Appendix K
Fall Seepage Meter Deployment Expedited Conditional Approval

From: Young, Hunter
To: Ryan Barth
Cc: Bob Wyatt; Peterson, Lance; Azhar, Wardah; Jen Mott; Nik Bacher
Subject: RE: US Moorings Second Phase PDIWP - proposed seepage meter timing
Date: Monday, September 26, 2022 4:32:41 PM

Bob, Ryan,

EPA approves the responses provided to the September 19, 2022 conditional approval and the seepage meter scope of work may proceed with the understanding that the explanation regarding Specific Comment 15 (as well as the figure and geographic coordinates) will be incorporated into the revised US Moorings First Phase Pre-Design Investigation Data Summary Report and Second Phase Pre-Design Investigation Work Plan.

Thank you,

Hunter Young
U.S. Environmental Protection Agency
Region 10 - Oregon Operations Office
Young.Hunter@epa.gov
(503)-326-5020

From: Ryan Barth <rbarth@anchorqea.com>
Sent: Friday, September 23, 2022 10:38 AM
To: Young, Hunter <Young.Hunter@epa.gov>
Cc: rjw@nwnatural.com; Peterson, Lance <petersonle@cdmsmith.com>; Wardah Azhar <azharw@cdmsmith.com>; jmott@anchorqea.com; Nik Bacher <nbacher@anchorqea.com>
Subject: RE: US Moorings Second Phase PDIWP - proposed seepage meter timing

Hunter –

Please disregard my previous email containing this same information on 9/23 at 1032am. I inadvertently replied to the incorrect email chain. This email includes the correct email chain.

NW Natural reviewed the first attached EPA conditional approval of the groundwater seepage meter deployment scope of work in the *Revised First Phase Pre-Design Investigation Data Summary Report and Second Phase Pre-Design Investigation Work Plan* (Combined DSR-PDIWP) for the US Moorings Project Area dated September 19, 2022. Regarding EPA's response to Specific Comment 15, Anchor QEA evaluated EPA's request to add a minimum of one to two seepage meter locations closer to the navigation channel but still within the capping footprint in the intermediate region. As shown in the first attached figure, the depths of contamination (DOC; see bold font callouts adjacent to each first

phase PDI core location) within 150-feet of the navigation channel boundary are less than or equal to 6 to 7 feet (total of 4 locations) except in two isolated locations where the DOC is 10 feet and 14 feet. As discussed in Section 5.3.1 of the Combined DSR-PDIWP, EPA assumed that 5 feet of dredging would occur prior to capping in the shallow and intermediate regions in ROD Sections 14.2.3 and 14.2.4 (as a presumptive non-mitigating remedy). Therefore, a simple screening for the potential applicability of capping in these regions is dependent on the DOC being below 5 feet and/or if the DOC is caused by deep buried contamination. NW Natural believes the marginally deeper DOCs at 6 feet and 7 feet (which do not include buried contamination) would likely be more cost effective to dredge than cap. In addition, the 14-foot DOC is located directly adjacent to the U.S. Moorings L-dock within the future maintenance dredge area, so capping is not considered feasible in that location. Alternatively, the 10-foot DOC location has two proximal, landward core locations with DOC's greater than 13 feet, both with contamination buried under multiple feet of non-exceedances (and thus NW Natural's rationale for proposing a seepage meter at the attached shown location). To address EPA's comment to collect more seepage data further into the channel within a potential capping footprint, NW Natural repositioned the seepage meter as shown in the second attached figure. In addition, NW Natural has also decided to add a single additional meter in the attached shown location to provide additional seepage meter data spatial coverage in this potential capping area. The geographic coordinates for the repositioned seepage meter locations is provided in the third attachment.

Regarding EPA's Specific Comment 17, NW Natural's response to EPA's Specific Comment 17d will be incorporated into the text of the revised Combined DSR-PDIWP per EPA's request.

With submittal of this additional information and your emailed acceptance of the diver certifications on September 21, 2022, NW Natural understands the seepage meter deployment can initiate next week. Please let us know if you have any additional questions/comments on this scope of work. Regards.

Ryan Barth, P.E.
Principal

ANCHOR QEA, LLC

From: Young, Hunter <Young.Hunter@epa.gov>
Sent: Monday, September 19, 2022 3:27 PM
To: Ryan Barth <rbarth@anchorqea.com>; Bob Wyatt <rjw@nwnatural.com>
Cc: Peterson, Lance <petersonle@cdmsmith.com>; Azhar, Wardah <azharw@cdmsmith.com>; Jen Mott <jmott@anchorqea.com>
Subject: RE: US Moorings Second Phase PDIWP - proposed seepage meter timing

Bob, Ryan,

See attached for EPA's conditional approval for the seepage meter deployment scope of work associated with the US Moorings First Phase Pre-Design Investigation Data Summary Report and Second Phase Pre-Design Investigation Work Plan. Please provide the diver certifications submittal as soon as possible (ideally by Wednesday) to allow for review this week.

Thank you,

Hunter Young
U.S. Environmental Protection Agency
Region 10 - Oregon Operations Office
Young.Hunter@epa.gov
(503)-326-5020

From: Ryan Barth <rbarth@anchorqea.com>
Sent: Tuesday, September 13, 2022 2:20 PM
To: Young, Hunter <Young.Hunter@epa.gov>
Cc: Peterson, Lance <petersonle@cdmsmith.com>; Wardah Azhar <azharw@cdmsmith.com>; rjw@nwnatural.com; jmott@anchorqea.com
Subject: RE: US Moorings Second Phase PDIWP - proposed seepage meter timing

Hunter – below please find NW Natural's red font responses to EPA's conditional approval comments on the US Moorings Project Area seepage meter deployment scheduled to initiate the last week in September. Also, attached please find responses to EPA's Specific Comments 15 and 17 on the Combined DSR-PDI WP that were specific to the seepage meter deployment scope of work. Please let us know if you have any further feedback and if we are approved to perform the seepage meter deployment pending EPA's review of the forthcoming diver certifications submittal. Regards.

Ryan Barth, P.E.
Principal

ANCHOR QEA, LLC

From: Young, Hunter <Young.Hunter@epa.gov>
Sent: Monday, July 25, 2022 8:31 AM
To: Ryan Barth <rbarth@anchorqea.com>
Cc: Peterson, Lance <petersonle@cdmsmith.com>; Azhar, Wardah <azharw@cdmsmith.com>; Bob Wyatt <rjw@nwnatural.com>; Jen Mott <jmott@anchorqea.com>
Subject: RE: US Moorings Second Phase PDIWP - proposed seepage meter timing

Bob, Ryan,

EPA has reviewed the information provided by NW Natural to substantiate the targeted conditions for seepage meter deployments at the U.S. Moorings Project Area. The proposed periods of seepage meter deployments are conditionally approved based on consideration of the following EPA comments which you can refer to when responding to Specific Comment 17a on the First Phase Pre-Design
Investigation Data Summary Report and Second Phase Pre-Design Investigation Work Plan (Combined DSR-PDI WP).

1. River elevations begin to rise in April such that the difference in head between the groundwater and surface water is minimized. This may result in conditions that are different from the preferred conditions in March. The March to early April time period should be targeted for the second deployment to avoid these conditions. The text will be revised to state that the March to early April time period will be targeted for the second deployment.
2. The Second Phase PDIWP and FSP should be revised to reflect the September/October and March/early April time periods. The Combined DSR-PDI WP currently indicates that late summer/early fall (i.e., August through October) and spring (i.e., March through May) time periods will be targeted. The text will be revised as requested.
3. If September/October water depth conditions are conducive to seepage meter deployments at one or more of the four nearshore locations, consideration should be given to collecting nearshore seepage data during this period of highest potential groundwater seepage. NW Natural and the seepage meter contractor will deploy seepage meters at all locations with sufficient water depth during the fall deployment.
4. Add footnotes to Figure 7 to clarify the anomalous results for observation well elevations at OW-7-17, OW-8-15, and OW-9-25, as applicable. The footnotes will be added to the figure, as requested.
5. Include the seven figures and supplemental text introducing the figures and their purpose at an appropriate location in the revised Combined DSR-PDI WP. This information will be included as an appendix to the Revised Combined DSR-PDI WP.

Thank you,

Hunter Young
U.S. Environmental Protection Agency
Region 10 - Oregon Operations Office
Young.Hunter@epa.gov

(503)-326-5020

From: Ryan Barth <rbarth@anchorqea.com>
Sent: Wednesday, July 13, 2022 10:32 AM
To: Young, Hunter <Young.Hunter@epa.gov>
Cc: Peterson, Lance <petersonle@cdmsmith.com>; Wardah Azhar <azharw@cdmsmith.com>; rjw@nwnatural.com; jmott@anchorqea.com
Subject: RE: US Moorings Second Phase PDIWP - proposed seepage meter timing

As requested in your below email regarding our proposed seepage meter deployments in the US Moorings Project Area (Project Area) as part of our *First Phase Pre-Design Investigation Data Summary Report and Second Phase Pre-Design Investigation Work Plan* (Work Plan), this email and attached figures provide an evaluation of groundwater levels in representative upland monitoring wells and Willamette River elevation data to substantiate the targeted conditions for offshore seepage meter deployments proposed in the Work Plan (i.e., fall for the first round of deployment during low river elevations and spring for the second round of deployments during high river elevations).

As described in the U.S. Environmental Protection Agency's (EPA's) *Remedial Design Guidelines and Considerations – Portland Harbor Superfund Site, Portland, Oregon* (2021), porewater and seepage meter deployments should be conducted "at a time of the year when groundwater flux into the river is at its maximum." This occurs when the river elevations are lowest relative to upland groundwater in hydraulic connection with the locations of the proposed seepage meter deployments (i.e., during the fall period). In addition, NW Natural proposes to collect offshore seepage data during high river elevations to understand the variability of seepage relative to groundwater elevations. To evaluate when these hydraulic conditions occur within the Project Area, Anchor QEA, LLC, evaluated the nearshore groundwater elevations in the Fill Water-Bearing Zone (WBZ) on the northeast portion of the Gasco property closest to the US Moorings property because there are no monitoring wells on the US Moorings property. We compared the river elevations over a 5-year period (2017 through 2021) to the measured observation well elevations at OW-7-17, OW-8-15, OW-9-25, and OW-10F (see attached Figure 1). These Fill WBZ observation wells are not affected by pumping from the Gasco property hydraulic control and containment (HC&C) system and are directly upriver from the US Moorings property, so they are representative of the groundwater/surface water interactions in the Project Area. Figures 3 to 7 depict a comparison of the mean measured river elevations during the 5-year period, starting with OW-10F, which is closest to the US Moorings property, and extending to OW-7-17 slightly farther upriver from the property. This multiyear comparison documents that the river elevations are lowest and highest relative to nearshore groundwater elevations in September/October and March/April, respectively. Therefore, consistent with the deployment period identified in the Work Plan, NW Natural proposes to deploy the seepage meters during these two periods.

River elevations were also evaluated over a 5-year period (2017 through 2021) to determine the time of year with the lowest elevations. Figure 2 shows a box plot for each month of the river elevation data for the 5-year period. The box plots show that mean water levels are lowest in

September and October and that the river typically begins to rise with seasonal rainfall beginning in October. NW Natural previously received EPA approval to deploy seepage meters at the Gasco Sediments Site Project Area during these low river elevation periods in August 2005, October 2007, and September 2017.

Please let us know if you have any questions or comments on this evaluation and whether we have approval to proceed with the seepage meter deployments during September/October and March/April. We look forward to your feedback. Regards.

Ryan Barth, P.E.
Principal

ANCHOR QEA, LLC

From: Young, Hunter <Young.Hunter@epa.gov>
Sent: Tuesday, June 7, 2022 11:11 AM
To: Bob Wyatt <rjw@nwnatural.com>; Jen Mott <jmott@anchorqea.com>; Ryan Barth <rbarth@anchorqea.com>
Cc: Peterson, Lance <petersonle@cdmsmith.com>; Azhar, Wardah <azharw@cdmsmith.com>
Subject: US Moorings Second Phase PDIWP - proposed seepage meter timing

Bob, Ryan, Jen,

For consistency with what's being requested at other project areas, EPA asks that you provide an evaluation of groundwater levels in representative upland monitoring wells and Willamette River stage data to substantiate the targeted conditions for seepage meter deployments proposed in the Second Phase PDI Work Plan (i.e., late summer/early fall for the first round of deployment and spring for the second round). EPA recommends including a plot(s) of changes in groundwater elevations and river stage data over a period of at least one year. Note that the data to be used for this evaluation should be as localized to the US Moorings Project Area as possible. If groundwater data from nearby areas is used, justification should be provided for its relevance to the US Moorings Project Area. No resubmittal of the PDI Work Plan is necessary; the information can be transmitted to EPA via email. Please reach out with any questions.

Thanks,

Hunter Young
U.S. Environmental Protection Agency

Region 10 - Oregon Operations Office
Young.Hunter@epa.gov
(503)-326-5020

EPA Comments and Responses on Groundwater Seepage Meter Deployment-related comments on the First Phase Pre-Design Investigation Data Summary Report and Second Phase Pre-Design Investigation Work Plan US Moorings Project Area

EPA Response dated September 19, 2022

This is U.S. Environmental Protection Agency's (EPA's) conditional approval of the groundwater seepage meter deployment scope of work in the Revised First Phase Pre-Design Investigation Data Summary Report and Second Phase Pre-Design Investigation Work Plan (Combined DSR-PDIWP) for the US Moorings Project Area. The Combined DSR-PDIWP was prepared by Anchor QEA, LLC on behalf of NW Natural and dated May 27, 2022. EPA provided its comments on the Combined DSR-PDIWP to NW Natural on July 21, 2022. NW Natural provided responses to groundwater seepage meter-related comments on September 13, 2022 so that EPA may approve the groundwater seepage meter scope of work such that seepage meter placement may commence on September 26, 2022.

Approval of the groundwater seepage meter scope of work is conditioned on NW Natural adequately addressing EPA's responses as described below and incorporating revisions into the revised version of the Combined DSR-PDIWP.

EPA Comments on NW Natural responses to EPA's Specific Comments 15 and 17 on the Revised Combined DSR-PDIWP

EPA Specific Comment 15 (July 21, 2022)

Section 5.1.2 Buried Contamination Evaluations, LOE 3: Chemical Stability, page 30: Revise Figure 5-3 to show the 30 locations with buried contamination that are discussed in the text, and revise the text to discuss the rationale for proposed seepage meter placement. This information will allow EPA to evaluate the spatial density of the nine seepage meter locations for the intended use of the seepage velocity data for buried contamination evaluations. The figure should also include historical buried contamination locations.

NW Natural Response (September 13, 2022)

Figure 5-3 has been revised to show all historical and first phase PDI locations with buried contamination (i.e., no remedial action level [RAL] exceedances or principal threat waste [PTW] threshold exceedances in surface sediments, but one or more RAL or PTW threshold exceedances in subsurface sediment interval[s] below 1-foot). The seepage meter locations were selected to cover both the Record of Decision (ROD)-identified Shallow and Intermediate Regions of the US Moorings Project Area with location density and spacing similar to the EPA-approved Gasco seepage meter deployments in 2017 and 2018. As discussed in NW Natural's response to EPA Specific Comment 17d below, seepage meters were also spaced to adequately cover areas 1) inside of surface sediment exceedance based sediment management area (SMAs) footprints, to be used for potential cap modeling evaluation purposes, and 2) outside of

surface-based SMA footprints to inform buried contamination evaluations and, if needed, potential future capping evaluations. Preference was given to locations with deeper RAL or PTW threshold exceedances, as these locations are more likely candidates for buried contamination or potential future capping. As a final measure, NW Natural reviewed surface sediment grain size data to confirm the proposed locations cover the general range of grain sizes within the Project Area.

EPA Response (September 19, 2022)
A minimum of one to two seepage meter locations should be added closer to the Navigation Channel but still within the capping footprint in the intermediate zone. Review of the pre-hydraulic control and containment (HC&C) system seepage data for the Gasco Sediments Site indicate that offshore seepage meter locations had relatively high seepage rates. Similar to the Gasco Sediments Site, seepage rates may be higher closer to the navigation channel considering US Moorings does not have a similar upland HC&C system as the Gasco Sediments Site.

EPA Specific Comment 17 (July 21, 2022)

Section 5.1.2.3 Seepage Meters, page 32: EPA has the following comments on this section and text should be revised accordingly:

a. For consistency with what is being requested at other project areas, EPA asks that NW Natural provide an evaluation of groundwater levels in representative upland monitoring wells and Willamette River stage data to substantiate the targeted conditions for porewater sampling and seepage meter deployments proposed in the Second Phase PDI WP. EPA recommends including a plot(s) of changes in groundwater elevations and river stage data over a period of at least one year.

NW Natural Response (September 13, 2022)
This information was provided to EPA via email on July 13, 2022, and that communication will be included as an appendix to the revised *Phase PDI Data Summary Report and Second Phase PDI Work Plan*. In an email from EPA on July 25, 2022.

EPA Response (September 19, 2022)

The responses provided on September 13, 2022 to EPA's July 25, 2022 comments on the July 13, 2022 email are acceptable pending review of the revised Combined DSR-PDIWP.

b. Surface waves and wakes due to nearby vessels can influence the results of an ultrasonic seepage meter. Revise the text to acknowledge that appropriate precautions will be taken to address this concern or, at the very least, thorough notes and automatic identification system (AIS) ship logs (large commercial vessels all have AIS transmitters that can be tracked online) should be recorded for possibly interfering vessel wakes encountered during seepage meter deployment. Data should also be reviewed for anomalous results, as with any data set.

NW Natural Response (September 13, 2022)

The text will be revised to acknowledge that appropriate precautions will be taken to limit seepage meter exposure to surface waves and wakes due to nearby vessels. Thorough notes will be taken during deployment regarding any potential sources of disturbance, and AIS ship logs will be recorded for possibly interfering vessel wakes encountered during seepage meter deployment.

EPA Response (September 19, 2022)

The response is acceptable pending EPA's review of the revised Combined DSR-PDIWP.

c. EPA recommends inquiring with the ultrasonic seepage meter contractor to determine the number of meters available for deployment at one time at the project area. If seepage data may not be collected simultaneously at all seepage monitoring locations, data should be recorded from a nearby tide gauge (USGS or otherwise) so potential impacts to seepage measurements due to changes in tidal amplitude (natural or storm induced) can be evaluated in conjunction with the seepage data.

NW Natural Response (September 13, 2022)

The text will be updated as requested. Data from the Gasco property upland source control system gauges will be recorded and used as necessary to support evaluation of the seepage meter data.

EPA Response (September 19, 2022)

The response is acceptable pending EPA's review of the revised Combined DSR-PDIWP.

d. Clarify why only some of the proposed seepage meter locations are associated with ROD SMAs and/or the areas depicted as "Post-ROD SMAs + First Phase PDI Data" on Figure 5-3.

NW Natural Response (September 13, 2022)

As stated in footnote 5, the "Post-ROD SMAs + First Phase PDI Data" shown on Figure 5-3 were developed consistent with ROD-identified methodologies using surface sediments only. As requested in EPA's Remedial Design Guidelines and Considerations (RDGC), dated April 23, 2021, NW Natural will revise the SMA boundaries to include subsurface sediment data, pending the results of buried contamination evaluations described in EPA's Buried Contamination Guidelines for Portland Harbor Site, dated January 18, 2022. The proposed seepage meters shown on Figure 5-3 that are located outside of the surface-based SMAs will be used for buried contamination evaluations. Data collected from these seepage meter locations may also be used for cap modeling evaluations, if applicable, in areas that become part of the final SMAs following buried contamination evaluations. The proposed seepage meters located within the surface-based SMAs will be used as necessary to support cap modeling evaluations.

EPA Response (September 19, 2022)
NW Natural's response should be incorporated into the text of the revised Combined DSR-PDIWP.

e. Explain why the nine proposed seepage meter locations is sufficient to achieve data quality objectives.

NW Natural Response (September 13, 2022)
See NW Natural's response to EPA Specific Comment 15.

EPA Response (September 19, 2022)
See EPA's response to Specific Comment 15.