From: Halah Voges <hvoges@anchorqea.com>
Sent: Thursday, October 29, 2020 11:06 AM
To: BAYUK Dana <Dana.BAYUK@state.or.us>; Bob Wyatt <rjw@nwnatural.com>
Cc: Christopher Ryan <cryan@chrisryanpe.com>; Heidi Nelson (Heidi.NELSON@state.or.us) <Heidi.NELSON@state.or.us>; LARSEN Henning <Henning.LARSEN@state.or.us>; Joe Burke <jburke@sevenson.com>; John Renda <jrenda@anchorqea.com>; Jen Mott <jmott@anchorqea.com>; Crystal, Mike <mdcrystal@sevenson.com>; SEIDEL Paul <Paul.SEIDEL@state.or.us>; Patricia Dost <pdost@pearllegalgroup.com>; Lance Peterson (PetersonLE@cdmsmith.com) <PetersonLE@cdmsmith.com>; Ryan Barth <rbarth@anchorqea.com>; Rick Schwarz <rschwarz@anchorqea.com>; Sarah Riddle <sriddle@pearllegalgroup.com>; Hunter Young (young.hunter@epa.gov) <young.hunter@epa.gov>; Lance Downs (advremtech@canby.com) <advremtech@canby.com>; Bob Wyatt <rjw@nwnatural.com>; Dehlia McCobb <dmccobb@anchorqea.com>
Subject: RE: NW Natural: Fill Water-Bearing Zone (WBZ) Trench Design - For Expedited Review

Hi Dana –

On behalf of NW Natural, attached please find responses to the Requests for Information and Clarifications listed below as well as revised Figure C05. We are excited to begin trench construction on Monday, November 2, 2020 and appreciate your expedited review and approval of September 28, 2020 Fill Water-Bearing Zone Trench Design. Please let me know if you have any questions or need additional information concerning our responses. Thanks.

Halah M. Voges, P.E.
Anchor QEA, LLC
D 206.903.3303
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From: BAYUK Dana <Dana.BAYUK@state.or.us>
Sent: Wednesday, October 7, 2020 3:43 PM
To: Bob Wyatt <rjw@nwnatural.com>
Cc: Christopher Ryan <cryan@chrisryanpe.com>; Heidi Nelson (Heidi.NELSON@state.or.us) <Heidi.NELSON@state.or.us>; LARSEN Henning <Henning.LARSEN@state.or.us>; Halah Voges <hvoges@anchorqea.com>; Joe Burke <jburke@sevenson.com>; John Renda <jrenda@anchorqea.com>; Jen Mott <jmott@anchorqea.com>; Crystal, Mike <mdcrystal@sevenson.com>; SEIDEL Paul <Paul.SEIDEL@state.or.us>; Patricia Dost <pdost@pearllegalgroup.com>; Lance Peterson (PetersonLE@cdmsmith.com) <PetersonLE@cdmsmith.com>; Ryan Barth <rbarth@anchorqea.com>; Rick Schwarz <rschwarz@anchorqea.com>; Sarah Riddle <sriddle@pearllegalgroup.com>; Hunter Young (young.hunter@epa.gov) <young.hunter@epa.gov>; Lance Downs (advremtech@canby.com) <advremtech@canby.com>; Bob Wyatt <rjw@nwnatural.com>; Dehlia McCobb <dmccobb@anchorqea.com>
Subject: RE: NW Natural: Fill Water-Bearing Zone (WBZ) Trench Design - For Expedited Review

Good afternoon Bob.

DEQ reviewed the "Fill Water-Bearing Zone Trench Design" dated September 28, 2020 (LNG Basin Trench Design). The LNG Basin Trench Design responds to DEQ's September 2, 2020 comments to the Draft LNG Basin Trench Design dated August 13, 2020 (see footnote). The LNG Basin Trench Design presents the design for two trenches positioned downgradient of the Liquefied Natural Gas (LNG) Basin. NW Natural is constructing the trenches as a removal action to address groundwater contamination migrating from under the LNG Basin and towards the Willamette River. Anchor QEA, LLC prepared both design documents on behalf of NW Natural.

The primary purpose of this e-mail is to inform NW Natural that DEQ:

- Acknowledges NW Natural has addressed our September 2, 2020 comments; and
- Approves the Fill WBZ Trench Design for implementation.

DEQ is requesting NW Natural to provide information and/or clarifications as indicated below to supplement the LNG Basin Trench Design with additional details (labeled "Response #_"). DEQ also has comments on new sections of the design document (labeled "Comment #_") that request changes as indicated. For clarification, DEQ considers the document to be complete, and is not requesting the submittal to be revised. DEQ does request the NW Natural reply to this e-mail with the requested information and that the reply address our comments. DEQ will consider the e-mail

reply as a supplement to the LNG Basin Trench Design.

Requests for Information and Clarifications

Response #8. For clarification, DEQ notes that in addition to widening the capture zone and lengthening groundwater flow paths, the 30-foot long trench extends the capture zone further downgradient of monitoring well MW-49F.

Response #11. DEQ requests that NW Natural provide the average of the specified length(s) of time associated with evaluations of trench capture zones during extreme wet and extreme dry conditions.

Response #13 (1st bullet). To preserve the thickness of the upper silt below the two trenches, including below the sumps, DEQ requested that NW Natural consider switching to an excavator bucket with a smooth cutting edge (toothless) when excavating in this unit. This option is not mentioned in the design document and DEQ requests additional information regarding the status of use.

Response #15. DEQ anticipates that NW Natural will provide information regarding the source and results of characterizing material when the information becomes available.

Response #16 (3rd bullet). The tracer wire DEQ recommends does not appear to be mentioned in the narrative of the document or shown on the plans. DEQ requests information regarding the use of tracer wire along the trench alignments.

Response #17. Consistent with our September 2nd comment, DEQ requests that LEL monitoring be frequently measured at vaults and cleanouts along the trench and enclosures along the conveyance lines during system start-up, and during scheduled monitoring events as the system operates (applies to new Section 6.1.2 [Long-Term Operations]).

Response #21. The reference to a 2019-version of the Contaminated Materials and Management Plan should be checked as DEQ is only aware of a preliminary plan prepared by Anchor for NW Natural and dated February 23, 2016.

Response #25. The design adds Drawing C05 to Appendix E to illustrate conveyance piping alignments and certain features of the trench system (e.g., control panel, equalization tank) appears. The drawing appears to be incomplete. DEQ understands from Section 5.5.2 and Appendix G (see Process Flow Diagram) that the NW Natural retreatment system expansion includes essentially the same process equipment as the existing facility. DEQ requests that NW Natural confirm that the pretreatment system expansion shown in Appendix G will occupy the area between the Anchor trailer and the existing system.

Response #28. DEQ requests confirmation that NW Natural selects the "Fused End-Cap" indicated on Detail 4/Sheet C03 is nearly flush with bottom of the sump and minimizes coverage of perforations.

Response #29. Head loss calculations don't appear to match the text for pipe selection. The pipe was changed from SDR 11 to SDR 9 in the text, but the SDR 9 was not evaluated in Appendix H. DEQ requests information to verify the maximum flow for each of the selected pumps will meet the total head requirements, including the head loss estimated for the SDR 9 pipe conveyances from the in-trench sump and the treatment plant.

Comments to New Information

Comment #1. Section 5.5.3 lays out the startup testing approach for the NW Natural Pretreatment Plant expansion. Step 4 describes the "full-flow" test that involves combining and routing the flows from the LNG Basin trench and HC&C system extraction wells through the plant expansion for 24-hours. NW Natural indicates that a sample of the combined effluent will be analyzed for oil and grease, VOCs, and naphthalene during the test. Subsequent to the full-flow test the section indicates the system will ready for operation "...either discharging to the existing NW Natural Pretreatment Plant wet well or returning to the head of the existing NW Natural Pretreatment Plant." Based on this information DEQ does not approve limiting analysis of the combined effluent as proposed. Given the combined effluent will be discharged to the wet well, the combined effluent should be analyzed for the complete list of parameters consistent with analysis of effluent from the existing pretreatment facility.

Comment #2. Appendix G provides information regarding the NW Natural Pre-Treatment Plant expansion. DEQ understands expansion adds essentially a 2nd pre-treatment system configured the same as the existing facility. DEQ's comment on the expansion include the following requests for additional information:

- The Process Flow Diagram does not include the equalization tank shown in Figure C05 and DEQ requests information regarding the specific location of the tank in the diagram;
- Appendix G should clarify whether the diversion of flows to the system expansion involves some or all of the HC&C system extraction wells, and identify the wells if a subset of installations are involved; and
- The total capacity of the treatment system with the expansion should be provided.

Comment #3. Section 6.1.1 presents the initial startup and testing approach for the LNG Basin trenches. DEQ's comments include the following:

- The baseline water levels should be recorded and mapped prior to startup testing of the system.
- The post-startup water levels should mapped and recorded at weekly intervals to assess the capture zone development.
- Weekly observations of the surface conditions during startup testing should be recorded to evaluate subsidence within the trench and additional observations of odor/vapors.
- A log of DNAPL observations/recovery should be prepared each time measurements occur. The log should include observations of evidence of DNAPL, changes from previous measurements, and records DNAPL recovery with the trench flowrates.

DEQ requests that subsequent to construction, NW Natural provide copies of the as-built drawings for both trenches and the boring logs for the four additional monitoring wells. The as-builts and logs will provide information to support evaluations of startup operations and monitoring results.

Please do not hesitate to contact me with questions regarding this e-mail and hope your day is going well.

Dana

Mr. Dana Bayuk
Cleanup Program Project Manager/Hydrogeologist
Oregon Department of Environmental Quality
Northwest Region
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Phone: 503-229-5543
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From: Jen Mott <jmott@anchorqea.com>
Sent: Monday, September 28, 2020 5:35 PM
To: BAYUK Dana <Dana.BAYUK@state.or.us>
Cc: Christopher Ryan <cryan@chrisryanpe.com>; Heidi Nelson (Heidi.NELSON@state.or.us) <Heidi.NELSON@state.or.us>; LARSEN Henning <Henning.LARSEN@state.or.us>; Halah Voges <hvoges@anchorqea.com>; Joe Burke <jburke@sevenson.com>; John Renda <jrenda@anchorqea.com>; Crystal, Mike <mdcrystal@sevenson.com>; SEIDEL Paul <Paul.SEIDEL@state.or.us>; Patricia Dost <pdost@pearllegalgroup.com>; Lance Peterson (PetersonLE@cdmsmith.com) <PetersonLE@cdmsmith.com>; Ryan Barth <rbarth@anchorqea.com>; Rick Schwarz <rschwarz@anchorqea.com>; Sarah Riddle <sriddle@pearllegalgroup.com>; Hunter Young (young.hunter@epa.gov) <young.hunter@epa.gov>; Lance Downs (advremtech@canby.com) <advremtech@canby.com>; Bob Wyatt <rjw@nwnatural.com>; Dehlia McCobb <dmccobb@anchorqea.com>
Subject: RE: NW Natural: Fill Water-Bearing Zone (WBZ) Trench Design - For Expedited Review

Dana,

The follow email is provided on behalf of Halah.

Thanks for your expedited review of the Fill WBZ Trench Design. All your comments have been addressed. We posted the Final Fill WBZ Trench Design to our FTP site and, for your convenience, we are also providing PDFs of the comment/response matrix, redline strikeout (RLSO) of the main text, and RLSO of the Appendix D text.

If possible, please provide approval within a week so we can begin to mobilize as soon as possible.

Please let us know if you have any additional questions or comments.

Instructions to access the FTP:

To access the FTP site automatically using Windows Explorer please follow the steps below for your version of Windows:

- **Windows 7**: Click Start -> and click in the search box; **Windows 8.1/10**: Right-Click Start -> Run
- Copy/Paste the following line into the "Open" box for XP/8.1/10 or the "Search" box for Windows 7 and hit "enter"

- You should now be logged into the site using Windows Explorer. You can use copy/paste to move files to or from the site

To access the FTP site manually using a FTP browser like CoreFTP or Windows Explorer please use the info below.

- Site URL:
- Username:
- Password:

To access the FTP site via web browser please follow the steps below.

- Click on the following link: https://ftp.anchorqea.com/aq
- Input the username and password that are listed in the above section

Use the tools available directly to the site to download or upload

Jen Mott
Project Coordinator
Anchor QEA, LLC
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(503) 972-5014

From: BAYUK Dana <Dana.BAYUK@state.or.us>
Sent: Wednesday, September 2, 2020 12:40 PM
To: Bob Wyatt <rjw@nwnatural.com>
Cc: Christopher Ryan <cryan@chrisryanpe.com>; Heidi Nelson (Heidi.NELSON@state.or.us) <Heidi.NELSON@state.or.us>; LARSEN Henning <Henning.LARSEN@state.or.us>; Halah Voges <hvoges@anchorqea.com>; Joe Burke <jburke@sevenson.com>; Jen Mott <jmott@anchorqea.com>; John Renda <jrenda@anchorqea.com>; Crystal, Mike <mdcrystal@sevenson.com>; SEIDEL Paul <Paul.SEIDEL@state.or.us>; Patricia Dost <pdost@pearllegalgroup.com>; Lance Peterson (PetersonLE@cdmsmith.com) <PetersonLE@cdmsmith.com>; Ryan Barth <rbarth@anchorqea.com>; Rick Schwarz

<rschwarz@anchorqea.com>; Rana Uhl <ruhl@anchorqea.com>; Sarah Riddle <sriddle@pearllegalgroup.com>; Hunter Young (young.hunter@epa.gov) <young.hunter@epa.gov>
Subject: RE: NW Natural: Fill Water-Bearing Zone (WBZ) Trench Design - For Expedited Review

[CAUTION: EXTERNAL EMAIL]
Good afternoon Bob.

DEQ reviewed the "Fill Water-Bearing Zone Trench Design," dated August 13, 2020 (Draft LNG Basin Trench Design), and our comments letter is attached.

The submittal presents the NW Natural design for a groundwater removal action consisting of two trenches positioned downgradient of the LNG Basin. The removal action is being implemented to address groundwater contamination migrating from under of the basin and towards the Willamette River.

The primary purpose of the attachment is to inform NW Natural that DEQ:

- Approves the principal elements of the trench design, including the locations, lengths, alignments, depths, and approach to constructing the two trenches that comprise the removal action; and
- Does not approve Draft LNG Basin Trench Design as the document is incomplete.

DEQ requests that NW Natural revise the Draft LNG Basin Trench Design consistent with the attached comments letter, and submit a revised version of the document for review on or before September 30, 2020.

DEQ acknowledges and appreciates the work NW Natural is doing to address groundwater contamination migrating downgradient of the LNG Basin . Please feel free to contact me with questions regarding this e-mail or the attachment.

Hope your day is going well.

Dana

Mr. Dana Bayuk
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From: Jen Mott <jmott@anchorqea.com>
Sent: Thursday, August 13, 2020 10:39 AM
To: BAYUK Dana <Dana.BAYUK@state.or.us>
Cc: Heidi Nelson (Heidi.NELSON@state.or.us) <Heidi.NELSON@state.or.us>; LARSEN Henning <Henning.LARSEN@state.or.us>; paul.seidel@state.or.us; Lance Peterson (PetersonLE@cdmsmith.com) <PetersonLE@cdmsmith.com>; Hunter Young (young.hunter@epa.gov) <young.hunter@epa.gov>; Patricia Dost <pdost@pearllegalgroup.com>; Bob Wyatt <rjw@nwnatural.com>; Sarah Riddle <sriddle@pearllegalgroup.com>; Crystal, Mike <mdcrystal@sevenson.com>; Halah Voges <hvoges@anchorqea.com>; John Renda <jrenda@anchorqea.com>; Rick Schwarz <rschwarz@anchorqea.com>; Ryan Barth <rbarth@anchorqea.com>; Christopher Ryan <cryan@chrisryanpe.com>; Joe Burke <jburke@sevenson.com>; Rana Uhl <ruhl@anchorqea.com>
Subject: NW Natural: Fill Water-Bearing Zone (WBZ) Trench Design - For Expedited Review

Dana,

The *Fill Water-Bearing Zone (WBZ) Trench Design* has been uploaded to our FTP site, see access instruction below. The trench system was designed consistent with DEQ's April 20, 2020 decision regarding implementation of the LNG Basin Fill WBZ Removal Action (LNG Basin Removal Action) and includes the results of the predesign investigation.

We would like to begin installation of the trench system in early October 2020. To meet this schedule, we request expedited DEQ review with DEQ comments due by August 27, 2020.

Please let us know if you have any questions.

Instructions to access the FTP:
To access the FTP site automatically using Windows Explorer please follow the steps below for your version of Windows:

- **Windows 7**: Click Start -> and click in the search box; **Windows 8.1/10**: Right-Click Start -> Run
- Copy/Paste the following line into the "Open" box for XP/8.1/10 or the "Search" box for Windows 7 and hit "enter"

- You should now be logged into the site using Windows Explorer. You can use copy/paste to move files to or from the site

To access the FTP site manually using a FTP browser like CoreFTP or Windows Explorer please use the info below.

- Site URL:
- Username:
- Password:

To access the FTP site via web browser please follow the steps below.

- Click on the following link: https://ftp.anchorqea.com/aq
- Input the username and password that are listed in the above section
- Use the tools available directly to the site to download or upload

Jen Mott
Project Coordinator
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jmott@anchorqea.com
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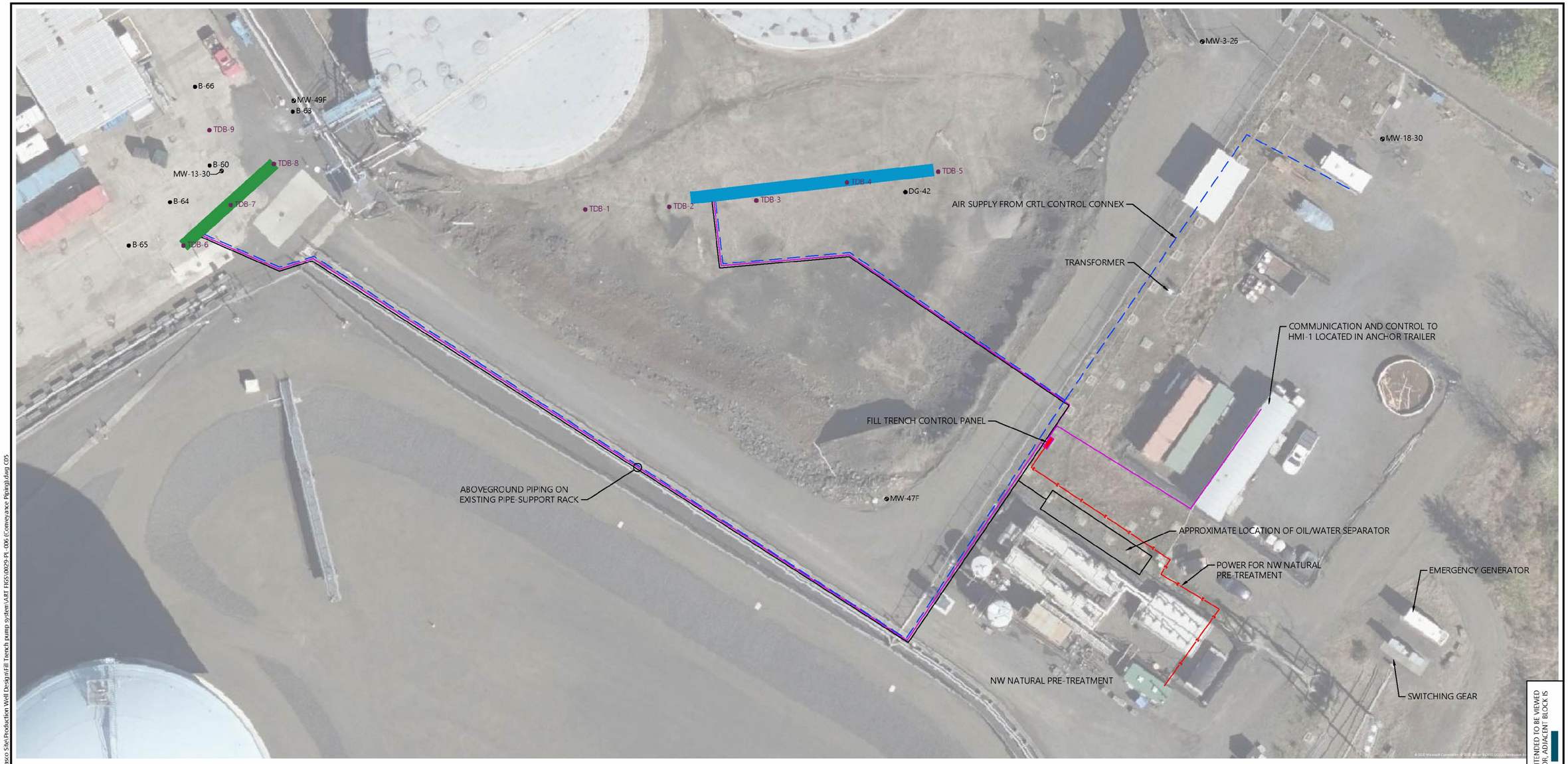

LEGEND:

- 100' PRIMARY TRENCH LOCATION
- 50' SECONDARY TRENCH LOCATION
- TDB-7 ● TRENCH DESIGN BORING
- MW-3-26 ⊗ EXISTING MONITORING WELL, OBSERVATION WELL, OR PIEZOMETER
- DG-42 ● EXISTING SOIL BORING
- CONVEYANCE LINE
- REMOTE CONTROL PANEL LINE
- AIR SUPPLY LINE
- ELECTRICAL LINE

NORTH

0 20 40

SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: OREGON STATE PLANE NORTH ZONE, NORTH AMERICAN DATUM OF 1983/91 (NAD83/91HARN), INTERNATIONAL FEET
2. VERTICAL DATUM: CITY OF PORTLAND
3. AERIAL ©2020 MICROSOFT CORPORATION ©2020 DIGITALGLOBE ©CNES (2020) DISTRIBUTION AIRBUS DS

FINAL DESIGN

PLAN INTENDED TO BE VIEWED IN COLOR, ADJACENT BLOCK IS "BLUE"

ONE INCH — AT FULL SIZE. IF NOT ONE INCH SCALE ACCORDINGLY

ANCHOR QEA

NW Natural

REGISTERED PROFESSIONAL ENGINEER 18510PE OREGON JULY 10, 1998 LANCE ARLEN DOWNS

RENEWAL 12/31/21

REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

DESIGNED BY: R. SCHWARZ
DRAWN BY: H. MERRICK
CHECKED BY: J. RENDA
APPROVED BY: L. DOWNS
SCALE: AS NOTED
DATE: SEPTEMBER 2020

FILL WATER-BEARING ZONE TRENCH INTERIM MEASURE

PROPOSED CONVEYANCE PIPING

C05

SHEET NO. 8 OF 8

G:\ART\ART Active Projects\Anchor Environmental\Gasco Site\Production Well Design\Fill Trench pump system\ART 16SEP0929 PL-006 (Conveyance Piping).dwg COS

Oct 13, 2020 11:04am Lance

NWN-PCI0788739

Fill Water-Bearing Zone Trench Design
DEQ Comment and Response Matrix

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	DEQ Comment	NW Natural Response
1.	Response No. 8	Section 4.1	9	For clarification, DEQ notes that in addition to widening the capture zone and lengthening groundwater flow paths, the 30-foot long trench extends the capture zone further downgradient of monitoring well MW-49F.	Agreed and noted.
2.	Response No. 11	Section 4.4.1	11	DEQ requests that NW Natural provide the average of the specified length(s) of time associated with evaluations of trench capture zones during extreme wet and extreme dry conditions.	The evaluations of trench capture zones during extreme wet and extreme dry conditions were performed under steady-state conditions.
3.	Response No. 13 (1st bullet)	Section 5.1	13	To preserve the thickness of the upper silt below the two trenches, including below the sumps, DEQ requested that NW Natural consider switching to an excavator bucket with a smooth cutting edge (toothless) when excavating in this unit. This option is not mentioned in the design document and DEQ requests additional information regarding the status of use.	SES will start with a smooth bucket, but if site conditions require a bucket with teeth, SES will switch.
4.	Response No. 15	Section 5.4.2.1	17	DEQ anticipates that NW Natural will provide information regarding the source and results of characterizing material when the information becomes available.	The fill will be obtained from Knife River Corporation. The bulk density of the trench drain backfill will be approximately 105 to 110 pounds/cubic foot (1.4 to 1.5 tons/cubic yard).
5.	Response No. 16 (3rd bullet)	Section 5.5.1	17	The tracer wire DEQ recommends does not appear to be mentioned in the narrative of the document or shown on the plans. DEQ requests information regarding the use of tracer wire along the trench alignments.	Tracer wire will be installed along the alignment of underground trench components.
6.	Response No. 17	Section 5.5.1	17	Consistent with our September 2nd comment, DEQ requests that LEL monitoring be frequently measured at vaults and cleanouts along the trench and enclosures along the conveyance lines during system start-up, and during scheduled monitoring events as the system operates (applies to new Section 6.1.2 [Long-Term Operations]).	LEL monitoring will be performed as described by DEQ for the first year of operation. LEL monitoring will be discontinued if there are no LEL detections greater than 5% in the first year of operation.
7.	Response No. 21	Section 5.5.1	17	The reference to a 2019-version of the Contaminated Materials and Management Plan should be checked as DEQ is only aware of a preliminary plan prepared by Anchor for NW Natural and dated February 23, 2016.	The citation in the comment response was in error and should have referred to the 2016 *Contaminated Materials Management Plan*. The reference in the design document correctly referenced the 2016 submittal.
8.	Response No. 25	Appendix E	Drawing C05	The design adds Drawing C05 to Appendix E to illustrate conveyance piping alignments and certain features of the trench system (e.g., control panel, equalization tank) appears. The drawing appears to be incomplete. DEQ understands from Section 5.5.2 and Appendix G (see Process Flow Diagram) that the NW Natural retreatment system expansion includes essentially the same process equipment as the existing facility. DEQ requests that NW Natural confirm that the pretreatment system expansion shown in Appendix G will occupy the area between the Anchor trailer and the existing system.	Drawing C05 has been revised (and is attached) to show the additional oil-water separator between the existing pretreatment system and the Anchor QEA trailer.
9.	Response No. 28	Appendix E	Drawing C03	DEQ requests confirmation that NW Natural selects the "Fused End-Cap" indicated on Detail 4/Sheet C03 is nearly flush with bottom of the sump and minimizes coverage of perforations.	The end cap will not interfere with the slots in the sump. The cap will be fabricated from a 1-inch HDPE plate and will be welded flush with the bottom of the 18-inch pipe.

Fill Water-Bearing Zone Trench Design
DEQ Comment and Response Matrix

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	DEQ Comment	NW Natural Response
10.	Response No. 29	Appendix F	N/A	Head loss calculations don't appear to match the text for pipe selection. The pipe was changed from SDR 11 to SDR 9 in the text, but the SDR 9 was not evaluated in Appendix H. DEQ requests information to verify the maximum flow for each of the selected pumps will meet the total head requirements, including the head loss estimated for the SDR 9 pipe conveyances from the in-trench sump and the treatment plant.	According to the manufacturer, the estimated head loss for conveyance piping having an SDR of 9 is the same as for SDR 7.4.
11.	Comment No. 1	Section 5.5.3	20	Section 5.5.3 lays out the startup testing approach for the NW Natural Pretreatment Plant expansion. Step 4 describes the "full-flow" test that involves combining and routing the flows from the LNG Basin trench and HC&C system extraction wells through the plant expansion for 24-hours. NW Natural indicates that a sample of the combined effluent will be analyzed for oil and grease, VOCs, and naphthalene during the test. Subsequent to the full-flow test the section indicates the system will ready for operation "...either discharging to the existing NW Natural Pretreatment Plant wet well or returning to the head of the existing NW Natural Pretreatment Plant." Based on this information DEQ does not approve limiting analysis of the combined effluent as proposed. Given the combined effluent will be discharged to the wet well, the combined effluent should be analyzed for the complete list of parameters consistent with analysis of effluent from the existing pretreatment facility.	The wet well is an existing aboveground tank at the NW Natural Pretreatment Plant where the effluent from the NW Natural Pretreatment Plant and the Siltronic Pretreatment Plant currently come together before going to the Main Treatment Plant. Treated water from the NW Natural Pretreatment Plant expansion will either be directed to the head of the existing NW Natural Pretreatment Plant or combined in the aboveground tank (wet well) before going to the Main Treatment Plant. Both the effluent from the NW Natural Pretreatment Plant expansion and combined effluent at the aboveground tank (wet well) will be tested for the complete list of parameters, consistent with analysis of effluent from the existing pretreatment facility.
12.	Comment No. 2	Appendix G	N/A	Appendix G provides information regarding the NW Natural Pre-Treatment Plant expansion. DEQ understands expansion adds essentially a 2nd pre-treatment system configured the same as the existing facility. DEQ's comment on the expansion include the following requests for additional information: • The Process Flow Diagram does not include the equalization tank shown in Figure C05 and DEQ requests information regarding the specific location of the tank in the diagram; • Appendix G should clarify whether the diversion of flows to the system expansion involves some or all of the HC&C system extraction wells, and identify the wells if a subset of installations are involved; and • The total capacity of the treatment system with the expansion should be provided.	The oil-water separator was incorrectly identified as "Equalization Tank" on Drawing C05 and has been relabeled on the revised drawing. The oil-water separator will receive initial flows from the Fill WBZ trench drains. The diversion of a portion of flow from the existing NW Natural wells would be immediately prior to the existing NW Natural Pretreatment Plant and would be from the combined flow from the wells, not a particular subset of wells. This diversion flow to the new facilities would range from 0 gpm to as high as 300 gpm. The diversion flow is intended to reduce peak flows to the existing plant, improve its performance, and allow for maintenance of the existing plant while still running all wells. The precise amount of diversion flow of 0 to 300 gpm to the new system will depend upon the needs of the operation and the actual flow from the interim trench. All flow, whether diverted to the new treatment system or not, will still be discharged to the existing NW Natural Pretreatment Plant wet well and discharged to the Groundwater Treatment System in the building. The peak capacity of the existing NW Natural Pretreatment Plant remains at 600 gpm. With peak flows through the existing NW Natural Pretreatment Plant reduced through diversion to the new facilities, coupled with flow equalization in new facilities, the peak flow from the overall NW Natural Pretreatment Plant will be reduced from current levels. The 6 to 35 gpm seasonal flows projected from the interim trench will have minimal impact on average flows from the NW Natural Pretreatment Plant and are well within existing design parameters.

Fill Water-Bearing Zone Trench Design
DEQ Comment and Response Matrix

ID No.	Section Name/Topic	Section/Table/ Figure No.	Page No.	DEQ Comment	NW Natural Response
13.	Comment No. 3	Section 6.1.1	21	Section 6.1.1 presents the initial startup and testing approach for the LNG Basin trenches. DEQ's comments include the following: • The baseline water levels should be recorded and mapped prior to startup testing of the system. • The post-startup water levels should mapped and recorded at weekly intervals to assess the capture zone development. • Weekly observations of the surface conditions during startup testing should be recorded to evaluate subsidence within the trench and additional observations of odor/vapors. • A log of DNAPL observations/recovery should be prepared each time measurements occur. The log should include observations of evidence of DNAPL, changes from previous measurements, and records DNAPL recovery with the trench flowrates.	The monitoring will incorporate the items identified in the comment.
14.	General Comment	--	--	DEQ requests that subsequent to construction, NW Natural provide copies of the as-built drawings for both trenches and the boring logs for the four additional monitoring wells. The as-builts and logs will provide information to support evaluations of startup operations and monitoring results.	Record drawings of the installed system will be provided to DEQ.

Notes:
DEQ: Oregon Department of Environmental Quality
gpm: gallons per minute
HDPE: high-density polyethylene
LEL: lower explosive limit
LNG: liquefied natural gas
SDR: standard dimension ratio
SES: Sevenson Environmental Services, Inc.
WBZ: water-bearing zone