Development Review Committee is represented by the City of Chehalis:
Building and Planning | Engineering | Public Works | Fire Department | Police Department | Airport

Development Review Committee Agenda

Chehalis Building and Planning Department
June 12, 2024, at 9 A.M.
Meeting Location: Chehalis Airport Conference Room

9:00 AM ST-24-0020; 1162 NW State Ave
Applicant proposes to construct a 20 x 40 metal carport on Lewis County Parcel 004333001000 which is zoned IL- Light Industrial.

9:30 AM SEPA-24-005/ST-24-0009; 0000 Bishop Rd
Applicant proposes to construct a new 4,480 square foot warehouse shop with associated parking. Located on Lewis County Parcel 017760002000 which is zoned CG- General Commercial.

10:00 Interdepartmental staff meeting.

Join Zoom Meeting

https://us06web.zoom.us/j/83910241095?pwd=dUI1Ym0rTkt6SHZCZjkxUTRHVDBUUT09

Directions to Development Review Committee

Chehalis Airport Conference Room

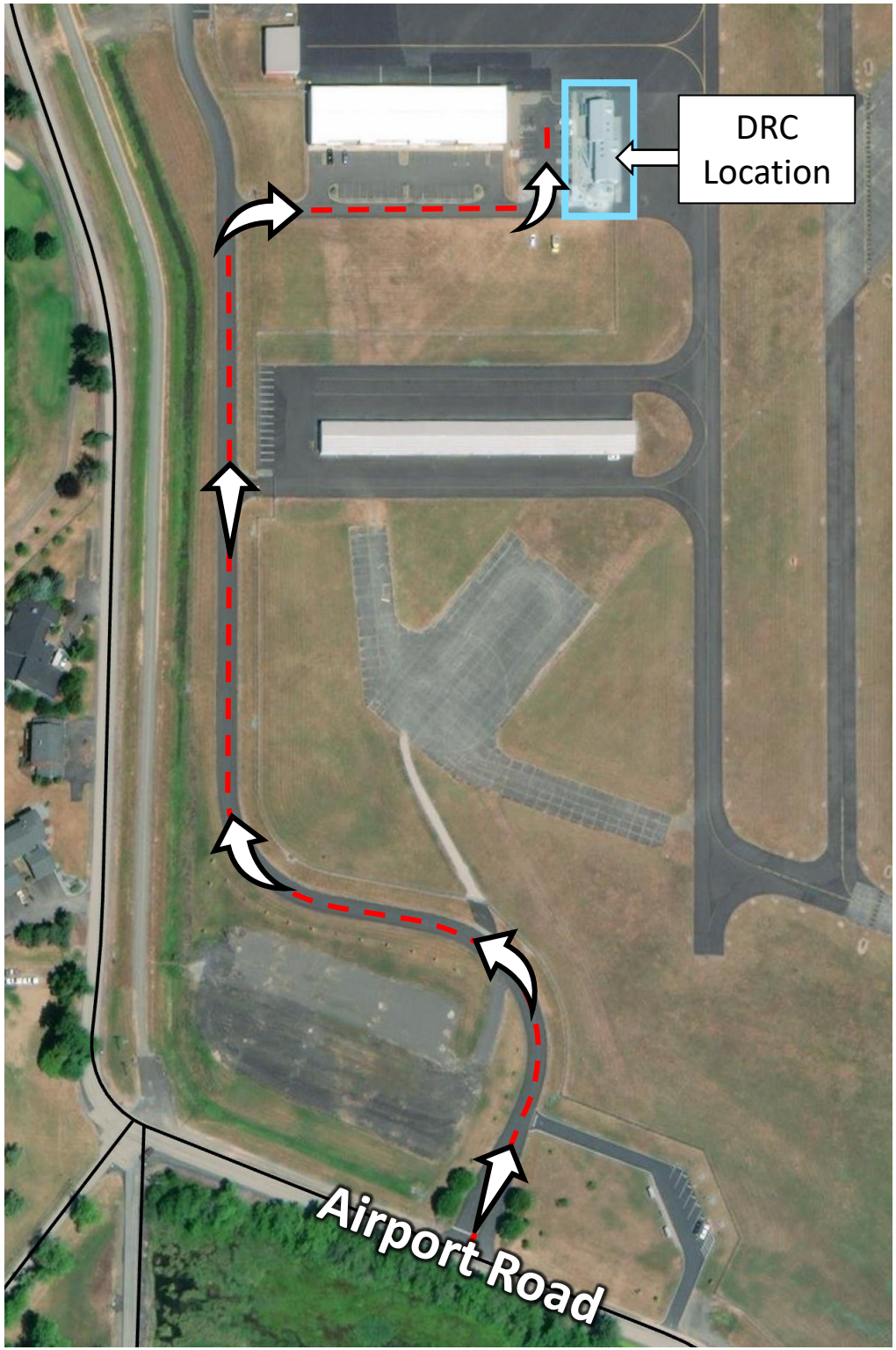
Coordinates:

(46.672787, -122.984924)

or

46° 40' 22.0332'' N

122° 59' 5.7264'' W



CITY OF CHEHALIS
Where Heart and History Shape Our Future

Return your permit application to Community Development Department
1321 S Market Blvd. Chehalis, WA 98532
(360) 345-2229
www.ci.chehalis.wa.us email: comdev@ci.chehalis.wa.us

Job address: 1162 N.W. State Ave Parcel #: 004333001000

Applicant/Contact person

Name: Sean Ghere / Moerker Sons Pump and Drilling
Mailing address: 1162 NW State Ave
City, State, and Zip: Chehalis, WA 98532
Phone #: 360-748-3805 Email: (required) sghere@moerkersons.com

Contractor/Engineer/Surveyor

Contact Name: Madelyn
Company/Firm Name: Northside Metal Carports
Mailing address: 110 Avery Rd E
City, State, and Zip: Chehalis, WA 98532
Phone #: 360-262-9354 Email: (required) northsidemetalc@gmail.com
Contractor's L&I #: NORTHMC820L7

Project Description: (Create a project narrative on a separate page if there is not enough room to completely describe your project below.)

Metal carport to park drill rigs in. There will be no power or water.

Current market value of proposed work:
(Fair market labor and materials) $23,705.75

Only the plan(s) submitted will be reviewed for compliance with applicable codes. By signing below, you grant permission for any City of Chehalis employee the right to access and remain on the property for the purpose of review and approval of this proposal and to conduct inspections related to this proposal.

Signature: Sean C. Ghere GM	Date: 4/18/24
Print Name: Sean C. Ghere GM	

Office use only

Received by:	Date Received:
Parcel #:	
Permit #:	
Zoning:	
Flood Zone: yes no Zone Classification:	

Form 1-A (9/15/2017)

Development Permit Attachment

City of Chehalis
Community Development Department
1321 S MARKET BLVD
CHEHALIS, WA 98532
(360) 345-2229

Site Address: 1162 NW State Ave. Permit # _____

☒ Building	☐ Plumbing	☐ Mechanical	☐ Manufactured Structure
☐ Sign	☐ Occupancy	☐ Demolition	☐ Administrative
☐ Flood Plain	☐ Tenant Improvement	☐ Fire Permit	☐ Other

PROPOSED USE OF BLDG: Storage
TOTAL SQ FT OF BLDG: 800
OF DWELLING UNITS: N/A
OF PARKING SPACES: N/A
TYPE OF BLDG HEAT: N/A
PROPOSED HEIGHT : 18' 9 1/8"
AREA OF ADDITION: N/A
VALUE/CONST COST OF THE CONSTRUCTION PORTION $ 23,705.75

PLEASE NOTE

For new construction, additions and substantial remodel, alterations, demolitions;

- ✓ *Application cover sheet and attachment forms*
- ✓ *Two complete sets of plans of any size and one set of reproducible plans, including civil plans will be required. One set will be returned as the approved construction plan.*
- ✓ *Site plan drawn to scale depicting entire property; what's existing, what's proposed*
- ✓ *Fees*

For an application to be deemed complete, all fees must be paid. Contact Community Development to determine what fees will be owed at the time of submittal.

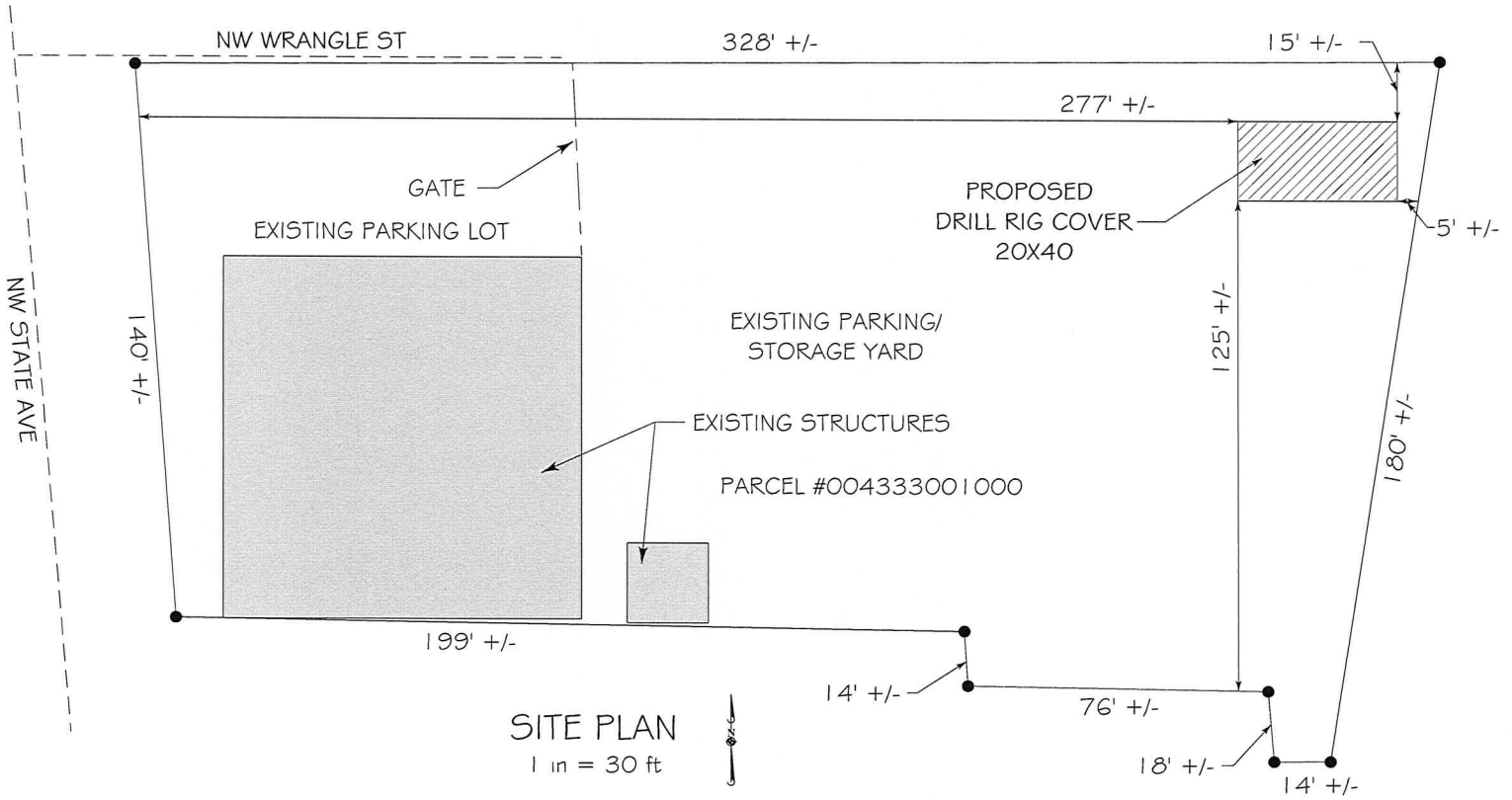
TO THE APPLICANT:

WAC 296-200A-110 Before issuing a building permit, a city, county or town must verify the registration of the general or specialty contractor applying for the permit.

RCW 18.27.010 (1)(a) "Contractor" includes any person, firm, corporation, or other entity who or which, in the pursuit of an independent business undertakes to, or offers to undertake, or submits a bid to, construct, alter, repair, add to, subtract from, improve, develop, move, wreck, or demolish any building, highway, road, railroad, excavation or other structure, project, development, or improvement attached to real estate or to do any part thereof including the installation of carpeting or other floor covering, the erection of scaffolding or other structures or works in connection therewith, the installation or repair of roofing or siding, performing tree removal services, or cabinet or similar installation; or, who, to do similar work upon his or her own property, employs members of more than one trade upon a single job or project or under a single building permit except as otherwise provided in this chapter. "Contractor" also includes a consultant acting as a general contractor.

"Contractor" also includes any person, firm, corporation, or other entity covered by this subsection (1), whether or not registered as required under this chapter or who are otherwise required to be registered or licensed by law, who offer to sell their property without occupying or using the structures, projects, developments, or improvements for more than one year from the date the structure, project, development, or improvement was substantially completed or abandoned. A person, firm, corporation, or other entity is not a contractor under this subsection (1)(c) if the person, firm, corporation, or other entity contracts with a registered general contractor and does not superintend the work.

CMC: 5.04.020 Business License required. No person shall engage in business in the city without first obtaining a license for such business issued by the city as provided herein. (This includes contractors.)



SITE PLAN

1 in = 30 ft

THE PROPERTY LINES IN THIS MAP ARE APPROXIMATE AND ARE NOT INTENDED TO BE USED AS SURVEY.

EXODUS ENGINEERING
PHONE: (360) 345-1566
LUKE@EXODUSENGINEER.COM

MOERKE & SONS
- DRILL COVER
1162 NW STATE AVE
CHEHALIS, WA 98532

REVISION TABLE			
NUMBER	DATE	REV. BY	DESC.

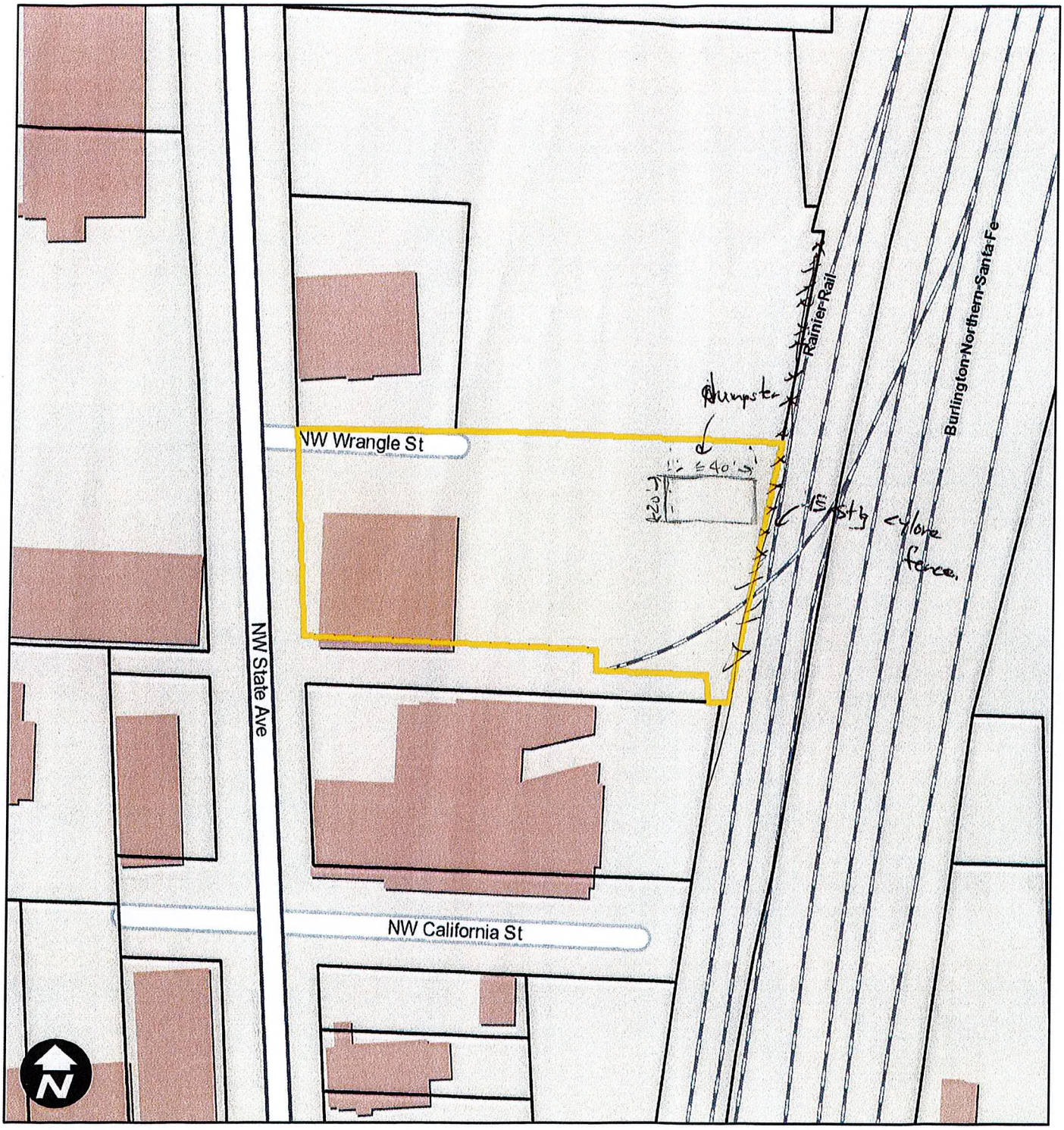
DRAWN BY: CLA

PROJECT # 24-100

PRINT DATE: 4/25/2024

SHEET: C-1

Lewis County GIS Web Map



4/19/2024, 10:54:57 AM

1:1,128

Parcels

Parcels

0 50 100 200 ft

NAD 1983 StatePlane Washington South FIPS 4602 Feet

LEWIS COUNTY

Lewis County GIS

CITY OF CHEHALIS
Where Heart and History Shape Our Future

Return your permit application to Community Development Department
1321 S Market Blvd. Chehalis, WA 98532
(360) 345-2229
www.ci.chehalis.wa.us email: comdev@ci.chehalis.wa.us

Job address: 0 Bishop Rd Parcel #: 017730002000

Applicant/Contact person

Name: Blake Regan / Spencer Kast - K&R Resources LLC

Mailing address: PO Box 7

City, State, and Zip: Adna, WA 98522

Phone #: 206.683.7340 Email: (required) kandrresources@gmail.com

Contractor/Engineer/Surveyor

Contact Name: Zach Wirkkala, EIT

Company/Firm Name: RB Engineering

Mailing address: PO Box 923

City, State, and Zip: Chehalis, WA 98532

Phone #: 360.740.8919 Email: (required) zachw@rbengineers.com

Contractor's L&I #:

Project Description: (Create a project narrative on a separate page if there is not enough room to completely describe your project below.)
Construction of a new 4,480 square foot warehouse shop with associated parking.

Current market value of proposed work: *(Fair market labor and materials)* $350,000

Only the plan(s) submitted will be reviewed for compliance with applicable codes. By signing below, you grant permission for any City of Chehalis employee the right to access and remain on the property for the purpose of review and approval of this proposal and to conduct inspections related to this proposal.

Signature: Date: 2.29.24

Print Name: Zachary Wirkkala, EIT

Office use only

Received by: Date Received:

Parcel #:

Permit #:

Zoning:

Flood Zone: yes no Zone Classification:

Clearing, Filling or Grading Attachment

City of Chehalis
Public Works Department
2007 NE KRESKY AVE; CHEHALIS, WA 98532
(360) 748-0238 / fax (360) 748-0694

Type of Proposed Work: ☒ Filling ☒ Grading ☐ Clearing

Number of Days Required to Complete Work: _____ Number of Acres Directly Affected: 0.53

Number of Cubic Yards of Fill Involved: 820 Cubic Yards

Maximum Fill Height: 6 feet Maximum Excavation Depth: 4 feet

The following items are required with ***every application***:

☑ Site Plan ☑ Grading Plan

☑ Interim Erosion & Sediment Control Plan ☑ Work Schedule

Required information (Check Applicable Boxes)

Environmental Checklist	☒ YES	☐ NO	☐ N/A: _____
Final Erosion/Sediment Control Plan	☒ YES	☐ NO	☐ N/A: _____
Soil Engineering Report	☐ YES	☐ NO	☐ N/A: _____
Engineering Geology Report	☐ YES	☐ NO	☐ N/A: _____
SEPA	☒ YES	☐ NO	☐ N/A: _____
Other:	☐ YES	☐ NO	☐ N/A: _____

Other Requirements / Comments: _____

"CALL BEFORE YOU DIG" 1-800-424-5555

****State law requires 48 hours advance notice to <u>all</u> utilities prior to any excavation work****

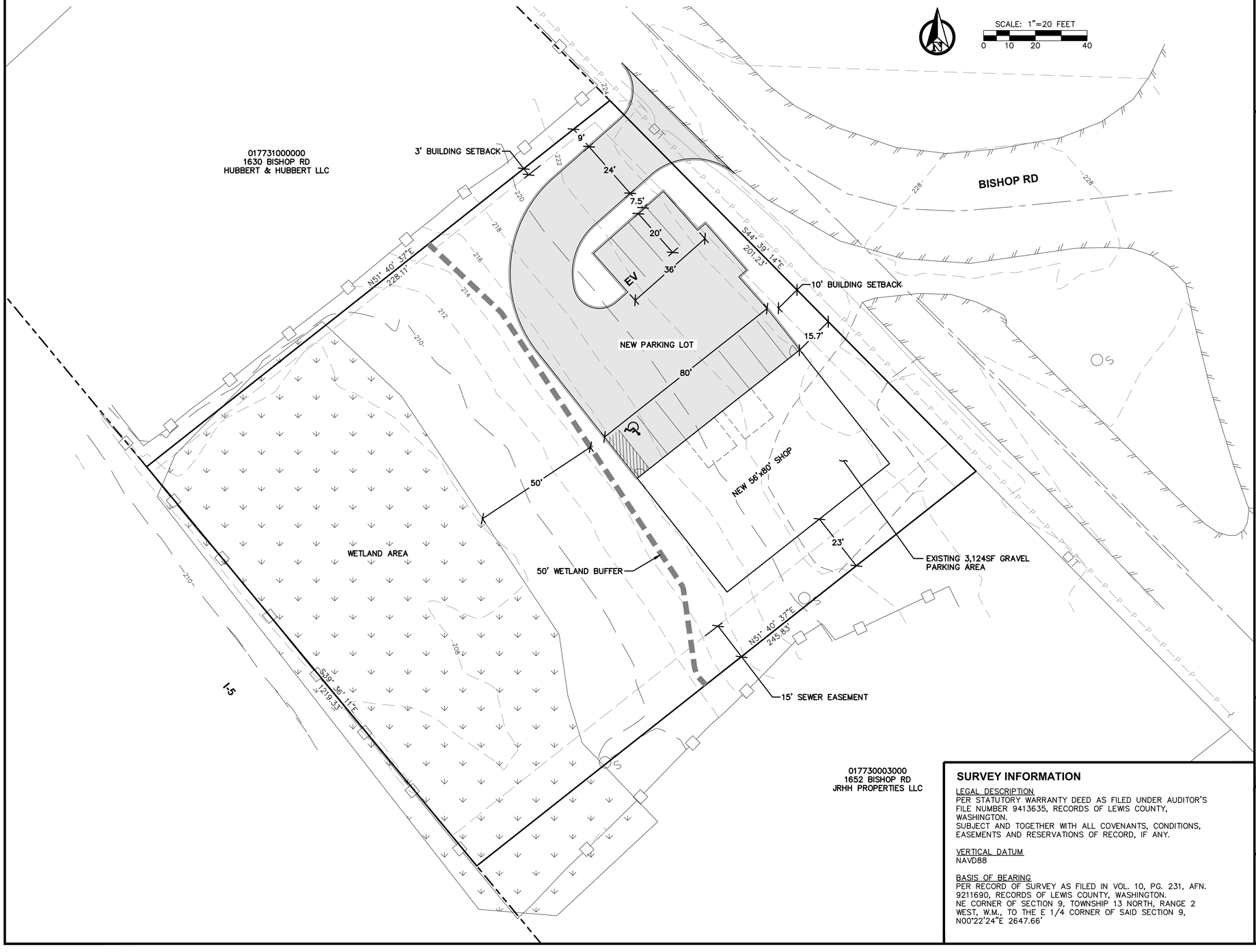
See Chehalis Municipal Code 15.28 for complete permit requirements and conditions.

Subject to all the terms, conditions and provisions written on, printed on, or attached to this form, the applicant is hereby authorized to perform the work as described on the application and approved plans. The City of Chehalis reserves the right to alter, amend, and/or rescind this permit, or modify any conditions or requirements.

Revised: 1/25/2010

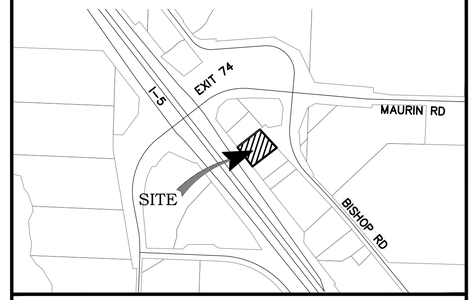
BISHOP RD SHOP

SECTION 9, TOWNSHIP 13 NORTH, RANGE 02 WEST, W.M.
LEWIS COUNTY, WASHINGTON



VICINITY MAP

N.T.S.



PROJECT INFORMATION

APPLICANT:	K&R RESOURCES KANDRRESOURCES@GMAIL.COM BLAKE REGAN 206-683-7340 SPENCER KAST 206-669-9983
ENGINEER:	ROBERT W. BALMELLI 91 S.W. 13TH ST. P.O. BOX 923 CHEHALIS, WA. 98532-0923 (360) 740-8919 PHONE (360) 740-8912 FAX
SURVEYOR:	BLUHM AND ASSOCIATES 1068 S. MARKET BLVD. CHEHALIS, WA 98532 360-748-1551
PARCEL NOS:	017730002000
SITE ADDRESS:	"0" BISHOP RD CHEHALIS, WA 98532
LAND USE APPROVAL:	SPR
SEPA CHECKLIST:	YES
CRITICAL AREAS:	WETLAND, 50' BUFFER
ZONING:	CG – GENERAL COMMERCIAL
SETBACKS:	FRONT 10', BACK 0', SIDE 3'
MAX. BLDG. HEIGHT:	50 FEET
BUILDING SIZE/USE:	4,480 SF / COMMERCIAL SHOP
BUILDING HEIGHT:	27 FT
TOTAL SITE AREA:	47,394 SF / 1.09 ACRES
EXISTING IMPERVIOUS:	3,124 SF / 0.07 ACRES (6.4%)
NEW IMPERVIOUS:	9,123 SF / 0.21 ACRES
REPLACED IMPERVIOUS:	3,124 SF / 0.07 ACRES
NEW+REPLACED IMPERV:	12,247 SF / 0.28 ACRES (25.7%)
LANDSCAPE AREA:	600 SF / 0.01 ACRES
TOTAL DISTURBED AREA:	12,847 SF / 0.29 ACRES
STREET FRONTAGE:	201 LINEAR FEET
GRADING (CUT/FILL):	±700 CY CUT / ±800 CY FILL
STORMWATER REGS:	2019 SWMMWW
SOIL CLASSIFICATION	NRCS, SILTY CLAY LOAM
INFILTRATION:	NO
TREATMENT:	BASIC
FLOW CONTROL:	DETENTION
NPDES STORM PERMIT:	NO
DRIVEWAY WIDTH:	24' WIDE, MAX. ALLOWED = 26'
PARKING REQUIRED:	1 PER 1,000 SF (5 TOTAL)
ADA REQUIRED:	1 STALL
PARKING PROVIDED:	7 STD. STALLS, 1 ADA STALL (8 TOTAL)
WATER SERVICE:	CITY OF CHEHALIS
SEWER SERVICE;	CITY OF CHEHALIS
FIRE DISTRICT:	LEWIS COUNTY FIRE DISTRICT #6
SCHOOL DISTRICT:	CHEHALIS SCHOOL DISTRICT
POWER SERVICE:	LEWIS COUNTY PUD
GAS SERVICE:	PSE

SHEET INDEX

SURVEY INFORMATION

LEGAL DESCRIPTION
PER STATUTORY WARRANTY DEED AS FILED UNDER AUDITOR'S FILE NUMBER 9413635, RECORDS OF LEWIS COUNTY, WASHINGTON.
SUBJECT AND TOGETHER WITH ALL COVENANTS, CONDITIONS, EASEMENTS AND RESERVATIONS OF RECORD, IF ANY.

VERTICAL DATUM
NAVD88

BASIS OF BEARING
PER RECORD OF SURVEY AS FILED IN VOL. 10, PG. 231, AFN. 9211690, RECORDS OF LEWIS COUNTY, WASHINGTON.
NE CORNER OF SECTION 9, TOWNSHIP 13 NORTH, RANGE 2 WEST, W.M., TO THE E 1/4 CORNER OF SAID SECTION 9, N00°22'24"E 2647.66'

WORK IN COUNTY RIGHT-OF-WAY

CONTRACTOR TO OBTAIN RIGHT OF WAY PERMIT PRIOR TO ANY WORK WITHIN COUNTY RIGHT OF WAY. ALL WORK WITHIN COUNTY RIGHT OF WAY SHALL ADHERE TO COUNTY STANDARDS AS OUTLINED IN THE RIGHT OF WAY PERMIT.

TOPOGRAPHIC NOTE

TOPOGRAPHIC INFORMATION DEPICTED HEREON WAS PROVIDED BY BLUHM AND ASSOCIATES. TOPOGRAPHIC INFORMATION WAS NOT FIELD VERIFIED BY RB ENGINEERING.

NO.	DATE	REVISION

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP
CHEHALIS WA.

PRELIMINARY SITE PLAN

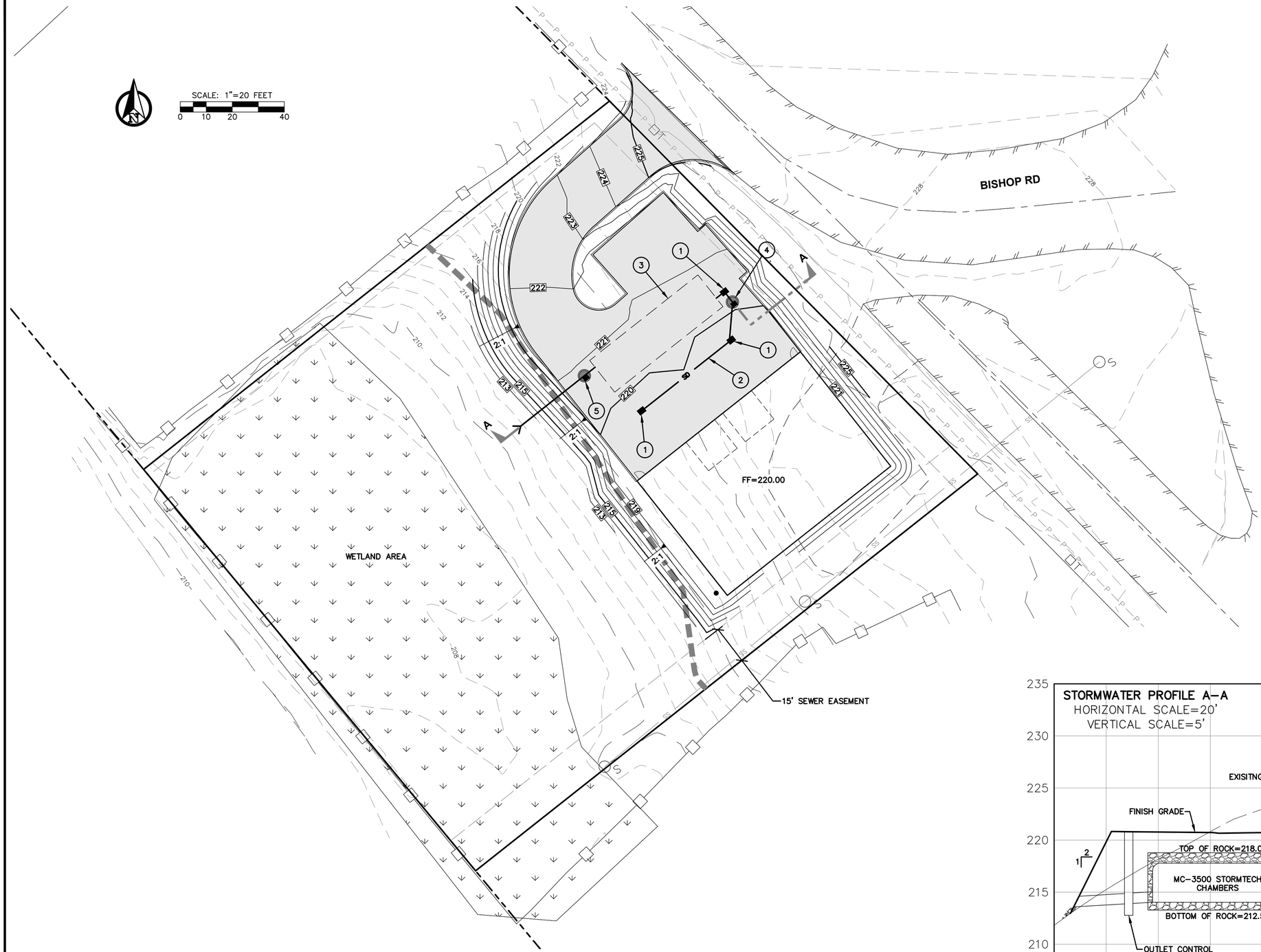
ROBERT W. BALMELLI — STATE OF WASHINGTON — 21141 — REGISTERED PROFESSIONAL ENGINEER

RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8919
EMAIL: CraftsmanRB@Engineers.com

811 Know what's below. Call 811 before you dig.

JOB NUMBER 21141
DRAWING NAME 21141_PSP

P0.1



STORM CONSTRUCTION NOTES:

1. INSTALL NEW TYPE 1 CATCH BASIN
2. INSTALL NEW 12" PVC STORM PIPE
3. INSTALL NEW UNDERGROUND ADS STORMTECH DETENTION SYSTEM
4. INSTALL NEW MANUFACTURED TREATMENT DEVICE (MANUFACTURER TO BE DETERMINED)
5. INSTALL NEW TYPE 2 CATCH BASIN WITH OUTLET STRUCTURE

STORMWATER PROFILE A–A

HORIZONTAL SCALE=20'
VERTICAL SCALE=5'

NO.	DATE	REVISION

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP
CHEHALIS WA.

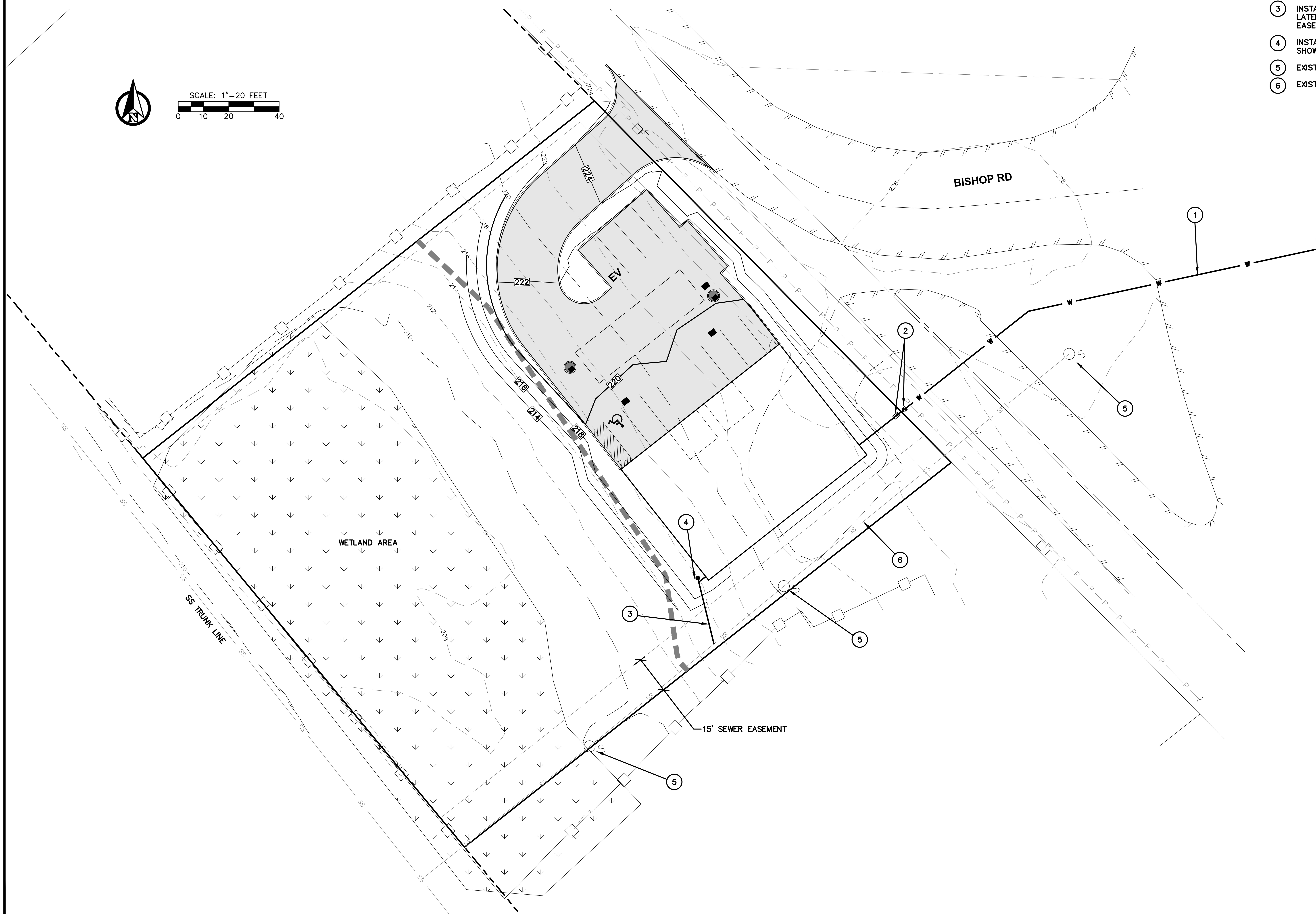
PRELIMINARY GRADING AND DRAINAGE PLAN

RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8919
EMAIL: CivilPros@RBEngineers.com

JOB NUMBER 21141
DRAWING NAME 21141_PGDPL

P1.1

2 OF 5



WATER CONSTRUCTION NOTES:

1. INSTALL NEW 2" WATER LINE. CONNECT TO EXISTING WATER MAIN IN BISHOP ROAD. EXACT LOCATION TBD.
2. INSTALL NEW WATER SERVICE METER AT PROPERTY LINE AND RPBA.
3. INSTALL NEW SEWER LATERAL. CONNECT NEW LATERAL TO EXISTING SEWER MAIN WITHIN EASEMENT
4. INSTALL NEW SEWER CLEANOUT AT LOCATION SHOWN
5. EXISTING SEWER MANHOLE
6. EXISTING SEWER MAIN

NO.	DATE	REVISION

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP
CHEHALIS WA.

PRELIMINARY UTILITY PLAN

ROBERT W. BA... REGISTERED PROFESSIONAL ENGINEER

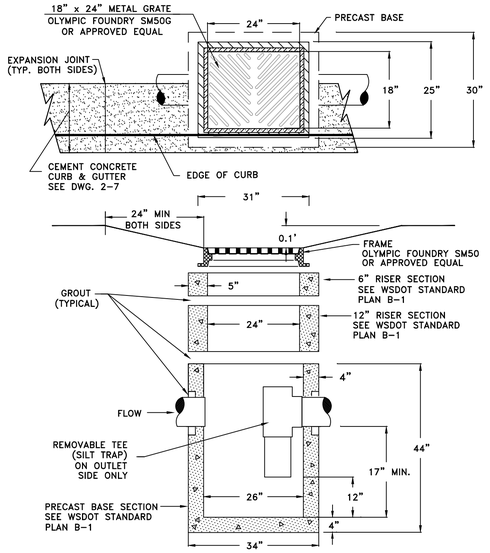
RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8919
EMAIL: CivilPros@RBEngineers.com

811 Know what's below. Call 811 before you dig.

JOB NUMBER
21141

DRAWING NAME
21141_PUTPL

P1.2
3 OF 5



NOTES:

1. CATCH BASIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH SPECIFICATIONS IN WSDOT STANDARD PLAN B-1.
2. OLYMPIC FOUNDRY GRATES SM50VG OR SM50S (OR APPROVED EQUAL), MAY BE REQUIRED WHEN CONDITIONS WARRANT, AS DETERMINED BY THE PUBLIC WORKS DIRECTOR.

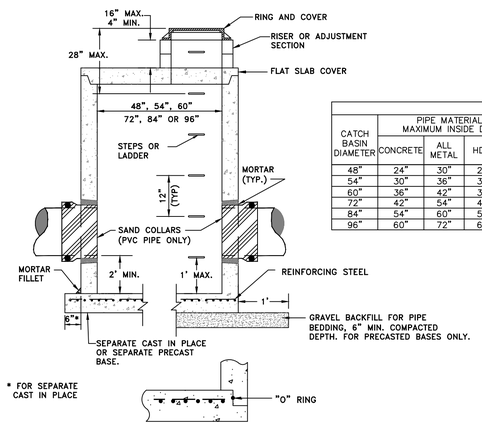
Drawing Not to Scale

City of Chehalis

CATCH BASIN WITH SILT TRAP TEE

APPROVED BY	DWG. NO. 3-1
	REVISED DATE 1/02/2003
CITY ENGINEER	

CATCH BASIN DIAMETER	WALL THICKNESS	BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS	BASE REINFORCING STEEL in^2/ft IN EACH DIRECTION	
					INTEGRAL	SEPARATE
48"	4"	6"	36"	8"	0.15	0.23
54"	4.5"	8"	42"	8"	0.19	0.19
60"	5"	8"	48"	8"	0.25	0.25
72"	6"	8"	60"	12"	0.24	0.35
84"	8"	12"	72"	12"	0.29	0.39
96"	8"	12"	84"	12"	0.29	0.39



PRECAST BASE JOINT DETAIL

CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER			
	CONCRETE	ALL METAL	HDPE	SOLID WALL PVC
48"	24"	30"	24"	27"
54"	30"	36"	30"	27"
60"	36"	42"	36"	36"
72"	42"	54"	42"	36"
84"	54"	60"	54"	36"
96"	60"	72"	60"	36"

NOTES:

1. NO STEPS ARE REQUIRED WHEN THE HEIGHT IS 4' OR LESS.
2. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM. TO 2.5" MAXIMUM. PROVIDE A 1.5" MINIMUM GAP BETWEEN THE KNOCKOUT WALL AND THE OUTSIDE OF THE PIPE. AFTER THE PIPE IS INSTALLED, FILL THE GAP WITH JOINT MORTAR.
3. THE BOTTOM OF THE PRECAST BASIN MAY BE SLOPED TO FACILITATE CLEANING.
4. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.

Drawing Not to Scale

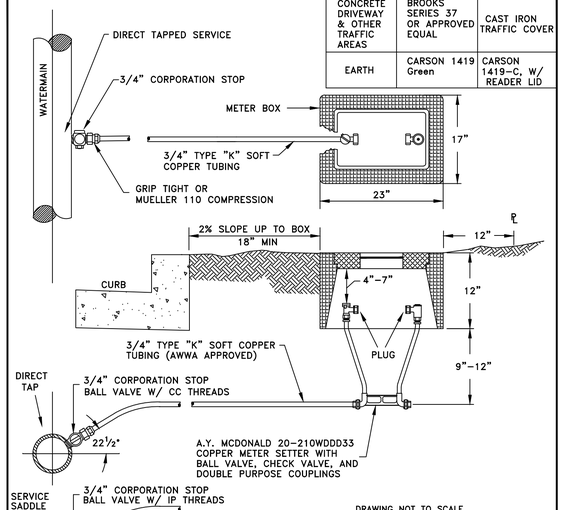
City of Chehalis

CATCH BASIN TYPE 2

APPROVED BY	DWG. NO. 3-9
	REVISED DATE 4/14/2005
CITY ENGINEER	

THE CITY UTILIZES A TOUCH READ METER SYSTEM. METER LIDS FOR METER BOX INSTALLATIONS MUST BE DRILLED WITH A 2" HOLE TO ACCOMMODATE TOUCH PAD.

ENVIRONMENT	METER BOX	LID TYPE*
CONCRETE SIDEWALK	BROOKS SERIES 37 OR APPROVED EQUAL	CONCRETE
CONCRETE DRIVEWAY & OTHER TRAFFIC AREAS	BROOKS SERIES 37 OR APPROVED EQUAL	CAST IRON TRAFFIC COVER
EARTH	CARSON 1419 Green	CARSON 1419-C, W/ READER LID



DRAWING NOT TO SCALE

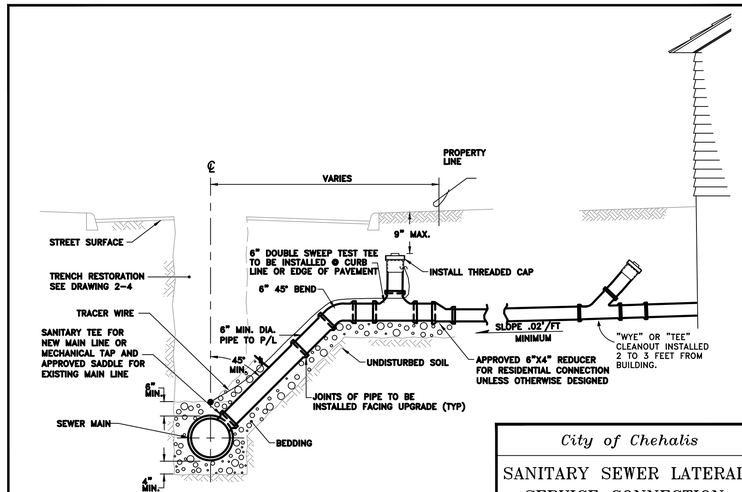
NOTES:

1. CORPORATION STOPS SHALL BE ALL U.S. BRASS, & SHALL BE FORD, MUELLER, OR A.Y. MCDONALD W/ THREADS CONFORMING TO AWWA.
2. ALL SERVICE SADDLES SHALL HAVE RUBBER GASKET, I.P. THREADS, & STAINLESS STEEL DOUBLE STRAPS.

City of Chehalis

5/8" X 3/4" SINGLE WATER SERVICE

APPROVED BY	DWG. NO. 4-1
	REVISED DATE 3/14/2005
CITY ENGINEER	



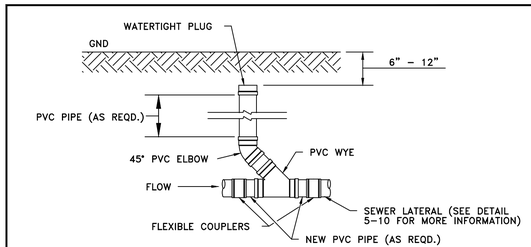
NOTES:

1. SIDE SEWER PIPE TO BE PVC ASTM D3034.
2. ALL JOINTS & CONNECTIONS TO BE RUBBER GASKETED TYPE CONFORMING TO ASTM D3212.
3. BEDDING AND GRADE SHALL BE ESTABLISHED PRIOR TO PIPE BEING PLACED IN TRENCH.

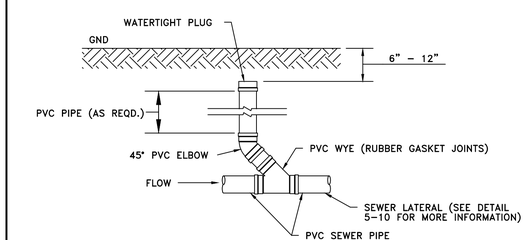
City of Chehalis

SANITARY SEWER LATERAL SERVICE CONNECTION

APPROVED FOR PUBLICATION	DWG. NO. 5-10
TIM GROCHOWSKI	REVISED DATE 3/17/2009
PUBLIC WORKS DIRECTOR	



CLEANOUT DIAGRAM FOR RETROFITTING EXISTING SERVICES



CLEANOUT DIAGRAM FOR NEW SERVICES

NOTES:

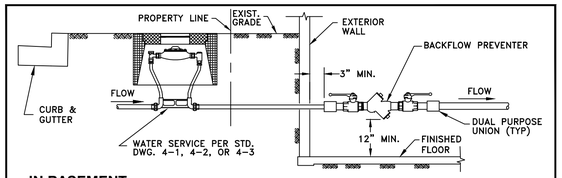
1. ALL JOINT CONNECTIONS SHALL BE RUBBER GASKETED.
2. SANITARY TEES MAY BE USED FOR DEPTHS LESS THAN 3', UPON APPROVAL OF THE PUBLIC WORKS DIRECTOR.

DRAWING NOT TO SCALE

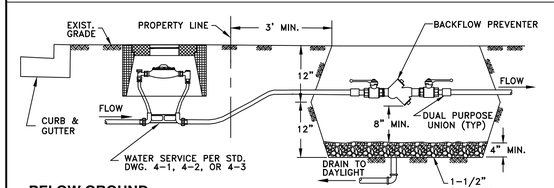
City of Chehalis

SIDE SEWER CLEANOUT

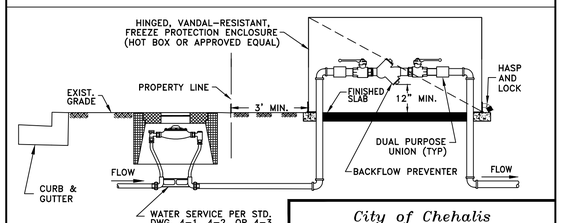
APPROVED BY	DWG. NO. 5-11
	REVISED DATE 1/02/2003
CITY ENGINEER	



IN BASEMENT



BELOW GROUND



ABOVE GROUND

NOTES:

1. BACKFLOW ASSEMBLY SHALL BE A WA. STATE D.O.H. APPROVED MODEL.
2. ALL MATERIALS TO BE BRASS OR COPPER AS APPROVED BY THE DIRECTOR OF PUBLIC WORKS.

DRAWING NOT TO SCALE

City of Chehalis

1/2"-2" DOUBLE CHECK BACKFLOW PREVENTER

APPROVED BY	DWG. NO. 4-18
	REVISED DATE 1/02/2003
CITY ENGINEER	

NO.	DATE	REVISION

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP

CHEHALIS WA.

PRELIMINARY DETAILS

ROBERT W. BALLEW — STATE OF WASHINGTON — 21141 — REGISTERED PROFESSIONAL ENGINEER

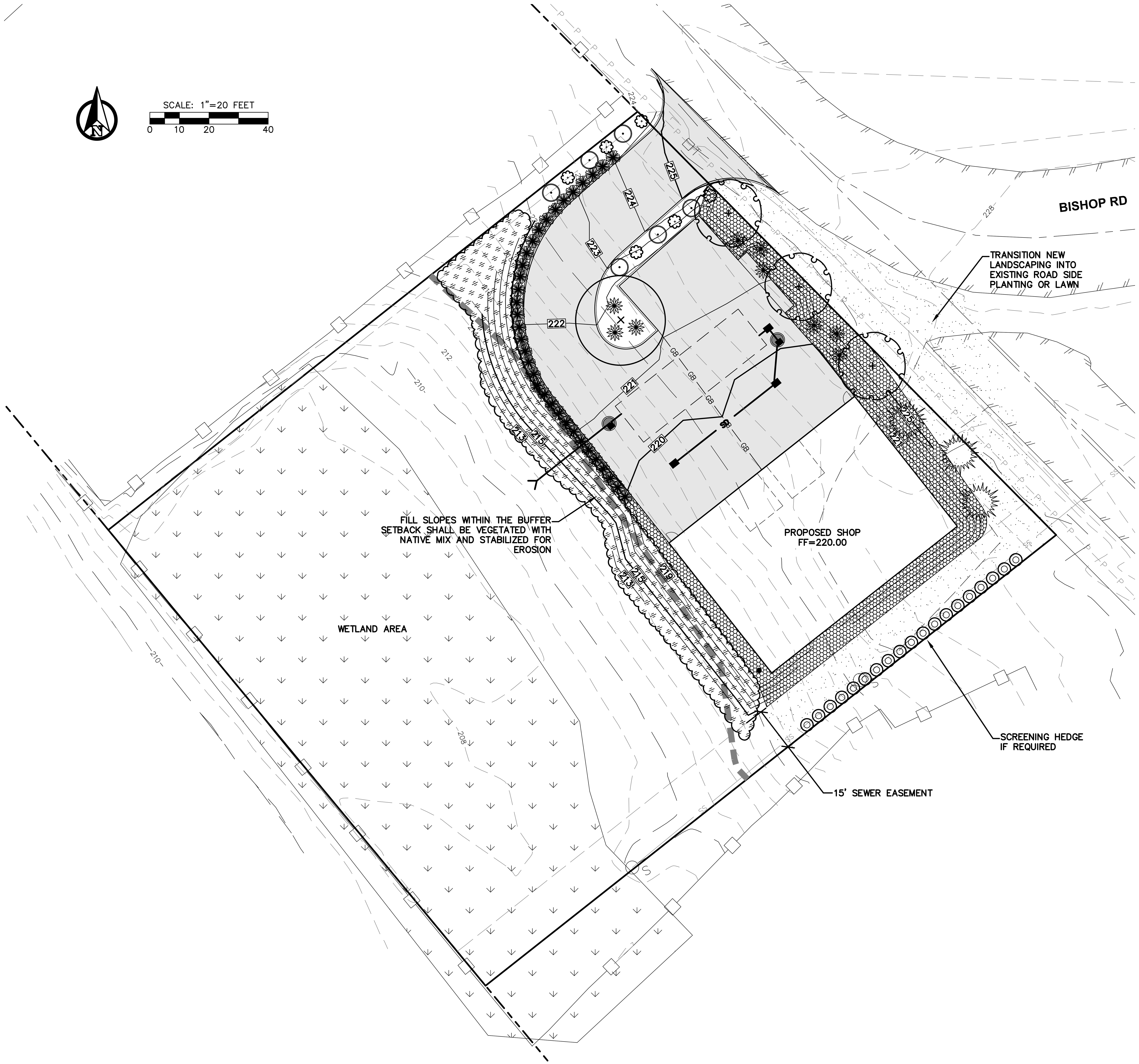
RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8819
EMAIL: ChehalisRBEngineers.com

811 Know what's below. Call 811 before you dig.

JOB NUMBER 21141
DRAWING NAME 21141_PDT

P1.3

4 OF 5



PRELIMINARY PLANT SCHEDULE

SYMBOL	QTY*	BOTANICAL NAME	COMMON NAME	SIZE	SPACING (NOTES)
		STREET TREE** Acer platanoides Liquidambar styraciflua Pyrus calleryana Acer rubrum	'Emerald Queen' Maple American Sweetgum Flowering Pear Red Sunset Maple	2.0" CAL. MIN.	B&B/cont. 35' O.C.
		ORNAMENTAL ACCENT TREE Fagus sylvatica 'Pendula' Malus spp. Acer palmatum Cerciciphyllum japonicum	Weeping Beech Flowering Crabapple Japanese Maple Katsura Tree	1.5" CAL. MIN.	B&B/cont.
		NARROW EVERGREEN TREE Chamaecyparis nootkatensis Pinus leucodermis	Alaskan Weeping Cedar Bosnian Pine	7–8' HT. MIN.	B&B/cont.
		MEDIUM GROWING SHRUBS Nandina Domestica Prunus laurocerasus Leucothoe hyb. Euonymus alata 'Compacta'	Heavenly Bamboo 'Otto Luyken' Laurel Leucothoe Dwarf Burning Bush		
		LOW GROWING SHRUBS Nandina domestica Azalea Spirea x. bumalda Pennisetum 'Rubrum' Hemmerocallis x. 'Malja' Sarcoccoca ruscifolia Erica carnea 'Springwood Pink'	Harbor Dwarf Nandina Azalea spp. Gold Mound Spirea Dwarf Fountain Grass Golden Zebra Daylilly Sweet Box Spring Heath		
		SPREADING ORNAMENTAL GROUNDCOVERS Viburnum davidii Euonymus fortunei Archtostaphylos uva–ursi Cotoneaster dammerii	David's Viburnum 'Emerald Gaiety' Euonymus Kinnickinnick Bearberry		
		WASHED ROCK SURFACE 2" graded washed rock mulch			
		BUFFER ENHANCEMENT PLANTING Symphoricarpos alba Rosa nutkana Spirea douglasii Cornus sericea Sambucus racemosa Rubus spectabilis Fraxinus latifolia	Snowberry Nootka Rose Douglas Spirea Red–twig Dogwood Red Elderberry Salmonberry Oregon Ash	1 GAL. or B.R.	6' O.C.
		SEEDED TURF AREA	Perennial rye lawn mixture		

PRELIMINARY PLANTING NOTES

* FINAL QUANTITES TO BE BASED ON MINIMUM CODE REQUIREMENTS. THE FINAL LANDSCAPE PLAN SHALL BE REVIEWED AND APPROVED ILLUSTRATING THE ACTUAL LANDSCAPE PLANT MATERIALS PROPOSED FOR CONSTRUCTION.

** STREET TREE SELECTION SUBJECT TO PUBLIC WORKS STANDARDS. FINAL SELECTION SHALL HAVE CHARACTERISTICS SUITABLE FOR STREET USE

1. FINAL LANDSCAPE PLANTING PLANS SHALL ILLUSTRATE LANDSCAPE INSTALLATION DETAILS & SPECIFICATIONS INCLUDING SOIL PREPARATION AND AMENDMENTS.

2. ALL LANDSCAPED AREAS SHALL DEMONSTRATE A MEANS OF IRRIGATION FOR ESTABLISHMENT, WHICH MAY INCLUDE AN AUTOMATIC IN–GROUND SPRINKLER SYSTEM WITH SOLID STATE PROGRAMMABLE CONTROLLER.

STATE OF WASHINGTON LICENSED LANDSCAPE ARCHITECT

REVISION | NO. | DATE

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP
CHEHALIS WA.

PRELIMINARY LANDSCAPE PLAN

ROBERT W. BAYLEY — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER

RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8919
EMAIL: CellPros@RBEngineers.com

811 Know what's below. Call 811 before you dig.

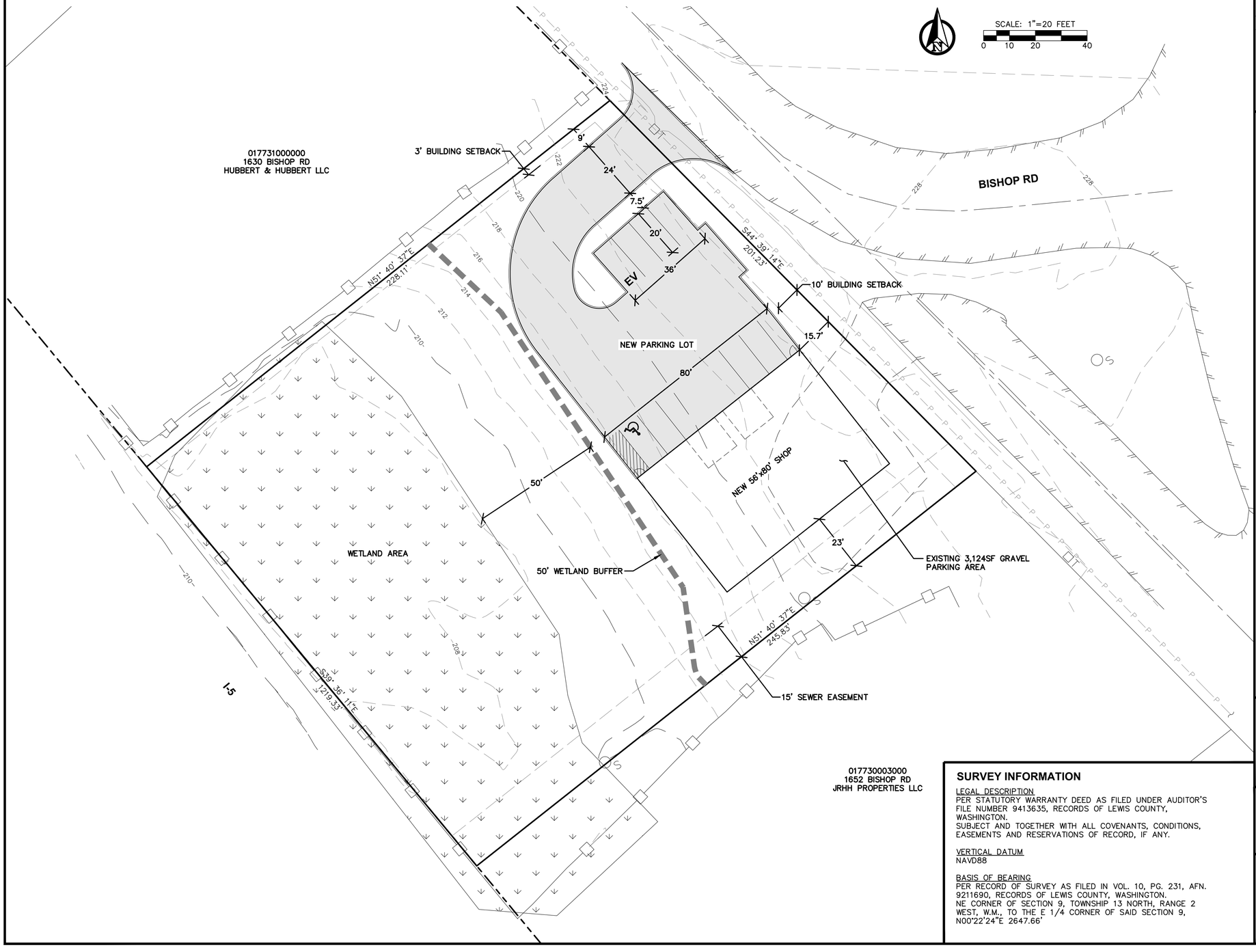
JOB NUMBER 21141

DRAWING NAME 21141_PLSP

L1.0

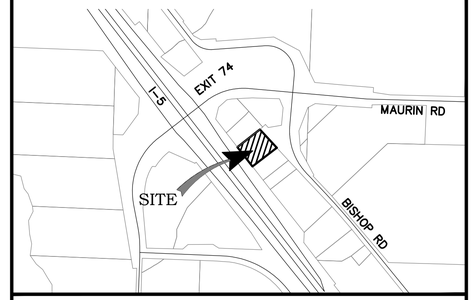
BISHOP RD SHOP

SECTION 9, TOWNSHIP 13 NORTH, RANGE 02 WEST, W.M.
LEWIS COUNTY, WASHINGTON



VICINITY MAP

N.T.S.



PROJECT INFORMATION

APPLICANT:	K&R RESOURCES KANDRRESOURCES@GMAIL.COM BLAKE REGAN 206-683-7340 SPENCER KAST 206-669-9983
ENGINEER:	ROBERT W. BALMELLI 91 S.W. 13TH ST. P.O. BOX 923 CHEHALIS, WA. 98532-0923 (360) 740-8919 PHONE (360) 740-8912 FAX
SURVEYOR:	BLUHM AND ASSOCIATES 1068 S. MARKET BLVD. CHEHALIS, WA 98532 360-748-1551
PARCEL NOS:	017730002000
SITE ADDRESS:	"0" BISHOP RD CHEHALIS, WA 98532
LAND USE APPROVAL:	SPR
SEPA CHECKLIST:	YES
CRITICAL AREAS:	WETLAND, 50' BUFFER
ZONING:	CG – GENERAL COMMERCIAL
SETBACKS:	FRONT 10', BACK 0', SIDE 3'
MAX. BLDG. HEIGHT:	50 FEET
BUILDING SIZE/USE:	4,480 SF / COMMERCIAL SHOP
BUILDING HEIGHT:	27 FT
TOTAL SITE AREA:	47,394 SF / 1.09 ACRES
EXISTING IMPERVIOUS:	3,124 SF / 0.07 ACRES (6.4%)
NEW IMPERVIOUS:	9,123 SF / 0.21 ACRES
REPLACED IMPERVIOUS:	3,124 SF / 0.07 ACRES
NEW+REPLACED IMPERV:	12,247 SF / 0.28 ACRES (25.7%)
LANDSCAPE AREA:	600 SF / 0.01 ACRES
TOTAL DISTURBED AREA:	12,847 SF / 0.29 ACRES
STREET FRONTAGE:	201 LINEAR FEET
GRADING (CUT/FILL):	±700 CY CUT / ±800 CY FILL
STORMWATER REGS:	2019 SWMMWW
SOIL CLASSIFICATION	NRCS, SILTY CLAY LOAM
INFILTRATION:	NO
TREATMENT:	BASIC
FLOW CONTROL:	DETENTION
NPDES STORM PERMIT:	NO
DRIVEWAY WIDTH:	24' WIDE, MAX. ALLOWED = 26'
PARKING REQUIRED:	1 PER 1,000 SF (5 TOTAL)
ADA REQUIRED:	1 STALL
PARKING PROVIDED:	7 STD. STALLS, 1 ADA STALL (8 TOTAL)
WATER SERVICE:	CITY OF CHEHALIS
SEWER SERVICE;	CITY OF CHEHALIS
FIRE DISTRICT:	LEWIS COUNTY FIRE DISTRICT #6
SCHOOL DISTRICT:	CHEHALIS SCHOOL DISTRICT
POWER SERVICE:	LEWIS COUNTY PUD
GAS SERVICE:	PSE

SHEET INDEX

SURVEY INFORMATION

LEGAL DESCRIPTION
PER STATUTORY WARRANTY DEED AS FILED UNDER AUDITOR'S FILE NUMBER 9413635, RECORDS OF LEWIS COUNTY, WASHINGTON.
SUBJECT AND TOGETHER WITH ALL COVENANTS, CONDITIONS, EASEMENTS AND RESERVATIONS OF RECORD, IF ANY.

VERTICAL DATUM
NAVD88

BASIS OF BEARING
PER RECORD OF SURVEY AS FILED IN VOL. 10, PG. 231, AFN. 9211690, RECORDS OF LEWIS COUNTY, WASHINGTON.
NE CORNER OF SECTION 9, TOWNSHIP 13 NORTH, RANGE 2 WEST, W.M., TO THE E 1/4 CORNER OF SAID SECTION 9, N00°22'24"E 2647.66'

WORK IN COUNTY RIGHT-OF-WAY

CONTRACTOR TO OBTAIN RIGHT OF WAY PERMIT PRIOR TO ANY WORK WITHIN COUNTY RIGHT OF WAY. ALL WORK WITHIN COUNTY RIGHT OF WAY SHALL ADHERE TO COUNTY STANDARDS AS OUTLINED IN THE RIGHT OF WAY PERMIT.

TOPOGRAPHIC NOTE

TOPOGRAPHIC INFORMATION DEPICTED HEREON WAS PROVIDED BY BLUHM AND ASSOCIATES. TOPOGRAPHIC INFORMATION WAS NOT FIELD VERIFIED BY RB ENGINEERING.

NO.	DATE	REVISION

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP
CHEHALIS WA.

PRELIMINARY SITE PLAN

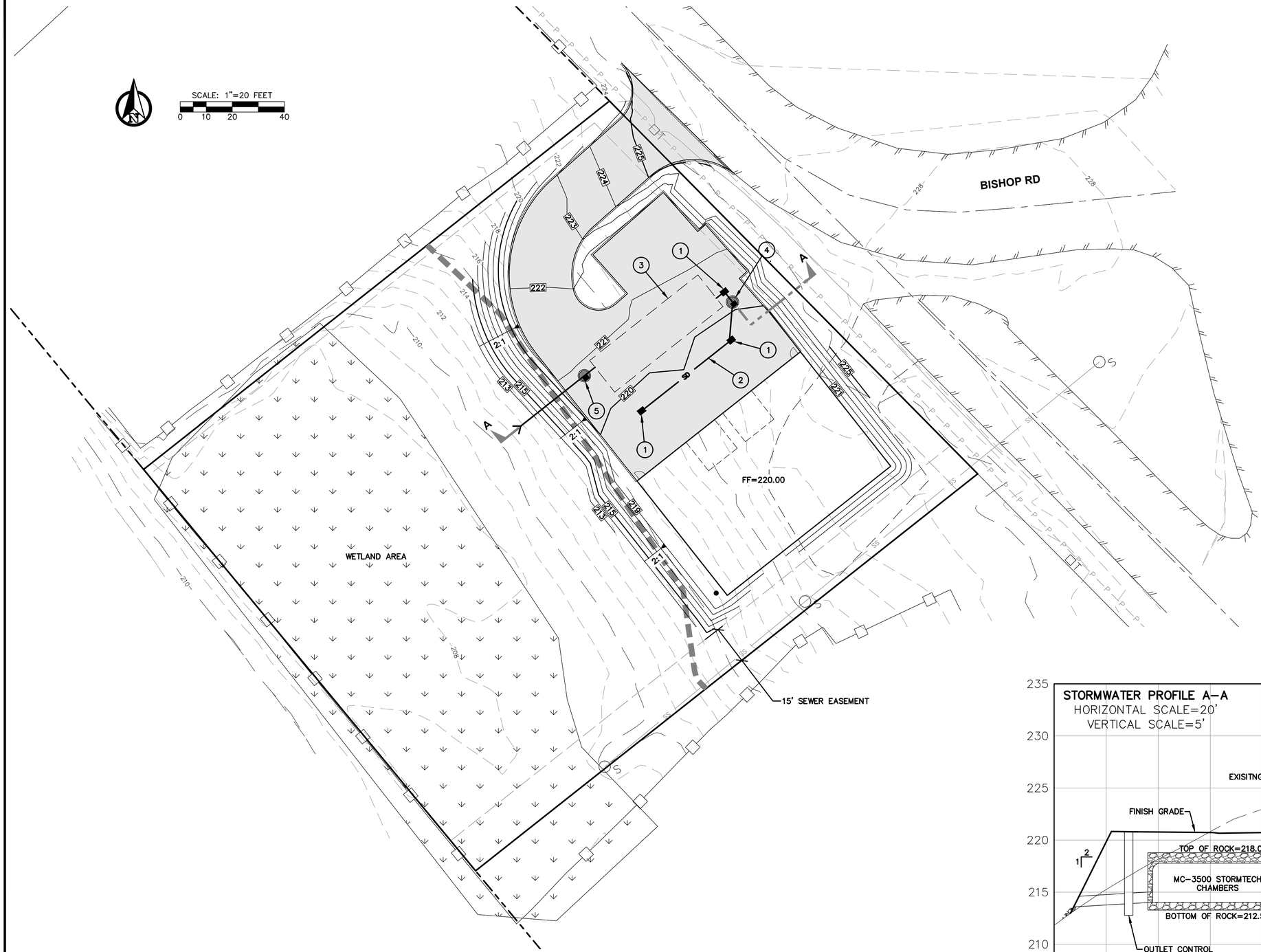
ROBERT W. BALMELLI — STATE OF WASHINGTON — 21141 — REGISTERED PROFESSIONAL ENGINEER

RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8919
EMAIL: CraftsmanRB@Engineers.com

811 Know what's below. Call 811 before you dig.

JOB NUMBER 21141
DRAWING NAME 21141_PSP

P0.1



STORM CONSTRUCTION NOTES:

1. INSTALL NEW TYPE 1 CATCH BASIN
2. INSTALL NEW 12" PVC STORM PIPE
3. INSTALL NEW UNDERGROUND ADS STORMTECH DETENTION SYSTEM
4. INSTALL NEW MANUFACTURED TREATMENT DEVICE (MANUFACTURER TO BE DETERMINED)
5. INSTALL NEW TYPE 2 CATCH BASIN WITH OUTLET STRUCTURE

NO.	DATE	REVISION

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP

CHEHALIS WA.

PRELIMINARY GRADING AND DRAINAGE PLAN

ROBERT W. BALMELLI
STATE OF WASHINGTON
52107
REGISTERED PROFESSIONAL ENGINEER

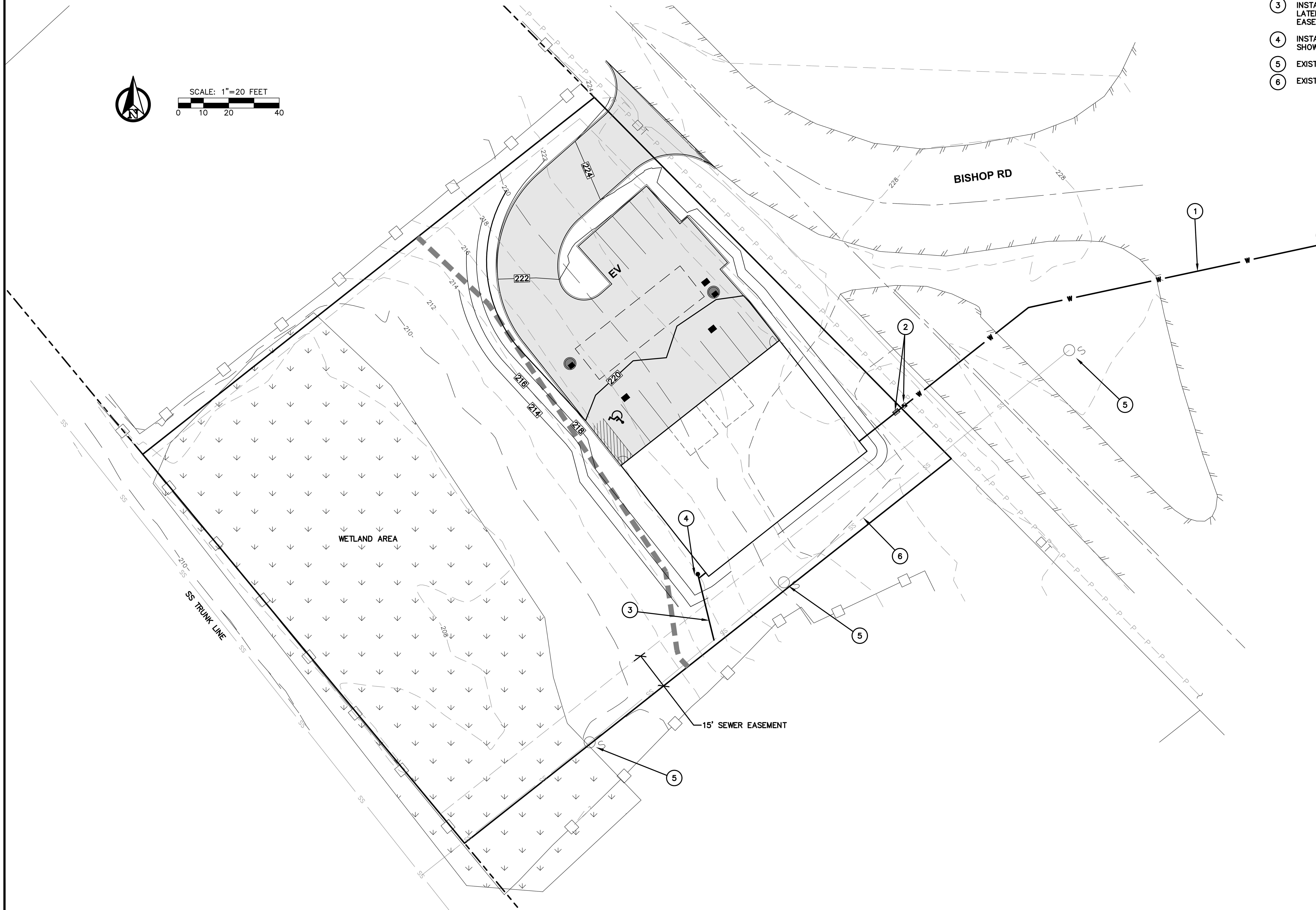
RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8919
EMAIL: CivilPros@RBEngineers.com

811 Know what's below. Call 811 before you dig.

JOB NUMBER
21141

DRAWING NAME
21141_PGDPL

P1.1
2 OF 5



WATER CONSTRUCTION NOTES:

1. INSTALL NEW 2" WATER LINE. CONNECT TO EXISTING WATER MAIN IN BISHOP ROAD. EXACT LOCATION TBD.
2. INSTALL NEW WATER SERVICE METER AT PROPERTY LINE AND RPBA.
3. INSTALL NEW SEWER LATERAL. CONNECT NEW LATERAL TO EXISTING SEWER MAIN WITHIN EASEMENT
4. INSTALL NEW SEWER CLEANOUT AT LOCATION SHOWN
5. EXISTING SEWER MANHOLE
6. EXISTING SEWER MAIN

NO.	DATE	REVISION

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP
CHEHALIS WA.

PRELIMINARY UTILITY PLAN

ROBERT W. BA... REGISTERED PROFESSIONAL ENGINEER

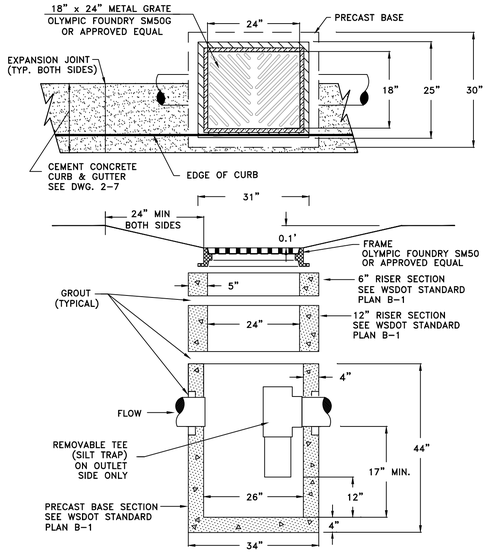
RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8919
EMAIL: CivilPros@RBEngineers.com

811 Know what's below. Call 811 before you dig.

JOB NUMBER
21141

DRAWING NAME
21141_PUTPL

P1.2



NOTES:

1. CATCH BASIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH SPECIFICATIONS IN WSDOT STANDARD PLAN B-1.
2. OLYMPIC FOUNDRY GRATES SM50VG OR SM50S (OR APPROVED EQUAL), MAY BE REQUIRED WHEN CONDITIONS WARRANT, AS DETERMINED BY THE PUBLIC WORKS DIRECTOR.

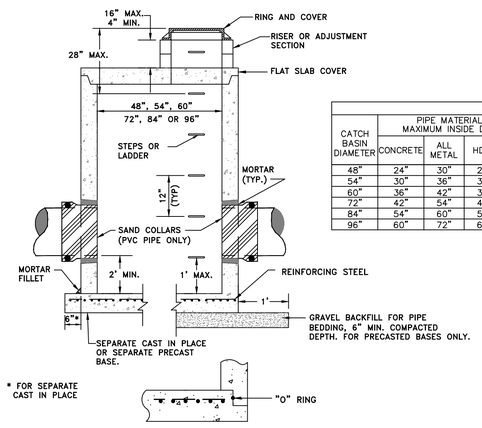
Drawing Not to Scale

City of Chehalis

CATCH BASIN WITH SILT TRAP TEE

APPROVED BY	DWG. NO. 3-1
	REVISED DATE 1/02/2003
CITY ENGINEER	

CATCH BASIN DIAMETER	WALL THICKNESS	BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS	BASE REINFORCING STEEL in^2/ft IN EACH DIRECTION	
					INTEGRAL	SEPARATE
48"	4"	6"	36"	8"	0.15	0.23
54"	4.5"	8"	42"	8"	0.19	0.19
60"	5"	8"	48"	8"	0.25	0.25
72"	6"	8"	60"	12"	0.24	0.35
84"	8"	12"	72"	12"	0.29	0.39
96"	8"	12"	84"	12"	0.29	0.39



PRECAST BASE JOINT DETAIL

CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER			
	CONCRETE	ALL METAL	HDPE	SOLID WALL PVC
48"	24"	30"	24"	27"
54"	30"	36"	30"	27"
60"	36"	42"	36"	36"
72"	42"	54"	42"	36"
84"	54"	60"	54"	36"
96"	60"	72"	60"	36"

NOTES:

1. NO STEPS ARE REQUIRED WHEN THE HEIGHT IS 4' OR LESS.
2. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM. TO 2.5" MAXIMUM. PROVIDE A 1.5" MINIMUM GAP BETWEEN THE KNOCKOUT WALL AND THE OUTSIDE OF THE PIPE. AFTER THE PIPE IS INSTALLED, FILL THE GAP WITH JOINT MORTAR.
3. THE BOTTOM OF THE PRECAST BASIN MAY BE SLOPED TO FACILITATE CLEANING.
4. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.

Drawing Not to Scale

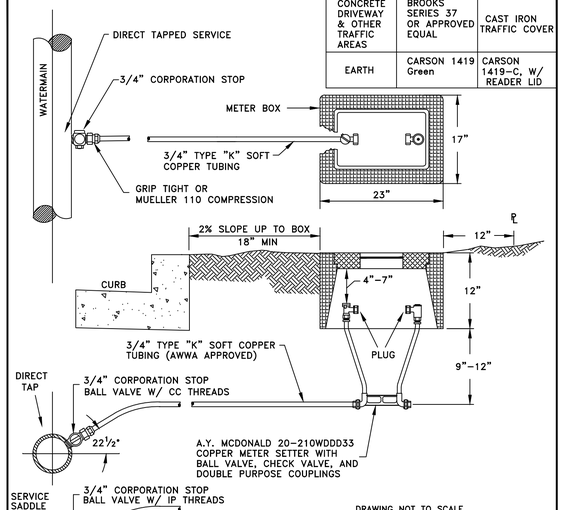
City of Chehalis

CATCH BASIN TYPE 2

APPROVED BY	DWG. NO. 3-9
	REVISED DATE 4/14/2005
CITY ENGINEER	

THE CITY UTILIZES A TOUCH READ METER SYSTEM. METER LIDS FOR METER BOX INSTALLATIONS MUST BE DRILLED WITH A 2" HOLE TO ACCOMMODATE TOUCH PAD.

ENVIRONMENT	METER BOX	LID TYPE*
CONCRETE SIDEWALK	BROOKS SERIES 37 OR APPROVED EQUAL	CONCRETE
CONCRETE DRIVEWAY & OTHER TRAFFIC AREAS	BROOKS SERIES 37 OR APPROVED EQUAL	CAST IRON TRAFFIC COVER
EARTH	CARSON 1419 Green	CARSON 1419-C, W/ READER LID



DRAWING NOT TO SCALE

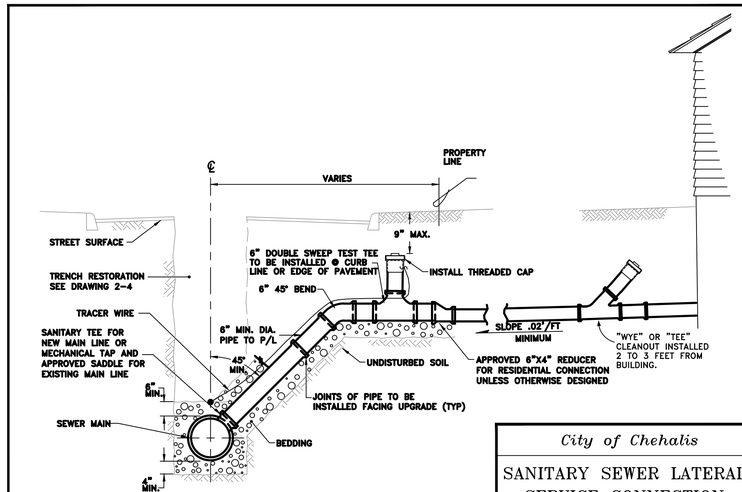
NOTES:

1. CORPORATION STOPS SHALL BE ALL U.S. BRASS, & SHALL BE FORD, MUELLER, OR A.Y. MCDONALD W/ THREADS CONFORMING TO AWWA.
2. ALL SERVICE SADDLES SHALL HAVE RUBBER GASKET, I.P. THREADS, & STAINLESS STEEL DOUBLE STRAPS.

City of Chehalis

5/8" X 3/4" SINGLE WATER SERVICE

APPROVED BY	DWG. NO. 4-1
	REVISED DATE 3/14/2005
CITY ENGINEER	



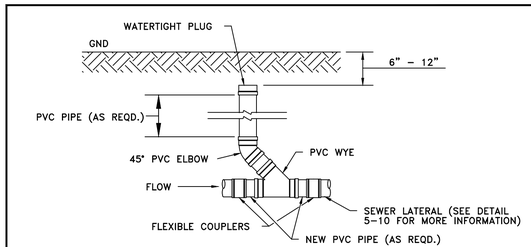
NOTES:

1. SIDE SEWER PIPE TO BE PVC ASTM D3034.
2. ALL JOINTS & CONNECTIONS TO BE RUBBER GASKETED TYPE CONFORMING TO ASTM D3212.
3. BEDDING AND GRADE SHALL BE ESTABLISHED PRIOR TO PIPE BEING PLACED IN TRENCH.

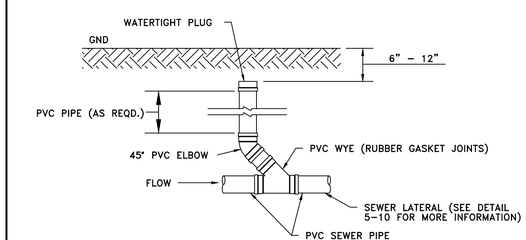
City of Chehalis

SANITARY SEWER LATERAL SERVICE CONNECTION

APPROVED FOR PUBLICATION	DWG. NO. 5-10
TIM GROCHOWSKI	REVISED DATE 3/17/2009
PUBLIC WORKS DIRECTOR	



CLEANOUT DIAGRAM FOR RETROFITTING EXISTING SERVICES



CLEANOUT DIAGRAM FOR NEW SERVICES

NOTES:

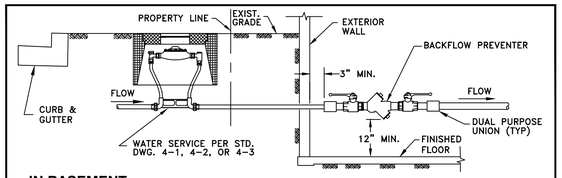
1. ALL JOINT CONNECTIONS SHALL BE RUBBER GASKETED.
2. SANITARY TEES MAY BE USED FOR DEPTHS LESS THAN 3', UPON APPROVAL OF THE PUBLIC WORKS DIRECTOR.

DRAWING NOT TO SCALE

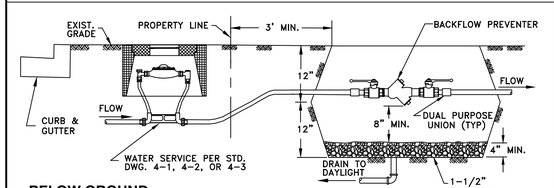
City of Chehalis

SIDE SEWER CLEANOUT

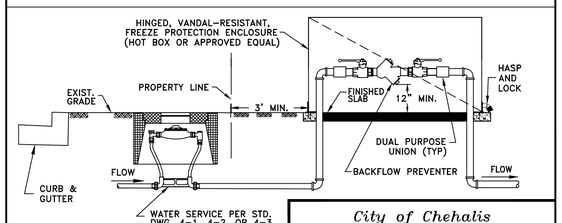
APPROVED BY	DWG. NO. 5-11
	REVISED DATE 1/02/2003
CITY ENGINEER	



IN BASEMENT



BELOW GROUND



ABOVE GROUND

NOTES:

1. BACKFLOW ASSEMBLY SHALL BE A WA. STATE D.O.H. APPROVED MODEL.
2. ALL MATERIALS TO BE BRASS OR COPPER AS APPROVED BY THE DIRECTOR OF PUBLIC WORKS.

DRAWING NOT TO SCALE

City of Chehalis

1/2"-2" DOUBLE CHECK BACKFLOW PREVENTER

APPROVED BY	DWG. NO. 4-18
	REVISED DATE 1/02/2003
CITY ENGINEER	

NO.	DATE	REVISION

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP

CHEHALIS WA.

PRELIMINARY DETAILS

ROBERT W. BALLEW — STATE OF WASHINGTON — 21141 — REGISTERED PROFESSIONAL ENGINEER

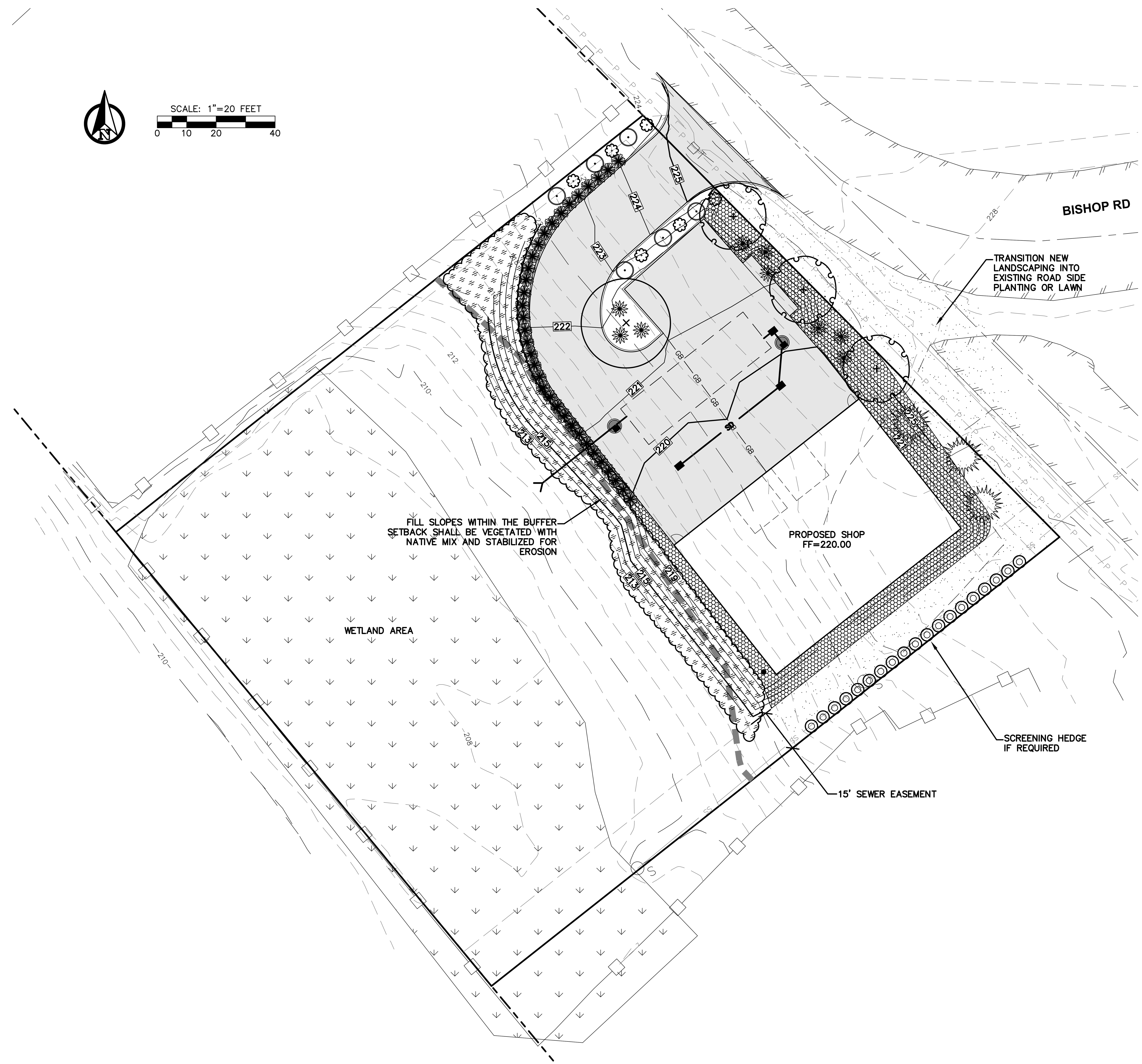
RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8819
EMAIL: ChehalisRBEngineers.com

811 Know what's below. Call 811 before you dig.

JOB NUMBER 21141
DRAWING NAME 21141_PDT

P1.3

4 OF 5



PRELIMINARY PLANT SCHEDULE

SYMBOL	QTY*	BOTANICAL NAME	COMMON NAME	SIZE	SPACING (NOTES)
		STREET TREE**			
		Acer platanoides	'Emerald Queen' Maple	2.0" CAL. MIN.	B&B/cont. 35' O.C.
		Liquidambar styraciflua	American Sweetgum		
		Pyrus calleryana	Flowering Pear		
		Acer rubrum	Red Sunset Maple		
		ORNAMENTAL ACCENT TREE			
		Fagus sylvatica 'Pendula'	Weeping Beech	1.5" CAL. MIN.	B&B/cont.
		Malus spp.	Flowering Crabapple		
		Acer palmatum	Japanese Maple		
		Cerciciphyllum japonicum	Katsura Tree		
		NARROW EVERGREEN TREE			
		Chamaecyparis nootkatensis	Alaskan Weeping Cedar	7–8' HT. MIN.	B&B/cont.
		Pinus leucodermis	Bosnian Pine		
		MEDIUM GROWING SHRUBS			
		Nandina Domestica	Heavenly Bamboo		
		Prunus laurocerasus	'Otto Luyken' Laurel		
		Leucothoe hyb.	Leucothoe		
		Euonymus alata 'Compacta'	Dwarf Burning Bush		
		LOW GROWING SHRUBS			
		Nandina domestica	Harbor Dwarf Nandina		
		Azalea	Azalea spp.		
		Spirea x. bumalda	Gold Mound Spirea		
		Pennisetum 'Rubrum'	Dwarf Fountain Grass		
		Hemmerocallis x. 'Malja'	Golden Zebra Daylilly		
		Sarcoccoca ruscifolia	Sweet Box		
		Erica carnea 'Springwood Pink'	Spring Heath		
		SPREADING ORNAMENTAL GROUNDCOVERS			
		Viburnum davidii	David's Viburnum		
		Euonymus fortunei	'Emerald Gaiety' Euonymus		
		Archtostaphylos uva–ursi	Kinnickinnick		
		Cotoneaster dammerii	Bearberry		
		WASHED ROCK SURFACE			
		2" graded washed rock mulch			
		BUFFER ENHANCEMENT PLANTING			
		Symphoricarpos alba	Snowberry	1 GAL. or B.R.	6' O.C.
		Rosa nutkana	Nootka Rose		
		Spirea douglasii	Douglas Spirea		
		Cornus sericea	Red–twig Dogwood		
		Sambucus racemosa	Red Elderberry		
		Rubus spectabilis	Salmonberry		
		Fraxinus latifolia	Oregon Ash		
		SEEDED TURF AREA	Perennial rye lawn mixture		

PRELIMINARY PLANTING NOTES

* FINAL QUANTITES TO BE BASED ON MINIMUM CODE REQUIREMENTS. THE FINAL LANDSCAPE PLAN SHALL BE REVIEWED AND APPROVED ILLUSTRATING THE ACTUAL LANDSCAPE PLANT MATERIALS PROPOSED FOR CONSTRUCTION.

** STREET TREE SELECTION SUBJECT TO PUBLIC WORKS STANDARDS. FINAL SELECTION SHALL HAVE CHARACTERISTICS SUITABLE FOR STREET USE

1. FINAL LANDSCAPE PLANTING PLANS SHALL ILLUSTRATE LANDSCAPE INSTALLATION DETAILS & SPECIFICATIONS INCLUDING SOIL PREPARATION AND AMENDMENTS.

2. ALL LANDSCAPED AREAS SHALL DEMONSTRATE A MEANS OF IRRIGATION FOR ESTABLISHMENT, WHICH MAY INCLUDE AN AUTOMATIC IN–GROUND SPRINKLER SYSTEM WITH SOLID STATE PROGRAMMABLE CONTROLLER.

STATE OF WASHINGTON LICENSED LANDSCAPE ARCHITECT

REVISION | NO. | DATE

DESIGNED BY: ZRW
DRAWN BY: ZRW
CHECKED BY: RWB
DATE: 2/29/24
SCALE:

BISHOP RD SHOP
CHEHALIS WA.

PRELIMINARY LANDSCAPE PLAN

ROBERT W. BAKER — REGISTERED PROFESSIONAL ENGINEER

RB Engineering
DESIGN → PERMIT → MANAGE
P.O. Box 923
CHEHALIS, WA 98532
OFF: (360) 740-8919
EMAIL: CellPros@RBEngineers.com

JOB NUMBER 21141
DRAWING NAME 21141_PLSP

L1.0

SEPA ENVIRONMENTAL CHECKLIST

Bishop Road Shop

RBE Project No. 21141

February 2024

Prepared by:

RB Engineering

Table of Contents

A. Background

1. **Name of proposed project, if applicable:**

   Bishop Road Multi-Family

   RBE Project No. 21141

2. **Name of applicant:**

   K&R Resources

3. **Address and phone number of applicant and contact person:**

   PO Box 7
   Adna, WA 98522

4. **Date checklist prepared:**

   2/6/2024

5. **Agency requesting checklist:**

   City of Chehalis

6. **Proposed timing or schedule (including phasing, if applicable):**

   Spring 2025

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

   No.

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

   A Geotech Report and Wetland Report have been completed for this project.

9. **Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.**

   No.

10. **List any government approvals or permits that will be needed for your proposal, if known.**

    This project will include the following permits: Land Use, Grading, Site Development Permit.

11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The project includes constructing a new 4,480 square foot shop building with associated parking, utilites, and stormwater facilities. The site has a sinlge access off of Bishop Rd.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Property address(s) is 0 Bishop Rd, Chehalis WA 98532, Parcel No.(s) 017730002000 Section 9, Township 13N, Range 02W, W.M.

B. Environmental Elements

1. Earth

a. General description of the site:

☐ Flat, ☐ Rolling, ☒ Hilly, ☐ Steep slopes, ☐ Mountainous, ☐ other: _____

b. What is the steepest slope on the site (approximate percent slope)?

Steepest slope onsite is approximately 15%.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them, and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Per NRCS Soil Data Survey Reed silty clay loam and Scamman silty clay loam are present onsite.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so,
describe.

There is no indication of history of unstable soils in the immediate vicinity.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

The site will include approximately 700 cy of cut and 820 cy of fill. Material will be from a local DNR approved mining operation.

f. Could erosion occur because of clearing, construction, or use? If so, generally describe.

Yes, however a Stormwater Pollution Prevention Plan (SWPPP) will be prepared that outlines appropriate Best Management Practices to control and contain any sediment migration within the project limits.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

26 percent of the property will be covered with impervious surface.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any.

Best Management Practices will be used to prevent and contain erosion onsite during construction. The project's SWPPP requires that a Certified Erosion and Sediment Control Lead (CESCL) monitors the site during construction.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Normal emissions associated with construction equipment combustion engine exhaust and possible dust emoissions will be generated during the construction phase of the project. Once the project is completed, public and commercial vehicle emissions will be generated.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any.

N/A

3. Water

a. Surface Water:

1. **Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.**

   Yes, there is a wetland in the southwest portion of the site caused from a low spot between the site and I-5.

2. **Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

   Yes, the entire project is located within 200-feet of the existing wetland, however no impervious surfaces will be constructed within the wetland's 50-foot buffer.

3. **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.**

   None.

4. **Will the proposal require surface water withdrawals or diversions? Give a general description, purpose, and approximate quantities if known.**

   No.

5. **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

   No.

6. **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

No.

b. Ground Water:

1. **Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give a general description, purpose, and approximate quantities if known.**

   No.

2. **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (domestic sewage; industrial, containing the following chemicals…; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

   None.

c. Water Runoff (including stormwater):

1. **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

   The project will create new impervious surface that will generate stormwater runoff. The runoff will be conveyed to the new stormwater facility. The stormwater facility will dishcarge runoff by metered release to the wetland.

2. **Could waste materials enter ground or surface waters? If so, generally describe.**

   No.

3. **Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.**

   No.

4. **Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any.**

   The project will incorporate a SWPPP and stormwater design that provides water quality and flow control facilities to mitigate the impacts to surface and ground waters.

4. Plants

a. Check the types of vegetation found on the site:

- ☐ **deciduous tree: alder, maple, aspen, other**
- ☐ **evergreen tree: fir, cedar, pine, other**

☐ **shrubs**
☒ **grass**
☒ **pasture**
☐ **crop or grain**
☐ **orchards, vineyards, or other permanent crops.**
☐ **wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other**
☐ **water plants: water lily, eelgrass, milfoil, other**
☐ **other types of vegetation**

b. What kind and amount of vegetation will be removed or altered?

Approximately 0.53 acres of vegetation will be removed to construct this project. Vegetation include: grasses, brush

c. List threatened and endangered species known to be on or near the site.

None known.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any.

A Landscaping Plan will be prepared by a Landscape Architect and submitted to the City for approval. The plan will consist of native drought resistant plantings.

e. List all noxious weeds and invasive species known to be on or near the site.

None known.

5. Animals

a. List any birds and other animals that have been observed on or near the site or are known to be on or near the site. Examples include:

Birds: ☐ hawk, ☐ heron, ☐ eagle, ☐ songbirds, ☐ other: _____
Mammals: ☐ deer, ☐ bear, ☐ elk, ☐ beaver, ☐other: _____
Fish: ☐ bass, ☐ salmon, ☐ trout, ☐ herring, ☐ shellfish, ☐ other: _____

b. List any threatened and endangered species known to be on or near the site.

None known.

c. Is the site part of a migration route? If so, explain.

Yes, Pacific Flyway Migration Route.

d. Proposed measures to preserve or enhance wildlife, if any.

None.

e. List any invasive animal species known to be on or near the site.

None known.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity will be used to provide heating and power to future shop.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.

The project building design will utilize the latest IBC and Energy Codes to provide an energy efficient facility.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur because of this proposal? If so, describe.

No.

1. Describe any known or possible contamination at the site from present or past uses.

None.

a. Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

None known.

b. Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Typical commercial chemicals may be stored in the new shop building.

c. Describe special emergency services that might be required.

None.

d. Proposed measures to reduce or control environmental health hazards, if any.

N/A

b. Noise

1. What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

There will be typical traffic noise from I-5, but it will not affect the project.

2. What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site)?

Short Term: Construction noise from equipment and building construction.
Long Term: Private vehicles accessing the completed project.

3. Proposed measures to reduce or control noise impacts, if any.

Construction will be limited to Monday through Friday, 7:30 to 4:30pm.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The site is vacant land. Adjacent properties consist of vacant land, single family residence and I-5 corridor.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses because of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

No.

1. Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how?

No.

c. Describe any structures on the site.

None.

d. Will any structures be demolished? If so, what?

No.

e. What is the current zoning classification of the site?

The site is zoned General Commercial.

f. What is the current comprehensive plan designation of the site?

Urban.

g. If applicable, what is the current shoreline master program designation of the site?

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Yes, there is a mapped wetland in the southwest portion of the site.

i. Approximately how many people would reside or work in the completed project?

Approximately 6 people will work at the completed site.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any.

None.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.

None.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any.

None.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high,

middle, or low-income housing.

0

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any.

N/A

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The future shop will be designed to current building practices and use modern materials. The tallest building height would be 27 feet.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any.

Current design standards and materials will be used for the future shop development.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None.

d. Proposed measures to reduce or control light and glare impacts, if any.

None.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

None.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any.

N/A

13. Historic and Cultural Preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

Research of available public resources did not produced any structures over 45 years old.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

Research of available public resources did not produce any known registers.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Review of the online search engine WISAARD on the Washington State Department of Historic Preservation website.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

14. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Bishop Road currently serves as access to project site. Future development will utilize the same access road.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No, nearest transit stop is .8 miles away.

c. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle, or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No.

d. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The project will generate 1 AM peak hour trips and 1 PM peak hour trips based on the ITE manual.

f. Will the proposal interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

g. Proposed measures to reduce or control transportation impacts, if any.

None.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

Yes. Fire, police, and health care services may be needed for the future development.

b. Proposed measures to reduce or control direct impacts on public services, if any.

N/A

16. Utilities

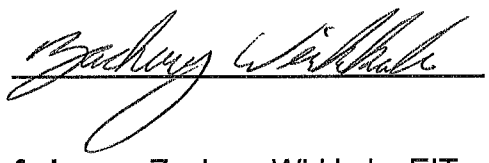
a. Check utilities currently available at the site:
☒ electricity, ☐ natural gas, ☒ water, ☒ refuse service, ☒ telephone, ☒ sanitary sewer, ☐ septic system, ☐ other: _____

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Sewer Service - City of Chehalis
Water Service - City of Chehalis
Gas Service - Puget Sound Energy
Phone Service - Lumen, Rainier Connect, Comcast
Cable Service - Dish Service, Comcast
Power - Lewis County PUD

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 

Type name of signee: Zachary Wirkkala, EIT

Position and agency/organization: Engineer-in-Training / RB Engineering

Date submitted: 2/29/24

GEOTECHNICAL REPORT

PROPOSED MULTI-UNIT HOUSING SUBDIVISION
PARCEL 017730002000
21141 BISHOP ROAD, CHEHALIS, WASHINGTON

Prepared for:

K & R Resources, LLC
c/o: RB Engineering

May 5, 2022

STRATA Project No. 22-0659

Prepared By:

Randall S. Goode, PE
Principal

STRATADESIGN

2117 NE OREGON STREET, SUITE 502
PORTLAND, OREGON 97232
971.400.0269 MAIN
STRATA-DESIGN.COM

TABLE OF CONTENTS

FIGURES

APPENDIX A – Field Explorations and Laboratory Testing

1.0 INTRODUCTION

This report presents our geotechnical site evaluation for a proposed multi-unit housing development on vacant Parcel 017730002000 along Bishop Road in Chehalis, Washington. This report summarizes the work accomplished and provides our conclusions and recommendations for site development. The location of the site is shown on Figure 1 (Vicinity Map).

2.0 PROJECT AND SITE DESCRIPTION

The vacant site is bordered to the upgradient east by Bishop Road, and by Interstate 5 right-of-way to the west. The southeast third of the site appears to consist of unmapped wetland areas, including a densely wooded area separating the upper and middle terraces of the site from lower terrace (unmapped wetland area). We understand the project is in the preliminary design and planning stage, thus limited plans have been made available.

3.0 SLOPE OBSERVATIONS AND REGIONAL MAPPING

Figure 3 (attached) displays the site contour lines and bare-earth imagery which were compiled by STRATA in GIS using LiDAR survey (WA-DNR, 2017). The site topography essentially consists of three relatively flat terraces separated by gentle to steep slopes. The site generally slopes downward to the west. The upper terrace and proposed building area of the site ranges in elevation from about 215 to 220 feet (NAD 88). The west facing slope is a native grade, at between 15 to 20 percent. The lower terrace contains some wetland species of plant, but no standing water at the time of our investigation.

We completed an on-site reconnaissance of the property at the time of our subsurface exploration on March 11, 2022. Our field observations were performed during wet conditions at the time of our subsurface exploration. We traversed the property to assess the general features and conditions of the surrounding slopes for evidence of hazards in the form of broken ground, obvious slope movements, or disturbances. From review of historical aerial photographs, it does not appear that grading changes (cuts and fills) have occurred at the study site. From our site reconnaissance and review of the LiDAR, we do not observe a presence of or shallow slumps and sloughing or other immediate signs of slope disturbance or instability to be present.

4.0 SITE GEOLOGY

According to published geologic mapping[1], the site is underlain by Outwash deposits (pre-Fraser glaciation). Starting approximately 2.6 million years ago, the Cordilleran ice sheet advanced and retreated across British Columbia and into the northwestern parts of the United States. The Fraser glaciation was one of the last glacial advances into northwestern United States and was succeeded by the Vashon glaciation. Much of the Puget sounds was carved by this glacial activity. The glacial meltwater carried sediment of all sizes from clay to boulders beyond the southern extent of the ice sheet, where alpine and continental glacial deposits are mapped today. Due to controversy over the

[1] *Walsh, T.J., Korosec, M.A., Phillips, W.M., Logan, R.L., and Schasse, H.W., 1987, Geologic map of Washington--Southwest quadrant: Washington Division of Geology and Earth Resources, Geologic Map GM-34, scale 1:250,000.*

number of glaciations in this area, geologic mapping often references pre-Fraser glaciation and during Fraser glaciation to simplify age constraints of the geologic units.

The pre-Fraser glaciation Outwash deposits (Qapo) mapped at the site are characterized by outwash sand and gravel with minor silt and clay. These undifferentiated deposits include till, moraine, advance and recessional drift and glacial outwash[2].

5.0 SUBSURFACE CONDITIONS

5.1 Field Explorations

Subsurface explorations were carried out by STRATA on January 11, 2022 by excavating three test pits, designated TP-1 through TP-3. During our subsurface exploration, we encountered stiff silt mixed with gravel/cobble (flood deposit). Depths explored were about 7 feet below ground surface (bgs) within each test pit. The approximate locations of the explorations are shown on Figure 2. Logs of the explorations are provided in the attached Appendix A.

5.2 Groundwater

Seepage and shallow groundwater conditions were not encountered in the test pits at the site. It should be noted that groundwater levels can fluctuate during the year depending on climate, irrigation season, extended periods of precipitation, drought, and other factors. Shallow perched-groundwater conditions may develop in the near-surface silt and clay soils and are likely to approach the ground surface during periods of prolonged precipitation or flooding.

6.0 CONCLUSIONS AND RECOMMENDATIONS

It is our opinion that the site can be developed as proposed with the inclusion of appropriate foundation systems and proper drainage, Our specific recommendations for site development are provided in the following paragraphs.

Based on our review of available geologic mapping and engineering judgement, it is our opinion that conventional, shallow spread concrete footings will be appropriate to the building development.

6.1 General Construction Considerations

The site is mantled at the ground surface with relatively soft and moisture-sensitive silt soils, which are susceptible to disturbance from construction equipment activity. The silt found at the site is generally underlain by glacial deposits of silty-gravel and cobbles. The presence of gravels and cobbles observed at the site should not be significantly deter conventional trackhoe excavation methods.

Fine-grained soils on the site easily lose strength when disturbed by construction traffic and activities during wet weather. We recommend earthwork take place during the typically dry months of the year

[2] *Lasmanis, R. and Hall, T., 1985, A Geologic Feasibility Study for the Superconducting Super Collider: Washington Division of Geology and Earth Resources, Open-File Report 85-3.*

when groundwater levels and perched groundwater conditions are likely to be the lowest. It can be expected that extra costs will accrue if earthwork is planned for the wet winter and spring months. If not carefully planned and executed, site preparation, utility trench work, and excavation can create extensive soft areas and significant repair costs can result. Earthwork should be planned and executed to minimize subgrade disturbance.

When it is necessary to construct driveways suitable for support of emergency vehicle traffic, including firetrucks, the base rock thickness for project streets, as described below in the section titled "Asphalt Pavement", are intended to support post construction design traffic loads. The base rock thickness determined for post construction traffic will not support construction traffic or pavement construction when the subgrade soils are wet.

To prevent disturbance and softening of the silty subgrade soils during wet weather or ground conditions in areas outside existing paved surfaces, movement of construction traffic should be limited to granular haul roads and work pads in these areas. In general, a minimum of 18 to 24 in. of relatively clean, granular material is required to support concentrated construction traffic, such as dump trucks and concrete trucks, and protect the subgrade. A 12-in.-thick granular work pad should be sufficient to support occasional light-truck traffic and low-volume construction operations. If wet-weather construction is anticipated, a woven geotextile separation fabric may be placed on the exposed subgrade prior to placement and compaction of the granular work pad to improve the performance of work pads and haul roads. The imported granular material should be placed in one lift over the prepared or undisturbed subgrade and compacted using a smooth drum, non-vibratory roller.

Geotextile fabric used in construction should have a minimum Mullen burst strength of 250 pounds per square inch (psi) for puncture resistance and an apparent opening size between the U.S. Standard No. 70 and No. 100 Sieve to minimize migration of fines into the imported granular material.

6.2 Site Preparation

Areas of proposed development should be stripped of existing vegetation, surface organics, and loose or soft surface soils. We estimate stripping will generally be necessary to a depth of about 6 inches. Stripping may need to extend into non-organic soils in areas where significant roots are present. Depending on the methods used, considerable disturbance and loosening of the subgrade could occur during stripping. Strippings should be removed from the site or stockpiled for use in landscaped areas. Following the removal of organic soils and roots, the area should be evaluated by STRATA for the presence of soft, yielding soils. Where encountered, these soils should be removed to expose competent, native soils. We recommend excavations and subgrade preparation be completed with smooth-edged buckets equipped to hydraulic excavators to minimize disturbance to subgrade. Over-excavations should be backfilled with structural fill.

Although none were observed in our investigations, any existing building footings, floor slabs, septic tanks and drain fields and other structural elements should be removed from the site. Existing utilities underlying new footings, structural fill, or other structural elements should be abandoned by removing

the conduit and backfilling with granular structural fill. Openings in existing utilities that underly landscape areas and daylight into excavations should be capped or grouted to avoid loss of excavation backfill or subgrade soils into voids. Soil disturbed during building demolition and grubbing operations should be removed to expose firm undisturbed subgrade. The resulting excavations should be backfilled with structural fill.

We recommend proof rolling the subgrade with a fully loaded dump truck or similar size, rubber-tire construction equipment after stripping and required site cutting have been completed. The proof rolling should be observed by STRATA to identify areas of excessive yielding. Areas of excessive yielding should be excavated and replaced with compacted materials recommended for structural fill. Areas that appear to be too wet and soft to support proof rolling equipment should be prepared in accordance with the recommendations for wet weather construction presented in the following section of this report.

Additionally, it should be noted that existing pavement may not be designed for use with repeated heavy construction traffic, and thus may become distressed during construction and some repair may be required. All construction traffic should adhere to the setback requirements from the steep sloping ground near the southeast third of the site.

Grades should be developed and maintained to drain surface and roof runoff away from structures and other site improvements. On-site disposal of stormwater may be feasible given the moderately permeable silty-gravel/cobble. Permanent cut and fill slopes should be planned no steeper than 2H:1V (Horizontal to Vertical).

6.3 Temporary Excavations, Shoring, and Groundwater Management

6.3.1 General

STRATA should be notified once final plans are made available so additional recommendations can be provided if necessary, especially if partial or full basements are planned for the building, or deep excavations, are required.

Temporary shoring systems may be required for excavation support for trenches, depending onactual soil conditions during the time of construction; however, open-cut excavations could also be considered where site access allows. The method of excavation and design of temporary excavation support and dewatering systems are the responsibilities of the contractor and are subject to applicable local, state, and federal safety regulations, including the current Washington Occupational Safety and Health Administration (OSHA) excavation and trench safety standards. The means, methods, and sequencing of construction operations and site safety are also the responsibilities of the contractor. The information provided below is for the use of our client and should not be interpreted to imply we are assuming responsibility for the contractor's temporary excavation and dewatering design, actions, or site safety.

It should be understood that unsupported cut slopes may exhibit distress in the form of localized sloughing or raveling, particularly if seepage develops in portions of the slopes with higher sand content. The on-site soil, if groundwater or seepage is not present, is classified as "Soil Type C". For planning purposes, temporary cut slopes in this type of soil should be made at 1.5H:1V (Horizontal:Vertical) or flatter. If significant seepage, running-soil conditions, or slope instability are observed during excavation, flatter slopes may be necessary. Some minor amounts of sloughing, slumping, or running of temporary slopes should be anticipated during and shortly after excavation. Open-cut excavations should be completed and backfilled in the shortest practical sequence. In our opinion, the short-term global stability of temporary slopes will be adequate if surcharge loads due to construction traffic, vehicle parking, material laydown, foundations for existing nearby structures, etc., are maintained a horizontal distance equal to the height of the slope away from the top of the excavation and if the excavations are made above groundwater. However, smaller horizontal offsets may be appropriate for surcharge loads that act over smaller areas, such as point loads and foundation loads of limited areal extent.

If shoring systems are selected instead of slope layback, these are typically designed by a specialty shoring contractor, who should also have a proven record of successful shoring installation in similar materials. Shoring systems can be either cantilevered or braced using internal bracing. Cantilevered systems are generally designed for maximum exposed wall heights of about 15 feet; however, greater heights may be possible depending on tolerable shoring movements and potential settlement in the surrounding areas. We recommend including a minimum vertical surcharge pressure of 250 pounds per square foot (psf) in the design of the shoring system.

6.3.2 Utilities

Trench construction and maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. The method of excavation and design of temporary excavation support and dewatering systems are the responsibilities of the contractor and are subject to applicable local, state, and federal safety regulations, including the current Washington Occupational Safety and Health Administration (OSHA) excavation and trench safety standards. Temporary excavations should either be shored or sloped in accordance with applicable regulations. Excavation spoils and material-laydown areas should be set back at least 10 feet from the edge of excavations and the existing steep slope south of the middle terrace.

All utility trenches that will be underlying new pavements, walkways, buildings, or new structural fill should be backfilled with structural fill. Trench backfill should consist of well-graded imported granular material (see Structural Fill section below) with a maximum particle size of ¾-inch and less than 8 percent by weight passing the U.S. Standard No. 200 Sieve. The material should be free of roots, organic matter, and other unsuitable materials.

Trench backfill in the bedding zone and pipe zone should be placed and compacted in maximum lifts of 6 inches. Trench backfill above the pipe zone should be placed and compacted in 8-in. (loose) lifts. A minimum cover of 3 feet over the top of the pipe should be placed before compacting with

a hydraulic plate compactor (hoe-pack). The granular backfill should be compacted to at least 95% of the maximum dry density determined by ASTM D698. Flooding or jetting the backfilled trenches with water to achieve the recommended compaction should not be permitted.

6.4 Foundation Support Recommendations

We understand structural loads and final layout of the development are not available in final form at this time; however, we assume the structures will be wood-framed, relatively lightly loaded, and will not include partial or full basements. STRATA should be notified once final plans are made available so additional recommendations can be provided if necessary. It is our opinion the structures can be supported on shallow foundations.

6.4.1 Minimum Footing Widths / Design Bearing Pressure

Continuous wall and isolated spread footings widths should be designed minimum to prescribe to residential building code. Footings may be proportioned using a maximum allowable bearing pressure of 2,500 pounds per square foot (psf), provided the footings are established in firm native soils. This is a net bearing pressure, and the weight of the footing and overlying backfill can be disregarded in calculating footing sizes. The recommended allowable bearing pressure applies to the total of dead plus long-term live loads. Allowable bearing pressures may be increased by one-third for seismic and wind loads. Footings will settle in response to column and wall loads. Based on our evaluation of the subsurface conditions and our analysis, we estimate post-construction settlement will be less than 1 inch for the column and perimeter foundation loads, provided subgrade is prepared in accordance with the recommendations provided in this report.

6.4.2 Footing Embedment Depths

STRATA recommends that all footings be founded at depths below surrounding adjacent grades as prescribed by residential building code. The footings should be founded below an imaginary line projecting upward at a 1H:1V (horizontal to vertical) slope from the base of any adjacent, parallel utility trenches or deeper excavations.

6.4.3 Footing Preparation

Excavations for footings should be carefully prepared to a neat and undisturbed state. A representative from STRATA should confirm suitable bearing conditions and evaluate all exposed footing subgrades. Observations should also confirm that loose or soft materials have been removed from new footing excavations and concrete slab-on-grade areas. Localized deepening of footing excavations may be required to penetrate loose, wet, or deleterious materials. STRATA recommends a layer of compacted, crushed rock be placed over the footing subgrades to help protect them from disturbance due to foot traffic and the elements. Placement of this rock is the prerogative of the contractor; regardless, the footing subgrade should be in a dense or stiff condition prior to pouring concrete. Based on our experience, about 2 inches of compacted crushed rock will be suitable beneath the footings.

6.4.4 Lateral Resistance

Lateral loads can be resisted by passive earth pressure on the sides of footings and grade beams, and by friction at the base of the footings. A passive earth pressure of 250 pounds per cubic foot (pcf) may be used for footings confined by native material and new structural fills. The allowable passive pressure has been reduced by a factor of two to account for the large amount of deformation required to mobilize full passive resistance. Adjacent floor slabs, pavements, or the upper 12-inch depth of adjacent unpaved areas should not be considered when calculating passive resistance. For footings supported on native gravels or new structural fills, we recommend using a coefficient of friction equal to 0.4 when calculating resistance to sliding. These values do not include a factor of safety (FS).

6.5 Slab-on-Grade Floors

Where lightly loaded residential building floor slabs are planned, satisfactory subgrade support can be obtained on the undisturbed native soil or on engineered structural fill. A subgrade modulus of 125 pounds per cubic inch may be used to design floor slabs founded on medium stiff or better subgrade, to be evaluated by the geotechnical engineer at the time of subgrade preparation.

A minimum 6-inch-thick layer of free draining fill should be placed and compacted over the prepared subgrade to assist as a capillary break and blanket drain. Open-graded, angular, ¼- to ¾-inch drain rock meeting the requirements of free draining fill in the Structural Fill section of this report is commonly used for this purpose. The free draining fill layer may be capped with a 1- to 2-inch-thick layer of clean ¾ inch minus crushed rock that contains no more than 5 percent fines.

6.6 Site Drainage

Foundation and crawl space drainage should be sloped to drain to a sump or low point drain outlet. Water should not be allowed to pond within crawl spaces.

Roof drains should be connected to a tightline drainpipe leading to storm drain utilities. Pavement surfaces and open space areas should be sloped such that surface water runoff is collected and routed to storm drain utilities. Ground surfaces adjacent to buildings should be sloped to drain away from the buildings.

6.7 Structural Fill

Fill within building, pavement, and sidewalk areas should be placed as compacted structural fill. Structural fill should be compacted to at least 95 percent of the maximum dry density as determined by ASTM D698/AASHTO T-99, the standard Proctor. In landscaped areas or areas not sensitive to settlement, fill should be compacted to about 90% of the maximum dry density determined by ASTM D698. Flooding or jetting structural fill with water to achieve the recommended compaction should not be permitted.

The earthwork contractor's compactive effort should be evaluated based on field observations. Lift thicknesses should be adjusted to meet compaction requirements. The moisture content for compaction should be within 3 percent of optimum.

Brush, roots, construction debris, and other deleterious material should not be placed in the structural fill. Additional information regarding specific types of fill is provided below.

On-Site Silt: The on-site soil is suitable for use as structural fill provided it can be moisture-conditioned, separated from concentrations of organics, construction debris, and other unsuitable material, and compacted to the specified density. The fill should be placed in lifts with a maximum loose thickness of 8 inches. The on-site silt is considered to be moderately permeable and may be suitable for use as underlying new improvements.

Imported Granular Material: Imported granular fill material may include sand, gravel, fragmented rock, or recycled crushed concrete with a maximum size of 4 inches and with not more than about 8 percent passing the No. 200 sieve (washed analysis). Material satisfying these requirements can usually be placed during periods of wet weather. The first lift of granular fill placed over a fine-grained subgrade should be about 18 inches thick and subsequent lifts about 12 inches thick when using medium- to heavy-weight vibratory rollers. Granular structural fill should be limited to a maximum size of about 1-½ inches when compacted with hand-operated equipment. Lift thicknesses should be limited to less than 8 inches when using hand-operated vibratory plate compactors.

Free-Draining Fill: Free-draining material should have less than 2 percent passing the No. 200 sieve (washed analysis). Examples of materials that would satisfy this requirement include open-graded, angular ¾ to ¼ inch, 1½ to ¾ inch, or 3- to 1-inch crushed rock.

6.8 Permanent Slopes

Permanent cut and fill slopes should not exceed a grade of 2H:1V (Horizontal to Vertical). Slopes that will be maintained by mowing should not be constructed steeper than 3H:1V. Structures and paved surfaces should be located at least 5 feet from the slope face.

The slopes should be planted with vegetation to provide protection against erosion. Surface water runoff should be collected and directed away from slopes steeper than 3H:1V to prevent water from running down the face of the slope.

6.9 Slope stability

Depending on the actual location of the planned residences, individual lot slope stability may be required once finalized plans are made available. STRATA should be notified once final plans are available so additional recommendations can be provided if necessary. A minimum setback of 25 feet should be adhered to, but may need to be increased based on final slope stability analysis.

6.10 Retaining Walls

6.10.1 Lateral Earth Pressures

The following recommendations assume that site retaining walls (where planned) will be less than 12 feet in height. The parameters stated for retaining wall design assume that backfill is drained and consists of imported granular structural fill (WSDOT specification for retaining walls) and that slopes are graded to drain surface water away from the wall.

Backfill for retaining walls should extend a horizontal distance of H/2 from the back of wall, where H is the embedded height, and compacted as recommended for structural fill, except for backfill placed immediately adjacent to walls. To reduce pressure on walls, backfill located within a horizontal distance of 3 feet from retaining walls should be compacted to approximately 95 percent of the maximum dry density, as determined by ASTM D698, and should be compacted in maximum 6-inch-thick lifts using hand-operated compaction equipment (such as a jumping jack or vibratory plate compactor). Backfill greater than 3 feet from retaining walls should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D698.

For permanent site retaining walls not restrained from rotation (i.e., walls allowed to yield, should they exist) with a flat backslope, an equivalent fluid pressure (EFP) of 35 pcf may be used for design, and for restrained walls (i.e., embedded basement walls) an EFP of 55 pcf may be used for design. The EFP values provided above assume the grade behind wall is level, or sloping down and away from the wall, for a distance of 6 feet or more, and grade in front of wall is level or sloping up for a distance of at least 5 feet. Recommended lateral earth pressure distributions are shown on Figure 4, Retaining Wall Earth Pressure Diagram. Additional pressures may need to be accounted for if other surcharges are located within a horizontal distance from the back of a wall equal to twice the height of the wall, as discussed further below. Geotextile drainage products utilized behind the wall should conform to WSDOT Standard Specifications (SS) section 9-33.2. Moisture barrier applied to the concrete face behind the wall may be included at the discretion of the design architect.

Seismic earth pressures may be determined by assuming a uniformly distributed rectangular pressure which is applied to the back of the wall of 7*H for unrestrained walls and 11*H for restrained walls. The resultant load force may be assumed as acting at a distance of 0.3*H above the base of the wall. According to more recent, widely accepted research material[3], for restrained walls less than 12 feet height and designed to a factor of safety of 1.5 under static condition, the addition of a seismic surcharge load to the calculated static lateral load is unnecessary as applied to embedded (basement) walls.

Additional lateral pressures due to surcharge loading in the backfill area of retaining walls must be added to the above-recommended earth pressures. Additional lateral pressures induced by surcharge loads can be estimated using the guidelines provided on the attached Figure 5. We

[3] *Reference: Sitar, Mikola and Candia (GeoCongress 2012, "Seismically Induced Lateral Earth Pressures on Retaining Structures and Basement Walls") and by Lew, Sitar, Atik, Pourzanjani.*

recommend assuming a minimum-250-psf vertical construction surcharge to account for typical construction equipment and traffic behind walls.

6.10.2 Retaining Wall Drainage

Retaining walls should have a minimum-12-inch-wide drainage zone of free-draining meeting the requirements in the Structural Fill section of this report and should be provided with a perforated drainpipe or weepholes at the bottom of the backfill. The drainage backfill should also conform to section 9-03.12(4) (Gravel Backfill for Drains) of WSDOT Standard Specifications (SS). A non-woven geotextile filter fabric, meeting the requirements of section 9-33.2 WSDOT SS for drainage geotextile, should be placed between the drainage blanket and general wall backfill. Section 9-05.2 of the WSDOT SS also provides guidelines for appropriate drainpipe materials and construction.

6.11 Asphalt Pavement

The pavement subgrade should be prepared in accordance with the previously described recommendations described in the "Construction Considerations", and "Structural Fill" sections of this report.

We do not have specific information on the frequency and type of vehicles that will use the area; we assume that traffic conditions will be primarily light vehicles and fewer than 10 heavy trucks per day. We assume that subgrade stiffness will be relative soft, conforming to California Bearing Ratio (CBR) equal to 4 and the assumption that construction will be completed during a period of extended dry weather. An increased thickness of granular base course will be required if pavement construction occurs during wet weather conditions.

We recommend an asphalt pavement thickness of at least 3-1/2 inches of Asphalt Concrete (AC) over at least 10 inches of compacted crushed rock base, provided the subgrade is prepared in accordance with our recommendations.

The base aggregate should contain no deleterious materials, meet specifications provided in WSDOT SS 9-03.9(3) – Crushed Surfacing Base Course, and have less than 5 percent (by dry weight) passing the US Standard No. 200 Sieve. The imported granular material should be placed in one lift and compacted to at least 95 percent of the maximum dry density as determined by AASHTO T-99. Aggregate base contaminated with soil during construction should be removed and replaced before paving.

The AC pavement should conform to Section 00744 of the specifications. We recommend half inch dense graded Hot Mix Asphalt Concrete for Design Level 2 using Performance Grade Asphalt PG-64-22.

6.12 Seismic Setting

6.12.1 General

We anticipate the project will likely be designed in accordance with the current International Building Code (IBC). For seismic design, the current IBC references American Society of Civil Engineers (ASCE) document 7-16, titled "Minimum Design Loads and Associated Criteria for Buildings and Other Structures" (ASCE 7-16). The current IBC and ASCE 7-16 seismic hazard levels are based on a Risk-Targeted Maximum Considered Earthquake (MCE_R).

Based on our review of the 2018 IBC and soils disclosed by our subsurface explorations, we recommend using Site Class D (Default) to evaluate the seismic design of the structures. The maximum horizontal-direction spectral response accelerations S_S and S_1 were obtained from the USGS Seismic Design Maps for the project coordinates. Site coefficients F_a and F_v were used to develop the Site Class D MCE_R-level spectrum in accordance with Section 11.4 of ASCE 7-16. However, Section 11.4.8 of ASCE 7-16 requires a ground-motion hazard analysis be completed for structures on Site Class D sites to determine the F_v coefficient when the S_1 parameter is greater than or equal to 0.2 g. The code provides an exception that waives the ground-motion hazard analysis if the seismic-response coefficient, C_s, is determined in accordance with Section 11.4.8, Exception 2, of ASCE 7-16. We anticipate the response coefficient will be developed as discussed above; therefore, the code-based, Site Class D, ground-surface MCE_R response spectrum is appropriate for design of the structures. The design-level response spectrum is calculated as two-thirds of the ground-surface MCE_R spectrum.

SEISMIC DESIGN PARAMETERS

2018 IBC/ASCE7-16 CODE BASED RESPONSE SPECTRUM MCE_R GROUND MOTION - 5% DAMPING 1% IN 50 YEARS PROBABILITY OF COLLAPSE			
LAT	46.4472	LON	-122.8535
S_S		1.03G	
S_1		0.45G	
MAPPED MAXIMUM CONSIDERED EARTHQUAKE SPECTRAL RESPONSE ACCELERATION PARAMETER (SITE CLASS D)			
F_A		1.2	
F_V		1.85	
S_{MS}		1.23G	
S_{M1}		0.83G*	
DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETER			
S_{DS}		0.82G	
S_{D1}		0.56G*	

*Notes:
1) Exception 2 of Section 11.4.8 should be considered when evaluating base shear calculations in Section 12.8.
2) The S_{D1} value is intended only for calculating T_s

6.12.2 Seismic Hazards

Liquefaction is a phenomenon that occurs when saturated sandy silt, sand, and some gravel deposits lose strength and stiffness during strong seismic shaking. Based on the types of soils present at the site and the topography, the potential for earthquake-induced liquefaction and slope instability is low. Review of available geologic literature indicates inactive faults are mapped within about 10 of the site. In our opinion, the risk of ground rupture during a design-level earthquake is low unless occurring on a previously unknown or unmapped fault. The risk of tsunami inundation at the site is essentially absent.

7.0 ADDITIONAL SERVICES

Because the future performance and integrity of the structural elements will depend largely on proper site preparation, drainage, excavations, fill placement, and construction procedures, monitoring and testing (geotechnical special inspection) by experienced geotechnical personnel should be considered an integral part of the design and construction process. Consequently, we recommend that STRATA be retained to provide the following post-investigation services:

- Review construction plans and specifications to verify that our design criteria presented in this report have been properly integrated into the design.
- Attend a pre-construction conference with the design team and contractor to discuss geotechnical construction issues, erosion control measures, and maintain slope stability.
- Observe placement of fill and conduct density testing of structural fill.
- Conduct density testing of underground utility backfill.
- Observe proof rolling of pavement and curb line base rock and compaction of asphalt pavement as it is placed.
- Observe footing subgrade before footings are constructed to verify the soil conditions.
- Prepare a post-construction letter-of-compliance summarizing our field observations, inspections, and test results.

8.0 LIMITATIONS

This report has been prepared for the exclusive use of the addressee, and their architects and engineers, for aiding in the design and construction of the proposed development and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced, in total or in part, without the express written consent of the client and STRATA. It is the addressee's

responsibility to provide this report to the appropriate design professionals, building officials, and contractors to ensure the correct implementation of the recommendations.

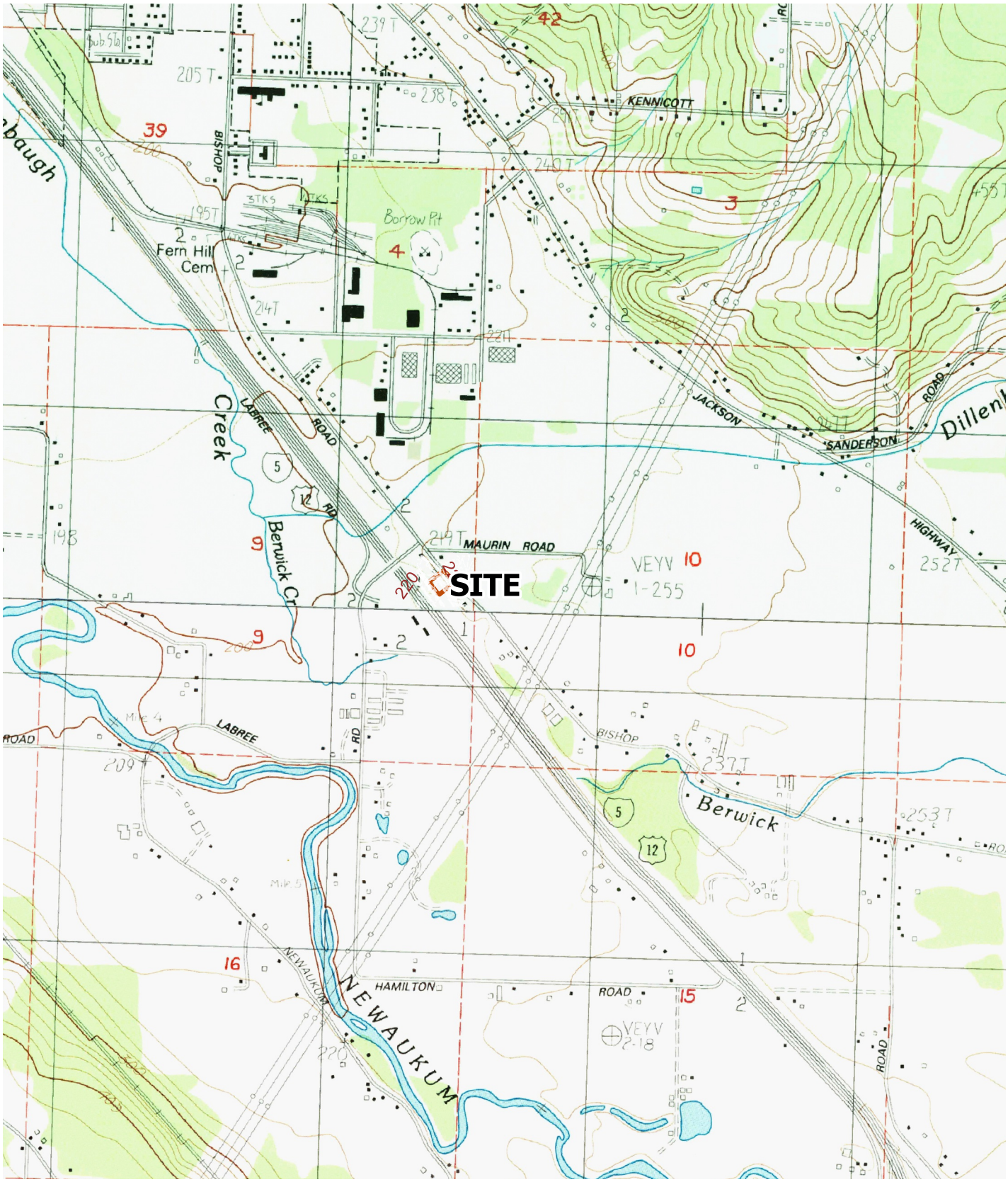
The opinions, comments, and conclusions presented in this report are based upon information derived from our literature review, field explorations, laboratory testing, and engineering analyses. It is possible that soil, rock, or groundwater conditions could vary between or beyond the points explored. If soil, rock, or groundwater conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that STRATA is notified immediately so that we may reevaluate the recommendations of this report.

Unanticipated fill, soil, and rock conditions, and seasonal soil moisture and groundwater variations are commonly encountered and cannot be fully determined by merely taking soil samples or completing explorations such as soil borings or test pits. Such variations may result in changes to our recommendations and may require additional funds for expenses to attain a properly constructed project; therefore, we recommend a contingency fund to accommodate such potential extra costs.

The scope of work for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site.

If there is a substantial lapse of time between the submission of this report and the start of work at the site, if conditions have changed due to natural causes or construction operations at or adjacent to the site, or if the basic project scheme is significantly modified from that assumed, this report should be reviewed to determine the applicability of the conclusions and recommendations presented herein. Land use, site conditions (both on and off site), or other factors may change over time and could materially affect our findings; therefore, this report should not be relied upon after three years from its issue or if the site conditions change

♦ ♦ ♦



0 1,000 2,000 3,000 ft

FIGURE 1
VICINITY MAP

0 BISHOP ROAD
CHEHALIS, WA

STRATA DESIGN

TOPOGRAPHIC MAP

PROPOSED DEVELOPMENT
'0' BISHOP ROAD
CHEHALIS, WA

2-Foot Contours Intervals derived from 2010 (WA-DNR)

STRATA DESIGN

Job #22-659

Aerial base map from Google Earth

Lot lines shown are from GIS and should be considered approximated

Figure 2

APPENDIX A

Field Explorations and Laboratory Testing

APPENDIX A: FIELD EXPLORATIONS AND LABORATORY TESTING

A1 GENERAL

The site was explored by STRATA on January 11, 2022. The subsurface explorations included advancing five excavated test pits, designated TP-1 through TP-5, to depths ranging from about 7 to 13 feet bgs. The approximate locations of the explorations are shown on the Site Exploration Plan, Figure 2. The procedures used to excavate the test pits, collect samples, and other field techniques are described in detail in the following paragraphs. Unless otherwise noted, all soil sampling and classification procedures followed engineering practices in general accordance with relevant ASTM procedures. "General accordance" means that certain local drilling/excavation and descriptive practices and methodologies have been followed.

A2 EXPLORATIONS AND SAMPLING

Test Pit Excavation

The test pit was excavated using a narrow bucket equipped to a mini-trackhoe. The test pit was observed by a member of the STRATA geotechnical staff, who maintained a log of the subsurface conditions and materials encountered during the course of the work.

Sampling

Disturbed grab samples were collected from the excavator bucket at selected depth intervals at the time of test pit excavation. The disturbed soil samples were examined by a member of the STRATA geotechnical staff and then sealed in plastic bags for further examination in our laboratory.

Test Pit Logs

The test pit logs show the various types of materials that were encountered in the test pits and the depths where the materials and/or characteristics of these materials changed, although the changes may be gradual. Where material types and descriptions changed between samples, the contacts were interpreted. The types of samples taken during excavating, along with their sample identification number, are shown to the left of the classification of materials.

A3 MATERIAL DESCRIPTION

Initially, samples were classified visually in the field. Consistency, color, relative moisture, degree of plasticity, and other distinguishing characteristics of the soil samples were noted. Afterward, the samples were reexamined in the STRATA laboratory and the field classifications were modified

where necessary. The terminology used in the soil classifications and other modifiers are defined in Table A-1, Guidelines for Classification of Soil.

A4 LABORATORY TESTING

A4.1 General

Samples obtained during the field explorations were examined in the STRATA laboratory. The physical characteristics of the samples were noted and field classifications were modified where necessary. During the course of examination, representative samples were selected for further testing. The testing program for the soil samples included standard classification tests, which yield certain index properties of the soils important to an evaluation of soil behavior. The testing procedures are described in the following paragraphs. Unless noted otherwise, all test procedures are in general accordance with applicable ASTM standards. "General accordance" means that certain local and common descriptive practices and methodologies have been followed.

A4.2 Visual Classification

The soils were classified in accordance with the Unified Soil Classification System with certain other terminology, such as the relative density or consistency of the soil deposits, in general accordance with engineering practice. In determining the soil type (that is, gravel, sand, silt, or clay) the term that best described the major portion of the sample was used. Modifying terminology to further describe the samples is defined in Table A-1, Guidelines for Classification of Soil, in Appendix A.

A4.3 Moisture (Water) Contents

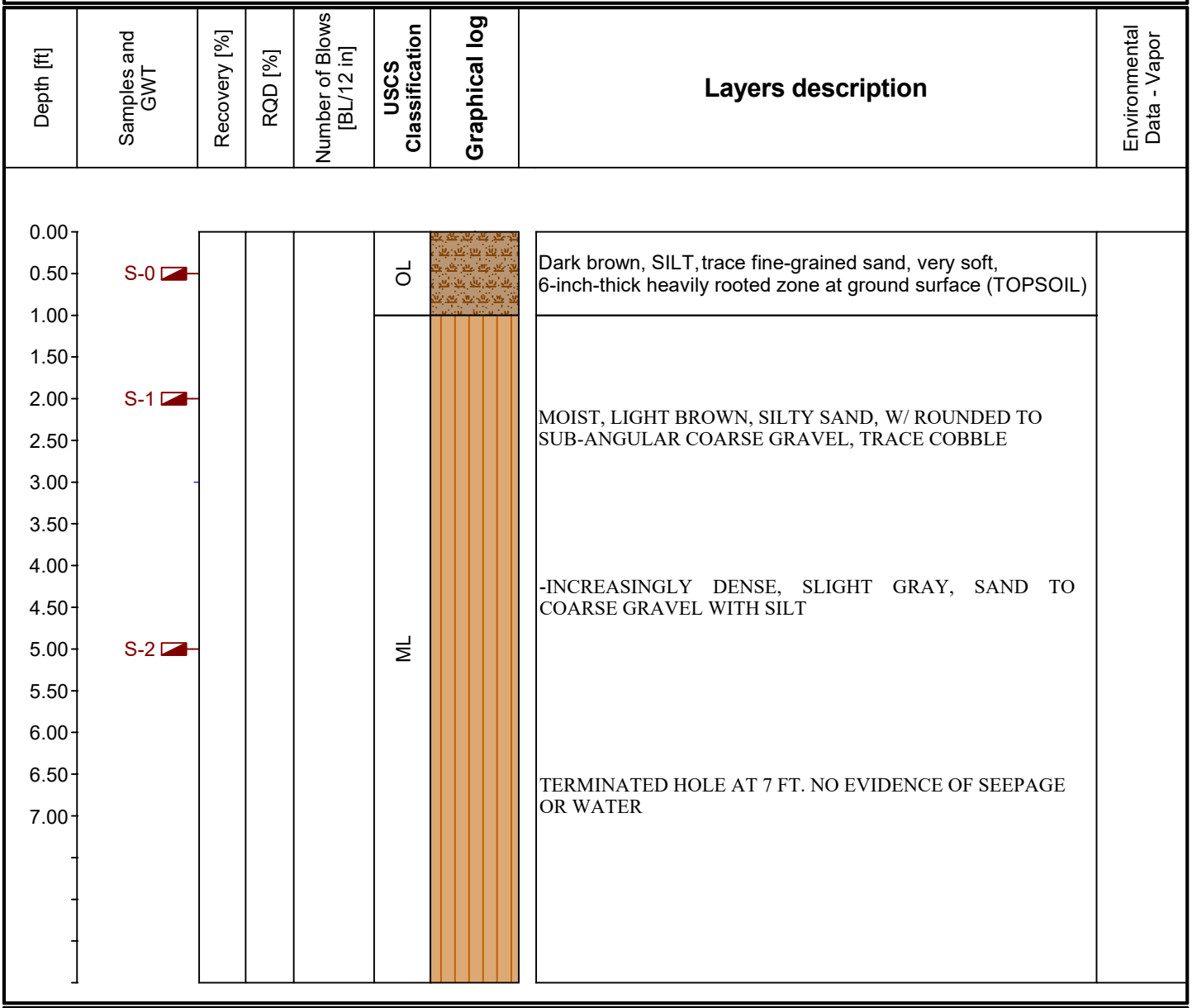
Natural moisture content determinations were made on samples of the fine-grained soils (that is, silts, clays, and silty sands). The natural moisture content is defined as the ratio of the weight of water to dry weight of soil, expressed as a percentage. The results of the moisture content determinations are presented on the logs of the test pits in Appendix A.

A4.4 Atterberg Limits

Atterberg-limits determinations were completed on a select soil sample in substantial conformance with ASTM D4318. The results of the Atterberg-limits test are presented in Appendix A.

Borehole: TP-1

Project:		Date start:	4/21/2022
Project ID:	0 Bishop Road, Chehalis, WA	Date end:	4/21/2022
Location:	Northern Portion of Site		
Client		Easting:	
Drilling Co.:	Client Excavator	Northing:	
Method of drilling:	Test Pit Excavation	Ground Elevation:	
Logged by:	RSG	Checked by: RSG	Altitude system: user
Notes:		Scale:	

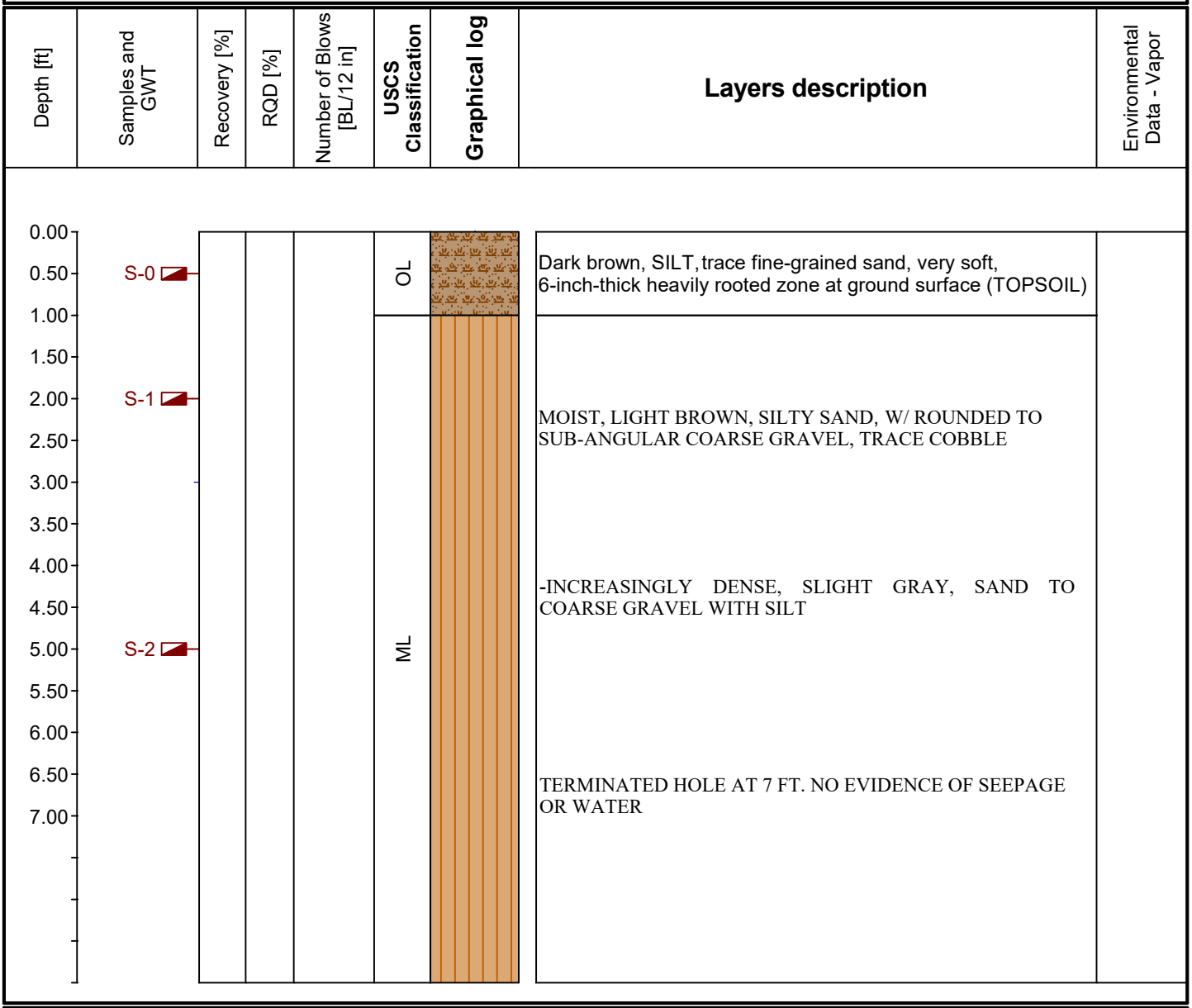


Key:

GWT bored — DISTURBED SAMPLE (GRAB)

Borehole: TP-2

Project:		Date start:	4/21/2022
Project ID:	0 Bishop Road, Chehalis, WA	Date end:	4/21/2022
Location:	Northern Portion of Site		
Client		Easting:	
Drilling Co.:	Client Excavator	Northing:	
Method of drilling:	Test Pit Excavation	Ground Elevation:	
Logged by:	RSG	Checked by: RSG	Altitude system: user
Notes:		Scale:	

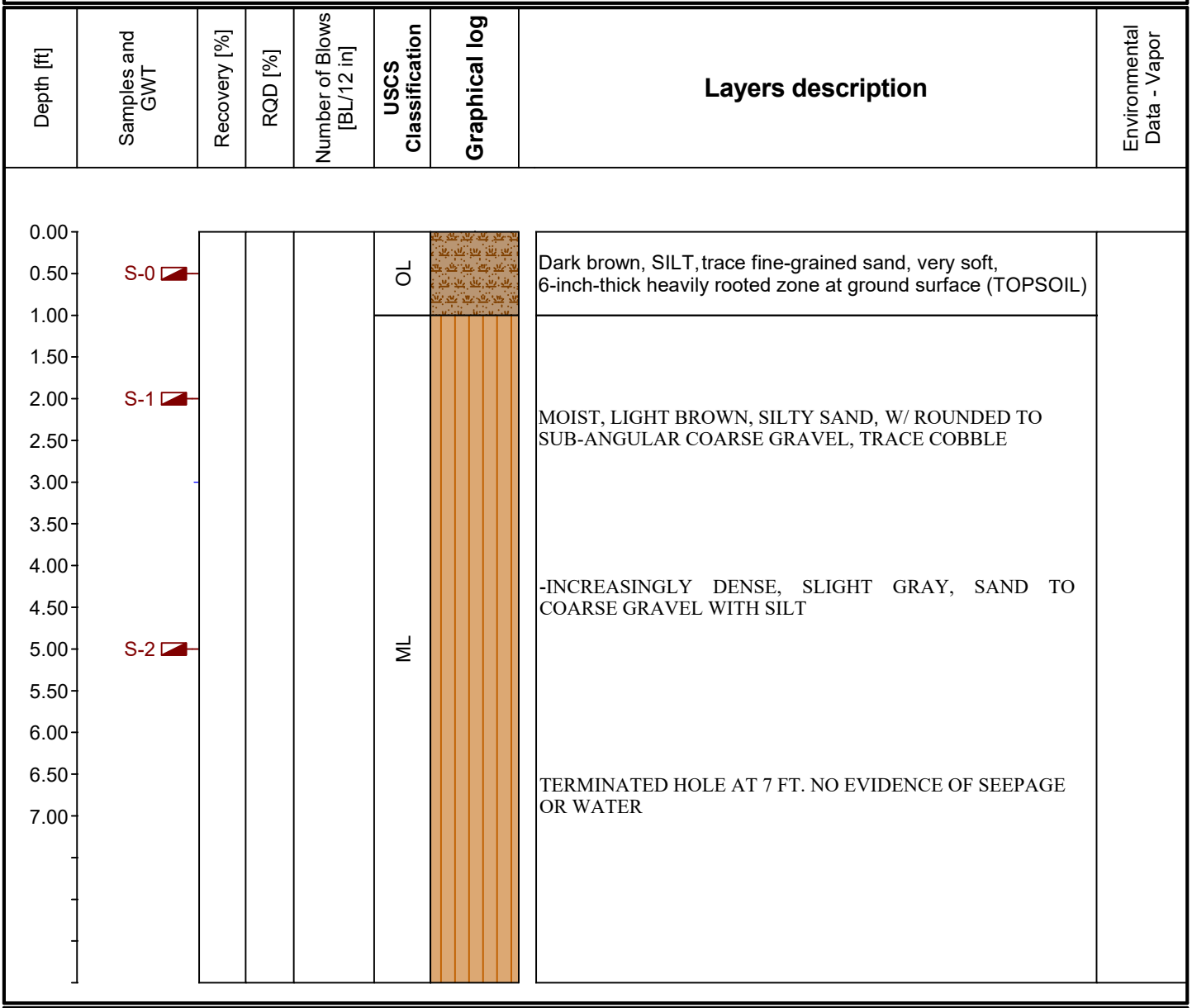


Key:

GWT bored — DISTURBED SAMPLE (GRAB)

Borehole: TP-3

Project:		Date start:	4/21/2022
Project ID:	0 Bishop Road, Chehalis, WA	Date end:	4/21/2022
Location:	Northern Portion of Site		
Client		Easting:	
Drilling Co.:	Client Excavator	Northing:	
Method of drilling:	Test Pit Excavation	Ground Elevation:	
Logged by:	RSG Checked by: RSG	Altitude system:	user
Notes:		Scale:	



Key:

GWT bored — DISTURBED SAMPLE (GRAB)

Critical Area Report

Prepared For: K & R Resources

Site Address: Bishop Road, Chehalis

Tax Parcel Number: 017730002000

Date: February 28, 2024

Prepared By:

Environmental Design, LLC.

Septic Design • Wetlands • Mapping

901 L Street, Centralia, WA 98531

(360) 219-3343

Table of Contents

Introduction:

Environmental Design, LLC conducted a Wetland Study on February 1, 2023 to determine if wetland habitat is present on the site located at Bishop Road in Chehalis. The site is vacant land with commercial and residential surrounding it. The site is located between Bishop Road and Interstate 5. The client is proposing a development on the site. A critical area report is being completed as the site has mapped hydric soil and a wetland unit along the Interstate 5 corridor.

In order to conduct a thorough review of the site to determine if wetlands are present on the site several resources were reviewed. The project started by pulling research and reviewing the research from several sources. After review of the research it was noted that wetlands were mapped on the site. A site visit was then conducted in order to test in areas for wetland habitat. Since the site has been primarily used and maintained as vacant land, test sites were completed in areas where vegetation, elevation or other characteristics changed that indicated a possible presence of wetland habitat.

Site Description:

The site is located at Bishop Road in Chehalis, Washington. The site is in Section 09 of Township 13 North, Range 02 West and is identified by Lewis County with the parcel number of 01773002000. The total acreage of the parcel is about 1.11 acres. The permitting jurisdiction is the City of Chehalis.

The area around the site is primarily residential and commercial land with hydric soils and wetland habitat mapped throughout the sites.

Methodology:

A site visit was conducted on February 1, 2023, where Environmental Design walked the property and tested in various areas where vegetation seemed to have changed or where wetland habitat could be present. The site is relatively flat and has slight elevation changes.

Environmental Design, LLC completed the wetland study of this site by using the Routine Determination Method according to the 1987 U.S. Army Corp of Engineers Wetland Delineation Manual and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region.

In order to complete this method first research was conducted by pulling information and maps from the National Wetland Inventory website, the Lewis County Website, the NRCS website to find out what the soils were, and also further information was pulled from the Department of Natural Resources website. After reviewing the research, a site visit was conducted and areas were tested where vegetation, elevation, or the soil may have changed.

When using the Routine Approach, a wetland area must meet three specific parameters. These three parameters are hydrology, vegetation and hydric soils. Hydrology can be difficult to assess because it may or may not be present, depending on the time of year. Vegetation and soils are important to assess if there has been hydrology present in the past. If the site meets the hydrology, vegetative and hydric soil parameters then the site is considered a wetland. If one parameter is not met then the area is not considered a wetland. There must be hydrology present as this is the most critical parameter that makes a wetland.

Observations:

Vegetation:

Wetland Vegetation has been classified into indicator statuses of how likely the plant is to be found in a wetland habitat. The indicator status of each plant species can be found on the data forms. The different indicator statuses are listed below:

- Obligate Wetland (OBL) – highly likely to be in a natural wetland environment
- Facultative Wetland (FACW) –most likely to be present in a natural wetland environment
- Facultative (FAC) – can be present in both a natural wetland and non-wetland environment
- Facultative Upland (FACU) –may be present in a natural wetland, but most likely to be seen in non-wetland conditions
- Obligate Upland (UPL) – most likely to occur in non-wetland conditions
- No Indicator – the plant does not have enough data to determine the indicator status yet

The primary vegetation in the upland portion of the site is identified as listed:

Common Name	Scientific Name	Indicator
Common Dandelion	*Taraxacum officinale*	FACU
Annual Ryegrass	*Lolium perenne ssp. multiflorum*	FACU

The primary wetland vegetation on the site is identified as listed:

Common Name	Scientific Name	Indicator
Soft Rush	*Juncus effusus*	FACW
Reed Canary Grass	*Phalaris arundinacea*	FACW

The vegetation makes a very defined change at the edge of the depressional area. There is a defined vegetation line where the site meets the criteria for wetland vegetation.

Soils:

The site is primarily mapped as Reed Silty Clay Loam and Scamman Silty Clay Loam Series according to the U.S.D.A Natural Resources Conservation Service *Soil Survey of Lewis County, Washington (1980)*. The series are listed on the hydric soils list produced by the U.S.D.A Natural Resources Conservation. The areas where test plots were conducted, the soil appeared to be consistent with the mapped series.

The NRCS describes Reed Silty Clay Loam series as very deep poorly drained soil located on flood plains. In a representative profile, the surface layer is mottled, very dark grayish brown silty clay loam about 6 inches thick. The lower portion is mottled, very dark grayish brown silty clay loam extending about 8 inches thick. The upper layer of the subsoil is about 6 inches thick and is mottled, brown silty clay. The following layer is mottled very dark gray, dark gray clay and dark grayish brown silty clay loam about 17 inches thick. The lower portion extends to a depth of 60 inches or more and is mottled, black clay.

The NRCS describes the Scamman Silty Clay Loam series as a very deep somewhat poorly drained soil located on broad plains, terraces and foot slopes. In a representative profile, the surface layer is dark brown silty clay loam for the upper 6 inches. The lower portion is dark yellowish brown silty clay loam for about 7 inches. The subsoil is about 60 percent mottled, dark brown silty clay loam and 40 percent gray silt loam for the upper 10 inches. The lower 9 inches is mottled, grayish brown silty clay. The substratum extends to a depth of 60 inches or more and is mottled, dark grayish brown silty clay.

The soil appeared to be poorly drained throughout the site. The soil was evaluated to a depth of about 20 inches or less at each test plot location as indicators of hydric soil were present. See Appendix C for the profile details at the test plot locations.

Hydrology:

The site appears to be moderately drained on the upland side and did not have indicators of hydrology such as drainage patterns, standing water or oxidized roots.

The wetland area is in a depressional area and receives its hydrology from the higher elevations. Hydrology was present in the area and met the criteria for wetland habitat. See Appendix C for the Test Plot Data Forms.

Wildlife:

The area is shown to have Big Brown Bat and wetland habitat as a priority species listed on the Priority Habitat Species Map produced by Fish and Wildlife.

The vegetation in the area is moderate and provides a great area for frogs and other amphibians to habitat. The shrubs surrounding the wetland and in the wetland provide habitat for birds and other mammals, as well as a sound barrier from activities outside of the habitat.

Topography:

The topography of the site is sloped at about 5-10% on the hill side. The topography on the west side of the site is depressed where water from the higher elevations and Interstate 5 are collected.

Surrounding Wetlands and Impacts:

The National Wetlands Inventory (NWI) map and other maps do depict mapped wetlands within the area. It needs to be noted that the NWI maps and GeoData Center needs to be used cautiously as they compile general wetland data.

Environmental Design did find wetland habitat located on the site. Environmental Design conducted a further site investigation covering an area of 300 feet or more by site visit and by the use of mapping resources to determine if wetlands were present around the site or if buffers from other wetland habitats would impact the site. Wetland habitat was not found outside of the depression area. There also does not appear to be any other wetland buffers that would impact the client’s project.

Wetland Buffer:

For this report the wetland on the site has been named Wetland A. Wetland A has been rated in accordance with the current Department of Ecology's Rating forms and it is calculated to be a Category IV wetland. Wetland A has a protective buffer of 50 feet as stated in the City of Chehalis Critical Area Ordinance 17.38.207 in Table 17.23.030. The wetland has a low wildlife function.

The wetland edge was flagged using wetland boundary flagging and the flags were then gathered using a Trimble Geo7X GPS unit. Flags were placed on the boundary and the client is aware of the habitat and where it begins. The mapping was completed with known point being the existing property corner and driveway.

The wetland is possibly located off the site in areas so the wetland boundary located on the rating figures was determined using the hill shade map where the depressional area could be seen. This is approximate and was unable to be field verified.

Conclusions:

Environmental Design, LLC concludes that wetland habitat is present on the site and within 300 feet of the proposed project. Wetland A has a buffer of 50 feet in accordance with being a low wildlife function as stated in the City of Chehalis Critical Area Ordinance.

The buffer is not of impact to the client's project as the project will be placed outside of the buffer.

References:

City of Chehalis. Title 17 Uniform Development Regulations. Online.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Lewis County. Critical Areas Map. Online map. https://fortress.wa.gov/lewisco/home/.

Soil Conservation Service. 1995. Hydric Soils for Washington. Online document: http://www.statlab.iastate.edy:80/soils/hydric/wa/html.

Soil Conservation Service. 1980. Soil Survey of Lewis County, Washington. U.S. Department of Agriculture, Washington DC.

Soil Conservation Service. 1990. Soil Survey of Thurston County, Washington. U.S. Department of Agriculture, Washington DC.

U.S Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0), ed. J. S. Wakeley, R.W. Lichvar, and C. V. Noble. ERDC / EL TR-103. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Washington State Department of Ecology. 1997. Washington State Wetlands Identification and Delineation Manual. Publication # 96-94. Olympia, Washington.

Washington State Department of Ecology. 2004. Washington State Wetlands Rating System: Western Washington Revised. Publ. # 04-06-025. Olympia, Washington.

Washington Department of Fish and Wildlife. Priority Habitat Species (PHS) Database. (August 2014)

The determination of this wetland was completed by Environmental Design, LLC. The determination of this wetland is based on scientific method and our best professional judgment. Environmental Design, LLC agrees that the conclusion should agree with the local, state, and federal regulatory agencies.

Completed By:

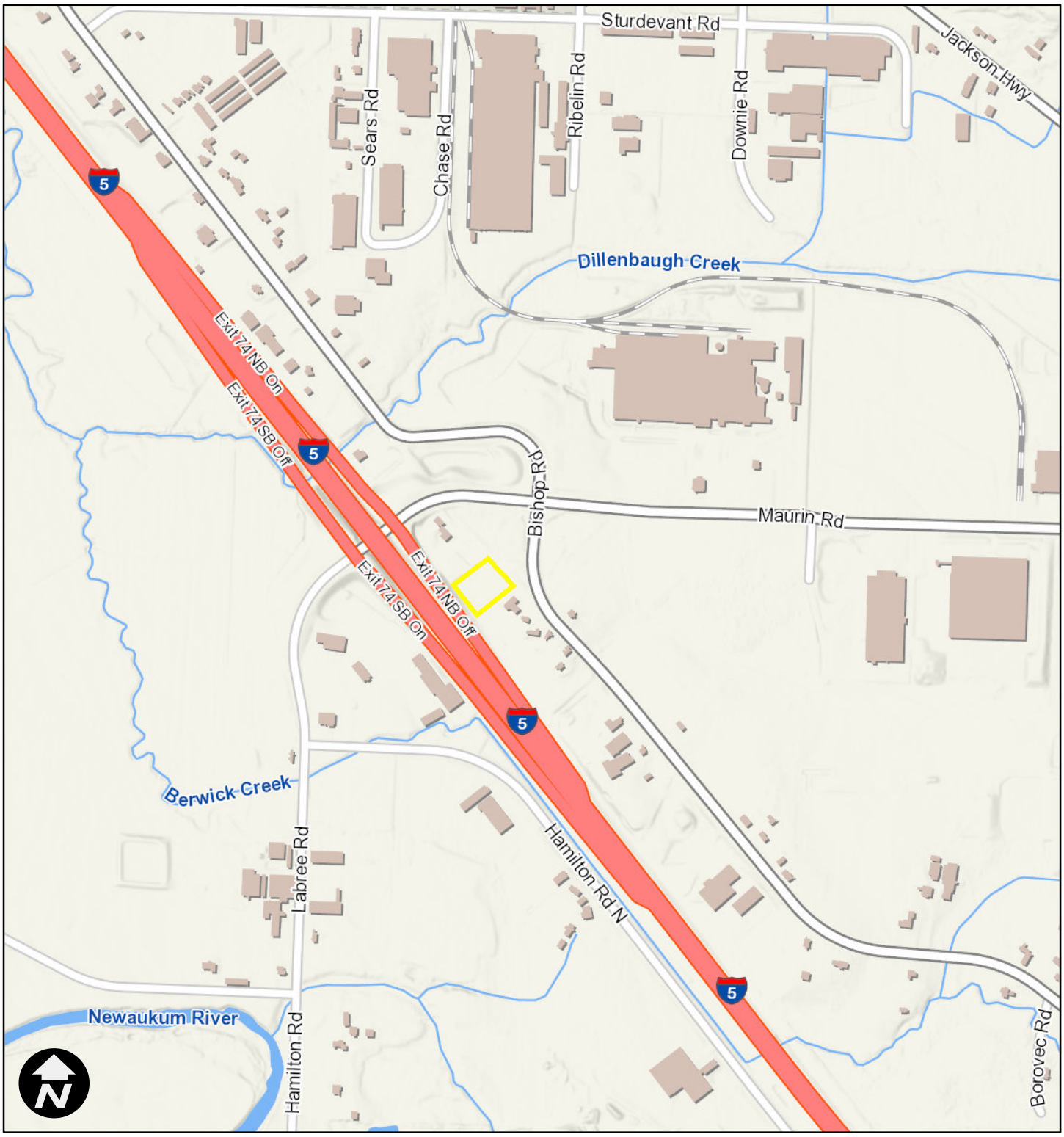
Becky Rieger

Becky Rieger, *Wetland Specialist*

Appendix A:

Wetland Maps

Figure 1: Site Location Map



2/28/2024, 8:54:02 AM

1:9,028

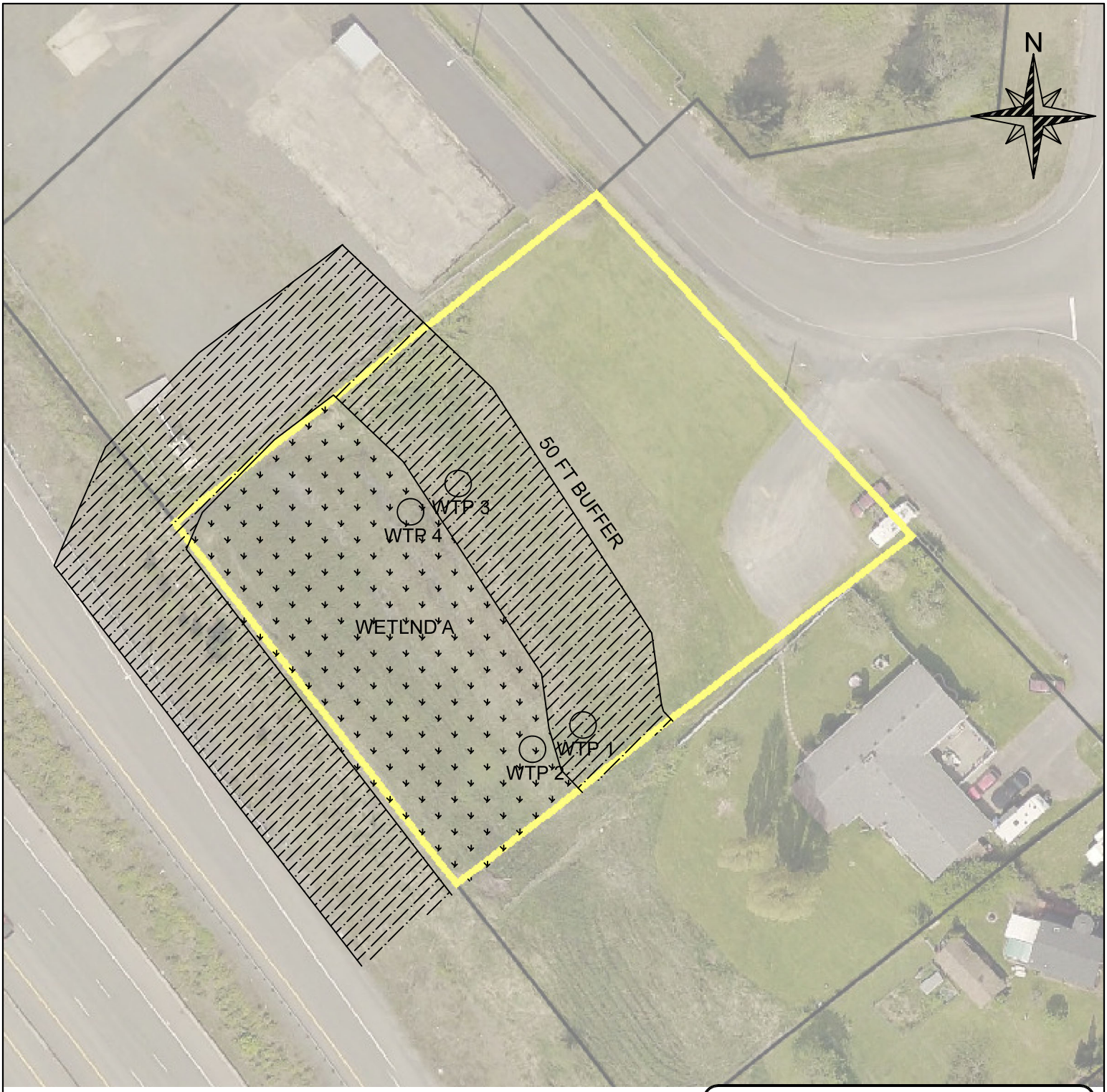
Parcels

0 400 800 1,600 ft

NAD 1983 StatePlane Washington South FIPS 4602 Feet

LEWIS COUNTY
— est. 1845 —

Lewis County G.I.S.



0 60 120

1" = 60 FT

THE PROPERTY LINES IN THIS MAP ARE APPROXIMATE AND ARE NOT INTENDED TO BE USED AS A SURVEY.

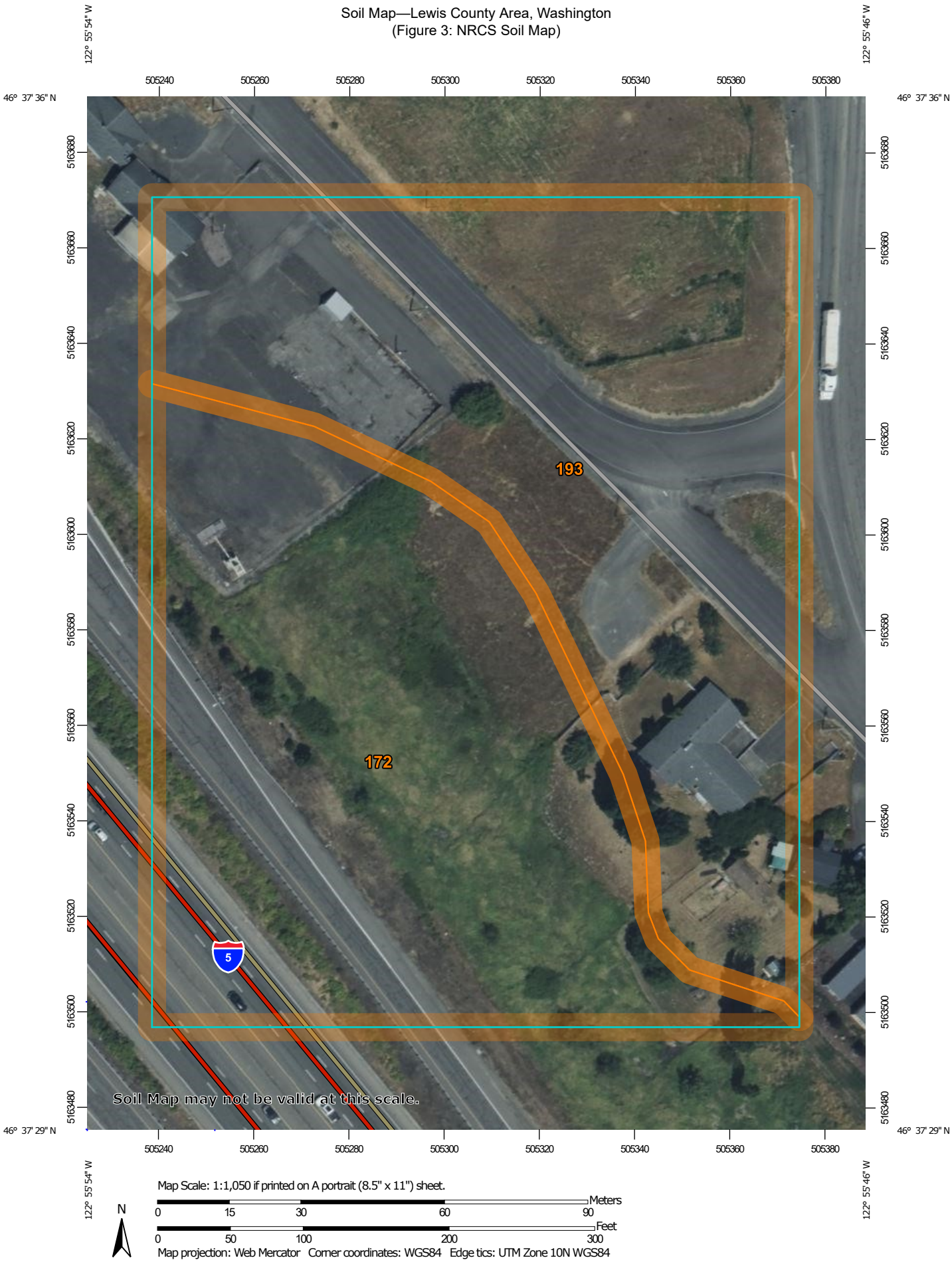
FIGURE 2: SITE MAP
TEST PLOT LOCATIONS

Environmental Design, LLC.
Septic Design • Wetlands • Mapping
901 L Street
Centralia, Wa. 98531
(360) 219-3343

CLIENT NAME:	K & R Resources	SITE ADDRESS:	BISHOP ROAD
MAILING ADDRESS:	PO BOX 7		CHEHALIS
	CHEHALIS, WA 98532	PARCEL NUMBER:	017730002000
PHONE NUMBER:	----	SEC-TWN-RNG:	09-13N-02W

JOB NUMBER:	2023-007
DATE:	02.28.2024
DRAFTED BY:	BJR
REVIEWED BY:	BJR

Soil Map—Lewis County Area, Washington
(Figure 3: NRCS Soil Map)



Map Scale: 1:1,050 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lewis County Area, Washington
Survey Area Data: Version 23, Aug 29, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 26, 2023—Aug 14, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
172	Reed silty clay loam	2.9	49.0%
193	Scamman silty clay loam, 0 to 5 percent slopes	3.0	51.0%
Totals for Area of Interest		**5.9**	**100.0%**

U.S. Fish and Wildlife Service
National Wetlands Inventory

Figure 4: NWI Map

February 28, 2024

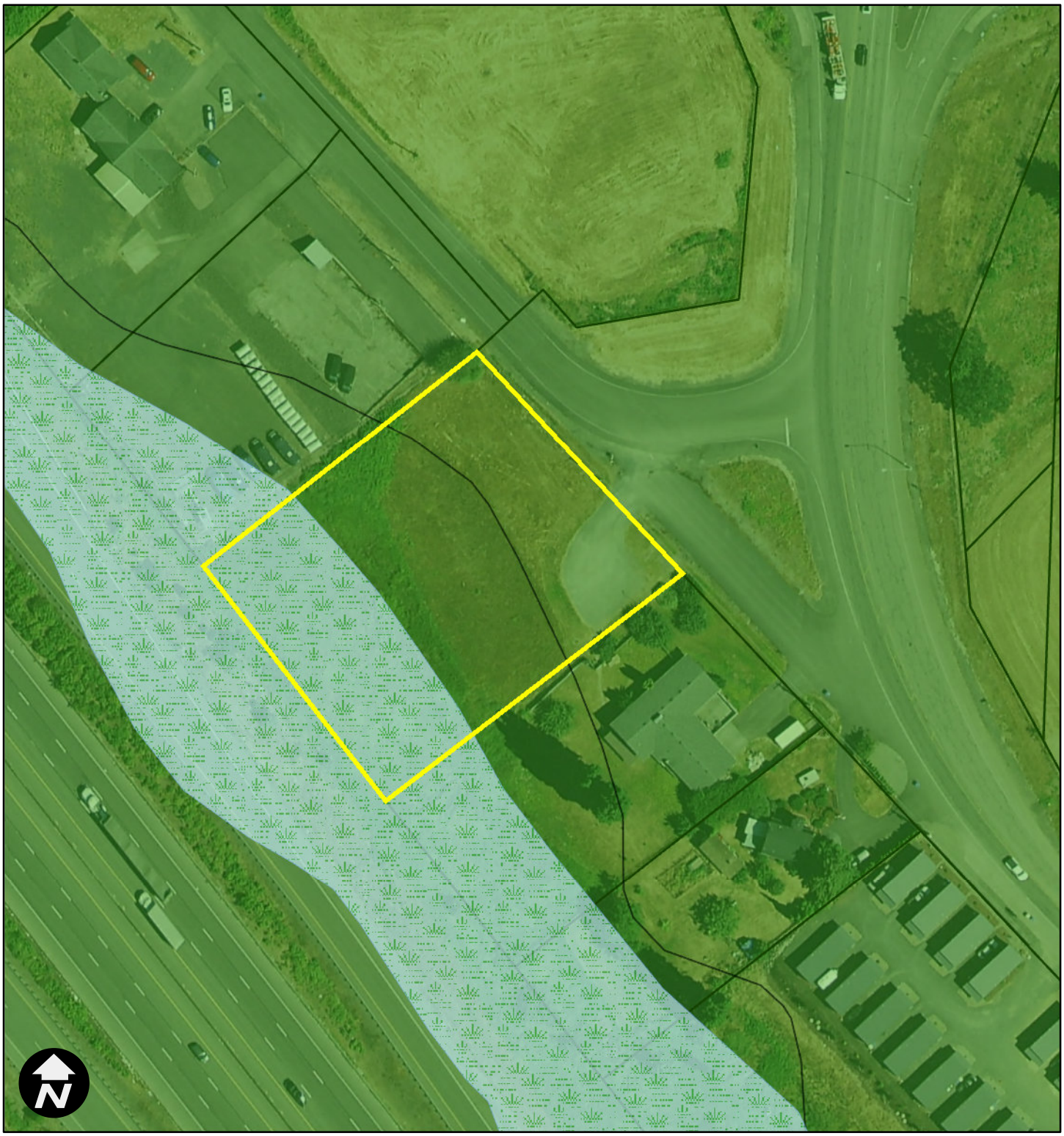
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Figure 5: Lewis County Critical Area Map



2/28/2024, 8:55:25 AM

1:1,128

Parcels

Wetlands

Hydric Soils

Shoreline Environments

Aquatic

Natural

Rural or Urban Conservancy

Shoreline Residential

High Intensity

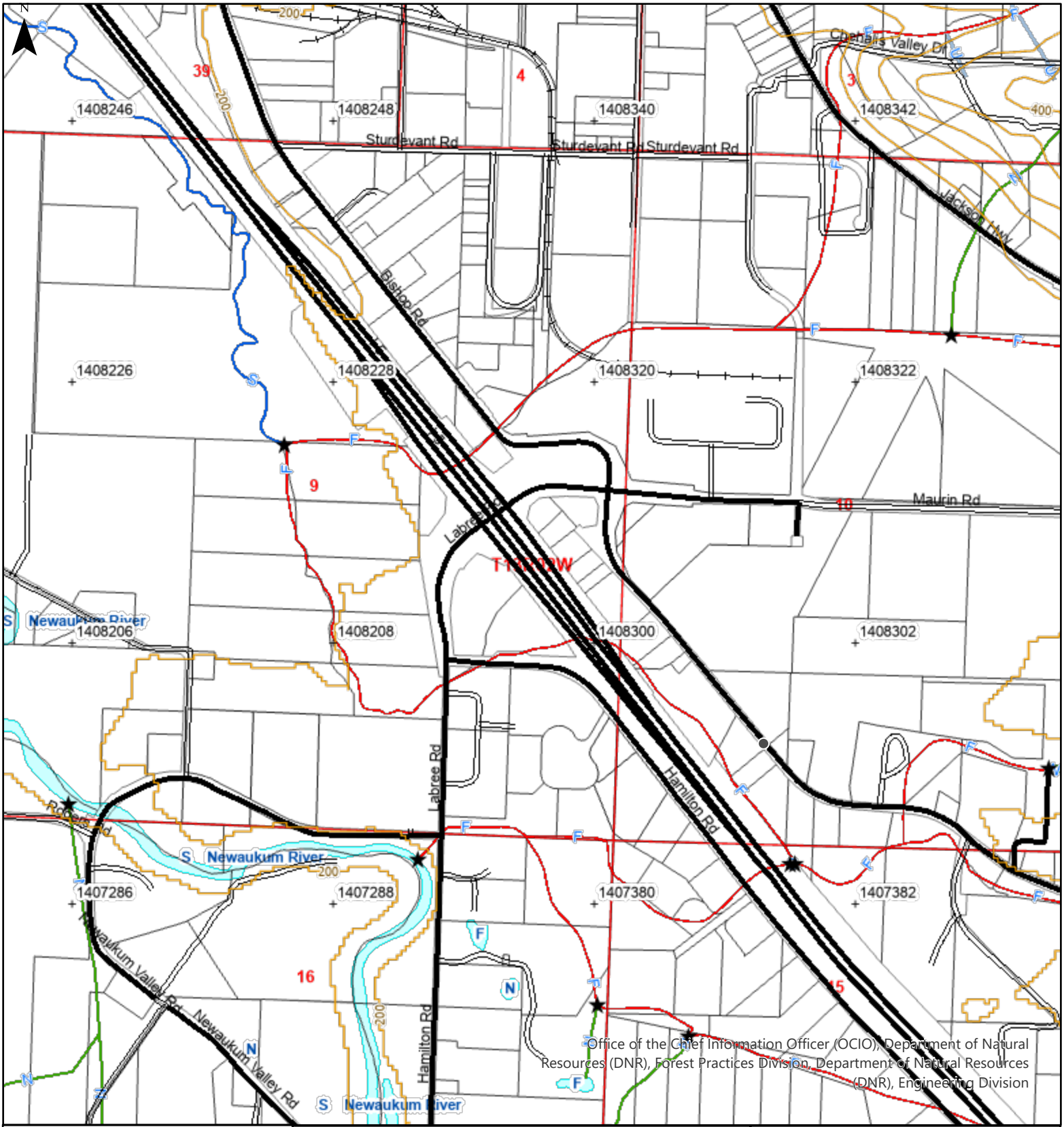
0 50 100 200 ft

NAD 1983 StatePlane Washington South FIPS 4602 Feet

LEWIS COUNTY
— est. 1845 —

Lewis County G.I.S.

Forest Practices Activity Map - Application #_____



Map Symbols

- Harvest Boundary
- Road Construction
- Stream
- RMZ / WMZ Buffers
- Rock Pit
- Landing
- Waste Area
- Clumped WRTS/GRTS
- Existing Structure

Additional Information

Legal Description

S09 T13.0N R02.0W, S39 T13.0N R02.0W, S03 T13.0N R02.0W, S16 T13.0N R02.0W, S04 T13.0N R02.0W, S10 T13.0N R02.0W, S15 T13.0N R02.0W

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

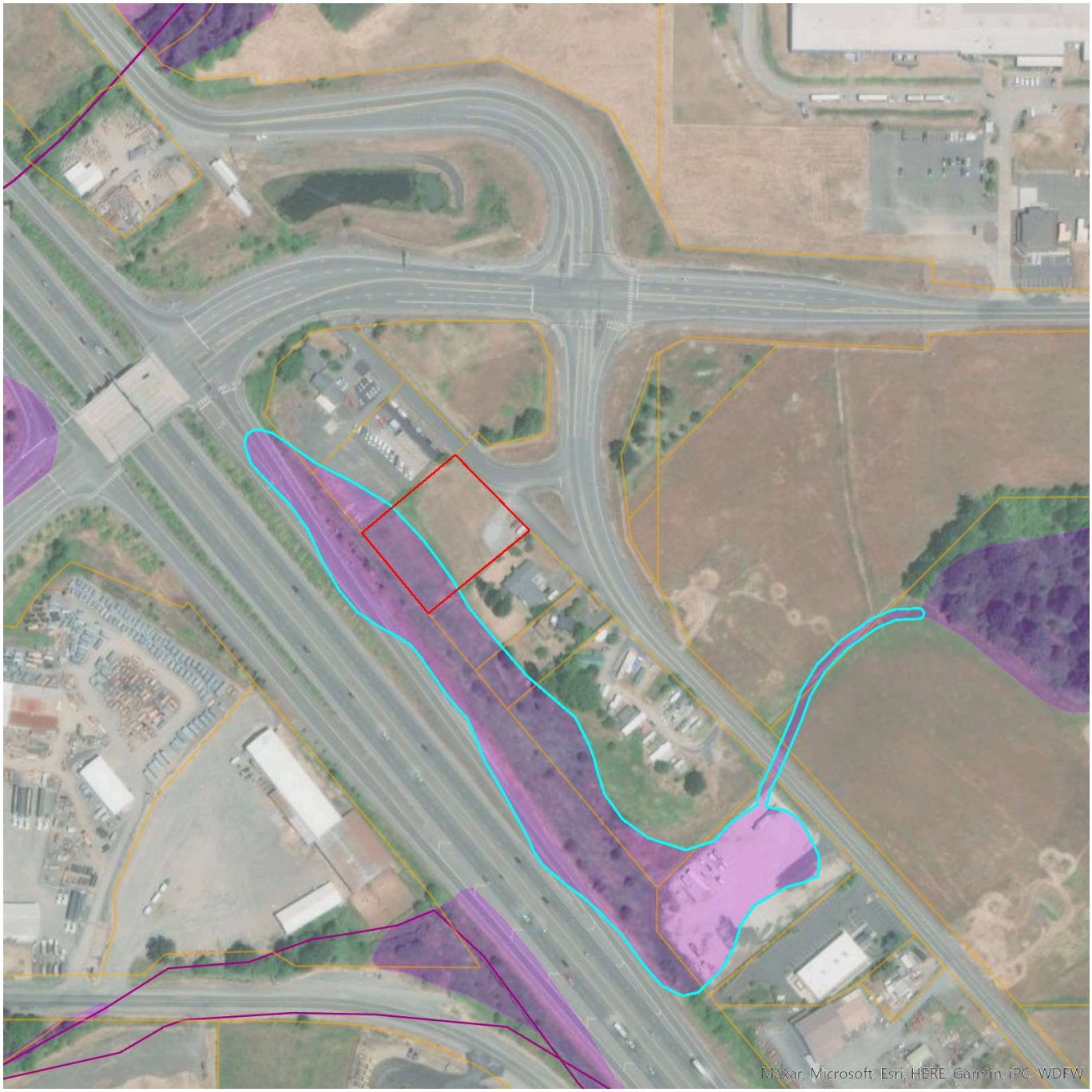
Extreme care was used during the compilation of this map to ensure its accuracy. However, due to changes in data and the need to rely on outside information, the Department of Natural Resources cannot accept responsibility for errors or omissions, and therefore, there are no warranties that accompany this material.

Approximate Scale : 1:12,000

0 500 1,000 2,000 Feet

Date: 2/28/2024 Time: 9:04 AM

Priority Habitats and Species on the Web



Report Date: 02/28/2024, Parcel ID: 017730002000

PHS Species/Habitats Overview:

Occurence Name	Federal Status	State Status	Sensitive Location
Freshwater Emergent Wetland	N/A	N/A	No
Big brown bat	N/A	N/A	Yes

PHS Species/Habitats Details:

Freshwater Emergent Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Emergent Wetland - NWI Code: PEM1C
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Big brown bat	
Scientific Name	*Eptesicus fuscus*
Notes	This polygon mask represents one or more records of the above species or habitat occurrence. Contact PHS Data Release at phsproducts@dfw.wa.gov for obtaining information about masked sensitive species and habitats.
PHS Listing Status	PHS Listed Occurrence
Sensitive	Y
Display Resolution	TOWNSHIP
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00605

Appendix B:

Site Pictures

View of North

View of Northwest

View of West

View of North

View of East

View of West

View of South

View Southeast

Appendix C:

Test Plot Data Forms

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 21141 Bishop Road City/County: Chehalis / Lewis Sampling Date: 2023-02-01

Applicant/Owner: K&R Resources State: Washington Sampling Point: WTP 1

Investigator(s): Becky Rieger Section, Township, Range: 09-13N-02W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: NAD83_2011

Soil Map Unit Name: Reed Silty Clay Loam / Scamman Silty Clay Loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Test Plot does not meet criteria

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Lolium perenne	60	✔	FACU
2. Taraxacum officinale	40	✔	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

Vegetation does not meet criteria

SOIL

Sampling Point: WTP 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/3	100					Silty Clay Loam	
12 - 22	10YR 5/1	80	10YR 7/8	20	C	M	Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ **No** _____

Remarks:

Soil is hydric

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Aerial Photos / Site Inspections throughout project time frame and nearby sites

Remarks:

Hydrology is not present

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 21141 Bishop Road City/County: Chehalis / Lewis Sampling Date: 2023-02-01

Applicant/Owner: K&R Resources State: Washington Sampling Point: WTP 2

Investigator(s): Becky Rieger Section, Township, Range: 09-13N-02W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): _____ Slope (%): 0

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: NAD83_2011

Soil Map Unit Name: Reed Silty Clay Loam / Scamman Silty Clay Loam NWI classification: PEM1c

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Test site meets wetland criteria

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Spiraea douglasii	30	✔	FACW
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Phalaris arundinacea	80	✔	FACW
2. Juncus effusus	20	✔	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	130	x 2 =	260
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	130 (A)		260 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Site does meet vegetation

SOIL

Sampling Point: WTP 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 22	10YR 6/1	80	10YR 8/8	20	C	M	Silty Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ **No** _____

Remarks:

Soil is hydric

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✔ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✔ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Aerial Photos / Previous Inspections

Remarks:

Hydrology is present

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 21141 Bishop Road City/County: Chehalis / Lewis Sampling Date: 2023-02-01

Applicant/Owner: K&R Resources State: Washington Sampling Point: WTP 3

Investigator(s): Becky Rieger Section, Township, Range: 09-13N-02W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: NAD83_2011

Soil Map Unit Name: Reed Silty Clay Loam / Scamman Silty Clay Loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Test Plot does not meet criteria

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Lolium perenne	60	✔	FACU
2. Taraxacum officinale	40	✔	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

Vegetation does not meet criteria

SOIL

Sampling Point: WTP 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 4/3	100					Silty Clay Loam	
12 - 22	10YR 5/1	80	10YR 7/8	20	C	M	Silty Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** _____

Remarks:

Soil is hydric

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Aerial Photos / Site Inspections throughout project time frame and nearby sites

Remarks:

Hydrology is not present

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 21141 Bishop Road City/County: Chehalis / Lewis Sampling Date: 2023-02-01

Applicant/Owner: K&R Resources State: Washington Sampling Point: WTP 4

Investigator(s): Becky Rieger Section, Township, Range: 09-13N-02W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): _____ Slope (%): 0

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: NAD83_2011

Soil Map Unit Name: Reed Silty Clay Loam / Scamman Silty Clay Loam NWI classification: PEM1c

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

Test site meets wetland criteria

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Spiraea douglasii	30	✔	FACW
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Phalaris arundinacea	80	✔	FACW
2. Juncus effusus	20	✔	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	130	x 2 =	260
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	130 (A)		260 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Site does meet vegetation

SOIL

Sampling Point: WTP 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 22	10YR 6/1	80	10YR 8/8	20	C	M	Silty Clay Loam	
-								
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

Soil is hydric

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✔ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Vis ble on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✔ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): _____

Water Table Present? Yes ___ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Aerial Photos / Previous Inspections

Remarks:

Hydrology is present

Appendix D:

Wetland Rating Forms

Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: February 2024

Rated by Becky Rieger Trained by Ecology? X Yes ___No Date of training 6/2014

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___Y X N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.

Source of base aerial photo/map Lewis County GIS

OVERALL WETLAND CATEGORY IV (based on functions X or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

X **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H **M** L	H M **L**	H M **L**	
Landscape Potential	H **M** L	H **M** L	H **M** L	
Value	H **M** L	H M **L**	H M **L**	**TOTAL**
Score Based on Ratings	6	4	4	14

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	N/A

Wetland name or number A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	RF1
Hydroperiods	D 1.4, H 1.2	RF2
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	RF2
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	RF3
Map of the contributing basin	D 4.3, D 5.3	RF3
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	RF4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	303D Map
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	303D Map

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number A

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ___The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number A

NO – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number A

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	1
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*. Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	2
Total for D 1 Add the points in the boxes above	6

Rating of Site Potential If score is: ___ **12-16 = H** X **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 or 4 = H** X **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? Yes = 2 No = 0	0
Total for D 3 Add the points in the boxes above	1

Rating of Value If score is: ___ **2-4 = H** X **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number A

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	0
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	0
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	3

Rating of Site Potential If score is: ___**12-16 = H** ___**6-11 = M** X **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	0
Total for D 5 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___**3 = H** X **1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther down-gradient. points = 1 Flooding from groundwater is an issue in the sub-basin. points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* In a depressional area points = 0 There are no problems with flooding downstream of the wetland. points = 0	0
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	0

Rating of Value If score is: ___**2-4 = H** ___**1 = M** X **0 = L** *Record the rating on the first page*

Wetland name or number A

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

____Aquatic bed — 4 structures or more: points = 4
____Emergent — 3 structures: points = 2
_X_Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1
____Forested (areas where trees have > 30% cover) — 1 structure: points = 0

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

1

H 1.2. Hydroperiods

X

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

____Permanently flooded or inundated — 4 or more types present: points = 3
_X_Seasonally flooded or inundated — 3 types present: points = 2
____Occasionally flooded or inundated — 2 types present: points = 1
____Saturated only — 1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland
____Seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland** — **2 points**
____**Freshwater tidal wetland** — **2 points**

0 0 0 0 0 40 40

0

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

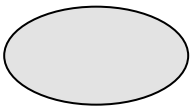
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted: > 19 species — points = 2
5 - 19 species — points = 1
< 5 species — points = 0

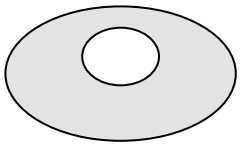
1

H 1.4. Interspersion of habitats

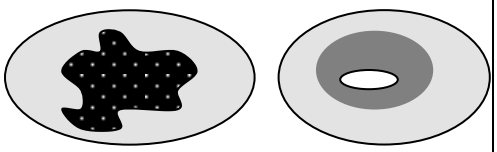
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points

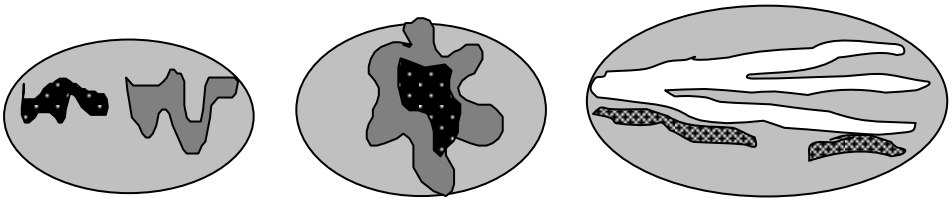


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **HIGH** = 3points



1

Wetland name or number __A__

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ____Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ____Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ___ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	0
Total for H 1 Add the points in the boxes above	3

Rating of Site Potential If score is:___**15-18 = H** ___**7-14 = M** ___**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat___**+** [(% moderate and low intensity land uses)/2] __**=** ___% If total accessible habitat is: > $^1/_3$ (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. ~~Undisturbed~~ habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat __ **+** [(% moderate and low intensity land uses)/2] __ **=** ____% ~~Undisturbed~~ habitat > 50% of Polygon points = 3 ~~Undisturbed~~ habitat 10-50% and in 1-3 patches poins = 2 ~~Undisturbed~~ habitat 10-50% and > 3 patches points = 1 ~~Undisturbed~~ habitat < 10% of 1 km Polygon points = 0	2
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	0
Total for H 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is:___**4-6 = H** X__**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	0

Rating of Value If score is:___**2 = H** ___**1 = M** X__**0 = L** *Record the rating on the first page*

X

Wetland name or number A

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** (No) = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 2.2** (No) – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** (No) **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** (No) – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** (No) = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number A

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** (No) = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** (No) = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** (No) = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

RF 1: Cowardin Plant Classes

2/28/2024, 9:08:21 AM

1:4,514

Legend:
Orange - Wetland Area

All of wetland is emeregent and scrub / shrub

0 205 410 820 ft

NAD 1983 StatePlane Washington South FIPS 4602 Feet

LEWIS COUNTY
— est. 1845 —

Lewis County G.I.S.

RF 2: Hydroperiods

2/28/2024, 9:08:30 AM

1:4,514

Legend:
Orange - Wetland Area

All of wetland is Seasonally Saturated

0 205 410 820 ft

NAD 1983 StatePlane Washington South FIPS 4602 Feet

LEWIS COUNTY
— est. 1845 —

Lewis County G.I.S.

RF 3: Contributing Basin

2/28/2024, 9:09:33 AM

1:4,514

Legend:
Orange - Wetland Area
Blue - Contributing Basin

0 205 410 820 ft

NAD 1983 StatePlane Washington South FIPS 4602 Feet

LEWIS COUNTY
— est. 1845 —

Lewis County G.I.S.

RF 4: 1km Polygon

2/28/2024, 9:16:04 AM

1:18,056

Legend:
Orange - Wetland Area
Red Shade - High Intensity
Unshaded - Moderate Intensity

0 800 1,600 3,200 ft

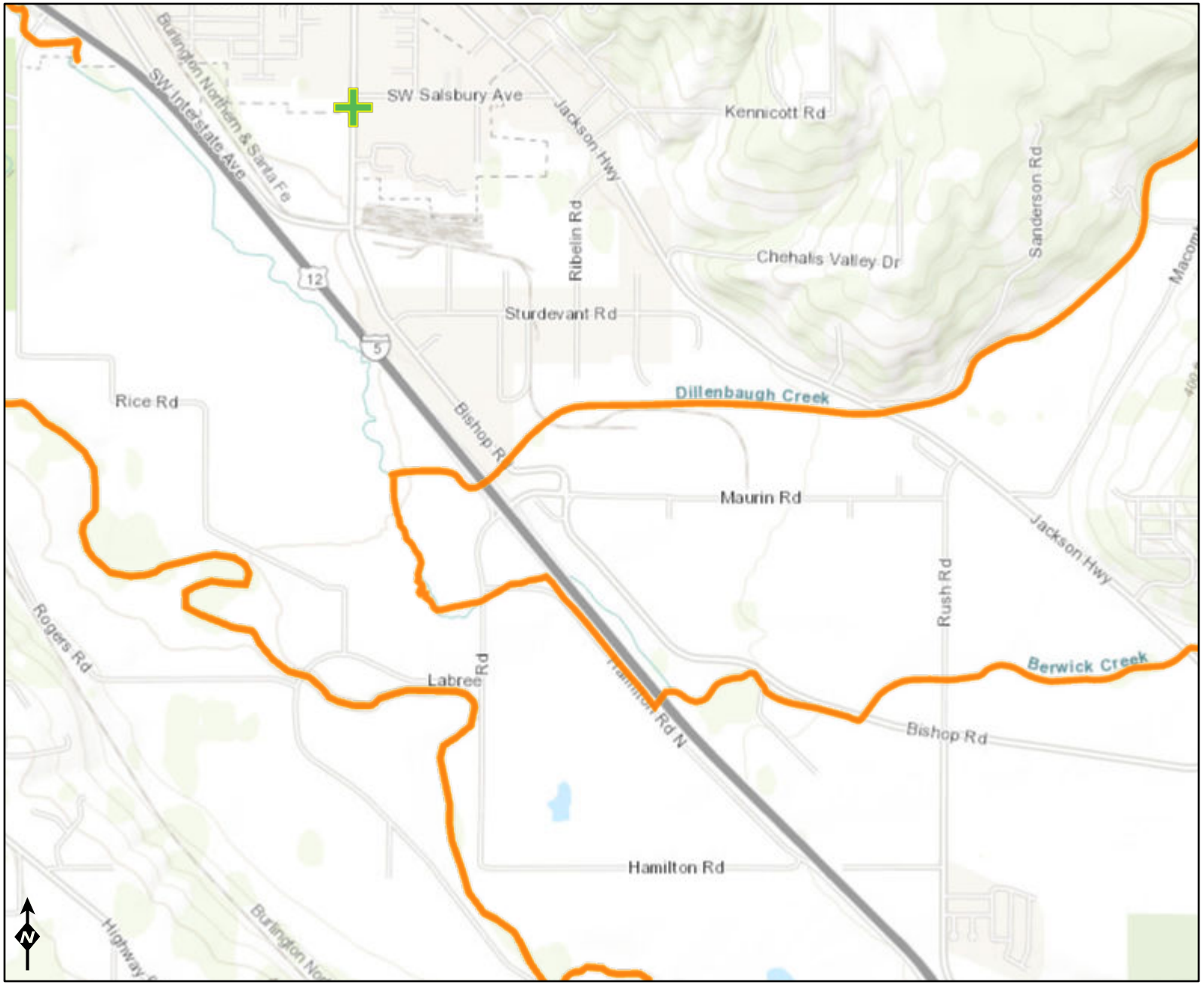
NAD 1983 StatePlane Washington South FIPS 4602 Feet

LEWIS COUNTY
— est. 1845 —

Lewis County G.I.S.

February 28, 2024

303d Map



Assessed Water/Sediment

Water
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Sediment
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Miles
0 0.23 0.45 0.9

Esri, NASA, NGA, USGS, FEMA
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

Credentials

Becky Rieger

Home Address:
901 L Street
Centralia, WA 98531
Phone: (360) 219-3343

Education

Associates Degree in Arts
Centralia Community College — Centralia, Washington
Date of Graduation: June 2007

Associates Degree in Applied Science
Major in Geographic Information Systems
Grays Harbor Community College — Aberdeen, Washington
Date of Graduation: June 2002

Continuing Education / Awards / Organizations

Coastal Training Program
- Certificate in Using the Revised Wetland Rating System (2014)
- Certificate in Identifying Hydric Soils (2012)
- Certificate in Using the Revised Wetland Rating System (2007)

Oregon State University (2006)
- Certificate in Soil Identification

Portland State University Wetland Program (2006)
- Certificate in Wetland Delineation Course
- Certificate in Advanced Hydric Soils and Hydrology Course
- Certificate in Hydrophytic Vegetation Identification Coarse

Licensed On-Site Wastewater Designer (2009-Current) License # 5100369

Olympia Master Builders
- Lewis County Chapter Vice President
- Olympia Master Builders Associate Vice President

Washington On-Site Sewage Association
- SW Washington Designer Rep. (2018 – Current)

Professional Experience

Licensed Designer / Wetland Specialist / Owner May 5, 2010 - Current
Environmental Design, LLC
- Complete Site and Soil Evaluations, Site Consultations, Topography Field Work
- Complete Septic Designs and mapping projects using MicroSurvey
- Complete Wetland and other Critical Area Reports per regulations in multiple jurisdictions
- Perform presentations to educate people about wetlands and septic systems

Assistant Designer / Certified Wetland Specialist Feb. 24, 2005 – Oct. 30, 2007
Goode & Associates Supervisor: Jeannie Yackley
- Complete designs of on-site wastewater designs for county submittal
- Communicate with county regulators, installers, and clients
- Conduct wetland determinations, delineations, mitigations and consultations
- Research projects, apply for permits, and conduct final inspections on installed septic systems
- Perform presentations to educate people about wetlands and septic systems