Industrial Archaeology at Willamette Falls:
Exploratory Investigations at the North Woolen Mill, Oregon City

1. This presentation is a preliminary report on the archaeological investigations last August in the foundation of the North Woolen Mill in Oregon City. Our project is an example of industrial archaeology, in that it was conducted in an industrial setting and it employed an archaeological approach to the study of the industrial era.

Our investigations can be characterized as “exploratory,” a term that was commonly used in archaeology in earlier times—say the 1930s and 1940s—when so little archaeological research had yet been done that archaeologists often had no idea what they were going to find. In a similar way, when we began our investigations in the North Mill foundation we really were not sure what, if any, archaeological evidence was to be found there.

2. Acknowledgements: Archaeological investigations are rarely a one-person endeavor. It is important again to acknowledge the many people who contributed to the success of this project.

3. Native Americans: The historic industries at Willamette Falls were constructed on terraces scoured into basalt bedrock by the Missoula Floods. The last of the Missoula Flood occurred about 13,000 years ago, and it can be assumed that Native Americans have been living around the Falls ever since that time.

Willamette Falls is known to have been a major trading center for Native peoples, second in the Pacific Northwest only to the rapids at The Dalles of the Columbia River. The Falls continues to be an important place for fishing and lamprey-harvesting by native tribes today. Because the lower terrace below the Falls was developed quite early in the historic period as the site of Oregon City and associated industrial developments, there has never been any opportunity for archaeologists to search for evidence of Native American occupation there.

4. Willamette Falls Industrial Area. Considering the intense nature of industrial development the primary question became: Is there any archaeology there? After all the development, are there any intact deposits of soil, sediments, dirt in which archaeological remains may still be present?

A secondary question: Given this opportunity to conduct archaeological investigations in this intensively industrialized setting, what could we accomplish in two weeks with a
volunteer crew? We needed to identify a place, amidst all this concrete and metal, where we had some hope of finding artifact-bearing deposits.

We decided to focus on the early mills, not just because they are the earliest architectural remains of industry at the Falls, but also because they appeared to be places where we might get access to actual dirt. The original mill is fully covered with a metal roof which makes it pretty dark inside, so we decided to explore for archaeological deposits within the foundation of the North Mill addition.

5. Early Mills: The construction of early mills was characterized by large-scale earth-moving projects in which the landscape was drastically altered to make way for factories and their power systems as well as for workers’ housing. The most famous example is the Boott Cotton Mill complex in Lowell, Massachusetts, where the landscape was extensively filled to level the land surface. Mill-period features were constructed through the fill, and in some cases, through both the fill and original buried land surface. The Oregon City mill was built in a similar architectural style, and its construction also involved earth-moving and importation of fill, as we determined during the archaeological investigations.

6. Basalt Masonry Construction: Experience gained during archaeological investigations between 2003 and 2010 at the Oswego Iron Furnace resulted in appreciation of the massive size of 19th-century industrial structures and the substantial nature and considerable depth of their foundations. The basalt masonry stack that stands above the surface at the furnace rests on a foundation that extends 10 feet below surface to bedrock.

7. This 1867 photo shows the original woolen mill at 2nd and Main Streets two years after construction was completed in 1865. Immediately north of the mill are three narrow undeveloped lots and then two wood frame buildings at the end of the block (at 3rd and Main). Our investigations were focused in the area between the mill and the wood frame buildings, where the North Mill addition was later constructed. Mill operation was actually interrupted by flooding in January 1867.

8. This 1874 photo shows the original mill after a fire in 1872 destroyed everything but the masonry foundation walls. The mill was quickly rebuilt as three stories the same year. Two new structures are shown on the previously undeveloped lots immediately north of the mill. The fire does not seem to have affected the two wood-frame structures at the end of the block.

9. On this 1888 Sanborn fire insurance map the buildings on the northwest side of 3rd and Main streets are identified (from south to north) as a saloon, an undeveloped lot, a building used for waste wool storage, the Barlow House (hotel), and a vacant building
10. On this 1890 Sanborn map the North Mill is identified by a rectangle and indicated as under construction. “The flood of 1890 resulted in substantial loss of property, and it was necessary to purchase adjacent ground, erect new and repair damaged buildings, and install some new machinery.”

11. This 1892 photo, taken from across the river in West Linn, shows the original mill on the south (right) and new mill addition on the north (left).

12. This 1910 photo shows buildings of the Hawley Pulp and Paper Company now on site to the south of the woolen mills.

13. Mid-20th Century. Sign on roof: “Oregon City Woolen Mills” so it was taken before February 1, 1955 when the mills ceased production and were sold to Publishers Paper Company. The brick stories of the two woolen mill buildings were demolished in 1980, leaving only the masonry foundation walls.

14. Foundations of North Mill Site Today. The height of the foundation sill (top) is roughly equivalent to the present grade of Main Street, which was built up over the years.

15. Top: Photo view to south of concrete floor within mill foundation. Bottom: East-West GPR Profile—showing fill material over bedrock.

A ground-penetrating radar (GPR) survey was conducted in an effort to understand the nature of the sediments under the concrete floor within the mill foundation. GPR is a geophysical technique used to identify contrasts within subsurface soils and sediments. Contrast can reflect natural stratigraphy and geology or be created through cultural activities.

The GPR survey involved walking systematic transects, spaced every 0.5 m, with the instrument across the interior of the mill foundation. The east-west GPR profile shows bedding within the deposits, but most importantly shows the steep slope indicating that, like the original mill, the north mill addition was constructed along the edge of an underlying basalt terrace. The heavy black line on the east-west GPR profile was initially interpreted as representing bedrock. That interpretation turned out to be wrong, actually in a good way.

16. Documenting Foundation. The basalt masonry foundations remaining from the woolen mills had not been previously documented. Initial steps toward this task were undertaken, including preparation of scaled field sketches and extensive photo-documentation. Further field documentation recording the foundation in greater detail with an accompanying narrative description remains to be conducted.
17. The surface of the North Mill foundation is a patchwork of concrete and asphalt sections. As the proposed archaeological excavations would remove some of these sections, a sketch of the surface was prepared to document existing conditions.

18. Asphalt/Concrete Removal. Archaeological investigations in urban and industrial settings often require removal of concrete or asphalt to sample archaeological deposits below. A section of the asphalt/concrete floor within a north-south-trending trench was removed to obtain access to the sediments below.

19. It was originally assumed that the asphalt/concrete surface within the mill foundation was associated with the historic North Mill. But the profile of the concrete floor exposed in the trench excavation showed that the concrete contained metal rebar reinforcement, suggesting that it is a relatively recent addition, likely poured after Publishers Paper Company purchased the property in 1955. The historic mill most likely had a wood plank floor.

20. The trench was placed where it was thought, based on our interpretation of the GPR Profile, that we might be able to reach bedrock in our manual excavations. The trench began 3 m north of the common wall with the original mill and continued 32 m to the north. At that point, an asphalt ramp ascends to street level. The trench extended across the former locations of the saloon, undeveloped lot, waste wool storage building, and Barlow House. The northernmost structure, unidentified on the 1890 Sanborn, was below the asphalt ramp and thus was outside the area investigated.

Controlled manual excavations were conducted in 1x1 m units, in 10 cm levels, with the sediments removed screened through 1/8-inch mesh. The sediments beneath the concrete surface are fill on which the wood frame structures were constructed that are shown in on the block in historical photographs dating to before the North Mill addition. Deposition of this fill material probably occurred about the same time as construction of the original mill in 1865. As expected, the manual excavations immediately began recovering late 19th century historical artifacts. The additional recovery of prehistoric lithic artifacts in the fill sediments was a surprise! The presence of these prehistoric artifacts indicates that the fill material used to level the landform for construction of the wood frame buildings originated from a Native American archaeological site!

21. As excavations proceeded in the trench from south to north, an effort was made to excavate deeply in at least one unit to document the full extent of the sediments overlying bedrock.

22. Deeper excavations in the unit at the south end of the trench (A4) exposed large basalt spalls. Similar basalt spalls were common at the Oswego Iron Furnace, where they appeared to represent detritus from work by stone masons, as the stone blocks underwent final shaping before placement in the masonry furnace structure. The basalt spalls rested
on top of a compact silt layer referred to by geomorphologists as a “fragipan” at 147 cm below surface.

The strata exposed in the east and west walls of this deep unit sloped steeply downward to the south, toward the common wall between the original mill and North Mill addition. In constructing the woolen mills, sizable construction trenches would have been excavated to remove any sediments on the site and allow the masonry foundations to be seated on bedrock. The downward sloping strata are interpreted as sediments backfilled into the construction trench after erection of the foundation walls.

23. As the manual excavations approached 150 cm below surface, it was necessary to transition from unit excavations to coring to sample deeper deposits. Project geomorphologist Curt Peterson was on-site to aid in interpreting the sediments below fill.

24. Coring in the bottom of Unit A4 at the south end of the trench penetrated the compact silt “fragipan” layer, which was found to extend from 147 to 170 cm below surface. Below the fragipan was native soil from 170 to 235 cm. A second auger hole excavated to recover a larger sample from below the fragipan reached bedrock at 230 cm. Two chert artifacts were recovered in the native sediments. Charcoal from 190-200 cm produced an AMS radiocarbon date of 1490 ± 30 years Before Present. No Historical artifacts were found below this layer.

25. Systematic coring was then conducted by Curt Peterson to establish the depth of deposits over basalt bedrock by excavating an auger hole in each unit (1x1 m) in the trench. The auger was blocked by rocks at various depths in most units, but in one unit in the middle of the trench (A16) the auger reached bedrock at a depth of 220 cm. This depth is shallower than the 230 and 235 cm depths to bedrock at the south end of the trench.

26. As the deep testing was underway at the south end of the trench, controlled manual excavations proceeded northward in the trench in the hope of encountering cultural features such as structural remains from the wood frame buildings or privy pits or trash pits associated with occupation on the block before construction of the north mill addition. One cultural feature encountered consisted of a pile of brick rubble at the former location of the Waste Wool Storage Building shown on the 1888 Sanborn map.

27. Removal of the brick rubble exposed a terra-cotta pipe, indicating that the bricks had been used as material to backfill into the pipe trench. A blob of mortar nearby apparently was also dumped into the pipe trench at the same time.

28. The excavations eventually reached the north end of the trench at Unit A32, which falls in the vicinity of the Barlow House shown on the 1888 Sanborn map.
29. Another pile of brick rubble was exposed in the two units at the north end of the trench, which as previously mentioned falls in the vicinity of the Barlow House.

30. As previously noted, in addition to being informative about the nature of sediments and stratigraphy, GPR may be useful in identifying soil disturbances indicative of cultural activities. A comparison of the GPR profile with the trench wall profile revealed two noteworthy anomalies: (1) the terra-cotta pipe and the trench in which it was placed, and (2) the strata sloping downward to the south toward the common mill wall at the south end of the trench.

31. Prehistoric stone artifacts were relatively common in the fill deposits within the foundation. As previously noted, their presence indicates that the fill material was dug out of a Native American site and transported to the woolen mill site.

32. Ceramic fragments were relatively frequent but were almost always consisted of small pieces.

33. As with the ceramics, glass vessel fragments found were highly fragmentary. The few larger fragmentary objects found included two tumblers, a bottle neck with applied finish, and an applied crown-style bottle finish.

34. Miscellaneous artifacts recovered included smoking pipe fragments, an 1849 dime, a gunflint, and buttons of shell, rubber or composite material, and glass.

35. Mill-Related artifacts included possible teeth from carding machines, straight pins, and probable wool fragments. The small size of most of the historical artifacts gave the impression that a lot of this material might represent sweepings, either out doorways or through cracks in floors.

36. At the beginning of this project two questions were posed. Considering the intense nature of industrial development on the property, is there any archaeology there? And given this opportunity to conduct archaeological investigations in this intensively industrialized setting, what could we accomplish in two weeks with a volunteer crew?

In providing an initial look at the potential for archaeology, this project can count the following accomplishments:

- Initial documentation of North Mill foundation
- GPR survey undertaken to characterize deposits below the mill floor
- Systematic coring established depth of deposits over bedrock at ca. 2.2-2.3 m
- Manual excavations recovered mixture of prehistoric and pre-1890 historical artifacts from fill deposits under floor of North Mill
• Stratigraphy and radiocarbon date established presence of 60-cm-thick native soil containing evidence of prehistoric activity by Native Americans in the vicinity of Willamette Falls

Although limited in scope and duration, this project is truly “ground-breaking,” establishing the presence of archaeological remains associated with both prehistoric Native Americans and historic Euro-Americans on the lower terrace in the old industrial core of Oregon City.
Building on the results of the initial archaeological investigations in 2015, this proposal outlines further measures recommended to document the nature, extent, and significance of archaeological remains underlying the North Mill addition. Implementation of these measures will contribute to development of an informed plan for identifying archaeological resources buried beneath existing buildings and structures during future development on the Blue Heron property.

The initial exploratory archaeological investigations carried out over 10 days in August 2015 were successful in establishing the presence of artifact-bearing deposits below the concrete surface within the North Mill foundation. A Ground-Penetrating Radar (GPR) survey confirmed that construction of the mill buildings involved importation of fill material to create a level surface over the sloping bedrock of the river terrace. Historical artifacts recovered in these fill deposits were associated with operation of the original mill (built in 1865) and with activities related to the wood-frame buildings (including a saloon and the Barlow House) that stood in the area before construction of the North Mill in 1890.

In addition, artifacts associated with activities carried out by prehistoric Native Americans were recovered from an intact native soil deep below the fill material. These prehistoric artifacts were beneath a fragipan (compact silt) layer at 147 to 170 cm below surface. The intact soil extended from 170 to bedrock at 230 cm below surface. Charcoal from 190-200 cm produced an AMS radiocarbon date of 1490 ± 30 years Before Present (BP). No historical materials were found below the fragipan, which provides a firm boundary between the overlying fill and underlying native soil.

To complement the information obtained from the initial north-south trench excavated in 2015, project geomorphologist Curt Peterson recommends excavation of a second trench perpendicular to the first to obtain an east-west cross-section of the sediments within the foundation. The suggested location of this trench is shown in Figure 1. Excavation of this trench would have at least four objectives.

1. It would establish the thickness of the artifact-bearing fill sediments, which based on the GPR increases substantially as the underlying bedrock slopes downward toward the river.
Figure 1. Proposed location of trench excavation in 2016 in relation to the previously excavated trench and structural features within the North Mill foundation.
2. It would establish the presence/absence of intact native soil in the northern portion of the mill foundation and to the west, following the downward sloping bedrock toward the river. Time during the brief 2015 field session did not permit excavations in the northern units of the trench to extend deep enough to establish the presence of native soil in this area. Native soil in this area would potentially contain additional evidence of Native American activity below the fill, as was found at the south end of the north-south trench in 2015.

3. It would provide an opportunity to establish the nature of the “old masonry footings” visible on the surface of the concrete. Concrete poured around these “footings” has obscured their function. At the present time these features are thought to have served as bases for posts that supported the three floors in the mill, but exactly how they were seated within fill deposits is unclear.

4. It would provide an opportunity to recover artifacts, and potentially encounter cultural features such as refuse and privy pits, associated with the Barlow Hotel which was situated in this area (see Figure 2).

In summary, the previous trench excavation over 10 days in 2015 sampled only a small portion of the area inside the North Mill foundation. As is common in archaeology, these investigations raised a number of new and important questions that can be addressed only through further fieldwork. A second session of investigations, similar in size and scope to that previously conducted, would go a long way toward contributing important new information about the prehistoric and historical archaeological record at the North Woolen Mill. These findings will prove useful in developing plans for managing archaeological resources during future development on the Blue Heron property.

Heritage archaeologists and Oregon Archaeological Society volunteers excavating inside the North Mill foundation in 2015.
Figure 2. Location of the trench excavated in 2015 in relation to buildings shown on the 888 Sanborn fire insurance map.