Draft Analysis of Brownfield Cleanup Alternatives

Former Blue Heron Paper Mill
419-427 Main Street
Oregon City, Oregon 97045

Stantec

Prepared for:
Confederated Tribes of the Grand Ronde Community of Oregon

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Acronyms / Abbreviations

ABCA	Analysis of Brownfield Cleanup Alternatives
bgs	Below Ground Surface
CTGR	Confederated Tribes of the Grand Ronde Community of Oregon
DEQ	Oregon Department of Environmental Quality
EPA	United States Environmental Protection Agency
mg/kg	Milligrams Per Kilogram
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PPA	Prospective Purchaser Agreement
Property	Former Blue Heron Paper Company Mill
RBC	Risk-Based Concentration
Stantec	Stantec Consulting Services Inc.
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound
WSP	Williams Sale Partnership

1 INTRODUCTION

This Draft Analysis of Brownfield Cleanup Alternatives (ABCA) has been prepared by Stantec Consulting Services Inc. (Stantec) for the Former Blue Heron Paper Mill property (Property). The Property is a brownfield as defined by the United States Environmental Protection Agency (EPA). The purpose of this ABCA is to present and evaluate remedial actions that may be used in mitigating the Property to facilitate its redevelopment.

1.1 Property Background

The Property is owned by The Confederated Tribes of the Grand Ronde Community of Oregon (CTGR), which purchased the Property in 2019 from Willamette Falls Legacy, LLC, which acquired the Property out of bankruptcy in 2011.

A Prospective Purchaser Agreement (PPA) was executed between CTGR and the Oregon Department of Environmental Quality (DEQ) effective August 15, 2019 (DEQ, 2019). As the Property owner, CTGR has primary responsibility for all investigation and remediation activities at the Property.

1.2 Property Description

The address of the Property is 419 - 427 Main Street, Oregon City, Oregon 97045. The Property is at latitude 45.355355 North and longitude 122.611734 West (Figure 1). The Property consists of a total of 23.16 acres and is described as a portion of the Plat “Oregon City” and other lands located in the northwest ¼ and southwest ¼ of Section 31, Township 2 South, Range 2 East, Willamette Meridian, Oregon City, Clackamas County, Oregon (Figure 2).

The Property is shown relative to surrounding features and topography in Figure 1. A site layout showing Property conditions in 2023 is shown in Figure 2. The Property is on the southeast bank of the Willamette River, abutting Willamette Falls.

The Property has been subdivided into nine parcels based upon future development plans. Assessment and cleanup activities completed in each of these nine parcels is described in the EPA’s Assessment, Cleanup and Redevelopment Exchange System database. The configuration of these nine parcels is depicted in Figure 3.

The Oregon City zoning map shows the Property with a zoning designation of Willamette Falls Downtown District that applies to the historic Willamette Falls area bordered by US Highway 99E/McLoughlin Boulevard, the Oregon City downtown district to the north and east, and the Willamette River to the west and south.

The Property is a vacant former pulp and paper mill and in 2021 contained approximately 55 buildings and ancillary structures that were vacated when Blue Heron Paper Company ceased operations in 2011. Numerous buildings and ancillary structures have been removed from the Property from 2021 to present.

The CTGR employs 24-hour security, and a security office is maintained off Main Street near the entrance to the Property.

1.3 Property History

The Property is located adjacent to the Willamette River, abutting Willamette Falls, a unique hydrologic, historic, and culturally significant natural feature, which made the Property a hub for Native American life and later for industrial development.

Willamette Valley tribes and bands of the CTGR historically inhabited the lands surrounding Willamette Falls and managed access to Willamette Falls (Beckham, 2021). Willamette Falls and its vicinity was the aboriginal homeland of the Clackamas, Clowwewalla, and Multnomah and was a fishery used by their neighbors, the Kalapuya and Mollala. Willamette Falls is in the ratified treaty area of the CTGR Reservation. The Clowwewalla (an antecedent tribe of the CTGR) signed the Willamette Valley Treaty of 1855, which ceded title to Willamette Falls and the local area to the United States in exchange for certain rights and benefits. Willamette Falls and the local area is a core ancestral homeland of the CTGR. In April 2016, the CTGR formally gained the permission of the State of Oregon to construct and use a fishing platform at Willamette Falls (“Beckham Report Bolsters Tribe’s Historical Claims to Managing Willamette Falls Fishery | Smoke Signals”). The 2019 purchase of the Property returns CTGR control to land abutting Willamette Falls.

Willamette Falls Woolen Mill was opened on the Property in 1857 and Oregon City Woolen Mill began operations in 1862. Beginning in the 1860s, paper mills began operations using the water power from the falls. Oregon City Paper Manufacturing Co. began operations in 1866. Electricity was generated at Willamette Falls in 1888 by the Willamette Falls Electric Company. In the 1890s, the falls was the site of the first successful plant in the United States to send electricity through long-distance power lines. Willamette Falls provided electricity for the Pacific Gas & Electric Company at its plant across the river. In 1892, Portland General Electric Company (PGE) was formed. PGE continues to generate electricity at the falls today.

Prior to its development, the southern portion of the Property consisted of a basalt outcrop that had been scoured free of unconsolidated materials by the Willamette River. These areas were filled over time to extend buildable land. The original tailraces beneath Property buildings and structures provided drainage along natural pathways; however, over the years, these were improved and became part of the Property's water discharge system. Below-grade spaces, basements, equipment areas, drainageways and below grade pipe corridors span much of the Property today.

Notable past Property operations included a tannery and soap manufacturing, at least three bleach houses, two dye houses, laundry operations, several large aboveground fuel storage tanks, two electrical substations, a former transformer "field", tailraces, rail spurs, and large product storage areas and stockpiles.

1.4 Regulatory Status

The investigation and cleanup work at the Property is being performed consistent with the PPA executed between the CTGR and the DEQ (DEQ, 2019), applicable Oregon Administrative Rules (340-122-0010 through -0115), DEQ guidance, and, as appropriate, the EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under the Comprehensive Environmental Response, Compensation, and Liability Act, Office of Solid Waste and Emergency Response Directive 9355.3-01, 1988. Regulatory oversight of the Property investigation and cleanup is provided via the DEQ Voluntary Cleanup Program. The DEQ project manager for the Property is Mark Pugh.

1.5 Previous Investigations

Due to the Property's extensive industrial history, numerous soil and groundwater sampling events have taken place over the years. These include investigations by Bridgewater in 2011, Environmental Resources Management in 2012, Maul Foster Alongi in 2017 and 2018, and Apex Companies LLC in 2018. For details regarding the findings of previous investigations refer to individual reports, and the Previous Investigations section of the Draft Soil and Groundwater Focused Remedial Investigation Report (WSP, 2024). Assessment findings for all previous investigations are summarized in Section 2 below.

2 SITE ASSESSMENT FINDINGS

Focused Remedial Investigation soil and groundwater sampling activities were completed at the Property in 2024. Focused Remedial Investigation results are presented in the Draft Soil and Groundwater Focused Remediation Investigation Report prepared by WSP and dated February 26, 2024 (WSP, 2024). The primary goal of the Focused RI was to eliminate assessment data gaps identified through a review of all previous investigation data.

Remedial Investigation activities identified environmental impacts in 17 areas. Site assessment findings for each of these areas are summarized below.

2.1 Bleach Plant Waste Pile

The Bleach Plant waste pile appears to have accumulated directly on top of the basalt bedrock. The waste pile contains soil at approximately 75% by volume, wood pulp/paper fiber accretions/fluff at approximately 5% by volume, and wood/concrete/brick/other debris at approximately 20% by volume. Debris in the middle zone of the waste pile exhibited leaching of lead at concentrations exceeding characteristic hazardous waste levels. The debris is intimately mixed with the soil and fluff material, and a conservative working estimate of the hazardous waste volume present is 200 cubic yards. The soil in the entire Bleach Plant Waste Pile (approximately 500 cubic yards) contains constituent concentrations exceeding the Urban Residential direct contact risk-based concentrations (RBCs).

2.2 South Substation Catch Basin

Soil/fill constituent concentrations exceeding the Urban Residential direct contact RBCs for polycyclic aromatic hydrocarbons (PAHs) and dioxins/furans is present beneath the catch basin and trench and is likely present down to the top of the basalt (12 feet below ground surface [bgs]). The estimated volume of contaminated soil/fill is approximately 500 cubic yards.

2.3 Underground Storage Tank Area

Soil and groundwater contamination remain near two former underground storage tanks. It is expected that soil contamination extends radially outward from the former tank cavity, and after several feet distance becomes confined to the “smear” zone (estimated to extend from about 5 feet bgs to the top of the basalt). The lateral extent of soil contamination has not been defined to the north, west, or south, and this represents a data gap. Groundwater contamination is expected to be limited to the shallow/perched water present on top of the basalt and to extend in the presumed downgradient direction towards the Willamette River. The groundwater plume is not defined in any direction, and this constitutes a data gap. Volume of soil exceeding the Urban Residential Cleanup Level of 2,800 milligrams per kilogram (mg/kg) is estimated at approximately 1,500 cubic yards.

2.4 Former Truck Dump – North Group 1

Delineation sampling has not been conducted to the north, south, or east of TD-01 and TD-02 and the lack of defined boundaries of soil contamination is considered a data gap.

The volume of PAH contaminated soil is estimated to be approximately 1,000 cubic yards.

2.5 Building 1 West Parking Lot – North Group 2

The carcinogenic PAH RBC exceedance detected at F01-01 has been partially delineated to the west-southwest. Delineation sampling has not been conducted to the north or east or vertically and the lack of defined boundaries of soil contamination is considered a data gap.

The volume of carcinogenic PAH contaminated soil is estimated to be approximately 500 cubic yards.

2.6 Vacated Third Street – North Group 3

PAHs exceeding Urban Residential direct contact RBCs at F07-01 have been delineated to the east and west. Delineation sampling has not been conducted to the north or south and the lack of defined boundaries of soil contamination is considered a data gap.

The volume of PAH impacted soil is estimated to be approximately 500 cubic yards.

2.7 Butler Building – North Group 4

Lead and PAHs above Urban Residential direct contact RBCs have been delineated vertically and are expected to extend from near the surface to the top of basalt at about 10 to 12 feet bgs. The lateral extent has been delineated in this area except to the north, and the lack of delineation in this direction is considered a data gap.

The volume of lead and/or PAH impacted soil is estimated to be approximately 2,500 cubic yards.

2.8 Vacated Fourth Street – North Group 5

Exceedances of TPH, PAHs, and arsenic in this area have not been delineated to the north or east and is considered a data gap.

The volume of impacted soil in this area is estimated to be between 1,000 and 2,000 cubic yards.

2.9 Vacated Main Street – North Group 6

The PAH exceedances detected at GP15 have not been delineated to the north, west, or east and this is considered a data gap.

The volume of PAH impacted soil in this area is estimated to be approximately 500 cubic yards.

2.10 East of Building 41/42A – North Group 7

Arsenic and lead RBC exceedances have not been delineated laterally or vertically in this area and is considered a data gap.

The volume of arsenic and lead impacted soil in this area is estimated to be approximately 5,000 cubic yards.

2.11 Weld Shop – South Group 1

Concentrations of lead exceeding DEQ RBCs are present in soil and shallow/perched groundwater in the southern portion of the Property (near the intake basin).

The lead soil exceedance area above 800 mg/kg (Commercial RBC) appears defined to the southwest, south, and southeast but remains undefined to the northwest, north, and northeast. The area of contaminated soil/fill exceeding 400 mg/kg (Urban Residential RBC) only appears to be defined to the west. Vertically, the contaminated soil is not expected to extend below the top of the basalt (approximately 22 feet bgs). The lack of defined lateral boundaries to the lead-contaminated soil is a data gap.

The volume of contaminated soil (above 800 mg/kg) is estimated to be approximately 2,500 cubic yards and the volume of contaminated soil above 400 mg/kg is estimated to be approximately 5,000 cubic yards.

The area of lead impacted groundwater (above human health and ecological screening levels) is not defined but is expected to be localized. It is not known if the lead groundwater plume reaches the nearby intake basin, which is connected to the Willamette River. The lack of a defined down-gradient boundary to the lead in groundwater plume is a data gap.

2.12 Sulfite Plant – South Group 2

Lead in soil is variable with two exceedances of the Urban Residential RBC. There were no exceedances of the Occupational or Construction Worker RBCs. The boundary of the lead exceeding the Urban Residential RBC is not known with certainty and is a data gap. However, the lead seems to be co-located with the PAH contamination and is not a driver of investigation and/or remediation but can be performed in conjunction with further PAH investigation/remediation. The leaching to groundwater pathway cannot yet be ruled out and this may affect ecological receptors.

The area of lead impacted groundwater (above ecological screening levels) is not defined but is expected to be localized. It is not known if the lead plume reaches the nearby intake basin, which is connected to the Willamette River. The lack of a defined down-gradient boundary to the lead in groundwater plume is a data gap.

Concentrations of PAHs (particularly benzo(a)pyrene) exceeding DEQ RBCs are present in soil. The area of soil exceedances has been defined to the north, west, and southeast, but remains undefined to the south and east. Vertically, the contaminated soil is not expected to extend below the top of the basalt (approximately 22 feet bgs). The lack of defined lateral boundaries to the PAH-contaminated soil in the southern and eastern directions is a data gap.

The volume of contaminated soil is estimated to be approximately 2,500 cubic yards.

No volatile organic compounds were detected in shallow/perched groundwater near the Sulfite Plant.

2.13 South Plaza and South Substation Area – South Group 3

Based on the sampling data, polychlorinated biphenyls (PCBs) are no longer considered a contaminant of concern in this area.

2.14 Auto Shop – South Group 4

The lateral extent of arsenic contaminated soil in the Auto Shop area exceeding both the Urban Residential RBC of 1.0 mg/kg and the background level for the Portland Basin of 8.8 mg/kg has not been delineated and this is a data gap.

The estimated volume of arsenic contaminated soil (above 8.8 mg/kg) is about 1,500 cubic yards.

2.15 Main Plaza and Carpentry Shop Area – South Group 5

Delineation of lead in soils above the Urban Residential direct contact RBC is considered complete, with only two small areas identified that may require remediation (estimated at approximately 500 cubic yards each). The lateral extent of lead in soil exceeding the leaching-to-groundwater pathway is not well defined and is a data gap. Because lead exceeds the leaching to groundwater RBC throughout this large area, and the Willamette River is less than 100 feet to the west, the lack of groundwater quality data for the shallow/perched seasonal groundwater also represents a data gap.

2.16 Former Above Ground Storage Tank Location Near South Substation and Recovery Boiler – South Group 6

PAH concentrations exceeding RBC screening levels are confirmed in this area and are believed to extend to a depth of approximately 8 feet bgs but could potentially go deeper (top of basalt is 21 feet bgs in this area). The northern and western extents of RBC level exceedances appear to have been delineated laterally and vertically; however, the southern extent of the cluster has not been delineated and this is a data gap. The volume of PAH-contaminated soil exceeding the 0.25 mg/kg threshold is estimated at approximately 1,000 cubic yards.

2.17 Area Between Pipe Shop, Mill O, and Carpentry Shop – South Group 7

Dioxin/furan RBC level exceedances in the South Group 7 area are delineated vertically (confined to the soil/fill above the basalt at 13 feet bgs, and likely confined to within the top 9 feet) and are partially delineated laterally in the eastern and western directions. Dioxins/furans are not delineated laterally in the northern and southern directions, and this is a data gap. The volume of dioxin/furan contaminated soil exceeding the 12 picogram per gram threshold is estimated at approximately 1,500 cubic yards.

2.18 Site Assessment Findings Summary

In total, 17 distinct areas of soil contamination that pose an unacceptable risk to human health have been delineated at the Property. The estimated quantity of soil in these areas believed to pose an unacceptable risk to human health is 26,500 cubic yards. Table 1 provides a summary of areas and quantities of contaminated soils. To protect human health, and possibly ecological receptors in the adjoining Willamette River, these soils must be mitigated.

In addition, CTGR plans to complete ecological restoration activities in the southern portion of the Property that will require the removal of additional soils. Most of this soil contains contaminant concentrations that exceed DEQ clean fill screening criteria and as a result require disposal at a Subtitle D Landfill. The estimated quantity of soil that will be excavated, transported, and disposed to accomplish Property ecological restoration, excluding the contaminated soils in the 17 areas described above, is 17,300 cubic yards.

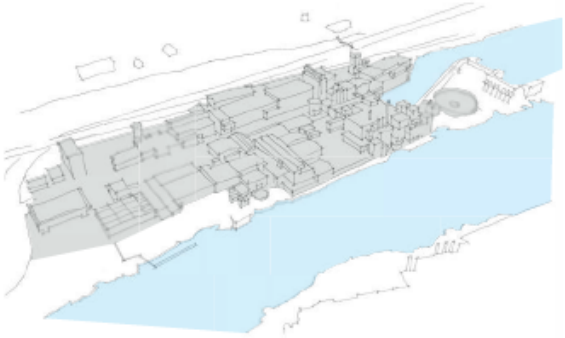
3 PROPERTY REUSE PLAN

The vision for the Property is a transformation from its current condition as a former industrial complex into an environmentally restored, mixed-use village being referred to as *tumwata village*. The vision is captured in the tumwata village master plan, completed in Fall 2022 by GBD Architects and Walker|Macy (GBD/Walker|Macy, 2022).

Buildings will be sensitively placed in an expansive green space that evokes that character of the Property's historic landscape, extensive basalt channel formations and the property's unique topography and relationship to the falls. Buildings will offer spaces for special tribal functions, events and ceremonies as well as new opportunities for working, living, visiting and learning.

tumwata village is a modern development that will provide for a mix of open space, retail, shopping, residential, office, restaurants, and a hotel/event space. It will become a vibrant pedestrian destination that includes opportunities for public and Tribal celebration located at the south end of downtown Oregon City. As a Grand Ronde tribal village, it is a place for our people to be welcome and associate with as familiar. As a place, it is a living honor to the tribal people of the falls and their continued persistence. A thriving modern tribal village is a place of prosperity and abundance. *tumwata village* will spur economic development not only within the Property, it will also do so throughout Oregon City, West Linn, Clackamas County, and the State of Oregon. This Tribal Village, *tumwata village*, will be an extension to downtown Oregon City's Main Street. The Property will be an example of what a landscaped based community can be. From anywhere on-site, as one moves west toward the river or south toward the falls one's senses will be enlivened with sounds and feeling of moving water. The feeling of association created by this experience will contribute to the sense of place a modern landscape based tribal village.

The redevelopment of the Property will embody the Tribe's commitment to healing. Through significant ecological restoration this will be a place that enhances the river's natural functions, provides habitat and refuge for migratory fish, replaces industrial degradation with resilient native vegetation and cleans the Property's water. The village will provide opportunities for a variety of mixed-use buildings for living, working and enjoyment within its green framework. Visitors will be welcomed and provided access to the river's edge, views of the restored native basalt riverbank, and to enjoy a public gathering space with ever



Current conditions

Restorative conditions

changing activity. As one moves from the Property's northern entry, the journey changes from one of urban activity to one that is natural and connected to the environment as it invites contemplation and awareness. This transformed Property will provide important messages about the benefits of the natural environment, the value of nurturing restoration and the Tribe's long-term commitment to healing.

3.1 *tumwata village* | north

The redeveloped Property will welcome visitors with significant native planting areas and restored ecology. Upon crossing McLoughlin Boulevard, the configuration of the streets, walks and planting areas will signal one is entering a place of restoration and revitalization. A broad planting area of native trees and shrubs along Main Street will establish a green gateway. Mixed use buildings will be integrated in the landscape and provide places to live, work and enjoy. Along the river's edge, a broad walkway along a new Water Street will establish direct connections to the Oregon City promenade and to the restored riverbank. Accommodations will be available for a future Riverwalk if developed. The existing boat dock will be restored, and new access provided. A lively gathering space that can accommodate a wide variety of events and support daily activity will be established adjacent to the historic Flour Mill foundations and the re-emerging river alcove area. A variety of overlooks and seating will provide opportunities to enjoy views of the river and invite all to enjoy the restored ecology of the enlivened place.

3.2 *tumwata village* | south

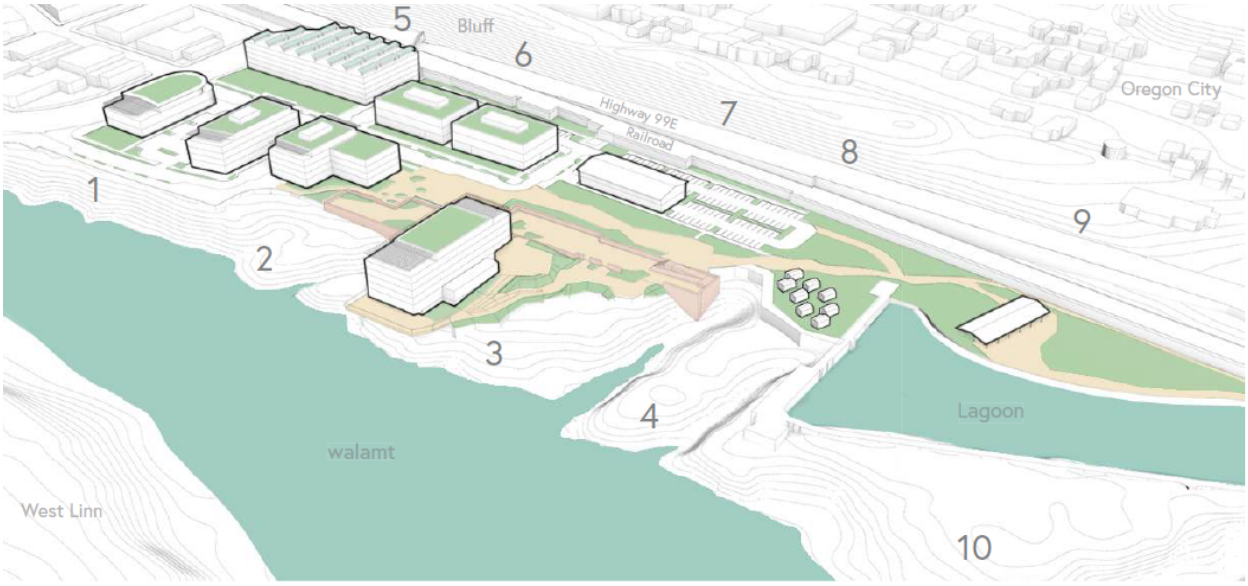
As one moves from north to south, the character of the village evolves from a green urban form to one that embodies the natural character of the river. Main Street changes character at 3rd Street to a pedestrian-oriented route and becomes increasingly naturalized as one journeys towards Canemah. This broad walkway provides lush planting and variety of places to sit and enjoy. A mix of uses including a hotel will be established within the new green framework. The historic Woolen Mill foundations will be restored and provide spaces for gathering, an outdoor café and connections to the river's edge. Significant restoration of the native basalt riverbank will provide river alcoves for migratory fish refuge, removal of industrial degradation such as the clarifier and establish new ecological value on the river. Visitors will be welcomed to the upper riverbank to enjoy views and be within this restored ecology. An area of small overnight structures will be available adjacent to the restored riverbank. A Tribal area will be established adjacent to the restored lagoon as a place for gathering and direct connection to the upper river. From the renaturalized site, a trail will be extended south along the restored riverbank to Canemah.

3.3 Potential Development Scenario

tumwata village is anticipated to comprise 300,000 – 350,000 square feet of program development, including buildings with tribal, hotel, residential, employment and retail uses. Building massing and intensity of use is expected to generally step down from north to south, emphasizing a transition from an urban to a natural character. At full build out, structured parking will be necessary to serve development on the Property, proposed at the northeastern corner of the site near the McLoughlin/99E tunnel. The table and rendering below provide the specifics for the current potential development scenario planned for

the Property. The nine blocks comprising the development scenario generally, but not exactly, conform with the nine parcels shown in Figure A.

BLOCK	TYPE	SIZE (square feet)
Block 1	Office and Residential	90,000
Block 2	Residential	63,750
Block 3	Hotel	89,000
Block 4	Restoration	None
Block 5	Parking Structure	147,500
Block 6	Flex Building	64,000
Block 7	Flex Building	17,000
Block 8	Village Cabins	3,000
Block 9	Tribal Building	4,700
TOTAL		478,950



4 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

4.1 Remedial Action Team Organization and Responsibilities

The remedial action team for the project will be led by Ryan Webb, CTGR Engineering and Planning Manager, an environmental consultant that will report to Mr. Webb, and DEQ (led by Mark Pugh, the project manager who has provided oversight of prior environmental assessment and cleanup activities completed at the Property for a number of years). DEQ oversight will be facilitated through DEQ's Voluntary Cleanup Program (VCP), and CTGR will pay all DEQ VCP oversight fees.

4.2 Potentially Applicable Cleanup Standards

Oregon Revised Statute 465.315(1)(a) requires that any removal or remedial action shall attain a degree of cleanup of the hazardous substance and control of further release of the hazardous substance that assures protection of present and future public health, safety and welfare and of the environment. A remedial action may achieve protection of human health and the environment through: (A) Treatment that eliminates or reduces the toxicity, mobility or volume of hazardous substances; (B) Excavation and off-site disposal; (C) Containment or other engineering controls; (D) Institutional controls; (E) Any other method of protection; or (F) A combination of the above (Oregon Revised Statute 465.315(1)(c)). The method of remediation appropriate for a specific facility shall be selected by the DEQ using an evaluation of remedial alternatives that balances the following factors: (A) The effectiveness of the remedy in achieving protection; (B) The technical and practical implementability of the remedy; (C) The long term reliability of the remedy; (D) Any short term risk from implementing the remedy posed to the community, to those engaged in the implementation of the remedy and to the environment; and (E) The reasonableness of the cost of the remedy.

The DEQ has developed RBCs for both human and ecological receptors that can be used in making cleanup decisions. RBCs have been developed for soil, groundwater soil vapor, and air for a number of receptors and exposure pathways. DEQ RBCs were most recently updated in August 2023.

The DEQ also has developed clean fill screening values. These screening values are used to ensure that soils being excavated and transported off site during brownfield redevelopment projects are properly managed. Soils with contaminant concentrations exceeding these screening values must be managed as solid waste. The DEQ last updated clean fill screening values in June 2019.

5 EVALUATION OF CLEANUP ALTERNATIVES

To address contamination present at the Property described in Section 3 of this ABCA, the following three alternatives are evaluated herein:

1. **Alternative #1:** No action
2. **Alternative #2:** A combination of a) excavation, transport, and disposal of all soil containing contaminant concentrations that exceed DEQ residential direct-contact RBCs; and b) incremental transport and disposal costs associated with soil containing contaminants concentrations that exceed DEQ clean fill screening criteria that must be removed to complete planned ecological restoration measures
3. **Alternative #3:** Same as Alternative #2, except that soil containing contaminant concentrations that pose an unacceptable risk to residential receptors will be mitigated using engineering controls (e.g., surface cap) where feasible (e.g., in developed areas, but not in ecological restoration areas).

5.1 Effectiveness

Alternative #1 is not effective in preventing the exposure of future Property receptors to contamination present at the Property and would prohibit planned ecological restoration activities from being completed.

Alternative #2 will be effective in preventing the exposure of future Property receptors to contamination present at the Property in the following manner:

1. The excavation, transport, and disposal of all soil containing contaminant concentrations that pose an unacceptable risk to residential receptors will prevent all exposure to contaminated soil via all exposure pathways.
2. The appropriate management of all soil excavated during ecological restoration activities will prevent soil with contaminant concentrations exceeding DEQ clean fill screening criteria from being placed in a location where human or ecological receptors might be exposed to contaminants in the soil.

Alternative #3 will be effective in preventing the exposure of future Property receptors to contamination present at the Property in the following manner:

1. The excavation, transport, and disposal of soil containing contaminant concentrations that pose an unacceptable risk to residential receptors in ecological restoration areas will prevent all exposure to contaminated soil via all exposure pathways. Use of a surface cap to mitigate soil containing contaminant concentrations that pose an unacceptable risk to residential receptors in developed area will prevent future receptor direct contact with contaminated soil. Since VOCs have not been detected at concentrations exceeding vapor intrusion screening values, there is no

need to mitigate vapor intrusion exposure. Based on the types of contaminants detected (e.g., metals and PAHs) it is considered unlikely that contaminants will migrate to areas where human or ecological receptor exposure could occur in the future.

2. The appropriate management of all soil excavated during ecological restoration activities will prevent soil with contaminant concentrations exceeding DEQ clean fill screening criteria from being placed in a location where human or ecological receptors might be exposed to contaminants in the soil.

5.2 Implementability

Alternative #1 is easy to implement since no actions will be conducted.

Alternative #2 is moderately implementable. Excavation with offsite disposal is moderately difficult to implement. Coordination (e.g., dust suppression and monitoring) during cleanup activities and short-term disturbance to the community (e.g., trucks transporting contaminated soils and backfill) are anticipated. However, contractors to perform the work are readily available.

Alternative #3 is easily to moderately implementable. A lesser amount of excavation with offsite disposal, which is moderately difficult to implement, will be required for Alternative #3. Surface capping could be completed in conjunction with Property development by the construction contractor and is easily implementable.

5.3 Long Term Reliability

Alternative #1 does not reliably prevent exposure to contamination in the long term.

Alternative #2 has a high degree of long-term reliability because in involves the removal of all contamination (soil contamination) from the Property.

Alternative #3 has a moderate to high degree of long-term reliability. Some contaminated soil will remain on the Property under this alternative. Exposure to remaining contaminated soil will be controlled with a surface cap, but inspection and maintenance of the surface cap in perpetuity is required to ensure control of exposure. Therefore, surface capping is considered to have less long-term reliability than removal.

5.4 Short Term Risk

There is no short-term risk associated with the implementation of Alternative #1.

Alternative #2 has moderate short-term risk. Excavation with offsite disposal has a number of short term risks associated with it including: heavy equipment operation, risk of dust creation and inhalation, and the physical and contaminant exposure hazards to off Property populations associated with truck transport of the soil.

Alternative #3 has low to moderate short-term risk. Alternative #3 will involve less excavation and offsite disposal than Alternative #2 resulting in a commensurate reduction in the short-term risks associated with excavation and offsite disposal. Surface capping will be done in conjunction with Property development and does not increase the short-term risk associated with development activities.

5.5 Cost Reasonableness

There is no cost associated with the implementation of Alternative 1.

Costs associated with the implementation of Alternative #2 included the following:

1. An estimated cost for the excavation and offsite disposal of soil containing contaminant concentrations exceeding DEQ direct contact RBCs of $1,911,000 (see Table 1, attached).
2. An estimated incremental environmental cost for the disposal of soil excavated as part of ecological restoration activities of $4,860,000 (estimated 108,000 cubic yards of excavation, transport and disposal at a unit rate of $45 per cubic yard).
3. An estimated cost for qualified environmental professional (QEP) oversight of the above cleanup activities of $200,000.

The total estimated cost for Alternative #2 is $7,021,000.

Costs associated with the implementation of Alternative #3 included the following:

1. An estimated cost for the excavation and offsite disposal of soil containing contaminant concentrations that pose an unacceptable risk to residential receptors of $1,236,500 (see Table 2, attached).
2. An estimated incremental environmental cost for the disposal of soil excavated as part of ecological restoration activities of $4,860,000 (estimated 108,000 cubic yards of excavation, transport and disposal at a unit rate of $45 per cubic yard).
3. An estimated surface capping cost of $300,000 ($50K for each of six anticipated phases of development).
4. An estimated cost for QEP oversight of the above cleanup activities of $250,000 (higher cost associated with added project duration and additional reporting associated with surface capping remedial action element).

The total estimated cost for Alternative #3 is $6,346,500.

5.6 Recommended Cleanup Alternative

The recommended cleanup alternative is Alternative #2. Alternative #1 cannot be recommended since it does not address Property risks associated with human and ecological receptor exposure to

contamination and would prohibit planned ecological restoration activities. Alternative #3 is estimated to cost $624,500 less than Alternative #2. However, Alternative #3 would require ongoing monitoring and maintenance of the surface cap and therefore has less long-term reliability than Alternative #2.

Green and Sustainable Remediation Measures for Selected Alternative - To make the selected alternative greener, or more sustainable, several techniques are planned. The most recent Best Management Practices (BMPs) issued under ASTM Standard E-2893: Standard Guide for Greener Cleanups will be used as a reference in this effort. CTGR will require the cleanup contractor to follow an idle-reduction policy and use heavy equipment with advanced emissions controls operated on ultra-low sulfur diesel. The excavation work would be conducted during the dry-weather months (summertime) in order to minimize perched groundwater infiltration into the excavation area, in turn reducing dewatering needs and the amount of dewatering liquids requiring disposal/treatment. The number of mobilizations to the Property will be minimized and erosion control measures will be used to minimize runoff into environmentally sensitive areas including the adjoining Willamette River. In addition, CTGR plans to ask bidding cleanup contractors to propose additional green remediation techniques in their response to the Request for Proposals for the cleanup contract.

6 REFERENCES

Apex, 2018. Pre-Demolition Asbestos and Lead Paint Survey, Former Blue Heron Mill, Main Street, Oregon City, Oregon. December 7, 2018.

Beckham, S.D., 2021. Rewriting History: An Analysis of the “Traditional Use Study of Willamette Falls and the Lower Columbia River by the Confederated Tribes of the Umatilla Reservation". Report submitted to CTGR, 9615 Grand Ronde Road, Grand Ronde, Oregon 97347. March 2021.

DEQ, 2023. Risk-Based Decision Making for the Remediation of Contaminated Sites, Appendix A, Table of Risk-Based Concentrations for Individual Chemicals. Last updated April 2023.

DEQ, 2019. Prospective Purchaser Agreement: Department of Environmental Quality, 700 NE Multnomah Street, Suite 600, Portland, Oregon. August 15, 2019.

WSP, 2024. Draft Soil and Groundwater Focused Remedial Investigation Report, Former Blue Heron Paper Company Mill, 419-427 Main Street, Oregon City, Oregon 97045, WSP Project No. 261M135588. February 26, 2024.

7 LIMITATIONS

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

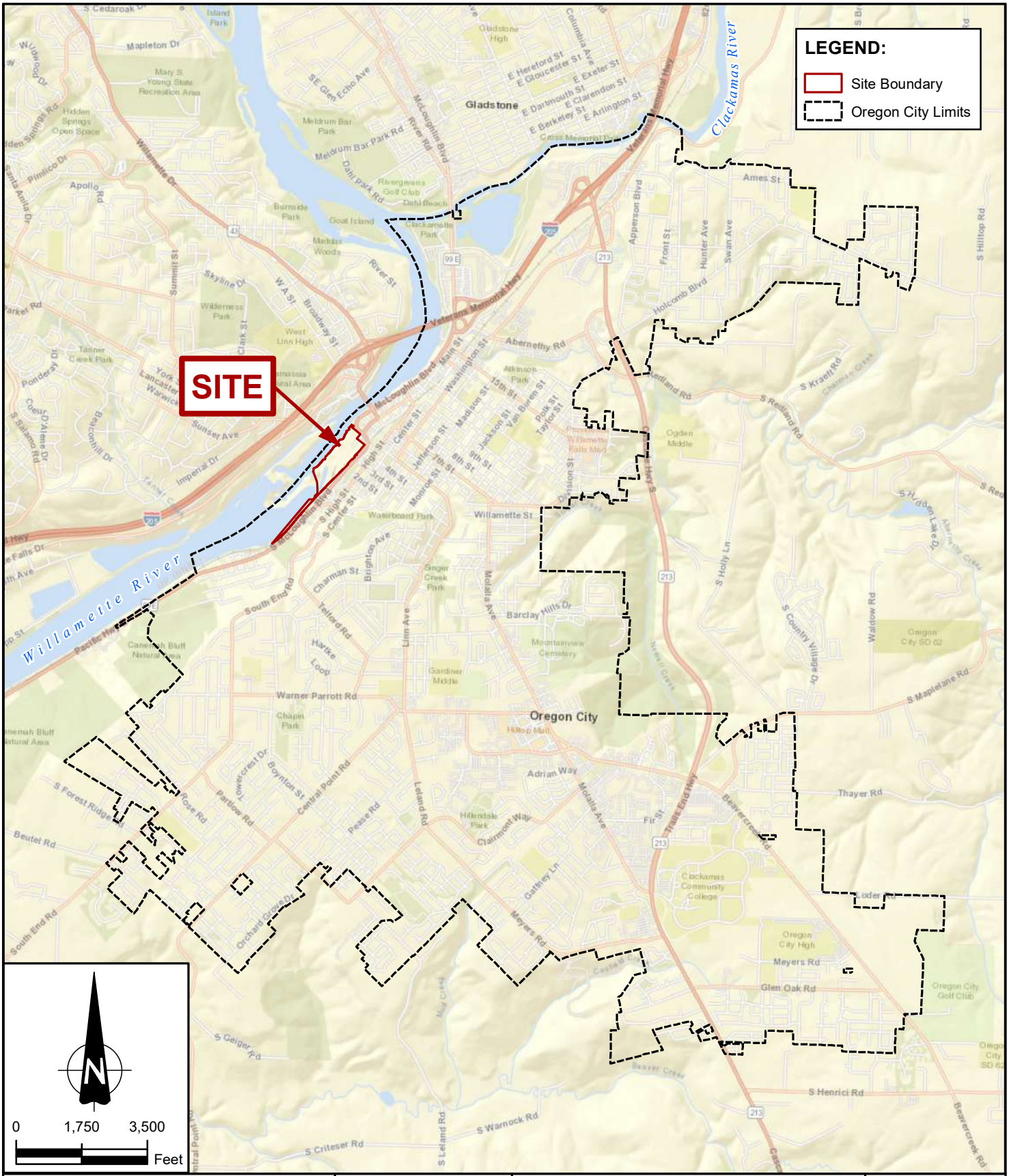
This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

FIGURES



CONFEDERATED TRIBES OF THE GRAND RONDE		REMEDIAL INVESTIGATION REPORT FORMER BLUE HERON PAPER MILL 419-427 MAIN STREET, OREGON CITY, OREGON	DATE: NOVEMBER 2023 SCALE: 1 " = 3,500 feet
WSP USA 15862 SW 72nd Ave., Suite 150 Portland, OR 97224		SITE LOCATION MAP	PROJECT NO.: 961M13558.04 FIGURE: 1

DRAWN BY: SD CHECKED BY: JK

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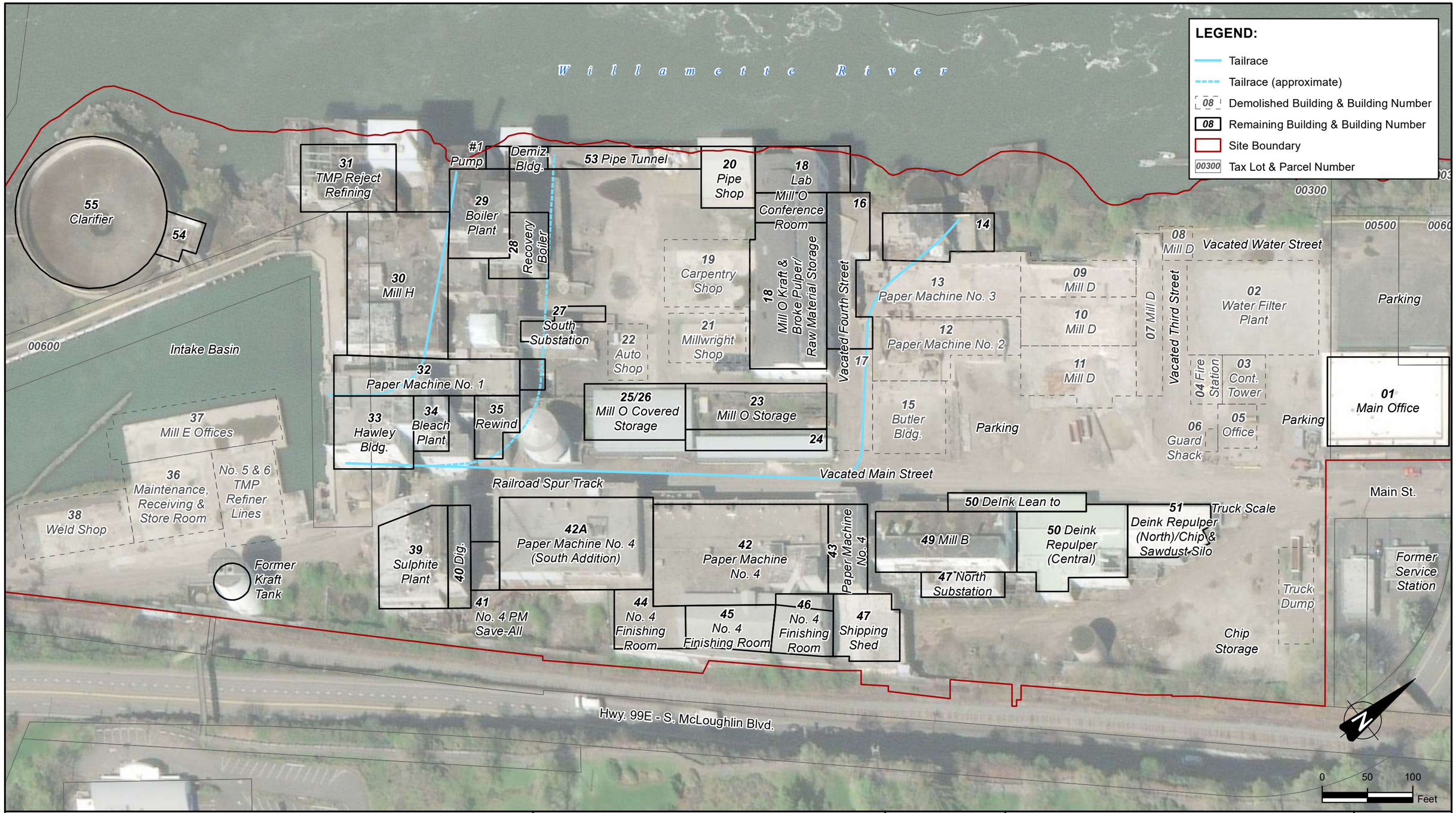
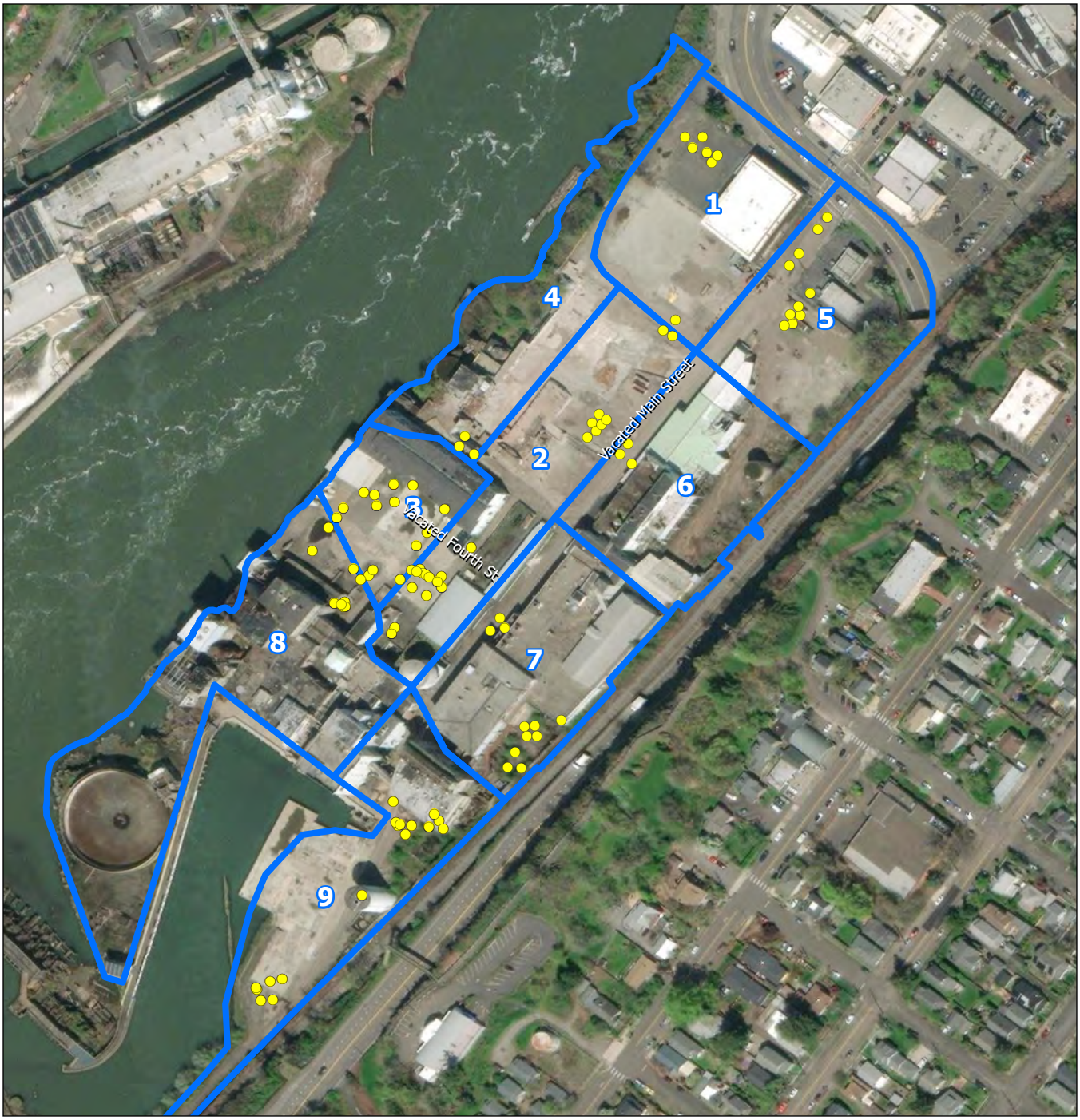


	CONFEDERATED TRIBES OF THE GRAND RONDE		REMEDIAL INVESTIGATION REPORT FORMER BLUE HERON PAPER MILL 419-427 MAIN STREET, OREGON CITY, OREGON	DATE: NOVEMBER 2023 SCALE: 1 " = 100 ' PROJECT NO.: 961M13558.04 FIGURE: 2
	WSP USA 15862 SW 72nd Ave., Suite 150 Portland, OR 97224		SITE FEATURES IN 2023	

DRAWN BY: PM CHECKED BY: JKH

X:\US\USPDX800-POR\ClientData\13000\13500\13558\13558\13.0 GIS\Figure 2A - Site Features - 2023.mxd - USSD715014 - 11/28/2023 - 10:51:39 AM



Parcel Boundary

Borehole Locations

0 100 200 US Feet

1 inch equals 250 feet
(at original document size of 8.5x11)

N

Stantec

Project Location
419 - 427 Main Street
Oregon City, Oregon

Prepared by NZ on : 2023-12-15
TR by EN on 2023-12-15

Client/Project

Confederated Tribes of the Grand Ronde
Former Blue Heron Paper Mill

Figure No.
3

Title
Map Depicting the Nine Property Parcels

Notes
1. Coordinate System: NAD 1983 2011 Oregon Statewide Lambert Ft Intl
2. Credits: Stantec, 2023.

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TABLES

Table 1: Alternative #2 - Summary of Remedial Action Costs: Former Blue Heron Mill Property
Main Street Oregon City, Oregon

AREA	PARCEL	WITHIN ECOLOGICAL RESTORATION AREA?	BORINGS	DELINEATED?	COCs	QUANTITY (yds)	UNIT COST (yd)	COST
Bleach Plant Waste Pile	9	No		Yes	F008	200	$ 150.00	$ 30,000.00
					Lead	300	$ 95.00	$ 28,500.00
South Substation Catch Basin	2	--	?	Yes	PAHs, Dioxin	500	Not Eligible	
UST Area	2	--		No (N, W, S)	TPH	1,500	Not Eligible	
Former Truck Dump - NG1	5	No	S30A - S30F	No (N, S, or E)	PAHs	1,000	$ 95.00	$ 95,000.00
Building 1 West Parking Lot - NG2	1	No	S28, S29, S30, S65, S66, S67	No (N or E)	PAHs	500	$ 95.00	$ 47,500.00
Vacated 3rd Street - NG3	1	No	S25, S26, S27	No (N or S)	PAHs	500	$ 95.00	$ 47,500.00
Butler Building - NG4	2	No	S22, S23, S24, S59 - S64	No (N)	Lead, PAHs	2,500	Not Eligible	
Vacated 4th Street - NG5	3/4	No	S17, S18, S19	No (N or E)	TPH, PAHs, Arsenic	2,000	$ 95.00	$ 190,000.00
Vacated Main Street - NG6	7	No	S20, S21	No (N, W, or E)	PAHs	500	$ 95.00	$ 47,500.00
East of Bldg 41/42A - NG7	7	No	S36 - S41	No	Lead, Arsenic	5,000	$ 95.00	$ 475,000.00
Weld Shop - SG1	9	No	S46 - S49	No	Lead	5,000	$ 95.00	$ 475,000.00
Sulfite Plant - SG2	9	No	S9 - S13	No (S or E)	Lead, PAHs	2,500	$ 95.00	$ 237,500.00
South Plaza and South Substation Area - SG3	8	Yes	S1 - S5	Yes		0	$ 95.00	$ -
Auto Shop - SG4	2	--	S41A - S41	No	Arsenic	1,500	Not Eligible	
Main Plaza and Carpentry Shop Area - SG5	3	Yes	?	Yes	Lead	500	$ 95.00	$ 47,500.00
Former AST Location Near South Substation and Recovery Boiler - SG6	3	Yes	S14, S15, S16	No (S)	PAHs	1,000	$ 95.00	$ 95,000.00
Area Between Pipe Shop, Mill O, and Carpentry Shope - SG7	3	Yes	S31 - S34, S50, S52	No (N or S)	Dioxin	1,500	$ 95.00	$ 142,500.00
Total Nonhazardous						26,500		
Total Nonhazardous (eligible only)						19,800	$ 95.00	$ 1,881,000.00
Total Hazardous						200	$ 150.00	$ 30,000.00
Total Eligible Soil Hot Spot Cleanup Cost								$ 1,911,000.00

Ecological Restoration	108,000	$ 45.00	$ 4,860,000.00
QEP Cost Estimate			$200,000
Total Estimated Remediation Cost			$ 6,971,000.00

Table 2: Alternative #3 - Summary of Remedial Action Costs: Former Blue Heron Mill Property
Main Street Oregon City, Oregon

AREA	PARCEL	WITHIN ECOLOGICAL RESTORATION AREA?	BORINGS	DELINEATED?	COCs	QUANTITY (yds)	UNIT COST (yd)	COST
Bleach Plant Waste Pile	9	No		Y	F008	200	$ 150.00	$ 30,000.00
					Lead	300	$ 95.00	$ 28,500.00
South Substation Catch Basin	2	--	?	Y	PAHs, Dioxin	500	Not Eligible	
UST Area	2	--		N (N, W, S)	TPH	1,500	Not Eligible	
Former Truck Dump - NG1	5	No	S30A - S30F	N (N, S, or E)	PAHs	1,000	Mitigated with Surface Cap	
Building 1 West Parking Lot - NG2	1	No	S28, S29, S30, S65, S66, S67	N (N or E)	PAHs	500	Mitigated with Surface Cap	
Vacated 3rd Street - NG3	1	No	S25, S26, S27	N (N or S)	PAHs	500	Mitigated with Surface Cap	
Butler Building - NG4	2	No	S22, S23, S24, S59 - S64	N (N)	Lead, PAHs	2,500	Not Eligible	
Vacated 4th Street - NG5	3/4	No	S17, S18, S19	No (N or E)	TPH, PAHs, Arsenic	2,000	$ 95.00	$ 190,000.00
Vacated Main Street - NG6	7	No	S20, S21	No (N, W, or E)	PAHs	500	Mitigated with Surface Cap	
East of Bldg 41/42A - NG7	7	No	S36 - S41	No	Lead, Arsenic	5,000	Mitigated with Surface Cap	
Weld Shop - SG1	9	No	S46 - S49	No	Lead	5,000	$ 95.00	$ 475,000.00
Sulfite Plant - SG2	9	No	S9 - S13	No (S or E)	Lead, PAHs	2,500	$ 95.00	$ 237,500.00
South Plaza and South Substation Area - SG3	8	Yes	S1 - S5	Y		0	$ 95.00	$ -
Auto Shop - SG4	2	--	S41A - S41	N	Arsenic	1,500	Not Eligible	
Main Plaza and Carpentrtry Shop Area - SG5	3	Yes	?	Y	Lead	500	$ 95.00	$ 47,500.00
Former AST Location Near South Substation and Recovery Boiler - SG6	3	Yes	S14, S15, S16	N (S)	PAHs	1,000	$ 95.00	$ 95,000.00
Area Between Pipe Shop, Mill O, and Carpentry Shope - SG7	3	Yes	S31 - S34, S50, S52	N (N or S)	Dioxin	1,500	$ 95.00	$ 142,500.00
Total Nonhazardous not mitigated with surface cap						18,700		
Total Nonhazardous (eligible only)						12,700	$ 95.00	$ 1,206,500.00
Total Hazardous						200	$ 150.00	$ 30,000.00
Total Eligible Soil Hot Spot Cleanup Cost not mitigated by surface cap								$ 1,236,500.00

Ecological Restoration	108,000	$ 45.00	$ 4,860,000.00
QEP Cost Estimate			$ 250,000.00
Total Hot Spot Cleanup and Ecological Restoration Cost not including areas mitigated with a surface cap			$ 6,346,500.00

Stantec

Stantec is a global leader in sustainable architecture, engineering, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.