GR water for golf course irrigation, and is unlikely to be the result of rainfall infiltration. Simulated hydraulic conductivities are consistent with those in 2010 Groundwater Assessment.
Age dating of groundwater	WPD staff refining work plan for age-dating analysis.



## Environmental Monitoring Update – Surface flow



- All springs and stream reaches flowing
- Water quality parameters within expected range
- Nondetects for indicators of mining, vehicular operation, and drilling (TPH, Cu, Cr, Zn)
- Background Screening for phthalates from hydrophobic grout injection at Four Points (JT-112 and Gaas Spring) negative. Will continue screening on weekly basis.



# Jollyville Plateau Salamander Monitoring

Spring	Date of Last Count	Count #	Historical Average (& last four counts)
Lanier	Jan 3, 2012	85	65 (56,48,59,85)
Franklin/Pit	Feb 2, 2012	39	78 (102,73,87,39)
Tanglewood	March 2012	0	8 (1,0,0,0)
Lower Ribelin	Jan 6, 2012	42	42 (53,176,43,42)
Upper Ribelin	Feb 2011	67	64 (64,123,74,67)

-- provided by Nathan Bendik, Salamander Biologist for WPD



# JVTM Environmental Monitoring Summary (cont.)

Trigger	Range	Recent Occurrences
TROLL Alarms	Outside of range of historical Variability	3/12/12 JT-128 during runoff event 3/19/12 JT-128 during runoff event
Tunnel inflow triggers	<p><b>Baseline water inflow triggers:</b> 50 gpm over 10 feet of tunnel length 200 gpm over 500 feet of tunnel length 400 gpm over a single tunnel reach (1, 2, or 3)</p> <p><b>Sensitive area triggers:</b> 25 gpm over 10 ft of tunnel length 100 gpm over 500 ft of tunnel length</p>	n/a; Minor tunnel excavation, almost no inflow
Spring/Streamflow Alarms	Relative to each other; TBD	n/a; Minor tunnel excavation, almost no inflow



# JVTM Environmental Monitoring Summary

- East side wells (various) and BCP wells continuing rise in groundwater levels. Deeper Glen Rose wells show a larger increase than shallow wells. Rise is not likely to be related to rainfall increase or connection with shallow groundwater.
- West side wells (Ed/Wal contact) flat or showing very slight rise, and wells near Four Points shaft recovering.
- JT-127 has shown a rapid drop of 56 feet, possibly due to the release of pressure after excavating through the Comanche Peak/ Edwards contact, with the Comanche Peak formation acting as a confining layer.
- Springs and Bull Creek flowing and water quality parameters within normal range. Nondetects for indicators of mining, vehicular operation, and drilling (TPH, Cu, Cr, Zn).
- Sampling for grout compounds (phthalates) negative. Will continue to test 112 and Gaas spring on a weekly basis.
- Only new triggers associated with rain event weekends of March 10-11 & 19-20 2012



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