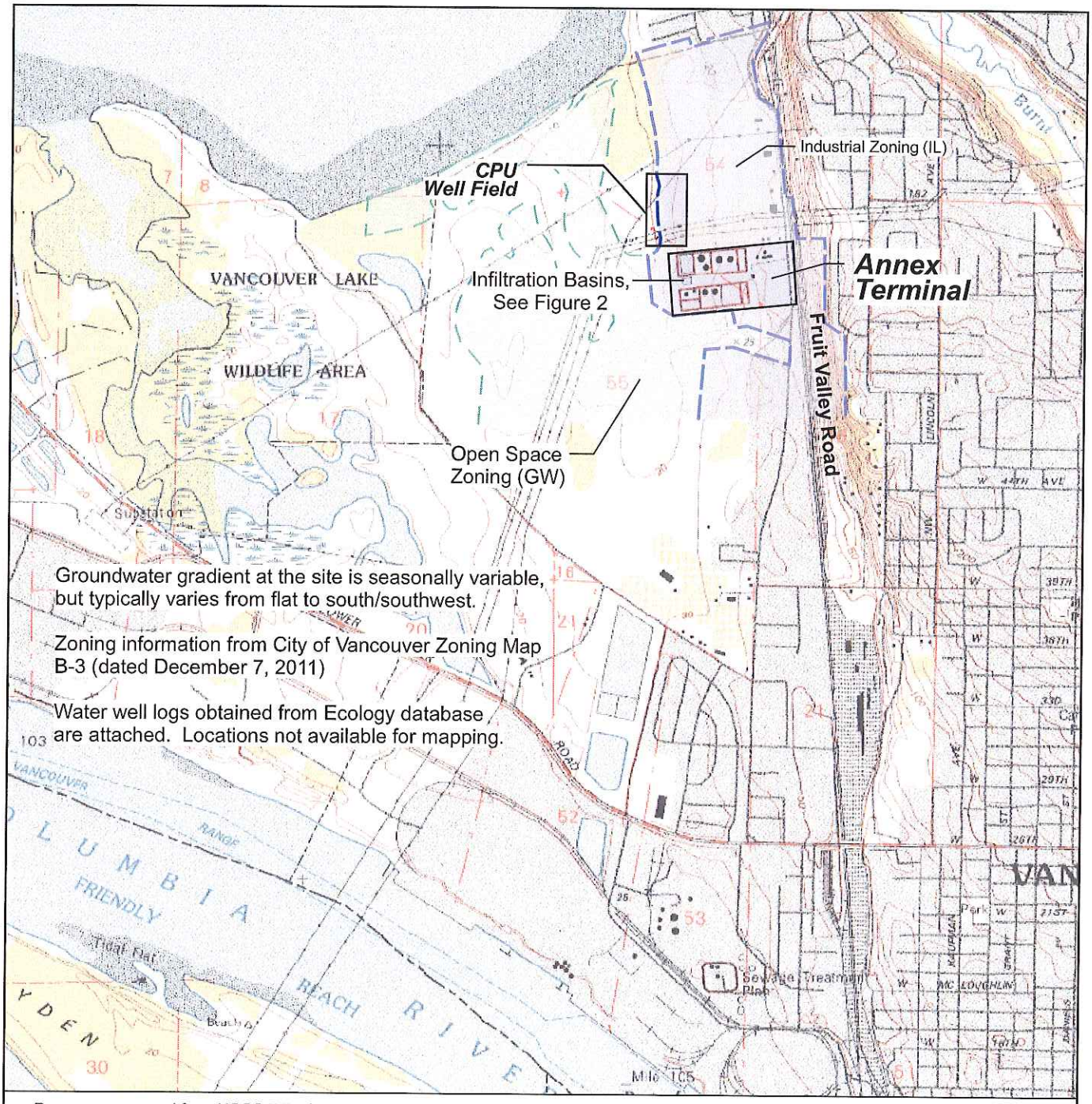
Attachment C.2

Site Plan



Base map prepared from USGS 7.5-minute quadrangle of Vancouver, WA, dated 1990, as provided by Topozone.

0 2,000 4,000

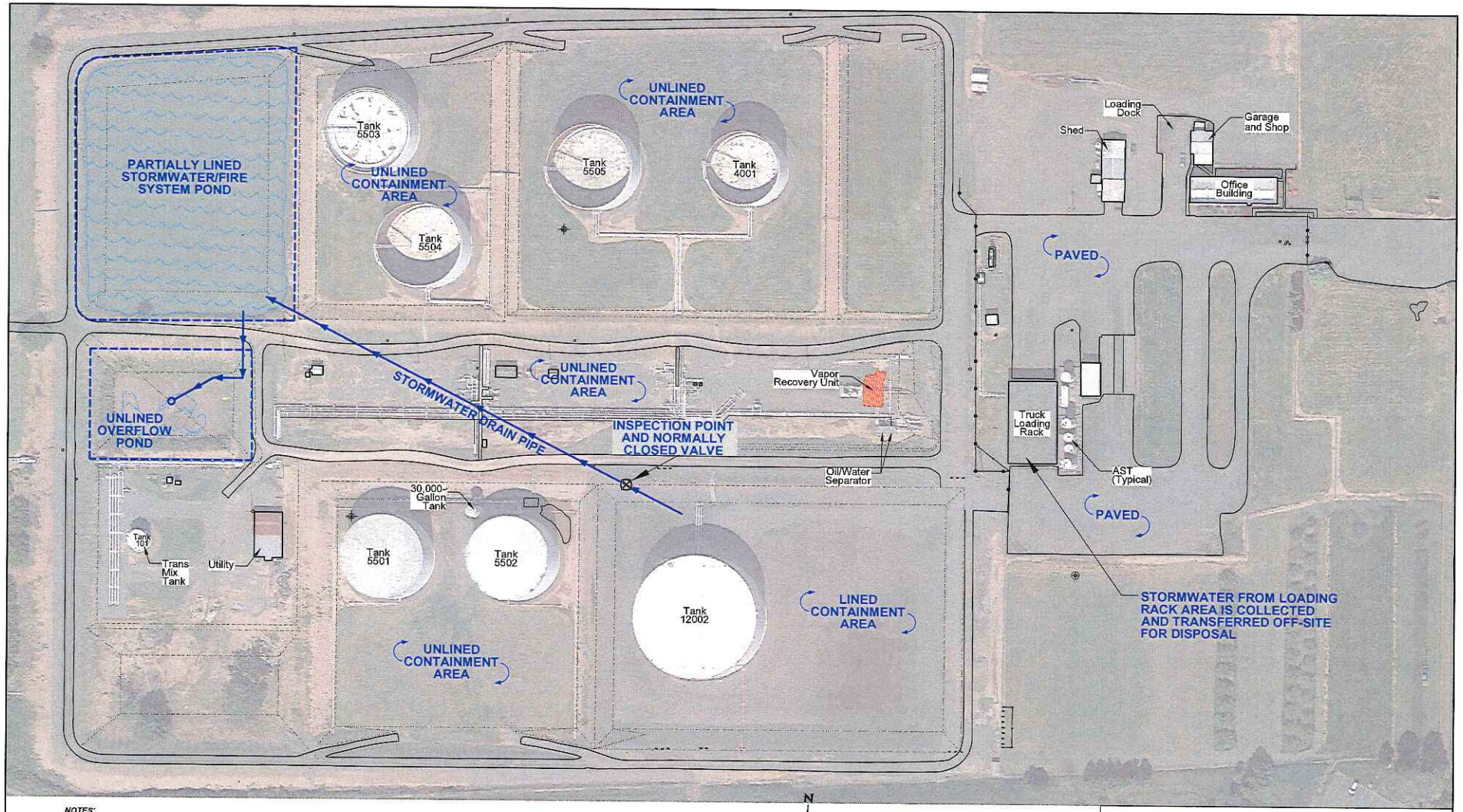
Scale in Feet

N

Site Location Map

Stormwater Permit
NuStar Terminals Operations Partnership, L.P. - Annex Terminal
Vancouver, Washington

APEX Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1569-10	Figure 1
	March 2015		



NOTES:

1. CONTACT STORMWATER AND TANK BOTTOM WATER IS REMOVED (SUCH AS WITH A VAC TRUCK) AND TRANSFERRED OFF-SITE FOR DISPOSAL.
2. NO DISCHARGE FROM UNLINED CONTAINMENT AREAS (100% INFILTRATION AND EVAPORATION)
3. FLOW FROM LINED CONTAINMENT AREA IS INSPECTED AND RELEASED TO STORMWATER POND IF ACCEPTABLE. IF FULL, STORMWATER POND CAN INFILTRATE AROUND PERIMETER (ABOVE LINER) OR OVERFLOW INTO ADJACENT STORM POND.
4. NO AVENUE FOR SURFACE WATER DISCHARGE FROM FACILITY.

N

0 100 200

Scale in Feet

NOTE: Base map completed from a number of sources including but not limited to; Figure VAN1-21-002 provided by NuStar (1/8/2007) and a Monitoring Well Survey by Statewide Land Surveying, Inc (10/30/2007). Locations of roads and containments are approximate. Aerial photograph from Google Earth Pro (4/2016).

Site Plan

Stormwater Permit
NuStar Terminals Operations Partnership, L.P. - Annex Terminal
Vancouver, Washington

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1569-10	Figure
March 2016		2

Regional Water Well Logs

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original with Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy 318106

WATER WELL REPORT

STATE OF WASHINGTON PAGE 1

Notice of Intent W159523.
UNIQUE WELL I.D. # AKS-795
Water Right Permit No.

(1) OWNER: Name Clark Public Utilities Address PO Box 8900 Vancouver, WA 98668

(2) LOCATION OF WELL: County Clark NE 1/4 NW 1/4 Sec 16 T 2 N.R. 1E WM
(2a) STREET ADDRESS OF WELL: (or nearest address) 5900 NW Fruit Valley Rd Vancouver, WA 98660
TAX PARCEL NO.: 147361000

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal ☐ Irrigation ☒ Test Well ☐ Other ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) TW-7
☒ New Well ☐ Deepened ☐ Reconditioned ☐ Decommission
Method: ☐ Dug ☒ Cable ☐ Rotary ☐ Bored ☐ Driven ☐ Jetted

(5) DIMENSIONS: Diameter of well 12 inches
Drilled 605 feet. Depth of completed well 590 ft.

(6) CONSTRUCTION DETAILS
Casing Installed:
☒ Welded 16 " Diam. from 0 ft. to 360 ft.
☐ Liner installed 12 " Diam. from +3 ft. to 400 ft.
☐ Threaded " Diam. from ft. to ft.

Perforations: ☐ Yes ☒ No
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.

Screens: ☒ Yes ☐ No ☐ K-Pac Location
Manufacturer's Name Johnson
Type 304 Stainless Model No.
Diam. 8 inch Slot Size 60 from 390 ft. to 461 ft.
Diam. 8-inch Slot Size 60 from 521 ft. to 582 ft.

Gravel/Filter packed: ☒ Yes ☐ No ☐ Size of gravel/sand #6-10
Material placed from 360 ft. to 590 ft.

Surface seal: ☒ Yes ☐ No To what depth? 38 ft.
Material used in seal Bentonite
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level 20 ft.
Static level Artesian 20.6 ft. below top of well Date 12/11/03
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? PGG (Mather & Sons)
Yield: 700 gal./min. with 99.55 ft. drawdown after 72 hrs.
Yield: gal./min. with ft. drawdown after hrs.
Yield: gal./min. with ft. drawdown after hrs.
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
2	36.5	20	30.65	60	27.9
5	34.1	29	29.74	90	27.17
10	32.36	41	28.87	110	26.37

Date of test 3/13/07
Bailer test gal./min. with ft. drawdown after hrs.
Airtest gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☒ Yes ☐ No

RECEIVED
OCT 22 2008
Washington State Department of Ecology

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION
Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered.

MATERIAL	FROM	TO
Brown Silt	0	30
Brown Sand & Silt	30	37
Gray gravelly fine Sand w/ Silt interbeds	37	41
Gray fine Sand w/ Sea Herd Grains	41	50
Brownish-black fine Sand	50	65
Brownish-black, cobbly, m-c Sand & Gravel	65	72
Brown gravelly m-c Sand	72	101
Brown fine Sand w/ some gravel	101	107
Brown, gravelly, f-c sand grading to m-c Sand & Gravel	107	116
Brown m-c Sand w/ silt interbeds	116	119
Brown Sand, Gravel & Cobbles	119	138
Brown slightly sandy Gravel & cobbles	138	142
Brown slightly silty Gravel & cobbles w/ fine Sand	142	167
Brown Gravel & Cobbles w/ fine Sand	167	180
Gray silt bound cemented Sand & Gravel	180	250
Gravel very silt bound Sand & Gravel	250	255
Gray Clay	255	269
Gray silty slightly gravelly f-c Sand	269	272
Greenish-gray Clay	272	321
Greenish-gray Sandy Silt w/ some gravel	321	342
Greenish gray silty Clay (SEE Page 2)	342	349

Work Started 10/9/03 Completed 12/09/03

WELL CONSTRUCTION CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.
Type or Print Name Joey Fernbacker License No. 1094 (Licensed Driller/Engineer)
Trainee Name License No.
Drilling Company Holt Drilling
(Signed) License No. 1094 (Licensed Driller/Engineer)
Address PO Box 1989, Milton WA 98354
Contractor's Registration No. BOARTLC941RA Date 9-15-08

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (360) 407-6600. The TDD number is (360) 407-6006.

ECY 050-1-20 (11/98)

File Original with Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON
PAGE 2

Notice of Intent W159523
UNIQUE WELL I.D. # AKS-795
Water Right Permit No.

(1) OWNER: Name Clark Public Utilities Address PO Box 8900 Vancouver WA 98668

(2) LOCATION OF WELL: County Clark NE 1/4 NW 1/4 Sec 16 T 2 N.R. 1E WM

(2a) STREET ADDRESS OF WELL: (or nearest address)

TAX PARCEL NO.: 147361000

(3) PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal ☐ Irrigation ☒ Test Well ☐ Other ☐ DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) TW-7
☒ New Well Method: ☐ Dug ☐ Bored ☐ Deepened ☒ Cable ☐ Driven ☐ Reconditioned ☐ Rotary ☐ Jetted ☐ Decommission

(5) DIMENSIONS: Diameter of well 12 inches
Drilled 605 feet. Depth of completed well 590 ft.

(6) CONSTRUCTION DETAILS
Casing Installed: ☐ Welded ☐ Liner installed ☐ Threaded
Diam. from ft. to ft.
Diam. from ft. to ft.
Diam. from ft. to ft.

Perforations: ☐ Yes ☐ No
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.

Screens: ☐ Yes ☐ No ☐ K-Pac Location
Manufacturer's Name
Type Model No.
Diam. Slot Size from ft. to ft.
Diam. Slot Size from ft. to ft.

Gravel/Filter packed: ☐ Yes ☐ No ☐ Size of gravel/sand
Material placed from ft. to ft.

Surface seal: ☐ Yes ☐ No To what depth? ft.
Material used in seal
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
Static level ft. below top of well Date
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
Yield: gal./min. with ft. drawdown after hrs.
Yield: gal./min. with ft. drawdown after hrs.
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Airtest gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☐ No

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION
Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. Indicate all water encountered.

MATERIAL	FROM	TO
Brown silty Clay	349	356
Black Sand Stone	356	368
Gray Sandy Silt w/scattered Gravel	368	374
Brown silty fine Sand	374	387
Brown fine Sand	387	450
Gray fine Sand w/ minor gravel & wood frags	450	468
Greenish-gray silty clay	468	493
Gray silty fine Sand w/ silt interbeds	493	516
Gray fine Sand w/wood frags	516	582
Greenish-gray Clay	582	605

RECEIVED
OCT 22 2008
Washington State Department of Ecology

Work Started 10/9/03 Completed 12/09/03

WELL CONSTRUCTION CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Tony Ferenback License No. 1094 (Licensed Driller/Engineer)
Trainee Name License No.
Drilling Company Holt Drilling
(Signed) License No. 1094 (Licensed Driller/Engineer)
Address PO Box 1890, Milton WA 98354
Contractor's Registration No. BOARTLC941RA Date 9-15-08

(USE ADDITIONAL SHEETS IF NECESSARY)

Ecology is an Equal Opportunity and Affirmative Action employer. For special accommodation needs, contact the Water Resources Program at (360) 407-6600. The TDD number is (360) 407-6006.

ECY 050-1-20 (11/98)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

RECEIVED
JAN 26 2015
WA State Department of Ecology (S...

WATER WELL REPORT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission ("x" in circle)

☒ Construction

☐ Decommission *ORIGINAL INSTALLATION*

Notice of Intent Number _____

CURRENT

Notice of Intent No. WE 18705

Unique Ecology Well ID Tag No. BIP-845

Water Right Permit No. G2-30381

Property Owner Name Clark Public Utilities

Well Street Address 5906 NW Fruit Valley Rd

City Vancouver County Clark

Location NW 1/4-1/4 NE 1/4 Sec 16 Twn 2N R 1E EWM ☒ Or WWM ☐

(s, t, r Still REQUIRED)

Lat/Long Lat Deg 45° Lat Min/Sec 39' 49.92" Long Deg 122° Long Min/Sec 41' 40.71"

Tax Parcel No. (Required) 147383-000

PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other _____

TYPE OF WORK: Owner's number of well (if more than one) PW-4

☒ New well ☐ Reconditioned Method: ☐ Dug ☐ Bored ☐ Driven ☐ Deepened ☒ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 20 inches, drilled 612 ft. Depth of completed well 612 ft.

CONSTRUCTION DETAILS

Casing Installed: ☐ Welded ☐ Liner installed ☐ Threaded

24" Steel from +1' to 274'
20" Steel from +3' to 428 ft.
16" Steel from 468 ft. to 542 ft.
16" Steel from 609 ft. to 612 ft.

Perforations: ☐ Yes ☒ No

Type of perforator used _____

SIZE of perfs ____ in. by ____ in. and no. of perfs ____ from ____ ft. to ____ ft.

Screens: ☒ Yes ☐ No ☐ K-Pac Location _____

Manufacturer's Name Johnson

Type Stainless Steel Model No. _____

Diam. 16" Slot size 40 from 428 ft. to 468 ft.

Diam. 16 Slot size 40 from 542 ft. to 609 ft.

Gravel/Filter packed: ☒ Yes ☐ No Size of gravel/sand 8x12 sand

Materials placed from 401 ft. to 612 ft.

Surface Seal: ☒ Yes ☐ No To what depth? 60 ft.

Material used in seal Cement 0-25', bentonite 25-60'

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? _____ Depth of strata _____

Method of sealing strata off _____

PUMP: Manufacturer's Name _____

Type: _____ H.P. _____

WATER LEVELS: Land-surface elevation above mean sea level 30 ft.

Static level 45.9 ft. below top of well Date 12/17/14

Artesian pressure ____ lbs. per square inch Date _____

Artesian water is controlled by _____ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? R&G/Mathu

Yield: 2612 gal./min. with 62.4 ft. drawdown after 8 hrs.

Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.

Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
2	63.68	16	56.51	35	53.19
4	61.26	21	52.49	38	53.66
10	58.13	30	54.46	59	52.55

Date of test _____

Bailer test ____ gal./min. with ____ ft. drawdown after ____ hrs.

Airtest ____ gal./min. with stem set at ____ ft. for ____ hrs.

Artesian flow ____ g.p.m. Date _____

Temperature of water 12.6°C Was a chemical analysis made? ☒ Yes ☐ No

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Brown Silt	0	20
Brown fine silty Sand	20	35
Dark gray fine Sand (water)	35	60
Gray coarse Sand	60	72
Gray M-C Sand, gravel, cobbles	72	94
Brown coarse Sand	94	115
Brown coarse Sand & Gravel	115	195
Blue-green and gray silty Sand w/ med. Sm gravel & trace green binder	195	210
Compacted medium Sand and Gravel, green binder	210	261
Green silty Sandy Clay	261	263
Light blue sticky Clay	263	283
Blue-green dense Clay w/ lenses of fine Sand & siltstone	283	309
Yellowish-brown Clay	309	311
Blue sticky Clay	311	317
Light blue Clay w/ siltstone layers	317	351
Dark grey-green Silt	351	353
Brown Clay	353	356
Gray dense Clay	356	361
Black Sandstone	361	371
Greenish-gray sticky Clay	371	382
Greenish-gray Clay	382	387
Greenish-gray silty fine Sand	387	404
Brown silty fine Sand	404	420
Brown silty very fine Sand w/ minor gravel	420	428
Brown fine Sand	428	445
Gray Silt	445	447

Start Date 7/28/14 Completed Date 12/18/14

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☐ Trainee Name (Print)	Drilling Company Holt Services Inc
Driller/Engineer/Trainee Signature	Address
Driller or trainee License No.	City, State, Zip
IF TRAINEE: Driller's License No:	Contractor's Registration No. Date
Driller's Signature:	

ECY 050-1-20 (Rev 02-2010) To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

RECEIVED
JAN 26 2015
WA State Department of Ecology (SWRO)

WATER WELL REPORT

CURRENT

Original & 1st copy – Ecology, 2nd copy – owner, 3rd copy – driller

DEPARTMENT OF ECOLOGY State of Washington

Construction/Decommission *("x" in circle)*

☒ Construction
☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* ______

PROPOSED USE: ☐ Domestic ☐ Industrial ☒ Municipal ☐ DeWater ☐ Irrigation ☐ Test Well ☐ Other ______

TYPE OF WORK: Owner's number of well (if more than one) PW-4

☒ New well ☐ Reconditioned *Method:* ☐ Dug ☐ Bored ☐ Driven
☐ Deepened ☒ Cable ☒ Rotary ☐ Jetted

DIMENSIONS: Diameter of well 20 inches, drilled 612 ft.
Depth of completed well 612 ft.

CONSTRUCTION DETAILS

Casing Installed: ☐ Welded ☐ Liner installed ☐ Threaded
24" Diam. from +1' ft. to 274'
20" Diam. from +3' ft. to 432'
16" riser Diam. from 400 ft. to 428'
16" riser Diam. from 468 ft. to 542'
16" tail Diam. From 609 ft. to 612'

Perforations: ☐ Yes ☒ No

Type of perforator used ______

SIZE of perfs ____ in. by ____ in. and no. of perfs ____ from ____ ft. to ____ ft.

Screens: ☒ Yes ☐ No ☐ K-Pac Location ______

Manufacturer's Name Johnson

Type Stainless steel Model No. ______

Diam. 16" Slot size 40 from 428 ft. to 468 ft.
Diam. 16" Slot size 40 from 542 ft. to 609 ft.

Gravel/Filter packed: ☒ Yes ☐ No Size of gravel/sand 8x12 Sand
Materials placed from 401 ft. to 612 ft.

Surface Seal: ☒ Yes ☐ No To what depth? 60 ft.
Material used in seal Cement 0-25; Bentonite 25-60
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? ______ Depth of strata ______
Method of sealing strata off ______

PUMP: Manufacturer's Name ______
Type: ______ H.P. ______

WATER LEVELS: Land-surface elevation above mean sea level 30 ft.
Static level 49.9 ft. below top of well Date 12/17/14
Artesian pressure ____ lbs. per square inch Date ______
Artesian water is controlled by ______ (cap, valve, etc.)

WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? PGG / Mathewson
Yield: 2612 gal./min. with 62.4 ft. drawdown after 8 hrs.
Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.
Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
2	67.68	16	56.51	35	53.94
4	61.36	21	55.48	38	53.66
10	58.13	30	54.46	54	52.55

Date of test ______
Bailer test ____ gal./min. with ____ ft. drawdown after ____ hrs.
Airtest ____ gal./min. with stem set at ____ ft. for ____ hrs.
Artesian flow ____ g.p.m. Date ______
Temperature of water 12.6°C Was a chemical analysis made? ☒ Yes ☐ No

Notice of Intent No. WE18705
Unique Ecology Well ID Tag No. BIP-845
Water Right Permit No. G2-30381
Property Owner Name Clark Public Utilities
Well Street Address 5806 NW Fruit Valley Rd
City Vancouver County Clark
Location NW1/4-1/4 NE1/4 Sec 6 Twn 2N R 1E EWM ☒ Or WWM ☐
(s, t, r Still REQUIRED)

Lat/Long Lat Deg 45° Lat Min/Sec 39' 49.92"
Long Deg 122 Long Min/Sec 41' 40.71"
Tax Parcel No. (Required) 147383-000

CONSTRUCTION OR DECOMMISSION PROCEDURE

Formation: Describe by color, character, size of material and structure, and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information. (USE ADDITIONAL SHEETS IF NECESSARY.)

MATERIAL	FROM	TO
Gray fine Sand	447	469
Greenish gray sticky Clay	469	497
Greenish gray silt w/ fine sand interbeds	497	527
Gray silty very fine Sand w/ wood	527	532
Gray slightly silty very fine Sand w/ wood	532	542
Gray fine Sand	542	609
Greenish-gray Clay	609	612

Start Date 7/28/14 Completed Date 12/18/14

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Randy Holt
Driller/Engineer/Trainee Signature [signature]
Driller or trainee License No. 1099
IF TRAINEE: Driller's License No: ______
Driller's Signature: ______

Drilling Company Holt Services Inc
Address 10621 Todd Rd E
City, State, Zip Edgewood WA 98372
Contractor's Registration No. HOLTSSI898JG Date 1-21-15

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy—Owner's Copy
Third Copy—Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Start Card No. 012992

Water Right Permit No. ____

(1) OWNER: Name Hal Firestone Address 4236 NW. Fruit Valley Rd. Vancouver,Wa

(2) LOCATION OF WELL: County Clark NE ¼ NW ¼ Sec 16 T 2N N., R 1E W.M.

(2a) STREET ADDDRESS OF WELL (or nearest address) ____

(3) PROPOSED USE: ☐ Domestic ☒ Irrigation ☐ DeWater Industrial ☐ Test Well ☐ Municipal ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ____
Abandoned ☐ New well ☐ Deepened ☐ Reconditioned ☒
Method: Dug ☐ Cable ☒ Rotary ☐ Bored ☐ Driven ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 10 inches.
Drilled 65 feet. Depth of completed well 58 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 10 " Diam. from + 2 ft. to 48 ft.
Welded ☒ ____ " Diam. from ____ ft. to ____ ft.
Liner installed ☐
Threaded ☐ ____ " Diam. from ____ ft. to ____ ft.

Perforations: Yes ☐ No ☒
Type of perforator used ____
SIZE of perforations ____ in. by ____ in.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type Stainless Steel Model No. ____
Diam. 8" teles Slot size 30 from 43 ft. to 58 ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

SAND Gravel packed: Yes ☒ No ☐ Size of gravel # 8 Monterey
Gravel placed from 47 ft. to 58 ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite & Hole plug
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ____ Depth of strata ____
Method of sealing strata off ____

(7) PUMP: Manufacturer's Name ____
Type: ____ H.P. ____

(8) WATER LEVELS: Land-surface elevation above mean sea level ____ ft.
Static level 27 ft. below top of well Date 7-1-88
Artesian pressure ____ lbs. per square inch Date ____
Artesian water is controlled by ____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? ____
Yield: ____ gal./min. with ____ ft. drawdown after ____ hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test ____
Bailer test 40 gal./min. with 0 ft. drawdown after 1 hrs.
Airtest ____ gal./min. with stem set at ____ ft. for ____ hrs.
Artesian flow ____ g.p.m. Date 7-1-88
Temperature of water ____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO

RECEIVED
88 AUG -8 P1:11

Work started 6-20-88, 19. Completed 7-1-88, 19.

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME Hansen Drilling Co. Inc. (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address 6711 NE. 58th Ave, Vancouver,Wa.98661

(Signed) [signature] (WELL DRILLER) License No. 0171
Contractor's Registration No. HANSED*377NT Date July 15,88, 19.

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 050-1-20 (10/87) -1329-

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Hal Firestone Address 4236 NW. Fruit Vally Rd. Vancouver, Wa. 9866(

(2) LOCATION OF WELL: County Clark — NE ¼ NW ¼ Sec. 16 T. 2 N., R. 1 E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) ....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☒ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 10 inches.
Drilled 65 ft. Depth of completed well 65 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 10 " Diam. from 0 ft. to 49 ft.
Threaded ☐ Tail 5 " Diam. from 58 ft. to 65 ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Johnson
Type Stainless steel Model No
Diam. 6 Slot size 30 from 42 ft. to 58 ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☐ Size of gravel Sand Packed # 8 Monterey
Gravel placed from 47 ft. to 65 ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite & hole plug
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 27 ft. below top of well Date 12-22-87
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom? Johnson
Yield: 75 gal./min. with 4'10 ft. drawdown after 1 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown top soil	0	2
Brown sticky clay	2	17
Brown sandy fine sand	17	30
Greyish fine sand, water	30	45
Greyish blue heaving sand	45	58
Fine packed sand	58	65

RECEIVED
DEC 11 AM 11:55
STATE OF WASHINGTON
DEPT. OF ECOLOGY

Work started Dec. 15, 19 87 Completed Dec. 22, 19 87

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Hansen Drilling Co. Inc.
(Person, firm, or corporation) (Type or print)

Address 6711 NE. 58th Ave. Vancouver, Wa. 9866i
0221 Murnett Johnson

[Signed] Murnett Johnson
(Well Driller)

License No. C-51 Date Dec. 23, 19 87

HANSED*377NT

(USE ADDITIONAL SHEETS IF NECESSARY)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Appli.4884
Per. 4597
Cert.:3880

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

WELL LOG

Record by Driller
Source Driller's Record

Location: State of WASHINGTON
County Clark
Area
Map
¼ ¼ sec 16 T 2 N., R 1 E W.M.

Diagram of Section

Drilling Co. R. J. Strasser Drilling Co.
Address 8110 S.E. Sunset Lane, Portland, Ore.
Method of Drilling drilled Date Dec. 13, 1958
Owner Pacific Supply Cooperative
Address Walla Walla, Washington
Land surface, datum ft above / below
SWL: 17' Date , 19 Dims.:

Consolidation	Material	From (feet)	To (feet)
	Cooling water for refinery process units & domestic supply		
	Topsoil	0	9
	Sand, fine	9	36
	Sand, coarse, some clay & gravel	36	57
	Sand, & gravel, some binder	57	84
	Sand, & gravel (water bearing)	84	103
	Sand, fine yellow	103	110
	Casing: 80" from 0' to 110'		
	Yield: 2800 gpm with 41' DD after 12 hrs.		
	Pump: 130 H.P. electric turbine		

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

Turn up

Sheet of sheets

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Appli. 4884
Per. 4597
Cert. 3880

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

WELL LOG

Record by Driller

Source Driller's Record

Location. State of WASHINGTON

County Clark

Area.

Map.

¼ ¼ sec 16 T. 2 N., R. 1 E. W.M.

Diagram of Section

Drilling Co. R. J. Strasser Drilling Co.

Address 8110 S.E. Sunset Lane, Portland, Ore.

Method of Drilling drilled Date Dec. 13, 1958

Owner Pacific Supply Cooperative

Address Walla Walla, Washington

Land surface, datum ft above below

SWL 17' Date, 19 Dims.:

Correlation	Material	From (feet)	To (feet)
	(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)		
	Cooling water for refinery process units & domestic supply		
	Topsoil	0	9
	Sand, fine	9	36
	Sand, coarse, some clay & gravel	36	57
	Sand, & gravel, some binder	57	84
	Sand, & gravel (water bearing)	84	103
	Sand, fine yellow	103	110
	Casing: 80" from 0' to 110'		
	Yield: 2800 gpm with 41' DD after 12 hrs.		
	Pump: 130 H.P. electric turbine		

Turn up

Sheet ____ of ____ sheets

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WELL LOG.—Continued   No. . . . / - . . .

Correlation	Material	Thickness (feet)	Depth (feet)
	Depth forward	————	

S. F No 7[illegible]—12-54—3M. 40105.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

UNIQUE WELL I.D. NUMBER A A B 7 5 6
X Y Z 1 2 3

CLR024

WELL TAGGING FORM

Date of Field Visit 1-29-93 By Chuck Lehotsky, Joe Cason

RECORD VERIFICATION

- ☒ Well Report available *(please attach)*
- ☐ Well Report not available
- ☐ Verification inconclusive

WELL OWNERSHIP; IF DIFFERENT FROM WELL REPORT

Title — First Name — Last Name CENEX

Street address 5420 Fruit Valley Road

City Vancouver State WA 98660

LOCATION OF WELL, IF DIFFERENT FROM WELL REPORT

Well Address Same as above

City _____ County _____

T. 2 N. R. 1 E WM Sec. 16 NE ¼ of the NW ¼

Latitude 45 ° 39 ' 41 "

Longitude 122 ° 41 ' 42 "

- ☐ GPS
- ☒ Topographic Map
- ☐ Survey
- ☐ Computer generated

Elevation at land surface 23 (feet) meters *(circle one)*

- ☐ Digital Altimeter
- ☒ Topographic Map
- ☐ Other _____

Additional information, if available:

☒ Location marked on topographic map *(please attach)*

☐ Location marked on air photo *(please attach)*

Please attach this form to the Well Report and submit it to the Department of Ecology Water Resources Program Headquarters.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

WELL CHARACTERISTICS

Physical Description of Well (size of casing, type of well, housing, etc.): 80"-diameter well with large electric turbine installed on concrete pad atop well. 8"-diameter access port exists on east side of well.

Location of Well Identification Tag: strapped to outside of 8"-diameter access port.

Was Supplemental Tag needed for ease of identifying well?

☒ NO ☐ YES

If yes, where was tag placed? _____

Scale 1:24,000 (1"=2,000')

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Indicate the location of the well within the Section by drawing a dot at that point.

SECTION 16

COMMENTS: _____

FOR ECOLOGY WATER RESOURCES PROGRAM USE ONLY

Water Right # _____ Date Issued _____

Circle one: Application Permit Certificate Claim Exempt

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Appli.4884
Per. 4597
Cert. 3880

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

CLR 024

WELL LOG

Record by Driller
Source Driller's Record

Location. State of WASHINGTON
County Clark
Area
Map
¼ ¼ sec 16 T 2 N, R 1 E W

Diagram of Section

Drilling Co R. J. Strasser Drilling Co.
Address 8110 S.E. Sunset Lane, Portland, Ore.
Method of Drilling drilled Date Dec. 13, 1958
Owner Pacific Supply Cooperative
Address Walla Walla, Washington
Land surface, datum ft above/below
SWL: 17' Date, 19 Dims.:

Correlation	Material	From (feet)	To (feet)
	Cooling water for refinery process units & domestic supply		
	Topsoil	0	9
	Sand, fine	9	36
	Sand, coarse, some clay & gravel	36	57
	Sand, & gravel, some binder	57	84
	Sand, & gravel (water bearing)	84	103
	Sand, fine yellow	103	110
	Casing: 80" from 0' to 110'		
	Yield: 2800 gpm with 41' DD after 12 hrs.		
	Pump: 130 H.P. electric turbine		

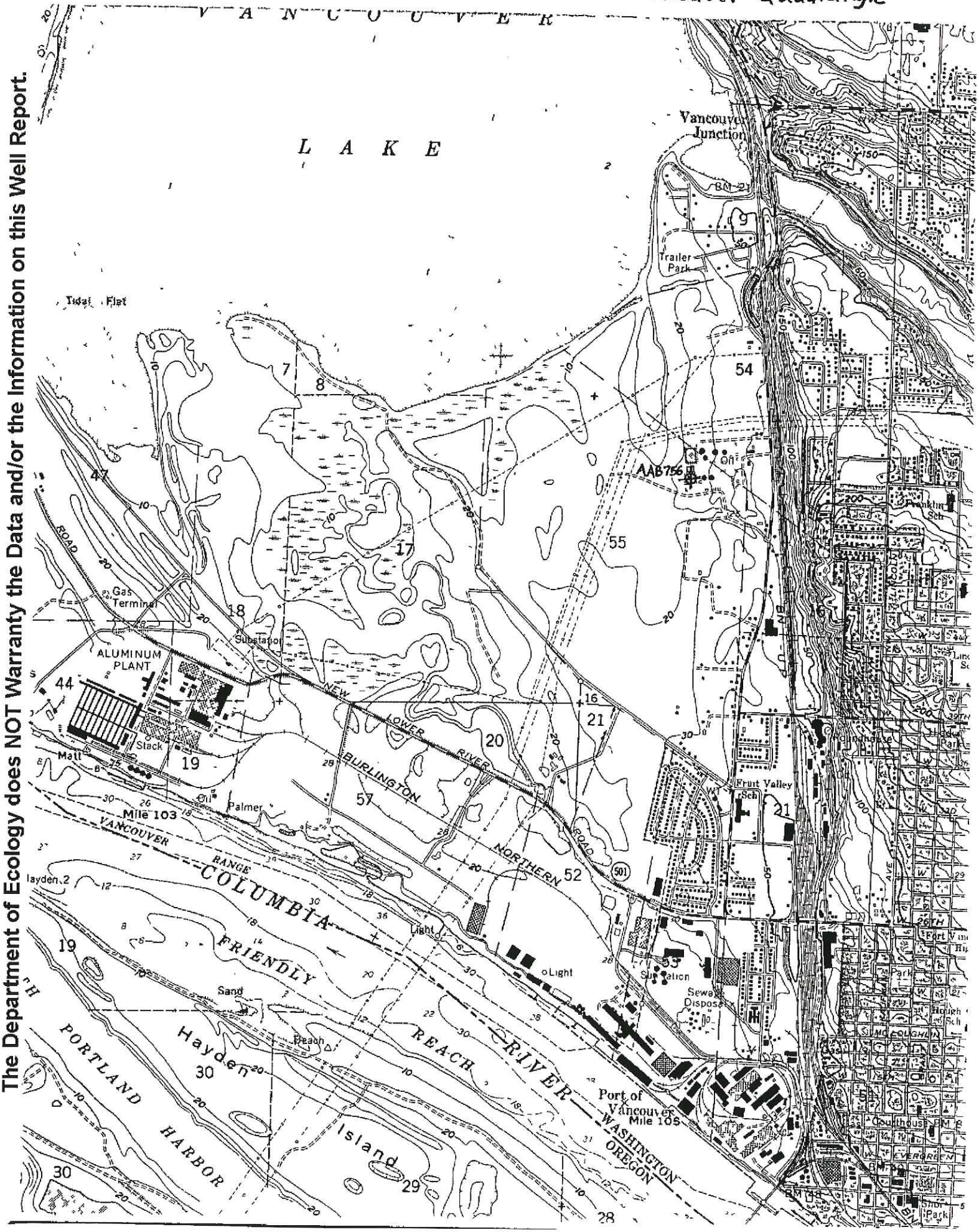
(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings perforations, screens, etc.)

Turn up

Sheet of sheets

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Vancouver Quadrangle



The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION AND DEVELOPMENT

WELL LOG No. Applⁿ. #4836

Date April 9, 1951

Record by well driller

Source driller's record

Location: State of WASHINGTON

County Clark

Area

NW¼NE¼ &
NE ¼ NW¼ sec. 16 T. 2 N., R. 1 E. W.

Diagram of Section

Drilling Co. George L. Zeht

Address Vancouver, Wash.

Method of Drilling Date, 19

Owner Wm. H. Brown

Address Vancouver, Wash.

Land surface, datum ft above below

CORRELATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
	(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)		
	Soil	2	2
	Sandy clay	18	20
	Fine sand	6	26
	Coarse sand & water	22	48
	PUMP TEST:		
	Dim. 46'x10"		
	SWL: 20 ft.		
	DD: 3 ft.		
	Yield: 96 g.p.m.		
	Type & size of pump: 5 h.p. centri.		
	Type & size of motor: 5 hp 3 phase electric		
	CASING: 24" diam. ¼" in dredge pipe from 0 to 27 ft.		
	10" diam. DD tubing from 15 to 46'6"		
	Perforations: 10" pipe torch cut perforations from 22 to 42 ft.		

Turn up

Sheet of sheets

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

WELL LOG No. Appli. #4836

Date April 9, 1951

Record by well driller

Source driller's record

Location: State of WASHINGTON

County Clark

Area

~~xxx~~ NW¼NE¼ &
NE ¼ NW¼ sec. 16 T. 2 N., R. 1 E. W.

Diagram of Section

Drilling Co. George L. Zeht

Address Vancouver, Wash.

Method of Drilling Date, 19

Owner Wm. H. Brown

Address Vancouver, Wash.

Land surface, datum ft. above / below

Correlation	Material	Thickness (feet)	Depth (feet)
	(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)		
	Soil	2	2
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	Yield: 96 g.p.m.		
	Type & size of pump: 5 h.p. centri.		
	Type & size of motor: 5 hp 3 phase electric		
	CASING: 24" diam. ¼" in dredge pipe from 0 to 27 ft.		
	10" diam. DD tubing from 15 to 46'6"		
	Perforations: 10" pipe torch cut perforations from 22 to 42 ft.		

Turn up

Sheet of

Attachment E.4

Additional Results of Stormwater Testing

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

April 21, 2015

Analytical Report for Service Request No: K1501111
Revised Service Request No: K1501111.01

Prad Shah
NuStar Energy
Vancouver, WA 98660

RE:

Dear Prad,

Enclosed is the revised report for the sample(s) submitted to our laboratory February 04, 2015
For your reference, these analyses have been assigned our service request number **K1501111.**

Copper, Nickel & Zinc were added to the metals list.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard B. Holmes

Howard Holmes
Project Manager

REVISED
5:16 pm, Apr 21, 2015

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
ISO 17025	http://www.pjlabs.com/	L14-50
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	NuStar Energy	**Service Request No.:**	K1501111
Project:	NA	**Date Received:**	02/04/15
Sample Matrix:	Water		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier I data deliverables. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Two water samples were received for analysis at ALS Environmental on 02/04/15. The samples were received in good condition and consistent with the accompanying chain of custody form, except where noted on the cooler receipt and preservation form included in this report. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Total Metals

No anomalies associated with the analysis of these samples were observed.

Diesel Range Organics by Method NWTPH-Dx-SGT

No anomalies associated with the analysis of these samples were observed.

Gasoline Range Organics by Method NWTPH-Gx

No anomalies associated with the analysis of these samples were observed.

Volatile Organic Compounds by EPA Method 8260

Calibration Verification Exceptions:
The following analyte was flagged as outside the control criterion for Continuing Calibration Verification (CCV) MS18\0126F008.D: Vinyl Chloride. In accordance with the EPA Method, 80% or more of the CCV analytes must pass within 20% of the true value. The ALS SOP allows for 40% difference for the remaining analytes. The CCV met these criteria. The quality of the sample data was not significantly affected. No further corrective action was required.

No other anomalies associated with the analysis of these samples were observed.

Semivolatile Organic Compounds by EPA Method 8270

Lab Control Sample Exceptions:
The upper control criterion was exceeded for Benzo(g,h,i)perylene in Duplicate Laboratory Control Sample (DLCS) KWG1501035-2. The analyte in question was not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

Approved by Howard B. Holmes

Relative Percent Difference Exceptions:
The Relative Percent Difference (RPD) for Diethyl Phthalate in the replicate Laboratory Control Sample (LCS) analyses (KWG1501035-1 and KWG1501035-2) was outside control criteria. All spike recoveries for the analyte in question were within acceptance limits in the LCS/DLCS. The error associated with an elevated RPD equated to a higher degree of variability. Since the affected target analytes were not detected in the sample, the quality of the sample data was not significantly affected. No further corrective action was taken.

Sample Notes and Discussion:
Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

No other anomalies associated with the analysis of these samples were observed.

Approved by Howard B. Holmes

Chain of Custody

ALS Environmental—Kelso Laboratory
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CHAIN OF CUSTODY

ALS Environmental

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SR# K1501111

PAGE _____ OF _____ COC# _____

PROJECT NAME
PROJECT NUMBER
PROJECT MANAGER
COMPANY NAME
ADDRESS
CITY/STATE/ZIP
E-MAIL ADDRESS
PHONE #
SAMPLER'S SIGNATUI

NuStar Energy
2565 NW Harborside Drive
Vancouver, WA 98660

prad.shah@nustarenergy.com
Phone:503-312-6457
Prad Shah
Project: NuStar - Annex Water
Date: February 03, 2015

Prad Shah

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics 625☐ 8270☐ 8270LL☐ SIM PAH☐	Volatile Organics 624☐ 8260☒ 8021☐ BTEX☐ Hydrocarbons (see below) Gas☐ Diesel☐ Oil☐	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCBs Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081☐ 8141☐ 8151☐	Chlorophenolics - 8151M PCP☐ TFT☐ Tetra☐	Metals, Total or Dissolved (See List below)	Cyanide☐ Hex-Chrom☐	(circle) pH, Cond., Cl, SO_4, PO4, F, NO_2, NO_3, BOD, TSS, TDS, Turb.	(circle) NH_3-N, COD, TKN, TOC, DOC, NO_2+NO_3, T-Phos	TOX 9020☐ AOX 1650☐ 506☐	Alkalinity ☐ CO_3☐ HCO_3☐	Dioxins/Furans 1613☐ 8290☐	Dissolved Gases RSK 175☐ CO_2☐ Methane☐ Ethane☐ Ethene☐	TPH G	TPH D		REMARKS
Annex Cont																							
TP #12002	02/03/15	1 30 PM		W		X	X		X			X									X	X	
Fire Pond	02/03/15	1 30 PM		W		X	X		X			X									X	X	

REPORT REQUIREMENTS

- X I. Routine Report: Method Blank, Surrogate, as required
- ___ II. Report Dup., MS, MSD as required
- ___ III. CLP Like Summary (no raw data)
- ___ IV. Data Validation Report
- ___ V. EDD

INVOICE INFORMATION

P.O. # 4501406073

Bill To: _____

TURNAROUND REQUIREMENTS

- ___ 24 hr. ___ 48 hr.
- ___ 5 day
- X Standard (15 working days)
- ___ Provide FAX Results

Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: _____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

☐ Sample Shipment contains USDA regulated soil samples (check box if applicable)

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature	Signature	Signature	Signature
Date/Time	Date/Time 2/4/14 11:40	Date/Time	Date/Time 2/4/15 1320
Printed Name	Printed Name	Printed Name	Printed Name
Firm	Firm ALS	Firm	Firm ALS

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PC HH

Cooler Receipt and Preservation Form

Client / Project: Nustar Service Request *K15* 01111

Received: 2/4/15 Opened: 2/4/15 By: KO Unloaded: 2/4/15 By: KO

1. Samples were received via? *Mail* *Fed Ex* *UPS* *DHL* *PDX* (*Courier*) *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where?_____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number (NA)	Filed
8.7	8.7	8.0	8.0	0	322			

4. Packing material: (*Inserts*) (*Baggies*) (*Bubble Wrap*) (*Gel Packs*) *Wet Ice* *Dry Ice* *Sleeves*_____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA (Y) N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA (Y) N
12. Was C12/Res negative? NA (Y) N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time
All samples	various	X								

*Notes, Discrepancies, & Resolutions:*_____

*Page*____ *of*____

Metals

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REVISED
5:16 pm, Apr 21, 2015

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	02/03/15 13:30
Sample Matrix:	Water	**Date Received:**	02/04/15 13:20
Sample Name:	Annex Cont Tr. #12002	**Basis:**	NA
Lab Code:	K1501111-001		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	ND U	ug/L	0.50	1	02/16/15 09:56	02/10/15	
Barium	6020A	**5.84**	ug/L	0.050	1	02/16/15 09:56	02/10/15	
Cadmium	6020A	ND U	ug/L	0.020	1	02/16/15 09:56	02/10/15	
Chromium	6020A	ND U	ug/L	0.20	1	02/16/15 09:56	02/10/15	
Copper	6020A	**2.02**	ug/L	0.10	1	02/16/15 09:56	02/10/15	
Lead	6020A	**0.111**	ug/L	0.020	1	02/16/15 09:56	02/10/15	
Mercury	7470A	ND U	ug/L	0.20	1	02/09/15 09:43	02/06/15	
Nickel	6020A	**0.31**	ug/L	0.20	1	02/16/15 09:56	02/10/15	
Selenium	6020A	ND U	ug/L	1.0	1	02/16/15 09:56	02/10/15	
Silver	6020A	ND U	ug/L	0.020	1	02/16/15 09:56	02/10/15	
Zinc	6020A	**4.50**	ug/L	0.50	1	02/16/15 09:56	02/10/15	

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	02/03/15 13:30
Sample Matrix:	Water	**Date Received:**	02/04/15 13:20
Sample Name:	Fire Pond	**Basis:**	NA
Lab Code:	K1501111-002		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	**1.27**	ug/L	0.50	1	02/16/15 10:00	02/10/15	
Barium	6020A	**21.1**	ug/L	0.050	1	02/16/15 10:00	02/10/15	
Cadmium	6020A	ND U	ug/L	0.020	1	02/16/15 10:00	02/10/15	
Chromium	6020A	**0.94**	ug/L	0.20	1	02/16/15 10:00	02/10/15	
Copper	6020A	**2.19**	ug/L	0.10	1	02/16/15 10:00	02/10/15	
Lead	6020A	**0.895**	ug/L	0.020	1	02/16/15 10:00	02/10/15	
Mercury	7470A	ND U	ug/L	0.20	1	02/09/15 09:44	02/06/15	
Nickel	6020A	**0.84**	ug/L	0.20	1	02/16/15 10:00	02/10/15	
Selenium	6020A	ND U	ug/L	1.0	1	02/16/15 10:00	02/10/15	
Silver	6020A	ND U	ug/L	0.020	1	02/16/15 10:00	02/10/15	
Zinc	6020A	**3.60**	ug/L	0.50	1	02/16/15 10:00	02/10/15	

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ1501158-02		

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Arsenic	6020A	ND U	ug/L	0.50	1	02/16/15 08:45	02/10/15	
Barium	6020A	ND U	ug/L	0.050	1	02/16/15 08:45	02/10/15	
Cadmium	6020A	ND U	ug/L	0.020	1	02/16/15 08:45	02/10/15	
Chromium	6020A	ND U	ug/L	0.20	1	02/16/15 08:45	02/10/15	
Copper	6020A	ND U	ug/L	0.10	1	02/16/15 08:45	02/10/15	
Lead	6020A	ND U	ug/L	0.020	1	02/16/15 08:45	02/10/15	
Nickel	6020A	ND U	ug/L	0.20	1	02/16/15 08:45	02/10/15	
Selenium	6020A	ND U	ug/L	1.0	1	02/16/15 08:45	02/10/15	
Silver	6020A	ND U	ug/L	0.020	1	02/16/15 08:45	02/10/15	
Zinc	6020A	ND U	ug/L	0.50	1	02/16/15 08:45	02/10/15	

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	KQ1501077-01		

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Mercury	7470A	ND U	ug/L	0.20	1	02/09/15 09:17	02/06/15	

Diesel and Residual Range Organics-Silica Gel Treated

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Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Diesel and Residual Range Organics - Silica Gel Treated

Sample Name: Annex Cont Tr. #12002
Lab Code: K1501111-001

Extraction Method: EPA 3510C
Analysis Method: NWTPH-Dx

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	250	1	02/11/15	02/19/15	KWG1501158	
Residual Range Organics (RRO)	ND	U	500	1	02/11/15	02/19/15	KWG1501158	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	90	50-150	02/19/15	Acceptable
n-Triacontane	96	50-150	02/19/15	Acceptable

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	02/03/2015
Sample Matrix:	Water	**Date Received:**	02/04/2015

Diesel and Residual Range Organics - Silica Gel Treated

Sample Name:	Fire Pond	**Units:**	ug/L
Lab Code:	K1501111-002	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	250	1	02/11/15	02/19/15	KWG1501158	
Residual Range Organics (RRO)	ND	U	500	1	02/11/15	02/19/15	KWG1501158	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	94	50-150	02/19/15	Acceptable
n-Triacontane	100	50-150	02/19/15	Acceptable

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Diesel and Residual Range Organics - Silica Gel Treated

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1501158-3	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	250	1	02/11/15	02/19/15	KWG1501158	
Residual Range Organics (RRO)	ND	U	500	1	02/11/15	02/19/15	KWG1501158	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	83	50-150	02/19/15	Acceptable
n-Triacontane	87	50-150	02/19/15	Acceptable

Comments:

Gasoline Range Organics

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Analytical Results

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	02/03/2015
Sample Matrix:	Water	**Date Received:**	02/04/2015

Gasoline Range Organics

Sample Name:	Annex Cont Tr. #12002	**Units:**	ug/L
Lab Code:	K1501111-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	02/12/15	02/12/15	KWG1501258	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	89	50-150	02/12/15	Acceptable

Comments:

Analytical Results

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	02/03/2015
Sample Matrix:	Water	**Date Received:**	02/04/2015

Gasoline Range Organics

Sample Name:	Fire Pond	**Units:**	ug/L
Lab Code:	K1501111-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	02/12/15	02/12/15	KWG1501258	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	91	50-150	02/12/15	Acceptable

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Gasoline Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1501258-3	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	ND	U	250	1	02/12/15	02/12/15	KWG1501258	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	94	50-150	02/12/15	Acceptable

Comments:

Semi- Volatile Organic Compounds

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Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Annex Cont Tr. #12002
Lab Code: K1501111-001

Extraction Method: EPA 3520C
Analysis Method: 8270D

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Aniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Bis(2-chloroethyl) Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Phenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Chlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
1,3-Dichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
1,4-Dichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
1,2-Dichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzyl alcohol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Bis(2-chloroisopropyl) Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Methylphenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachloroethane	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
N-Nitrosodi-n-propylamine	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Methylphenol†	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Nitrobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Isophorone	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Nitrophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4-Dimethylphenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Bis(2-chloroethoxy)methane	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4-Dichlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzoic acid	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
1,2,4-Trichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Naphthalene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Chloroaniline	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachlorobutadiene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Chloro-3-methylphenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Methylnaphthalene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachlorocyclopentadiene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4,6-Trichlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4,5-Trichlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Chloronaphthalene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Nitroaniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Acenaphthylene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Annex Cont Tr. #12002
Lab Code: K1501111-001

Extraction Method: EPA 3520C
Analysis Method: 8270D

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dimethyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,6-Dinitrotoluene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Acenaphthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
3-Nitroaniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
2,4-Dinitrophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Dibenzofuran	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Nitrophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
2,4-Dinitrotoluene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Fluorene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Chlorophenyl Phenyl Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Diethyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Nitroaniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
2-Methyl-4,6-dinitrophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
N-Nitrosodiphenylamine	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Bromophenyl Phenyl Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Pentachlorophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Phenanthrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Anthracene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Di-n-butyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Fluoranthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Pyrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Butyl Benzyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
3,3'-Dichlorobenzidine	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Benz(a)anthracene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Chrysene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Bis(2-ethylhexyl) Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Di-n-octyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzo(b)fluoranthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzo(k)fluoranthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzo(a)pyrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Indeno(1,2,3-cd)pyrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Dibenz(a,h)anthracene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	

Comments:

Analytical Results

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	02/03/2015
Sample Matrix:	Water	**Date Received:**	02/04/2015

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	Annex Cont Tr. #12002	**Units:**	ug/L
Lab Code:	K1501111-001	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270D		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzo(g,h,i)perylene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	58	39-103	02/11/15	Acceptable
Phenol-d6	61	38-107	02/11/15	Acceptable
Nitrobenzene-d5	62	46-115	02/11/15	Acceptable
2-Fluorobiphenyl	60	48-114	02/11/15	Acceptable
2,4,6-Tribromophenol	69	46-127	02/11/15	Acceptable
Terphenyl-d14	60	32-149	02/11/15	Acceptable

† **Analyte Comments**

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Fire Pond
Lab Code: K1501111-002

Extraction Method: EPA 3520C
Analysis Method: 8270D

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Aniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Bis(2-chloroethyl) Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Phenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Chlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
1,3-Dichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
1,4-Dichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
1,2-Dichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzyl alcohol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Bis(2-chloroisopropyl) Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Methylphenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachloroethane	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
N-Nitrosodi-n-propylamine	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Methylphenol†	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Nitrobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Isophorone	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Nitrophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4-Dimethylphenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Bis(2-chloroethoxy)methane	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4-Dichlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzoic acid	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
1,2,4-Trichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Naphthalene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Chloroaniline	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachlorobutadiene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Chloro-3-methylphenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Methylnaphthalene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachlorocyclopentadiene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4,6-Trichlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4,5-Trichlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Chloronaphthalene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Nitroaniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Acenaphthylene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Fire Pond
Lab Code: K1501111-002

Extraction Method: EPA 3520C
Analysis Method: 8270D

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dimethyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,6-Dinitrotoluene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Acenaphthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
3-Nitroaniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
2,4-Dinitrophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Dibenzofuran	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Nitrophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
2,4-Dinitrotoluene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Fluorene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Chlorophenyl Phenyl Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Diethyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Nitroaniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
2-Methyl-4,6-dinitrophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
N-Nitrosodiphenylamine	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Bromophenyl Phenyl Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Pentachlorophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Phenanthrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Anthracene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Di-n-butyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Fluoranthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Pyrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Butyl Benzyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
3,3'-Dichlorobenzidine	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Benz(a)anthracene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Chrysene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Bis(2-ethylhexyl) Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Di-n-octyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzo(b)fluoranthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzo(k)fluoranthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzo(a)pyrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Indeno(1,2,3-cd)pyrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Dibenz(a,h)anthracene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	

Comments:

Analytical Results

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	02/03/2015
Sample Matrix:	Water	**Date Received:**	02/04/2015

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	Fire Pond	**Units:**	ug/L
Lab Code:	K1501111-002	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270D		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzo(g,h,i)perylene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	63	39-103	02/11/15	Acceptable
Phenol-d6	68	38-107	02/11/15	Acceptable
Nitrobenzene-d5	71	46-115	02/11/15	Acceptable
2-Fluorobiphenyl	71	48-114	02/11/15	Acceptable
2,4,6-Tribromophenol	80	46-127	02/11/15	Acceptable
Terphenyl-d14	59	32-149	02/11/15	Acceptable

† **Analyte Comments**

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG1501035-3

Extraction Method: EPA 3520C
Analysis Method: 8270D

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
N-Nitrosodimethylamine	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Aniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Bis(2-chloroethyl) Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Phenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Chlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
1,3-Dichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
1,4-Dichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
1,2-Dichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzyl alcohol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Bis(2-chloroisopropyl) Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Methylphenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachloroethane	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
N-Nitrosodi-n-propylamine	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Methylphenol†	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Nitrobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Isophorone	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Nitrophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4-Dimethylphenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Bis(2-chloroethoxy)methane	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4-Dichlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzoic acid	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
1,2,4-Trichlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Naphthalene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Chloroaniline	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachlorobutadiene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Chloro-3-methylphenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Methylnaphthalene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachlorocyclopentadiene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4,6-Trichlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,4,5-Trichlorophenol	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Chloronaphthalene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2-Nitroaniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Acenaphthylene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name: Method Blank
Lab Code: KWG1501035-3

Extraction Method: EPA 3520C
Analysis Method: 8270D

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dimethyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
2,6-Dinitrotoluene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Acenaphthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
3-Nitroaniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
2,4-Dinitrophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Dibenzofuran	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Nitrophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
2,4-Dinitrotoluene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Fluorene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Chlorophenyl Phenyl Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Diethyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Nitroaniline	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
2-Methyl-4,6-dinitrophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
N-Nitrosodiphenylamine	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
4-Bromophenyl Phenyl Ether	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Hexachlorobenzene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Pentachlorophenol	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Phenanthrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Anthracene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Di-n-butyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Fluoranthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Pyrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Butyl Benzyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
3,3'-Dichlorobenzidine	ND	U	24	1	02/05/15	02/11/15	KWG1501035	
Benz(a)anthracene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Chrysene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Bis(2-ethylhexyl) Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Di-n-octyl Phthalate	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzo(b)fluoranthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzo(k)fluoranthene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Benzo(a)pyrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Indeno(1,2,3-cd)pyrene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	
Dibenz(a,h)anthracene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	

Comments:

Analytical Results

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1501035-3	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270D		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzo(g,h,i)perylene	ND	U	9.6	1	02/05/15	02/11/15	KWG1501035	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	67	39-103	02/11/15	Acceptable
Phenol-d6	68	38-107	02/11/15	Acceptable
Nitrobenzene-d5	72	46-115	02/11/15	Acceptable
2-Fluorobiphenyl	68	48-114	02/11/15	Acceptable
2,4,6-Tribromophenol	66	46-127	02/11/15	Acceptable
Terphenyl-d14	74	32-149	02/11/15	Acceptable

† **Analyte Comments**

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.

Comments:

Volatile Organic Compounds

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Volatile Organic Compounds

Sample Name: Annex Cont Tr. #12002
Lab Code: K1501111-001

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Chloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Vinyl Chloride	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromomethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Chloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Trichlorofluoromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1-Dichloroethene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Acetone	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
Carbon Disulfide	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Methylene Chloride	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
trans-1,2-Dichloroethene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1-Dichloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2,2-Dichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
cis-1,2-Dichloroethene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2-Butanone (MEK)	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
Bromochloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Chloroform	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Carbon Tetrachloride	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1-Dichloropropene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Benzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Trichloroethene (TCE)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Dibromomethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromodichloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
cis-1,3-Dichloropropene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
Toluene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
trans-1,3-Dichloropropene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1,2-Trichloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Tetrachloroethene (PCE)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2-Hexanone	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
1,3-Dichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Volatile Organic Compounds

Sample Name: Annex Cont Tr. #12002
Lab Code: K1501111-001

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dibromochloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
Chlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Ethylbenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
m,p-Xylenes	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
o-Xylene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Styrene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromoform	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Isopropylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromobenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
n-Propylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,3-Trichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2-Chlorotoluene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,3,5-Trimethylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
4-Chlorotoluene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
tert-Butylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,4-Trimethylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
sec-Butylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
4-Isopropyltoluene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,3-Dichlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,4-Dichlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
n-Butylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2-Dichlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,4-Trichlorobenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
Hexachlorobutadiene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
Naphthalene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,3-Trichlorobenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	

Comments:

Analytical Results

Client:	NuStar Energy	**Service Request:**	K1501111
Project:		**Date Collected:**	02/03/2015
Sample Matrix:	Water	**Date Received:**	02/04/2015

Volatile Organic Compounds

Sample Name:	Annex Cont Tr. #12002	**Units:**	ug/L
Lab Code:	K1501111-001	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	103	73-122	02/06/15	Acceptable
Toluene-d8	93	65-144	02/06/15	Acceptable
4-Bromofluorobenzene	86	68-117	02/06/15	Acceptable

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Volatile Organic Compounds

Sample Name: Fire Pond
Lab Code: K1501111-002

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA

Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Chloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Vinyl Chloride	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromomethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Chloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Trichlorofluoromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1-Dichloroethene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Acetone	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
Carbon Disulfide	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Methylene Chloride	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
trans-1,2-Dichloroethene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1-Dichloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2,2-Dichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
cis-1,2-Dichloroethene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2-Butanone (MEK)	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
Bromochloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Chloroform	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Carbon Tetrachloride	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1-Dichloropropene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Benzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Trichloroethene (TCE)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Dibromomethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromodichloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
cis-1,3-Dichloropropene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
Toluene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
trans-1,3-Dichloropropene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1,2-Trichloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Tetrachloroethene (PCE)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2-Hexanone	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
1,3-Dichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Volatile Organic Compounds

Sample Name: Fire Pond
Lab Code: K1501111-002

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dibromochloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
Chlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Ethylbenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
m,p-Xylenes	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
o-Xylene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Styrene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromoform	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Isopropylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromobenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
n-Propylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,3-Trichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2-Chlorotoluene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,3,5-Trimethylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
4-Chlorotoluene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
tert-Butylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,4-Trimethylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
sec-Butylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
4-Isopropyltoluene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,3-Dichlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,4-Dichlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
n-Butylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2-Dichlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,4-Trichlorobenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
Hexachlorobutadiene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
Naphthalene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,3-Trichlorobenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: 02/03/2015
Date Received: 02/04/2015

Volatile Organic Compounds

Sample Name: Fire Pond
Lab Code: K1501111-002

Units: ug/L
Basis: NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	101	73-122	02/06/15	Acceptable
Toluene-d8	92	65-144	02/06/15	Acceptable
4-Bromofluorobenzene	85	68-117	02/06/15	Acceptable

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1501078-5

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dichlorodifluoromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Chloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Vinyl Chloride	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromomethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Chloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Trichlorofluoromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1-Dichloroethene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Acetone	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
Carbon Disulfide	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Methylene Chloride	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
trans-1,2-Dichloroethene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1-Dichloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2,2-Dichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
cis-1,2-Dichloroethene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2-Butanone (MEK)	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
Bromochloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Chloroform	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1,1-Trichloroethane (TCA)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Carbon Tetrachloride	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1-Dichloropropene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Benzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dichloroethane (EDC)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Trichloroethene (TCE)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Dibromomethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromodichloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
cis-1,3-Dichloropropene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
4-Methyl-2-pentanone (MIBK)	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
Toluene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
trans-1,3-Dichloropropene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1,2-Trichloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Tetrachloroethene (PCE)	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2-Hexanone	ND	U	20	1	02/06/15	02/06/15	KWG1501078	
1,3-Dichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1501078-5

Extraction Method: EPA 5030B
Analysis Method: 8260C

Units: ug/L
Basis: NA
Level: Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dibromochloromethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dibromoethane (EDB)	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
Chlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Ethylbenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,1,1,2-Tetrachloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
m,p-Xylenes	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
o-Xylene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Styrene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromoform	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Isopropylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,1,2,2-Tetrachloroethane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
Bromobenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
n-Propylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,3-Trichloropropane	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
2-Chlorotoluene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,3,5-Trimethylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
4-Chlorotoluene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
tert-Butylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,4-Trimethylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
sec-Butylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
4-Isopropyltoluene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,3-Dichlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,4-Dichlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
n-Butylbenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2-Dichlorobenzene	ND	U	0.50	1	02/06/15	02/06/15	KWG1501078	
1,2-Dibromo-3-chloropropane	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,4-Trichlorobenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
Hexachlorobutadiene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
Naphthalene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	
1,2,3-Trichlorobenzene	ND	U	2.0	1	02/06/15	02/06/15	KWG1501078	

Comments:

Analytical Results

Client: NuStar Energy
Project:
Sample Matrix: Water

Service Request: K1501111
Date Collected: NA
Date Received: NA

Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: KWG1501078-5

Units: ug/L
Basis: NA

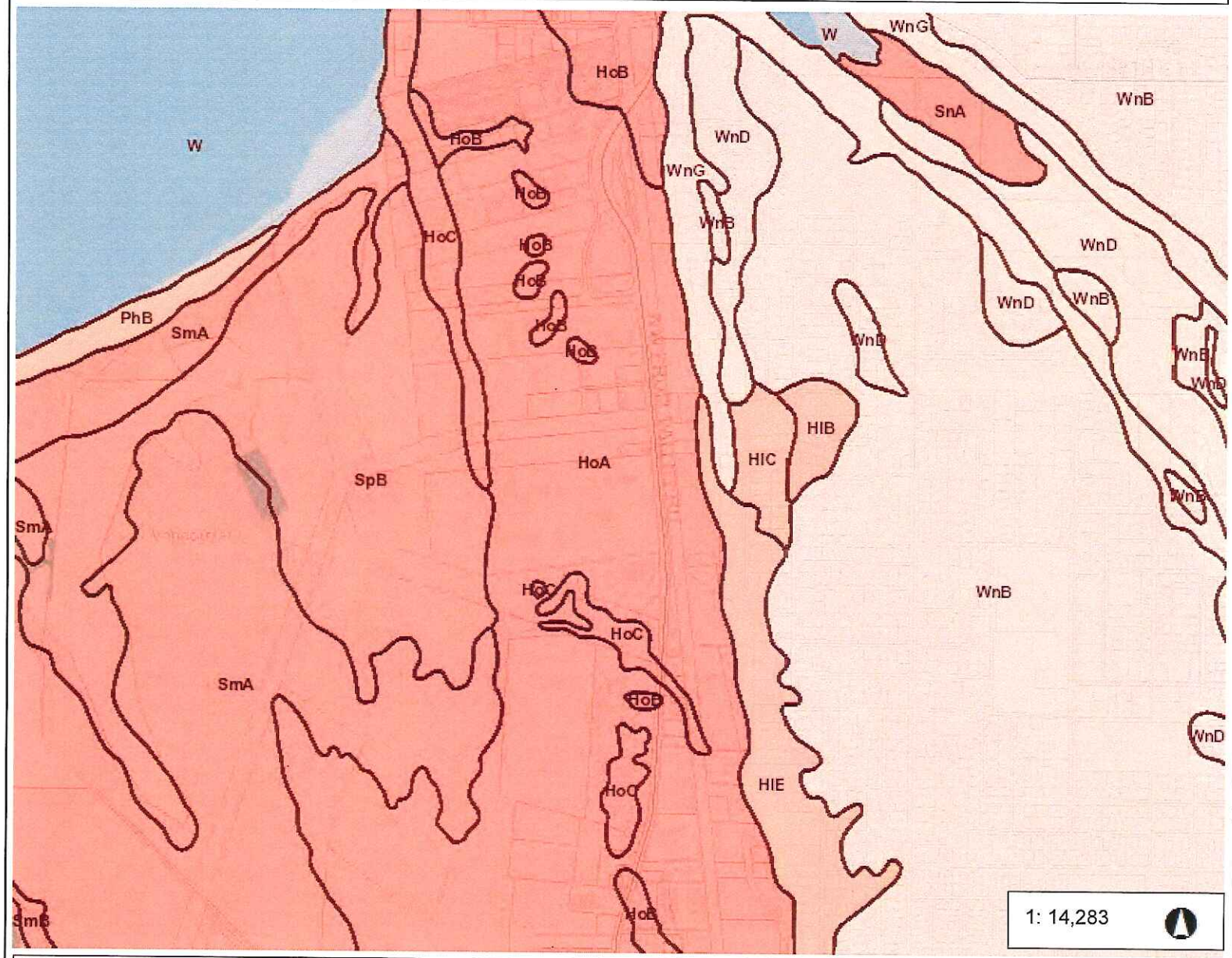
Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	99	73-122	02/06/15	Acceptable
Toluene-d8	91	65-144	02/06/15	Acceptable
4-Bromofluorobenzene	81	68-117	02/06/15	Acceptable

Comments:

Attachment G.4

Soils Description

Soil Map



Legend

- Soil Type
- WWHM Soil Group
  - 1 - Excessively drained soils
  - 2 - Well drained soils
  - 3 - Moderately drained soils
  - 4 - Poorly drained soils
  - 5 - Wetland soils
  - Unknown
- Building Footprints
- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

Notes:

2,380.5 0 1,190.23 2,380.5 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information.

This is a scanned version of the text of the original Soil Survey report of Clark County, Washington issued November 1972. Original tables and maps were deleted. There may be references in the text that refer to a table that is not in this document.

Updated tables were generated from the NRCS National Soil Information System (NASIS). The soil map data has been digitized and may include some updated information. These are available from http://soildatamart.nrcs.usda.gov.

Please contact the State Soil Scientist, Natural Resources Conservation Service (formerly Soil Conservation Service) for additional information.

SOIL SURVEY OF CLARK COUNTY, WASHINGTON

BY DALE A. McGEE, SOIL CONSERVATION SERVICE

SOILS SURVEYED BY DALE A. McGEE, RUDOLPH W. MAYKO, WILLARD A. CALL, CARL J. McMURPHY, AND JOHN G. KRAUTSCHEID, SOIL CONSERVATION SERVICE.

UNITED STATES DEPARTMENT OF AGRICULTURE, IN COOPERATION WITH THE WASHINGTON AGRICULTURAL EXPERIMENT STATION

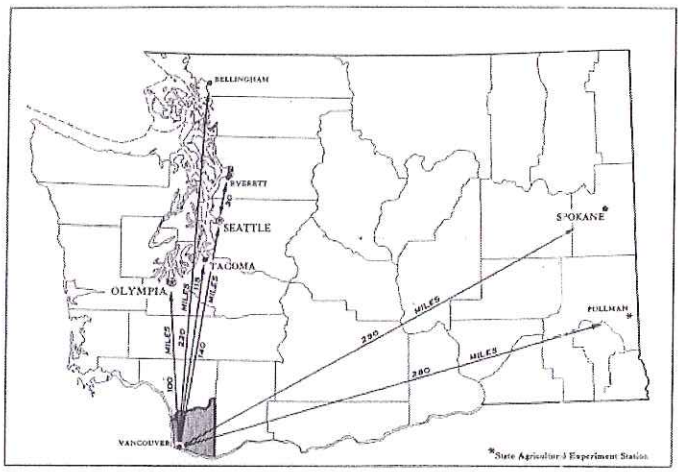


Figure 1.-Location of Clark County in Washington.

CLARK COUNTY is in the southwestern part of the State of Washington (fig. 1). The Columbia River forms its southern and western borders. It is bounded on the north by the Lewis River and on the east by Skamania County.

The land area comprises about 400,000 acres, or about 630 square miles. The population is approximately 101,000. The largest city, Vancouver, population 34,500, is the county seat and is 100 miles south of Olympia, the State capital. Vancouver is along the north shore of the Columbia River, opposite Portland, Oregon.

Economic development in Clark County is diversified. Farming is important, but it is secondary in value of total products to industrial products, which include lumber, pulp, paper, aluminum, carborundum, and chemicals. About 42 percent of the county is cleared and in farmland; the rest is forested or logged-off land. Most of the farmland lies in the central, western, and southwestern parts of the county. This area is composed of terraces and terrace plains, about 30 to 800 feet above sea level. The northern and eastern parts of the county are forested foothills and mountains of the Cascade Range. In these areas farming is confined to the larger valleys. Much of the cleared land is in hay and pasture.

Dairying is the most important farm enterprise in the county; it accounts for more than 40 percent of the value of farm products sold. Ranking second and third are livestock and poultry. Other important farm products are vegetables, berries, and orchard fruits.

The county lies in a long structural basin (Willamette-Puget Trough) between the Pacific Coast ranges to the west and the parallel Cascade Range to the east. The Columbia River, the major trunk stream of the Pacific Northwest, flows through the Cascade Range, borders Clark County as it crosses the trough, then passes through the Pacific Coast ranges into the Pacific Ocean to the west.

The western part of the county consists of a series of gently rolling alluvial terraces that form plains and benches rising steplike from the present level of the Columbia River. The elevations in these areas range from a few feet to more than 800 feet above sea level. The eastern part of the county consists of high old alluvial terraces against volcanic foothills and mountains of the western slopes of the Cascade Range. Along the eastern margin of the county, some of the higher peaks rise to an elevation of nearly 4,000 feet. Mountain ridges 2,000 to 3,000 feet in elevation are common. Much of this area is very steep, and a fall of 1,000 feet within a lateral distance of half a mile is not uncommon. The mountainous terrain is heavily dissected by streams that originate in this area and to the east. Most of the important streams that drain the county flow in a westerly direction. The more prominent streams are: the North Fork of the Lewis River; the East Fork of the Lewis River; the Washougal and Little Washougal Rivers; and Lacamas, Salmon, Big Tree, Cedar, Canyon, Mason, and Lockwood Creeks.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Clark County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the

Hesson clay loam, 30 to 55 percent slopes (HcF).-This soil is similar to Hesson clay loam, 0 to 8 percent slopes, except that the surface layer is 2 to 4 inches thinner. Included in mapping were some areas where the surface layer is gravelly clay loam. This soil occurs on terrace breaks that lead into valleys. The slopes are long. Surface runoff is rapid to very rapid, and the erosion hazard is severe to very severe where the surface is left bare.

This soil is too steep for cultivation, but it is suited to timber. (Capability unit VIe-3; woodland suitability group 3rH4; wildlife site 7)

Hesson very stony silty clay loam, 3 to 30 percent slopes (HhE).-This soil is in areas where local volcanic lava flows have deposited igneous rocks over the surface. It is generally near areas of Olympic soils. Included in mapping were a few areas where the slope is more than 30 percent and a few areas that are less than 3 feet deep to weathered gravel, cobblestones, and clay. Surface runoff is slow to rapid, and the erosion hazard is slight to severe if the surface is left bare.

This soil is suited to timber (Capability unit VIs-1; woodland suitability group 3dH3 ; wildlife site 12)

Hillsboro Series

The Hillsboro series consists of deep, well-drained soils on terraces. These are medium-textured soils that developed in deposits of old Columbia River alluvium. Most areas are nearly level to gently sloping, but strongly sloping to very steep areas are along drainageways and streams. Most areas are in the southwestern, central, and south-central parts of the county. The native, vegetation is dominantly Douglas-fir and a scattering of grand fir, bigleaf maple, and western dogwood. The understory consists principally of salal, ferns, Oregongrape, and vine maple. The annual precipitation is 40 to 50 inches.

Hillsboro soils are among the most productive terrace soils in the county; about 90 percent of the acreage is cultivated. These soils are used extensively for high-income crops, such as pole beans, strawberries, sweet corn, cucumbers, and other truck crops, and for hay and pasture. They are also used for urban development.

Hillsboro silt loam, 3 to 8 percent slopes (HoB).-This is the dominant soil in the southwestern part of the county. The relief is gently undulating. In most places the slopes are short.

In a typical profile the surface layer is dark-brown silt loam about 7 inches thick. The next layer is about 48 inches thick. In sequence from the top, the upper 17 inches is friable, dark-brown silt loam; the next 16 inches is friable, dark grayish-brown heavy silt loam; and the lower 15 inches is friable, dark grayish-brown silt loam. The next layer, to a depth of 86 inches, is dark grayish brown silt loam.

Included in mapping were areas between Whipple and Salmon Creek where the texture of the surface layer is nearly clay loam.

This soil is well drained, moderately permeable, and easily tilled. The available water capacity is very high. Fertility is moderately high. Surface runoff is slow, and the erosion hazard is slight.

Representative profile of Hillsboro silt loam, in a cultivated area 600 feet east of U.S. 99 and 350 feet north of 104th Street, 3 miles north of Vancouver, SE1/4NE1/4SW1/4 sec. 35, T. 3 N., R. 1 E.

Ap-0 to 4 inches, dark-brown (10YR 3/3) silt loam, pale brown (10YR 5/3) when dry; weak, very fine, granular structure ; soft, very friable, nonsticky and slightly plastic; no roots; strongly acid (pH 5.5) ; abrupt, smooth boundary. (3 to 6 inches thick)

A1-4 to 7 inches, dark-brown (10YR 3/3) silt loam, pale brown (10YR 5/3) when dry ; massive ; hard, firm, slightly sticky and slightly plastic ; few fine roots ; many very fine and medium, and few coarse, tubular and interstitial pores ; strongly acid (pH 5.5) ; clear, smooth boundary. (2 to 4 inches thick)

B1-7 to 17 inches, dark-brown (10YR 3/3) silt loam, pale brown (10YR 5/3) when dry; weak, medium and coarse, subangular blocky structure ; slightly hard, friable, sticky and plastic ; few fine roots ; many, very fine, tubular and interstitial pores ; thin, patchy clay films on ped surfaces; medium acid (pH 5.6) ; gradual, smooth boundary. (7 to 12 inches thick)

B21t-17 to 24 inches, dark-brown (10YR 3/3) heavy silt loam, brown (10YR 5/3) when dry; moderate, coarse, subangular blocky structure ; hard, friable, sticky and plastic ; very few, fine, fibrous roots ; many, fine, tubular and interstitial pores ; moderately thick, patchy clay films on ped surfaces and in pores ; strongly acid (pH 5.5) ; gradual, smooth boundary. (7 to 11 inches thick)

B22t-24 to 32 inches, dark grayish-brown (10YR 4/2) heavy silt loam, light brownish gray (10YR 6/2) when dry; moderate, medium and coarse, subangular blocky structure ; very hard, friable, sticky and plastic ; very few fine roots ; many, very fine, tubular and interstitial pores ; moderately thick, continuous clay films; strongly acid (pH 5.4) ; gradual, smooth boundary. (7 to 11 inches thick)

B23t-32 to 40 inches, dark grayish-brown (10YR 4/2) heavy silt loam, light brownish gray (10YR 6/2) when dry; weak, medium, prismatic structure breaking to moderate, medium, subangular blocky ; very hard, friable, slightly sticky and plastic ; no roots ; common, very fine, tubular pores ; moderately thick, patchy clay films on ped surfaces and moderately thick, continuous clay films in pores; very strongly acid (pH 5.0) ; gradual, smooth boundary. (6 to 12 inches thick)

B3t-40 to 55 inches, dark grayish-brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) when dry; weak, coarse, subangular blocky structure ; very hard, friable, slightly sticky and slightly plastic ; no roots ; common, very fine, interstitial pores ; moderately thick, patchy clay films ; strongly acid (pH 5.1) ; gradual, smooth boundary. (12 to 20 inches thick)

C1-55 to 72 inches, dark grayish-brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) when dry; few, fine, faint, dark-brown (7.5YR 4/2) mottles; massive ; hard, friable, nonsticky and nonplastic ; many, very fine, tubular pores ; thin clay films in pores; strongly acid (pH 5.3) ; gradual, smooth boundary. (12 to 20 inches thick)

C2-72 to 86 inches, dark grayish-brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) when dry; few, fine, faint, dark-brown (7.5YR 4/2) mottles; massive ; hard, friable, nonsticky and nonplastic ; common, very fine, tubular pores ; strongly acid (pH 5.5).

The A1 horizon ranges from very dark brown to dark brown in color. The B horizon ranges from 10YR to 7.5YR in hue and from 2 to 4 in chroma. In places the profile is loam to a depth of about 36 inches, sandy loam to a depth of 48 inches, and sand between 48 and 62 inches.

Most of the acreage of this soil is cultivated or in urban fringe development. Nearly all the crops suited to this area are grown. Pears, caneberries, strawberries (fig. 7), pole beans, potatoes, and walnuts are important truck crops. Alfalfa and red clover are important

Figure 7.-Strawberries on a Hillsboro silt loam. This area is near Salmon Creek.

legumes for hay, and white clover is important for pasture. Orchardgrass and ryegrass are the chief grasses for hay and pasture. (Capability unit IIe-1; woodland suitability group 2oL3 ; wildlife site 3)

Hillsboro loam, 0 to 3 percent slopes (HlA).-This soil is similar to Hillsboro silt loam, 3 to 3 percent slopes, except that the surface layer is 1 to 3 inches thicker, and the texture is loam to a depth of about 36 inches, sandy loam between a depth of 36 and 48 inches, and sand between a depth of 48 and 62 inches. Surface runoff is very slow, and the hazard of erosion is none to slight.

Where cultivated for a number of years, this soil tends to develop a tillage pan. Deep plowing or use of a subsoiler will alleviate this condition. The available water capacity is high.

Most of this soil is used for crops and pasture. Pole beans, strawberries, potatoes, and cucumbers are grown. Alfalfa or a mixture of red clover and ryegrass for hay is commonly grown in rotation with the cash crops. There is a small acreage of cane and tree fruits. (Capability unit I-2; woodland suitability group 3oH3; wildlife site 3)

Hillsboro loam, 3 to 8 percent slopes (HlB).-This is the dominant terrace soil in the central part of the county. It is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that the profile is loam to a, depth of about 36 inches, sandy loam between a depth of 36 and 48 inches, and sand between a depth of 48 and 62 inches.

Where cultivated for a number of years, this soil tends to develop a tillage pan. Deep plowing or use of a subsoiler will alleviate this condition. The available water capacity is high.

Most of this soil is used for crops and pasture. Pole beans, strawberries, potatoes, and cucumbers are grown. Alfalfa or a mixture of red clover and ryegrass for hay is commonly grown in rotation with the truck crops. There is a small acreage of cane and tree fruits. (Capability unit IIe-1; woodland suitability group 3oH3 ; wildlife site 3)

Hillsboro loam, 8 to 15 percent slopes (HlC).-This soil is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that the surface laver is 1 to 3 inches thinner, and the texture is loam to a depth of about 36 inches, sandy loam between a depth of 36 and 48 inches, and sand between a depth of 48 and 62 inches. Surface runoff is medium, and the erosion hazard is moderate. The slopes are complex and rather short.

Pole beans, strawberries, potatoes, and cucumbers are grown. Alfalfa or a mixture of red clover and ryegrass for hay is commonly grown in rotation with the cash crops. There is a small acreage of cane and tree fruits.

Cross-slope seeding and winter cover crops help control erosion. The available water capacity is high. (Capability unit IIIe-5; woodland suitability group 3oH3; wildlife site 3)

Hillsboro loam, 15 to 20 percent slopes (HlD).-This soil is along the edge of drainageways and streams. It is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that the slopes are longer, and the texture is loam to a depth of about 36 inches, sandy loam between a depth of 36 and 48 inches, and sand between a depth of 48 and 62 inches. Surface runoff is medium, and the erosion hazard is moderate.

Grasses and legumes are more common on this soil than other crops.

Use of machinery is difficult because of the slopes. Conservation practices, such as cross-slope seeding, and the use of long-lived grasses and legumes in the rotation are needed to control loss of soil. The available water capacity is high. (Capability unit IIIe-5; woodland suitability group 3oH3; wildlife site 3)

Hillsboro loam, 20 to 30 percent slopes (HlE).-This soil is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that the surface layer is 1 to 3 inches thinner, and the texture is loam to a depth of about 36 inches, sandy loam between a depth of 36 and 48 inches, and sand between a depth of 48 and 62 inches. It occurs along the edges of drainageways and streams. Surface runoff is medium to rapid, and the erosion hazard is moderate to severe if the surface is left bare through the winter.

Pasture is the main use where this soil is cleared. Uncleared areas are used primarily for timber production. The available water capacity is high. (Capability unit IVe-2; woodland suitability group 3oH3; wildlife site 3)

Hillsboro loam, 30 to 50 percent slopes (HlF).-This soil occurs along Salmon Creek and its tributaries. It is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that the surface layer is 2 to 4 inches thinner, and the texture is loam to a depth of about 36 inches, sandy loam between a depth of 36 and 48 inches, and sand between a depth of 48 and 62 inches. Surface runoff is rapid to very rapid, and the erosion hazard is severe to very severe if the surface is left bare in winter.

This soil is suited to timber.

The available water capacity is high. (Capability unit VIe-3 ; woodland suitability group 3rH4; wildlife site 3)

Hillsboro silt loam, 0 to 3 percent slopes (HoA).-This soil is similar to Hillsboro silt loam, 3 to S percent slopes. Surface runoff is very slow, and there is no erosion hazard.

Most of the acreage of this soil is cultivated or in urban fringe development. Nearly all the crops suited to this area are grown. Pears, caneberries, strawberries, pole beans, potatoes, and walnuts are important truck crops. Alfalfa and red clover are important legumes for hay, and white clover is important for pasture. Orchardgrass and ryegrass are the chief grasses for hay and pasture. (Capability unit I-2; woodland suitability group 2oL3; wildlife site 3)

Hillsboro silt loam, 8 to 15 percent slopes (HoC).-This soil is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that the surface layer is 1 to 3 inches thinner. Surface runoff is medium, and the erosion hazard is moderate. Host of the slopes are short.

Nearly all the crops suited to this area are grown. Pears, caneberries, strawberries, pole beans, potatoes, and walnuts are important cash crops. Alfalfa and red clover are the important legumes for hay, and white clover for pasture. Orchardgrass and ryegrass are the chief grasses for hay and pasture.

This soil is easily cultivated. Cross-slope tillage and grasses and legumes in the rotation are needed to control erosion. (Capability unit IIIe-5; woodland suitability group 2oL3 ; wildlife site 3)

Hillsboro silt loam, 15 to 20 percent slopes (HoD).-This soil is along streams and major drainageways. It is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that the surface layer is 2 to 3 inches thinner. Surface runoff is medium, and the erosion hazard is moderate.

Most of the crops grown on Hillsboro silt loam, 3 to 8 percent slopes, are grown on this soil. More long-lived grasses and legumes are grown because the steeper slopes create an erosion hazard and difficulty in operation of machinery. (Capability unit IIIe-5 ; woodland suitability group 2oL3 ; wildlife site 3)

Hillsboro silt loam, 20 to 30 percent slopes (HoE).-This soil is along Salmon Creek, Whipple Creek, and other major drainageways in the western part of Clark County. It is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that the surface layer is 2 to 4 inches thinner. Surface runoff is medium to rapid, and the erosion hazard is moderate to severe if the surface is left bare.

Most of the crops grown on Hillsboro silt loam, 3 to 8 percent slopes, are grown on this soil. More of the acreage is used for long-lived grasses and legumes because of the moderately steep slopes. (Capability unit IVe-2; woodland suitability group 2oL3; wildlife site 3)

Hillsboro silt loam, 30 to 65 percent slopes (HoG).This soil is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that the surface layer is 7 to 10 inches thick. Surface runoff is rapid to very rapid, and the erosion hazard is severe to very severe if the surface is left bare.

This soil is suited to Douglas-fir. (Capability unit VIe-3 ; woodland suitability group 2rL5 ; wildlife site 3)

Hillsboro bouldery silt loam, 3 to 8 percent slopes (HsB).-Most of the acreage of this soil is on terraces along the Columbia River. The soil is similar to Hillsboro silt loam, 3 to 8 percent slopes, except that it is bouldery on the surface. Included in mapping were a few areas steeper than 8 percent. The available water capacity is high.

The soil in most places is too bouldery to be cultivated. The boulders range in weight from a few hundred pounds to several tons. They can be removed only at considerable cost. Much of the acreage is view property and is gradually developing into residential use. (Capability unit Vs-1; wildlife site 12; not assigned to a woodland suitability group)

Hockinson Series

The Hockinson series consists of deep, moderately well drained and somewhat poorly drained, nearly level to gently sloping soils on terraces. These are loamy soils that formed in old alluvium of mixed origin. Nearly all the acreage is near Hockinson and Battle Ground, but some of the acreage is near Manor. The native vegetation on Hockinson soils is Oregon ash, Oregon white oak, western redcedar, red alder, hardhack, sedges, and water-tolerant grasses. The average annual precipitation is between 50 and 60 inches.

About 95 percent of the acreage has been cleared, and the soils are used chiefly for hay and pasture. In areas that are artificially drained, irrigated pasture, and some row crops, such as cucumbers, pole beans, and potatoes, are grown. Crops that require spring planting cannot be grown unless the soils are drained. Without artificial

Attachment G.5

Local Geology and Hydrogeology

Remedial Investigation and Risk Assessment Report
Vancouver Annex Terminal
Vancouver, Washington

Prepared for:
NuStar Terminals Operations Partnership L.P.

December 29, 2010
1569-00

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

property is located to the south. Undeveloped land or commercial/industrial facilities front the eastern side of Fruit Valley Road to the north, east, and south of the Facility.

2.2 Facility History

Support Terminals Operating Partnership, L.P. (STOP) purchased the Facility from Cenex Harvest States Cooperative (Cenex) in 2003. In March 2008, STOP changed its name to NuStar.

The property was developed in 1957 as a truck loading terminal. Records are unclear as to whether the Facility was developed by Cenex. Historically, chemicals and other products stored at the site included liquid fertilizers and refined petroleum products such as gasoline, diesel and kerosene, de-natured alcohol, and petroleum product additives. A slop tank is present in the eastern portion of the Facility (Figure 2) and this is typically where waste (such as from tank-bottom cleanouts or the OWS) would be stored prior to off-site disposal or recycling. There is no indication that materials from tank-bottom cleanouts were buried at the Facility.

Prior to or during Cenex's ownership, American Cyanamid conducted agricultural research—including the testing of herbicides and pesticides—in the southeastern portion of the Facility (Figure 2).

2.3 Geology

The regional geology and the Facility-specific geologic conceptual model are described below.

2.3.1 Regional Geology

The regional geology is summarized below and is based on reports prepared by Pacific Groundwater Group (PGG; 2001) and AMEC (2002a). The vicinity of the Facility is dominated by three primary units: Recent Alluvial deposits (referred to as the "Recent Alluvial Aquifer" [RAA]); the Pleistocene Alluvial deposits (the "Pleistocene Alluvial Aquifer" [PAA]); and the Troutdale Formation.

The RAA is the upper unit. The RAA deposits are approximately 55 feet thick and consist of fine-grained silt and sand within the areas investigated near Vancouver Lake. The PAA deposits are approximately 95 to 115 feet thick and consist of coarse-grained sand and gravel. The PAA originates from alluvial deposits of the Columbia River and deposits from the catastrophic Missoula Floods. The Troutdale Formation underlies the PAA and can be in excess of 1,000 feet thick. It is made up of cemented sandy gravels and semi-consolidated sands, silts, and clays.

2.3.2 Facility-Specific Geology

During previous Facility investigations performed by others, soil borings have been installed to depths of up to 50 feet below ground surface (bgs) at the Facility. During a 2007 Facility investigation conducted by Ash Creek Associates (Ash Creek), one boring was completed to a depth of 72 feet bgs.

The RAA underlying the Facility consists of silty, fine sand or sandy silt with variable layers of sand or silty sand to a depth of approximately 10 feet bgs. Below 10 feet bgs, the RAA consists of layers of fine- to medium-grained sand to a depth of approximately 50 to 60 feet bgs. The PAA is encountered below the RAA and consists of sand and/or gravel layers of varying thicknesses. The Troutdale Formation underlies the PAA and can be in excess of 1,000 feet thick. The base of the PAA is typically identified by the transition to an underlying conglomerate or consolidated/unconsolidated silty, sandy gravel of the Pleistocene Troutdale Formation.

2.4 Hydrogeology

This section presents the understanding of the regional and local hydrogeology.

2.4.1 Regional Hydrogeology

The regional aquifers follow the regional geology discussed above. The regional hydrogeology summarized below is based on reports prepared in support of Clark Public Utilities (CPU) South Lake Wellfield (PGG, 2001; PGG, 2009), and by Ash Creek (2008a and 2008b).

The RAA is unconfined and receives recharge directly from the land surface and/or surface water features. It is a productive aquifer with high well yields (several thousand gallons per minute [gpm] without significant drawdown). The groundwater flow system is highly influenced by local surface water bodies. The Columbia River, Vancouver Lake, Vancouver Lake Flushing Channel, and Lake River form natural hydrologic boundaries to the groundwater flow system. Tidal influences and seasonal variations in surface water runoff cause dynamic variation in the stage of the Columbia River, and resulting adjustments in the stages of the other three connected surface water bodies. The groundwater flow system is also influenced by tidal and seasonal variations in the surface water bodies. Regionally, it is anticipated that groundwater within the RAA and PAA in the vicinity of the Facility would have a net gradient towards Vancouver Lake and the Columbia River.

The Troutdale Gravel Aquifer (TGA) has been observed at a depth of approximately 200 feet at the CPU wellfield located 500 feet north of the Facility. It is approximately 50 feet thick and is underlain by a 100-foot thick clay confining layer. The Sand and Gravel Aquifer (SGA) of the Troutdale Formation is found beneath the confining layer. CPU has installed two production wells screened within the SGA at their wellfield.

2.4.2 Local Hydrogeology

The depth to first encountered groundwater at the Facility ranges from approximately 15 to 32 feet bgs (Table 1). This zone corresponds to the silty, fine- to medium-grained sand of the RAA. Deeper groundwater of the PAA is encountered at depths of approximately 50 to 70 feet bgs beneath the Facility (Ash Creek, 2008a).

Shallow groundwater flow at the Facility has remained, under static conditions, relatively flat with a slight gradient (0.0002 foot per foot [ft/ft]) to the southeast (AMEC, 2002a; SECOR, 2003; and Ash Creek, 2009). Groundwater contour maps prepared for previous investigations are contained in Appendix B for reference. As shown on Figure 3, groundwater elevations measured in September 2010 are consistent with previous observations.

3.0 Summary of Previous Investigations and Findings

Several investigations have been conducted at the Facility since 2001. The initial investigation addressed evidence of a possible fuel release during a UST decommissioning and resulted in further work to define the extent of potentially impacted soil and groundwater (AMEC 2002a, 2002b). In 2003, SECOR conducted a comprehensive Phase II ESA as a part of due diligence activities for Cenex during the property transaction to NuStar (SECOR, 2003). More recently, Ash Creek has completed several investigations to characterize current environmental conditions (Ash Creek, 2007, 2008a, and 2008b). The scope of each of these investigations is described below.

3.1 Summary of Previous Investigations

Environmental Site Assessment – April 2002. Petroleum-impacted soils were reportedly encountered during the decommissioning of an underground gasoline-vapor recovery tank. Cenex excavated several test pits to delineate the extent of the impacted soils and approximately 60 to 100 cubic yards (cy) of soil were then excavated. Cenex retained AMEC to conduct further investigations to assess soil and groundwater conditions at and near the former UST.

On April 10 and 11, 2002, AMEC conducted soil and groundwater sampling activities at the Facility to evaluate the potential subsurface impact in the vicinity of the former underground gasoline-vapor recovery tank. Twelve borings (GP-1 through GP-12) were completed by direct-push techniques or hand-operated rotohammer to depths ranging from 20 to 32 feet bgs. Figure 2 shows the locations of the borings. As shown on the figure, the borings were completed around the vapor recovery system and the former UST pit.

RECEIVED
JUN 20 2018
WA State Department
of Ecology (SWRO)

June 20, 2018

Mr. Jacek Anuszewski
Washington Department of Ecology - Water Quality Program
PO Box 47775
Olympia, WA 98504-7775

Subject: **State Waste Discharge Permit Application**
NuStar Terminals Operations Partnership, L.P.
5420 NW Fruit Valley Road
Vancouver, WA 98660

Mr. Anuszewski,

Attached is NuStar Terminals Operations Partnership, L.P. application for State Waste Discharge Permit. If you have any question, please do not hesitate to contact me.

Sincerely,

Chris Chan
Sr. HSE Manager – WR
(916) 296-3853
Chris.Chan@NuStarEnergy.com

Enclosures