NISQUALLY CHAPTER OF THE
ASSOCIATION OF ENVIRONMENTAL &
ENGINEERING GEOLOGISTS

The Official

AEG Nisqually Chapter Newsletter

Meeting Details

Tuesday, February 1st

Location: Mercato Ristorante

111 Market St NE

Olympia, WA

6:00 pm Social

7:00 pm Presentation

Dinner: Pizza and Salad

$25 Member or Non-Member

$15 Educators or Job Seekers

$5 Student

Virtual attendance is free

Upcoming Meetings:

South Tacoma Channel Well Evaluation

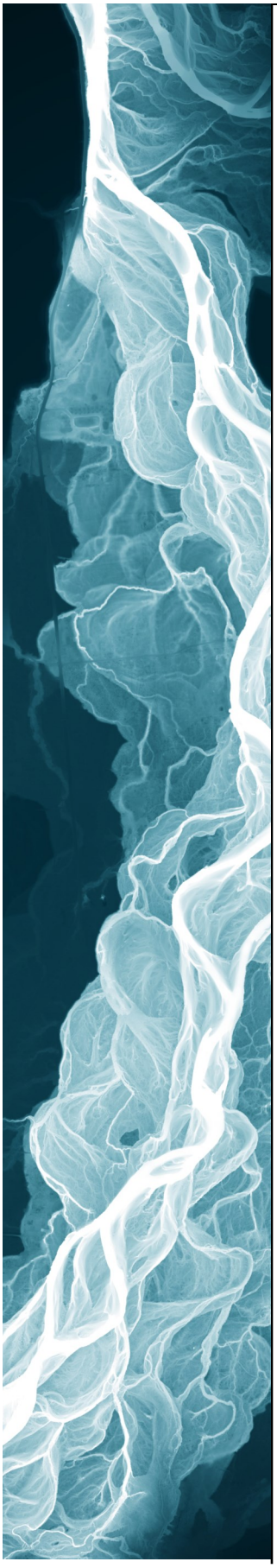
The City of Tacoma relies on pipelines from surface water intakes to provide a considerable amount of their potable water supply. Like most other utilities in the region, a system of water wells provides the balance. Unlike the pipelines, the wells can be turned on and off as demand changes, providing considerable flexibility in the operation of the system and management of the resource.

The main source wells for the City of Tacoma are located in the South Tacoma Channel Aquifer. The South Tacoma Channel is one of several large outwash channels in the south sound and forms a very significant local aquifer. It is a valley-filling aquifer that roughly parallels South Tacoma Way. The aquifer is broader to the south and narrower to the north. The gravel and sand making up the aquifer were deposited in a glacial outwash channel during the Pleistocene glaciations.

Some of the City's wells in the South Tacoma Channel Aquifer are among the largest in the State of Washington, with diameters of 36 inches and pumping capacities exceeding 10,000 gallons per minute. Wells were drilled at fourteen sites in the South Tacoma Channel Aquifer, some sites have had several wells drilled, other wells have been replaced over the years. Currently, the City is focusing on seven wells that are operational and online in the South Tacoma Channel Aquifer. These wells currently combine to produce approximately 36 million gallons per day. Though this sounds like a lot, it is only 75% of their historical capacity and is not sufficient to meet their projected future needs.

The seven wells are all currently in service, but have not been evaluated or rehabilitated in years, if ever. The City recently started a project to evaluate these wells, assessing their current performance and condition, comparing those observations to historical records, then determine if an investment in well rehabilitation is warranted. Several of these wells were drilled in the 1930s, so they're in the twilight years of their expected service life, if not already beyond it. Some of the pumps have experienced excessive wear. Other wells are experiencing issues with blockage due to bacterial growth.

The baseline testing of the wells was completed late last year. Testing was complicated by the logistics of water disposal. The City of Tacoma has grown and developed a lot since some of these wells were drilled, finding a place for the water to go during testing was a fundamental concern, especially when we're working with over 9,000 gallons per minute. During testing, each well was operated at multiple rates, with observations of pumping rate, total volume pumped, pumping water level, and elapsed time collected during each test. Additionally, Tacoma Water collected



motor performance information to determine “wire to water” efficiency for each of the pumps.

During testing, the pumping rates ranged from several hundred gallons per minute to over 9,000 gallons per minute depending on the particular well and pump combination. Most of the wells showed a typical decline in relative performance as the pumping rate was increased. Several of the wells showed a decline in performance from historical performance, others showed indications of inefficiency, presumably due to screen blockage. Though excessive sediment production was not observed at any of the wells tested, one well in particular pumped turbid water for the first 5 minutes of operation, which is extremely atypical. This well also showed a higher efficiency than when it was initially drilled, suggesting that the formation has been altered outside the well. Samples to test bacterial activity were also collected from all of the wells. Both iron bacteria and slime-forming bacteria were noted in some of the wells, but not all of them.

Well performance and condition are currently being evaluated, with an emphasis on the cost-benefit relationship of any planned work. Some of the wells are constructed in a manner that is not in compliance with current well construction standards (the wells pre-date the well construction standards). There is also concern that the construction of some of these wells increases their vulnerability to impacts from groundwater contaminants, including VOCs, metals, and PFAS/PFOA. In some cases, significant investment in an older well may not be warranted, as the costs required to restore lost production capacity and bring the well into compliance with current well construction standards may be excessive when evaluated against potential service life.

Please RSVP by 4 pm Friday, Oct. 29th if you plan on attending in person. RSVP at:

https://aeg-nisqually.brownpapertickets.com

COVID vaccination required for in-person attendance

Zoom Meeting Info:

https://us02web.zoom.us/j/84167848817?pwd=bzlqdUIxcW9wRkpyTEFET0V4ZS9hZz09

Meeting ID: 841 6784 8817
Passcode: 956589
One tap mobile
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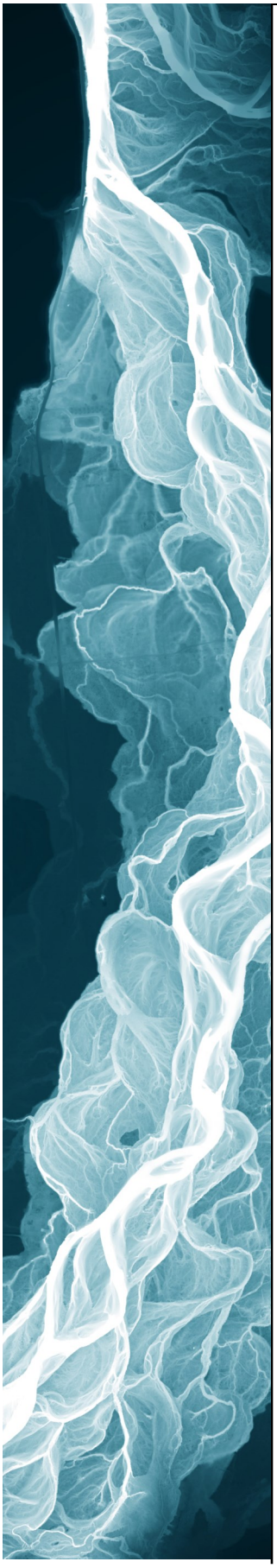
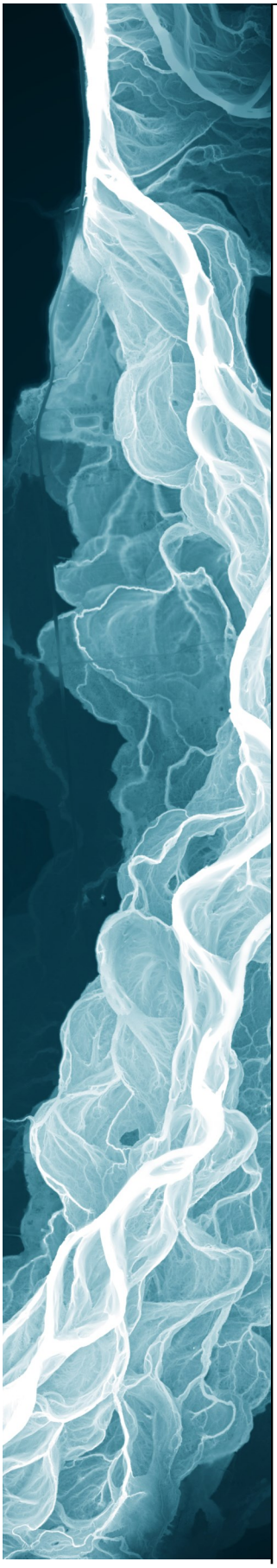
+16699006833,,84167848817#,,,,*956589# US (San Jose)



Bio: Mike Piechowski, LHG

Mike is a Principal Hydrogeologist at Robinson Noble with 27 years of professional experience. He is an expert in the design, construction, testing, and rehabilitation of water wells, and is familiar with all commonly-used drilling and well rehabilitation techniques. Mike has extensive experience with well video inspections, infiltration testing, groundwater monitoring instrumentation, and the completion and interpretation of downhole geophysical surveys. In addition, he has completed a number of regional groundwater resource evaluations and is proficient with analytical, analytic element, and numerical groundwater flow modeling.

Mike is the current president of the Washington State Ground Water Association, chairs the National Groundwater Association's Northwest Regional Policy Committee, and is an active member and was the founding chair of the Nisqually Chapter of the Association of Environmental & Engineering Geologists.



Message from the Chair

Welcome to 2022:

Greetings, AEG Nisqually! We made it through another year and as the days begin to lengthen once again we are looking forward to what is in store! I hope you all had a wonderful holiday season and have been able to remain (relatively) dry.

An additional shout out to our own Ken Neal who has stepped up to our call for volunteers with the Olympia School district!

Geohazards with increased rainfall

As I'm sure we're all well aware, this time of year is Landslide Season. With the recent heavy snowfall, consistent wet conditions and subsequent flooding, we are reminded once again that Washington State is one of the most landslide-prone states in the U.S. This year alone (and I'm talking 2022) we've already seen significant road closures as a result of avalanches and landsliding, several lost homes and more evacuated due to unstable conditions.

I thought this would be a good time to review what to look for if you live on or around unstable slopes. Below is a list of warning signs as provided by the USGS to help home owners recognize a landslide before it's too late. Remember; if you see something, say something.

- Any water or saturated ground in areas that are not typically wet, along with any broken water lines or other utilities
- Cracks or bulges in the ground, street pavement or sidewalk, tilting or cracking in concrete floors or foundations and secondary structures like decks, patios or additions
- Sunken roadbeds or leaning telephone poles, trees, retaining walls or fences as well as offset fence lines
- Inside of a structure, doors and windows may begin to stick and visible open spaces in doorframes and window frames could indicate they are out of plumb and shifting.
- For more information on landslide warning signs and how to reduce your risk, check out the Washington Geological Survey's Homeowner's Guide Landslides.

Please make sure to select AEG Nisqually when you renew your membership this year!

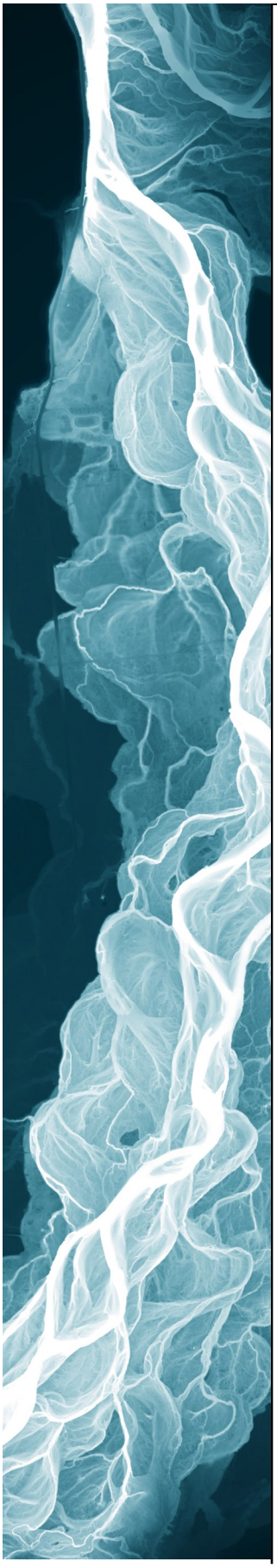
When you renew your annual AEG membership, please be sure to select Nisqually as your Chapter. It puts a few bucks into the Chapter pool and helps us track our numbers.

We look forward to seeing you at next meeting on February 1st! We will be meeting in one of the front rooms at Mercados again this month, rather than the back room we've been using. Signage will be posted as a reminder.

Cheers,

Brittany Dayley

aegnisqually@gmail.com



Message from the Chair

Current Job Postings:

Job Title (Linked)	Employer	Closing
Hydrogeologist, NRS3	Washington Geological Survey, DNR	02/01/2022
Geothermal Geologist, NRS3	Washington Geological Survey, DNR	02/01/2022

Meetings Sponsors:

We are currently seeking sponsors to help us support this chapter now and into the future! All interested Sponsors will be featured in the newsletter for the month, with monthly subscription options available as shown below. If you, or someone you know is interested, just let us know!

- Gold Status: $100/Month, Full Page
- Silver Status: $50/Month, ½ Page
- Bronze Status: $25/Month, ¼ Page

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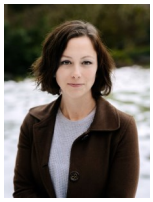

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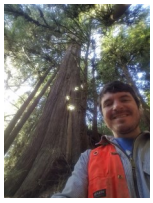

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Vacant

National AEG webpage:
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The AEG Nisqually Chapter Newsletter

The Association of Engineering Geologists (AEG) contributes to its members' professional success and the public welfare by providing leadership, advocacy, and applied research in environmental and engineering geology. AEG's values are based on the belief that its members have a responsibility to assume stewardship over their fields of expertise. AEG is the acknowledged international leader in environmental and engineering geology, and is greatly respected for its stewardship of the profession.

AEG NISQUALLY CHAPTER NEWSLETTER is published monthly from September through April. Subscriptions are for members of AEG affiliated with the Nisqually Chapter or other Chapters, and other interested people. E-mail subscriptions are free.

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