

From: "Ng, Gabe (Consultant)"
Sent: Tue, 14 Apr 2026 17:50:42 +0000
To: "Archer, Zach (Consultant)" , "Berriz, Sonia (Consultant)"
Subject: RE: Juanita Creek Lateral Migration - Draft Response to LTR 384

Hi Zach,

1. See attached email thread June 13 – July 25, 2025. Let me know if you need any of the attachments reference in this thread.
2. The July 1 TFM minutes say "WSDOT notes that lateral migration defined as low in Chapter 2 still requires the limits to be determined." What was the context for that? **Without rereading all emails and notes that I have; what I recall repeating to the DBer was "low" does not equate to zero. DBer still needs to understand if the lateral migration limits will impact the walls? They completed this simple analysis to my satisfaction in the email, as noted and should be documented in FHD as I noted.**
3. I agree with your statement below. The onerous should be on DBer to support their claims of "rejection" by WSDOT. I'm unclear what they are asking or claiming in that sentence. I'd ask for expanded clarification and documentation.

Hope this helps.

Gabe Ng, PE
WSDOT HQ Hydraulics
(consultant)
206-718-5252 mobile

From: Archer, Zach (Consultant) <zach.archer@consultant.wsdot.wa.gov>
Sent: Monday, April 13, 2026 8:09 AM
To: Ng, Gabe (Consultant) <Gabe.Ng@consultant.wsdot.wa.gov>; Berriz, Sonia (Consultant) <Sonia.Berriz@consultant.wsdot.wa.gov>
Subject: Re: Juanita Creek Lateral Migration - Draft Response to LTR 384

Hi Gabe,

If you're back today, it would be really helpful if you could have a quick look at my questions below. We have to send the letter back the DB tomorrow.

Thanks!

Zach Archer
Change Manager
WSDOT SR520/I-405 Programs
Mobile: 206.887.7046
Zach.Archer@consultant.wsdot.wa.gov

From: Archer, Zach (Consultant)
Sent: Monday, April 6, 2026 10:40 PM
To: Ng, Gabe (Consultant) <Gabe.Ng@consultant.wsdot.wa.gov>; Berriz, Sonia (Consultant) <Sonia.Berriz@consultant.wsdot.wa.gov>
Subject: Juanita Creek Lateral Migration - Draft Response to LTR 384

Gabe/Sonia,

Looks like you're both out this week, but if you happen to see this, a response this week would be much appreciated. These questions are mostly for Gabe because he was the reviewer.

I am preparing the response to Skanska LTR 384 regarding Juanita Creek lateral migration. The letter includes a detailed chronology of the design review process and task force minutes from January through July 2025.

1. An email between Gabe, Alex Strom, and Yacoub Raheem from June 13-18, 2025. Gabe, can you send me the complete email thread? Subject line was "RE: I405 BY: RSCR Comment Follow Up." The supplement includes

screenshots but I need the full thread so we have the complete conversation. Any additional messages on the subject could be helpful too.

2. The July 1 TFM minutes say "WSDOT notes that lateral migration defined as low in Chapter 2 still requires the limits to be determined." What was the context for that?
3. AECOM says WSDOT rejected the valley width (60 ft), 500-year flood extents, and stream power vs. erodibility approaches without providing alternatives. How would you characterize those discussions? Can you provide any specific responses to those proposals? I can only see a response to the 46-ft width design which was approved immediately.

Thanks,

Zach Archer
Change Manager
WSDOT SR520/I-405 Programs
Mobile: 206.887.7046
Zach.Archer@consultant.wsdot.wa.gov

This Message Is From an External Sender

This message came from outside your organization.

Thank you.

Following up on request for **updated Juanita Creek comment resolution form**.

Thank you,

Yacoub Raheem, PE*, CFM

he/him/his

Water Resources Engineer, US West Water

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yacoub.raheem@aecom.com

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From: Alex Strom <astrom@HNTB.com>

Sent: Thursday, July 24, 2025 4:33 PM

To: Raheem, Yacoub <yacoub.raheem@aecom.com>; Ng, Gabe <Gabe.Ng@jacobs.com>

Cc: Berriz, Sonia (Consultant) <sonia.berriz@consultant.wsdot.wa.gov>; Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>; Black, Alan (Consultant) <alan.black@consultant.wsdot.wa.gov>; Mika Miyamoto <mika.miyamoto@oneatlas.com>

Subject: RE: I405 BY: RSCR Comment Follow Up

Works for me.

From: Raheem, Yacoub <yacoub.raheem@aecom.com>

Sent: Thursday, July 24, 2025 4:31 PM

To: Alex Strom <astrom@HNTB.com>; Ng, Gabe <Gabe.Ng@jacobs.com>

Cc: Berriz, Sonia (Consultant) <sonia.berriz@consultant.wsdot.wa.gov>; Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>; Black, Alan (Consultant) <alan.black@consultant.wsdot.wa.gov>; Mika Miyamoto <mika.miyamoto@oneatlas.com>

Subject: RE: I405 BY: RSCR Comment Follow Up

External Email: Use caution when clicking on links, replying, or opening attachments.

Thank you.

Alex and Gabe – does Monday, 7/28 at 2pm work for a meeting with WDFW?

Thank you,

Yacoub Raheem, PE*, CFM

he/him/his

Water Resources Engineer, US West Water

M +1.914.420.8800

yacoub.raheem@aecom.com

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From: Alex Strom <astrom@HNTB.com>

Sent: Wednesday, July 23, 2025 10:56 AM

To: Raheem, Yacoub <yacoub.raheem@aecom.com>

Cc: Ng, Gabe <Gabe.Ng@jacobs.com>; Berriz, Sonia (Consultant) <sonia.berriz@consultant.wsdot.wa.gov>; Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>; Black, Alan (Consultant) <alan.black@consultant.wsdot.wa.gov>

Subject: Re: I405 BY: RSCR Comment Follow Up

I thought I had sent it. I will check my email and send to you ASAP.

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From: Raheem, Yacoub <yacoub.raheem@aecom.com>

Sent: Wednesday, July 23, 2025 10:21:23 AM

To: Alex Strom <astrom@HNTB.com>

Cc: Ng, Gabe <Gabe.Ng@jacobs.com>; Berriz, Sonia (Consultant) <sonia.berriz@consultant.wsdot.wa.gov>; Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>; Black, Alan (Consultant) <alan.black@consultant.wsdot.wa.gov>

Subject: RE: I405 BY: RSCR Comment Follow Up

External Email: Use caution when clicking on links, replying, or opening attachments.

Hi Alex,

I don't believe we have received an **updated Juanita Creek comment resolution form**, with your response to our responses, similar to Gabe's from 6/23. We also don't have updated resolutions from **Chris Vondrasek, Sam Michels-Boyce, and Darrell Sofield**.

I realize our meeting with WDFW could impact some of the responses, but I think it would be helpful to get a handle on outstanding comments that may not be impacted by WDFW comments.

We are still hoping to meet with WDFW as soon as possible, and we would like you and Gabe to join. That meeting has not been scheduled yet.

Thank you,

Yacoub Raheem, PE*, CFM

he/him/his

Water Resources Engineer, US West Water
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yacoub.raheem@aecom.com

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From: Ng, Gabe <Gabe.Ng@jacobs.com>

Sent: Wednesday, July 9, 2025 5:17 PM

To: Raheem, Yacoub <yacoub.raheem@aecom.com>; Alex Strom <astrom@hntb.com>; Berriz, Sonia (Consultant) <sonia.berriz@consultant.wsdot.wa.gov>

Cc: Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>; Black, Alan (Consultant) <alan.black@consultant.wsdot.wa.gov>

Subject: RE: I405 BY: RSCR Comment Follow Up

Hi Yacoub,

Attached is the backcheck from the model and scour review on Juanita Creek. I'm not sure who all should get these, so please forward to appropriate people.

Thanks,

Gabe Ng, PE
WSDOT HQ Hydraulics
(consultant)
206-718-5252 mobile

From: Ng, Gabe

Sent: Monday, June 23, 2025 4:21 PM

To: Raheem, Yacoub <yacoub.raheem@aecom.com>; Alex Strom <astrom@hntb.com>; Berriz, Sonia (Consultant) <sonia.berriz@consultant.wsdot.wa.gov>

Cc: Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>; Black, Alan (Consultant) <alan.black@consultant.wsdot.wa.gov>

Subject: RE: I405 BY: RSCR Comment Follow Up

Hi Yacoub,

Attached is comment resolution form closing out most original comments from the February 2025 DRAFT FHD.

There are a handful of remaining comments to be reconciled surrounding the topics of:

- Step Pool
 - morphology - does not match Sec. 2.30-B Table and FHD does not provide reference reach for this morphology; although there is discussion of step pools downstream.
 - morphology does not match what comanagers previously concurred on. Consultation with comanagers is needed to obtain concurrence. Justification for step pool design as a permit

- constraint and lengthy permit adjustment timeline is not valid basis of design.
- Confirmation from comanager (WDFW) that this step-pool design is NOT considered a "fishway." per HPA: "updated **design drawings** and streambed mix specifications must be reviewed by the Washington Department of Fish and Wildlife area habitat biologist and authorized through an HPA modification prior to construction."
- The step pool design, dimensions and spacing; the existing design doesn't mimic what naturally exists and there is a risk this will not perform as intended over time and result in a barrier to fish due to drop height and/or step failure. The risk of this design to meet long-term agency goals is not supported by HQ Hydraulics.
- Streambed Sediment
 - Confirmation with comanagers that they concur on proposed streambed material sizing; or provide documentation that this was previously concurred upon.
 - Please share who is the project permitting lead is so as to confirm this risk is not realized.
 - per HPA: "updated design drawings and **streambed mix specifications** must be reviewed by the Washington Department of Fish and Wildlife area habitat biologist and authorized through an HPA modification prior to construction."
- Hydrology
 - Method in modeling Existing & Proposed is flawed. Need to model existing detention facility using inflow hydrograph and outflow rating curve or culverts with the known values from the provided study.
 - Modeling a Natural conditions model to compare Proposed Conditions against will better support the "ongoing investigations." noted in the FHD.

Modeling backcheck is still outstanding as the engineer providing the original review has been out of the office and is scheduled to return next week.

My availability for meeting this week is:

Tue: 10-11, 3-4

Wed: 10-3, 4-5

Fri: 7-12

Thanks,

Gabe Ng, PE
WSDOT HQ Hydraulics
(consultant)
206-718-5252 mobile

From: Raheem, Yacoub <yacoub.raheem@aecom.com>
Sent: Friday, June 20, 2025 5:28 PM
To: Ng, Gabe <Gabe.Ng@jacobs.com>; Alex Strom <astrom@hntb.com>
Cc: Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>
Subject: [EXTERNAL] Re: I405 BY: RSCR Comment Follow Up

Hi Alex and Gabe,

We would like to check in on progress related to backchecking Juanita Creek FHD comment responses. If it would be helpful, we would be happy to have another meeting early next week to clarify and discuss any items before you return the official backcheck RSCR comments, including sediment gradation, meander bar, and step pool design. If so, please suggest preferred times on Monday, Tuesday, and Wednesday.

Otherwise, we look forward to receiving your comments and will schedule a meeting after reviewing.

Have a great weekend!

Thank you,

Yacoub Raheem, PE*, CFM

he/him/his

Water Resources Engineer, US West Water

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From: Raheem, Yacoub <yacoub.raheem@aecom.com>

Sent: Wednesday, June 18, 2025 10:35 AM

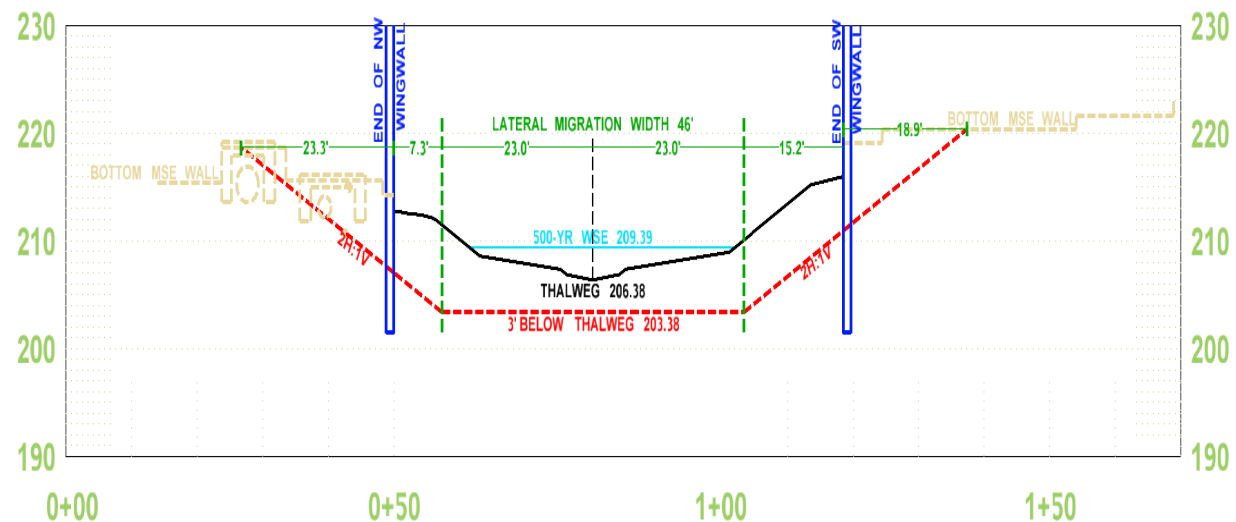
To: Ng, Gabe <Gabe.Ng@jacobs.com>; Alex Strom <astrom@hntb.com>

Cc: Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>

Subject: RE: I405 BY: RSCR Comment Follow Up

Hi Gabe,

Thank you for the quick response! Here is the updated section view of the scour prism at the downstream end of the wingwalls (at the MSE wall), looking upstream. We will use this as a guide to design buried riprap following HEC-23 to protect the MSE wall.



Note that I updated the lateral migration extents figure below to match the one in the spreadsheet (there was a minor difference).

Thank you,

Yacoub Raheem, PE*, CFM

he/him/his

Water Resources Engineer, US West Water

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yacoub.raheem@aecom.com

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From: Ng, Gabe <Gabe.Ng@jacobs.com>

Sent: Wednesday, June 18, 2025 9:26 AM

To: Raheem, Yacoub <yacoub.raheem@aecom.com>; Alex Strom <astrom@hntb.com>

Cc: Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>

Subject: RE: I405 BY: RSCR Comment Follow Up

Yacoub,

This looks good. Thank you. I agree with your estimate of lateral migration extents and documentation. Please include this information in the final FHD.

Thanks,

Gabe Ng, PE

WSDOT HQ Hydraulics

(consultant)

206-718-5252 mobile

From: Raheem, Yacoub <yacoub.raheem@aecom.com>

Sent: Wednesday, June 18, 2025 12:49 AM

To: Ng, Gabe <Gabe.Ng@jacobs.com>; Alex Strom <astrom@hntb.com>

Cc: Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>

Subject: [EXTERNAL] RE: I405 BY: RSCR Comment Follow Up

Hi Gabe and Alex,

We would like to come to a consensus on lateral migration extents for Juanita Creek as soon as possible, since this impacts other disciplines. We performed an updated valley width analysis for Juanita Creek, something we discussed with Gabe several months ago (Alex, I don't think you were on that call). We looked at cross sections in the design reference reach and estimated a conservative average width of **46.0 feet**. We propose to use this value for lateral migration extents. This is wider than the 30-foot meander belt width estimated by WSDOT for preliminary design, wider than the proposed tunnel width (37.8 feet), and wider than proposed 500-year extents downstream near the MSE wall.

Here is some additional text we would add to Section 2.7.5. Channel Migration:

To determine the lateral migration extents for Juanita Creek, valley width measurements were estimated for the design reference reach. Cross sections were cut for the nine upstream BFW locations (the most downstream BFW location was not used because it is near the bend in the creek where the valley floor widens in the wetland area). Valley width extents were estimated by analyzing grade breaks on the banks of the cross sections. They indicate the horizontal extent of the valley floor, which includes the river channel and associated floodplains and terraces. These are indicative of the extents that the channel could potentially migrate. The average valley width for the nine cross sections is 46.0 feet. This value will be used as a conservative estimate for the lateral migration extents. The figure below shows lines connecting the valley width extents for the 9 cross sections through the design reference reach. Appendix N [attached spreadsheet] shows the cross sections for each of these locations along with the valley widths.

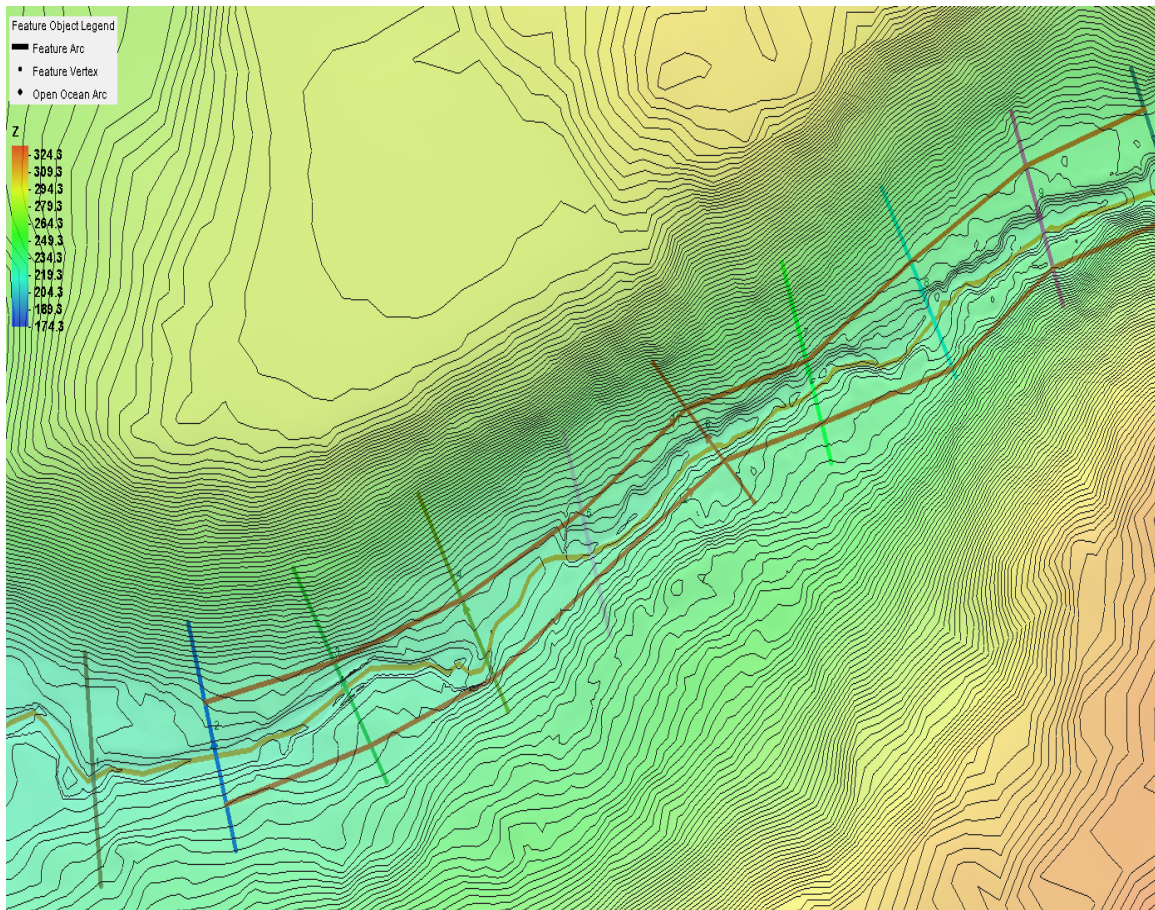


Figure X. Juanita Creek Design Reference Reach Lateral Migration Extents

The tunnel and wingwalls are designed for full scour depth and do not require scour protection. We propose to use this lateral migration extents to design scour protection for the MSE wall, using the extents to determine how much of the MSE wall will need to be protected .

<Curtis.Jones@aecom.com>

Subject: RE: I405 BY: RSCR Comment Follow Up

Thanks Yacoub,

I have similar comments/concerns. One of my added comments is to understand where/how the 30' meander width was estimated; and why the tunnel was additionally widened.

I didn't see any validation to the meander width or valley width in the updated FHD to support the outer limits of what the historic migration limits would be.

Depending on where the walls are located; I believe you could use a countermeasure to mitigate total scour but I have to double check which manual that is in.

Talk soon,

Gabe Ng, PE

WSDOT HQ Hydraulics

(consultant)

206-718-5252 mobile

From: Raheem, Yacoub <yacoub.raheem@aecom.com>

Sent: Friday, June 13, 2025 12:24 PM

To: Alex Strom <astrom@hntb.com>; Ng, Gabe <Gabe.Ng@jacobs.com>

Cc: Jarosz, Katherine <katherine.jarosz@aecom.com>; Cote, Meredith <Meredith.Cote@aecom.com>; Gentzler, Seth <seth.gentzler@aecom.com>; Mcneely, Steve <steven.mcneely@aecom.com>; Jones, Curtis <Curtis.Jones@aecom.com>

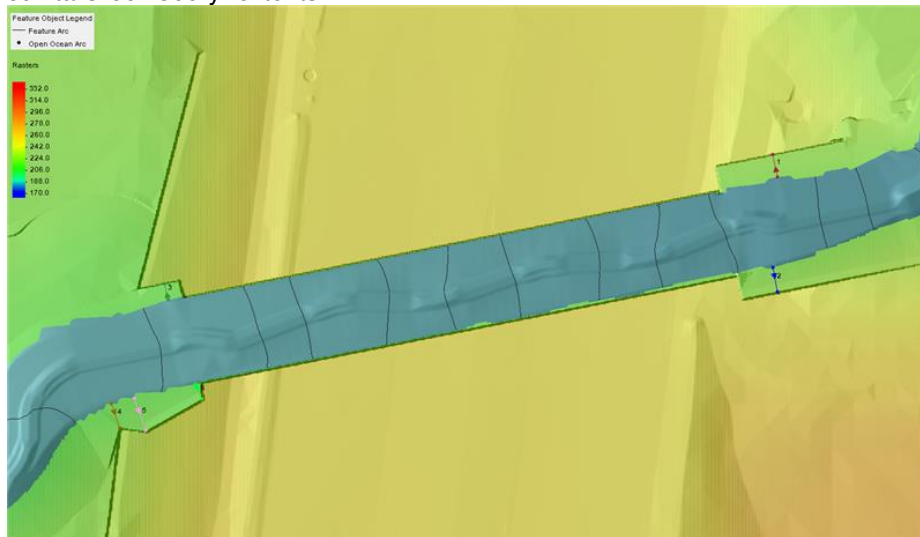
Subject: [EXTERNAL] RE: I405 BY: RSCR Comment Follow Up

Hi Gabe and Alex,

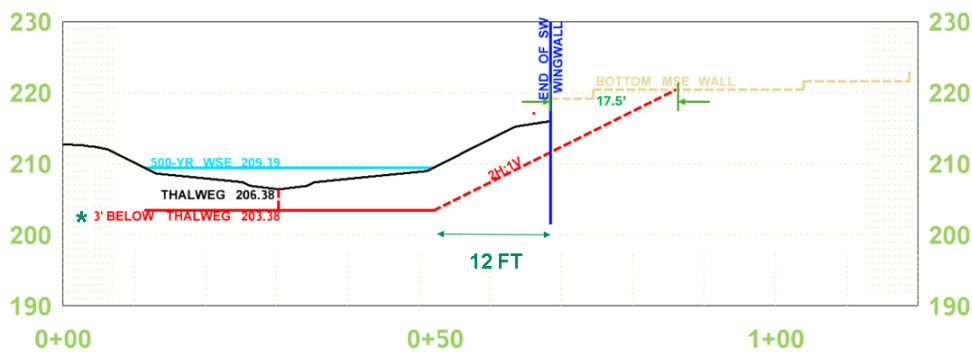
We look forward to speaking with you soon. In case you had a little bit of time before the call, we wanted to send along some bullet points we would like to discuss. In response to a structural comment from Jason Pang related to protection of the downstream MSE at Juanita Creek, we need to quantify potential extent of lateral migration. Up until now, we have found it difficult to develop an exact value for lateral migration, and thus, designed tunnel and wingwalls for full scour depth:

- Dense vegetation and tree cover, poor aerial imagery resolution, make it difficult to delineate features such as the top of bank and stream centerline, and thus it is **not possible to define the extents of channel migration based on historical imagery**.
- Based on **geotechnical information**, there are **no non-erodible geologic features or cohesive materials that could limit the extents** of lateral migration of the stream channel.
- Since this is a **new channel**, some historical features (e.g. trees or vegetation on the banks) may not be entirely relevant. Also there is **no historical imagery** upon which to estimate lateral migration of future conditions.
- The risk of lateral migration may only be low to moderate; however, to be conservative, **lateral migration was assumed when conducting scour analysis** (it is assumed that thalweg can migrate to wall for new structures).
- Regarding the structures, **both tunnel and wingwalls are designed for full scour depth**. FHD did not include scour countermeasures to be provided on top of that.
- During preliminary design, WSDOT measured the **meander belt width to be 30 feet**; this was used to size this width of the tunnel during preliminary design. Since then, **the tunnel has been widened to 37.8 feet**.
- The flood prone width (which is defined as the water surface width at twice the bankfull depth or the width at the 50-year to 100-year flood) can be considered as a proxy for the channel migration zone and the extents of lateral migration. The FPW was calculated as 18.1 ft in the upstream reach and 17 feet in the downstream reach, based on the 100-yr model results.
- We propose that the modeled **500yr extents be considered the extent of lateral migration**.

Junita Creek 500-yr extents:



Juanita scour prism at MSE wall:



*calculated total scour = 1.1 ft

Thank you,

Yacoub Raheem, PE*, CFM

he/him/his

Water Resources Engineer, US West Water

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yacoub.raheem@aecom.com

*Licensed in OR, WA, and CA

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-----Original Appointment-----

From: Cote, Meredith <Meredith.Cote@aecom.com>

Sent: Wednesday, June 11, 2025 9:35 AM

To: Ng, Gabe; Strom, Alex (Consultant); Raheem, Yacoub; Gentzler, Seth; Mcneely, Steve; Jones, Curtis; Alex Strom; Jarosz, Katherine

Subject: I405 BY: RSCR Comment Follow Up

When: Friday, June 13, 2025 1:30 PM-2:30 PM (UTC-08:00) Pacific Time (US & Canada).

Where: Microsoft Teams Meeting

Looking forward to our discussion!

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