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Renee France
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June 29, 2023

VIA: EMAIL

1600 SE 190th Avenue
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LUP-Comments@multco.us

RE: T3-2022-16220 Comments
Applicant's Pre-Hearing Statement

To the Multnomah County Hearings Officer:

These comments are submitted on behalf of the applicant, the Water Bureau,[1] in response to concerns about the project raised by public testimony and the staff report.

I. CONDITIONS OF APPROVAL

The applicant appreciates staff's recommendation of approval of the applications, as conditioned. Except as discussed below, all of the conditions are accepted by the applicant and will be integrated into the project. Proposed changes to the balance of the conditions are provided below in *italic* text with redlined changes, along with reason for the requested change.

Land Use Planning Proposed Condition 8.e:

> *The drawings for the Water Filtration Facility site (Exhibit A.212) shall be amended consistent with the plans provided during the land use review to show the access drive entering the subject property from the SE Carpenter Lane right- of-way shall be perpendicular as it crosses the 30-foot Front Yard [MCC 39.6580(A)].*

The requested modification of the access drive in the yard area has been incorporated into the project design. Changes to the design to incorporate the perpendicular access are shown in Attachment 1 to this Pre-Hearing Statement. Attachment 1 also provides the revised site plans requested by Transportation Planning's Proposed Condition 9.a.ii.

[1] Terms used but not defined in this letter have the meanings given to them in the application documents. A glossary is provided in the beginning of the Introduction section of the application narratives.

Exhibit H. 3

Land Use Planning Proposed Condition 11.d:

> *Should the Hearings Officer not grant the requested Exception to the required number of parking spaces, ~~in~~ the additional spaces will be provided consistent with the Parking Lot Expansion Plan provided during this land use review ~~shall be filed with Land Use Planning showing how the required number of parking spaces can be provided~~ on the subject Water Filtration Facility parcel ~~in the future~~. [MCC 39.6600(C)]*

The first sentence appears to contain a typographical error, as there would be no reason to require a Parking Lot Expansion Plan if the exception is granted.

The requested Parking Lot Expansion Plan is provided in Attachment 2 to this Pre-Hearing Statement. This plan shows all modifications to the design of the facility that would be required to provide the spaces.

Land Use Planning Proposed Condition 12.a:

> *Unless approved by the County Sanitarian, The Water Filtration Facility shall have ten maximum employees per day (7 for the 8 hr. shift and 3 for the 12hr shift), and not more than 30 visitors per day. Wastes including those associated with the drinking water quality analysis laboratory must be containerized and not enter the septic system. Only domestic strength wastewater is allowed. [MCC 39.4325(G)]*

The applicant understands that this condition was imposed because of the recommendation of the County Sanitarian in the Septic Review Certification (staff's Exhibit A.124, page 1) based on the sizing of the septic system. The applicant requests to provide in the condition that, if a larger size septic system is provided at the filtration facility, the employee numbers could be increased without a new Type III land use hearing being required (to modify a condition of approval). Note that other portions of the application made much more conservative assumptions about the number of employees – most notably that the Traffic Impact Analysis (staff's Exhibit A.31, page 9) states: "The filtration facility will be staffed by an estimated 26 full-time employees, with a maximum of 10 employees working any individual shift. For a conservative estimate, all 26 employees were accounted for in the trip generation calculations."[2] The Water Bureau needs the flexibility to ensure that the employees needed to provide safe drinking water are able to be provided at this facility. A cap based on the conservative estimate of 26 full-time employees in the Traffic Impact Analysis would be another appropriate way to modify Condition 12.a.

Land Use Planning Proposed Condition 16:

> *16. Any alteration made to the transmission tower after construction resulting in a substantial increase in the non-ionizing electromagnetic radiation (NIER) or radiation pattern of the NIER source shall require a modification of the Community Service Permit [MCC 39.7575(C)].*

[2] This same estimated employee assumption is also found in the narratives in multiple locations. *See, e.g.*, Section 1, page 2; Section 1.A, pages 10, 27; Section 1.B, page 41.

> 17. Pursuant to MCC 39.6200 et. seq., obtain and comply with all required permits for erosion and sediment control during and after construction, including, as applicable, the installation of erosion and sediment control best management practices (BMPs) based on an erosion and sediment control plan, ~~prepared and stamped by either a Certified Professional in Erosion and Sediment Control, Certified Professional in Stormwater Quality, Oregon Registered Professional Engineer, Oregon Registered Landscape Architect, or Oregon Certified Engineering Geologist. The erosion and sediment control plan shall effectively stabilize the site such that no disturbed ground is visible, and so no visible or measurable erosion or sedimentation occurs.~~

As a minor typographical correction, based on the bracketed [MCC 39.7575(C)] in the middle of this condition, it appears that the text after that bracket is intended to be a separate condition 17.

For that separate condition 17, the applicant requests that the condition be made clear that this language is not intended to modify the county's existing regulation of Erosion and Sediment Control (ESC) under MCC 39.6200 *et. seq*. The applicant has applied for the required Multnomah County ESC permits and is awaiting staff's review of the additional materials staff requested in order to make the applications complete. The last sentence of the proposed condition is particularly confusing – as it is unclear what it means to require "that no disturbed ground is visible" during inherently ground disturbing activities. If there are specific concerns staff or others have with visibility of the disturbed ground or the qualifications of the professionals preparing ESC plans for the project, the applicant would welcome the opportunity to address those specific concerns.

Transportation Planning Proposed Condition 4:

> *Pursuant to MCRR 6.100D, Applicant is required to comply with the ~~submit a~~ Transportation Demand Management (TDM) Plan provided in the record of this land use proceeding. ~~prior to start of construction. The plan will identify person/people responsible for coordinating demand reduction strategies (carpooling, offset arrival times, incentive program, etc.), when the strategies will be deployed, and how the strategies will be measured for impact. Applicant will provide progress reports to the County every 6 months during the construction of the facility. If traffic volumes exceed overall recommended volumes entering the site, applicant will develop new strategies.~~*

The requested Transportation Demand Management (TDM) Plan is provided in Attachment 3 to this Pre-Hearing Statement. The plan identifies the PWB Construction Manager as the person responsible for coordinating the demand reduction strategies and provides a hierarchy of TDM strategies that will be implemented in order to ensure that the capacity threshold is not exceeded at any point during construction. Consistent with the suggestions in Proposed Condition 4 and the Construction TIA, those TDM strategies are: use of the Bluff Road Access, offset arrival times, commuter shuttling, and rideshare/carpooling incentive programs. The strategies will be measured by use of a tube counter or similar device capable of 15-minute data bins, as well as a two-week look ahead of construction activities to forecast upcoming volumes. Note that the TDM provided in Attachment 3 proposes to provide this information in progress reports to the County monthly, which is more frequently than the six-month intervals proposed by Transportation Planning. This close coordination is intended to provide

additional assurances that County Transportation and the applicant will be able to respond in real time to any concerns about construction traffic exceeding operational capacity.

Transportation Planning Proposed Condition 5:

> *Prior to construction in the Right of Way (ROW), obtain Construction permit (MCRR 9.200, 18.200) for:*
>
> *a. [....]*
>
> *b. All roads requiring full or partial road work due to pipeline installation:*
>
> *i. SE Dodge Park Blvd from east of SE Cottrell Rd to east of SE Altman Rd*
>
> *ii. SE Altman Rd from SE Lusted Rd to SE Oxbow ~~Rd~~Drive*
>
> *iii. SE Cottrell Rd from SE Dodge Park Blvd to SE Lusted Rd*
>
> *iv. SE Lusted Rd from the Intertie Site to SE Altman Rd*
>
> *v. SE Lusted Rd just north of Clackamas County line*

These proposed edits ensure that Condition 5.b captures correctly all areas where road work due to pipeline installation is planned.

> *c. All roads requiring preliminary or ongoing maintenance due to projected use:*
>
> *i. SE Altman Rd from SE Oxbow Drive ~~and~~ to Dodge Park ~~Road~~Blvd*
>
> *ii. SE Cottrell Rd from SE Lusted Road ~~and~~ to SE Dodge Park ~~Road~~Blvd*
>
> *iii. SE Lusted Rd from SE ~~Altman~~ Pleasant Home Road ~~and~~ to SE Cottrell Road*
>
> *iv. SE Hosner Rd from SE Lusted Road ~~and~~ to SE Oxbow ~~Parkway~~Drive*
>
> *~~v. SE Lusted Rd from SE Altman Road to SE Pleasant Home Rd~~*

These proposed edits to Condition 5.c correct the typographical errors in the names of roads and clarify the syntax of "from ... to" in each road segment description. Additionally, subsection "v." is proposed to be combined with subsection "iii." as it makes up one continuous section of Lusted Road.

Transportation Planning Proposed Condition 6:

> *To ensure that the transportation network maintains a condition that is safe, does not create a safety hazard for the traveling public, nor creates an on-going maintenance problem, for the roads listed in Condition 5.c, the applicant is required to ~~maintain roads affected by Pipelines construction and detour routes. Pursuant to MCRR 9.500,~~ enter into a Project Agreement ~~is required between the applicant and the County to establish the maintenance of roads during construction of the Filtration Plant. The agreement shall include and address the following:~~ pursuant to MCRR 9.500, that requires the applicant to perform the following work at the following times:*

a. For SE Hosner Rd from SE Lusted Rd to SE Oxbow Dr: Full depth reclamation, or other approved pavement replacement methods, prior to use as primary or detour through truck haul route.

b. For SE Altman Rd from Dodge Park Rd to SE Lusted Rd: Full depth reclamation, or other approved pavement replacement methods, prior to use as primary or detour through truck haul route.

c. For SE Lusted Rd from SE Cottrell Rd to SE Hosner Rd: Full depth reclamation, or other approved pavement replacement methods, prior to use as primary or detour through truck haul route.

d. For SE Lusted Rd from the Beaver Creek culvert to SE Hosner: Full depth reclamation, or other approved pavement replacement methods, prior to use as primary or detour through truck haul route.

e. For SE Lusted Rd from SE Altman to the Beaver Creek culvert: At any time when using as a primary or detour through truck haul route, maintain in a serviceable condition. After completion of installation of pipelines in this section of road, replace roadway surface.

f. For SE Altman from SE Lusted Road to SE Oxbow Drive: At any time when using as a primary or detour through truck haul route, maintain in a serviceable condition. After completion of installation of pipelines in this section of road, replace roadway surface.

g. For SE Cottrell Rd from SE Lusted Road to SE Dodge Park Blvd: At any time when using as a primary or detour through truck haul route, maintain in a serviceable condition. After completion of installation of pipelines in this section of road, replace roadway surface.

h. For SE Dodge Park Blvd. from east of SE Cottrell Rd to east of SE Altman Rd (where pipeline work will occur): At any time when using as a primary or detour through truck haul route, maintain in a serviceable condition. After completion of installation of pipelines in this section of road, replace roadway surface.

i. If not already accomplished through the work described in a. - h. above, at the end of the construction period for the filtration facility and pipelines, the applicant will return the roads in Condition 5.c to as good or better condition than they were in on the date of the Hearings Officer's decision.

~~a. Identify and outline project phasing as well as how all road closures and detour routes will be maintained during the construction period.~~

~~b. Applicant is required to return the road(s) to as good or better condition at the end of the Construction period and prior to the Certificate of Occupancy of the Filtration Plant facility.~~

A "primary or detour through truck haul route" is a route used for more than 2 months duration that is not being used to directly access a construction site, such as when pipelines

> *are being installed in Lusted and Altman Roads or for improvements to the roadway itself. A two-month period reflects the time period in which there is potential for material degradation of the road surface. "Serviceable condition" means the roadway is safely usable for the purpose for which it was constructed (i.e., potholes are repaired timely , striping can be seen, etc.).*

Based on a study of County's PCI ratings for roads in the area, and in order to respond to staff's desire to have the applicant maintain roads in order to ensure that they are safe during and after construction, the applicant proposes to perform the work set forth in the above proposed condition language.

This is a "fix it first" proposal – rather than waiting for the roads to further degrade, the applicant proposes to, up front, fix the roads that staff have identified in Condition 5.c as needing maintenance. Specifically:

- Subsections "a." through "d." would require the applicant to perform a full depth reclamation, or other approved pavement replacement method, of those segments of roads prior to any significant use for construction traffic. A full depth reclamation is a process by which the full thickness of the pavement is pulverized and blended with a portion of underlying materials (base and/or subbase) compacted back in place and overlaid with new asphalt pavement. The result is a reconstructed road with a new, safe surface.
- Subsections "e." through "h." are road sections staff identified in Condition 5.c as needing maintenance, but which also will have pipeline work for the project. For these sections of road, rather than replacing the road before tearing it up for pipeline work, the applicant would first perform the County's deferred maintenance (filling potholes, replacing striping, etc.) in order to ensure the roadway is safely usable at all times during construction. After installation of the relevant section of pipeline, the roadway surface would be replaced.
- A catchall provision in subsection "i." ensures that this more specific proposal of what to "fix first" will still comply with staff's drafted requirement "to return the road(s) to as good or better condition at the end of the Construction Period."

By performing this work first, the applicant believes that staff's goal to "To ensure that the transportation network maintains a condition that is safe, does not create a safety hazard for the traveling public, nor creates an on-going maintenance problem" is met.

Transportation Planning Proposed Condition 7:

> *Temporary road closures, partial or complete, in relation to the construction of the Pipelines and facilities that form this land use application, requires prior review and approval by County Transportation (MCRR 13.000). Applications will need to be submitted to row.permits@multco.us for review and approval by County Engineer (MCRR 18.250). Application requirements and documents can be found at the following webpage: https://www.multco.us/roads/road-and-bridge-permit-applications.*
>
> *d. Traffic Control Plan (TCP) shall be submitted during the Construction Permitting process that shows detours and road closures. Any deviation to the approved TCP during construction shall require a resubmittal of the TCP for approval.*

~~b. All roads identified on the approved TCP as part of the construction area, whether as a detour and/or road closure, shall be evaluated for mitigation for serviceability during and after construction. The process for this will be outlined in the Project Agreement (see condition 6).~~

b. ~~c.~~ *TCP(s) must demonstrate consultation/engagement with Agricultural businesses abutting the pipeline and detour routes and Gresham-Barlow School Districts, as recommended in the Construction TIA (Exhibit A.230) to ensure impacts on the local transportation network are known in advance.*

c. ~~d.~~ *Except for those roads where specific work will be required by the Project Agreement described in Condition 6, R~~r~~ural roads with a Pavement Condition Index (PCI) rating below 50 must not be used as detour routes in the Traffic Control Plan unless the applicant submits construction plans to mitigate impacts and improve the PCI. The Construction Permit process (see condition 5 above) will be used to review TCP and confirm appropriate detour routes.*

These proposed changes to Condition 7 reflect the "fix it first" approach proposed in the edits to Condition 6. Rather than evaluating needed mitigation on an ongoing basis (under former subsection "b."), Condition 6 now requires that the roads are fixed before use. The applicant proposes that a safeguard catchall in the new subsection "c." here is retained, in order to address any specific roads with a PCI below 50 that are not captured in Condition 6.

Transportation Planning Proposed Condition 8.b:

b. County restrictions within the project vicinity include, but are not limited to:

v. No through trucks on SE Carpenter Ln from SE 327th Ave to ~~the Filtration Plant site~~SE Cottrell Road.

vi. No through trucks on SE Miller Rd from SE Bluff Rd to SE 327th Ave.

vii. No through trucks on SE Homan Rd.

viii. No through trucks on SE Oxbow Parkway.

ix. No through trucks on SE Stone Rd and SE Short Rd between US26 and SE Dodge Park Blvd.

x. S Buxton Rd and S Troutdale Rd are limited to trucks 40ft overall length.

This proposed edit reflects a concern that, if read strictly, the restriction would not allow trucks to access the filtration facility site for construction at all. The applicant believes that the proposed edit reflects the intention of staff in drafting this condition (that is, that the trucks do not go "through" from the site past Cottrell on the balance of Carpenter Lane). Note that the section of Carpenter Lane between Cottrell and the filtration facility site will be substantially upgraded in the initial phase of this project, similar to the "fix it first" approach described above.

Transportation Planning Proposed Condition 9.b:

> *b. Intertie site (R994210630):*
>
> *i. [....]*
>
> *ii. Applicant must provide copy of easements for PWB access from the subject property to SE Lusted Rd and SE Dodge Park Blvd.*
>
> *iii. Access to the Intertie Facility at 33304 SE Lusted Rd (R994210630) shall be limited to the existing northeast driveway access onto SE Lusted Rd.*
>
> *iv. Maintenance access to the Pipelines on the property shall use the northeast access as noted in 9(b)iii above. ~~Access~~ Maintenance access via SE Dodge Park Blvd is prohibited for PWB use.*
>
> *[....]*

Similar to Condition 8.b, this proposed edit reflects a concern that, if read strictly, the restriction would not allow access to the pipeline construction area that inherently crosses from Dodge Park Blvd onto the easement area (as that is the pipeline route). The edit reflects what the applicant believes was staff's intention, that the second sentence is addressing the same situation as the first sentence in subsection "iv.".

II. Construction-Related Traffic and Other Construction Concerns

Multiple public comments submitted into the record express construction-related concerns, particularly about safety and traffic. The Water Bureau has taken care to put safety first, for both the community and workers, and to limit community disruption during construction. These extensive efforts include robust and ongoing community outreach, honoring commitments in the Good Neighbor Agreement, identifying planned pipeline routes with community input, early engagement of an agricultural consultant, and extensive traffic analyses.

The Water Bureau understands the concerns about construction traffic and has and will continue to work with neighbors and Multnomah County to ensure that impacts are minimized. Since 2017, the Water Bureau has been using a robust public outreach process to share information about the project and gather input from interested parties. Drawing on information received from over 60 local farms, schools, businesses, and others, the Water Bureau has already taken action to adapt the construction activities to help limit community disruption. For example, the Water Bureau has organized the timing of certain lane and roadway closures needed to safely install the new pipelines so that farm detours can be minimized during seasonal peaks for agricultural traffic and has instructed contractors to avoid school zones prior to and just after start and end times of school. If there are additional specific ways to adapt construction activities to help limit community disruption, the Water Bureau is open to that feedback.

In this proceeding, and elsewhere in the Multnomah County Code, there are approval criteria related to construction. For example, one of the approval criteria for the Geologic Hazards permit requires that "soil disturbance shall be done in a manner which will minimize soil erosion, stabilize the

soil as quickly as practicable, and expose the smallest practical area at any one time *during construction*." MCC 39.5090(H) (emphasis added); Narrative Section 2: Pipeline Overview, page 34. In enacting that standard, the body that promulgated the law – the County Board – made clear that it is the construction activities themselves under review, and that a hearings officer applying the standard should evaluate how construction will minimize erosion, stabilize soil, and expose the smallest area during that construction.

As a general rule, however, comments related to construction activities are not related to the *project's* compliance with the applicable standards and criteria for these land use applications. Unless (as a matter of code interpretation under *PGE/Gains*) the code makes clear it was intended to evaluate construction, land use law regulates the ultimate use of the land after construction, not construction itself. This is a practical outcome of the fact that uses authorized by land use decisions require some construction activities which are inherently necessary (and were contemplated by the body that promulgated the law) but are also inherently temporary. The fact that construction activities are necessary does not convert those construction activities into the "land use" itself under review.

Moreover, it is the applicant team's experience with Multnomah County – and indeed with all Oregon land use jurisdictions – that they have not previously interpreted general land use review approval criteria that do not reference construction or construction concepts to require evidence about construction, such as construction TIAs. Note, for example, that no evaluation of the construction activities or construction traffic was even suggested when the significant change to farm practices standard was applied to Lusted Hill's lattice tower. (Staff's Exhibit B.11, page 4). A construction TIA is a highly unusual request from a land use jurisdiction. It is unusual because interpreting general approval criteria to sweep broadly into an evaluation of construction activities is unusual – and therefore unlikely to be what was contemplated by the body that promulgated the law unless the text or context of an approval criterion reference construction or construction concepts.

Despite this, the applicant has provided every item requested by staff in their review of the record, including evidence related to construction. In carefully considering the work that the Water Bureau has done to respond to public concerns about construction – such as through the Good Neighbor Agreement and work with the agricultural expert – the Water Bureau believes all approval criteria in this proceeding are met even if some approval criteria would be interpreted to sweep broadly to include evaluation of the temporary construction activities. A summary of construction activities is provided in Attachment 4 to this Pre-Hearing Statement.

In addition to information requested by staff, the Water Bureau's agricultural expert has summarized his work with the project team, reviewed the expected project traffic and construction activities during the temporary construction period, and identified and evaluated potential impacts of construction and construction traffic on farm vehicles using the public right-of-way and field access for farmers in the surrounding area. Based upon that evaluation, the agricultural expert concluded that project construction activity that could impact farm travel and field access will not force a significant change in, nor significantly increase the cost of, accepted farm practices on lands devoted to farm use in the surrounding lands. The detailed evaluation and conclusion are provided in a Compatibility of Proposed Portland Water Bureau Filtration Facility & Pipelines Construction with Farm Traffic report (the "Farm Traffic Report") provided in Attachment 5 to this Pre-Hearing Statement. Appendix A of the

Farm Traffic Report provides a detailed evaluation of the use of the public road system by individual farm operators with headquarters and fields in the surrounding lands that informed the recommendations and conclusions of the report. This was not a *post hoc* evaluation – the agricultural expert has been part of this project for years and his close coordination with the contractors and designers has guided the team to ensure that neither construction activities nor ongoing operations of the project will have significant impacts within the meaning of the relevant approval criterion.

The Water Bureau's agricultural expert also responded to public comments submitted into the record prior to the release of the staff report. Those responses are provided in three memoranda provided in Attachment 6 to this Pre-Hearing Statement.

III. Fire Protection

In response to concerns from Rural Fire Protection District No. 10, enclosed as Attachment 7 to this Pre-Hearing Statement is a Bull Run Filtration Facility Fire Protection Strategy memorandum that describes the filtration facility fire protection design and internal emergency response capabilities. As described in the memorandum, the facility includes multiple layers of fire and chemical protection and containment. Staff are also trained to address emergency situations. Those facility features and staff training collectively reduce the likelihood of a situation that would require any outside response or fast response times.

IV. Dust Control Plans

In response to concerns about gravel roads at the filtration facility, staff requested a dust control plan for the project. To be comprehensive, the applicant has also provided the dust control plan for the construction period. Both plans are provided in Attachment 8 to this Pre-Hearing Statement.

V. Conclusion

Applicant requests that the Hearings Officer approve the applications. Overall, the Project and the Project's upgrades of the County's infrastructure meet the approval criteria, both as to the ultimate proposed land use and when additionally considering the temporary construction period. Given the essential nature of this project for protecting the safety of our water supply and our regional economy, the Water Bureau asks that you take the feedback from the community and convert it into appropriate conditions of approval to the extent you believe necessary to meet approval criteria – as County Transportation has done related to construction traffic concerns.

Best regards,

Renee France
RADLER WHITE PARKS & ALEXANDER

Attachment 1

WINTER BROOK
COMMUNITY RESOURCE PLANNING

MEMORANDUM

To: Multnomah County Land Use Hearings Officer

From: Tim Brooks and Jesse Winterowd

Date: June 28, 2023

Re: T3-2022-16220 – Carpenter Lane Access

This memo provides updated plans and information for a revised access alignment on Carpenter Lane. These plans respond to proposed Condition 8.e in the Multnomah County staff report. Figure 1 shows the slight realignment of the northern 30 feet of driveway. The driveway turnaround remains in its prior location and the driveway connection at Carpenter Lane shifts approximately 50 feet to the east of its prior location shown on Sheet LU-302.

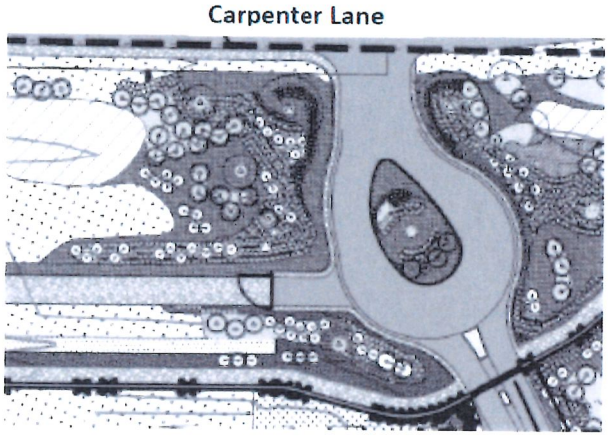


Figure 1. Realigned Entry Drive

The proposed landforms and landscaping along the Carpenter Lane frontage were modified to accommodate the adjusted drive alignment. The proposed grading and landscaping provide a consistent, attractive entrance and continued screening for the facility site.

The following plan sheets have been updated to reflect the perpendicular driveway alignment, as cited in MCC 39.6580 and noted in Multnomah County Transportation's proposed Condition 9.a (Exhibit B.13, page 6):

- LU-302, Proposed Conditions Site Plan
- LU-303, Utility Plan
- LU-304, Grading Plan
- LU-305, Facility Circulation Map
- LU-306, Landscape Plan
- LU-307, Stormwater Management Plan
- LU-400, Facility Enlargement

These sheets are included in Attachment A, which is a full replacement of Exhibit A.212 (A.1a Site Plans).

The project design team and Global Transportation Engineering have confirmed that the modified site access continues to meet applicable Multnomah County transportation standards. The Traffic Impact Analysis sight distance evaluation results (Exhibit A.30, A.31, table 3) remain valid. As noted in Multnomah County Transportation's memo dated June 19, 2023 (Exhibit B.13, page 9), there are no access spacing requirements for Carpenter Lane, a rural local road. In addition, the turn radii for the modified access were evaluated by the design team to ensure all vehicles can be safely accommodated.

The proposed access realignment continues to meet applicable Design Review criteria, including MCC 39.8040(A)(5), Pedestrian and Vehicular Circulation and Parking, and MCC 39.8040(A)(7), Buffering and Screening. Revised Sheet LU-305, Facility Circulation Map, shows the slight realignment of the north end of the driveway with no other changes to the circulation plan. As described above, this modification continues to meet applicable Multnomah County sight distance and other access standards. Global Transportation Engineering has noted that with the perpendicular approach the driver does not need to look over their shoulder, which will maximize safety at the access point. Additionally, revised Sheet LU-400 shows continued compliance with vision clearance for the entry sign (MCC 39.6780(C)).

Buffering and screening at the site entry will change little with the perpendicular entrance. The wide setbacks along Carpenter Lane are unchanged. Like the prior design, these wide setbacks allow space for berms and landscaping to buffer neighboring properties from sound and views of the site. Revised Sheet LU-302, Proposed Conditions Site Plan, Sheet 304, Grading Plan, and Sheet LU-306, Landscape Plan, show the updated planting and landform design at the entrance. Like the prior design, the variety in plant size and species creates a natural look, enhances the visual aesthetic of the facility, and minimizes visual impacts of the filtration facility when viewed from neighboring properties or Carpenter Lane. Updated site visualizations of the views from Carpenter Lane (Figures 2 and 3) illustrate the buffering effect. Figure 2 shows the adjusted view from Carpenter Lane, replacing Figure 3 on page 4 of Application Section 1. Figure 3 shows the adjusted view from Carpenter Lane, replacing Figure 19 on page 12 of Section 1.B.

Figure 2. View of Planned Filtration Facility Entrance from Carpenter Lane (an off-site PHWD storage tank is visible to the left)

Figure 3.Proposed Entrance to Filtration Facility from Carpenter Lane

Both views show the modified entry alignment with wide setback/buffer area planted with trees and shrubs. Like the prior alignment, the modified plantings and landforms provide an attractive, screened facility entrance from Carpenter Lane.

For the reasons provided above and in the attached plan updates, the proposed access realignment at Carpenter Lane satisfies the perpendicular access requirement of MCC 39.6580, and continues to satisfy other applicable Multnomah County standards and criteria.

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run TREATMENT PROJECTS

Filtration

Technical Memorandum

Subject:	Filtration Facility Site and Lighting Plans
PWB Project #s:	W02229
Date:	June 19, 2023
To:	Lyda Hakes, P.E., Project Manager Portland Water Bureau
From:	Mark Graham, P.E., Project Manager Stantec
Prepared by:	Jason Hirst, Oregon #LA0821 NNA Landscape Architecture LLC
	Rafael Gaeta, P.E. Emerio Design
Reviewed by:	Mark Graham, P.E. Stantec

Stantec | in association with Carollo and other firms

ATTACHMENT XX

The two sets of drawings attached to this technical memorandum (TM) were prepared in support of the City of Portland Water Bureau's Bull Run Treatment Facilities' land use applications in Multnomah County. The drawings have been prepared and compiled for the specific purpose of addressing conformance to Multnomah County land use requirements as expressed in the Multnomah County Code.

The contents of each set of drawings are listed in the tables below.

Table 1. Site Plan Drawings

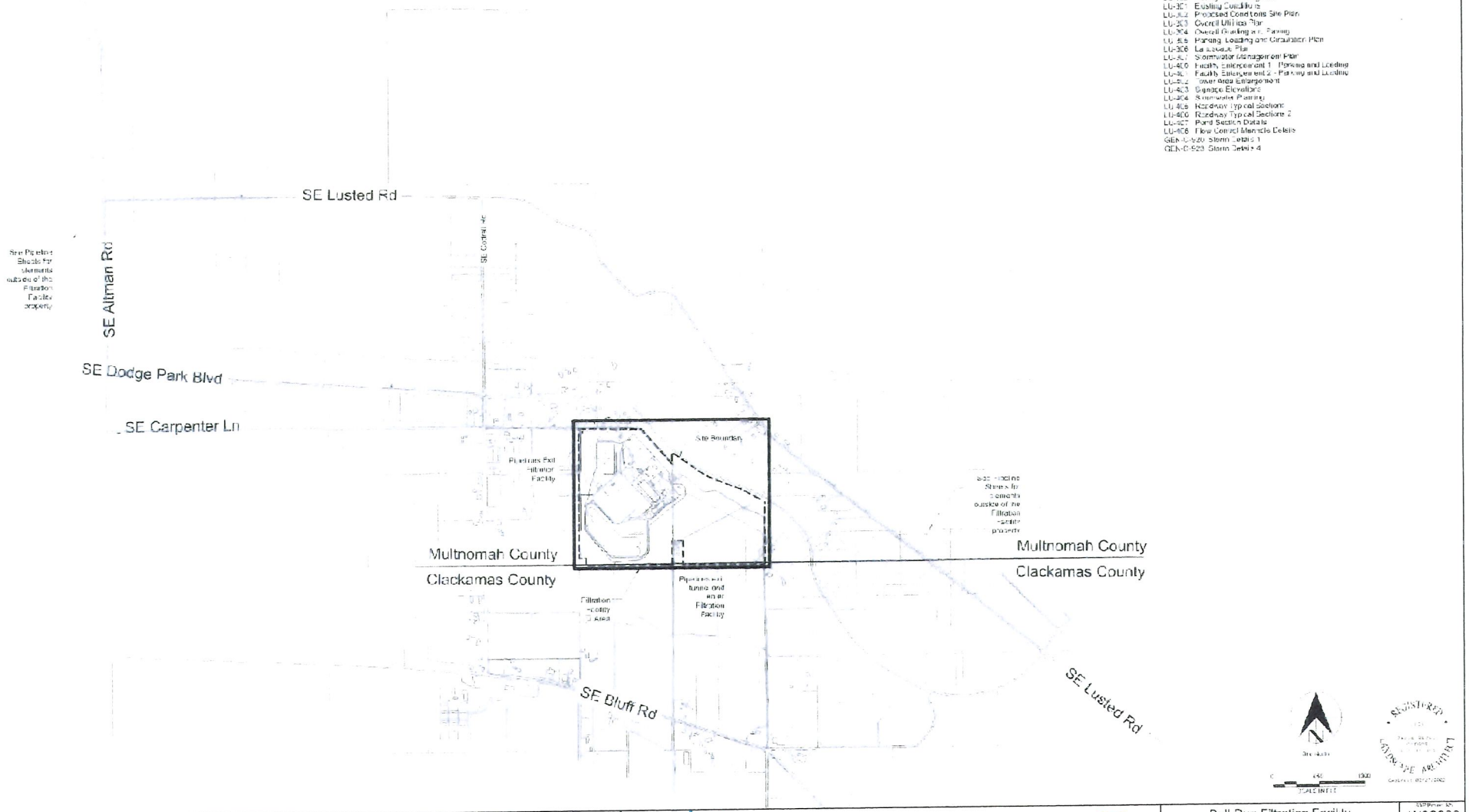
Drawing Number	Drawing Name
00-LU-101	Cover Sheet
00-LU-102	Vicinity and Zoning Map
00-LU-301	Existing Conditions Plan
00-LU-302	Proposed Conditions Site Plan
00-LU-303	Utility Plan
00-LU-304	Grading Plan
00-LU-305	Facility Circulation Map
00-LU-306	Landscape Plan
00-LU-307	Stormwater Management Plan - Filtration Facility
00-LU-400	Facility Enlargement 1
00-LU-401	Facility Enlargement 2
00-LU-402	Tower Area Enlargement
00-LU-403	Signs
00-LU-404	Stormwater Planting
00-LU-405	Roadway Typical Section
00-LU-406	Roadway Typical Section - 2
00-LU-407	Pond Section Details
00-LU-408	Flow Control Maintenance Hole Details
00-LU-409	Plant List
00-LU-410	Plant Layouts
GEN-C-920	Storm Details
GEN-C-923	Storm Details

Table 2. Lighting Plan Drawings	
Drawing Number	**Drawing Name**
00-E-322	Site Lighting Key Plan
00-E-323	Lighting & Receptacle Plan - Grid 1
00-E-324	Lighting & Receptacle Plan - Grid 2
00-E-325	Lighting & Receptacle Plan - Grid 3
00-E-326	Lighting & Receptacle Plan - Grid 4
00-E-327	Lighting & Receptacle Plan - Grid 5
00-E-328	Lighting & Receptacle Plan - Grid 6
00-E-329	Lighting & Receptacle Plan - Grid 7
00-E-330	Lighting & Receptacle Plan - Grid 8
00-E-331	Lighting & Receptacle Plan - Grid 9
00-E-332	Lighting & Receptacle Plan - Grid 10
00-E-333	Lighting & Receptacle Plan - Grid 11
GEN-E-140	Lighting Schedule - 1
GEN-E-141	Lighting Schedule - 2
GEN-E-142	Lighting Schedule - 3

Attachment A: Site Plans

Filtration Facility Land Use Submittal

Drawing Index



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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

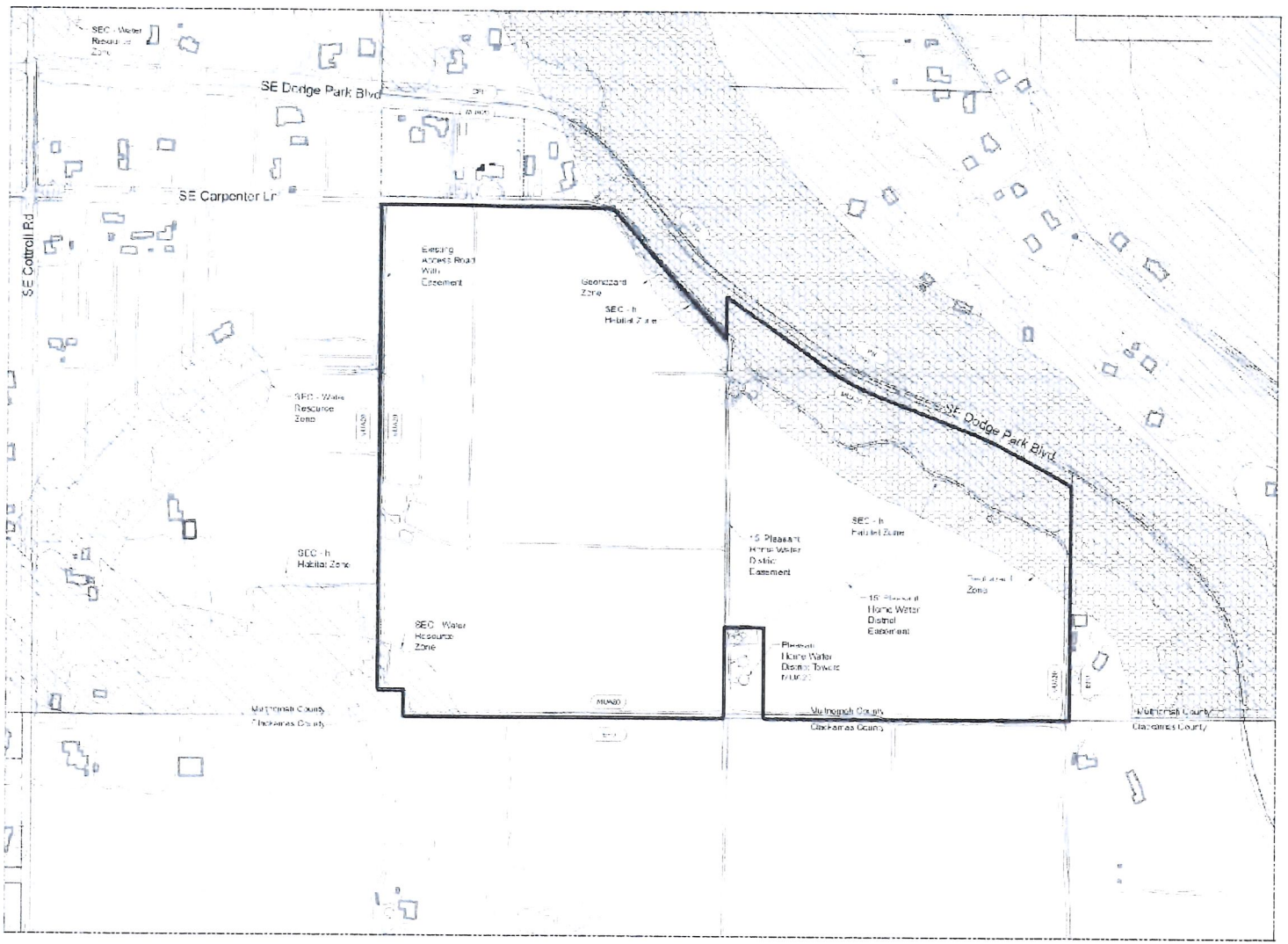
Land Use Plans

Cover Sheet

WD2229

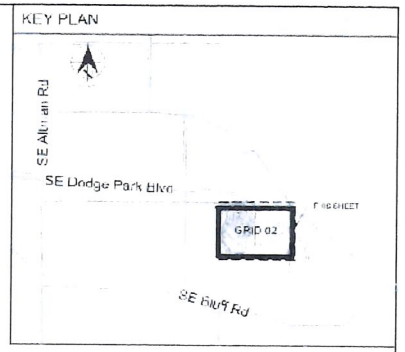
00-LU-101

1 of 18



PLAN

KEY PLAN



General Sheet Notes

1 No development or construction activity proposed within SEC zones on Filtration Site.

Legend

- Geohazard Zone
- Significant Environmental Concern (SEC) Zones - See Labels
- Lot Line
- ROW Line
- Topographic Lines - 5' Interval
- Structure
- Vegetation Edge
- MUA20 Zone
- EFU Zone
- CFU Zone
- RR Zone

0 200 400 600 800
FEET

REGISTERED LANDSCAPE ARCHITECT

Stantec

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

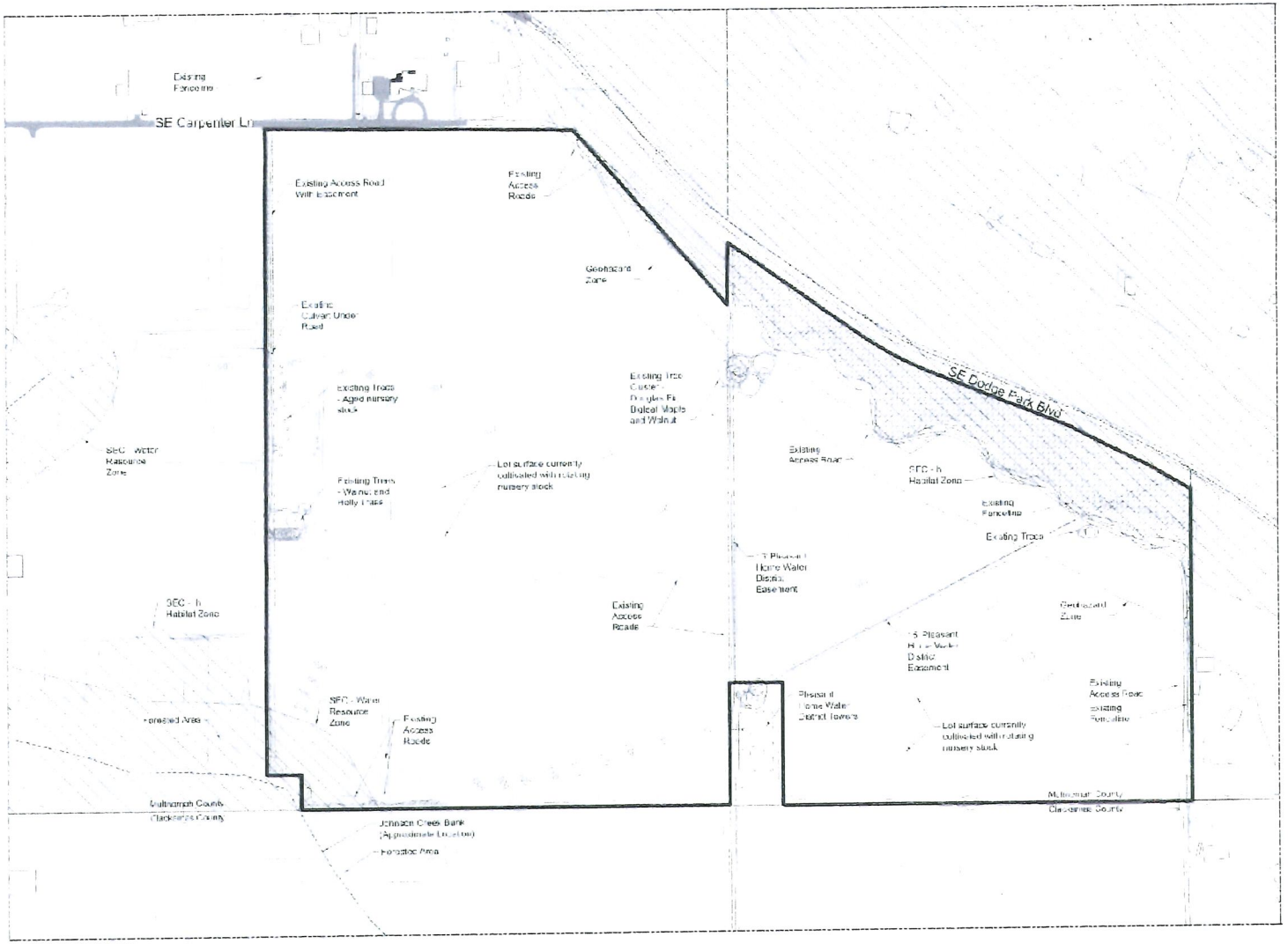
Bull Run Filtration Facility

Land Use Plans

Vicinity and Zoning Map

WO2229

2 of 18



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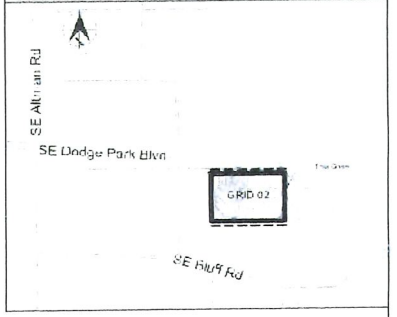

General Sheet Notes

1 Site is currently cultivated as nursery stock

Legend

Zones

- See Labels
- Lot Line
- ROW Line
- Topographic Lines - 5' Interval
- Structure
- Existing Fencing
- Edge of Existing Vegetation Areas
- Forested Area within Site Boundary

0 200 400 600 800

FEET

REGISTERED LANDSCAPE ARCHITECT

Grid North

Stantec

PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

Bull Run Filtration Facility

Land Use Plans

Existing Conditions Plan

WP Project No. W02229

Sheet No. 80-LU-301

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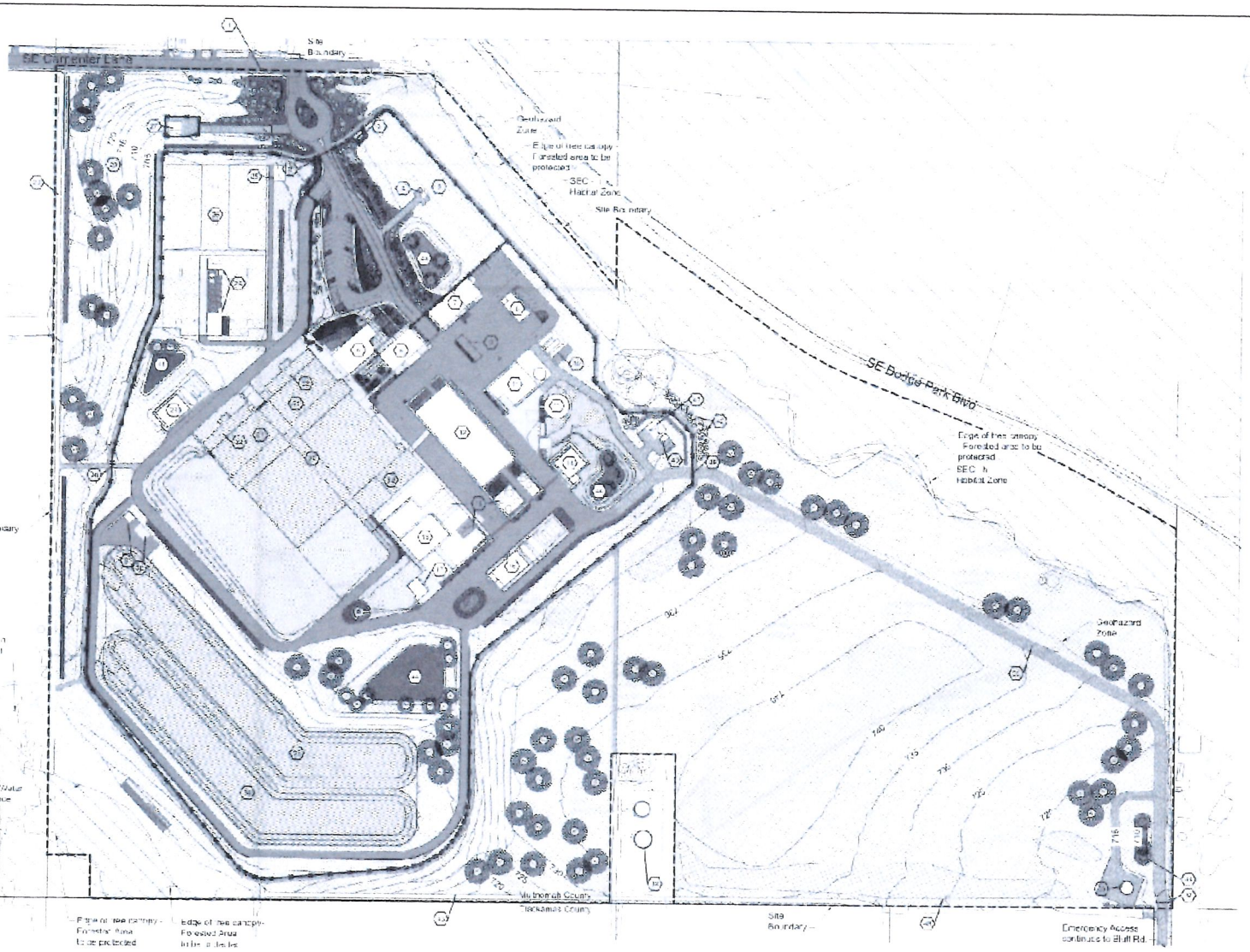

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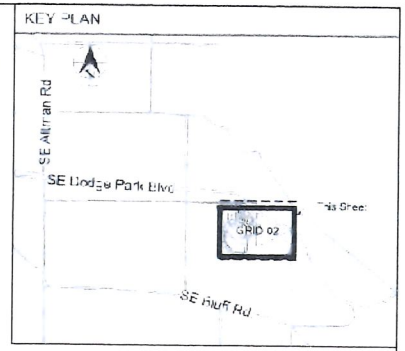

Sheet Keynotes

1. Carpenter Lane Entry
2. Main Facility Entry Fascia
3. North PGE Electrical Cutout
4. Septic Structure (At Grade)
5. Septic Drainage Field
6. Administration Building
7. Maintenance Building
8. General Storage Building
9. Refiner / Recycling Storage Shed
10. Mist Columns
11. Mechanical Dewatering / Belts
12. Chemical Building
13. Gravity Thickeners
14. Wastewater Clarification
15. Chemical Storage Tanks
16. Main Electric Complex
17. Raw Water Intake Structure
18. Ozone Building (North Unit)
19. Ozone Injection / Flash Mix
20. Flocculation / Sedimentation Basin
21. Filtration Basin
22. Waste Wastewater Equalization Basins
23. North Electric Complex
24. Fencing
25. Fire Protection Enclosure
26. Finish Water Clearwell (Below Grade)
27. Pleasant Home Pump Station (Future-PWB)
28. West Screening Berm
29. Easement on PWB Property (To Remain)
30. West Gate
31. Electrical Building
32. Drip Tank Installation (At-Grade)
33. West Overflow Basin
34. South Overflow Basin
35. Emergency Access Route
36. Raw Water Pipeline Cover (At-Grade)
37. Manual Jar Gate with Knox Box
38. Pleasant Home Water Towers (Off-Site)
39. Load Cells
40. Communication Tower Accessory Building
41. Communication Tower
42. Tower Screen Planting (Native Evergreen Hedge and 25' Min. Tree Buffer)
43. Agricultural Style Fence
44. Detention Ponds

General Sheet Notes

1. Site is zoned MUA-20
2. No development or construction activity proposed within SEC zones on Filtration Site. Revegetation of existing agricultural land to be performed with hand tools only. Native plant species only at forest or revegetation interface zones.
3. No development or construction activity proposed within Geohazard Areas on Filtration Site.

Legend

- Asphalt Paving
- Concrete Paving
- Gravel Paving
- Basins
- Fence Line
- Native Grass Planting
- Swale Planting
- Stormwater Planting
- Screen Mix Evergreen Planting
- Screen Mix Shrubs Planting
- Tree / Shrub Planting Clusters
- Proposed Trees - Deciduous and Evergreen
- Landscape Bed - Shrubs, Groundcover, Mulch
- Existing Tree to Remain

0 30 60 120 FEET

REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT
DIGITALLY SIGNED
Expires: 06/30/2021

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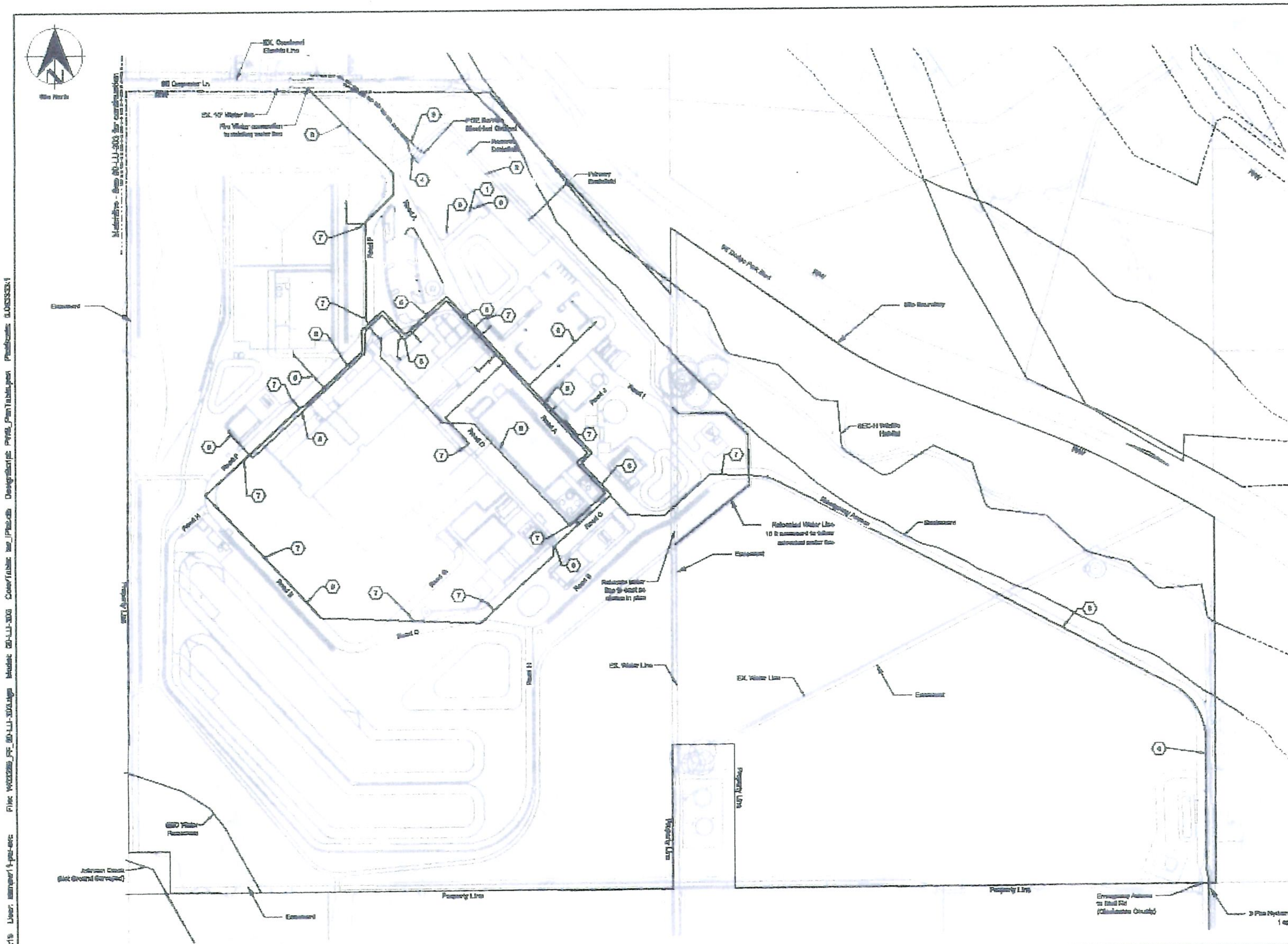
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility
Land Use Plans
Proposed Conditions Site Plan

Approval No. W02229
Revised Sheet No. 4 of 18



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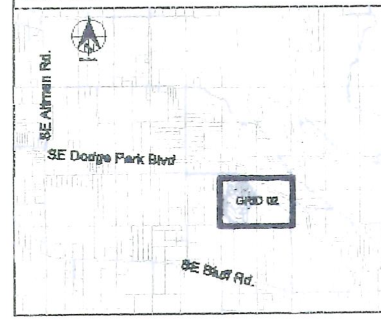

General Sheet Notes

1. All existing utilities to remain in place and protected during construction.
2. See Sheet 00-LU-307 for Stormwater features and pipes.
3. Potable Water and Utility Water lines come from Clearwell (on-site finished water).

Sheet Keynotes

1. Septic Tank
2. Septic Drainfield
3. Electrical Duct bank (underground)
4. Fiber Optic Line (underground)
5. Potable Water
6. Fire Water
7. Fire Hydrant
8. Septic Sewer Lift Station
9. Septic Dosing Tank

Legend

Fire Water
Potable Water
Duct Bank
SEC Zone
Easement
Existing Water Line
Existing Gas Line
Existing Overhead line
Property Line
Right-of-Way
Easement
Ditch
Water Valve
Utility Pole
Fire Hydrant
Site Boundary
Water Line

SCALE IN FEET

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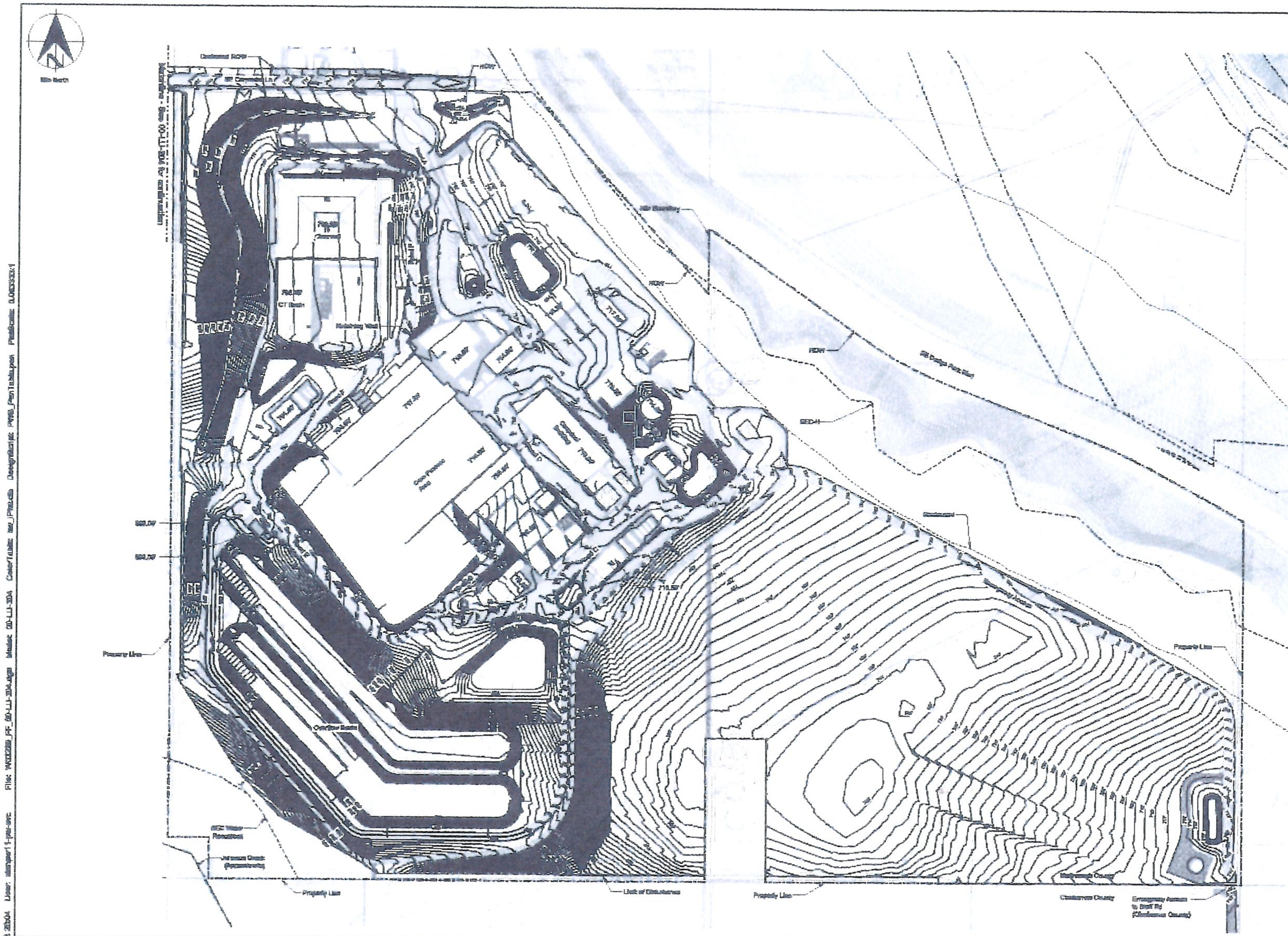
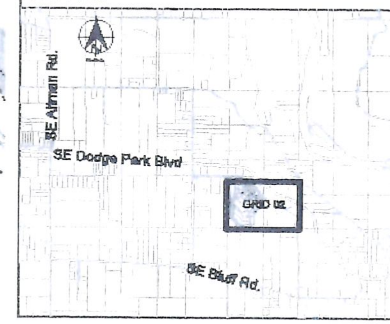
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility
Civil
Utility Plan
Filtration Facility

W02229
2765 / 2766
00-LU-303
3 of 10





Legend

Stantec

Date 08/02/22

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

Civil

Grading Plan
Filtration Facility

W02229

3705 / 3706

00-LU-304

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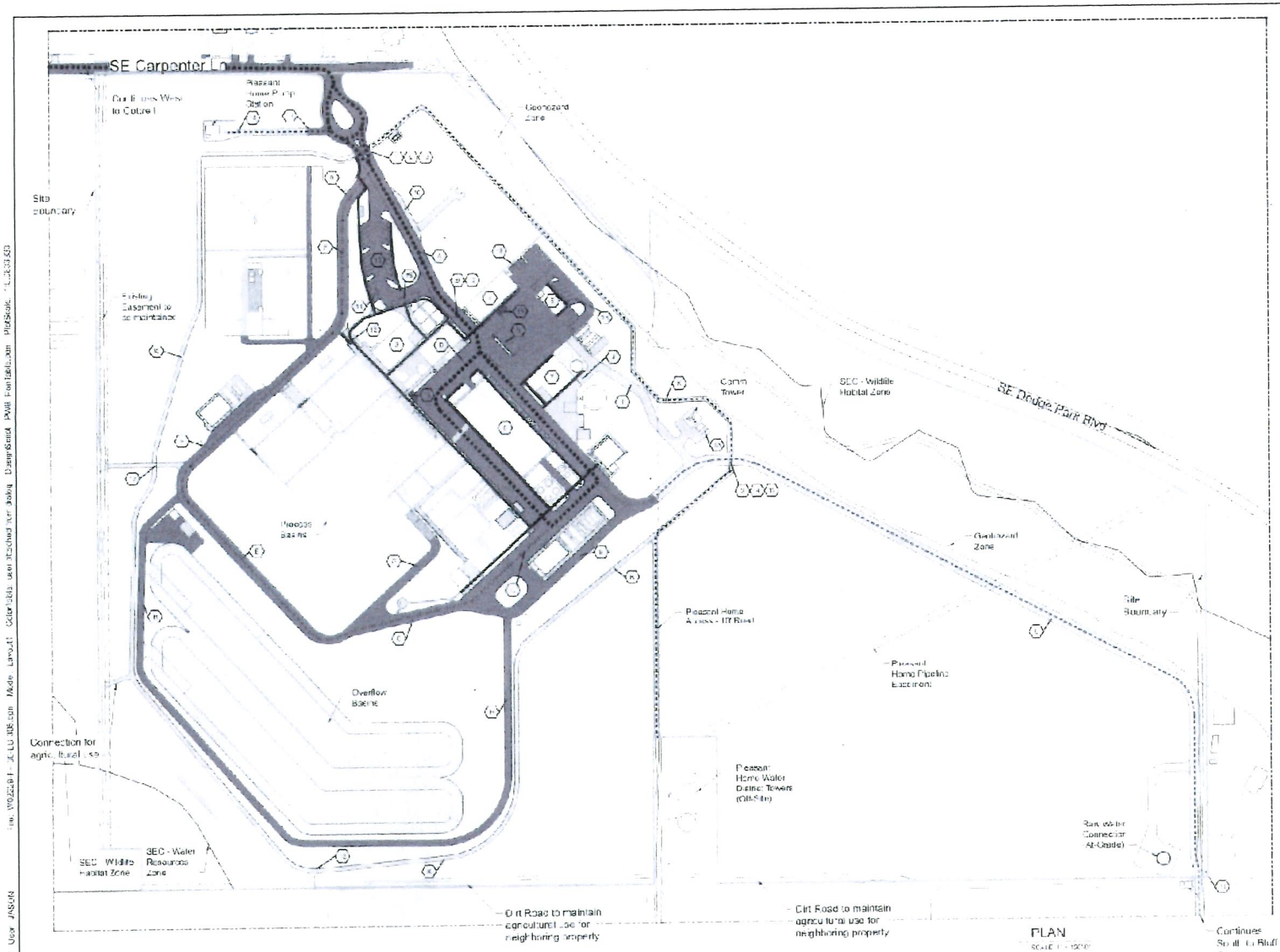
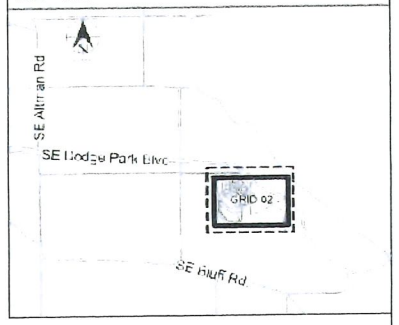


PLAN

SCALE: 1" = 150'

KEY PLAN



Sheet Keynotes

1.	Carpenter Lane Entry	9.	Automated Vehicle Gate
2.	Emergency Access Entry	10.	Manual Vehicle Gate
3.	Administration Building (Mail Delivery)	11.	Manual Bar Gate
4.	Maintenance Building	12.	Pedestrian Gate
5.	General Storage Building	13.	Parking Area
6.	Refuse / Recycling Storage (Pick-up)	14.	ADA Parking (2 spots / 1 van spot)
7.	Solids Handling Building	15.	Loading Zone
8.	Chemical Building	16.	Blue Striping Area

Road Keynotes

A	Road A	- Width varies 58' to 7[illegible]	- Asphalt Surface
B	Road B	- Width varies 20' to 28'	- Asphalt Surface
C	Road C	- Width varies 20' to 41.5'	- Asphalt Surface
D	Road D	- Width varies 24.5' to 40.5'	- Asphalt Surface
E	Road E	26' Width	- Asphalt Surface
F	Road F	- 20' Width	- Asphalt Surface
G	Road G	- 20' Width	- Asphalt Surface
H	Road H	- 40' Width	- Asphalt Surface
I	Road I	20' Width	- Gravel Surface
J	Road J	- 20' Width	- Concrete and Gravel Surface
K	Perimeter Road	- 20' Width	- Gravel Surface
L	Emergency Access - 20' Width		- Gravel Surface

General Sheet Notes

1. Unlabeled paved areas are occasional / maintenance access routes.

Legend

- Main Truck / Access Route - Chemical Delivery, Solids Removal, Process Circulation, General Deliveries
- Temporary Truck Route - Fuel Delivery, Alternative Chemical and Solids Use
- Emergency Access Route - Connects to Bluff Rd. to the south
- Pleasant Home Access Route - Tank and Pump Station accesses
- Main Pedestrian Routes
- Site Boundary
- Asphalt Paving - Main Thoroughfares
- Concrete Paving - Pedestrian Paths
- Crushed Rock Road / Access
- Easements
- Lot Line
- ROW Line
- Easement Line

0 20 40 80 160

1" = 40'

North

REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT
DIGITALLY SIGNED
Expires 06/30/2024

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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

Land Use Plans

Facility Circulation Map

W02229

70-10-906

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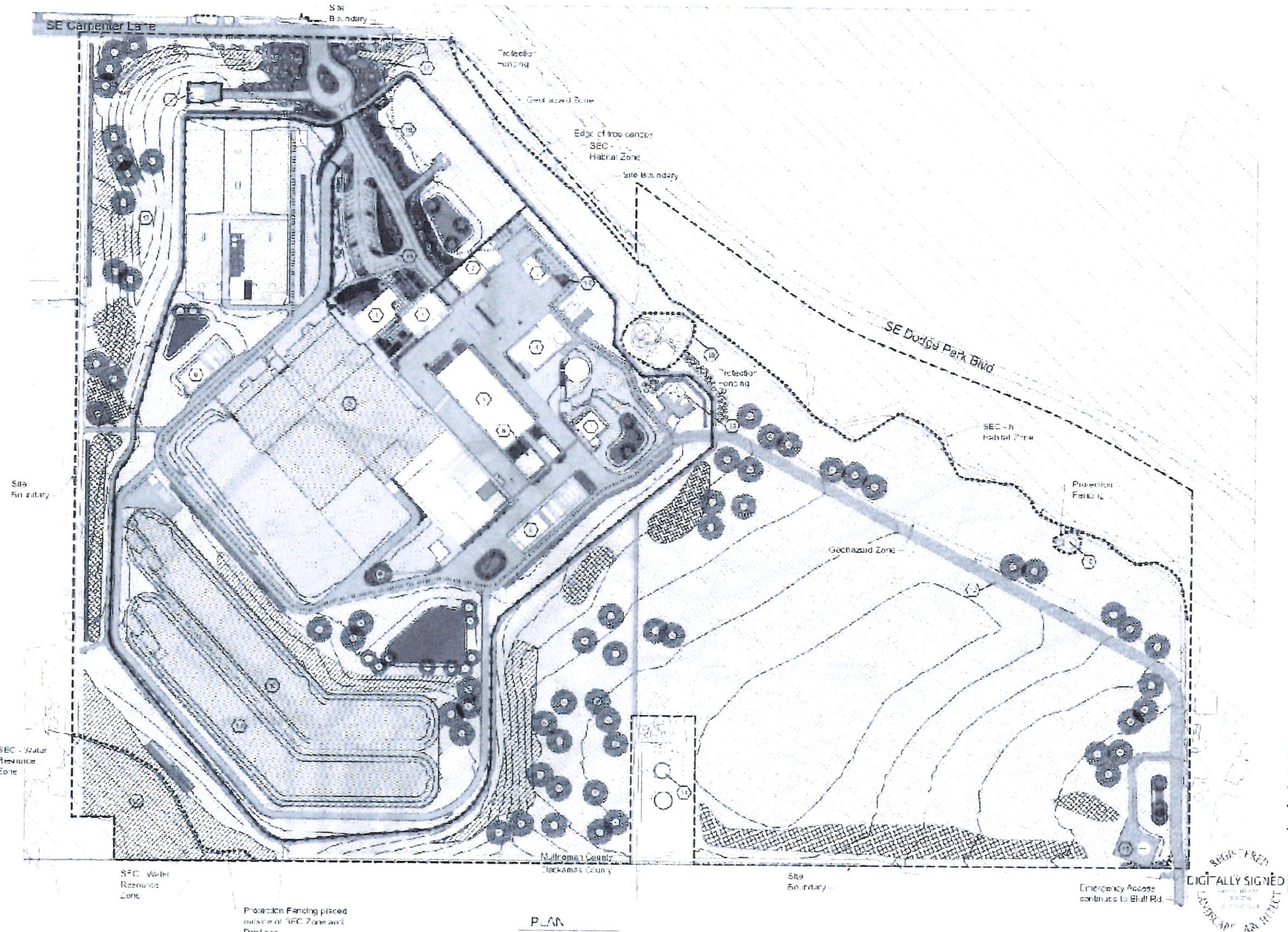

PLAN

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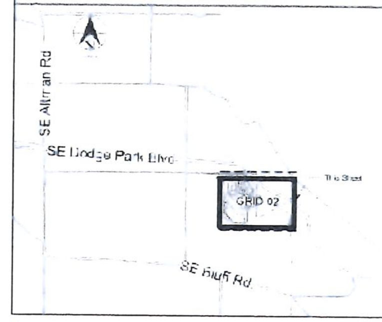

Sheet Keynotes

1. Administration Building
2. Maintenance Building
3. General Storage Building
4. Mechanical Dewatering Bldg.
5. Chemical Building
6. Chemical Storage tanks
7. Wash Water Clarification
8. Electric Building
9. Filtration Basins
10. Overflow Basins
11. Pleasant Home Pumpstation
12. Emergency Access Route
13. Raw Water Pipeline Corridor (At-Grade)
14. Pleasant Home Water Towers (Off Site)
15. Communication Tower Area (See Planting Note 1)
16. Existing Trees to Remain
17. Planted Berm for screening
18. Plantings at Facility Entry (See Planting Note 2)
19. Parking Area plantings (See Planting Note 3)
20. SEC Water Resource Area (See Planting Note 4)

Planting Notes

1. Communication Tower Area planting is designed to meet screening and parking requirements. See sheet LU-402 for enlargement and more detail on specific requirements.
2. Plantings around facility buildings are of a more ornamental nature and are proposed as containerized plants which will have supplemental irrigation. See sheet LU-400, 401 and 402 for enlargements [illegible] plant sizes and locations in this area. Additional [illegible] within facility [illegible] may receive supplemental irrigation as a fire risk mitigation measure. See outlined area.
3. Parking Area plantings - See sheets LU-400 and LU-402 for enlargements to see locations of parking islands with plant sizes to meet parking lot planting requirements established by Multnomah County.
4. SEC Water Resource Area - This area is currently under agricultural use and has bare soil. Proposed plans have no additional disturbance within this zone. Proposed plantings to be all native species installed with hand tools only.

General Sheet Notes

1. No development or construction activity proposed within SEC zones on Filtration Site. Native plantings only within these zones.

Legend

- Asphalt Paving
- Concrete Paving
- Gravel Paving
- Basins
- Facility Fencing
- Protection Fencing
- Areas to receive supplemental irrigation
- Native Grass / Forb Mixes
- Swale Planting
- Stormwater Planting
- Screen Mix, Forested Planting
- Screen Mix, Shrubby Planting
- Tree / Shrub Planting Clusters
- Proposed Trees - Deciduous and Evergreen
- Landscape Bed - Shrubs, Groundcover, Mulch
- Existing tree to remain
- Significant Environmental Concern (SEC) Zone

0 | 120 | 240 | 360 | 480

FEET

DIGITALLY SIGNED

REGISTERED LANDSCAPE ARCHITECT

Expires: 02/23/2024

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PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

If this bar does not measure 1" then the drawing is not to scale

Bull Run Filtration Facility

Land Use Plans

Landscape Plan

W02229

70-LU-306

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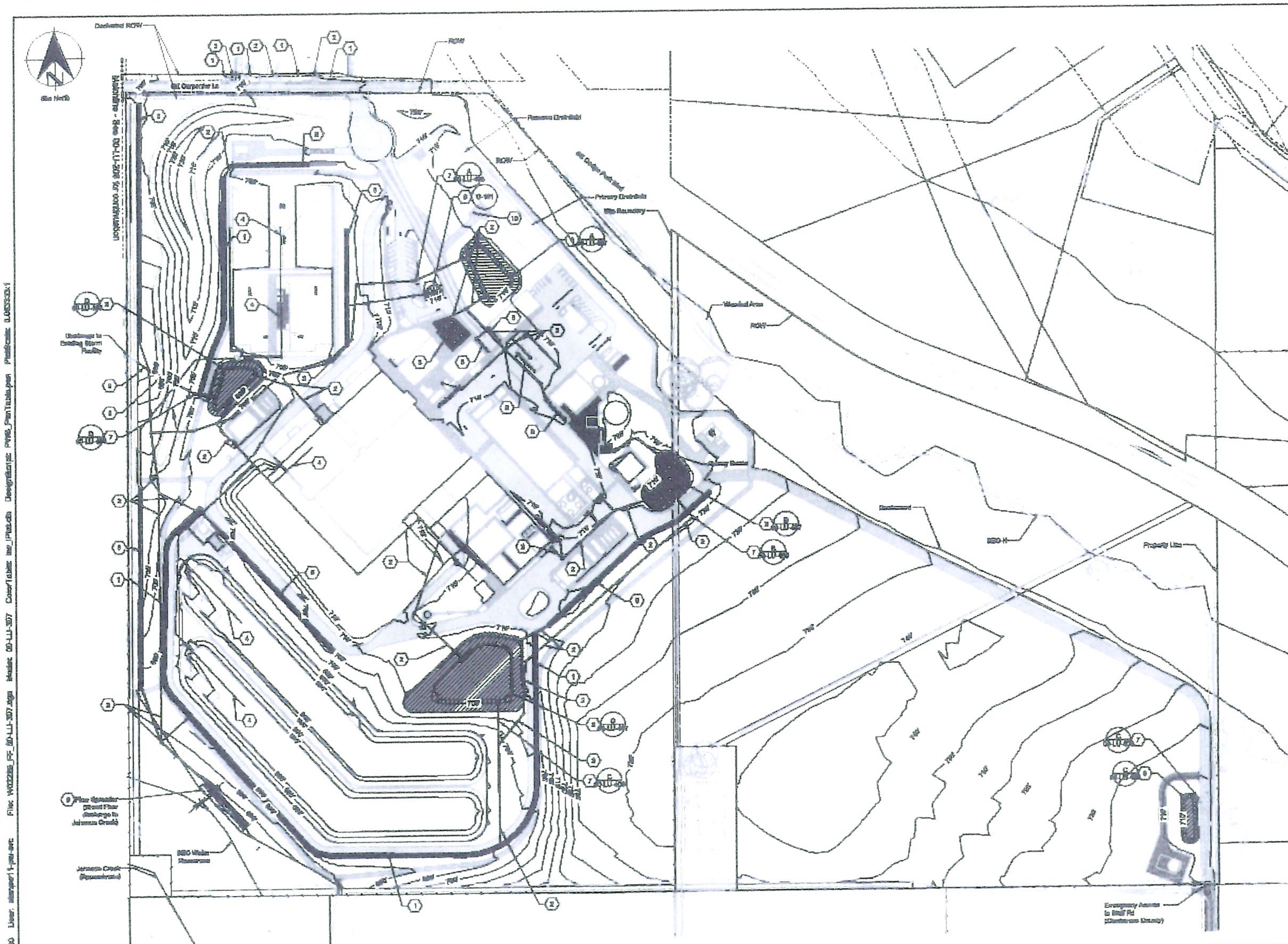

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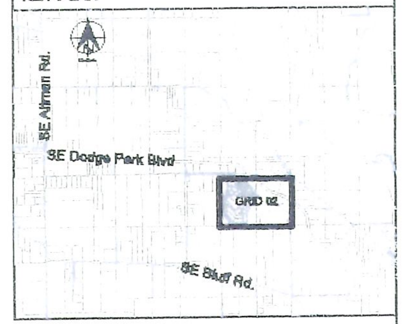

General Sheet Notes

1. Refer to Filtration Facility Stormwater Report (Appendix H.1) for stormwater calculations and sizing.
2. See 00-LU-304 (Grading Plan) for ground disturbance limits.
3. See 00-LU-308 (Landscape Plan) for proposed vegetation.

Sheet Keynotes

1. Drainage Ditch per detail C-169/GEN-C-823
2. Storm Pipes
3. Detention Pond
4. Underdrain Storm Pipe
5. Water Quality Swale per detail C-169/GEN-C-823
6. Stormwater Planter per detail C-169/GEN-C-820
7. Flow Control Maintenance Hole
8. Stormwater Basin per detail C-161/GEN-C-820
9. Outfall Flow Spreader per detail C-171/GEN-C-823
10. Septic Tank

Legend

- Major Contour
- Deciduous Tree
- Evergreen Tree
- Existing Water Line
- Existing Fence
- Existing Gas Line
- Existing Overhead line
- Existing Structure
- Property Line
- Right-of-Way
- Easement
- Ditch
- Detention Pond
- Storm Planter
- Swale/Ditch
- Site Boundary

0 120 240
SCALE IN FEET

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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

Civil

Stormwater Management Plan
Filtration Facility

W02229

3795 / 3796

00-LU-307

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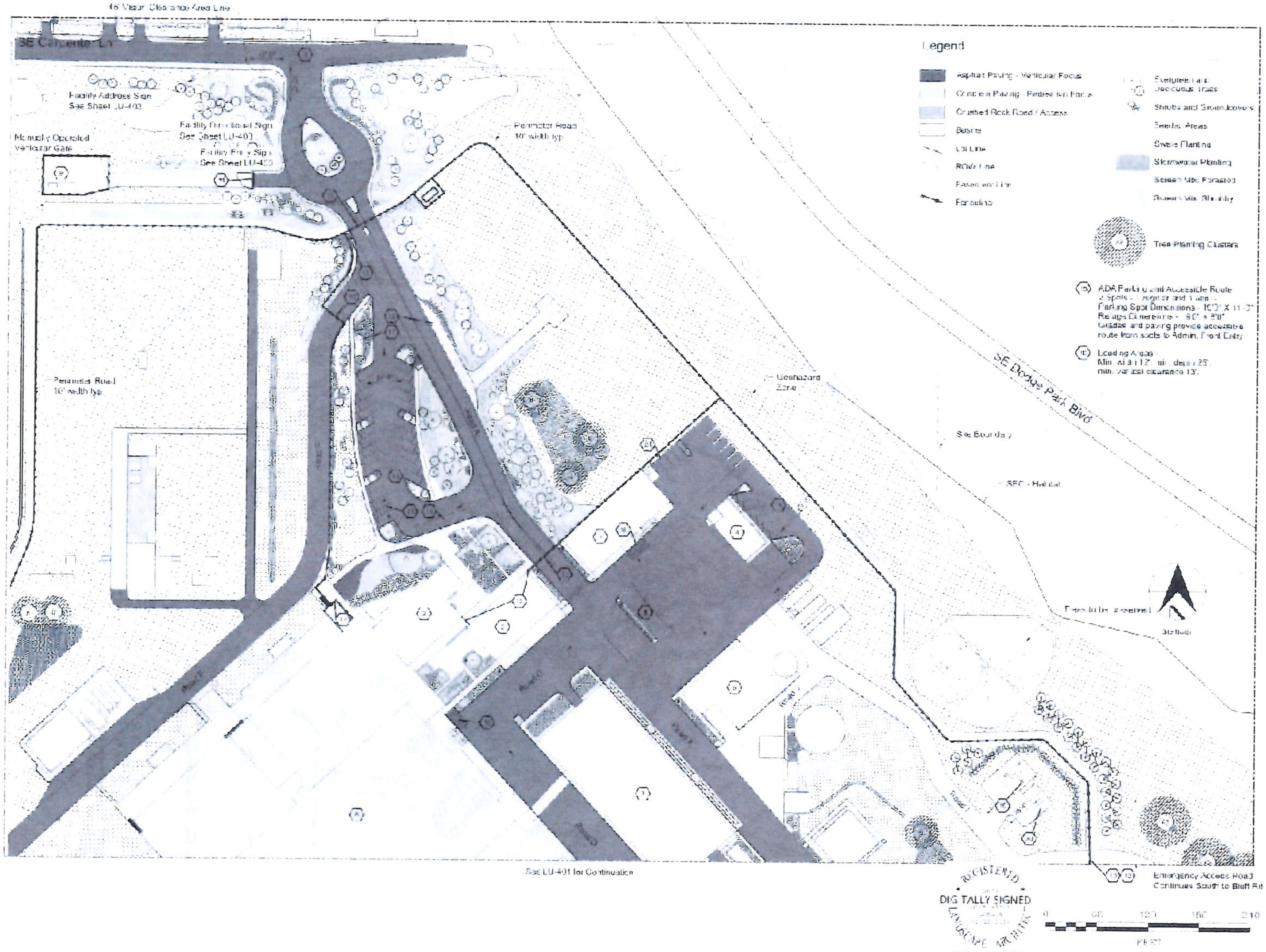

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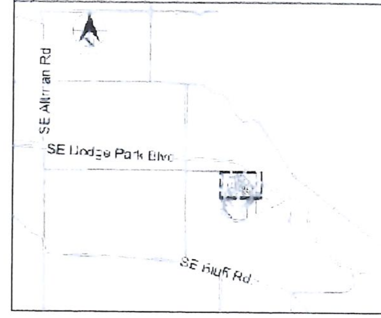

Sheet Keynotes

1. Carpenter Lane Entry
2. Administration Building - Mail Drop-Off
3. Maintenance Building
4. General Storage Building
5. Refuse / Recycling, Storage and Pickup
6. Solids Handling Building
7. Chemical Building
8. Process Basins
9. Existing Home Pump Station (Non-PWB)
10. Automated Vehicle Gate
11. Manual Bar Gate
12. Pedestrian Gate
13. Parking Area 1
14. Parking Area 2
15. ADA Parking (2 spots + refuge)
16. Loading Zone
17. Emergency Gathering Area
18. Bus Parking Spot
19. Comm. Tower and Accessory Building
20. Communication Tower Parking
21. Parking Area 4 Maintenance

Requirements

(13) Parking Area 1 - Administration
Angled Parking Drive Aisle Width - Requirement is not less than 20'
Proposed width 23' 5"
Number of Parking Spots - 23 standard and 2 accessible and 1 Bus (See note 18)
Area of Landscape - Parking/Loading Area greater than 10 spots requires 25 s.f. per
Parking Area 1 requires 625 s.f. - Area proposed exceeds 1,110 s.f. - Min. 5' width.
Parking Spot Dimensions - 19'-0" X 10'-0"
Wheelstops Typical - Bumper rails allowing for stormwater passage
Parking area 1 is set back from closest public road (Carpenter Lane) by over 350'. Planted buffer between Admin parking area and Carpenter is a min. 60' width and contains numerous evergreen shrubs and trees to create continuous screening

(14) Parking Area 2 - Fleet Parking
Angled Parking Drive Aisle Width - Requirement is not less than 20'
Proposed width 20'-0"
Number of Parking Spots - 8 standard and 0 accessible
Area of Landscape - Parking/Loading Area greater than 10 spots requires 25 s.f. per
Parking Area 2 requires 0 s.f. - Area proposed exceeds 275 s.f. - Min. 5' width.
Parking Spot Dimensions - 20-0" X 10'-0"
Wheelstops Typical - Bumper rails allowing for stormwater passage
Parking area 2 is set back from closest public road (Dodge Park Blvd.) by over 200'. Existing forest buffer between Fleet parking area and Dodge Park Blvd. is minimum 100' width and populated with a dense stand of developed evergreen forest forming a visual buffer.

(20) Parking Area 3 - Tower Parking Area
Parking Drive Aisle Width - Requirement is not less than 25'
Proposed width 25'-0"
Number of Parking Spots - 2 standard and 0 accessible. Non-public area.
Area of Landscape - Parking/Loading Area greater than 10 spots requires 25 s.f. per
Tower Parking Area requires 0 s.f. - Area proposed exceeds 100 s.f. - Min. 5' width.
Standard Parking Spot Dimensions - 20'-0" X 10'-0"
Wheelstops Typ. - Bumper rails allowing for stormwater passage
Tower parking area set back from closest public road (Dodge Park Blvd.) by over 330'. Planted buffer between Tower parking area contains 2 rows of large evergreen shrubs as well as 2 rows of evergreen trees to exceed the parking strip requirement listed in Multnomah County Code.

(21) Parking Area 4 - Maintenance Parking
Parking Drive Aisle Width - Requirement is not less than 25'
Proposed width min. 40' 0"
Number of Parking Spots - 4 standard and 0 accessible. Non-public area.
Area of Landscape - Parking/Loading Area greater than 10 spots requires 25 s.f. per
Maint. Parking Area requires 0 s.f. - Area proposed exceeds 105 s.f. - Min. 5' width
Standard Parking Spot Dimensions - 20'-0" X 10'-0"
Wheelstops Typ. - Bumper rails allowing for stormwater passage
Parking area 4 is set back from closest public road ROW (Dodge Park Blvd.) by over 195'. Existing forest buffer between Maintenance parking area and Dodge Park Blvd. is minimum 100' width and populated with a dense stand of developed evergreen forest forming a visual buffer.

DIGITALLY SIGNED
REGISTERED LANDSCAPE ARCHITECT
Expires: 09/30/2024

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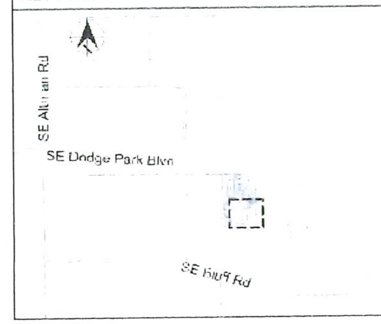
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility
Land Use Plans
Facility Enlargement 1

W02229
LU-400
10 of 18

KEY PLAN



Sheet Keynotes

1. Chemical Building
2. Storage Tanks
3. Process Basins
4. Overflow Basins
5. Emergency Gathering Area
6. Pedestrian Gate
7. Automatic Vehicular Gate
8. Electrical Building

Requirements

No parking areas in this portion of the facility

Emergency Gathering Area - 550' from Administration Building Accessible Route - 250 s.f. of paved space

Legend

- Asphalt Paving - Vehicular Focus
- Concrete Paving - Pedestrian Focus
- Crushed Rock Road / Access
- Berms
- Lot Line
- ROW Line
- Easement Line
- Fence line
- Tree Planting Clusters
- Evergreen and Deciduous Trees
- Shrubs and Groundcovers
- Seeded Areas
- Swale Planting
- Stormwater Planting
- Stream Mix: Forested
- Stream Mix: Shrubby

0 60 120 FEET

REGISTERED LANDSCAPE ARCHITECT

Stantec

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

Land Use Plans

Facility Enlargement 2

W02229

LU-401

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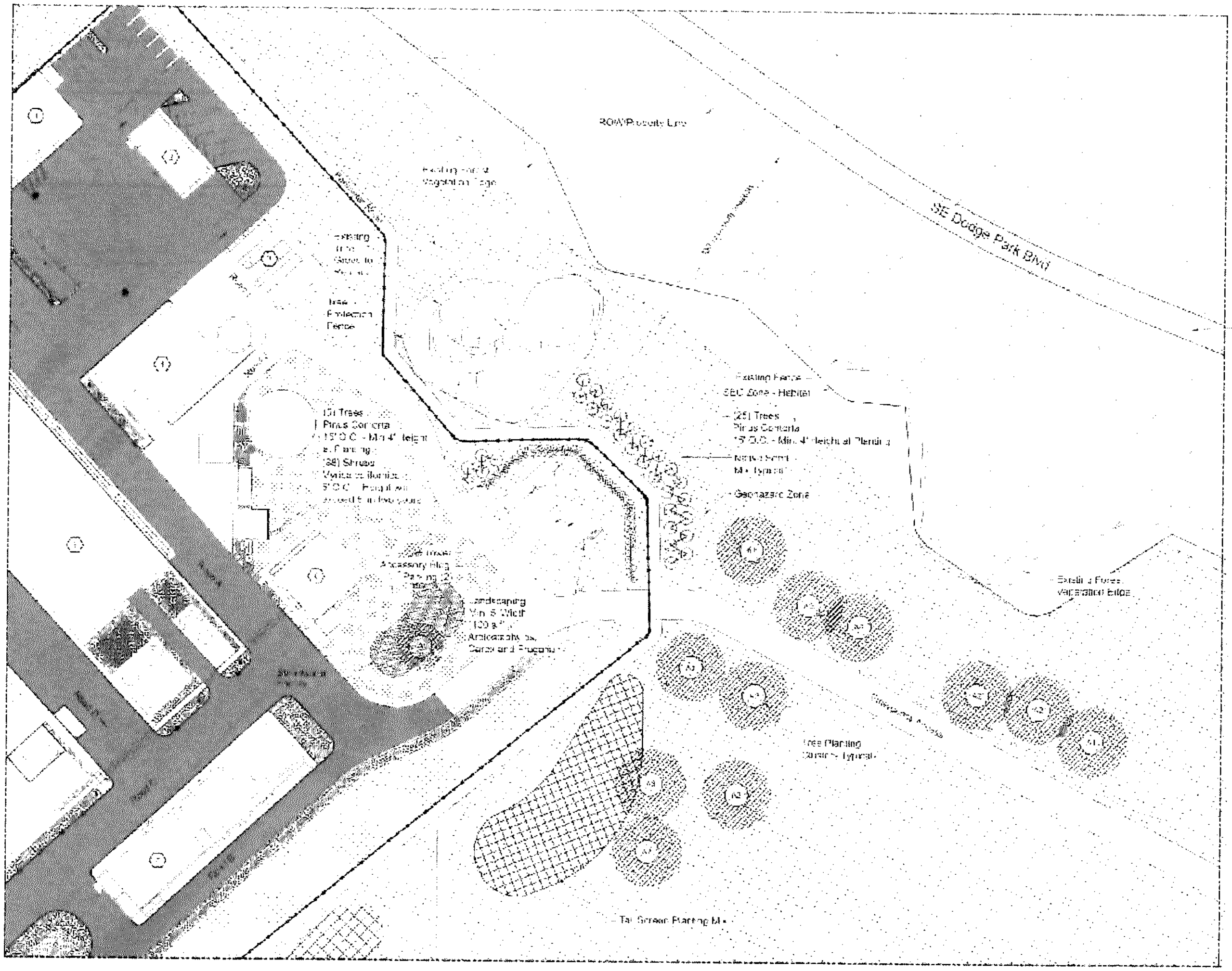

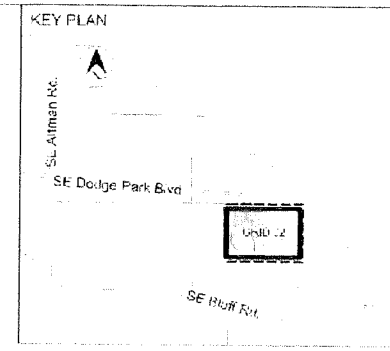

Sheet Keynotes

1. Maintenance Building
2. General Storage Building
3. Pilot Plant
4. Solids Handling Building
5. Chemical Building
6. Washwater Clarification
7. Electrical Building

Tower Screening Requirements and Information

Requirement - Provide Tower Buffer Area of not less than 25 feet wide.
Response - Buffer area from tower base to adjacent ROW is 330 feet wide.

Requirement - Screening of at least 1 row of evergreen shrubs shall be spaced not more than 5 feet apart. Shall grow to form a continuous hedge 5 feet in height at two years.
Response - Screening planting of 2 rows of evergreen shrubs spaced 5' O.C. Materials selected will exceed 5 feet in height at two years.
(38) Myrica californica - California Wax Myrtle

Requirement - Screening of at least 1 row of evergreen trees not less than 4' height and spaced not more than 15 feet apart.
Response - Screening planting of 2 rows of evergreen trees spaced 15' O.C. Materials planted will exceed 4' height at time of planting.
(30) Pinus contorta var. [illegible] - Shore Pine

Distance from Tower to closest property line is 330 Linear Feet.
Dodge Park Boulevard is approximately 80' downslope from Tower base elevation.

Within the existing tree grove one or more dead trees may be removed under arborist direction. These trees are not within the SEC zone.

Legend

- Asphalt Paving - Vehicular Focus
- Concrete Paving - Pedestrian Focus
- [illegible]
- Lot Line
- ROW Line
- Easement Line
- Existing Douglas Fir Forest - Vegetation Leads Down Hillside with Heights in excess of 100'

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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility
Land Use Plans
Tower Area Enlargement

W02229

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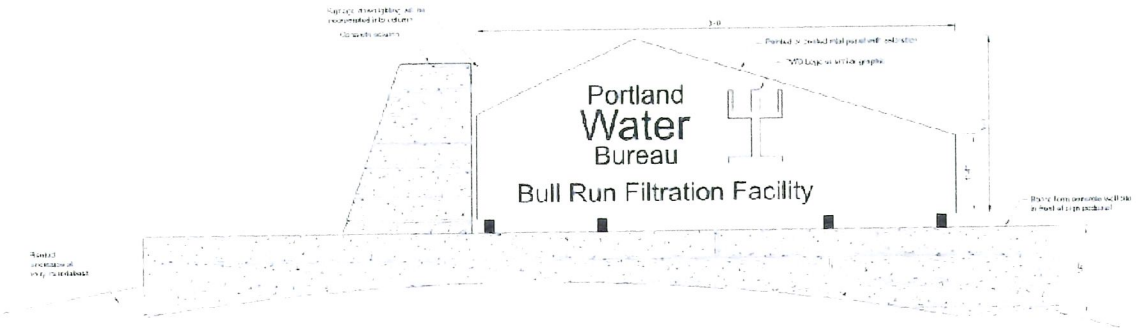
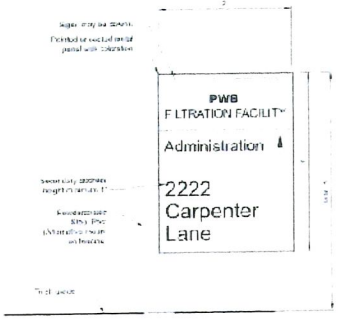
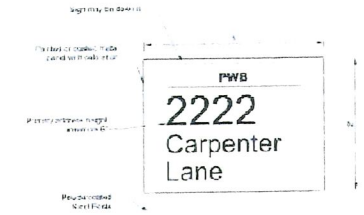


1 Elevation - Monument Entry Sign
NTS



2 Elevation - Directional Sign
NTS



3 Elevation - Address Sign
NTS

REGISTERED LANDSCAPE ARCHITECT

Stantec

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility
Land Use Plans
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Signs

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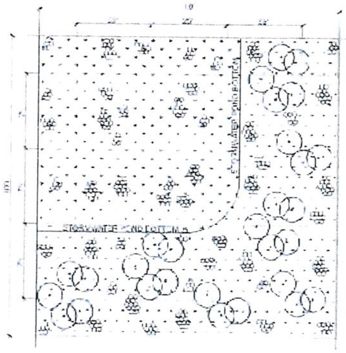


STORMWATER SEED MIX

SHRUBS

TREE CLUMP (10' DIAMETER)

Stormwater Pond Side - Trees

Alnus rhombifolia	White Alder
Rhamnus purshiana	Cascara
Thuja plicata	Western Red Cedar

Stormwater Pond Side - Shrubs

Lonicera involucrata	Twinberry
Mahonia aquifolium	Oregon Grape
Physocarpus capitatus	Ninebark
Rosa pisocarpa	Swamp Rose
Ribes sanguineum	Red Flowering Currant
Sambucus racemosa	Red Elderberry
Symphoricarpos albus	Snowberry

Stormwater Pond Bottom - Shrubs

Cornus sericea	Redtwig Dogwood
Salix sitchensis	Sitka Willow
Salix hookeriana	Hooker's Willow
Spiraea douglasii	Douglas Spirea

Stormwater Pond Planting

NTS

Legend

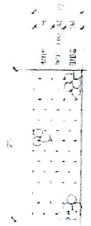
- Tree - 6 per cluster
- Shrub - 3 per cluster
  See plant schedule
  GEN-L-102 for spec

PLANTING DIAGRAM FOR B1

B1	*Mahonia aquifolium*	Oregon Grape	1 Gal. size bareroot
	Rhamnus purshiana	Cascara	1/2" Bareroot
	Salix scouleriana	Scouler's Willow	1/2" Bareroot
	Sambucus cerulea	Blue elderberry	1 gal size bareroot
	Symphoricarpos albus	Snowberry	1 Gal. Size Bareroot
	Symphoricarpos mollis	Snowberry	1 Gal. Size Bareroot

Stormwater Planting Cluster

NTS



STORMWATER SEED MIX 2

SHRUBS

Conveyance Swale - Shrubs	
Mahonia nervosa	Low Oregon Grape
Rosa pisocarpa	Swamp Rose
Spiraea betulifolia	Birchleaf spirea
Spiraea douglasii	Douglas spirea

Conveyance Swale Planting

NTS

STORMWATER SEED MIXES

These seed mixes are only to be applied to stormwater areas that are depicted with the hatch patterns shown in the sheet legends.

Legend	Stormwater - Seed Mix		
	Botanical Name	**Common Name**	**Lbs/Acre**
	Grasses		
	Danthonia californica	California Oatgrass	5
	Deschampsia cespitosa	Tufted Hairgrass	3
	Deschampsia elongata	Slender Hairgrass	3
	Hordeum brachyantherum	Meadow Barley	
	Flowering Plants		
	Achillea millefolium	Yarrow	0.5
	Asclepias speciosa	Milkweed	0.5
	Carex densa	Dense Sedge	
	Carex unilateralis	Lateral Sedge	
	Juncus patens	Slender Rush	
	Juncus tenuis	Spreading Rush	
	Lupinus latifolius	Broadleaf Lupine	0.1
	Potentilla gracilis	Graceful Cinquefoil	0.5

Legend	Stormwater Pond Bottom - Seed Mix		
	Botanical Name	**Common Name**	**Lbs/Acre**
	Carex densa	Dense Sedge	0.25
	Carex pachystachya	Chamisso Sedge	0.5
	Carex scoparia	Broom Sedge	0.5
	Carex unilateralis	One Sided Sedge	0.5
	Agrostis exarata	Spike bentgrass	
	Danthonia californica	California Oatgrass	2
	Deschampsia cespitosa	Tufted Hairgrass	
	Juncus tenuis	Slender Rush	0.1
	Achillea millefolium	Western Yarrow	0.25
	Epilobium densiflorum	Spike Primrose	0.1
	Grindelia integrifolia	Willamette Gumweed	0.1
	Lupinus rivularis	Riverbank Lupine	0.1
	Madia elegans	Common Madia	0.5
	Mimulus guttatus	Yellow Monkeyflower	0.1
	Plagiobothrys figuratus	Fragrant Popcorn Flower	0.1
	Sidalcea campestris	Checkermallow	0.5

Additional Stormwater Plants

These plants are planned to be used or may be used in limited areas near the Admin Building.

Stormwater Plants			
AST SUB	*Aster subspicatus*	Douglas Aster	1 Gal
CAM LEI	*Camassia leichtlinii*	Great Camas	Corm
CAR OBN	*Carex obnupta*	Slough Sedge	Plug
COR MID	*Cornus 'Midwinter Fire'*	Midwinter Fire Dogwood	1 Gal
JUN TEN	*Juncus tenuis*	Spreading Rush	Plug
MAH COM	*Mahonia 'Compacta'*	Compact Oregon Grape	1 Gal
MYR CAL	*Myrica californica*	Pacific Wax Myrtle	5 Gal
PHY CAP	*Physocarpus capitatus*	Ninebark	1 Gal
POL MUN	*Polystichum munitum*	Western Sword Fern	1 Gal
SAL NAN	*Salix 'Nana'*	Purple Willow	5 Gal
SPI TOR	*Spirea 'Tor'*	Birchleaf Spirea	5 Gal
DES GOL	*Deschampsia 'Goldtau'*	Gold Dew Tufted Hairgrass	Plug
CAM QUA	*Camassia quamash*	Camas	Corm
CAR DEN	*Carex densa*	Slough Sedge	Plug
COR KEL	*Cornus 'Kelseyi'*	Kelsey's Dogwood	1 Gal
IRI DOU	*Iris douglasii*	Douglas Iris	Corm
IRI TEN	*Iris tenax*	Pacific Coast Iris	Corm
MAH REP	*Mahonia repens*	Creeping Oregon Grape	1 Gal
MAH SOF	*Mahonia 'Soft Caress'*	Soft Caress Mahonia	5 Gal

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PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

Bull Run Filtration Facility

Land Use Plans

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Stormwater Planting

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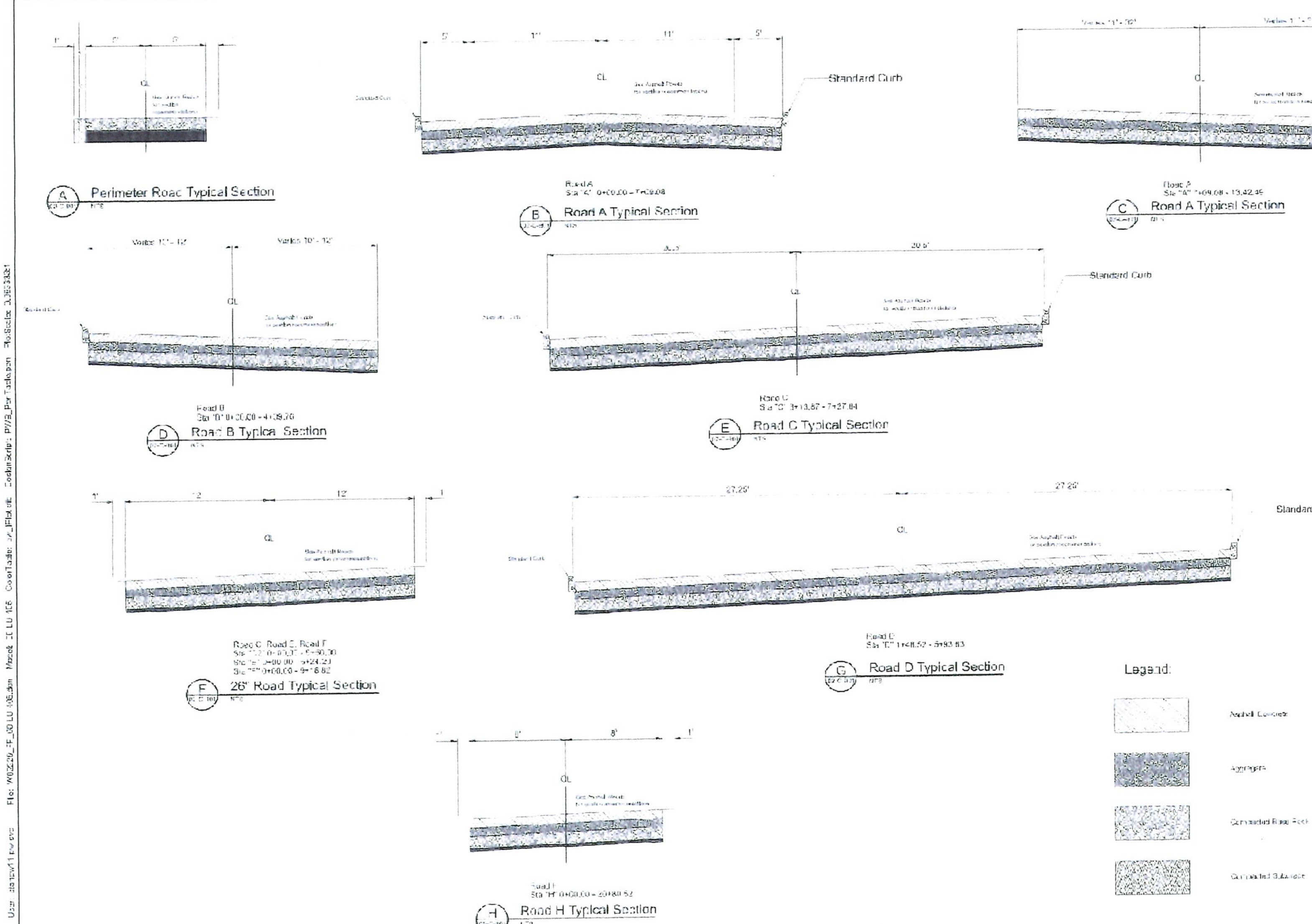
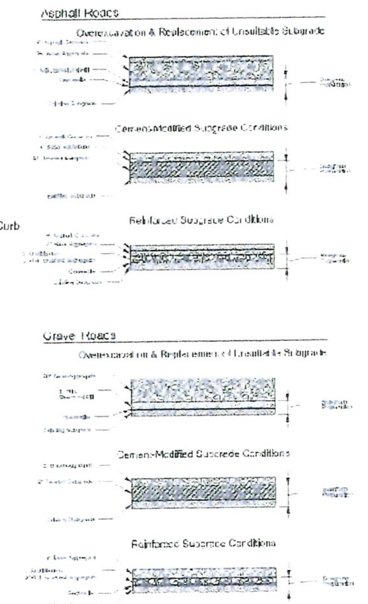


General Sheet Notes

1. Prepare subgrade in accordance with the sections shown below. Choose one method to stabilize the subgrade for each road.
2. Asphalt design parameters per Table 10-3 on sheet 00-LL-406.

Asphalt Roads



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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

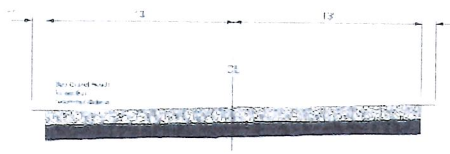
Bull Run Filtration Facility

Civil

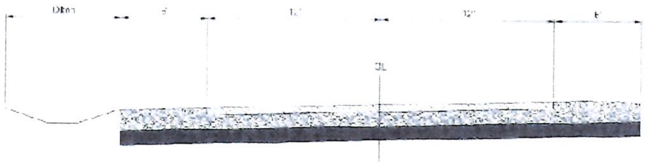
Roadway Typical Sections

W02229

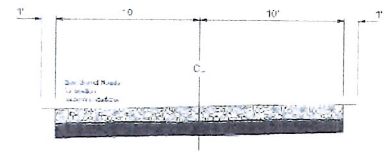
00-LL-405



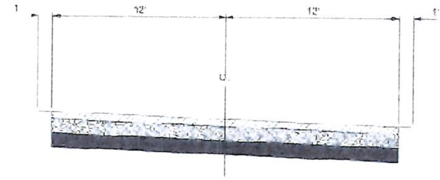
(A) Emergency Access



(B) Road I



(C) Carpenter Lane



(D) Cottrell Rd

Table 10-3 Asphalt and Gravel Road Design Parameters

Parameter	Value	Parameter		Value
Pavement Design Life (years)	20	Subgrade Resilient Modulus, M_r (psi)	Existing Subgrade Conditions - Fat Clay (CH), Lean Clay (CL), and Elastic Silt (MH)	3,300
Growth Rate (%)	0			
Initial Serviceability	4.2		Cement-Modified Subgrade	22,500
Terminal Serviceability	2.5		Reinforced Subgrade	9,000
Standard Deviation	0.49		Compacted Subgrade	15,000
Reliability (%)	90	Resilient Modulus - Aggregate Base (psi)		20,000
Drainage Coefficient - Asphalt	1.0	Structural Coefficient - Asphalt		0.42
Drainage Coefficient - Aggregate Base	1.0	Structural Coefficient - Aggregate Base		0.10
		Design Traffic (ESALs)		41,000

a. Values based on guidelines presented in the 2019 ODOT Pavement Design Guide for flexible pavements.

b. A 90% reliability value was selected to account for variations in traffic predictions and performance predictions to provide a predetermined level of assurance that pavement sections will survive the design life period (AASHTO, 1993).

c. Existing subgrade conditions M_r value based on mean value minus one standard deviation from the results of the 12 DCP tests performed, as discussed in Section 10.2.2.

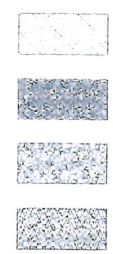
d. Cement-modified subgrade consists of a 12-inch subgrade treatment depth, amended with 5 percent Portland Cement (by weight). The cement-modified subgrade should have a minimum 7-day compressive strength of 100 psi and have a minimum in-place density of 95% of maximum dry density per Modified Proctor test. M_r value based on a conservative 50% improvement factor of subgrade conditions (Hopkins, et al. 2004).

e. Reinforced subgrade consists of a reinforcement & separation geotextile overlain by a minimum 6-inch subgrade stabilization layer in accordance with Section 9.5. M_r value recommended by geosynthetic manufacturer's engineer.

f. M_r value for compacted subgrade conditions is based on results of CBR tests performed on bulk samples. In-place density testing must be performed to verify that 95% of maximum dry density per Modified Proctor test has been achieved.

g. Our ESAL calculations assumed an average daily traffic (ADT) of 100 vehicles consisting of: two WB-50 trucks (Class 9, 5-axle tractor semitrailer truck), 44 passenger cars, 44 pickup trucks/vans, 2-axle, 6-tire (dual rear tires) trucks.

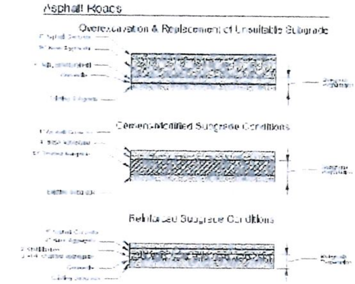
Legend



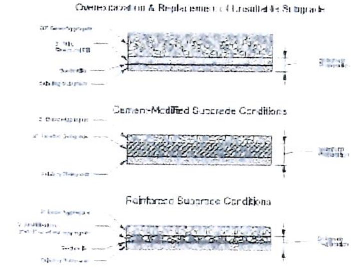
General Sheet Notes

1. Prepare subgrade in accordance with the sections shown below. Choose one method to stabilize the subgrade for each road.
2. Asphalt design parameters per Table 10-3 on sheet 00-LU-406.

Asphalt Roads



Gravel Roads



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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

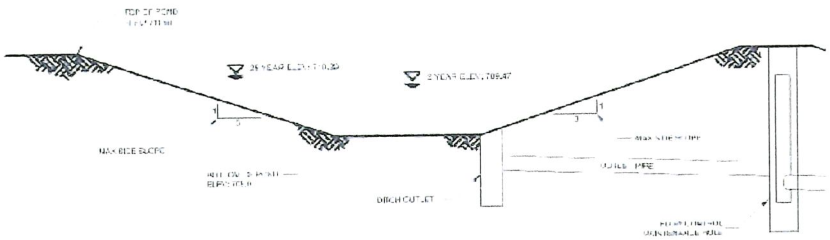
Civil

Roadway Typical Sections -2

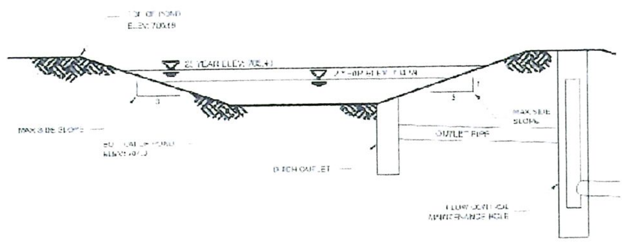
W02229

00-LU-406

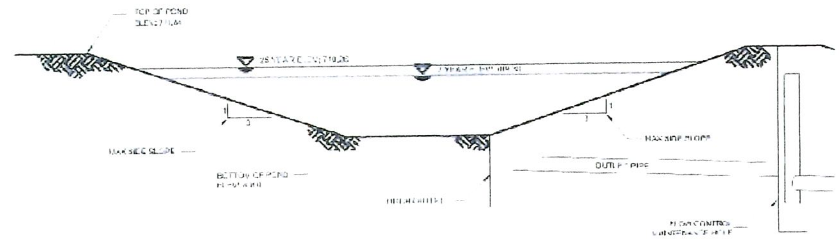
08/12/22



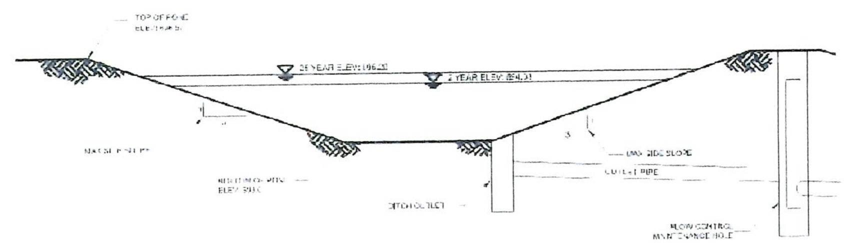
A Pond A
N.T.S.



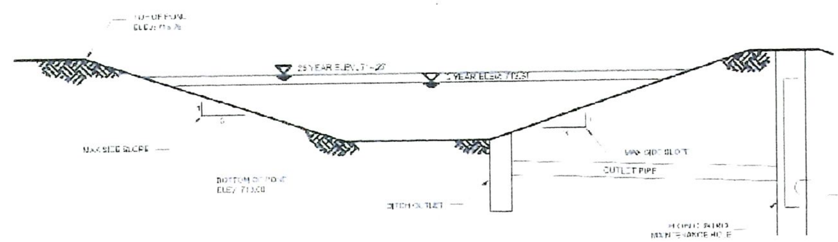
C Pond C
N.T.S.



B Pond B
N.T.S.



D Pond D
N.T.S.



E Pond E
N.T.S.

Stantec

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

Civil

Pond Section Details

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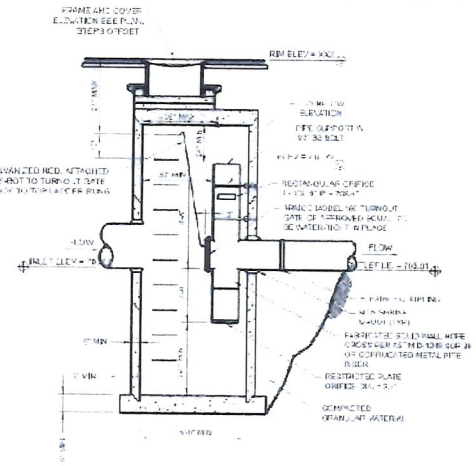
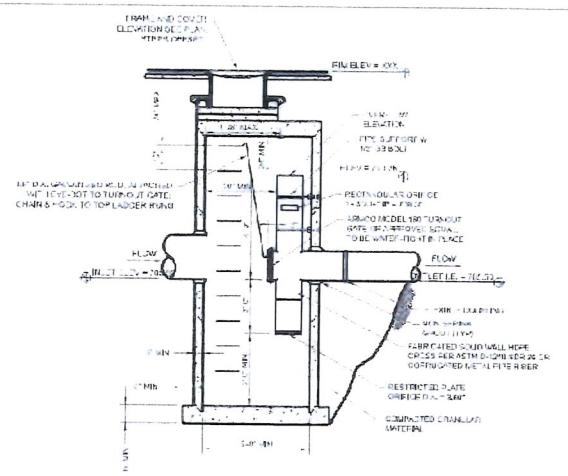
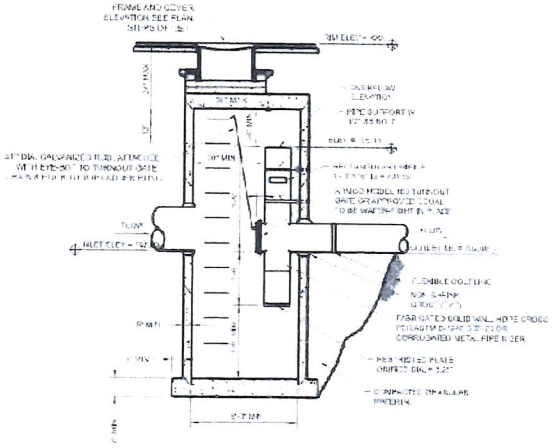


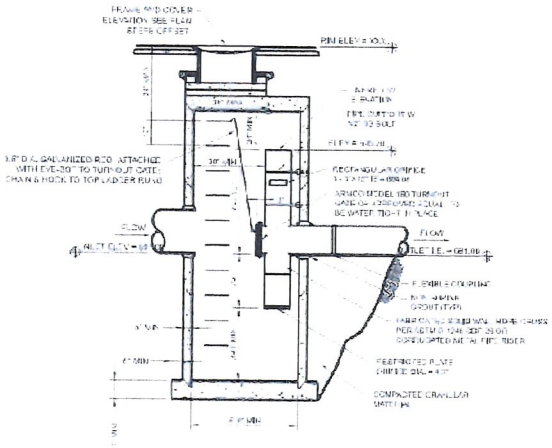
A Flow Control Maintenance Hole - Pond A



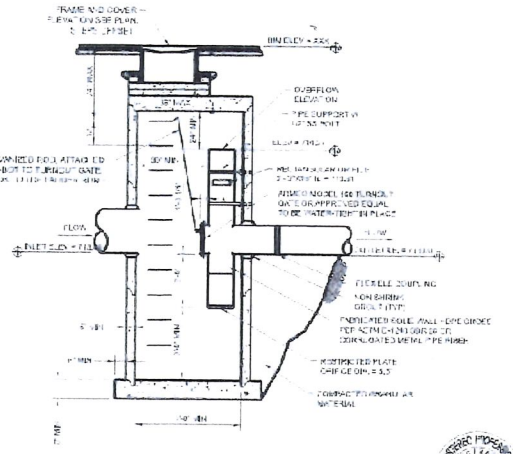
B Flow Control Maintenance Hole - Pond B



C Flow Control Maintenance Hole - Pond C



D Flow Control Maintenance Hole - Pond D



E Flow Control Maintenance Hole - Pond E

Stantec

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

Civil

Flow Control Manhole Details

W02229

Individual Plants

Managed Landscape Areas		
Botanical Name	Common Name	Plant Size
Trees		
Alnus rhombifolia	White Alder	1.5" Cal
Calocedrus decurrens	Incense-Cedar	5' Height
[illegible]	Tupelo	1.5" Cal
Pinus contorta var. [illegible]	Shore Pine	5' Height
Pinus ponderosa var. [illegible]	Pacific Ponderosa	5' Height
Pseudotsuga menziesii	Douglas-fir	1.5" Cal
Quercus garryana	Oregon White Oak	1.5" Cal
Quercus garryana	Oregon White Oak	2" Cal
[illegible]	[illegible]	1.5" Cal
Thuja 'Hogan'	Hogan Western Red Cedar	8' Height
Thuja plicata	Western Red Cedar	5' Height
Thuja plicata	Western Red Cedar	8' Height
Sub-Trees (10-15')		
Acer circinatum	Vine Maple	1½ Gal
Amelanchier alnifolia	Western Service Berry	1½ Gal
Large Shrubs (5-10')		
Garrya elliptica	Silk Tassle Tree	5 Gal
Myrica californica	Pacific Wax Myrtle	5 Gal
Rubus parviflora	Thimbleberry	1 Gal.
Viburnum 'Wentworth'	American Cranberry	1 Gal.
Small Shrubs (2' - 5')		
Cornus 'Kelseyi'	Kelsey's Dogwood	1 Gal
Mahonia aquifolium 'Compacta'	Compact Oregon Grape	1 Gal
Mahonia nervosa	Cascade Oregon Grape	1 Gal
Mahonia 'Soft Caress'	Soft Caress Mahonia	5 Gal.
Euphorbia [illegible]	Dwarf Markerange	1 Gal
Polystichum munitum	Western Sword Fern	1 Gal
Spiraea betulifolia var. 'Tor'	Birchleaf Spiree	1 Gal
Vaccinium ovatum	Evergreen Huckleberry	5 Gal
Herbaceous (perennials, ferns, grasses)		
Achillea 'Moonshine'	Moonshine Yarrow	1 Gal
Asclepias speciosa	Milkweed	1 Gal
Aquilegia columbiana	Columbine	1 Gal.
Calamgrostis nutkaensis	Pacific Reedgrass	1 Gal
Deschampsia 'Goldtau'	Gold Dew Tufted Hairgrass	1 Gal
Helleborus argutifolius	Corsican Hellebore	1 Gal
Iris douglasii	Douglas Iris	1 Gal
Lupinus polyphyllus	Big Leaf Lupine	1 Gal
Sidalcea campestris	Checker Mallow	1 Gal.
Tellima grandiflora	Fringecup	1 Gal
Groundcover (12" or less)		
Arctostaphylos 'Vancouver Jade'	Vancouver Jade Bearberry	1 Gal
Carex glauca	Grey Sedge	1 Gal
Fragaria chiloensis	Beach Strawberry	1 Gal
Mahonia repens	Creeping Oregon Grape	1 Gal
Sedum spathulifolium	Broadleaf Sedum	1 Gal.
Sedum oreganum	Oregon Sedum	1 Gal.

Unmanaged Landscape Areas		
Botanical Name	Common Name	Plant Size
Pinus contorta var. [illegible]	Shore Pine	5' Hgt
Pinus ponderosa var. willamettensis	Willamette Valley Ponderosa Pine	5' Hgt
Pseudotsuga menziesii	Douglas Fir	6' Hgt
Quercus garryana	Oregon Oak	2" Cal

Groundcover Mix - See sheet 00-LU-410 for layout details

Extended Area Groundcover				
Legend	Botanical Name	Common Name	Plant Size	% Composition
	Arctostaphylos 'Vancouver Jade'	Vancouver Jade Bearberry	1 Gal	33%
	Carex glauca	Grey Sedge	1 Gal	33%
	Fragaria chiloensis	Beach Strawberry	1 Gal.	34%

Screening Planting Mixes - See sheet 00-LU-410 for layout details

Screening Mix - Forested				
Legend	Botanical Name	Common Name	Plant Size	% Composition
	Trees			
	Abies grandis	Grand Fir	3 Ft. Bareroot	5%
	Acer macrophyllum	Bigleaf Maple	1.5" Cal. Bareroot	5%
	Calocedrus decurrens	Incense Cedar	3 Ft. Bareroot	15%
	Larix occidentalis	Western Larch	3 Ft. Bareroot	5%
	Pinus ponderosa	Ponderosa Pine	3 Ft. Bareroot	15%
	Pseudotsuga menziesii	Douglas Fir	3 Ft. Bareroot	5%
	Rhamnus purshiana	Cascara	3 Ft. Bareroot	5%
	Salix scouleriana	Scouler's Willow	3 Ft. Bareroot	5%
	Shrubs			
	Mahonia aquifolium	Tall Oregon Grape	Bareroot	10%
	Oemleria cerasiformis	Osoberry	Bareroot	5%
	Rubus spectabilis	Salmonberry	Bareroot	5%
	Rubus parviflorus	Thimbleberry	Bareroot	5%
	Symphoricarpos albus	Snowberry	Bareroot	5%

Screening Mix - Shrubby Unirrigated				
Legend	Botanical Name	Common Name	Plant Size	% Composition
	Trees			
	Cornus nuttallii	Pacific Dogwood	1.0" Bareroot	5%
	Pinus ponderosa var. [illegible]	Shore Pine	1.0" Bareroot	10%
	Shrubs			
	Amelanchier alnifolia	Serviceberry	1 Gal	5%
	Corylus cornuta var. californica	Western Hazelnut	1 Gal.	5%
	Holodiscus discolor	Oceanspray	1 Gal	5%
	Garrya elliptica	Silk Tassel	1 Gal	10%
	Mahonia aquifolium	Tall Oregon Grape	1 Gal	5%
	Myrica californica	Pacific Waxmyrtle	1 Gal	5%
	Philadelphus lewisii	Mockorange	1 Gal	5%
	Physocarpus capitatus	Pacific Ninebark	1 Gal	5%
	Ribes sanguineum	Chapparal Currant	1 Gal	5%
	Rosa nutkana	Nootka Rose	1 Gal	5%
	Sambucus racemosa	Red Elderberry	1 Gal	5%
	Spiraea douglasii	Douglas Spiraea	1 Gal	5%
	Symphoricarpos albus	Snowberry	Gal	5%
	Vaccinium ovatum	Evergreen Huckleberry	1 Gal	5%
	Viburnum edule	Highbush cranberry	1 Gal	5%

Planting Clusters - See sheet 00-LU-410 for layout details

Planting Clusters				
Legend	Botanical Name	Common Name	Plant Size	% Composition
A1	Quercus garryana	Oregon White Oak	1/2" Bareroot	100%
A2	Pinus ponderosa var. benthamiana	Pacific Ponderosa Pine	1/2" Bareroot	20%
	Quercus garryana	Oregon White Oak	1/2" Bareroot	80%
A3	Amelanchier alnifolia	Western Service Berry	1 Gal Bareroot	5%
	Holodiscus discolor	Oceanspray	1 Gal Bareroot	5%
	Mahonia aquifolium	Oregon Grape	1 Gal Bareroot	10%
	Philadelphus lewisii	Mockorange	1 Gal Bareroot	5%
	[illegible]	Ninebark	1 Gal Bareroot	5%
	Quercus garryana	Oregon Oak	1/2" Bareroot	30%
	Rosa pisocarpa	Baldhip Rose	1 Gal Bareroot	15%
	Symphoricarpos albus	Snowberry	1 Gal Bareroot	15%
U1	Mahonia aquifolium	Oregon Grape	1 Gal Bareroot	20%
	Rhamnus purshiana	Cascara	1/2" Bareroot	11%
	Salix scouleriana	Scouler's Willow	1/2" Bareroot	6%
	Sambucus cerulea	Blue Elderberry	1 Gal Bareroot	10%
	Symphoricarpos albus	Snowberry	1 Gal Bareroot	5%
	Symphoricarpos mollis	Creeping Snowberry	1 Gal Bareroot	5%
C1	Mahonia aquifolium	Tall Oregon Grape	1 Gal Bareroot	20%
	Rosa gymnocarpa	Baldhip Rose	1 Gal Bareroot	20%
	Rubus parviflorus	Thimbleberry	1 Gal Bareroot	20%
	Symphoricarpos albus	Snowberry	1 Gal Bareroot	10%

Type1 Seeding

Seeded Mowing Area			
Legend	Botanical Name	Common Name	Percentage/PLS
	Fleur de Lawn Blend		PLS
	Lolium perenne	Perennial Ryegrass	40%
	Festuca trachyphylla	Hard Fescue	22%
	Festuca 'Quatro'	Quatro Tetraploid Sheep Fescue	20%
	Trifolium repens	White Clover	5%
	Achillea millefolium	White Yarrow	5%
	Lobularia maritima	Sweet Alyssum	5%
	Bellis perennis	Single White English Daisy	3%

Type 2 Seeding

Grassland Seeding - Bunchgrass Focused			
Legend	Botanical Name	Common Name	Lbs/Acre
	Grasses		
	Danthonia californica	California Oatgrass	6
	Deschampsia elongata	Slender Hairgrass	5
	Festuca occidentalis	Western Fescue	1
	Festuca roemeri	Roemer's Fescue	2
	Hordeum brachyantherum	Meadow Barley	1
	Koeleria macrantha	Prairie Junegrass	1
	Poa secunda	Pine Junegrass	1
	Forbs		
	Achillea millefolium	Yarrow	0.5
	Anaphalis margaritacea	Pearly Everlasting	0.5
	Epilobium angustifolium	Fireweed	0.5
	Eriophyllum lanatum	Oregon Sunshine	1
	Geranium oreganum	Western Geranium	1
	Lupinus polyphyllus	Bigleaf Lupine	0.1
	Prunella vulgaris ssp. lanceolata	Common Selfheal	1
	Sidalcea campestris	Meadow checker mallow	1
	Lomatium utriculatum	Common lomatium	1
	Lomatium macrocarpum	Bigseed Biscuitroot	1
	Solidago canadensis	Canada Goldenrod	0.25

Type 3 Seeding

Grassland Seeding - Color and Fire Resistance Focused			
Legend	Botanical Name	Common Name	lbs/Acre
	Danthonia californica	California Oatgrass	6
	Deschampsia elongata	Slender Hairgrass	5
	Festuca occidentalis	Western Fescue	1
	Festuca roemeri	Roemer's Fescue	2
	Hordeum brachyantherum	Meadow Barley	2
	Koeleria macrantha	Prairie Junegrass	1
	Poa secunda	Pine Junegrass	2
	Forbs		
	Achillea millefolium	Yarrow	0.5
	Asclepias speciosa	Milkweed	0.5
	Anaphalis margaritacea	Pearly Everlasting	0.5
	Brodiaea coronaria	Brodiaea	0.5
	Epilobium angustifolium	Fireweed	0.25
	Eriophyllum lanatum	Oregon Sunshine	0.5
	Gaillardia aristata	blanket flower	0.5
	Geranium oreganum	Western Geranium	0.5
	Lomatium macrocarpum	Bigseed Biscuitroot	1
	Lupinus polyphyllus	Bigleaf Lupine	0.1
	Penstemon cardwellii	Cardwell's penstemon	0.25
	Prunella vulgaris ssp. lanceolata	Common Selfheal	0.5
	Sidalcea campestris	Meadow checkermallow	0.5
	Solidago canadensis	Canada Goldenrod	0.5

See Sheet 00-LU-404 for stormwater plants

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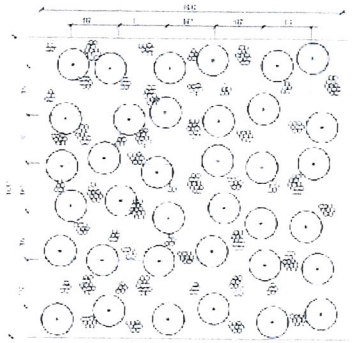
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

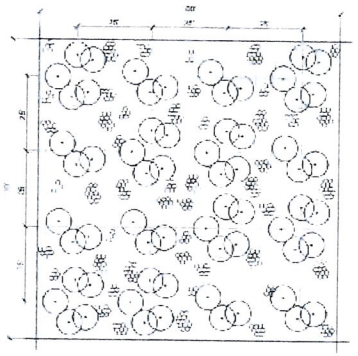
Date: 2/3/2022

Bull Run Filtration Facility
Land Use Plans
Plant Species and Sizes

W02229
00-LU-403
19



Screening Mix: Forested Planting
NTS



Screening Mix: Shrubby Planting
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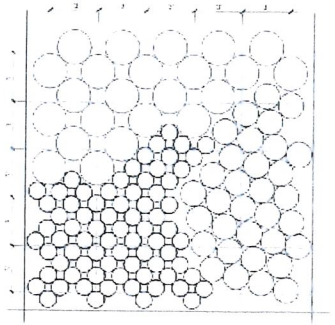

Groundcover Planting
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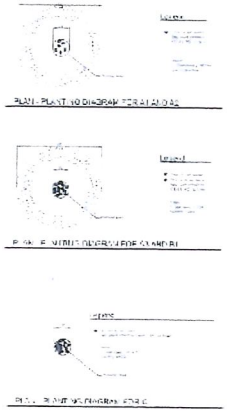

Cluster Planting
NTS

REGISTERED LANDSCAPE ARCHITECT

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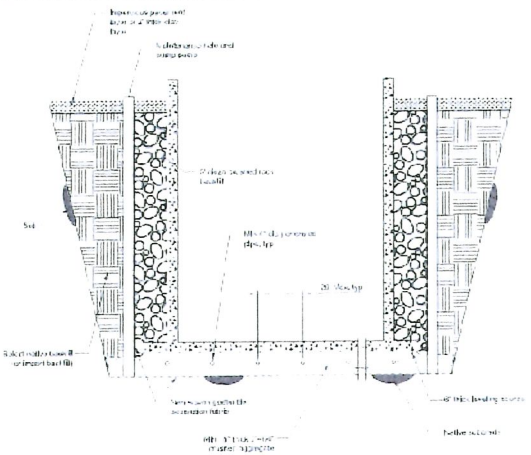
2/30/22

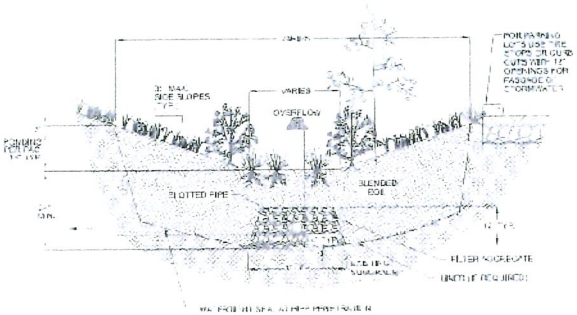
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility
Land Use Plans
Planting Details

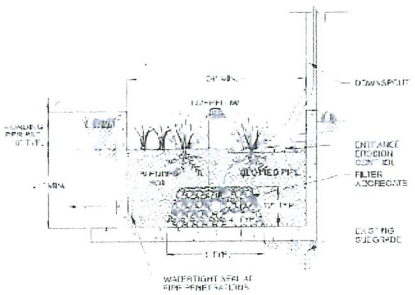
W02229
00-LU-41C
20



UNDERDRAIN SYSTEM



BASIN WITH UNDERDRAIN



PLANTER WITH UNDERDRAIN

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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

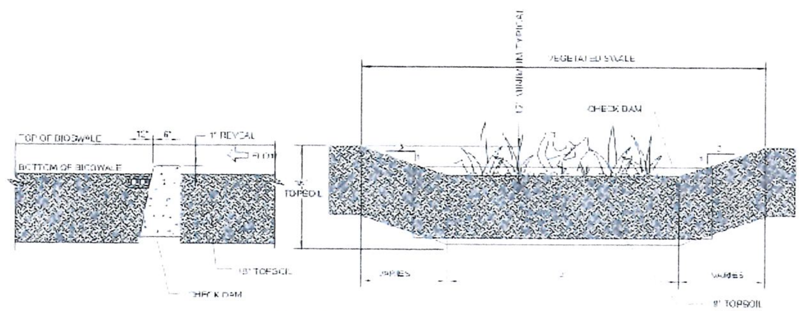
Bull Run Filtration Facility

Civil

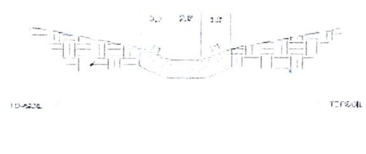
Storm
Details 1

W02220

GEN-C-920

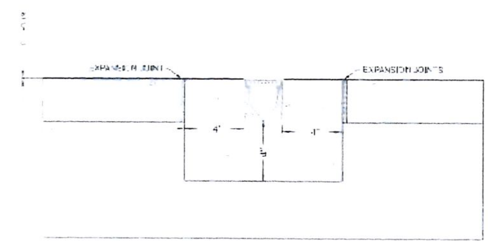


TYPICAL GRASSY SWALE



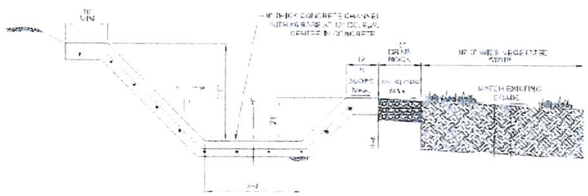
ROADSIDE DITCH

NTS

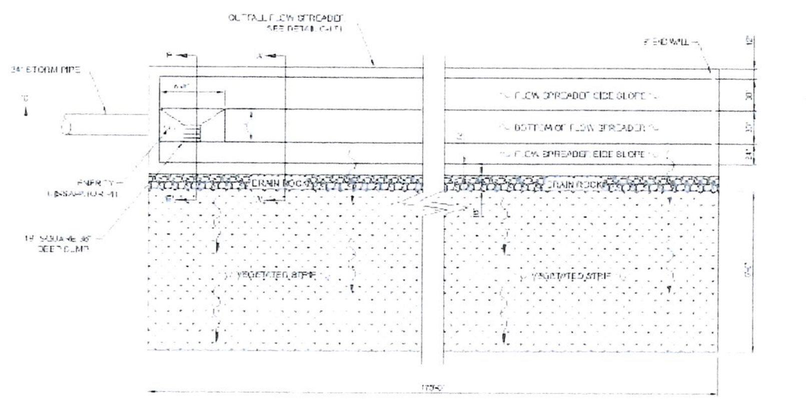


TRENCH DRAIN

NTS



SECTION VIEW



OUTFALL FLOW SPREADER

PRELIMINARY
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09/02/22

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

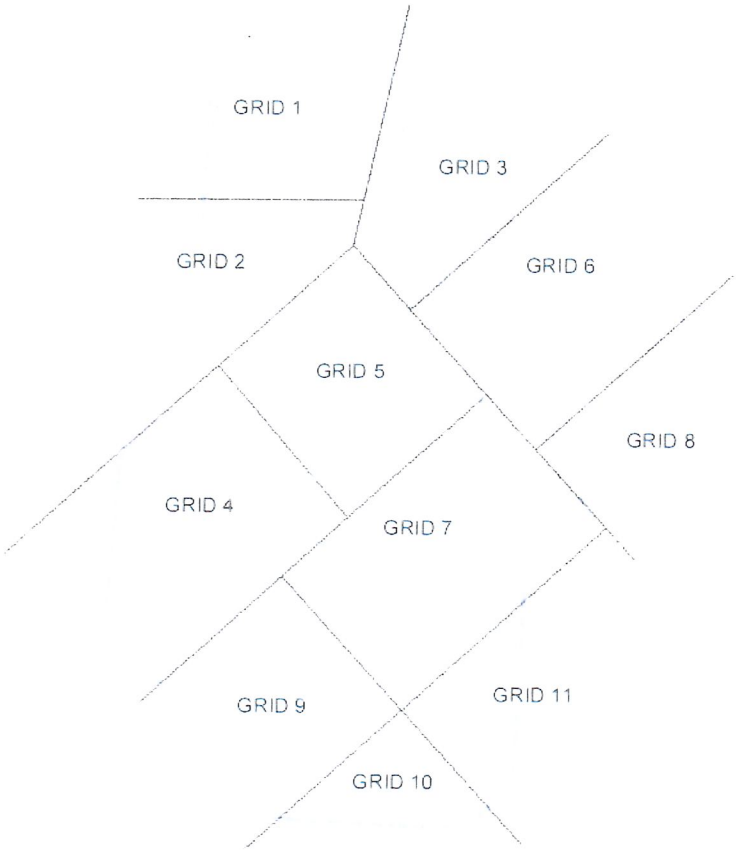
Civil

Storm
Details 4

W02229

GEN-C-923

Attachment B: Lighting Plans



Key Plan

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PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

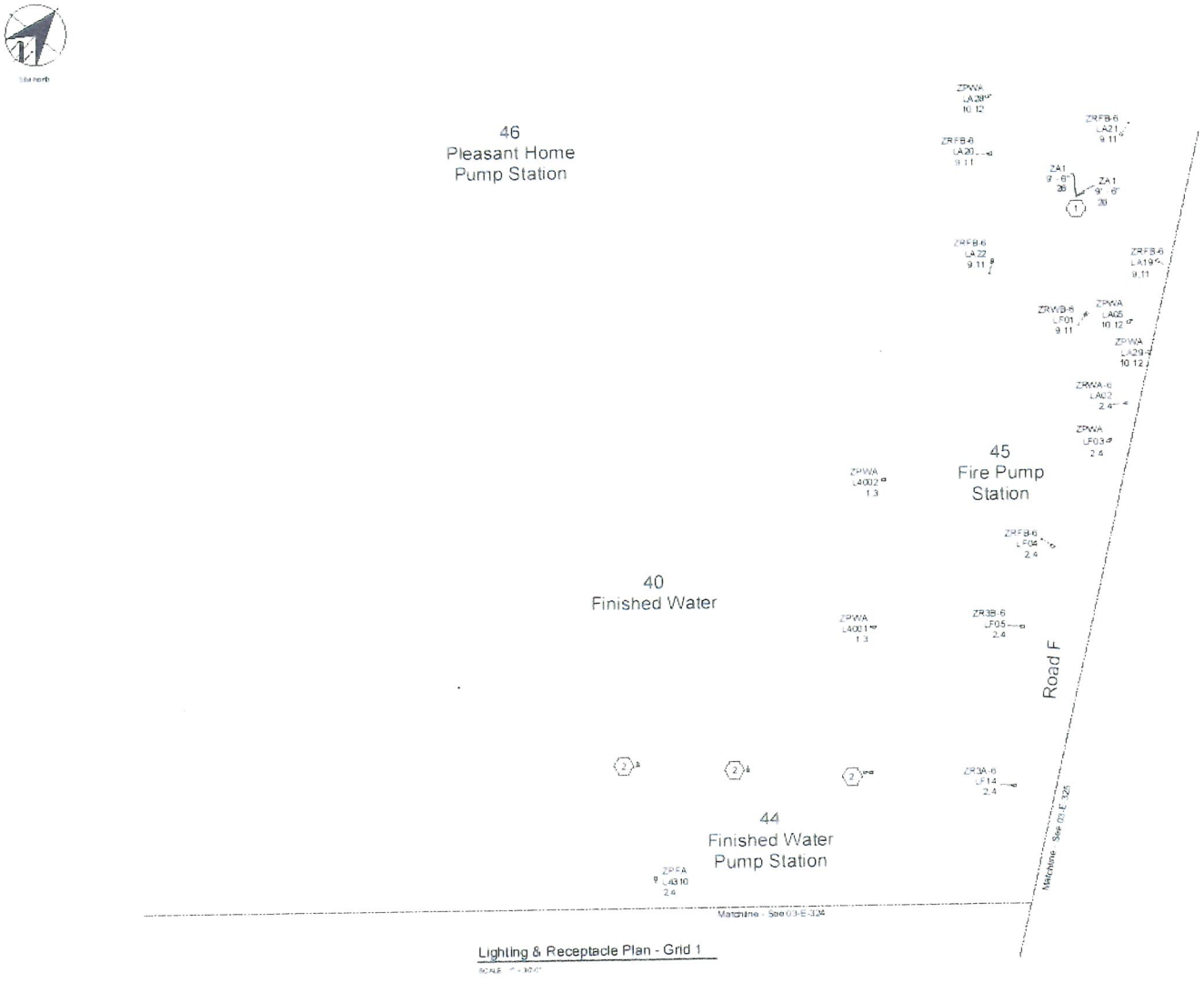
Bull Run Filtration Facility

Electrical

Site Lighting

Key Plan

W02229



Lighting & Receptacle Plan - Grid 1

SCALE: 1" = 30'-0"

General Sheet Notes

1. 480V roadway light poles with the road name tag shown on this sheet are powered from the building 16 panel, FF16-DP-1001
2. 480V pedestrian and roadway light poles with the area name tag are powered from the building feeding the area unless otherwise noted
3. Light pole fixture with the emergency symbol is circuited to 120V emergency panel in the building feeding power to that area. Refer to area specific plans for circuiting and fixture type
4. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-334 for Lighting Control Plan
5. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule

Sheet Keynotes

1. Plant entry sign floodlights. Provide and install on 8 feet round pole elevated on a 1.5' planting bed. Circuit fixture to FF16-PNL-1001
2. See Area 40 Plans for pole, light fixture, and circuiting information

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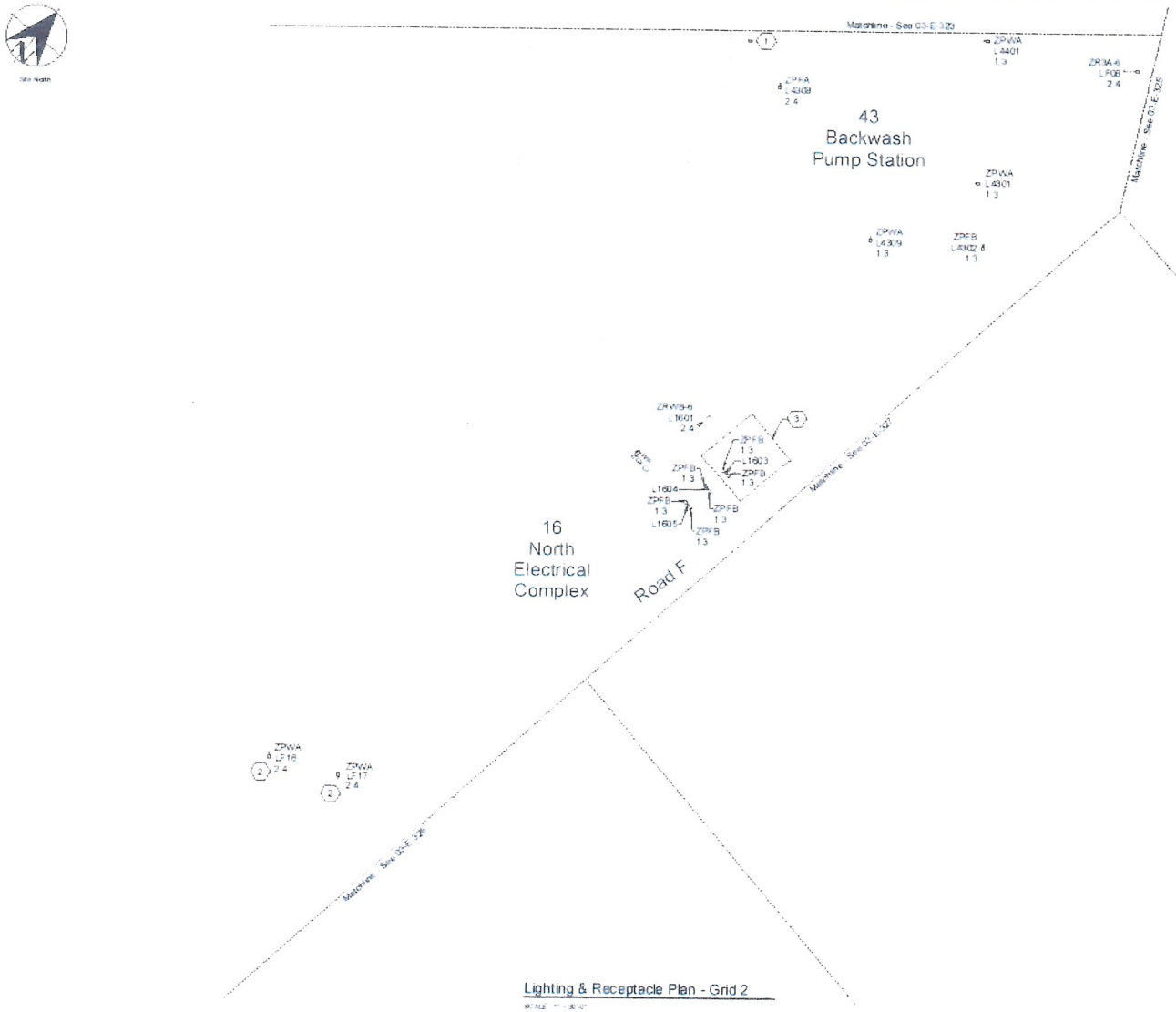
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility
Electrical
Site Lighting
Lighting & Receptacle Plan
Grid 1

W02229
03-E-324



Lighting & Receptacle Plan - Grid 2

SCALE: 1" = 30'-0"

General Sheet Notes

1. 480V roadway light poles with the road name tag shown on this sheet are powered from building 16. FF16-DP-1001
2. 480V pedestrian and roadway light poles with the area name tag are powered from the building feeding the area unless otherwise noted.
3. Light pole fixture with the emergency symbol is circuited to 120V emergency panel in the building feeding power to that area. Refer to area specific plans for circuiting and fixture type.
4. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-335 for Lighting Control Plan.
5. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule.

Sheet Keynotes

1. See Area 40 Plans for pole, light fixture, and circuiting information.
2. Fixtures are circuited to the panel in building 16.
3. Provide and install light pole with fixtures under Bid Alternate except as noted. See specification section 01_23_00 Alternates.

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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

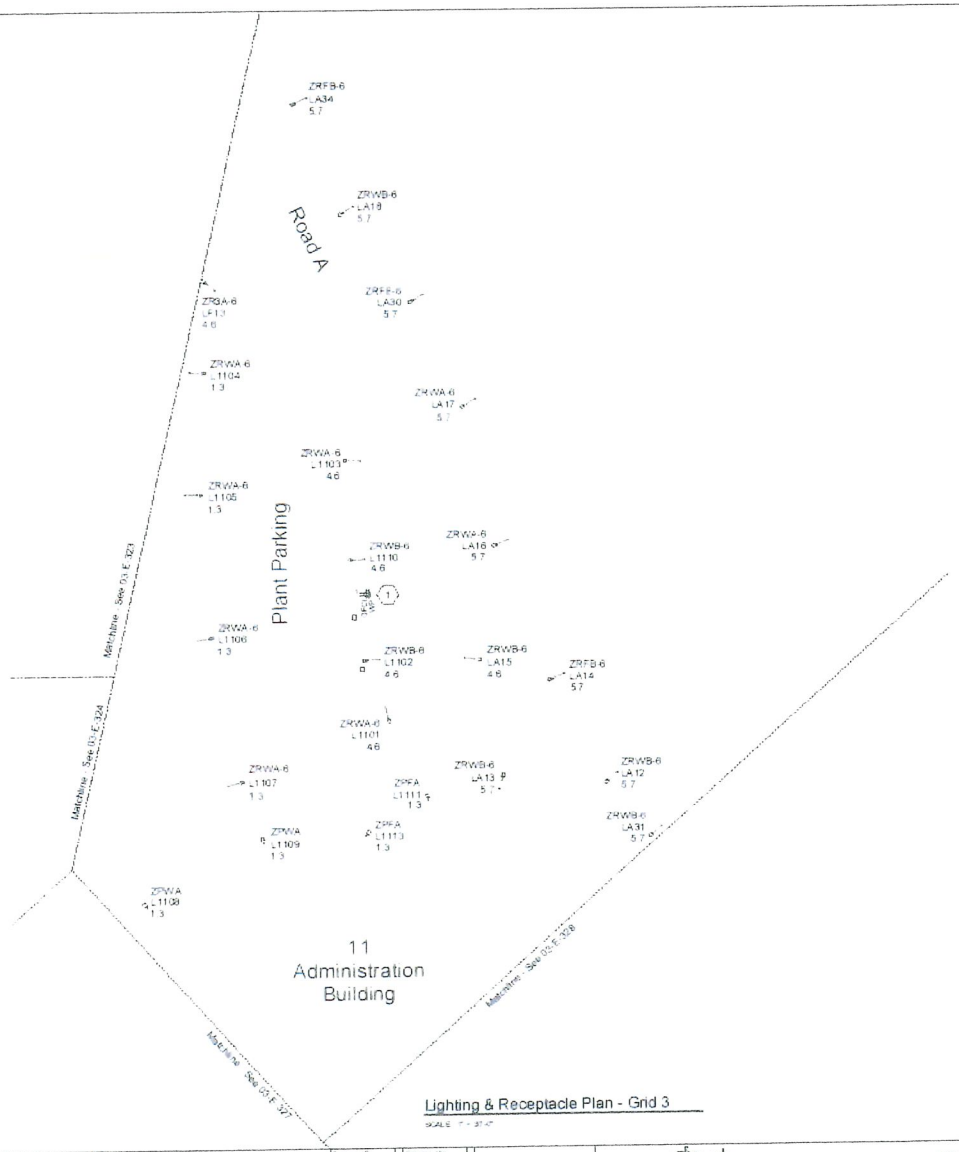
Bull Run Filtration Facility

Electrical

Site Lighting
Lighting & Receptacle Plan
Grid 2

W02229

03-E-324



Lighting & Receptacle Plan - Grid 3

SCALE: 1" = 30'-0"

General Sheet Notes

1. All the light poles shown on this sheet are powered from building 11. Refer to area specific plans for the panel name and schedule.
2. Light pole fixture with the emergency symbol is circuited to 120V emergency panel in the building 11.
3. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-336 for Lighting Control Plan.
4. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule.

Sheet Keynotes

1. Provide and install receptacle.

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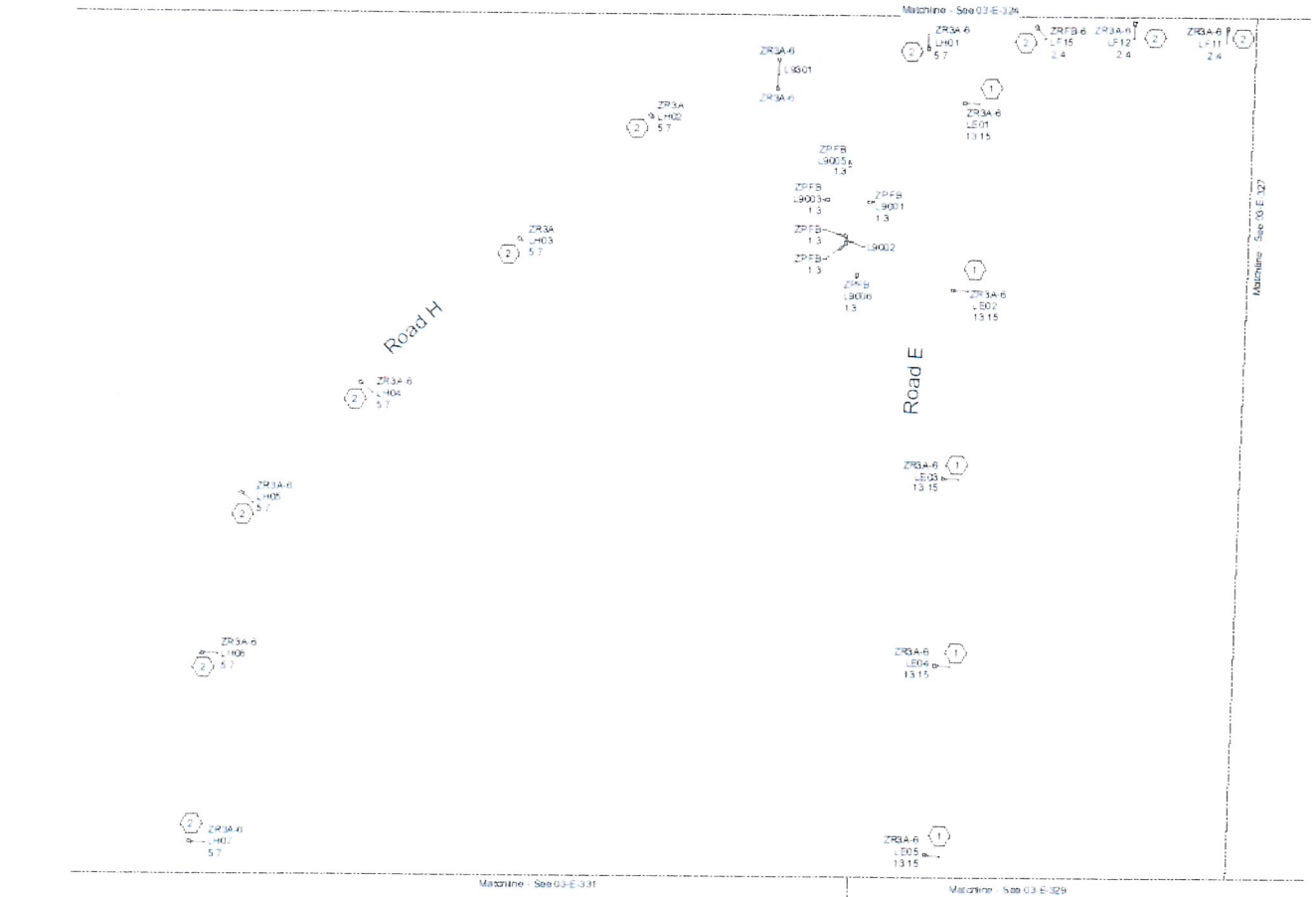
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility
Electrical
Site Lighting
Lighting & Receptacle Plan
Grid 3

W02229
03-E-325



Lighting & Receptacle Plan - Grid 4

SCALE: 1" = 30'-0"

General Sheet Notes

1. 480V roadway lightpoles with the road name tag shown on the sheet are powered from building 15 and 16
2. 480V pedestrian and roadway lightpoles with the area name tag are powered from the building feeding the area unless otherwise noted
3. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-337 for Lighting Control Plan
4. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule

Sheet Keynotes

1. The fixture is circuited to the panel in building 15
2. The fixture is circuited to the panel in building 16

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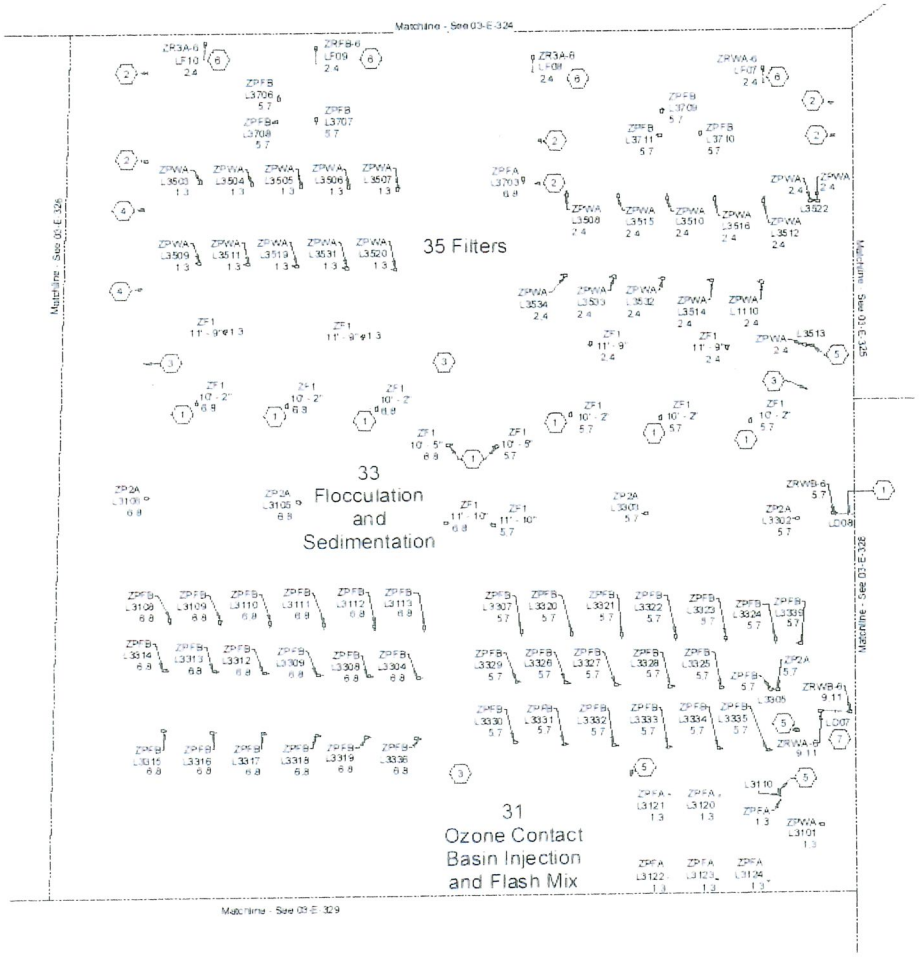
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility
Electrical
Site Lighting
Lighting & Receptacle Plan
Grid 4

W02229

03-E-326



Lighting & Receptacle Plan - Grid 5

SCALE: 1" = 10'-0"

General Sheet Notes

1. 480V roadway lightpoles with the road name tag shown on this sheet are powered from building 35 or 31 unless otherwise noted.
2. 480V pedestrian and roadway lightpoles with the area name tag are powered from the building feeding the area unless otherwise noted.
3. Light pole fixture with the emergency symbol is circuited to 120V emergency panel in the building feeding power to that area. Refer to area specific plans for circuiting.
4. Circuit numbers are shown. Refer to panel schedules to match the fixtures with the same circuit numbers.
5. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-338 for Lighting Control Plan.
6. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule.

Sheet Keynotes

1. This fixture is circuited to 480V panel in building 31. Fixtures to the north are circuited to 480V panel in building 35. Fixtures to the south are circuited to 480V panel in building 31. Refer to panel schedules to match the fixtures with the same circuit numbers.
2. See Area 37 plans for fixture, pole, and circuiting information.
3. See Area 30 plans for switch bank and switch circuiting information.
4. See Area 35 plans for fixture, pole, and circuiting information.
5. See Area 33 plans for fixture, pole, circuiting information.
6. Light pole is circuited to area 16 panel FF16-DP-1001.
7. Light pole is circuited to area 15 panel FF15-DP-1001.
8. Light pole is within LEED boundary. It is circuited to area 11 panel FF11-DP-1001.

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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

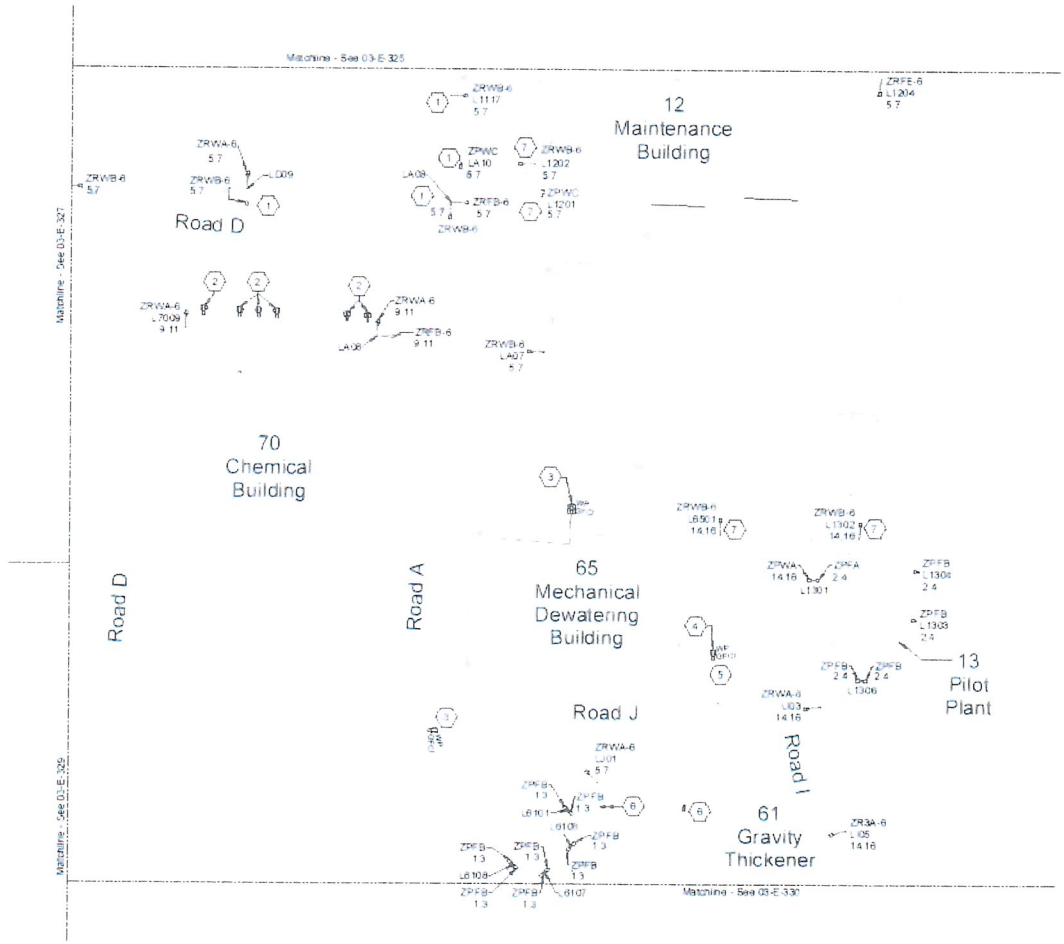
Electrical

Site Lighting
Lighting & Receptacle Plan
Grid 5

W02229

370/1-3700

03-E-327



Lighting & Receptacle Plan - Grid 6

SCALE: 1" = 30'-0"

General Sheet Notes

1. 480V roadway lightpoles with the road name tag shown on this sheet are powered from the building 15 panel.
2. 480V pedestrian and roadway lightpoles with the area name tag are powered from the building feeding the area unless otherwise noted.
3. Light pole fixture with the emergency symbol is circuited to 120V emergency panel in the building feeding power to that area. Refer to area specific plans for circuiting.
4. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-339 for Lighting Control Plan.
5. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule.
6. Task light pole fixtures in area 13, 61 and 51 are circuited to area 65 panel.

Sheet Keynotes

1. This fixture is within LEED boundary. It is circuited to the panel in building 11.
2. Provide and install dedicated receptacles for cart charger. Refer to area specific plans for circuiting.
3. Provide and install a receptacle in the metering vault. Provide with weatherproof and gfci features. Refer to area specific plans for circuiting.
4. Provide and install the dedicated receptacle for 65 tank dewatering pump. See area 65 plans for circuiting.
5. See Area 65 plans for lighting and circuiting information on 65 tank dewatering pump.
6. See Area 61 plans for pole, light fixture, and circuiting information.
7. The light pole is circuited to area 15 panel. FF15-DP-1001.

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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

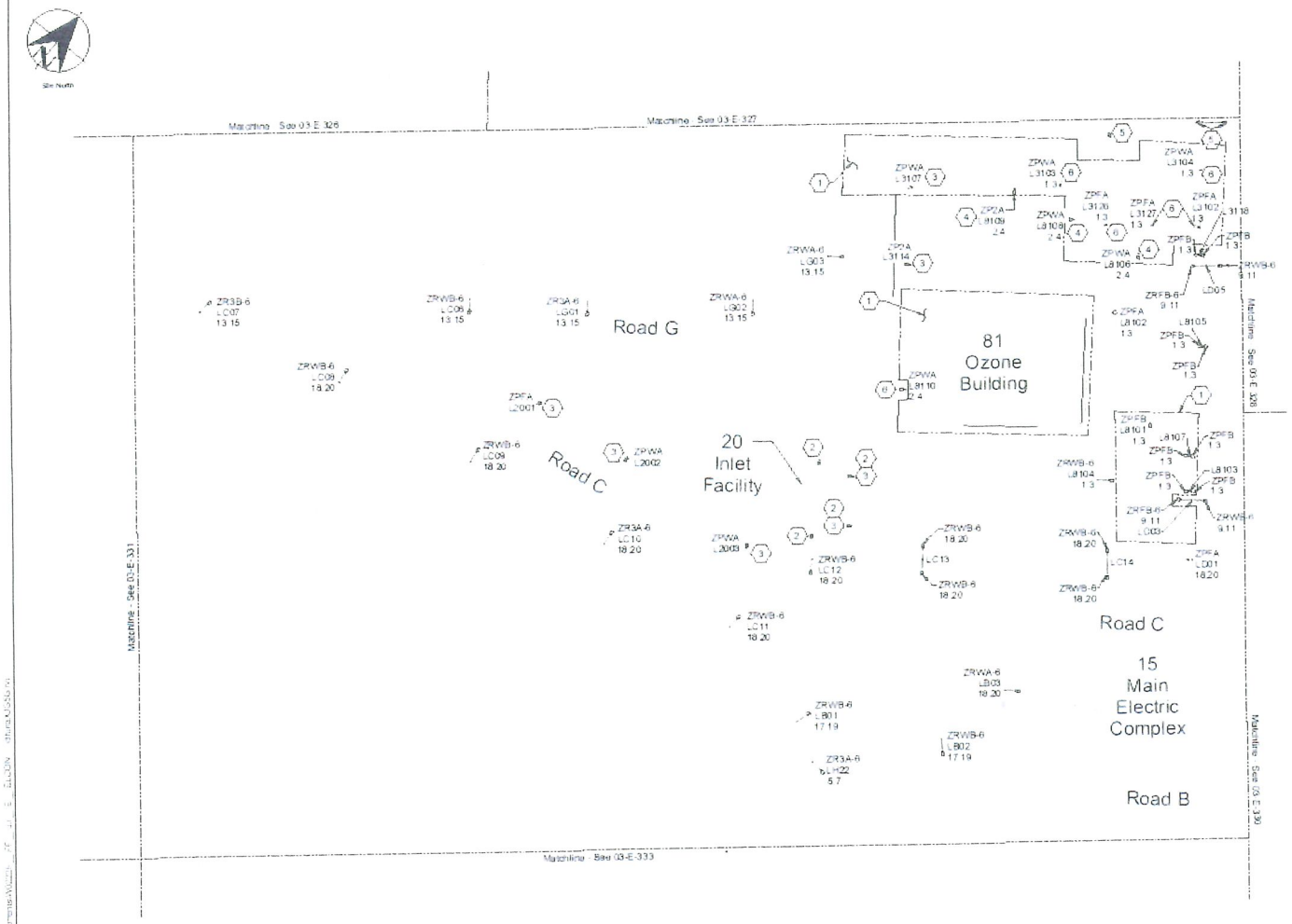
Bull Run Filtration Facility

Electrical

Site Lighting
Lighting & Receptacle Plan
Grid 6

W02229

03-E-328



General Sheet Notes

1. 480V roadway lightpoles with the road name tag shown on this sheet are powered from the building 15 panel.
2. Area 20 fixtures are powered from the panels in building 31.
3. 480V pedestrian and roadway lightpoles with the area name tag are powered from the building feeding the area unless otherwise noted.
4. Light pole fixture with the emergency symbol is circuited to 120V emergency panel in the building feeding power to that area. Refer to area specific plans for circuiting.
5. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-340 for Lighting Control Plan.
6. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule.

Sheet Keynotes

1. Work in this area to be performed under Bid Alternate except as noted. See specification section 01_23_00 Alternates.
2. See Area 20 plan for pole, light fixture, and circuit information.
3. Fixture is circuited to the emergency panel in building 31: PP31-ELP-1001, CKT # 22.
4. Fixture is circuited to the panel in building 81.
5. See Area 31 plans for fixture, pole, circuiting information.
6. The pole fixture is circuited to area 31 panel: PP31-DP-1001.

Lighting & Receptacle Plan - Grid 7

SCALE: 1" = 30'-0"

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PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

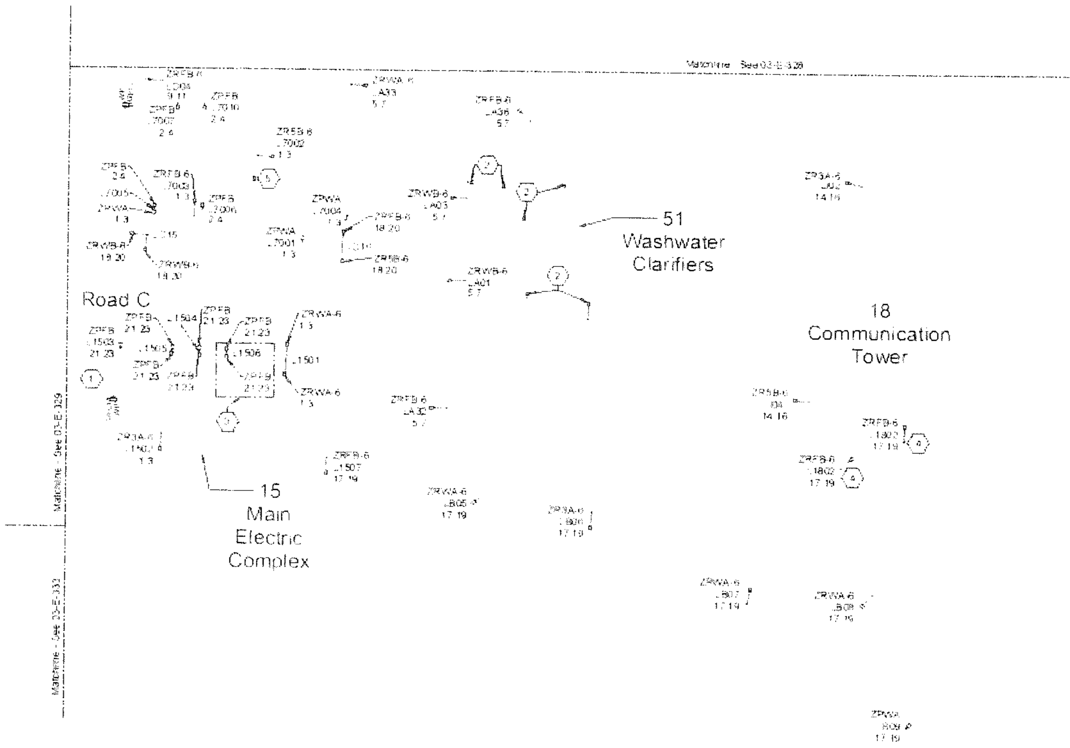
Bull Run Filtration Facility

Electrical

Site Lighting
Lighting & Receptacle Plan
Grid 7

W02229

03-E-325



Lighting & Receptacle Plan - Grid 8

General Sheet Notes

1. 480V roadway lightpoles with the road name tag shown on this sheet are powered from the building 15 panel
2. 480V pedestrian and roadway lightpoles with the area name tag are powered from the building feeding the area unless otherwise noted
3. Light pole fixture with the emergency symbol is circuited to 120V emergency panel in the building feeding power to that area. Refer to area specific plans for circuiting
4. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-341 for Lighting Control Plan
5. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule

Sheet Keynotes

1. Generator enclosure exterior wallpacks and receptacle to be provided by generator manufacturer
2. See Area 51 plan for pole, light fixture, and circuiting information
3. Provide and install the light pole with fixtures under Bid Alternate except as noted. See specification section 01_23_00 Alternates
4. The light pole is circuited to area 15 panel PP15-DP-1001
5. See Area 70 plan for pole, light fixture, and circuiting information

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CONSTRUCTION

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ELCON ASSOCIATES, INC.

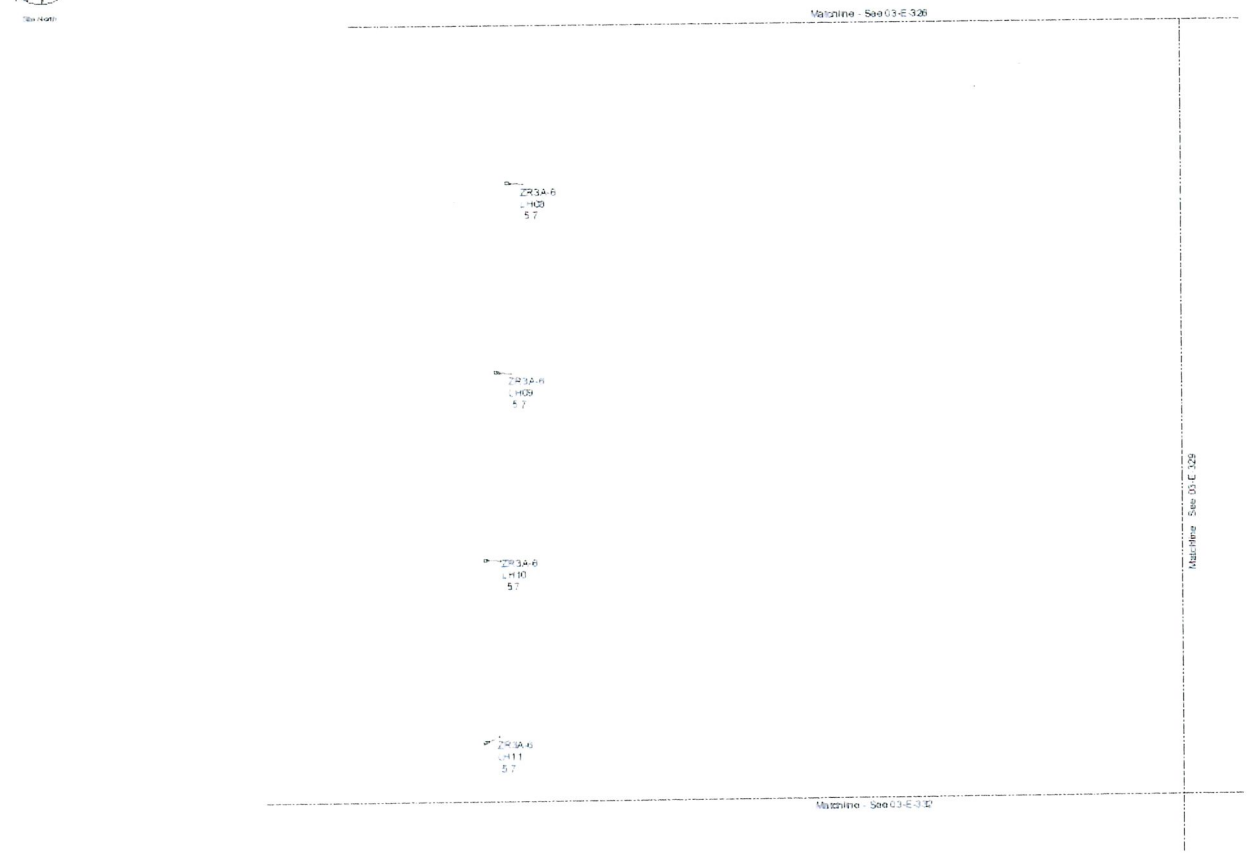
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

Electrical

Site Lighting
Lighting & Receptacle Plan
Grid 8

W02229



Lighting & Receptacle Plan - Grid 9

SCALE: 1" = 30'-0"

General Sheet Notes

1. 480V roadway lightpoles with the road name tag shown on this sheet are powered from building 16
2. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-342 for Lighting Control Plan
3. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule

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PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

Bull Run Filtration Facility

Electrical

Site Lighting

Lighting & Receptacle Plan

Grid 9

W02229

03-E-337

General Sheet Notes

1. 480V roadway lightpoles with the road name tag shown on this sheet are powered from building 16
2. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-343 for Lighting Control Plan
3. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule

Lighting & Receptacle Plan - Grid 10

SCALE 1" = 10'-0"

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PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

Bull Run Filtration Facility

Electrical

Site Lighting

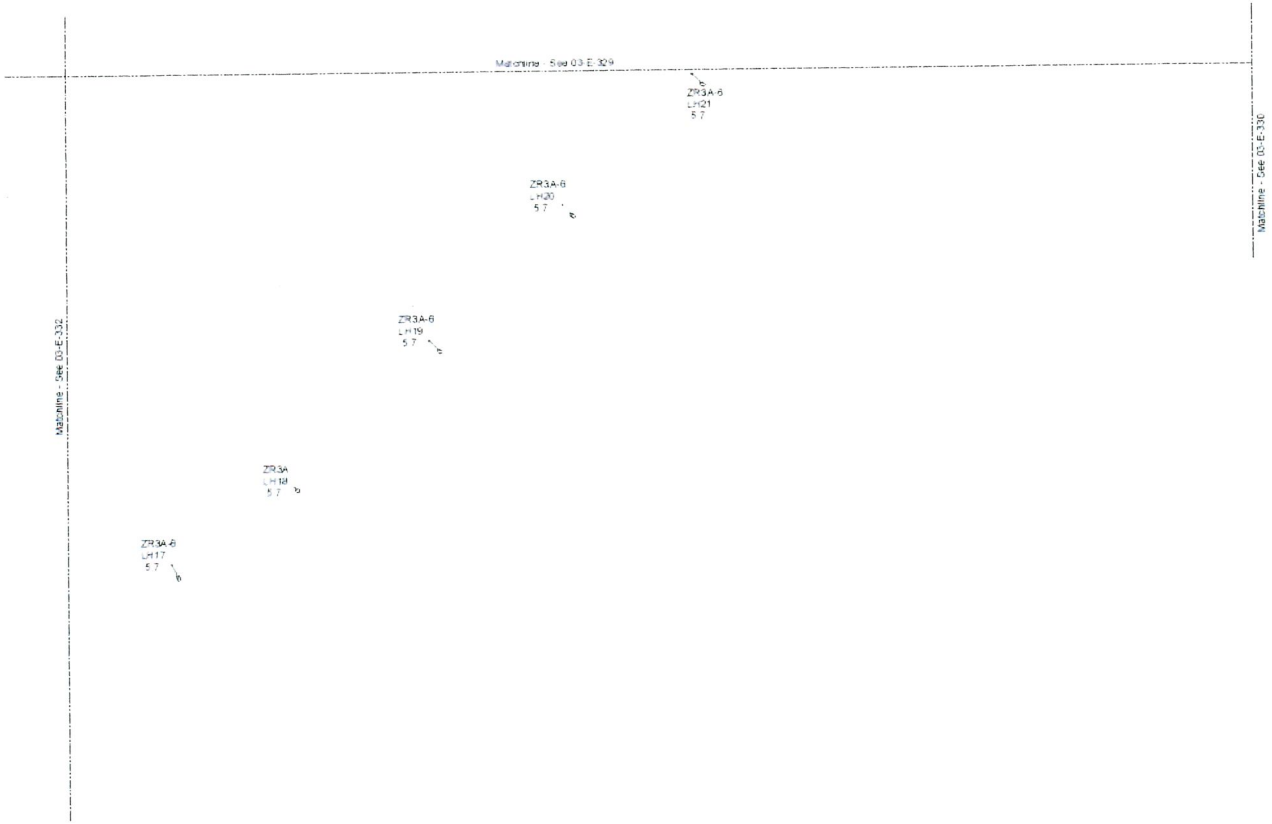
Lighting & Receptacles Plan - Grid 10

W02229

03-E-332

General Sheet Notes

1. 480V roadway lightpoles with the road name tag shown on this sheet are powered from building 16
2. See sheet GEN-E-142 for Lighting Controls and Controlled Receptacles Schedule and 03-E-344 for Lighting Control Plan
3. See sheets GEN-E-140 and GEN-E-141 for Luminaire Schedule



Lighting & Receptacle Plan - Grid 11

SCALE: 1" = 10'-0"

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PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

Bull Run Filtration Facility

Electrical

Site Lighting

Lighting & Receptacle Plan

Grid 11

W02229

03-E-333

Lighting Fixture Schedule - 1

Type	Voltage	Input Power	Description	Color Temp	CRI	Delivered Lumens	Lumens Per Watt	B-U-G Rating	Finish	Mounting	Manufacturer	Series
D1	120V	13 VA	3" square recessed downlight, die-cast aluminum frame and body, flanged trim, 60deg beam spread, 0-10V 1% dimming driver	3500	80	1100	85	N/A	White	Recessed	Zaniboni	Luna 3 AQ
D2	120V	9 VA	3" square recessed downlight, die-cast aluminum frame and body, flanged trim, 60deg beam spread, 0-10V 1% dimming driver	3500	80	800	89	N/A	White	Recessed	Zaniboni	Luna 3 AQ
D3	120V	35 VA	5" round dead front shower downlight. Rustproof and gasketed trim assembly, white polycarbonate trim and lens, aluminum housing, 0-10V 1% dimming driver, wide beam distribution	3500	90	1100	31	N/A	White	Recessed	Kirlin	LRP
HB1	120V	82 VA	1'x2' linear high bay pendant, aluminum body with steel channel, DLC listed, frosted acrylic IP5X rated lens, wide distribution, 10% 0-10V dimming driver	4000	80	11500	140	N/A	Arch to select from std finishes	Pendant	ILP	EDV
HB1C	120V	82 VA	Same as HB1 except with integral photocell	4000	80	11500	140	N/A	Arch to select from std finishes	Pendant	ILP	EDV
HB2	120V	104 VA	1'x2' linear high bay pendant, aluminum body with steel channel, DLC listed, frosted acrylic IP5X rated lens, wide distribution, 10% 0-10V dimming driver	4000	90	14900	143	N/A	Arch to select from std finishes	Pendant	ILP	EDV
HB2C	120V	104 VA	Same as HB2 except with integral photocell	4000	80	14900	143	N/A	Arch to select from std finishes	Pendant	ILP	EDV
HBV	120V	80 VA	1'x2' vapor tight high bay pendant, fiberglass body, F1 weatherability rating, 1500 psi high pressure hosedown, 5VA flame rating, IP65, IP66, IP69 rated, DLC rated frosted acrylic lens, wide distribution, 10% 0-10V dimming driver	4000	90	12500	152	N/A	Arch to select from std finishes	Pendant	ILP	BL
HB4	120V	51 VA	1'x2' linear high bay pendant, aluminum body with steel channel, DLC listed, frosted acrylic IP5X rated lens, wide distribution, 10% 0-10V dimming driver	4000	80	7527	148	N/A	Arch to select from std finishes	Pendant	ILP	EDV
HB4C	120V	51 VA	Same as HB1 except with integral photocell	4000	80	7527	148	N/A	Arch to select from std finishes	Pendant	ILP	EDV
L1	120V	5 VA	3" Recessed linear, high output, extruded aluminum trim with formed cold rolled 18-gauge steel back box housing, white painted steel reflector, satine acrylic high efficiency lens, powder coated trim, 0-10V 1% dimming driver. Wattage and lumens listed is per foot. See plans for fixture lengths	3500	80	750	144	N/A	White	Recessed	Pinnacle	EV3D
L2	120V	4 VA	3" Recessed linear, standard output, extruded aluminum trim with formed cold rolled 18-gauge steel back box housing, white painted steel reflector, satine acrylic high efficiency lens, powder coated trim, 0-10V 1% dimming driver. Wattage and lumens listed is per foot. See plans for fixture lengths	3500	90	500	143	N/A	White	Recessed	Pinnacle	EV3D
L3	120V	10 VA	3" Direct-indirect linear pendant, high output direct, standard output indirect, 6063-T6 extruded aluminum housing, die-formed white painted reflector, acrylic lens, powder coat finish, 0-10V 1% dimming driver, batwing distributions. Wattage and lumens listed is per foot. See plans for fixture lengths	3500	80	1250	128	N/A	Arch to select from std finishes	Pendant	Pinnacle	EX3D
L4	120V	5 VA	3" Linear pendant, high output, 6063-T6 extruded aluminum housing, die-formed white painted reflector, acrylic lens, powder coat finish, 0-10V 1% dimming driver, batwing distribution. Wattage and lumens listed is per foot. See plans for fixture lengths	3500	90	750	144	N/A	Arch to select from std finishes	Pendant	Pinnacle	EX3D
L5	120V	4 VA	3" Linear pendant, standard output, 6063-T6 extruded aluminum housing, die-formed white painted reflector, acrylic lens, powder coat finish, 0-10V 1% dimming driver, batwing distribution. Wattage and lumens listed is per foot. See plans for fixture lengths	3500	80	500	122	N/A	Arch to select from std finishes	Pendant	Pinnacle	EX3D
LB4	120V	10 VA	3" Direct-indirect linear pendant, high output direct, standard output indirect, 6063-T6 extruded aluminum housing, die-formed white painted reflector, acrylic lens, powder coat finish, 0-10V 1% dimming driver, asymmetric distribution direct, batwing distribution indirect. Wattage and lumens listed is per foot. See plans for fixture lengths	3500	80	1250	130	N/A	Arch to select from std finishes	Pendant	Pinnacle	EX3D
L6	120V	8 VA	3" Direct-indirect linear pendant, standard output direct, standard output indirect, 6063-T6 extruded aluminum housing, die-formed white painted reflector, acrylic lens, powder coat finish, 0-10V 1% dimming driver, asymmetric distribution direct, batwing distribution indirect. Wattage and lumens listed is per foot. See plans for fixture lengths	3500	80	1000	128	N/A	Arch to select from std finishes	Pendant	Pinnacle	EX3D
L7	120V	33 VA	4' linear, straight steel construction, frosted acrylic lens, DLC listed, 0-10V 10% dimming driver, integral motion sensor where required. See Lighting Control Schedule	4000	80	4300	130	N/A	Factory Standard	Pendant/Surface/Wall	ILP	FZ
L7C	120V	33 VA	Same as L7 except with integral photocell. Additional integral motion sensor where required. See Lighting Control Schedule	4000	80	4300	130	N/A	Factory Standard	Pendant/Surface/Wall	ILP	FZ
L8	120V	54 VA	8' linear, straight steel construction, frosted acrylic lens, DLC listed, 0-10V 10% dimming driver, integral motion sensor where required. See Lighting Control Schedule	4000	80	7300	135	N/A	Factory Standard	Pendant/Surface/Wall	ILP	FZ
L8C	120V	54 VA	Same as L8 except with integral photocell. Additional integral motion sensor where required. See Lighting Control Schedule	4000	80	7300	135	N/A	Factory Standard	Pendant/Surface/Wall	ILP	FZ
L9	120V	38 VA	4ft Linear vapor tight, fiberglass body with 51 weatherability rating & 5VA flame rating, IP67, NEMA4x & 1500 PSI hosedown, ETL listed for wet location, DLC listed, shallow acrylic frosted lens, 0-10V 10% dimming driver	4000	80	5100	134	N/A	Factory Standard		ILP	
L10	120V	6 VA	3" Led linear wall wash, standard output, extruded aluminum flanged trim with formed cold rolled 20 gauge steel back box housing, die formed white painted steel reflector, diffuse acrylic lens, powder coat textured finish, 0-10V 1% dimming driver, wall wash distribution. Wattage and lumens listed is per foot. See plans for fixture lengths	3500	80	340	57	N/A	White	Recessed	Pinnacle	EV3WW
L11	120V	10 VA	3" Led linear wall wash, high output, extruded aluminum flanged trim with formed cold rolled 20 gauge steel back box housing, die formed white painted steel reflector, diffuse acrylic lens, powder coat textured finish, 0-10V 1% dimming driver, wall wash distribution. Wattage and lumens listed is per foot. See plans for fixture lengths	3500	80	514	52	N/A	White	Recessed	Pinnacle	EV3WW
LP1	120V	45 VA	2'x4' flat lens volumetric troffer, lightweight aluminum body, impact & scratch resistant PMMA frosted acrylic lens, 0-10V 1% dimming driver	4000	80	4800	107	N/A	White	Recessed	ILP	FLT
LP1C	120V	45 VA	2'x4' flat lens volumetric troffer, lightweight aluminum body, impact & scratch resistant PMMA frosted acrylic lens, integral photocell, 0-10V 1% dimming driver	4000	80	4800	107	N/A	White	Recessed	ILP	FLT
LP2	120V	30 VA	2'x2' flat lens volumetric troffer, lightweight aluminum body, impact & scratch resistant PMMA frosted acrylic lens, 0-10V 1% dimming driver	4000	80	3500	117	N/A	White	Recessed	ILP	FLT
LP2C	120V	30 VA	2'x2' flat lens volumetric troffer, lightweight aluminum body, impact & scratch resistant PMMA frosted acrylic lens, integral photocell, 0-10V 1% dimming driver	4000	80	3500	117	N/A	White	Recessed	ILP	FLT
P1	120V	3 VA	2.5" Dia round cylinder pendant, die-cast aluminum body, 60deg beam spread, solite lens, 0-10V 1% dimming driver integral to canopy	3500	80	370	123	N/A	Arch to select from std finishes	Pendant	Zaniboni	
P2	120V	154 VA	6'x6'x13' Linear square direct indirect pendant, medium output direct, low output direct, one piece heavy gauge 6063 extruded aluminum housing, microstructure edge lit optics, batwing distributions, 0-10V 1% dimming integral driver	3500	80	18600	121	N/A	Arch to select from std finishes	Pendant	Eklart	Huntington 3
P3	120V	17 VA	24" Direct round led pendant, low output, rolled and welded aluminum housing, die-formed white painted steel reflector, single piece flush satine lens, powder-coat textured finish, 0-10V dimming driver	3500	80	1800	108	N/A	Arch to select from std finishes	Pendant	Pinnacle	Fina F24D
P4	120V	13 VA	18" Direct round led pendant, low output, rolled and welded aluminum housing, die-formed white painted steel reflector, single piece flush satine lens, powder-coat textured finish, 0-10V dimming driver	3500	80	1370	107	N/A	Arch to select from std finishes	Pendant	Pinnacle	Fina F18D
R1	120V	8 VA	14" Recessed direct architectural round pendant, low output, extruded aluminum housing, highly reflective die-formed white painted steel reflector, flush satine lens, flanged trim, 0-10V 1% dimming driver	80	90	800	98	N/A	Arch to select from std finishes		Pinnacle	Fina F14D
R2	120V	17 VA	24" Recessed direct architectural round pendant, low output, extruded aluminum housing, highly reflective die-formed white painted steel reflector, flush satine lens, flanged trim, 0-10V 1% dimming driver	3500	80	1800	108	N/A	White	Recessed	Pinnacle	Fina F24D
R3	120V	44 VA	36" Recessed direct architectural round pendant, low output, extruded aluminum housing, highly reflective die-formed white painted steel reflector, flush satine lens, flanged trim, 0-10V 1% dimming driver	3500	80	4800	109	N/A	Arch to select from std finishes	Recessed	Pinnacle	Fina F36D
UC1	120V	8 VA	18" Surface mount undercabinet light, extruded aluminum low profile housing, integral on/off sensor, 5% ELV dimming	3500	90	440	54	N/A	Arch to select from std finishes	Surface	Hafele	HU30
UC2	120V	4 VA	9" Surface mount undercabinet light, extruded aluminum low profile housing, integral on/off sensor, 5% ELV dimming	3500	90	220	59	N/A	Arch to select from std finishes	Surface	Hafele	HU30
W1	120V	18 VA	24" Wall mount vanity, high output, heavy gauge extruded aluminum, impact resistant co-extruded frosted white lens, 0-10V 1% dimming driver	3500	80	1900	106	N/A	Arch to select from std finishes	Wall Mount	Birchwood	NOVO LED
WA1C	120V	120 VA	Wall pack, die-cast aluminum heat sink, patented high efficiency injection-molded AccuLED optics, TGIC polyester powder coat paint, 0-10V dimming driver, Type 4 forward throw distribution	4000	70	16000	133	B0-U0-G3	Arch to select from std finishes	Wall	McGraw Edison	GWC
X1B	120V	1 VA	Illuminated Exit Sign, aluminum housing, high impact acrylic panel, single & double sided lenses included, clear mirror & white insert included, field installed and NFPA 101 compliant chevron directional indicators, 6" red letters						Brushed Aluminum	Back Mounted	Cooper Atlite	AUX
X1S	120V	1 VA	Illuminated Exit Sign, aluminum housing, high impact acrylic panel, single & double sided lenses included, clear mirror & white insert included, field installed and NFPA 101 compliant chevron directional indicators, 6" red letters						Brushed Aluminum	Side Mounted	Cooper Atlite	AUX
ZA1	120V	21 VA	Adjustable accent, nominal 12.6" long x 3.1" dia cylindrical die-cast aluminum housing, 20 degree 50% beamspread, 3500 max candela, 180 degree tilt, 0-10V dimming capability, integral driver, 45 degree angle cut cap, softening lens, IP66 wet location rated, thermoset powder coat finish. See lighting drawings for number of heads on pole	3000	80	1300	62	N/A	Arch to select from std finishes	Pole	Hydrel	SAF1 (fixture) AMHM (mount) AMPC (pole clamp)
Z1	120V	28 VA	19" Diameter led pendant, die-cast aluminum housing, integral motion sensor and photocell for bi-level switching, solite glass lens, powder coat finish, 0-10V dimming driver, concentrated type CQ distribution, integral wavelink wireless sensor, bird guard, pendant stem with 30 degree hang straight swivel at canopy, contractor to specify quantity and location of threaded taps on poles	3000	80	3400	121	B1-U0-G1	Arch to select from std finishes	Pendant	Mcgraw Edison (fixture), RAB Lighting (j-box)	Top Tier (fixture) CCB53 (j-box)

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ELCON ASSOCIATES, INC.

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Bull Run Filtration Facility

Electrical

W02229

Lighting Fixture Schedule - 2

Type	Voltage	Input Power	Description	Color Temp	CRI	Delivered Lumens	Lumens Per Watt	B-U-G Rating	Finish	Mounting	Manufacturer	Series
ZC1H	120V	75 VA	18" Diameter led pendant, die-cast aluminum housing, integral motion sensor and photocell for bi-level switching, soda glass lens, powder coat finish, 0-10v dimming driver, concentrated type CO distribution, integral wavelinx wireless sensor, bird guard, pendant stem with 30 degree hang straight swivel at canopy, contractor to specify quantity and location of threaded taps on yokes	3000	80	8300	111	B3-U0-G1	Arch to select from std finishes	Pendant	Mcgraw-Edison (fixture), HK Lighting (j-box)	Top Tier (fixture) CCB53 (j-box)
ZC2	120V	11 VA	4" Shallow square downlight, 2.75" max depth above ceiling, UL wet listed, rustproof acrylic enameled aluminum housing, white self-flanged regressed trim with clear microprismatic lens, 0-10V 1% dimming driver, wide 55 degree 50% beam distribution	3000	80	1000	91	B2-U0-G0	Arch to select from std finishes	Recessed	Kirlin	LRC-04SQN
ZC4H	120V	36 VA	Exterior 4' linear direct fixture, heavy gauge 4" square extruded aluminum housing, frosted white impact resistant extruded lens, UL listed for wet locations, 0-10V dimming driver. Provide bird spikes on top surface of fixture	3000	80	2800	78	B1-U0-G1	Arch to select from std finishes	Cable Suspension	Birchwood	VAN-LED-400
ZC4M	120V	36 VA	Exterior 4' linear direct fixture, heavy gauge 4" square extruded aluminum housing, frosted white impact resistant extruded lens, powder coat finish, UL listed for wet locations, 0-10v dimming driver, provide bird spikes on top surface of fixture	3000	80	2800	78	B1-U0-G1	Arch to select from std finishes	Mullion / Side mount	Birchwood	VAN-LED-400
ZC4S	120V	36 VA	Exterior 4' linear direct fixture, heavy gauge 4" square extruded aluminum housing, frosted white impact resistant extruded lens, powder coat finish, UL listed for wet locations, 0-10v dimming driver	3000	80	2800	78	B1-U0-G1	Arch to select from std finishes	Mullion / Side mount	Birchwood	VAN-LED-400
ZD5	120V	10 VA	Exterior decorative door light, nominal 9" wide x 8" tall x 5.5" deep die cast aluminum housing, thermoset powder coat finish, wedge profile, non-pixelated light source forward throw beamspread, UL listed for wet locations, 0-10v dimming capability, full cutoff. Provide back box option as needed for surface mounted conduit connection	3000	80	1100	110	B0-U0-G0	Arch to select from std finishes	Wall	Lithonia	WDGE1
ZD5W	120V	10 VA	Exterior decorative door light, nominal 9" wide x 8" tall x 5.5" deep die cast aluminum housing, thermoset powder coat finish, wedge profile, non-pixelated light source wide beamspread, UL listed for wet locations, 0-10v dimming capability, full cutoff. Provide back box option as needed for surface mounted conduit connection	3000	80	1100	110	B0-U0-G0	Arch to select from std finishes	Wall	Lithonia	WDGE1
ZD3	120V	15 VA	Exterior ADA door light, nominal 11-7/8" wide x 4-3/8" tall x 9-3/8" deep die cast aluminum housing, convex arc top profile, matte safety glass lens, Type 2 very short distribution, UL listed for wet locations, 0-10v dimming driver, nominal 85 degree 50% beamspread, full cutoff	3000	80	1050	70	B1-U0-G0	Arch to select from std finishes	Wall	Bega	24374
ZEP2	120V	34 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10V dimming driver, Type 2 with spill control distribution, quick mount 5" arm	3000	80	3200	94	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZEPC	120V	17 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10V dimming driver, Type 4 wide distribution, modified lumen output, quick mount 5" arm	3000	80	1400	82	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZEPF	120V	34 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10V dimming driver, Type 4 forward throw distribution, quick mount 5" arm	3000	80	2800	82	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZEPG	120V	44 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 forward throw distribution, quick mount 5" arm	3000	80	3400	77	B1-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZEPW	120V	34 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 wide distribution, quick mount 5" arm	3000	80	2800	82	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZERW-6	120V	44 VA	Exterior area light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 wide distribution, 6 ft steel mast arm	3000	80	3300	75	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GALN
ZF1	120V	52 VA	Exterior floodlight, nominal 17" long x 10.35" wide x 4" deep extruded aluminum housing, 0-180 degree tilt, trunnion mount bracket, UV stable clear polycarb lens, powder coat finish, 0-10V dimming driver, 7-pin NEMA receptacle, type 4 beamspread, nominal 0.58 EPA at 0 degree tilt above nadir, full cutoff aiming angle	3000	70	9100	156		Arch to select from std finishes	Surface / Eaves	Lumière LED	LL-SL1
ZP2A	480V	34 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 2 with spill control distribution, quick mount 5" arm	3000	80	3200	94	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZP2C	480V	17 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 2 with spill control distribution, modified lumen output, quick mount 5" arm	3000	80	1600	94	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZPFA	480V	34 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 forward throw distribution, quick mount 5" arm	3000	80	2800	82	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZPFB	480V	44 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 forward throw distribution, quick mount 5" arm	3000	80	3400	77	B1-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZPWA	480V	34 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 wide distribution, quick mount 5" arm	3000	80	2800	82	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZPWC	480V	17 VA	Exterior pedestrian light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral outdoor control module and wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 wide distribution, modified lumen output, quick mount 5" arm	3000	80	1400	82	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GPC
ZR3A	480V	33 VA	Exterior area light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 3R roadway distribution, quick mount 9" arm	3000	80	2800	85	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GALN
ZR3A-6	480V	33 VA	Exterior area light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 3R roadway distribution, 6 ft steel mast arm	3000	80	2800	85	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GALN
ZR3B-6	480V	44 VA	Exterior area light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 3R roadway distribution, 6 ft steel mast arm	3000	80	3500	80	B1-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GALN
ZR5B-6	480V	44 VA	Exterior area light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 5 wide distribution, 6 ft steel mast arm	3000	80	4700	107	B3-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GALN
ZRFB-6	480V	44 VA	Exterior area light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 forward throw distribution, 6 ft steel mast arm	3000	80	3200	73	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GALN
ZRWA-6	480V	33 VA	Exterior area light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 wide distribution, 6 ft steel mast arm	3000	80	2800	85	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GALN
ZRWB-6	480V	44 VA	Exterior area light, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral wireless sensor, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10v dimming driver, Type 4 wide distribution, 6 ft steel mast arm	3000	80	3300	75	B0-U0-G1	Arch to select from std finishes	Pole / Arm	McGraw-Edison	GALN
ZS1	120V	22 VA	Submersible floodlight, 316 marine grade stainless steel housing, 300 degree tilt, fully sealed and gasketed, IP68 at 10m/32.8 ft, powered by remote 100 watt transformer in stainless steel nema 3r housing (1 fixture per transformer), 30x40 degree horizontal 50% beamspread. See lighting details for fixture mounting to column which assembly to adjust mounting height. See lighting details for transformer mounting	4300	80	1100	50	N/A	Arch to select from std finishes	Custom Column / Winch (fixture), Wall (Transformer)	Lumascape	LS385LED (fixture), LS-TSS-100 (Transformer)
ZWFA	120V	34 VA	Exterior wall pack, die-cast aluminum housing and heat sink, houseside shield, integral motion sensor and photocell for bi-level switching, patented high efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10V dimming driver, Type 4 forward throw distribution	3000	80	2800	82	B0-U0-G1	Arch to select from std finishes	Wall	McGraw-Edison	GWC
ZWFB	120V	44 VA	Exterior wall pack, die-cast aluminum heat sink, patented high efficiency injection-molded Acculed optics, TGIC polyester powder coat paint, 0-10V dimming driver, Type 4 forward throw distribution	3000	80	3400	77	B1-U0-G1	Arch to select from std finishes	Wall	McGraw-Edison	GWC
ZWWA	120V	34 VA	Exterior wall pack, die-cast aluminum heat sink, patented high-efficiency injection-molded Acculed optics, TGIC polyester powder coat paint, 0-10V dimming driver, Type 4 wide distribution	3000	80	2800	82	B0-U0-G1	Arch to select from std finishes	Wall	McGraw-Edison	GWC
ZWWB	120V	44 VA	Exterior wall pack, die-cast aluminum housing and heat sink, houseside shield, 7-pin nema receptacle, integral motion sensor and photocell for bi-level switching, patented high-efficiency injection molded Acculed optics, TGIC polyester powder coat finish, 0-10V dimming driver, Type 4 wide distribution	3000	80	3500	80	B0-U0-G1	Arch to select from std finishes	Wall	McGraw-Edison	GWC

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ELCON ASSOCIATES, INC.

PORTLAND WATER BUREAU

FROM FOREST TO FAUCET

Bull Run Filtration Facility

Electrical

W02229

Lighting Fixture Schedule - 3

Type	Voltage	Input Power	Description	Color Temp	CRI	Delivered Lumens	Lumens Per Watt	B-U-G Rating	Finish	Mounting	Manufacturer	Series
ZX1S	120V	1 VA	Exterior exit sign, single-face, pvc frame, polycarbonate faceplate, heavy aluminum backplate, white with green letters, field selectable chevrons, UL listed for wet locations, back mounted						Arch to select from std finishes	Back Mounted	Emergi-lite	SVX
ZX1P	120V	1 VA	Exterior exit sign, single-face, pvc frame, polycarbonate faceplate, heavy aluminum backplate, white with green letters, field selectable chevrons, UL listed for wet locations, pendant mounted						Arch to select from std finishes	Pendant	Emergi-lite	SVX
ZX1S	120V	1 VA	Exterior exit sign, single-face, pvc frame, polycarbonate faceplate, heavy aluminum backplate, white with green letters, field selectable chevrons, UL listed for wet locations, side mounted						Arch to select from std finishes	Side Mounted	Emergi-lite	SVX
ZX2P	120V	1 VA	Exterior exit sign, double-face, pvc frame, polycarbonate faceplate, heavy aluminum backplate, white with green letters, field selectable chevrons, UL listed for wet locations, pendant mounted						Arch to select from std finishes	Pendant	Emergi-lite	SVX
ZX2S	120V	1 VA	Exterior exit sign, double-face, pvc frame, polycarbonate faceplate, heavy aluminum backplate, white with green letters, field selectable chevrons, UL listed for wet locations, side mounted						Arch to select from std finishes	Side Mounted	Emergi-lite	SVX

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PORTLAND WATER BUREAU

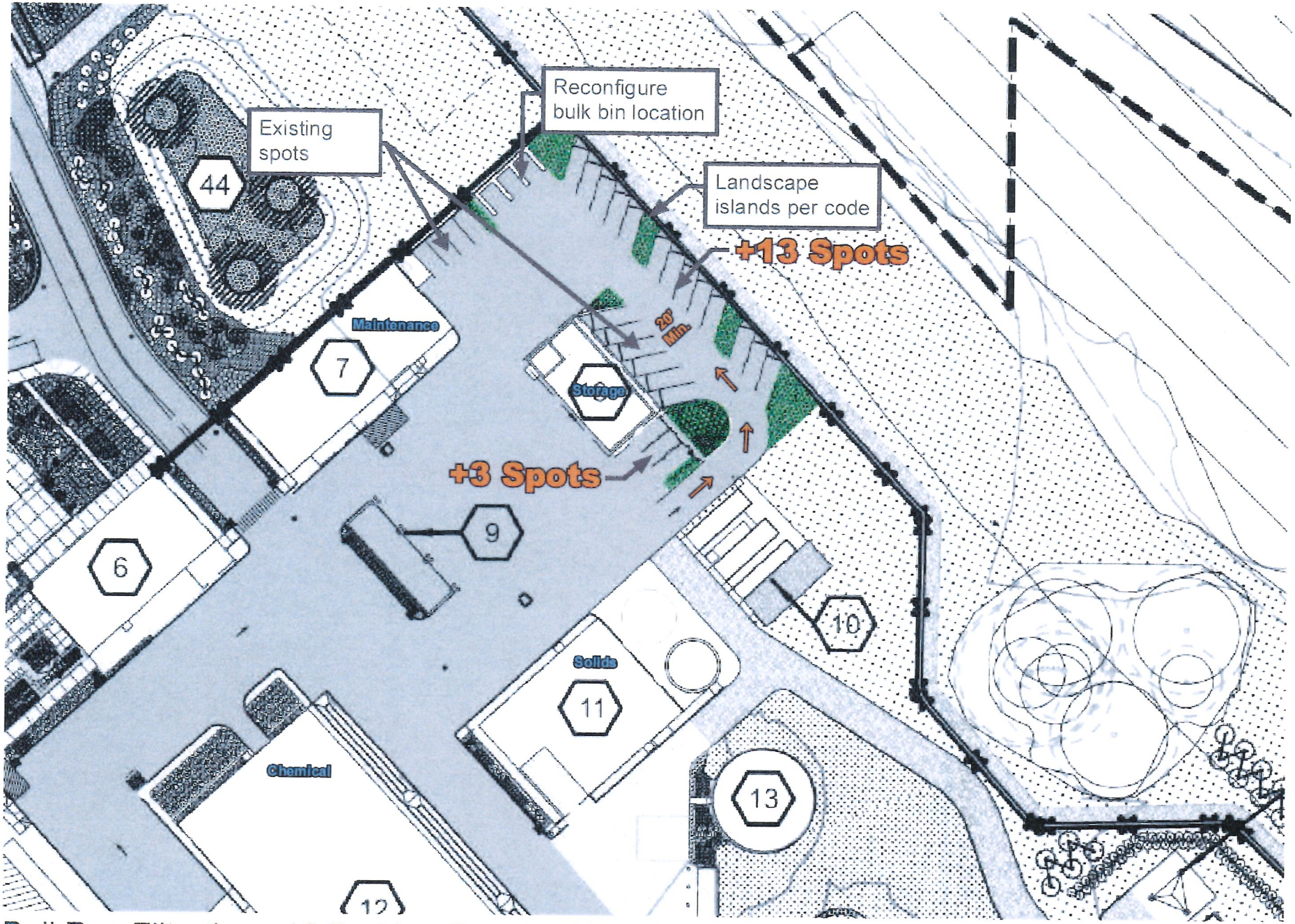
FROM FOREST TO FAUCET

Bull Run Filtration Facility

Electrical

WU2229

Attachment 2



Bull Run Filtration - 16 Parking Spot Addition Concept - 6-30-23

↑ NTS

Attachment 3

GLOBAL Transportation Engineering

MEMORANDUM

DATE: June 27, 2023

TO: Multnomah County

FROM: Dana Beckwith, PE, PTOE
Richard Martin, EIT

SUBJECT: Bull Run Filtration Facility – Construction Transportation Demand Management Plan

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This memorandum summarizes the Transportation Demand Management (TDM) Plan that will be utilized to mitigate traffic impacts created by construction-related traffic for the Portland Water Bureau's (PWB) Bull Run Filtration Facility (the Filtration Facility) and its associated pipelines (together, the Project) located within Multnomah County and adjacent to Clackamas County, Oregon. This plan outlines the strategies that will be implemented during the construction period to minimize construction impacts and maintain roadway and intersection capacity standards.

Operational Capacity

The operational capacity of the Carpenter Lane access related to construction traffic is limited to 387 total peak hour vehicles as documented in the Construction Transportation Impact Analysis (TIA). The peak hour is defined as a one-hour period during the heaviest existing traffic use of area roadways which occurs between 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM.

Trip generation and distribution forecasts developed in the Construction TIA for operational capacity at study intersections are conservative. It is not anticipated that these forecasted capacities for construction traffic will be exceeded, however, the potential does exist. The PWB is committed to mitigating construction traffic impacts through a TDM strategy that monitors construction traffic and implements mitigation as necessary.

Transportation Demand Management Plan

The PWB Construction Manager will implement the plan to limit the number of vehicles accessing the site via Carpenter Lane to the 387 peak hour vehicle capacity threshold. The Construction Manager will forecast trips on a bi-weekly (once every two weeks) basis. A tube counter or similar device capable of 15-minute data bins will be used to identify Carpenter Lane traffic trends for the AM peak hour, PM peak hour, and total daily traffic. A two-week look ahead of construction activities will be used to forecast peak AM and PM peak hour vehicle volumes expected to access the site for the upcoming two-week period. This monitoring will remain in place until there is a 150-vehicle reduction from the peak total daily traffic accessing the site for a one-month period[1].

In the event total peak hour trips exceed the 387 peak hour vehicle capacity threshold for Carpenter Lane, the following TDM measures are available and would be implemented as described:

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[1] This reduction is consistent with the point at which there is a permanent downward trend in total vehicle trips per day accessing the site as shown in the Construction TIA Appendix B Total Vehicle Trips Per Day 3.8.23 graph.

- Direct enough commuter traffic to Access B (Bluff Road Access) to keep the peak hour vehicle trips below the threshold level at the Carpenter Lane access. If Access B is permitted by Clackamas County, this is expected to be the only TDM measure needed.

- If the use of Access B is not available or will not reduce the peak hour vehicle trips below the threshold level at the Carpenter Lane access, the Contractors will implement one or both of the following as needed:

    - Offset commuter arrival/departure times to the Filtration Facility and/or
    - Provide a commuter shuttle

  Shift start times, shift end times, and location of off-site parking for a commuter shuttle will be provided to the County in the event these strategies are needed.

- Develop a rideshare or carpooling incentive program. Specific components of this program will be provided to the County in the event this strategy is needed.

PWB will submit a TDM monitoring report to the County monthly. The monitoring report will include the trip count data and identify any times the peak hour trips at the Carpenter Lane access exceeded the 387-vehicle threshold. If there were any exceedances, the monitoring report will describe the mitigation method(s) used and provide subsequent data to confirm that the mitigation successfully lowered the peak hour trips below the threshold number. Additional strategies will be developed and implemented if needed.

Attachment 4

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Mingus Mapps, Commissioner
Gabriel Solmer, Director

1120 SW Fifth Avenue, Room 405
Portland, Oregon 97204-1926
Information: 503-823-7404
Portland.gov/water

Subject: T3-2022-16220 – Filtration Facility and Pipelines Construction Activities

This memorandum describes proposed construction activities and phasing timeframes,[1] as well as ground disturbance and erosion control approaches, for the filtration facility site and pipelines.

Filtration Facility Phasing / Timelines

PHASE	DESCRIPTION
Mobilization/Site Setup	Initial mobilization and setup will require a relatively small crew of craft and staff people. Major activities include road improvements to Carpenter Lane, build-out of site infrastructure such as construction roadways, parking areas, laydown areas, etc. Trucking will include import of office trailers, maintenance facility, and aggregates for site improvements for yards and roadways. These loads will vary in frequency and quantity to support this work. This phase of the project will last approximately six months.
Mass Grading	Beginning after site setup, major excavation work will begin, which will notably increase activity on the project. Large equipment will be mobilized leading up to this period. The number of employees who travel to the site will increase. Trucking of material to the off-site disposal location(s) will begin in this phase. This will increase the traffic into and out of the project site. Dump trucks will be begin traveling into and out of the project site. This phase of work will run approximately four months.
Structural Concrete and Underground Piping	Structural concrete and underground piping installation will begin in this phase. The number of craft workers entering and exiting the site will increase when this phase begins. Offsite disposal of material will continue during this phase and the addition of concrete mixer trucks entering the site will begin. Trucks carrying piping and other materials will increase during this phase. This phase of the project will be ongoing for 18-24 months.
Mechanical and Electrical	Mechanical and electrical work for the project will begin in this phase. This will increase the craft employees entering the site. Offsite disposal of materials will continue throughout this phase. This phase of the project will continue approximately two years before ramping

[1] Note that many phases overlap in timeframes with other phases.

	down. This phase will be the peak for employees and trucks entering and exiting the site. The mechanical and electrical phase overlaps with the structural concrete and underground piping phase for approximately 10-12 months which creates the peak in activity onsite. Project activity will ramp down at the end of this phase.
Facility Startup and Site Finish	Site finishing will begin along with startup of filtration facility operations in this phase. The number of craft and staff entering the site will decline significantly. Offsite disposal of material will have concluded. This phase will continue to ramp down and be the final phase of the project.

Filtration Facility Site Ground Disturbance and Erosion Control

Proposed ground disturbing activity on the filtration facility site involves clearing, mass grading, utility construction, vertical construction, and final stabilization.

Proposed ground disturbing activity shall be done in a manner which will minimize soil erosion, stabilize the soil as quickly as practicable, and expose the smallest practical area at any one time during construction by measures including:

- Sequencing clearing and grading to the maximum extent practical to prevent exposed inactive areas from becoming a source of erosion to the maximum extent possible.
- Applying temporary and/or permanent soil stabilization measures immediately on all disturbed areas as grading progresses. Soil stabilization measures include establishing vegetation, permanent erosion control blankets, grassy swales, stilling basins, planters with underdrains, sediment fences, and straw waddles.
- Temporarily stabilizing soils with blown straw and a tackifier, loose straw, or an adequate covering of compost mulch at the end of the shift before holidays and weekends, if needed. Ensuring that soils are stable during rain events at all times of the year as needed based on weather conditions.
- Stabilizing or covering soil stockpiles at the end of each workday as needed based on weather conditions to prevent discharges to surface waters or conveyance systems leading to surface waters.
- Temporarily stabilizing portions of the site where construction activities cease for 14 days with a covering of blown straw and a tackifier, loose straw, or an adequate covering of compost mulch and applying temporary seeding until work resumes on that portion of the site.
- Not removing temporary sediment control practices until permanent vegetation or other cover of exposed areas is established. Once construction is complete and the site is stabilized, all temporary erosion controls and retained soils will be removed and disposed of properly, unless needed for long term use.
- Removing trapped sediment from the sediment fence before it reaches one third of the above ground height and before fence removal. Sediment will be removed to an approved disposal site. Removing trapped sediment from other sediment barriers such as biobags before it reaches two inches depth above ground height and before BMP (Best Management Practices) removal.

- Cleaning Catch Basins before retention capacity has been reduced by fifty percent. Removing trapped sediments from sediment basins and sediment traps before design capacity has been reduced by fifty percent and at the completion of project. Sediment will be removed to an approved disposal site.
- Initiating temporary stabilization measures, final vegetation cover, or permanent stabilization measures immediately whenever any land disturbing activities have permanently ceased or will be temporarily inactive on any portion of the site for 14 or more calendar days. The day activities cease and the location of the land disturbing activities will be documented in the visual monitoring report. The installation of stabilization measures will be completed as soon as practicable, and no later than seven calendar days after stabilization has been initiated.

Pipelines Phasing / Timelines

Note that many phases overlap in timeframes with other phases.

PHASE	DESCRIPTION
Mobilization/Site Setup Phase	Initial mobilization and setup will require a relatively small crew of craft and staff people.
Road Improvements and Traffic Control	This phase will last approximately two years. Install Traffic Management devices to begin work in public roads. Begin clear and grub operations and develop and install the temporary detour roads & access roads beginning on Dodge Blvd and Altman Rd, then moving to Lusted Rd and Cottrell Rd. Work will also include the pipeline access road along the easement between Dodge Park Blvd & Lusted Rd and road widenings at Lusted Rd at the Multnomah County / Clackamas County line.
Pleasant Home Water Pipeline Lusted/Altman Road	This phase is anticipated to last approximately five months. Installation of the Pleasant Home Water Line, starting on Lusted Rd then continuing onto Altman Rd, along with the installation of connections to existing water services. Perform connections to existing main and commissioning and start-up operations as needed.
Finish Water Pipeline Dodge Park & Easement	This phase is anticipated to last approximately four months. Installation of the Finish Water Pipeline, starting on Dodge Park Boulevard, through the easement to the Finish Water Intertie. Perform intertie connections and commissioning and start-up operations as needed.
Finish Water Pipeline Altman Road	This phase is anticipated to last approximately 22 months. Installation of the Finish Water Pipeline on Altman, including connections to the existing Pipelines. Perform intertie connections and commissioning and start-up operations as needed.
Finish Water Pipeline Lusted Road	This phase is anticipated to last approximately 19 months. Installation of the Finish Water Pipeline on Lusted, including connections to the Finish Water Intertie Pipelines. Perform intertie connections and commissioning and start-up operations as needed.
LRDM - Cottrell Road & Lusted Hill Facility	This phase is anticipated to last approximately nine months. Installation of the LRDM, including connections to the Finish Water Pipelines. Perform connections to the Lusted Hill facility.
Finish Water Intertie Vault near Lusted Road	This phase is anticipated to last approximately one year. Installation of the Finish Water Intertie off Lusted, including connections to the Finish Water Pipelines. Commissioning and start-up operations as needed.
Shaft and Tunnel	This phase is anticipated to last approximately three years. Installation of the Shaft and Tunnels. Installation of the Finish water pipeline and connections as needed.
Finish & Raw Water Pipeline Connections	This phase is anticipated to last approximately seven months.

	Investigation of the existing pipeline condition and size at the Multnomah Connection (Lusted Rd), and C-2, C-4 connection at Pipeline Road and Oxbow Road. Installation of the Raw Water Connections.
Raw Water Pipeline	This phase is anticipated to last approximately 26 months. Install access to the tunnel and install Raw Water Pipeline from Multnomah Connection (Lusted Rd) to the Tunnel Portal. Perform intertie connections and commissioning and start-up operations as needed.
Finish Water Pipeline C-3, final restoration	This phase is anticipated to last approximately 11 months. Install Conduit C3 along Lusted Rd., install C3 connection at Multnomah Connection, install local distribution pipelines, and final restoration.

Pipelines Ground Disturbance and Erosion Control

Proposed ground disturbing activity is clearing and grubbing, mass grading, and excavation. The Pipelines project includes the construction of pipelines by open cut excavation, by trenchless construction, and by tunnelling. A flow control and metering facility, the Finished Water Intertie, comprises a small site located along the pipelines and includes a buried vault and an above-grade electrical building.

Construction of the pipelines by open cut involves excavation from the surface to the depth of the pipeline trench, installation of the pipeline, and backfill of the trench. Ground disturbance for construction of pipeline by open cut includes the width of the pipeline trench for the length of the open cut pipeline, plus the associated construction zones adjacent to the pipeline trench for construction equipment, temporary public traffic or access, and erosion and sedimentation control measures.

Ground disturbance for construction of pipeline by trenchless construction includes an excavation at the beginning and end of the pipeline segment to deploy the trenchless construction technology, such as horizontal directional drill, plus the associated construction zones adjacent to the pipeline entry and exit excavations for construction equipment, temporary public traffic or access, and erosion and sedimentation control measures, but there is no ground disturbance along the length of a trenchless construction zone in between the entry and exit excavations.

Ground disturbance for construction of pipeline tunnel is the same as that of the trenchless method in that a tunnel portal is excavated where the tunnel begins and a tunnel exit shaft is excavated where the tunnel ends. Between the entry portal and exit shaft there is no ground disturbance.

At the Finished Water Intertie facility site, ground disturbance includes that for pipeline construction by open cut as well as excavation for the buried vault and site grading and drainage improvements, utility installation, street construction and final stabilization measures.

Proposed ground disturbing activity shall be done in a manner which will minimize soil erosion, stabilize the soil as quickly as practicable, and expose the smallest practical area at any one time during construction by measures including:

- Sequencing clearing and grading to the maximum extent practical to prevent exposed inactive areas from becoming a source of erosion to the maximum extent possible.

- Applying temporary and/or permanent soil stabilization measures immediately on all disturbed areas as grading progresses. Soil stabilization measures include grass seeding and permanent erosion control blankets, sediment fences, filter sock or straw waddles, and roadside seeding.
- Temporarily stabilizing soils with blown straw and a tackifier, loose straw, or an adequate covering of compost mulch at the end of the shift before holidays and weekends, if needed. Ensuring that soils are stable during rain events at all times of the year as needed based on weather conditions.
- Stabilizing or covering soil stockpiles at the end of each workday as needed based on weather conditions to prevent discharges to surface waters or conveyance systems leading to surface waters.
- Temporarily stabilizing portions of the site where construction activities cease for 14 days with a covering of blown straw and a tackifier, loose straw, or an adequate covering of compost mulch until work resumes on that portion of the site. Applying temporary seeding of sterile wheat grass-regreen, quickguard, or an approved equal at the rate of 50 lbs/acre or hordeum vulgare var. poco-poco barley at a rate of 60 lbs/acre.
- Not removing temporary sediment control practices until permanent vegetation or other cover of exposed areas is established. Once construction is complete and the site is stabilized, all temporary erosion controls and retained soils will be removed and disposed of properly, unless needed for long term use.
- Removing trapped sediment from the sediment fence before it reaches one third of the above ground height and before fence removal. Removing trapped sediment from other sediment barriers such as biobags before it reaches two inches depth above ground height and before bmp removal. Sediment will be removed to an approved disposal site.
- Cleaning Catch Basins before retention capacity has been reduced by fifty percent. Removing trapped sediments from sediment basins and sediment traps before design capacity has been reduced by fifty percent and at the completion of the project. Sediment will be removed to an approved disposal site.
- Initiating temporary stabilization measures, final vegetation cover, or permanent stabilization measures immediately whenever any land disturbing activities have permanently ceased or will be temporarily inactive on any portion of the site for 14 or more calendar days. The day activities cease and the location of the land disturbing activities will be documented in the visual monitoring report. The installation of stabilization measures will be completed as soon as practicable, and no later than seven calendar days after stabilization has been initiated.

Attachment 5

COMPATIBILITY OF PROPOSED PORTLAND WATER BUREAU FILTRATION FACILITY & PIPELINES CONSTRUCTION WITH FARM TRAFFIC

June 2023

Prepared for City of Portland

globalwise inc. 9311 SE Butte Avenue, Vancouver, WA 98664

Table of Contents

1.0 Introduction

The Portland Water Bureau ("Water Bureau") proposes the construction and operation of the Bull Run Filtration Facility (referred to as the "filtration facility") and the associated Water Bureau pipelines (referred to as the "new pipelines" or "pipelines"). Together, the filtration facility and pipelines are referred to as the "Bull Run Filtration Projects" or "projects." These improvements to the Bull Run water supply will provide consistent, high-quality drinking water for nearly one million people.

Globalwise previously analyzed the compatibility of agriculture with the Water Bureau projects. That report, "Compatibility of Proposed Portland Water Bureau Filtration Facility & Pipeline Operations with Surrounding Agriculture," dated September 2022, was submitted for the main land use application for the Water Bureau projects (the "Operations Report"). The Operations Report is in "Application Appendix D.1."

The analysis of potential farm impacts from the Water Bureau projects is based on over two years of reviewing farm conditions in the Surrounding Lands.[1] Globalwise interviewed more than 60 farmers in the area. Added insight on agricultural conditions came from interviews and discussions with private businesses serving farms, government officials, and farm-industry organizations in Multnomah and Clackamas counties as well as state-level organizations.

This report addresses Water Bureau project traffic during the temporary construction period and evaluates potential impacts on accepted farm practices and the cost of accepted farm practices on lands surrounding the projects.[2] The report evaluates field and facility access, alternative transportation routes, and overall traffic congestion due to construction activity related to the Bull Run Filtration Projects.

Based upon the evaluation, this report concludes that when taking into consideration the construction practices to minimize impacts to farm practices during pipeline and facility construction, the conclusion of the project Construction Traffic Impact Analysis identified in this report, and the duration of the construction activities, activities related to facility and pipeline construction will not force a significant change in or significantly increase the cost of accepted farm or practices on surrounding lands devoted to farm use.

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[1] Surrounding Lands are defined in the Operations Report as the area around the proposed filtration facility site and pipelines which encompasses the land area with any potential for significant impacts on accepted farm practices or farm operating costs. The Surrounding Lands are the same area described as the "study area" in the land use application narratives.

[2] ORS 215.203(2)(c) defines accepted farm practice as "A mode of operation that is common to farms of similar nature, necessary for the operation of such farms to obtain a profit in money, and customarily utilized in conjunction with farm use."

2.0 Operations Report Analysis and Findings

The Operations Report is a comprehensive assessment of impacts on agriculture during operations of the two Water Bureau projects. The analysis first considered types of farms and agricultural conditions in the Surrounding Lands. An inventory and understanding of the range of crops grown and the accepted farm practices for each crop was the starting point for understanding agriculture in the Surrounding Lands. The compatibility of the filtration facility and the pipelines with the character of the Surrounding Lands was also evaluated. Potential externalities and sensitivities that might be caused by the Water Bureau projects were also evaluated. All potential impacts related to project operations were also identified.

Finally, the Operations Report considered approval criteria for conditional uses related to potential impacts from the filtration facility and pipeline operations on accepted farm practices on surrounding farm use properties. The conclusion is that the operation of the Water Bureau's filtration facility and pipelines will not cause any significant changes in accepted farm practices in the Surrounding Lands. It also concluded that there will be no significant increase in the cost of accepted farm practices due to the operation of the Water Bureau's filtration facility and pipelines.

3.0 Focus on Farm Traffic

Consideration of farmer use of the public road system has been a primary element of project planning by the Water Bureau. This focus was reinforced by farmer comments during interviews Globalwise conducted with farm operators over the last two years. The Operations Report addressed farm traffic during the operations of the facilities. Additionally, over the last two years, analysis was conducted on construction-related farm traffic. That analysis is presented in this report. As a result, major attention has been devoted to assessing how the Water Bureau project construction activity could potentially impact farmers that use the road system within the Surrounding Lands and ways to minimize any impact. Farm travel on public roads in the Surrounding Lands is dominated by horticultural plant nurseries since they are the largest farms and have the most frequent need to travel between field and facility locations in the Surrounding Lands. However, all farmers use the road system to some extent.

Farmers use the public roads in two principal ways. First is road use to move farm equipment, employees, supplies, and crops between headquarters, ancillary facilities, and farm fields. Second is hauling crops from headquarters or hub facilities to customers.

Road travel is an accepted farm practice for farmers who have fields in separate locations and for hauling crops from farms to buyers. While farmers prefer to use the shortest or fastest route for road travel, there are circumstances that modify this preference. Conditions that cause farmers to modify their routes include county road and utility work, traffic accidents, and changes in traffic congestion patterns. Since farmers share the public roads with other road users, they must adapt to changing road conditions and at times use alternative travel routes on public roads to reach their destinations. This allows farmers to maintain their crops and profitability as they use the roads as an accepted farm practice in the Surrounding Lands.

Discussions with farmers have indicated that their preference is the shortest possible construction schedule. After careful review of primary and secondary farm road traffic routes, the Water Bureau and pipeline contractors addressed "fast-tracking" construction by defining limited cases where two pipe

segments in Multnomah County roadways can be constructed simultaneously. The chosen road segments allow farmers to reach fields using alternative routes and reduce the total construction time needed.

Information collection for the detailed analysis of farm traffic movement included: 1) locating the headquarters of farms and secondary facilities for equipment, supplies, and crop handling or storage, 2) identifying and locating fields owned or leased by farm operators as well as farm roads within fields and field access locations at public roads, 3) identifying seasonal use of roads, especially the peak times for road use, and 4) determining the most direct farm travel routes as well as secondary routes. The review generated a comprehensive description of the farm travel network for each road segment in the Surrounding Lands. Appendix A contains the detailed assessment of the farm-by-farm traffic analysis.

4.0 Integration of Farm Traffic Analysis with Pipeline Project Planning

After collecting the farm traffic data, Globalwise worked with Water Bureau staff, pipeline design engineers, consulting transportation engineers, pipeline construction contractors, filtration facility design engineers, and filtration facility construction contractors to consider how farm traffic can be accommodated during project construction.

This required an understanding of the primary characteristics of farm traffic in the Surroundings Lands. Farmers were interviewed and asked if they moved farm vehicles and equipment on public roads, and if so, what roads they used to travel between headquarters, fields, and any other facilities. Farmers were also asked to describe the types of vehicles and equipment they moved. This review covered both farm vehicle travel on the public roads as well as the need for transporting products from farms to customers.

The Water Bureau's design team considered many factors for final selection of the pipeline alignment. Among them was remaining in the road Right-of-Way and avoiding EFU zoned property. Both criteria support maintaining land in farming. After selection of the pipeline routes, constraints on pipeline construction were made to further reduce temporary impacts for farm use of the road system in the Surrounding Lands. These constraints are described in the next section of this report.

5.0 Actions that Minimize Farm Impacts from Pipeline Construction

The Water Bureau will implement a variety of actions during the construction phase to ensure farm traffic moves on public roads with no significant changes in accepted farm practices in the Surrounding Lands and no significant increase in the costs of accepted farm practices. During the planning stage for pipeline construction, the pipeline engineering team considered the farm-by-farm review of routes farmers use to reach their properties. Maintaining farm movement on public roads during project construction has been an important consideration during the design process.

5.1 Constraints Placed on Pipeline Construction to Support Farm Traffic Movement

After reviewing the detailed information on farm use of the road system, the Water Bureau worked with the contractors and Globalwise to establish constraints for pipeline construction. The constraints allow

for carefully determined road closures to reduce the total time for pipeline construction and prohibit the simultaneous closure of specific segments to maximize alternative routes. Several of the constraints also apply seasonal limitations on specific segments to avoid or minimize impacts during important periods of the year for road use by surrounding farmers. There are 11 specific constraints to support farm traffic throughout pipeline construction. These constraints are:

1. No work shall be performed simultaneously on two County roads at the same time with the exception that:
    a. S.E. Dodge Park Boulevard and Altman Road work is allowed to be performed concurrently; and
    b. S.E. Lusted Road (between Finished Water Intertie and S.E. Altman Road) and S.E. Cottrell Road work is allowed to be performed concurrently.
2. The segment east of the intersection of S.E. Cottrell Road and S.E. Dodge Park Boulevard can only be constructed during the time frame of August through October.
3. The intersection of S.E. Cottrell Road/S.E. Dodge Park Boulevard can only be closed in the month of October.
4. The closing of S.E. Dodge Park Boulevard to cross the road onto the private property at the west end of the Finished Water Pipes can only be closed in the month of October.
5. S.E. Cottrell Road cannot be closed or limited to traffic while work is being accomplished on S.E. Dodge Park Boulevard limiting traffic.
6. Pipeline installation across the private property is recommended to only be conducted during the summertime (non-wet periods).
7. A minimum single lane of traffic flow is required at all times along S.E. Dodge Park Boulevard while work is being accomplished, and the traffic limitations shall only be restricted by the rolling lane closure.
8. Closure of S.E. Lusted Road between the Finished Water Intertie to S.E. Altman Road is allowed with the following limitations:
    a. Emergency vehicle access and access for local residents and farmers shall be provided at all times during construction.
    b. A farm direct and u-pick peach orchard located approximately 900 feet east of S.E. Altman Road shall be provided with unimpeded access for their customers during the month of August.
9. The completion of the C4FWP pipeline from the stop sign referenced above into S.E. Oxbow Drive for connection to the existing Conduit 4 can only occur during the months of June/July or October/mid-November to not impede farmers' shipping traffic at other periods of the year.
10. S.E. Lusted Road closure cannot be done simultaneous with the closure of S.E. Altman Road.
11. The C4FWP pipeline and connection in Oxbow Drive cannot be constructed simultaneous with the work on finished water pipes in S.E. Lusted Road.

The implementation of the listed pipeline construction constraints, combined with the network of roads that provide multiple routes including detours at the option of farmers, are accommodations during temporary project construction that reduce impacts on farmers using the public rights-of-way for farm use purposes.

5.2 Maximize Road Passage and Field Access

On Dodge Park Boulevard when one lane is closed, a flagger will allow traffic, including farm traffic, to move through the construction zone if they choose to stay on that road segment. Farmers may also choose to take detour routes. Where no detour is available, farm traffic will be treated similar to emergency vehicles and will be flagged through otherwise closed work zones. Because the active construction work zone is limited and moves approximately 30 to 50 feet per day, even roads that are closed to through traffic will still provide access to field entry points that are outside of the work zone. The presence of active construction zones directly adjacent to field access points is a short duration impact that will be mitigated by coordination with farm operators well in advance.

The analysis in the appendix shows that farmers often have more than one access point they use to enter and exit their fields. It is therefore an accepted farm practice to evaluate changing road conditions and utilize alternative routes to their fields.

There are additional accepted farm practices that may in some cases be temporary adjustments farmers make to mitigate anticipated changes in road travel and field access. First, interviews with farmers show that equipment is at times left in fields overnight instead of returning daily to headquarters. This temporary response reduces road travel. Second, farmers may temporarily utilize direct "off-road" access where ditches or other roadside physical impediments are not barriers for field entry by tractors, trucks, or other farm equipment. Third, farmers may adjust their field travel route on a given day by changing the order in which they arrive at fields to avoid a construction zone at a particular time of day or at a specific location in a road segment.

There are additional situations where farmers have unique travel requirements where an alternative route may not be available. In those cases, the Water Bureau intends to provide special accommodations. An example is farm vehicle travel safety on public roads. Some farmers' safety protocol limits their travel to Dodge Park Boulevard east of Cottrell Road to reach their fields in the lower section of Lusted Road. To accommodate this unique travel limitation, construction activity in Dodge Park Boulevard will be restricted to months when farm vehicle traffic is at its lowest and one lane of flagger-controlled traffic through the work zone will be maintained.

6.0 Farm Traffic Impacts from Construction Traffic

Construction of the pipelines and the filtration facility will add vehicle trips to the surrounding road network. Additional vehicles on the roads within the Surrounding Lands will have a temporary impact on the movement of all vehicles, including farm vehicles that use the road network. To evaluate the scope of the impact, the Water Bureau's traffic consultant prepared a Construction Traffic Impact Analysis that analyzed impacts to study intersections and roadways related to construction of the Bull Run Filtration Projects (the "Construction TIA").[3] The Construction TIA identifies existing traffic volumes and expected construction-related trip generation. The Construction TIA considers four conservative trip distribution scenarios and assesses traffic impacts from each at 15 area intersections and planned filtration facility access points. The Construction TIA concludes that for three of the scenarios the study intersections will meet performance standards established by Multnomah and Clackamas Counties under peak hour

[3] Bull Run Filtration Facility – Construction Traffic Impact Analysis, June 2, 2023, prepared by Global Transportation Engineering.

traffic conditions without any mitigation. The study further concludes that performance standards can also be met for the fourth scenario with the inclusion of transportation demand management strategies identified in the report. Overall, the Construction TIA concludes that impacts to intersection and roadway operations due to construction traffic from the Project will be minimal even under conservative analysis assumptions that take into consideration roadway closures due to pipeline construction. As a result, farm vehicles traveling on identified roadways and through the study intersections will experience minimal delays because of the addition of construction traffic.

7.0 Construction Activity Communications

Through early engagement with local farm operators and other project neighbors, the Water Bureau developed a Good Neighbor Agreement that includes commitments to minimize disruption during construction and keep the community informed. Key goals for construction outreach include communicating early about what to expect, providing timely notice of work activities and traffic considerations, and dedicating the needed resources to respond to questions and resolve concerns quickly.

Current project-specific outreach includes a project email and comment form, regular project e-newsletters, project and construction webpage updates, neighbor information sessions, community group briefings, individual property owner meetings, direct mailings, doorhangers, traffic reader boards, project area signage, and an onsite Water Bureau liaison during work activities. All these outreach methods will be opportunities for farm operators and other interested parties to stay up to date about construction timelines and activities, including lane closures and other traffic considerations. While this outreach is not needed to avoid a significant change in farm practices or to avoid a significant increase in the cost of farm practices on surrounding lands, the Water Bureau is committed to these communication pathways as an accommodation to farms and farmers in the Surrounding Lands.

8.0 Conclusions

Globalwise considered and evaluated all the farm properties within the Surrounding Lands. The appendix to this report presents the detailed analysis.

For the reasons described in this report, Globalwise concludes that Bull Run Filtration Project construction activity that impacts farm travel and field access will not force a significant change in accepted farm practices on lands devoted to farm use in the Surrounding Lands and will not significantly increase the cost of accepted farm practices on Surrounding Lands devoted to farm use.

Appendix A: Analysis of Farm Use of the Public Roads in the Surrounding Lands

This appendix covers the farm transportation analysis for primary road use by farmers in the project area near the water filtration facility site and pipeline construction. The majority of the pipeline construction is in public right-of-way. Two segments of pipeline follow an existing farm access road across private property.

The purpose of this farmer information is: 1) provide the traffic engineers information for their analysis of traffic impacts (possible delays or detours for farm traffic during pipeline and filtration facility construction); and 2) assist project managers and construction contractors in the final planning, scheduling/sequencing of construction, and specifying appropriate traffic control measures.

This report notes traffic routes to and from farm headquarters; related operation facilities such as storage areas, equipment maintenance areas, or loading docks; and associated farm fields and field access points. A coding system is used in place of farm operator names to respect privacy.

The farms included in this appendix are those that most frequently use the public roads in the project area. Another factor is the frequency of travel which relates to farm size and the need to travel between multiple fields on the road system. Information about farmers who use the public roads less frequently is provided at the end of this appendix.

Farm traffic routes refer to travel by farm vehicles such as supervisor vehicles, crew buses, farm trucks pulling farm trailers, and tractors. Unless equipment is left in the field or moves to another field, each trip out has a corresponding daily trip back to the origin. Most nurseries do not leave equipment such as tractors, or field implements such as sprayers, in the fields due to the need to service the equipment, "reset" for the next day, protect against vandalism or theft, as well as other reasons. The exceptions to daily returning equipment are heavy equipment such as tree diggers that must be hauled to locations and are "time critical" for harvest.

Specific reference is sometimes made to the type of vehicle or equipment in this report. "Farm traffic" refers to all types of moving vehicles and equipment regardless of their speed. Tractors and the implements they pull are the slowest moving farm traffic. Faster farm vehicles include trucks of all sizes and the equipment they pull such as trailers as well as crew buses that can move at the posted speed limit on public roads.

Outbound traffic routes refer to truck traffic that usually originates at farm headquarters or other main loading facilities and loads shipped to customers. In most cases, these shipments are in semi-trucks with 53-foot trailers unless otherwise noted.

Figure 1 shows an overview of farm fields and headquarters evaluated in this appendix. Figures 2 through 5 show greater detail in four quadrants of the surrounding lands to show the locations of farm headquarters, other facilities, fields, and access points. For business confidentiality, farm information is presented using codes and symbols (see Figures 2-5). The conventions for the coding system are:

1) Farm Operators are indicated with a capitalized alphabetical letter. E.g., Farm Operator A is displayed as "A."

2) Headquarters locations are designated with the naming convention "HQ." Farm Operator A's headquarters is A-HQ. If the farm has additional facilities, these are referred to as hubs and the naming convention includes lower case alphabetical letters such as A-HQa, A-HQb, etc.

3) Farm fields are identified with a capitalized F, and followed by a number that distinguishes multiple field locations, for example "F-1," "F-2," etc.

4) Field access points are displayed with a dot in Figures 2 to 5.

Within a road segment, some farm operators are identified more than once. This occurs when a farm operator travels to more than one destination over the same road segment and the destinations are distinctly different.

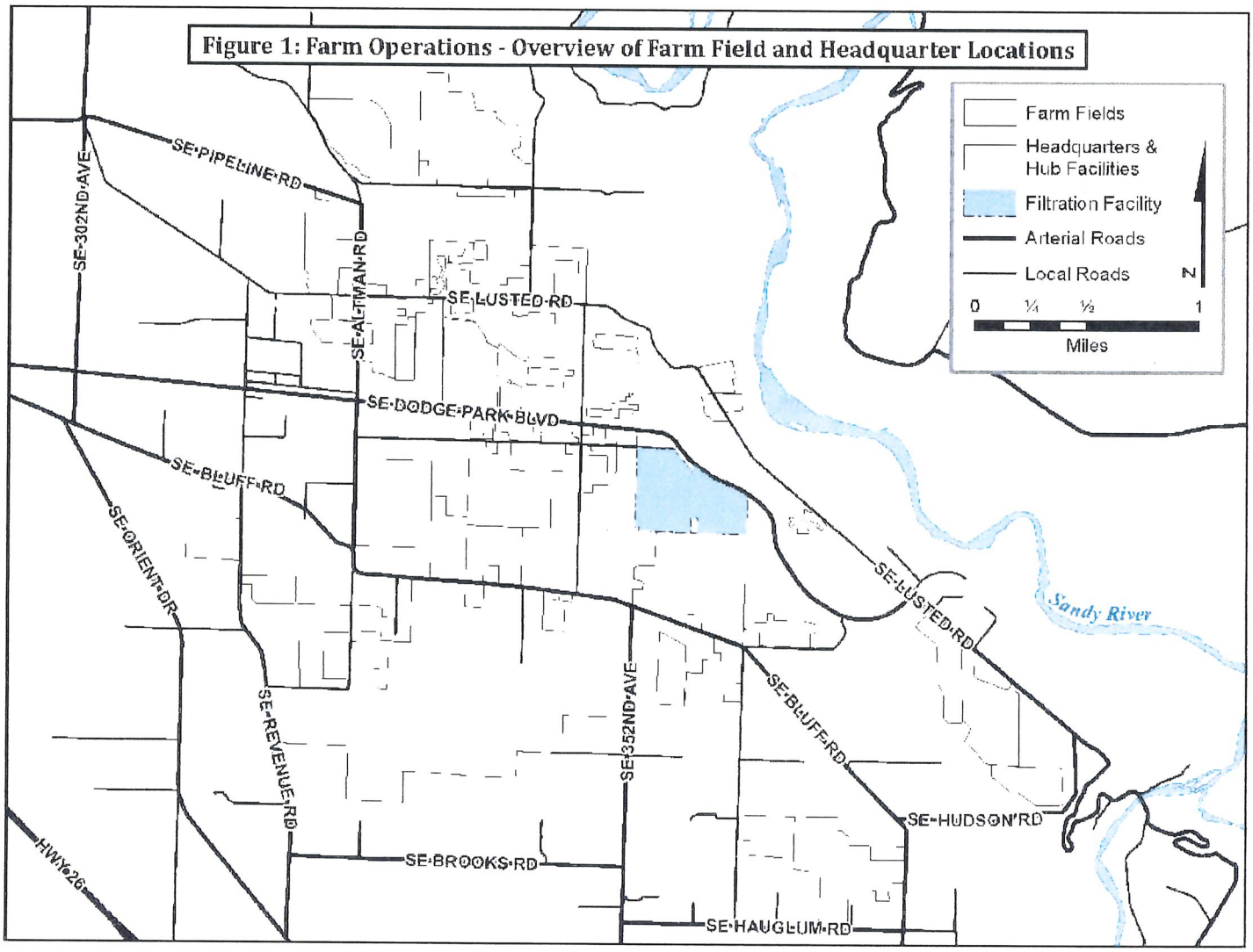


Figure 1: Farm Operations - Overview of Farm Field and Headquarter Locations
Farm Fields
Headquarters & Hub Facilities
Filtration Facility
Arterial Roads
Local Roads
N
0
¼
½
1
Miles
SE 302ND AVE
SE PIPELINE RD
SE ALTMAN RD
SE LUSTED RD
SE DODGE PARK BLVD
SE BLUFF RD
SE ORIENT DR
SE REVENUE RD
SE 352ND AVE
SE BLUFF RD
SE LUSTED RD
Sandy River
SE HUDSON RD
SE BROOKS RD
HWY 26
SE HAUGLUM RD

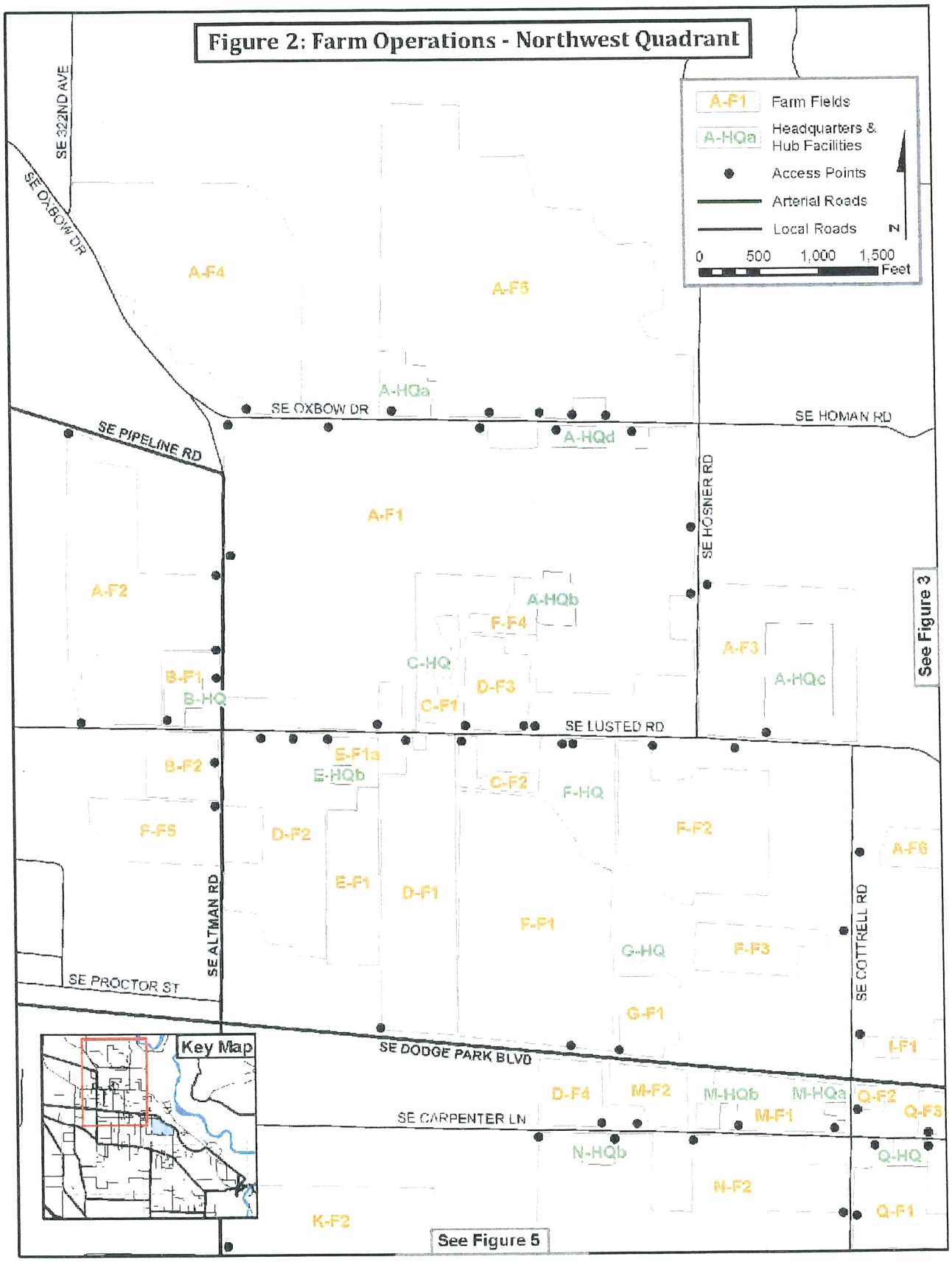


Figure 2: Farm Operations - Northwest Quadrant
A-F1 Farm Fields
A-HQa Headquarters & Hub Facilities
Access Points
Arterial Roads
Local Roads
N
0 500 1,000 1,500
Feet
SE 322ND AVE
SE OXBOW DR
SE OXBOW DR
SE PIPELINE RD
SE HOMAN RD
SE HOSNER RD
SE LUSTED RD
SE ALTMAN RD
SE PROCTOR ST
SE DODGE PARK BLVD
SE CARPENTER LN
SE COTTRELL RD
A-F4
A-F5
A-HQa
A-HQd
A-F1
A-F2
A-HQb
F-F4
A-F3
A-HQc
C-HQ
D-F3
B-F1
B-HQ
C-F1
See Figure 3
B-F2
E-F1a
E-HQb
C-F2
F-HQ
F-F5
D-F2
F-F2
A-F6
E-F1
D-F1
F-F1
G-HQ
F-F3
G-F1
I-F1
D-F4
M-F2
M-HQb
M-HQa
Q-F2
Q-F3
M-F1
N-HQb
Q-HQ
N-F2
Q-F1
K-F2
See Figure 5
Key Map

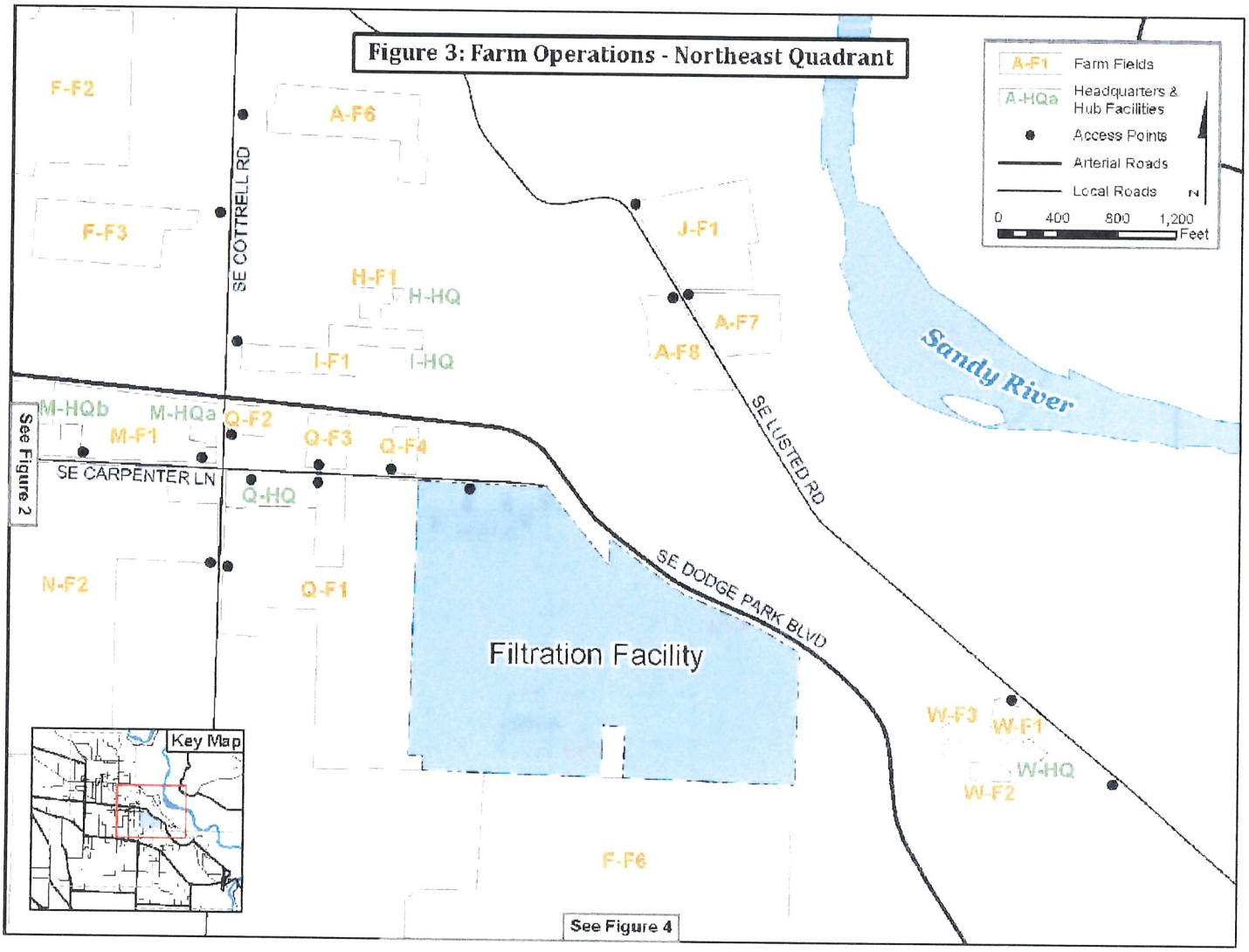
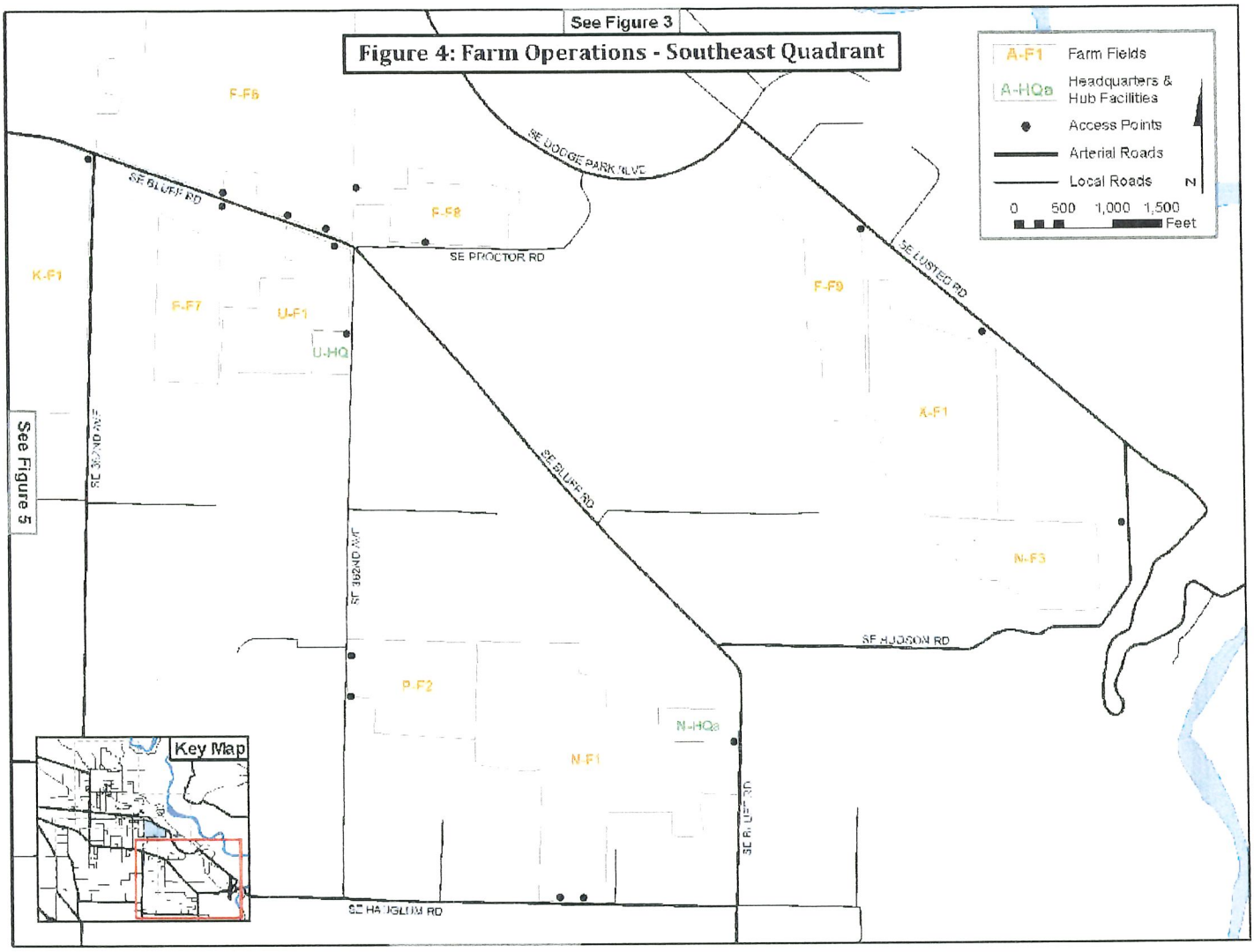


Figure 3: Farm Operations - Northeast Quadrant
A-F1 Farm Fields
A-HQa Headquarters & Hub Facilities
Access Points
Arterial Roads
Local Roads
N
0 400 800 1,200
Feet
F-F2
A-F6
F-F3
SE COTTRELL RD
H-F1
H-HQ
J-F1
A-F7
A-F8
I-F1
I-HQ
Sandy River
SE LUSTED RD
M-HQb
M-HQa
Q-F2
M-F1
Q-F3
Q-F4
SE CARPENTER LN
Q-HQ
See Figure 2
N-F2
Q-F1
SE DODGE PARK BLVD
Filtration Facility
W-F3
W-F1
W-HQ
W-F2
Key Map
F-F6
See Figure 4


See Figure 3
Figure 4: Farm Operations - Southeast Quadrant
A-F1 Farm Fields
A-HQa Headquarters & Hub Facilities
Access Points
Arterial Roads
Local Roads
N
0 500 1,000 1,500
Feet
F-F6
SE BLUFF RD
SE PROCTOR RD
F-F8
K-F1
F-F7
U-F1
U-HQ
F-F9
SE LUSTED RD
A-F1
See Figure 5
SE BLUFF RD
N-F3
SE HUDSON RD
P-F2
N-HQa
N-F1
Key Map
SE HADLUM RD

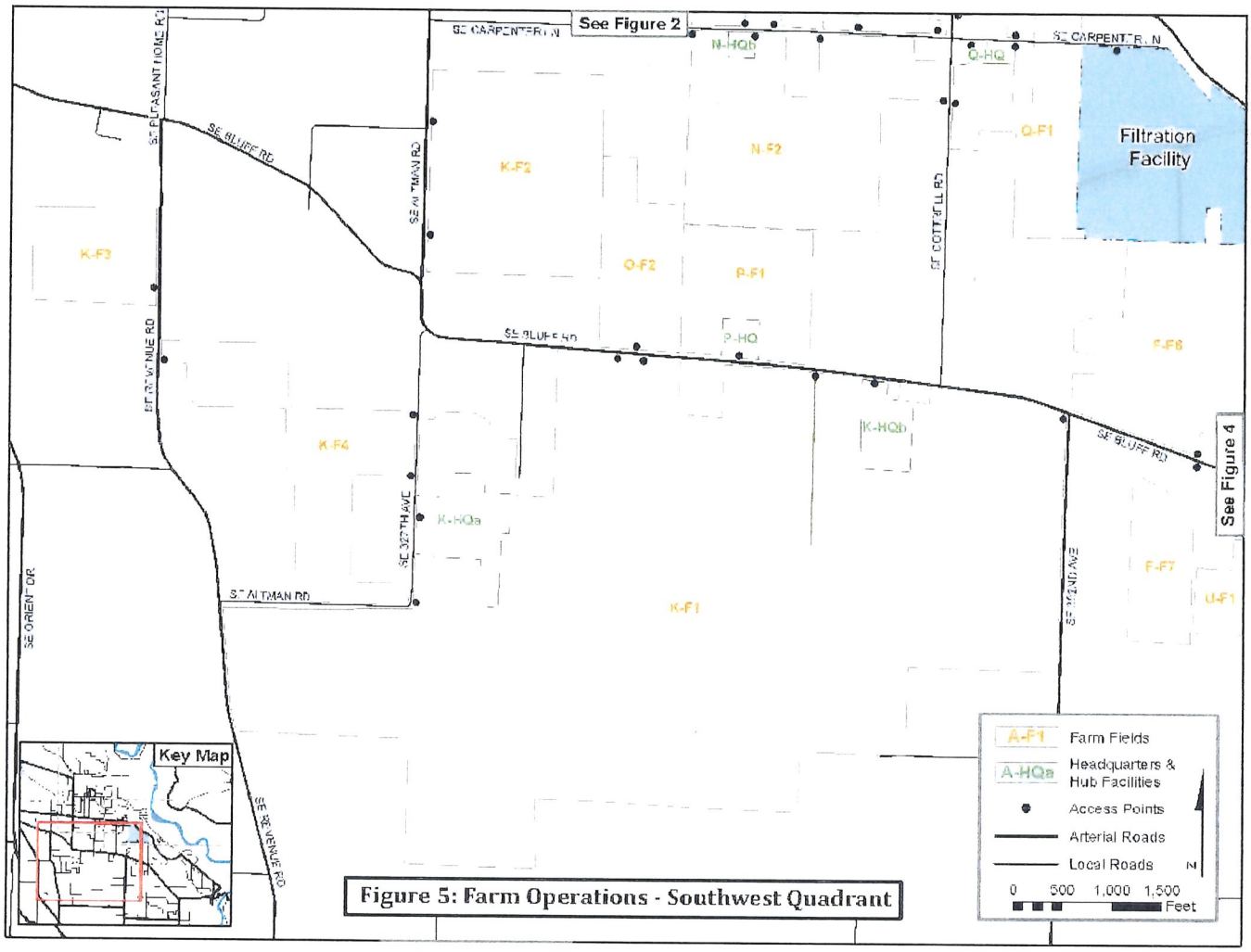
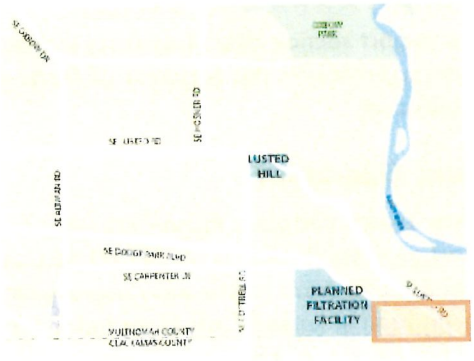


Figure 5: Farm Operations - Southwest Quadrant

Raw Water Pipeline Segment: Multnomah Connection to Tunnel Portal

This report section describes farm traffic for one Farm Operator in this raw water pipeline segment near the Multnomah Connection.



Farm Operator W

Farm Traffic Origin & Destination: Farm Operator W's headquarters (W-HQ) is at 36910 SE Lusted Road. This is an integrated farm location with fields W-F1 and W-F2 at the same location as the headquarters. Field W-F3 is accessed by a driveway to the north of the access for fields W-F1 and F2.

Farm Traffic Route: All farm traffic is between two separate "side-by-side" fields, W-F1 and W-F2, and farm equipment and crews move within a field or go a short distance within the farm location without entering or exiting Lusted Road.

Alternate Farm Traffic Route: For fields W-F1 and F2, no alternate access is needed. For any vehicle leaving the farm or nearby residence, access will be provided during construction. For field W-F3, access is north of the main farm access and not impeded by pipeline construction.

Outbound Shipping Traffic Route: From all origin points, the normal route is Lusted Road, with approximately equal trips going north or south from the farm headquarters. Outbound vehicle traffic is in smaller vehicles and the route used depends on the destination. However, if one direction is delayed for pipeline construction, the alternate direction on Lusted Road does not result in a significant delay.

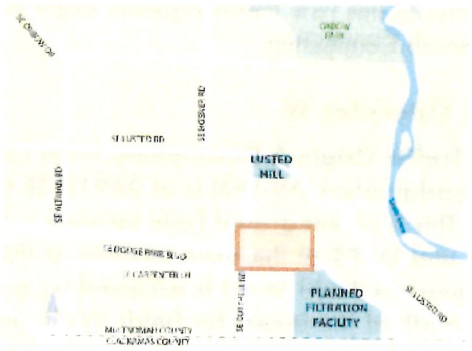
Lowest Traffic Volume Months for Road Segment Use: October to March are the lowest months for road use. July to September are important months for blueberry harvest access. U-pick blueberry customers can reach the blueberry fields by a second driveway apart from the main farm entrance that is near the pipeline construction. Farm traffic related to cattle production does not result in regular road use.

Summary for Multnomah Connection to Tunnel Portal

Farm Operator	Alternate Farm Traffic Route	Farm Traffic Lowest Use Season	Alternate Outbound Shipping Traffic Route
W	Yes	Oct - March	None needed

Finished Water Pipeline Segment: Dodge Park Boulevard through Cottrell Road Intersection

This report section describes farm traffic for four farm operators in this segment of Dodge Park Boulevard.



Farm Operator F

Farm Traffic Origins: Farm Operator F's headquarters (F-HQ) is at 33740 SE Lusted Road. Additionally farm traffic may move to the destination in Lusted Flats from fields F-F1, F2, F3, F4, F5, F6, F7, or F8.

Farm Traffic Destination: Field F-F9 in Lusted Flats.

Farm Traffic Route: From all origin points, the normal route is Dodge Park Boulevard. This route is chosen for safety and Farm Operator F does not use any other road (Lusted or Proctor) to access or return from field F-F9. Farm Operator F ordinarily returns all equipment and crews to headquarters F-HQ daily. Tractors are usually driven on roads and rarely trailered. All crew members report to work at F-HQ and are transported to fields in crew buses.

Alternate Farm Traffic Route: None due to safety issues, the route of travel is only on Dodge Park.

Outbound Shipping Traffic Route: This segment of Dodge Park Boulevard is not used for Farm Operator F's outbound truck traffic.

Lowest Traffic Volume Months for Road Segment Use: September to October is the lowest season, followed by July to August.

Farm Operator N

Farm Traffic Origins: Farm Operator N has a farm hub (N-HQb) for equipment holding on Carpenter Lane and also field N-F2 with access from either Carpenter Lane or Cottrell Road.

Farm Traffic Destination: Field N-F3 in Lusted Flats.

Farm Traffic Routes: From either a) hub N-HQb with an access on Carpenter Lane or an access at field N-F2 on Carpenter Lane or b) an access for field N-F2 on Cottrell Road, the route is Cottrell Road north to the intersection with Dodge Park Boulevard, then travel through the road segment to Lusted Road in Lusted Flats, then taking Hudson Road a short distance to field N-F3. The return trip normally uses the same route back to the origin point, but some trips take Hudson Road if the equipment is needed at N-HQa on Bluff Road. Farm equipment is generally driven on roads and crews are transported in buses.

Alternate Farm Traffic Route: An alternate route turns south on Cottrell Road to Bluff Road, then Bluff Road to Hudson Road and on to Lusted Flats to access field N-F3. This route can also be taken for return trips.

Outbound Shipping Traffic Route: This road segment of Dodge Park Boulevard is not used by outbound truck traffic by the farm operator.

Lowest Traffic Volume Months for Road Segment Use: July to October.

Farm Operator Q

Farm Traffic Origins: Farm Operator Q's headquarters (Q-HQ) is at 34826 SE Carpenter Lane with limited movement between fields Q-F2, F3, and F4.

Farm Traffic Destination: None of the fields are accessed from Dodge Park Boulevard. Fields Q-F2, F3, and F4 are near headquarters Q-HQ with access required across Carpenter Lane. In the case of field Q-F2, access is from Carpenter Lane to Cottrell Road.

Alternate Farm Traffic Route: None is needed, this road segment of Dodge Park Boulevard is not traversed.

Outbound Shipping Traffic Route: Trucks depart from Q-HQ on Carpenter Lane and can either turn left at Cottrell Road to reach Bluff Road or turn right to Dodge Park Boulevard.

Alternate Outbound Shipping Traffic Route: If the intersection at Dodge Park Boulevard is closed, trucks can exit south on Cottrell Road.

Lowest Traffic Volume Months for Road Segment Use: Approximately June to mid-November.

Farm Operator X

Farm Traffic Origin: Farm Operator X's headquarters X-HQ is at 31020 SE Waybill Road (outside the study area). There are farm fields around X-HQ.

Farm Traffic Destination: Field X-F1 requires farm equipment to regularly move through the road segment of Dodge Park Boulevard to reach Lusted Flats.

Farm Traffic Route: From X-HQ or fields near the headquarters, all equipment moves via Dodge Park Boulevard through this road segment to access Lusted Road in Lusted Flats. Farm Operator X usually returns equipment and vehicles including crew buses to the headquarters, but many of these moves are truck and trailer hauling equipment and supplies due to the distance between headquarters X-HQ and field X-F1. Tractors are usually driven on roads. All crew members report to headquarters daily and are transported to fields in crew buses.

Alternate Farm Traffic Route: None due to safety issues, the route of travel is only on Dodge Park.

Outbound Shipping Traffic Route: This road segment of Dodge Park Boulevard is not used for Farm Operator X's outbound truck traffic.

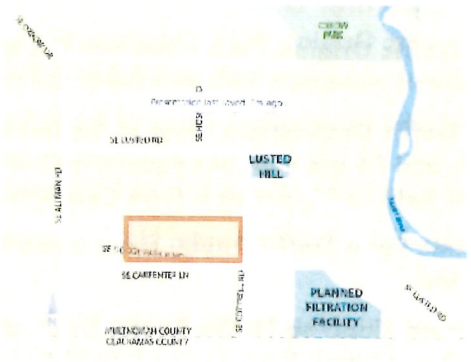
Lowest Traffic Volume Months for Road Segment Use: Approximately July to October.

Summary for Dodge Park Boulevard Through Cottrell Road Intersection

Farm Operators	Alternate Farm Traffic Route	Farm Traffic Lowest Use Seasons	Alternate Outbound Shipping Traffic Route
F	No	Sept - Oct	Road segment not used
N	Yes	July - Oct	Road segment not used
Q	Yes	June - mid-Nov	Yes
X	No	July - Oct	Road segment not used

Finished Water Pipeline Segment: Dodge Park Boulevard from Cottrell Road Intersection to Farm Access Road

This section of the report describes farm traffic for six farm operators in this segment of Dodge Park Boulevard. The segment begins at the intersection of Dodge Park Boulevard and Cottrell Road and continues west about 0.65 miles to the north-south farm access road in Farm Operator D's field D-F1.



Farm Operator D

Farm Traffic Origins: Farm Operator D's headquarters (D-HQ) at 3199 SE 302nd Avenue and Farm Operator D's fields west of the project area (west of Altman Road) near Gresham which are outside the mapped area.

Destination Locations: Fields D-F1, F2, and F3.

Farm Traffic Route: A portion of Farm Operator D's trips take 302nd Avenue from D-HQ to Dodge Park Boulevard and then travel west on Dodge Park Boulevard to the access location for field D-F1. This farm operator and others report that they avoid driving trucks with heavy loads or trailers up or down the steep grade on 302nd Avenue. They also avoid Barlow High School during morning and mid-afternoon school traffic congestion.

Alternate Farm Traffic Route: Many of the remaining trips by this farm operator take Division Street to Oxbow Drive, turning onto Altman Road and east on Lusted Road to access fields D-F1, F2, or F3. Access locations are available to reach each of these fields.

Outbound Shipping Traffic Route: This road segment is not used by farm operator D for outbound traffic.

Lowest Traffic Volume Months for Road Segment Use: June to November.

Farm Operator F

There are multiple route origins and destinations used by Farm Operator F along this road segment.

Farm Traffic Origins: Farm Operator F's headquarters (F-HQ) at 33740 SE Lusted Road, as well as farm equipment going to or coming from the following fields: F-F1, F2, F3, or F4. Any of these locations may be an origin or transfer point and use the road segment in Dodge Park Boulevard.

Farm Traffic Destinations: Fields F-F6, F7, and F8.

Farm Traffic Routes: The fields south of Dodge Park Boulevard are accessed by Cottrell Road. Farm Operator F can travel to these fields by taking a farm road in field F-F1 at an access on Dodge Park Boulevard and going east to the intersection with Cottrell Road, turning south on Cottrell to Carpenter Lane and using a proposed upgraded Water Bureau filtration site perimeter road to reach their field F-F6.

Farm Operator F can also use internal farm roads in field F-F6 to continue to Bluff Road and turn south on SE 352nd Avenue to reach field F-F7. Also, by exiting field F-F6 to Bluff Road and

continuing east to Proctor Road, the farm operator can reach field F-F8. The farm roads through field F-F6 are generally preferred to reach the two destination fields beyond field F-F6.

Alternate Farm Traffic Routes: An alternate route for Farm Operator F avoids Carpenter Lane by continuing south on Cottrell Road to Bluff Road, then east on Bluff Road to a farm access for field F-F6. Bluff Road can also be taken east and then turn south on SE 352nd Avenue to reach field F-F7. Additionally, field F-F8 can be reached from Bluff Road to Proctor Road using the driveway access.

Another alternate route from F-HQ initially takes Lusted Road going east to Cottrell Road, then turning south and crossing Dodge Park Boulevard. From that point, the routes to all fields are the same as described above.

Another alternate route that avoids the road segment is Lusted Road west to Altman Road, then Altman Road to Carpenter Lane with access to Cottrell Road.

Outbound Shipping Traffic Route: This road segment is not used by this farm operator for outbound truck traffic.

Lowest Traffic Volume Months for Road Segment Use: September to October is the lowest season, followed by July to August.

Farm Operator F

Farm Traffic Origins: Farm Operator F's headquarters (F-HQ) at 33740 SE Lusted Road, as well as farm equipment at fields F-F1or F5.

Farm Traffic Destination: Field F-F9.

Farm Traffic Routes: The field in Lusted Flats is accessed by taking Farm Operator F's farm road in field F-F1 at an access on Dodge Park Boulevard and going east through the intersection at Cottrell Road and proceeding on Dodge Park Boulevard to Lusted Road, then turning right on Lusted Road to reach field F-F9. From field F-F5, the route is south on Altman Road, then east on Dodge Park Boulevard through the road segment.

Alternate Farm Traffic Route: An alternate route for Farm Operator F to avoid the pipeline portion of Dodge Park Boulevard is to exit F-HQ on Lusted Road and proceed east to Cottrell Road, then south on Cottrell Road to the intersection with Dodge Park Boulevard, then turn left on Dodge Park Boulevard to reach Lusted Road and proceed to field F-F9. From field F-F5, the alternate route is north on Altman to Lusted Road then east on Lusted and follow the rest of the route as described above.

Although Farm Operator F only uses Dodge Park Boulevard to reach field F-F9, Dodge Park Boulevard can be used without passing through the pipeline construction area.

Outbound Shipping Traffic Route: This road segment is not used by farm operator F for outbound traffic.

Lowest Traffic Volume Months for Road Segment Use: September to October is lowest season, followed by July to August.

Farm Operator F

Farm Traffic Origin: Farm Operator F's headquarters (F-HQ) at 33740 SE Lusted Road traveling from field F-F1 to the farm access point on Dodge Park Boulevard.

Farm Traffic Destination: Field F-F5, located west of Altman Road.

Farm Traffic Route: Field F-F5 is accessed by taking the field F-F1 farm road south to reach Dodge Park Boulevard, proceeding west on Dodge Park Boulevard to Altman Road, then turning north on Altman to access F-F5.

Alternate Farm Traffic Route: The alternate route to field F-F5 exits headquarters F-HQ at Lusted Road and travels west on Lusted to Altman Road, then turns south on Altman Road to the field.

Outbound Shipping Traffic Route: This road segment is not used by this farm operator for outbound truck traffic.

Lowest Traffic Volume Months for Road Segment Use: September to October is lowest season, followed by July to August.

Farm Operator G

Farm Traffic Origin & Destination: Farm Operator G's headquarters (G-HQ) and field G-F1 are a single nursery location at 33915 SE Dodge Park Boulevard. This is a small-scale nursery that does not generate a significant number of road trips. There is one road access on Dodge Park Boulevard at the farm's access point and driveway.

Farm Traffic Route: The main traffic route exits onto Dodge Park Boulevard at the farm's access point on Dodge Park Boulevard and proceeds west in the road segment of Dodge Park Boulevard.

Alternate Farm Traffic Route: Alternate route exits onto Dodge Park Boulevard at Farm Operator G's access location, goes east on Dodge Park Boulevard through the road segment of Dodge Park Boulevard, and then turns south on Cottrell Road to Bluff Road.

Outbound Shipping Traffic Route: The main traffic route exits onto Dodge Park Boulevard at the farm access point and goes west.

Alternate Outbound Shipping Traffic Route: Alternate route exits onto Dodge Park Boulevard, goes east on Dodge Park Boulevard, and then turns south on Cottrell Road to Bluff Road.

Lowest Traffic Volume Months for Road Segment Use: July to November.

Farm Operator H

Farm Traffic Origin & Destination: Farm Operator H's headquarters (H-HQ) and field (H-F1) are a single farm location at 7416 SE Cottrell Road. The only road access is on Cottrell Road.

Farm Traffic Route: Main traffic route exits at the Cottrell Road access location to H-HQ and then turns south to Dodge Park Boulevard and west on Dodge Park Boulevard through the road segment.

Alternate Farm Traffic Route: Alternate route exits at Cottrell Road and proceeds north to Lusted Road, then west on Lusted Road.

Outbound Shipping Traffic Route: Main haul-out traffic exits this farm operation onto Cottrell Road, goes to Dodge Park Boulevard, and goes west on Dodge Park Boulevard through the road segment.

Alternate Outbound Shipping Traffic Route: The alternate route exits onto Cottrell Road and goes north to Lusted Road, then west on Lusted Road.

Lowest Traffic Volume Months for Road Segment Use: July to November.

Farm Operator I

Farm Traffic Origin & Destination: Farm Operator I's headquarters (I-HQ) and field (I-F1) are a single farm location at 7450 SE Cottrell Road. The only road access is at Cottrell Road to reach the headquarters and the field.

Farm Traffic Route: Main traffic route exits onto Cottrell Road at the residential driveway for Farm Operator I to reach Dodge Park Boulevard and proceed west on Dodge Park Boulevard through the road segment.

Alternate Farm Traffic Route: Alternate route exits onto Cottrell Road and proceeds north to Lusted Road, then goes west on Lusted Road.

Outbound Shipping Traffic Route: The main traffic route exits onto Cottrell Road at field Farm Operator I's access location and onward to Dodge Park Boulevard, then west on Dodge Park Boulevard through the road segment.

Alternate Outbound Shipping Traffic Route: Alternate route exits onto Cottrell Road, goes north to Lusted Road, and then west on Lusted Road.

Lowest Traffic Volume Months for Road Segment Use: July to November.

Farm Operator M

Farm Traffic Origin & Destinations: Farm Operator M's headquarters (M-HQa) and fields M-F1 and F2 are nearly side-by-side farm location at 34546 SE Carpenter Lane. Farm Operator M also has a separate shipping location (M-HQb) along field M-F1 on Carpenter Lane.

Farm Traffic Route: The road segment on Dodge Park is not traversed. All farm traffic and crews move between fields M-F1 and F2 which are close together. Farm equipment and crews move a short distance between the two fields by going a short distance on Carpenter Lane to each field's access location.

Alternate Farm Traffic Route: None needed.

Outbound Shipping Traffic Routes: Semi-trucks with 53-foot trailers must arrive from Altman Road and proceed east on Carpenter Lane to reach the shipping dock at M-HQb. This is the only route for access due to the limited driveway configuration at M-HQb. Outbound trucks continue east on Carpenter Lane, turn north at Cottrell Road, and then take Dodge Park Boulevard west through the road segment. They also can continue north on Cottrell Road through the intersection at Dodge Park Boulevard and turn west on Lusted Road.

Alternate Outbound Shipping Traffic Route: The alternate route is for trucks to leave M–HQb going east on Carpenter Lane, then turning south on Cottrell Road to Bluff Road. This is the primary option to avoid the road segment in Dodge Park Boulevard.

Lowest Traffic Volume Months for Road Segment Use: Early July to September and November to December.

Summary for Dodge Park Boulevard from Cottrell Road Intersection to Farm Access Road

Farm Operators	Alternate Farm Traffic Route	Farm Traffic Lowest Use Seasons	Alternate Outbound Shipping Route
D	Yes	June - Nov	Road segment not used
F (multiple routes)	Yes for all	Sept - Oct	Road segment not used
G	Yes	July - Nov	Yes
H	Yes	July - Nov	Yes
I	Yes	July - Nov	Yes
M	Yes	July - Sept & Nov - Dec	Yes

Finished Water Pipeline Segment: Dodge Park Boulevard across Farm Access Road to Finished Water Intertie

This section of the report describes farm traffic for one farm operator in this farm road segment.

Farm Operator D

Farm Traffic Origins: Farm Operator D's headquarters (D-HQ) at 3199 SE 302nd Avenue and this farm operator's fields west of the project area which are outside the Study Area.

Destination Location: Field D-F1 (pipeline alignment is within this field).

Farm Traffic Route: Approximately half of this farm operator's trips take 302nd Avenue from D-HQ to Dodge Park Boulevard and then travel west on Dodge Park Boulevard to the access point for field D-F1.

Alternate Farm Traffic Route: Approximately half of trips for this farm operator follow the route of Division Street to Oxbow Drive, then south on Altman Road and east on Lusted Road to access field D-F1.

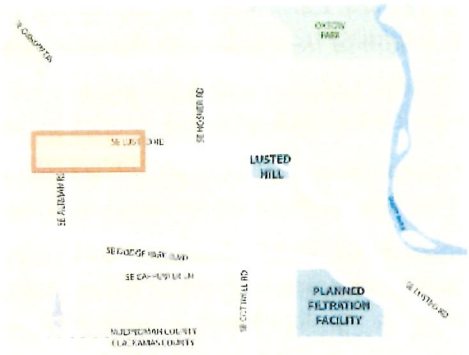
Outbound Shipping Traffic Route: This road segment is not used for Farm Operator D's outbound truck traffic.

Lowest Traffic Volume Months for Road Segment Use: June to November.

Summary for Dodge Park Boulevard across Farm Access Road to Finished Water Intertie

Farm Operator	Alternate Farm Traffic Route	Farm Traffic Lowest Use Season	Alternate Outbound Shipping Route
D	Yes	June - Nov	Road segment not used

Finished Water Pipeline Segment: Lusted Road from Finished Water Intertie Entry through Altman Road Intersection to Connect to Existing Conduit



This section of the report describes farm traffic for seven farm operators in this road segment.

Farm Operator A

There are multiple route origins and destinations used by Farm Operator A along this road segment.

Farm Traffic Origins: Farm Operator A's centrally located hub for cold storage and equipment (A-HQb), their hub for receiving, sorting, storage, and outbound shipping (A-HQc), and their hub for receiving, sorting and outbound shipping (A-HQd) are each a location for farm traffic origins. In addition, their headquarters (A-HQa) at 33205 SE Oxbow Drive is also a potential origin location for farm traffic.

Destination Location: Field A-F1 is a large nursery field block with field equipment and crews moving internally and through an intra-connected farm road system. Field block A-F1 is centrally located to facilities and includes hubs A-HQb and A-HQd, while headquarters A-HQa is just across Oxbow Drive, and hub A-HQc is across Hosner Road from field block A-F1.

Farm Traffic Routes: Most farm vehicles and equipment working in this field complex travel on internal farm roads but occasionally move on Oxbow Drive or Hosner Road. It is rare for farm equipment working in field block A-F1 to travel on this segment of Lusted Road, but there is an entry/exit access point on Lusted Road. Crew buses are more likely to use this route, for example moving from the access point across from A-HQc on Hosner Road and then traveling west on Lusted Road to reenter field block A-F1 at the access point north of Lusted Road before reaching the intersection with Altman Road.

Alternate Farm Traffic Route: None needed.

Outbound Shipping Traffic Route: The Lusted Road segment is rarely used for Farm Operator A's outbound shipping traffic from hub A-HQc.

Lowest Traffic Volume Months for Road Segment Use: June to July and September to November.

Farm Operator A

Farm Traffic Origins: Farm Operator A's equipment, crews, and vehicles can depart from any of these farm operator headquarters/farm hubs, namely A–HQa, HQb, HQc, and HQd. Movement may also originate in any of these fields: A-F3, F6, F7, and F8.

Farm Traffic Destinations: Field A-F2 and fields to the west on Pipeline Road.

Farm Traffic Routes: Tractors and related farm equipment from the origin locations travel through internal farm roads in field block A–F1 to an access location at Altman Road to reach fields on Pipeline Road. Farm vehicles such as crew buses can travel on internal farm roads or take public roads including travel through the road segment in Lusted Road when going to field A-F2.

Farm traffic can also exit field Block A-F1 at multiple access locations on Oxbow Drive and reach field A-F1 from Altman Road as well as other fields on Pipeline Road.

Plant materials move frequently between fields and for sorting at hub A-HQc and A-HQd. Return trips from the destination locations also move plants and equipment to the traffic origin locations.

Alternate Farm Traffic Routes: Faster-moving vehicles can avoid the segment of Lusted Road by taking Hosner Road to Oxbow Drive, then going to Altman Road to access field A-F2, or by traveling on Pipeline Road or continuing on Oxbow Drive to 302nd Avenue and going east on Pipeline Road to access field A-F2.

Outbound Shipping Traffic Route: Lusted Road is rarely used by outbound trucks from A-HQc and is not a direct route from farm hub A-HQd. The route for hub A-HQc is a short distance on Lusted Road to Hosner Road and onward to Oxbow Drive and Division Street. The route for hub A-HQd is Oxbow Drive to Division Street.

Alternate Outbound Shipping Traffic Route: None needed.

Lowest Traffic Volume Months for Road Segment Use: June to July and September to October.

Farm Operator A

Farm Traffic Origins: Farm Operator A's equipment, crews and vehicles depart from all farm operator headquarters/farm hubs previously described: headquarters A-HQa, and hubs A-HQb, HQc, and HQd. Farm equipment in Farm Operator A's fields A-F3, F6, F7, and F8 may also move to destination locations using the routes described below.

Farm Traffic Destinations: The segment in Lusted Road is used for travel to Farm Operator A's fields on Lusted Road to the west of Altman Road, Dodge Park Boulevard to the west of Altman Road, and A's farm operations near Damascus.

Farm Traffic Routes: To reach fields west of Altman Road on Lusted Road, slower farm equipment can move on Farm Operator A's internal farm roads and exit from either an access for field block A-F1 onto Altman Road or exit from two access points for field block A-F1 on Lusted Road, to proceed west through the segment of Lusted Road. For fields west of Dodge Park Boulevard from the origins, farm equipment can also follow the internal farm roads described above to access either Altman Road going south or turn onto Lusted Road going east and then south on Pleasant Home Road to Dodge Park Boulevard.

For faster road vehicles from hub A-HQb, the route is south on a farm field access road to Lusted Road and west through the road segment on Lusted Road and proceed to the intersection of Lusted Road with Altman Road and onward to the destinations. For hub A-HQc, the fastest road route is also Lusted Road going west through the road segment to the Lusted Road and Altman

Road intersection and onward to the destinations. For A-HQa and hub A-HQd, and fields A- F3, F6, F7, and F8 the fastest route is Oxbow Drive to Altman Road and then south to either Lusted Road or to Dodge Park Boulevard.

Alternate Farm Traffic Routes: If the intersection at Lusted Road and Altman Road is congested or temporarily closed, the best alternate route to reach Lusted Road is to take Altman Road to Pipeline Road, then east to 302nd Avenue and turn south, then turn east on Lusted Road. The best alternate route to reach Dodge Park Boulevard is to proceed east on Lusted Road to Cottrell Road, then south to Dodge Park Boulevard, and proceed west.

For trucks and other faster vehicles going to fields on Lusted Road west of Altman Road, or fields west of Altman Road on Dodge Park Boulevard, the route is Hosner Road to Oxbow Drive and Altman Road if the Altman/Lusted intersection is open. Alternately, the longer route is south on Cottrell Road to Dodge Park Boulevard going east and turning north on Pleasant Home Road to Lusted Road.

This farm operator's trucks going to the Damascus farm also have the alternate route of Cottrell Road from Lusted Road and south to Dodge Park Boulevard or Bluff Road.

Outbound Shipping Traffic Routes: Lusted Road is rarely used by outbound trucks from either hub A-HQc or hub A-HQd. The route for hub A-HQc is Lusted Road to Hosner Road and onward to Oxbow Drive and Division Street. The route for hub A-HQd is Oxbow Drive to Division Street.

Alternate Outbound Shipping Traffic Route: None needed.

Lowest Traffic Volume Months for Road Segment Use: June to July and September to October.

Farm Operator A

Farm Traffic Origins: Farm Operator A fields A-F4 and F5, which include greenhouse starter plants and outdoor plant production.

Farm Traffic Destinations: All farm hubs: A-HQa, HQb, HQc and HQd, as well as fields A-F6, F7, and F-8.

Farm Traffic Routes: All routes do not use the road segment in Lusted Road. The farm headquarters and hubs can all be accessed by Oxbow Drive and Hosner Road and may include use of internal farm roads in field block A-F1. Fields A-F6, F7, and F8 use Lusted Road to the east of the road segment in Lusted Road.

Alternate Farm Traffic Route: None needed.

Outbound Shipping Traffic Route: The Lusted Road segment is not used by this farm operator for outbound truck traffic.

Lowest Traffic Volume Months for Road Segment Use: June to July and September to October.

Farm Operator B

Farm Traffic Origin: Farm Operator B headquarters (B-HQ) is at 32539 SE Lusted Road. The headquarters is fully integrated with field B-F1, and no public road access is needed.

Farm Traffic Destination: Access to field B-F2 is a short distance from the access location for B-HQ on Lusted Road through the intersection of Lusted Road Altman a short distance south on Altman Road. The field access point is the primary access to field B-F2.

Alternative Farm Traffic Route: If the intersection of Lusted Road and Altman Road is temporarily closed, Farm Operator B can reach field B-F2 from Lusted Road with direct field entry from B-HQ across Lusted Road.

Outbound Shipping Traffic Route: The loading dock at B-HQ on Lusted Road is at the access location. Trucks arrive traveling east on Lusted Road and turn north into the loading area. Trucks depart from the nursery west on Lusted Road to avoid the intersection of Lusted Road and Altman Road.

Alternate Outbound Shipping Traffic Route: None needed.

Lowest Traffic Volume Months for Road Segment Use: June to October.

Farm Operator C

Farm Traffic Origin & Destination: Farm Operator C headquarters (C-HQ) is at 33417 SE Lusted Road. This headquarters is integrated with field C-F1. The farm also has field C-F2 immediately across Lusted Road from the farm and residential access road to C-HQ.

Farm Traffic Route: Farm Operator C-HQ has the farm storage, equipment holding area, and loading facilities immediately next to field C-F1. This is a self-contained farm operation with access that also serves as the residential driveway. Farm traffic moves a short distance across Lusted Road to travel between fields C-F1 and F2.

Alternate Farm Traffic Route: None.

Outbound Shipping Traffic Route: The main outbound truck traffic proceeds west on Lusted Road through the segment to Altman Road and then either north or south depending on route preferences.

Alternate Outbound Shipping Traffic Route: The secondary haul-out traffic route is to proceed east on Lusted Road to either Hosner Road and north for access to Oxbow Drive or south on Cottrell Road for access to Dodge Park Boulevard or Bluff Road.

Lowest Traffic Volume Months for Road Segment Use: June to November.

Farm Operator D

Farm Traffic Origin: Farm Operator D's headquarters (D-HQ) is at 3199 SE 302nd Avenue (outside the study area). The farm also has fields west of the project area.

Farm Traffic Destinations: Fields D-F1, F2, and F3. Farm Operator D also has fields west of Altman Road that can be origin points to transfer equipment to fields D-F1, F2, and F3.

Farm Traffic Routes: Approximately half of the time the route from D-HQ to the destination fields is Division Street to Oxbow Drive, then south on Altman Road and east on Lusted Road to or through the road segment to access three fields from Lusted Road.

When farm vehicles and equipment move to the destination from fields located west of Altman Road, the route is Lusted Road east through the road segment to access fields D-F1, F2, and F3.

Alternate Farm Traffic Routes: The alternate route from the headquarters that this farm travels to field D-F1 is 302nd Avenue to Dodge Park Boulevard and east on Dodge Park Boulevard to the access for field D-F1. This assumes there is no need to avoid the steep grade on 302nd Avenue. If that grade needs to be avoided, the route is Division Street east to Oxbow Drive, then south on Hosner Road to Lusted Road and proceeding east to Cottrell Road then west on Dodge Park Boulevard to the access point for fields D-F1 and F2.

The alternative to reach field D-F3 from the D-HQ is to take Division Street to Oxbow Drive and proceed east to Hosner Road, then to Houser Road south to Lusted Road and west on Lusted Road to the field access point.

Outbound Shipping Traffic Route: This Lusted Road segment is not used for outbound truck traffic by Farm Operator D.

Lowest Traffic Volume Months for Road Segment Use: July to October.

Farm Operator E

There are multiple route origins and destinations used by Farm Operator E along this road segment.

Farm Traffic Origin: Farm Operator E headquarters (E-HQ) is at 6358 SE 302nd Avenue (outside the study area).

Farm Traffic Destination: Field E-F1 on Lusted Road.

Farm Traffic Route: From E-HQ, farm traffic goes south on 302nd Avenue, turns east on Jackson Road to Pleasant Home Road, continues north to Lusted Road, and then goes east to the farm access point at E-F1.

Alternate Farm Traffic Route: From headquarters E-HQ farm traffic goes south on 302nd Avenue to Dodge Park Boulevard and east to the access point for field E-F1.

Outbound Shipping Traffic Route: None needed, this Lusted Road segment is not used by this farm operator for outbound truck traffic.

Lowest Traffic Volume Months for Road Segment Use: July to October.

Farm Operator E

Farm Traffic Origin & Destination: Farm Operator E has a second farm business which is a single location fruit orchard at 33030 SE Lusted Road with the headquarters designation E-HQb. This headquarters is next to the orchard with farm access on Lusted Road. Field E-F1a is a small-scale orchard next to field E-F1, and both fields share access from Lusted Road. Farm equipment and work crew activity take place at this location with farm equipment also moving here from headquarters E-HQa which is west and outside the study area.

Alternate Farm Traffic Route: None needed.

Outbound Shipping Traffic Route: Field E-F1a is a u-pick peach orchard. All traffic comes to this farm on Lusted Road using the farm access point on Lusted Road. Traffic arrives from either direction on Lusted Road and follows the reverse route when departing. During the harvest period between late July and August, several hundred customers came to the farm to pick or purchase harvested peaches. Customers can only enter and exit at the farm access point which is also the residential driveway. The alternative farm access location at Dodge Park Boulevard is not suitable for orchard customer traffic access.

Alternate Outbound Shipping Traffic Route: None.

Lowest Traffic Volume Months for Road Segment Use: July to October.

Farm Operator F

Farm Traffic Origin: Farm Operator F's headquarters (F-HQ) is at 33740 SE Lusted Road.

Farm Traffic Destination: Field F-F5.

Farm Traffic Route: From headquarter F-HQ on Lusted Road, travel west to the intersection of Altman Road and Lusted Road, turn south on Altman Road, and access field F-F5.

Alternate Farm Traffic Route: From F-HQ, the farm road is followed along field F-F1 south to the access point on Dodge Park Boulevard and proceeds west to the intersection of Altman Road and Dodge Park Boulevard, then turns north on Altman Road to access field F-F5.

Outbound Shipping Traffic Route: From F-HQ at 33740 SE Lusted Road, farm traffic turns east on Lusted Road, then north on Hosner Road to Oxbow Drive, then west to Division Street. Note: Trucks arrive at F-HQ by using Hosner Road and then going west on Lusted Road to access the shipping docks at F-HQ. With this routing, the road segment for pipeline construction is not used for outbound shipping by this farm operator.

Alternative Outbound Shipping Traffic Route: The Lusted Road segment is not used for outbound traffic by Farm Operator F.

Lowest Traffic Volume Months for Road Segment Use: July to October.

Farm Operator J

Farm Traffic Origin: Farm Operator J (J-HQ) is located at 28745 SE Division Street (outside the study area).

Farm Traffic Destination: Field J-F1.

Farm Traffic Route: From J-HQ the normal route is east on Division Street to Oxbow Drive and continues east and turns south at Altman Road then proceeds east on Lusted Road to field J-F1.

Alternate Farm Traffic Route: From headquarters J-HQ, the route is east on Division Street to Oxbow Drive and continues east past Altman Road and turns south on Hosner Road to reach Lusted Road, then east and enter field J-F1 at the field access point.

Outbound Shipping Traffic Route: This road segment is not used by Farm Operator J for outbound traffic.

Lowest Traffic Volume Months for Road Segment Use: June to November.

Summary for Lusted Road from Finished Water Intertie Entry through Altman Road Intersection to Connect to Existing Conduit

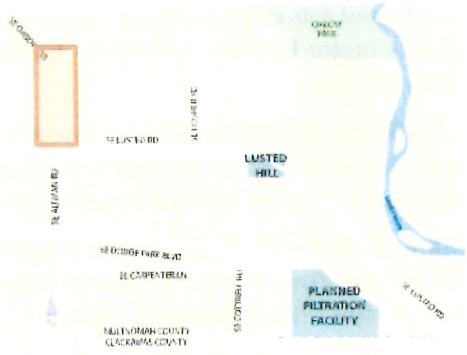
Farm Operators	Alternate Farm Traffic Route	Farm Traffic Lowest Use Seasons	Alternate Outbound Shipping Route
A (multiple routes)	Yes or none needed	Varies from June - Nov	None needed/Yes
B	Yes	June - Oct	None needed
C	None needed	June - Nov	Yes
D	Yes	July - Oct	Road segment not used
E (multiple routes)	Yes	July - Oct	No – direct market customers need access in August
F	Yes	July - Oct	Road segment not used
J	Yes	June - Nov	Road segment not used

Finished Water Pipeline Segment: Altman Road from Lusted Road Intersection to Oxbow Drive Intersection

This section of the report describes farm traffic for eight farm operators in this road segment.

Farm Operator A

There are multiple route origins and destinations used by Farm Operator A along this road segment.



Farm Traffic Origins: Farm equipment, crews and vehicles depart from farm hub A-HQa, hub A-HQb, and hub A-HQc. Farm equipment in fields A-F1, F2, F3, F4, F5, F6, F7, F8, and F9 may also move to destination locations.

Farm Traffic Destinations: The segment in Altman Road is traversed by farm traffic to field A-F2 located west of Altman Road, Farm Operator A's fields west of Altman Road off Pipeline Road, and fields adjacent to Lusted Road west of the Altman Road/Lusted Road intersection.

Farm Traffic Routes: From the three main facility origin points, farm equipment travels on internal farm roads in field A-F1 and exits from that field's access point on Altman Road approximately halfway between Lusted Road and Pipeline Road. From fields A-F3, F6, F7, or F8 for any type of vehicle it is faster to travel on Lusted Road to Altman Road and go north. From fields A-F4 and F5 the route is Oxbow Drive to Altman Road.

Vehicles that travel faster than tractors going from hub A HQc, the route is Oxbow Drive to Altman Road when in fields A-F4 or F5. These faster vehicles go from hub A-HQa and A-HQb using Hosner Road to Oxbow Drive and then Altman Road. Faster vehicles can also take Hosner Road to Lusted Road and travel west to Altman Road.

Alternate Farm Traffic Routes: If Farm Operator A does not have direct access to Altman Road, the first alternative is detour taking Oxbow Drive to Division Street, then turning south on 302nd Avenue, and then coming in a southeasterly direction on Pipeline Road to access field A-F2. This requires travel over a steep section of 302nd Avenue that is north of Barlow High School. This route also provides access to other farm fields on Pipeline Road. If the destination is a field west of the Altman/Lusted intersection, the travel route on 302nd Avenue passes Pipeline Road proceeding south to Lusted Road and then east on Lusted Road.

Outbound Shipping Traffic Route: The outbound route for this farm is Oxbow Drive to Division Street. Farm Operator A's shipping route will be impeded for a relatively short time to connect to the intertie at Oxbow Drive and Altman Road.

Alternate Outbound Shipping Traffic Route: The best alternative option for outbound loads is Oxbow Drive to Hosner Road then to Cottrell Road and exit to the west on Bluff Road.

Lowest Traffic Volume Months for Road Segment Use: June to November.

Farm Operator A

Farm Traffic Origins: Farm equipment, crews, and vehicles depart from farm hub A-HQa, hub A-HQb, and hub A-HQc. Farm equipment in fields A-F1, F2, F3, F4, F5, F6, F7, F8, and F9 may also move to destination locations.

Nursery plants grown in multiple fields of farm operator A are transported to headquarters A-HQc at Oxbow Drive. Harvested plants are from fields located on Pipeline Road, and on Lusted Road west of Altman Road, as well as fields A-F2, F4, F5, F7, and F8. Trucks from farm operator A's Damascus location also transfer crops between the farms to hub A-HQc and/or to hub A-HQb. Box trucks and full-size semi-truck and trailer equipment are used to move plants within the farm and its two major locations. Close-by fields such as A-F4 and A-F5 often move plants by farm tractor and trailer.

Farm Traffic Destinations: Altman Road is also the most direct route for this farm's equipment that goes to fields west of Dodge Park Boulevard Altman Road is also used for trucks that travel between this farm's Multnomah County operations and their farm operations in Damascus.

Alternate Farm Traffic Route: Farm equipment that is accessing fields on Dodge Park Boulevard west of Altman Road have the alternate route of Lusted Road to Cottrell Road and then Cottrell Road to Dodge Park Boulevard. Vehicles faster than tractors would also take this route.

Outbound Shipping Traffic Route: The outbound route farm operator A uses is Oxbow Drive to Division Street. This route will be impeded for a relatively short time to connect to the Finished Water Intertie at Oxbow Drive and Altman Road.

Alternate Outbound Shipping Traffic Route: The most practical option for outbound loads is Oxbow Drive to Hosner Road then to Cottrell Road and exit to the west on Bluff Road.

Lowest Traffic Volume Months for Road Segment Use: June to November.

Farm Operator B

Farm Traffic Origins: Farm Operator B headquarters (B-HQ) at 32539 SE Lusted Road. This farm's headquarters has a farm access location on Altman Road and a second farm access on Lusted Road. Therefore, if the farm operator cannot access the farm from Altman Road the access on Lusted Road can be used.

Farm Traffic Destination: Field B-F2.

Farm Traffic Route: Headquarters B-HQ and field B-F1 are fully integrated with no public road access needed. From the headquarters or field B-F1, field B-F2 is reached by taking the access location south of B-HQ and then east a short distance on Lusted Road through the intersection of Lusted Road and Altman then south a short distance on Altman Road to the access point. The field access point is the primary access to field B-F2.

Alternate Farm Traffic Route: If the intersection of Lusted Road and Altman Road is temporarily closed, Farm Operator B can reach field B-F2 from Lusted Road with direct field entry from B-HQ across Lusted Road.

Outbound Shipping Traffic Route: The loading dock at headquarters B-HQ on Lusted Road at the nearby access point. All trucks arrive on Lusted Road going east and turn north into the loading area. Trucks depart from the nursery and travel west on Lusted Road to avoid the intersection with Altman Road.

Alternate Outbound Shipping Traffic Route: None needed.

Lowest Traffic Volume Months for Road Segment Use: June to October.

Farm Operator C

Farm Traffic Origin & Destinations: Farm Operator C headquarters (C-HQ) at 33417 SE Lusted Road and is integrated with field C-F1. The farm also has field C-F2 immediately across Lusted Road from the farm and residential access road to headquarters C-HQ.

Farm Traffic Route: Headquarters C-HQ has the farm storage, equipment holding area, and loading facilities immediately next to field C-F1. This is a self-contained farm operation with access that also serves as the residential driveway. Farm traffic moves a short distance across Lusted Road to travel between fields C-F1 and C-F2.

Alternate Farm Traffic Route: None.

Outbound Shipping Traffic Route: The main outbound shipping traffic proceeds west on Lusted Road through the segment to Altman Road and then either north or south depending on route preferences.

Alternate Outbound Shipping Traffic Route: The secondary outbound shipping route is to proceed east on Lusted Road to either Hosner Road and north for access to Oxbow Drive or south on Cottrell Road for access to Dodge Park Boulevard or Bluff Road.

Lowest Traffic Volume Months for Road Segment Use: June to November.

Farm Operator D

Farm Traffic Origin: Farm Operator D's headquarters (D-HQ) is at 3199 SE 302nd Avenue.

Farm Traffic Destination: Field D-F4.

Farm Traffic Route: The principal route to field D-F4 from the farm headquarters takes Division Street to Oxbow Drive and turns south on Altman Road and through the road segment then turns east on Dodge Park Boulevard to access field D-F4.

Alternate Farm Traffic Route: The alternate route from the farm headquarters proceeds on 302nd Avenue to Dodge Park Boulevard and then goes east to access field D-F4.

Outbound Shipping Traffic Route: None needed.

Lowest Traffic Volume Months for Road Segment Use: June to November.

Farm Operator E

Farm Traffic Origin: Farm Operator E's headquarters (E-HQa) is at 6358 SE 302nd Avenue (outside the study area). A second headquarters (E-HQb) is at 33030 SE Lusted Road.

Farm Traffic Destinations: Fields E-F1a and E-F1 which are adjacent to each other.

Farm Traffic Route: When travelling from headquarters E-HQa the principal route to fields E-F1a and E-F1 is south on 302nd Avenue then east on SE Jackson Road and turns north on SE Pleasant Hone Road and then east on Lusted Road. Headquarter E-HQb is adjacent to field E-F1a.

Alternate Farm Traffic Route: The alternate route from headquarters E-HQa travels south on 302nd Avenue, then east on Dodge Park Boulevard to an access road and goes north to both fields.

Outbound Shipping Traffic Route: This road segment is not used for shipping from headquarters E-HQa. Some customers for products at headquarters E-HQb would arrive and depart using this road segment.

Alternate Outbound Shipping Traffic Route: For headquarters E-HQb, customers can take Lusted Road east to Hosner Road and then north to Oxbow Drive and west to Division Street.

Lowest Traffic Volume Months for Road Segment Use: July to November.

Farm Operator J

Farm Traffic Origin: Farm Operator J headquarters (J HQ) is located at 28745 SE Division Street (outside the study area).

Farm Traffic Destination: Field J-F1.

Farm Traffic Route: From headquarters J-HQ, the normal route goes east on Division Street to Oxbow Drive and continues east and turns south at Altman Road then proceeds east on Lusted Road to field J-F1.

Alternate Farm Traffic Route: From J-HQ, proceeds east on Division Street to Oxbow Drive and continues east past Altman Road and turns south on Hosner Road to reach Lusted Road, then east to field J-F1.

Outbound Shipping Traffic Route: This road segment is not used by farm operator J for outbound traffic.

Lowest Traffic Volume Months for Road Segment Use: June to November.

Farm Operator O

Farm Traffic Origin: Farm Operator O headquarters (O-HQ) at 1918 SE 302nd Avenue.

Farm Traffic Destination: Field O-F2.

Farm Traffic Route: The principal route to field O-F2 from the farm headquarters goes east on Division Street to Oxbow Drive and turns south on Altman Road and through the road segment then turns east on Bluff Road to access the field.

Alternate Farm Traffic Route: The alternate route from the farm headquarters is 302nd Avenue to Dodge Park Boulevard and continues east to Altman Road and then goes south to access Bluff Road and proceeds east to the Windy Ridge field north of Bluff Road.

Outbound Shipping Traffic Route: This road segment is not used by farm operator O for outbound traffic.

Lowest Traffic Volume Months for Road Segment Use: December to July.

Farm Operator P

Farm Traffic Origin: Farm Operator P headquarters (P-HQ) at 33755 SE Bluff Road.

Farm Traffic Destination: Fields north of Division Street toward Troutdale (beyond study area).

Farm Traffic Route: Traffic exits P-HQ onto Bluff Road and proceeds west to Altman Road, then north on Altman Road through the road segment to Oxbow Drive, then Division Street to 302nd Avenue turning north to access fields on farm road.

Alternate Farm Traffic Route: The alternate route is to exit to Bluff Road and go west to Pleasant Home Road, then north to Pipeline Road turning northwest on Pipeline Road to 302nd Avenue.

Outbound Shipping Traffic Route: The outbound route is west on Bluff Road.

Lowest Traffic Volume Months for Road Segment Use: June through August.

Summary for Altman Road from Lusted Road Intersection to Oxbow Drive Intersection

Farm Operators	Alternate Farm Traffic Route	Farm Traffic Lowest Use Season	Alternate Outbound Shipping Route
A (multiple routes)	Yes	June - Nov	Yes
B	Yes	June - Oct	None needed
C	None needed	June - Nov	Yes
D	Yes	June - Nov	None needed
E (multiple routes)	Yes	July - Nov	None needed/Yes
J	Yes	June - Nov	None needed
O	Yes	Dec - July	None needed
P	Yes	June - Aug	None needed

Farms Traveling on Bluff Road

Farm Operator K

There are multiple route origins and destinations used by Farm Operator K along this road segment.

Farm Traffic Origins & Destinations: Farm Operator K headquarters (K-HQa) at 9500 SE 327th Avenue and hub facilities K-HQb at 34210 SE Bluff Road are integrated with field block K-F1.

Farm Traffic Destinations: Field block K-F1.

Farm Traffic Route: Headquarters K-HQa has offices, equipment holding areas, cold storage and other crop receiving facilities, and outbound shipping facilities next to field block K-F1. The hub facility K-HQb with greenhouse propagation and loading facilities is also located within the complex of consolidated fields with an entrance on Bluff Road. Within field block K-F1, most farm traffic moves within the extensive internal farm road system but occasionally, farm equipment may travel on Bluff Road and use field access location to enter field block K-F1. Faster road vehicles and trucks that move plant materials between K-HQa and K-HQb move on Bluff Road and SE 327th Avenue.

Alternate Farm Traffic Route: None.

Outbound Shipping Traffic Route: The primary outbound shipping route from K-HQa is SE 327th Avenue north to Bluff Road and west on Bluff Road toward Gresham. From K-HQb the main outbound truck route is to enter Bluff Road and proceed west toward Gresham.

Alternate Outbound Shipping Traffic Route: The secondary shipping route for K-HQa is south on SE 327th Ave and west on SE Altman Road a short distance to SE Revenue Road, then south on SE Revenue Road to SE Orient Drive then turning on SE Compton Road for a short distance to Highway 26. For hub K-HQb, travel on Bluff Road is the only alternate outbound shipping route.

Lowest Traffic Volume Months for Road Segment Use: Most of the year has significant outbound shipping. December is the lowest month for road use.

Farm Operator K

Farm Traffic Origin: Farm Operator K headquarters (K-HQa) at 9500 SE 327th Avenue.

Farm Traffic Destinations: Fields K-F2 and K-F3.

Farm Traffic Route: From headquarters K-HQa the route to field K-F2 is north on 327th Avenue, then straight through a short segment of Bluff Road to Altman Road with access to field K-F2.

From headquarters K-HQa the route to field K-F3 from the K-HQa headquarters is north on 327th Avenue, then straight through a short segment of Bluff Road, then west on Bluff Road and turning south on Pleasant Home Road to reach the field.

Alternate Farm Traffic Routes: There is no alternate route from headquarters K-HQa to field K-F2. From K-HQa to field K-F3 the alternative is south on 327th Avenue then turning west on Altman Road, then right on Revenue Road which becomes Pleasant Home Road to enter the field. One other alternate route to reach field K-F3 is a farm road that crosses SE 327th Avenue to Pleasant Home Road. Use of this farm road avoids travel on Bluff Road but is not accessible in wet weather due to field road mud.

Outbound Shipping Traffic Route: See description above for Farm Operator K.

Alternate Outbound Shipping Traffic Route: See description above for Farm Operator K.

Lowest Traffic Volume Months for Road Segment Use: July to August and October.

Farm Operator U

Farm Traffic Origin & Destination: Farm Operator U headquarters (U-HQ) at 9825 SE 362nd Avenue is integrated with field U-F1, the farm's container operations.

Farm Traffic Route: The headquarter U-HQ is located with the container yard, and all internal farm travel is within farm roads at this site.

Alternate Farm Traffic Route: None needed.

Outbound Shipping Traffic Route: The principal outbound shipping route is SE 362nd Avenue north to Bluff Road then west on Bluff Road.

Alternate Outbound Shipping Traffic Route: The secondary outbound shipping route is SE 362nd Avenue north to Bluff Road then east on Bluff Road. Travel on Bluff Road is the only alternate outbound shipping route.

Summary for Farms Traveling on Bluff Road

Farm Operators	Alternate Farm Traffic Route	Farm Traffic Lowest Use Seasons	Alternate Outbound Shipping Route
K (multiple routes)	No/Yes	July - Oct	Yes/No
U	None Needed	July - Jan	No

Farm Access at Carpenter Lane

Farm Operator Q

Farm Traffic Origin & Destination: Farm Operator Q headquarters (Q-HQ) at is at 34826 SE Carpenter Lane with short distance movement between fields Q-F2, F3, and F4.

Farm Traffic Destination: Fields Q-F2, F3 and F4 are north of Carpenter Lane.

Farm Traffic Route: Field Q-F2 is accessed from Carpenter Lane and then turning north a short distance on Cottrell Road to reach the field. Fields Q-F3 and F4 are accessed from the headquarters on the south side of Carpenter Lane by crossing Carpenter Lane.

Alternate Farm Traffic Route: None.

Outbound Shipping Traffic Route: Trucks depart from Q-HQ on Carpenter Lane and turn left to Cottrell Road. At Cottrell Road vehicles turn left to reach Bluff Road or turn right to Dodge Park Boulevard.

Alternate Outbound Shipping Traffic Route: There is not alternate route for shipping because Farm Operator Q's loading dock is accessed from Carpenter Lane.

Lowest Traffic Volume Months for Road Segment Use: Approximately June to mid-November.

Summary for Farms Traveling on Bluff Road

Farm Operators	Alternate Farm Traffic Route	Farm Traffic Lowest Use Seasons	Alternate Outbound Shipping Route
Q	No	July - Oct	No

Travel by Other Farms

The farms reviewed in this section are primarily larger farms that frequently use the roads in the project area. Other farms in the area that are not directly on the pipeline route have been identified in the operations report for agricultural compatibility. These additional farms are small-scale and are mainly near the filtration facility. They are not specifically identified here because they have lower reliance on road use than the larger farms.

The farms not specifically included are integrated in a single location, so they do not travel between farm locations on the road system. This greatly reduces their use of public roads. Second, their accepted farm practices have less seasonal variation which reduces critical short-term time periods when they travel on the public roads. Third, unlike the farms identified here, the other farms do not sell farm crops in large volume, so they do not transport products in semi-truck and trailer loads to their customers. All of these factors increase the flexibility for the frequency and timing of when small-scale farms travel on the public roads.

Attachment 6

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Date: June 28, 2023

To: Multnomah County Hearings Officer

From: Bruce Prenguber, M.S., Agricultural Economist

Subject: Bull Run Filtration Facility and Pipelines Project – Response to Public Comments for Farm Use in Multnomah County

This memorandum responds to public comments received as of June 12, 2023, that address farm use in Multnomah County. I have studied the compatibility of the Water Bureau projects with agriculture in the Surrounding Lands for over three years and submitted a report, "Compatibility of Proposed Portland Water Bureau Filtration Facility and Pipeline Operations with Surrounding Agriculture," dated September 2022. That report was submitted for the main land use application for the Water Bureau projects (the "Operations Report"). My "Compatibility of Proposed Portland Water Bureau Filtration Facility & Pipelines Construction with Farm Traffic" report dated June 2023 has also been submitted into the record.

Cottrell Community Planning Organization – Resolution No. 2023-01

This resolution by CCPO makes two broad statements on farm use impacts related to the construction and operation of the Water Bureau filtration facility and pipelines.

Comment 1 – "Whereas the Portland water Bureau has failed to adequately investigate construction and operational effects on existing farming practices on surrounding farm operations within the Cottrell Hamlet" .... Now therefore be it resolved that the Cottrell Community Planning Organization, representing the residents and businesses of the Cottrell Hamlet, that the CPO is opposed to the construction and operation of Portland water bureaus proposed water filtration project at SE Carpenter Lane.

Response to Comment 1: Globalwise, the farm expert retained by the Water Bureau, has extensively studied the agriculture in the Surrounding Lands for the Water Bureau Project for over three years. This includes contact with over 60 property owners in this area and 17 trips into the area for meetings to identify farms, report on accepted farm practices, and to conduct farm-by-farm information for evaluations of potential impacts and mitigation to reduce and eliminate impacts on accepted farm practices. Outreach has also been extended to persons spanning a wide range of subjects, that include extension agents and specialists, university researchers, government inspectors, farm product suppliers, conservation districts and others with expertise to consider their insights on farming in the Surrounding Lands. Published reports have also been reviewed to evaluate farming conditions and determine accepted farm practices.

As a result of this data collection and grower survey work, Globalwise has written extensive reports to address the types of farm businesses in the area, operational characteristics of the farms, farm traffic use of public roads, and any potential construction impacts that might be caused by the Water Bureau's Projects. These reports are now in the land use record.

Globalwise concludes that there will be no significant change in accepted farm practices as a result of either the construction or operation of the Water Bureau Project.

Comment 2 – "Whereas the Portland Water Bureau has failed to adequately include the operational and financial effects of construction on the regional agricultural industry" ... Now therefore be it resolved that the Cottrell Community Planning Organization, representing the residents and businesses of the Cottrell Hamlet, that the CPO is opposed to the construction and operation of Portland water bureaus proposed water filtration project at SE Carpenter Lane.

Response to Comment 2: As part of the extensive analysis of farming and accepted farm practices in the Surrounding as described in the response to Comment 1, Globalwise studied how farmers would respond to both the temporary construction and the operation of the Water Bureau Project. The Water Bureau has carefully considered how to manage the Project so that no significant change in the cost of accepted farm practices will occur in the Surrounding Lands.

Kost Memorandum dated April 17, 2023

Comment 3 – "This plant would also take away a very large piece of valuable farmland. It would be better served and building it on land that is zoned for commercial use instead of taking away production of this agricultural land."

Response to Comment 3: The Water Bureau has proposed to change this property use from farm use to a water filtration facility, a community service use, to meet its mission of providing safe drinking water for nearly one million residents of Oregon. Customers for the drinking water from this facility will include area residents who are customers of the Pleasant Home Water District.

The filtration facility property is zoned MUA-20. In this zone the filtration facility is a community service use that is permitted as a conditional use. As stated in the Water Bureau's land use application, this facility will serve the area's residents, which includes residential customers of the Pleasant Home Water District. The land use application and record further demonstrate that the project satisfies all applicable approval criteria for proposed conditional use, including not forcing a significant change in accepted farm practices on surrounding lands devoted to farm use. Notably, the filtration facility site itself is not considered "surrounding land" for purposes of this standard.

Swinford Email dated April 17, 2023

Comment 4 – "Moreover, the Exclusive Farm Use MCC 39.4215 clearly states that the area is designated for agricultural purposes and discourages any non-farm uses, including industrial or commercial development. The proposed water filtration site would, therefore, be in violation of this code as it does not support the primary agricultural use of the land."

Response to Comment 4: The water filtration facility is not an industrial or commercial development. Instead, it is a community service use. As stated in Comment 3, community service uses are allowed as conditional uses in the MUA-20 zone. Provision of needed community services like reliable, safe drinking water is recognized in the Multnomah County planning regulations. Serving the basic need of the area's population with water has to be balanced with other land use goals, including protecting agricultural land.

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Date: June 28, 2023

To: Multnomah County Hearings Officer

From: Bruce Prenguber, M.S., Agricultural Economist

Subject: Bull Run Filtration Facility and Pipelines Project – Response to Public Comments by Shelly L. Ekstrom LLC Property Letter Regarding Farm Use in Multnomah County

This memorandum responds to the comments of Shelly L. Ekstrom, LLC in their letter dated March 14, 2023, expressing concern for their farm use in conjunction with the Bull Run pipelines and filtration facility construction activities (together referred to as the "Project") proposed by the Water Bureau in Multnomah County.

Comments in the Ekstrom letter are each separately addressed below.

Comment 1– "...the Portland Water Bureau is trying to take prime farmland to site their water filtration plant. The land they are planning to take is some of the finest farmland in the east Multnomah County area, specifically around Carpenter Lane, Dodge Park Blvd., and Lusted Rd. I am not sure if the land is zoned EFU or MUA but placing a 100 acre industrial plant on either of these zonings would never be acceptable in any other case. This would create a strong precedent for future development trying to encroach on farmland."

Response to Comment 1: The property where the water filtration facility is proposed has been owned by the Water Bureau since 1975. This property is in in the Multnomah County Multiple Use Agriculture (MUA-20) zone. In this zone community service uses are allowed as a conditional use and include public water filtration facilities. As stated in the Water

Bureau's land use application, this facility will serve the area's residents, which includes residential customers of the Pleasant Home Water District. The application narrative and information in the record demonstrate that the Project satisfies all applicable Multnomah County approval criteria or will meet the criteria with conditions of approval.

As the property owner, the Water Bureau is applying for community service use to fulfill its mission of supplying its customers with high quality water from its current major source of water supply, the Bull Run system. No zoning changes are requested for this property and there is no zoning change for any other farm use property in the Surrounding Lands as part of this land use application.[1] This land use approval does not give other landowners, whether farmers or otherwise, a foundation to request a change in zoning or use of their property not permitted in their respective zone. Therefore, approval of the Water Bureau's land use application does not result in strong precedence for further encroachment on other farmland in this area.

Comment 2 – "The Portland Water Bureau plans to place two 5 ½' pipes on the eastern property line of the property that would be roughly 50-100' wide and run the length of the property, taking about 4 acres of prime farm land out of production. This equates to 38,000 to 40,000 plants per year with a value of about $500,000 per year. At the NE property corner where the property connects to Lusted Rd., the Portland Water Bureau wants to locate a valving station that would require a large building and an additional acre of land. This would be roughly 5 acres of land in total that are at risk of being taken out of productive farming.

The Portland Water Bureau communicated to us that they will replace the layers of soil exactly how they are now, so the land will not be harmed. Anyone with the slightest bit of soil or geological knowledge, knows that is not possible, especially a farmer."

Response to Comment 2: The Ekstrom property is in the MUA-20 zone. The Water Bureau has carefully evaluated the property and proposes to locate the pipelines along the eastern edge of the field and place the Finished Water Intertie next to Lusted Road along the northern property edge. The existing farm road will be used for construction access which minimizes removal of land from crop production and reduces soil compaction and other ground disturbance where crops are grown. The pipeline construction design team has also held the permanent and temporary easement areas to the minimum area necessary for construction activity. All of the land area required for temporary easement access as well as land within the permanent easement that the farmer can use for crop production will be restored as nearly as possible to its pre-construction condition. The native topsoil will be kept separate from other sub-soil and returned over the pipeline construction zone where nursery plants can be again grown. The existing dirt and partially gravel farm road will be replaced with an improved gravel road and will be available

[1] Surrounding Lands is defined as the area around the proposed filtration facility site and pipelines which encompass the land area with any potential for significant impacts on accepted farm practices or farm operating costs. This is discussed on the report, "Compatibility of Proposed Portland Water Bureau Filtration Facility and Pipeline Operations with Surrounding Agriculture" which has been submitted to Multnomah County.

for farm use, as well as monitoring and maintenance of the pipeline, and accessing the intertie building.

The Water Bureau will restore agricultural land and associated improvements that are damaged or disturbed following the best science and soil restoration practices as described in the Agricultural Soil Restoration Plan prepared by Dr. Denny Mengel, Certified Professional Soil Scientist, (Land Use Application, Appendix D.2). Additionally, the Water Bureau will allow the Ekstrom & Schmidt Nursery to raise crops on the permanent pipeline easement area, except for trees which cannot be grown within a 5-foot buffer from the Water Bureau's buried pipelines.

The property owners will be compensated for any nursery crop loss due to the interruption of growing and selling nursery crops on the small portion of the Ekstrom field impacted by construction of Water Bureau pipelines and the intertie. However, this compensation is not considered in the evaluation of the farm use impact.

Only a small share of the Ekstrom field will be permanently removed from crop production after the temporary construction is complete for the pipelines and intertie. As noted previously, immediately after construction extensive soil remediation and monitoring will be implemented to return the land to reasonable crop productivity. The Water Bureau will also replace or repair any farm infrastructure that may be damaged during construction activity on the Ekstrom property and follow clear and objective conditions imposed by Multnomah County to mitigate and minimize any such impacts.

For all these reasons, the construction of the pipeline, pipeline appurtenances, and the intertie facility will not cause any significant change in the accepted farm practices for the Ekstrom and Schmidt Nursery and there will not be a significant increase in the costs of accepted farm practices.

Comment 3 – "I have farmed in this area for over 40 years and farmed over the existing Portland Water Bureau pipelines on several different properties where the old pipes were laid in the 1930's. The soil and plant growth has never been the same as the natural undisturbed soil. I'm not sure whether it is the changes of the interface between the layers of soil or the compaction from equipment or a combination of both issues. The production of the soil in terms of plant growth is not the same. In addition, there is the issue of uncovering old weed seeds that have been buried for years. Bringing them up to the surface allows them to come back to life (Horsetail Rush in particular). Thus, creating a problem."

Response to Comment 3: Current knowledge and the extensive effort to restore soil conditions in farmland after pipeline construction is significantly improved over the more minimal soil restoration practices from 90 years ago. The soil restoration activities planned for the Ekstrom property are summarized in the response to Comment 2 and are fully explained in the Agricultural Soils Restoration Plan by Dr. Mengel. Regarding weed reinfestation, monitoring of conditions which includes weed assessment will occur for two years after construction and initial restoration is complete. Any indications of new weed species introduced due to construction will be treated by Water Bureau contractors in consultation with Ekstrom and Schmidt Nursery personnel.

For all these reasons, the construction of the pipeline, pipeline appurtenances, and the intertie facility will not cause any significant change in the accepted farm practices for the

Ekstrom and Schmidt Nursery and there will not be a significant increase in the costs of accepted farm practices.

Comment 4 – "I have not even spoken to the problems we as farmers will have on the local roads considering the addition of thousands of heavy trucks on the already crumbling roads in the area if this construction project goes through."

Response to Comment 4:

The Ekstrom letter does not describe any specific impacts for their farm use property regarding the construction traffic that will be added on the roads. However, the impacts of additional construction traffic in Surrounding Lands, has been extensively studied by Globalwise and analyzed in the Construction Traffic Impacts Analysis. Regarding the farm use of the Ekstrom property several factors are important. Like most other farmers in the surrounding lands, the Ekstrom and Schmidt Nursery has alternative routes they take as road traffic conditions change. Use of alternative routes to reach farm fields is an accepted farm practice. The Ekstrom property has access points from both Lusted Road and Dodge Park Boulevard, which gives the nursery flexible choices for road travel on the local road network.

Furthermore, there is no proposed pipeline construction in the segment of Dodge Park Boulevard between Altman Road to the east on Dodge Park Boulevard at the Ekstrom field access point.

The pipeline and filtration facility construction contractors have plans to address specific farmer road use needs by 1) giving farmers prior notice when increased deliveries of construction supplies are planned, 2) providing farm businesses property access as necessary during the construction process, 3) two-way information sharing to facilitate movement of larger agricultural equipment and heavy vehicles, construction schedules and critical farm routes (See Construction TIA, page 20).

Finally, the overall conclusion of the Construction TIA is impacts to intersection and roadway operations due to construction traffic from the Project will be minimal even under conservative analysis assumptions that take into consideration pipeline construction closures. As a result, farm vehicles traveling on identified roadways and through the study intersections will experience minimal delays as a result of the Project construction.

For all these reasons, the construction of the pipeline construction in the public roads, and the farm properties as well as the added construction traffic will not cause any significant change in the accepted farm practices for the Ekstrom and Schmidt Nursery or for other farmers operating farm use properties in the Surrounding Lands, and there will not be a significant increase in the costs of accepted farm practices.

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Date: June 28, 2023

To: Multnomah County Hearings Officer

From: Bruce Prenguber, M.S., Agricultural Economist

Subject: Bull Run Filtration Facility and Pipelines Project – Response to Public Comments by Surface Nursery Letter and Email Regarding Farm Use in Multnomah County

This memorandum responds to the comments of Surface Nursery in their letter dated April 4, 2023. They expressed concern for their farm use in conjunction with the Bull Run pipelines and filtration facility construction activities (together referred to as the "Project") proposed with Water Bureau in Multnomah County. The first nine comments with responses are contained in the letter of April 4, 2023. An additional comment was received from Surface Nursery in an email dated March 3, 2023. That comment with my response is included at the end of this memorandum.

The first nine comments are stated in the April 4, 2023, letter. Surface Nursery broadly stated how the filtration facility and pipelines, in their words, "will force a significant change in our well-established farm practices and influence our daily routines in a negative matter." Each separate comment is addressed below.

Comment 1– "In summer we have an average of 7 tractors per day on the roads in the area."

Response to Comment 1: Globalwise, the farm expert retained by the Water Bureau, has extensively studied farm vehicle travel routes on public roads in the area referenced in this letter. This is based on discussions with farmers in the Surrounding Lands, including

Surface Nursery, and observing road use during 17 trips in the Surrounding Lands.[1] A farm-by-farm assessment of farm travel resulted from the study of agriculture and farm road travel in the Surrounding Lands and this is part of the basis for this response. My "Compatibility of Proposed Portland Water Bureau Filtration Facility & Pipelines Construction with Farm Traffic" report dated June 2023 has also been submitted into the record. The appendix to that report has detailed farm-by-farm information on the farm traffic in the Surrounding Lands.

Surface Nursery as well as other farms in the area stated that, with some exceptions, they will take alternative routes when needed. All farm use of the public roads is predicated on the shared public road use by farmers with other users. Shared public road use is an accepted farm practice.

Information Globalwise gained from discussions with Surface Nursery and other farmers on their travel routes was reviewed with the Water Bureau's pipeline designers. As part of the design process, pipeline construction constraints have been incorporated in the construction plans to accommodate farmers' use of the roads.

Tractors and other slow farm vehicles will, in most cases, pass through pipeline work zones with negligible delay time. In the case of Surface Nursery, its main location of concern is the intersection of Cottrell Road and Dodge Park Boulevard. The Water Bureau has added a pipeline construction constraint to allow multi-day closure of that intersection only during their low seasonal travel on the roads and that intersection.

Regarding the addition of construction vehicles on public roads, information from the Traffic Impact Analysis ("construction TIA") by Global Transportation Engineering shows that all intersections in the Surrounding Lands will remain at Level of Service (LOS) to meet Multnomah County standards. The Water Bureau has mitigation plans to manage construction-related traffic to meet the LOS standards of Multnomah County. This means the delay times at all intersections analyzed will be minor even with added Water Bureau construction vehicles.

Surface Nursery has travel safety reasons for designating that tractors and other slow-moving vehicles only use Dodge Park Boulevard when traveling to or from one of their fields located in Lusted Flats on lower elevation of Lusted Road. When the Water Bureau is installing pipes in Dodge Park Boulevard to the east of the intersection of Cottrell Road and Dodge Park Boulevard, a flagger will facilitate the passage of Surface Nursery farm traffic through the single lane of construction zone traffic.

For other travel routes taken by Surface Nursery, they may choose to send farm vehicles on a detour route. The alternate routes have been evaluated. For vehicles going to Surface Nursery fields along Bluff Road or to the south of Bluff Road, the route from their headquarters is to go west to Altman Road and then east on Carpenter Lane. If a delay is in the segment of Lusted Road, slow moving farm vehicles can take a farm road south to Dodge Park Boulevard, and then go west to Altman Road to reach that field.

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[1] Surrounding Lands is defined as the area around the proposed filtration facility site and pipelines which encompass the land area with any potential for significant impacts on accepted farm practices or farm operating costs. This is discussed on the report, "Compatibility of Proposed Portland Water Bureau Filtration Facility and Pipeline Operations with Surrounding Agriculture" which has been submitted to Multnomah County.

Another means of assistance for Surface Nursery for route planning is the frequent sharing of construction schedules by on-site pipeline construction supervisors. They will contact designated personnel at Surface Nursery. Also, Surface Nursery managers can request the latest updates on pipeline construction information. This two-way communication is a valuable accommodation to further reduce and/or eliminate farm vehicle delays through construction work zones.

Comment 2 – "On any given day, roughly 50 employees travel in four buses to seven locations within a 3-mile radius."

Response to Comment 2: As discussed in Comment 1, some employees drive tractors and slow-moving vehicles. However, most of Surface Nursery's field crew members are transported in small buses with 6 to 8 employees. The buses are capable of travel at posted speed limits on public roads. Other employees such as supervisors and field irrigators also drive passenger vehicles that travel at posted speed limits. These vehicles reach fields with little delay time if they choose to take an alternate route.

Comment 3 – "Assuming 200+ trucks a day during construction project... we have workers as close as 10 feet from construction road... Potential diesel fumes, noise, road dust; would be a concern for employee health impacts as well as safety concerns."

Response to Comment 3: This comment appears to be a reference to the use of the emergency access road south of the facility for construction. The emergency access road is located in Clackamas County and is therefore outside of Multnomah County's jurisdiction. Nonetheless, all construction vehicles will travel on public roads or along existing farm road alignments. All trucks for construction as well as all other vehicles will meet applicable air emission standards, and all construction vehicles will travel at or below posted speed limits. On project roads with a gravel surface, road dust will be managed by water application or other dust suppression techniques during dry periods. Therefore, to the limited extent that this concern is applicable to the Multnomah County decision, use of the emergency access road will not a force a significant change in accepted farming practices.

Comment 4 – "Employees apply pesticides to trees as close as 10 feet from construction road."

Response to Comment 4: It is accepted farm practice for all farms in the Surrounding Lands to follow farm pesticide labels as determined by the Environmental Protection Agency, and it is understood that Surface Nursery employees may apply pesticides to trees in as close as 10 feet from a construction road. Currently Surface Nursery applies pesticides within 10 feet of roads which include Bluff Road, Lusted Road, and other roads in the Surrounding Lands. Their continued accepted farm practice of applying approved farm chemicals at this distance from construction roads will have no bearing on the health and safety for either Surface Nursery employees or construction vehicle occupants.

Comment 5 – "Trailers hauling our freshly dug trees are traveling on the roads numerous times each day between the fields and our home farm tree storage facility. Congestion from additional construction vehicles will cause delays in our processes."

Response to Comment 5: As stated in comment 1, the Water Bureau will implement constraints that facilitate farm vehicle travel though work zones and intersections. The Water Bureau's Construction Traffic Impact Analysis shows that intersections in the Surrounding Lands will not have significant delays at intersections with the additional

construction vehicles on the public roads. Therefore, any delays that Surface Nursery may experience will not significantly change their accepted farm practices during the harvest of trees and nor will it result in a significant increase in the cost of their accepted farm practices.

Comment 6 – "During shipping season, semi-trucks back into our loading docks off Lusted Road."

Response to Comment 6: Semi-trucks arrive and depart from Surface Nursery's headquarters on a section of Lusted Road between Surface Nursery's headquarters on Lusted Road and Hosner Road. This segment of road will have no pipeline construction which greatly minimizes the potential for delays. Furthermore, the Water Bureau has plans for phasing minimal pipeline construction in other segments of roadways for semi-trucks to reach Surface Nursery's headquarters. Therefore, any delays for trucks arriving or departing from Surface Nursery headquarters will not change their accepted farm practices and will not result in a significant increase in the cost of accepted farm practices.

Comment 7 – "Deliveries made to and from our home farm property and office will be impacted through traffic delays in construction routes/detours on the area roads."

Response to Comment 7: Delivery vehicles travel at or near the posted speed limits for public roads. As stated in the responses of comments 1, 2, and 6, the water Bureau has included constraints for pipeline construction that will allow reasonable farm movement in the Surrounding Lands for Surface Nursery. Furthermore, the Construction TIA shows that intersection delays will be negligible due to the increase in construction vehicle travel. Finally, as an accommodation the Water Bureau plans to communicate with farmers and delivery service companies to share construction schedules so that alternate routes can be utilized if that choice is made. Therefore, any delivery delays for arrival or departing vehicles from Surface Nursery headquarters will not change Surface Nursery's accepted farm practices and will not result in a significant increase in the cost of accepted farm practices.

Comment 8 – "Oil and gas washing into our streams and fields. Impact on our trees?"

Response to Comment 8: This comment is vague but seems to reference use of the emergency access road located in Clackamas County. To the limited extent that it applies to the Multnomah County land use decision, all vehicles used during construction and facility operation will be inspected and maintained to avoid release of oil or gas on surrounding lands.

Comment 9 – "Our company office, tree storage facility, maintenance and operation buildings are all located on Lusted Road. In project proposal documents, Lusted Road is mentioned in nearly every single part of the proposed development. Thus our farm, our employees, and our partners have a high probability of being impacted by this project."

Response to Comment 9: The response to previous comments describes Water Bureau project plans to avoid or mitigate impacts on Surface Nursery and their headquarters on and near Lusted Road. The responses show that there will be no changes in accepted farm practices for Surface Nursery and there will be no significant increase in the cost of accepted farm practices for this nursery.

Comment from Surface Nursery in an email dated March 3, 2023 – "I am concerned about roads the PWB plans on using during construction. There is concern from neighbors and I that Multnomah County has determined that Dodge Park Blvd., Carpenter Lane, and Cottrell Road do not qualify for use during construction. If this is true all traffic would have to use Bluff Rd. and the only way to get to Bluff Rd. would be through our nursery.

Response to Above Comment: The phrase the roads "do not qualify for use during construction" is vague. However, the Water Bureau has not requested that Multnomah County disqualify any road for non-use during Project construction. Road widening and repavement improvement is proposed by the Water Bureau for Carpenter Lane and for the short section of Cottrell Road from Carpenter Lane to Dodge Park Boulevard. These improvements are typically made in half-width increments which facilitate access to adjoining property or other essential traffic with only brief delay. This includes access to Surface Nursery property.

Short-term intersection closure is necessary for pipeline construction within the intersection of Cottrell Road and Dodge Park Boulevard. However, this will be scheduled for the lowest season of farm traffic use.

For the reasons stated above, the Project activities identified in the letter will not result in significant changes in accepted farm practices or cause a significant increase in costs of accepted farm practices for Surface Nursery.

Attachment 7

June 29, 2023

mwa architects

SAN FRANCISCO · PORTLAND

Bull Run Filtration Facility Fire Protection Strategy

In response to the statement by Gresham Fire and Emergency Services that they are not able to deliver the requisite personnel and equipment to a major event within the standards of NFPA 1710 (which includes a stated eight minute response time), the Portland Water Bureau is providing the following overview of the Filtration Facility's fire protection design and strategies that will provide building and site protection should an extended response time by Gresham Fire occur. The items covered in this overview include:

- Site provisions for fire containment and to limit spread
- Fire protection system information
- Facility fire suppression provisions that go beyond code requirements
- Chemical containment provisions and response plans
- Staff training to address emergencies

Site Provisions

The Facility site layout groups structures together near the center of the site to provide large perimeter buffers between the structures and the property lines and hazard zones. The landscaping at the site incorporates fire risk management strategies consistent with Multnomah County guidelines for areas subject to wildfires. These strategies include restrictions on the types of plantings within 30 feet of buildings and site-wide management of plantings to reduce fuel and fire risks. The interior of the site is generally hardscaped. Areas of rescue assistance away from facilities have been located for staff protection in case of evacuation. Road widths, turning radii, and overall circulation patterns were designed to accommodate fire apparatus access. Two points of emergency access are provided – the main entrance off Carpenter Lane and a secondary access south to Bluff Road – as well as perimeter facility access via easements and security paths.

Each building and structure have been assigned a name and will have large exterior signage for fire department identification purposes. Each building has been separated from adjacent structures to avoid the need for fire-rated exterior walls.

Fire Protection System

A fire pump station dedicated to the Facility will provide water to hydrants and sprinkler systems throughout the site. This pump station, capable of providing 3,000 gpm at 75 ft of discharge pressure, draws from the Clearwell, which will maintain a minimum of 1.0 million gallons of water storage dedicated to fire protection. There will be up to 3.7 million gallons of additional operational storage available for fire protection, if needed.

Facility Provisions

All buildings on the site will meet, and in some cases exceed, current codes and best practices for fire protection, including NFPA 285 and NFPA 13. Preliminary designs were reviewed by Gresham Fire and FM Global (the City of Portland's insurer and a publisher of

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industry standards for fire protection). Based on these external reviews and recommendations from PWB operations staff and design team fire protection experts, the following aspects of the design exceed minimum code requirements.

- The Maintenance Building (Area 12) was provided with sprinklers, despite not being required by minimum code requirements.
- For the Facility, sprinkler actuation in an instrumentation room can have severe consequences, potentially risking an extended interruption in water production. To balance the risks of a fire starting in an instrumentation room against the consequences of deluging the Facility process controls system with water, the instrumentation rooms within buildings where sprinklers are provided (the Administration, Maintenance, Chemical and Ozone Buildings) have been provided with clean-agent fire suppression systems which will suppress a fire with little or no damage to electrical and controls equipment.

Most of the structures on site (by area) are concrete water-bearing structures, which are inherently fire resistant. Most other buildings are designed with fire-resistant materials, such as concrete and steel, and use FM Global-listed fire-resistant exterior materials including metal panel siding, standing seam metal roofing, rock-wool insulation, and double paned windows.

Fire protection at the facility is further enhanced by an extensive fire alarm system that includes numerous manual pull stations and smoke detectors throughout the facility. Additionally, the many cameras in and around the facility provide the round-the-clock operations staff (both on-site and off-site) with the ability to monitor the facility, evaluate potential threats, assess the need for responses to a variety of alarms, and direct those responses once the authorities have been dispatched.

Chemical Containment Provisions and Response Plans

The design of chemical delivery, storage and dosing systems follows IBC building codes, NFPA fire codes, and industry best practices. Throughout the design process, consultant and PWB staff engaged in focused efforts on improving the safety of construction, operations and maintenance, using safety as a primary criterion in decision-making processes. These efforts included formal Hazard and Operability (HAZOP) review workshops with PWB operations and safety staff following Occupational Safety Health Administration (OSHA) guidelines for process safety management.

Chemical deliveries to the site will follow routes through the site which do not require trucks to back up. Separate delivery zones are provided for acidic and basic chemicals to reduce the risk that chemicals that react with each other could come into contact. Loading areas are covered and are provided with separate catchment and containment areas.

Within the Chemical Building, six separate containment areas are provided for chemical storage tanks and feed equipment. These containment areas are designed to hold the

volume of the single largest tank in the containment area plus twenty minutes of sprinkler flow, while allowing two inches of freeboard.

Staff Training for Emergency Response Assistance

Water Bureau treatment operators are currently trained for hazards present at their work sites, including hazardous materials and confined spaces. Water Bureau treatment operator training for the filtration facility will include facility-specific safety protocols and Occupational Safety Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) certification and training.

MWA Architects

Casey Hagerman, AIA, Project Manager

Jeff McGraw, AIA, Principal in Charge

REGISTERED ARCHITECT
JEFFREY J. McGRAW
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Attachment 8

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Mingus Mapps, Commissioner
Gabriel Solmer, Director

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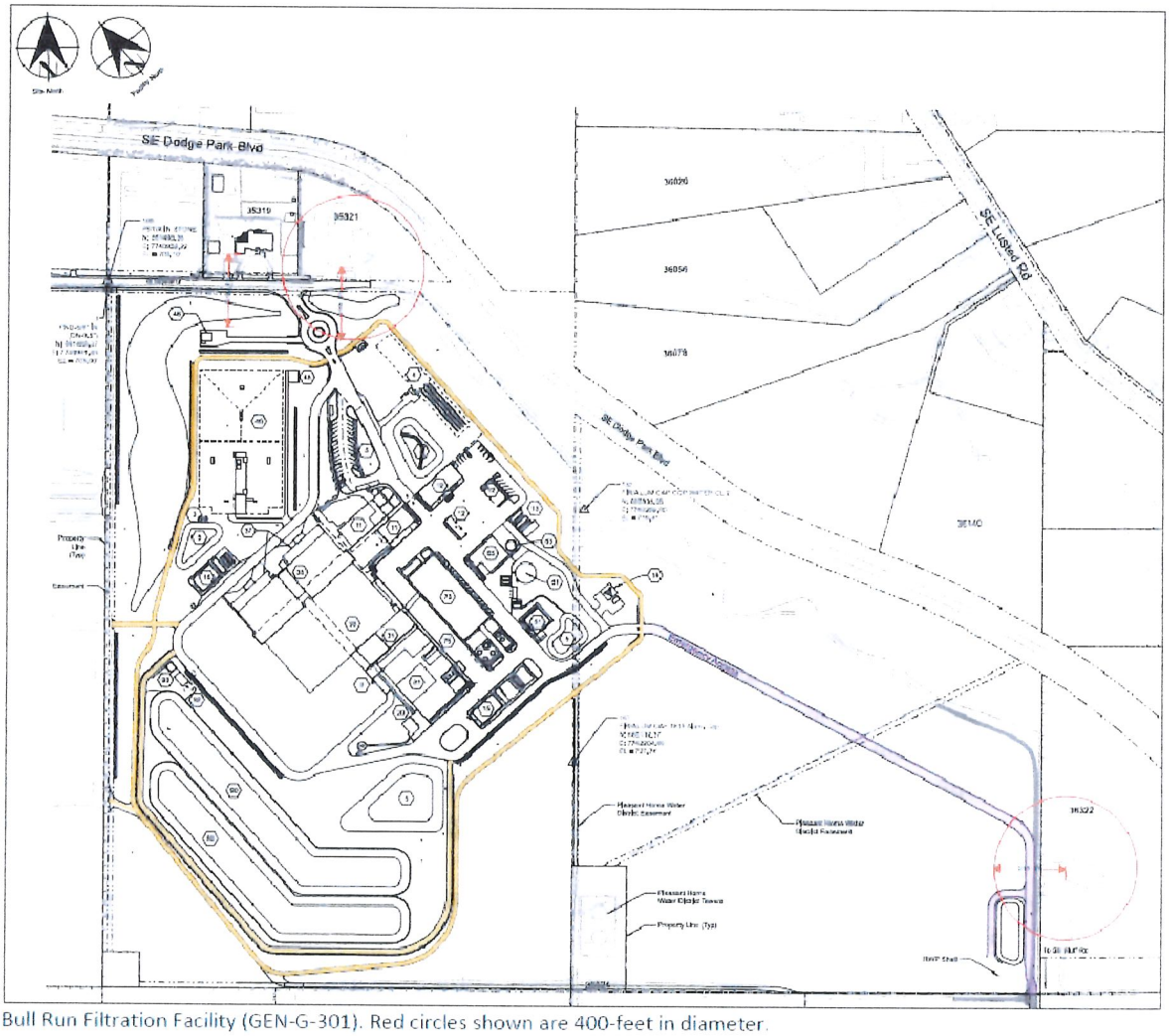
Dust Control of Bull Run Filtration Facility Perimeter and Emergency Access Roads

Measures to control dust from the filtration facility perimeter and emergency access roads will primarily be based on operational procedures and permanent design of the Facility. The perimeter and emergency access roads are shown in the graphic below as yellow and pink, respectively. While active preventative measures to maintain dust control will be employed during any construction activity, the best measures for typical operation are those with permanent passive measures.

The following measures will be used to control dust from the emergency access road and the perimeter road around the facility:

- Vehicle trips will be limited.
  - Security inspection will occur twice a day to confirm that fencing and security measures are in place.
  - Inspection of the roadways and gravel is anticipated to be monthly.
  - Inspection access to the shaft will be monthly. Facility assets near the emergency access road on property are primarily underground therefore surface inspections will be uncommon.
  - Inspection of stormwater facilities will be monthly, primarily during the wet season and after storm events.
- Vehicular speed will be limited to 15mph and documented in operation procedures.
- Install berms to serve as windbreaks.
  - Grading plans include significant berms at several locations on the outer edges of the facility. These berms will provide screening and serve as windbreaks.
- Install vegetation to serve as windbreaks.
  - Landscape plans include dense plantings on the outer edges of the facility which will provide screening and act as windbreaks that prevent dust dispersion to neighboring properties.

Where maintenance activity, including repairs or replacement of the fence, landscaping, and or stormwater system is required, active dust control will be employed consistent with dust control used during construction of the facility. These activities will vary from annual trimming of landscaping to cleaning of stormwater ditches and grading of access road approximately once every five years.



Bull Run Filtration Facility (GEN-G-301). Red circles shown are 400-feet in diameter.

There are two residences within 200' of the proposed gravel roads.

- 35321 SE Carpenter Lane, R342586 – A berm is proposed on PWB property between the gravel road and the SE Carpenter Lane right-of-way. The berm is proposed to be five feet above the roadway. The berm will act as a windbreak between the roadway and the residence. The berm will be planted with a Screening Mix Forested and will be further surrounded with trees and with Grassland Seeding per the schedule below. The vegetation will act as a windbreak.

- 36322 SE Dodge Park, R154381 – There is a dense wall of trees on PWB property at the east edge of the facility. The trees are proposed to be retained and will serve as a barrier and windbreak between the gravel road and the residence. While these are deciduous trees, the trees are leafed out during the summer and fall when dust dispersion is most likely. Landscaping along the emergency access road will be restored with topsoil and grassland seeding with Grassland Seeding per the schedule below.

Screening Mix - Forested				
Legend	Botanical Name	Common Name	Plant Size	% Composition
	Trees			
	Abies grandis	Grand Fir	2' Ht. Max Bareroot	15%
	Acer macrophyllum	Bigleaf Maple	2' Ht. Max Bareroot	5%
	Calocedrus decurrens	Incense Cedar	2' Ht. Max Bareroot	15%
	Larix occidentalis	Western Larch	2' Ht. Max Bareroot	5%
	Pinus ponderosa	Ponderosa Pine	2' Ht. Max Bareroot	10%
	Pseudotsuga menziesii	Douglas Fir	2' Ht. Max Bareroot	5%
	Rhamnus purshiana	Cascara	2' Ht. Max Bareroot	5%
	Salix scouleriana	Scouler's Willow	2' Ht. Max Barerot	5%
	Shrubs			
	Mahonia aquifolium	Tall Oregon Grape	Bareroot	15%
	Oemleria cerasiformis	Oceberry	Bareroot	5%
	Polystichum munitum	Swordfern	Bareroot	5%
	Rubus parviflorus	Thimbleberry	Bareroot	5%
	Symphoricarpos albus	Snowberry	Bareroot	5%

Planting Schedule 1 (GEN-L-102)

	Grassland Seeding - Color and Fire Resistance Focused		
Legend	Botanical Name	Common Name	lbs/Acre
	Danthonia californica	California Oatgrass	6
	Deschampsia elongata	Slender Hairgrass	5
	Festuca occidentalis	Western Fescue	1
	Festuca roemeri	Roemer's Fescue	2
	Hordeum brachyantherum	Meadow Barley	2
	Koeleria macrantha	Prairie Junegrass	1
	Poa scabrella	Pine Junegrass	2
	Forbs		
	Achillea millefolium	Yarrow	0.5
	Asclepias speciosa	Milkweed	0.5
	Anaphalis marginatacea	Pearly Everlasting	0.5
	Brodiaea coronaria	Brodiaea	0.5
	Epilobium angustifolium	Fireweed	0.25
	Eriophyllum lanatum	Oregon Sunshine	0.5
	Gaillardia aristata	blanket flower	0.5
	Geranium oreganum	Western Geranium	0.5
	Lomatium macrocarpum	*Bigseed Biscuitroot*	1
	Lupinus polyphyllus	*Bigleaf Lupine*	0.1
	Penstemon cardwellii	Cardwell's penstemon	0.25
	Prunella vulgaris ssp lanceolata	Common Selfheal	0.5
	Sidalcea campestris	Meadow checkermallow	0.5
	Solidago canadensis	Canada Goldenrod	0.5

Planting Schedule 1 (GEN-L-101)

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Dust Control Plan for Bull Run Filtration Facility

The following measures will be used to control dust during the construction of the Bull Run Water Filtration Facility:

- Vehicle speeds will be limited to 10 mph according to the traffic control plan, which will reduce dust on temporary paved/gravel road surfaces.
- Use signs and access barriers where appropriate to deter unauthorized access in accordance with the traffic control plan and access management.
- Water trucks will be operated continuously through the dry season, wetting all onsite gravel roads and haul routes which produce dust.
- Paved roads will be periodically swept and washed.
- Water truck passes will be conducted in a manner that applies enough water to control dust but not to an excess that will cause runoff and erosion.
- There will be two onsite filling stations for water trucks. The first is located at the fire hydrant in the NW corner of the site along SE Carpenter Lane. The second is located at the NW side of the overflow ponds on the uphill side. Both filling locations will be temporarily paved or stabilized to provide adequate erosion prevention for continuous use.
- Limited use of water absorbing (hygroscopic) salts or lignin products as per manufacturer's recommendation to decrease the frequency of watering trafficked areas.
- Wheel wash facilities will be installed and utilized as necessary to control track-out which would otherwise contribute to dust on Carpenter Lane and Bluff Rd.
- Use of cover or other acceptable means (e.g., watering as needed) of retaining soils on stockpiles and preventing fugitive dust releases.
- While loading trucks from stockpile or excavation areas, when practical, conduct loading/unloading activities on the downwind side of the pile.
- Addition of moisture, as needed, during the loading operation to minimize the release of dust during loading and/or hauling.
- While loading trucks from stockpile or excavation area, minimize drop heights and transfer points whenever practical.