UNIVERSITY OF WASHINGTON ANIMAL RESEARCH AND CARE FACILITY

Final Environmental Impact Statement

UNIVERSITY OF WASHINGTON

November 2014

FINAL

ENVIRONMENTAL IMPACT STATEMENT

for the

UNIVERSITY of WASHINGTON

Animal Research and Care Facility Project

University of Washington

Capital Projects Office

The Final EIS (FEIS) for the University of Washington *Animal Research and Care Facility Project* has been prepared in compliance with the State Environmental Policy Act (SEPA) of 1971 (Chapter 43.21C, Revised Code of Washington); the SEPA Rules, effective April 4, 1984, as amended (Chapter 197-11, Washington Administrative Code); and rules adopted by the University of Washington implementing SEPA (478-324 WAC). Preparation of this FEIS is the responsibility of the University's Capital Projects Office. The Capital Projects Office and the University's SEPA Advisory Committee have determined that this document has been prepared in a responsible manner using appropriate methodology and they have directed the areas of research and analysis that were undertaken in preparation of this FEIS. This document is not an authorization for an action, nor does it constitute a decision or a recommendation for an action; in its final form, it will accompany the *Proposed Action* and will be considered in making further decisions on the proposal.

Date of Draft EIS Issuance .....**July 29, 2014**

Date of Final EIS Issuance ..... **November 5, 2014**

FACT SHEET

PROJECT TITLE	**University of Washington Animal Research and Care Facility Project**
PROPONENT/APPLICANT	University of Washington
LOCATION	The site of the proposed Animal Research and Care Facility (ARCF) is located on the University of Washington Seattle campus, in the Southwest Campus area and includes the Portage Bay Vista. The site is bounded by NE Pacific Street on the north, NE Boat Street on the south, William H. Foege Hall on the west and Hitchcock Hall on the east.
EIS ALTERNATIVES	Two development alternatives are analyzed in the EIS, including Alternative 1 – Proposed Action and Alternative 2 – Alternate Site, as well as the No Action Alternative (Alternative 3).

Alternative 1 – Proposed Action

Alternative 1 (Proposed Action) would involve development of the proposed ARCF within a below-grade structure on a site that includes the Portage Bay Vista. The ARCF building would include approximately 95,700 square feet of building development to replace currently non-compliant facilities (e.g., with functional and space deficiencies) and provide centralized holding and procedure space for the Department of Comparative Medicine (DCM) and the Washington National Primate Research Center (WaNPRC). Two below-grade building levels would be provided on the site and would comprise approximately 90,000 square feet; below-grade development would also include an expanded loading dock that would contain an access corridor to link the ARCF with adjacent buildings. Above-grade features of the project would include an approximately 66-foot high, 4,200-square foot utility/exhaust tower for air intake and exhaust in the northeast corner of the proposed building, and an approximately 1,500

square foot structure to provide elevator and stairway access located in the southeast corner of the building. All above-grade building features would be located outside of the Portage Bay Vista. Once building construction is complete, the Portage Bay Vista would be retained and include improved access and landscaping. The existing view corridor created by the Portage Bay Vista would remain as part of the project.

Alternative 2 – Alternate Site

Under Alternative 2, the ARCF would be constructed as an above-ground structure on Development Site 45S (located south of the Portage Bay Parking Facility between Brooklyn Avenue NE and 15th Avenue NE). The two-level building would contain approximately 90,000 square feet of building space and would be approximately 30 to 40 feet tall. Loading and service areas would be located above-grade at the northwest corner of the building.

Alternative 3 - No Action Alternative

Under the No Action Alternative, the ARCF would not be constructed and the alternative sites would remain in their existing conditions. The DCM and WaNPRC animal research facilities would remain in their existing condition and locations, and would continue to experience functional and space deficiencies.

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PURPOSE OF THIS EIS

The University has determined that this proposal may have potential significant adverse impacts on the environment. This EIS is intended to address the potential for significant adverse environmental impacts that could occur as a result of the Proposed Action. The SEPA environmental review process is designed to be used along with other decision-making factors to provide a comprehensive review of the proposal (WAC 197-11-055). The purpose of SEPA is to ensure that environmental values are given appropriate deliberation, along with other considerations. This EIS incorporates by reference the *CMP-Seattle 2003 EIS*, per WAC 197-11-635.

FINAL ACTION

The award of the General Contractor/Construction Manager (GC/CM) contract by the Capital Projects Office after consideration of alternatives and final approval of an alternative by the Board of Regents.

PERMITS AND APPROVALS

Preliminary investigation indicates that the following permits and/or approvals could be required or requested for the Proposed Actions. Additional permits/approvals may be identified during the review process associated with specific development projects.

University of Washington

- Project Approval, design approvals, authorization to prepare contract documents, and authorization to Call-for-Bids.

Agencies with Jurisdiction

- ***State of Washington***
  - Dept. of Labor and Industries
  - Dept. of Ecology, Construction Stormwater General Permit

- ***City of Seattle***
  - Master Use Permit
  - Grading Permit
  - Shoring Permit
  - Building Permits
  - Electrical Permits
  - Mechanical Permits
  - Occupancy Permits
  - Comprehensive Drainage Control Plain, Inspection and Maintenance Schedule
  - Construction Stormwater Control Plan Approvals

- ***Seattle-King County Department of Health***
  - Plumbing Permits

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PREVIOUS ENVIRONMENTAL DOCUMENTS

Per WAC 191-11-635, this EIS incorporates by reference the following environmental document: University of Washington Master Plan-Seattle Campus EIS (2003) – This EIS evaluated future development of the campus under the Campus Master Plan (*CMP-Seattle 2003*). The Plan identified approximately 70 potential development sites throughout the campus, and included guidelines and policies for development on these sites. The *CMP-Seattle 2003* identified maximum allowable building heights and maximum building envelope estimates for each potential development site, as well as an overall new building square footage maximum of three million gross square feet. A copy of this document is available for review at the University's Online Public Information Center (http://f2.washington.edu/cpo/university-washington%E2%80%99s-sepa-online-public-information-center-0).

LOCATION OF BACKGROUND INFORMATION

Background material and supporting documents are located at the office of:

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DATE OF FINAL EIS ISSUANCE

November 5, 2014

AVAILABILITY OF THE DRAFT AND FINAL EIS

The Draft and Final EIS have been distributed to agencies, organizations and individuals noted on the Distribution List contained in **Appendix A** to this document. Copies of the Draft and Final EIS are also available for review at the University's Capital Projects Office (University Facilities Building), the University's Online Public Information Center (http://f2.washington.edu/cpo/university-washington%E2%80%99s-sepa-online-public-information-center-0), and at the following University and Seattle Public Libraries:

University of Washington

- Suzzallo Library
- Architecture and Urban Planning (Gould Hall)

Seattle Public Libraries

- Downtown Central Library (1000 Fourth Avenue)
- University District Branch (5009 Roosevelt Way NE)
- Montlake Branch (2300 24th Avenue E)

A limited number of copies of this Final EIS are available at the University's Facilities Building while the supply lasts. Additional copies may be purchased at the University's Facilities Building for the cost of reproduction.

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CHAPTER 1

Summary

CHAPTER 1
SUMMARY

1.1 INTRODUCTION

This chapter provides a summary of the Environmental Impact Statement (EIS) for the University of Washington Animal Research and Care Facility (ARCF) Project. **Chapter 1** briefly describes the Proposed Action (Alternative 1), Alternative 2 (alternate ARCF site) and Alternative 3 (No Action Alternative), and contains a comprehensive overview of environmental impacts identified for the Proposed Action and alternatives. Please see **Chapter 2** of this FEIS for a more detailed description of the Proposed Actions and alternatives; the environmental impacts summarized in Chapter 1 of this FEIS are based on detailed environmental analysis contained in Chapter 3 of the DEIS. Updated information provided subsequent to the issuance of the DEIS is indicated by shaded text.

To support the research being conducted by the University of Washington Health Sciences Department, including the Department of Comparative Medicine (DCM) and the Washington National Primate Research Center (WaNPRC), the University has proposed a new ARCF to meet the specialized building and research requirements of these departments. Currently, existing research and animal housing functions are situated in various locations throughout the campus and Health Sciences Complex. In addition, the DCM and WaNPRC have experienced animal housing capacity issues due to a lack of adequate space which has hampered their ability to function and meet demand. In order to upgrade currently non-compliant facilities, increase holding and procedure space, and provide a new centralized resource for animal research and care, the University of Washington proposes to construct a modernized and centralized facility to provide a productive and healthy working environment for staff, researchers, and animals, while providing adequate space and flexibility for housing animals.

For the purposes of environmental review, two development alternatives (Alternative 1 – Proposed Action and Alternative 2 – Alternate Site), and a No Action Alternative are analyzed in the EIS.

Alternative 1 – Proposed Action

Location

The Proposed Action site is located in the central portion of the University of Washington's Southwest Campus area and includes the Portage Bay Vista. The site is generally bounded by NE Pacific Street to the north, Hitchcock Hall to the east, NE Boat Street to the south, and the William H. Foege Building to the west (refer to **Figure 2-1** and **2-2** for maps illustrating the site location). The Proposed Action is located at and below-grade, under the Portage

Bay Vista, which provides open space, views and pedestrian circulation. The site is generally comprised of vegetated open space area (primarily grass/lawn) and paved pathways, which provide connections between Pacific Street, Boat Street, Foege Hall, and Hitchcock Hall. The "Stronghold" sculpture is located in the central portion of the site and serves as a small gathering area with views towards Portage Bay. The Portage Bay Vista provides a visual corridor though the western portion of the site and was a requirement as part of the 15th Avenue Street Vacation Agreement between the University of Washington and the City of Seattle (August 18, 2000).

Design Concept

Alternative 1 (Proposed Action) would involve development of the proposed ARCF within a below-grade structure on a site that includes the Portage Bay Vista. The ARCF building would include approximately 95,700 square feet of building development to replace currently non-compliant facilities and provide centralized holding and procedure space for the DCM and WaNPRC. Two below-grade building levels would be provided; development would also include an expanded loading dock that would contain an access corridor to link the ARCF with adjacent buildings. Above-grade features of the project would include an approximately 66-foot high, 4,200-square foot utility/exhaust tower for air intake and exhaust in the northeast corner of the proposed building, and an approximately 1,500-square foot structure to provide elevator and stairway access located in the southeast corner of the building. All above-grade building features would be located outside of the Portage Bay Vista. Once building construction is complete, the Portage Bay Vista would be replaced and include a winding pathway and replacement landscaping. The existing view corridor created by the Portage Bay Vista would also remain as part of the project.

Alternative 2 – Alternate Site

Location

The Alternative 2 site is identified as Development Site 45S in the C*ampus Master Plan-Seattle Campus* (*CMP)-Seattle 2003.* and is located in the University of Washington's Southwest Campus area to the south of the Portage Bay Parking Facility and University Transit Center, and west of 15th Avenue NE (refer **Figures 2-1** and **2-2** for maps illustrating the Alternative 2 site location). The Alternative 2 site is primarily comprised of existing surface parking areas (parking lot W24 and W28). Three existing buildings are also located along the western edge of the site, including the Oceanography Research Building.

Design Concept

Under Alternative 2, the ARCF would be constructed as an above-ground structure on Development Site 45S (located south of The Portage Bay Parking Facility between Brooklyn Avenue NE and 15th Avenue NE). The two-level building would contain approximately 90,000 square feet of above-grade and below-grade building space and would be

approximately 30 to 40 feet tall. Loading and service areas would be located above-grade at the northwest corner of the building.

Alternative 3 - No Action Alternative

Under Alternative 3 – No Action Alternative, the ARCF would not be constructed and the proposed site would remain in its primarily vegetated condition with existing pathways. The DCM and WaNPRC would remain in their existing locations and could continue to experience capacity and space deficiencies.

1.2 IMPACTS, MITIGATION MEASURES AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

The following highlights the impacts, mitigation measures, and significant unavoidable adverse impacts that would potentially result from the alternatives analyzed in this EIS. **Table 1-1** provides a summary of the potential impacts that would be anticipated under the EIS Alternatives. This summary is not intended to be a substitute for the complete discussion of each element that is contained in **Chapter 3** of this document.

Table 1-1
IMPACT SUMMARY MATRIX

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
3.1 – CONSTRUCTION			
Construction Activities	• Construction activities on the site would include demolition and removal of all existing landscaping, trees, pathways, and the existing curb north of the site.	• Construction activities would include the demolition and removal of three existing buildings, surface parking areas, landscaping, and paved driveways/pathways.	• No new development would occur under Alternative 3 and no impacts associated with construction activities would occur.
Grading	• Grading activities would require approximately 84,000 cubic yards of cut and 3,150 cubic yards of fill.	• Grading activities would require approximately 30,000 cubic yards of cut.	• No new development would occur under Alternative 3 and there would be no impacts associated with grading.
Air Quality	• Construction would generate air pollutants as a result of fugitive dust from demolition, earthwork/excavation activities, construction vehicles and equipment emissions, and other activities. Nearby buildings, pedestrians and bicyclists could be sensitive to fugitive dust. Air intakes of adjacent buildings would be temporarily ducted and protected.	• Construction activities would generate similar air pollutants to those described for Alternative 1, but the overall amount of fugitive dust would be less due to a lower amount of anticipated excavation. Demolition of existing buildings on the site could result in exposure to hazardous materials; if found onsite, materials would be treated and removed in accordance with applicable laws and regulations.	• No new development would occur under Alternative 3 and no construction-related impacts to air quality would occur.
Greenhouse Gas Emissions	• Construction activities would generate GHG emissions associated with production and extraction of construction materials, energy consumption, and vehicle emissions associated with delivery vehicle trips.	• The proposed project would generate construction GHG emissions as described for Alternative 1.	• No new development would occur under Alternative 3 and no construction-related GHG emissions would be generated.
	• Alternative 1 would result in estimated total annual GHG emissions of 2,321.3 $MTCO_2E$.	• Alternative 2 GHG emissions are anticipated to be similar to or less than Alternative 1.	• No new development would occur under Alternative 3 and no construction-related GHG emissions would be generated.
Noise	• Construction activities would temporarily increase localized sound levels in the site vicinity and in the vicinity of streets used by construction vehicles accessing the site. Construction noise would result in a temporary annoyance and possibly	• Construction noise impacts would be similar to those described for Alternative 1, although noise associated with excavation is anticipated to be less than Alternative 1, and building construction noise would likely be higher due to the amount of above-ground	• No new development would occur under Alternative 3 and no impacts associated with construction noise would occur.

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
	increased speech interference at adjacent University uses and local businesses. Measures to limit impacts could include limiting construction hours and use of higher noise equipment, and ensuring use of properly sized/maintained equipment and mufflers, etc.	construction. Measures to limit the potential for construction noise impacts would be undertaken as described for Alternative 1.	
Vibration	• Construction activities would temporarily generate vibration at the site and surrounding area, with the highest vibration levels generated by the following activities: demolition, excavation, drilling piles, and underpinning foundations. Measures to limit vibration could include drilling rather than driving piles, utilizing a concrete processor instead of a hoe ram, using a static roller for compaction, and sawcutting the foundations at Foege North.	• Construction activities would be similar to Alternative 1, and vibration impacts would be similar to or less than those described for Alternative 1 due to less excavation occurring under Alternative 2.	• No new development would occur under Alternative 3, and no construction-related vibrations would be generated.
	• Sensitive research uses within nearby campus buildings that could be affected by construction vibration include: research animals, routine laboratory/optical imaging tools, and advanced imagining tools and experiments. – *Research Animals* — Most research animal spaces are located on upper building floors where vibration from construction activities would not be expected to substantially increase above existing conditions. Foege North is the only building where the potential for vibration impacts is considered high. – *Routine Laboratory/Optical Imaging Tools* — This sensitive use is mostly conducted on upper building floors, and is therefore at a low risk of vibration impacts. There is a high potential for impact at the Physics/Astronomy Auditorium where	• Construction activities under Alternative 2 would be similar to those described for Alternative 1. Due to the location of the Alternative 2 site, however, sensitive uses are located at a greater distance from the site. Therefore, it is anticipated that potential vibration impacts to surrounding sensitive uses would be lower than under Alternative 1. As under Alternative 1, any potential vibration impacts could be addressed through monitoring, schedule coordination, and/or relocation.	• No new development would occur under Alternative 3 and vibration from outside of buildings would continue to dominate vibration levels on slob-on-grade building floors, and vibration from inside buildings (from people walking) would continue to dominate the vibration level on upper building floors.

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
	activities take place on the ground floor, and at Foege North and South due to proximity to the project site. – *Advanced Imagining Tools and Experiments* — Based on the distance from construction activities, this sensitive use would be considered at a high potential for impact within the Magnuson J-Wing and Physics/Astronomy (under Auditorium) buildings. Vibration impacts to sensitive research uses would be addressed through monitoring, schedule coordination, equipment, and/or relocation.		
Transportation	• Construction activities would generate varying levels of traffic and associated transportation impacts for the duration of the 27-month construction period.	• Construction activities would generate varying levels of traffic and impacts for the duration of construction similar to that described for Alternative 1.	• No new development would occur under Alternative 3 and there would be no construction-related transportation impacts.
Street System Impacts	• Street system impacts would include creation of a new construction access to the site from NE Boat St., physical circulation needs of truck haul routes to and from the site, material deliveries and intermittent lane closures along area roadways.	• Street system impacts would include access to the site from Brooklyn Ave. NE, the anticipated haul route of trucks to and from the site, material deliveries, and intermittent lane closure along area roadways for utility work.	• No new development would occur under Alternative 3 and there would be no construction-related street system impacts.
Traffic Volume Impacts	• Construction traffic to and from the site would occur intermittently throughout the course of a weekday, with the highest traffic levels occurring during excavation and site grading. Up to 20 trucks per hour could travel to and from the site during this four-month period, between 7 AM and 3:30 PM, outside of PM peak hour traffic (4 to 6 PM). This would represent approx. 10 % of existing volumes on 15th Ave. NE and NE Boat St. Given the magnitude, temporary nature and proposed mitigation, significant traffic volume impacts are not anticipated.	• Traffic volume impacts would be similar to those identified for Alternative 1. The traffic surge associated with excavation hauling activity is not anticipated to create significant traffic volume impacts.	• No new development would occur under Alternative 3 and there would be no construction-related traffic volume impacts.

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
Pedestrian Facility Impacts	• Pedestrian pathways on the site (including the east-west pedestrian corridor) and the Hitchcock Bridge ramp would be closed throughout much of the construction period, and the NE Pacific St. sidewalk would be temporarily closed for about two weeks. Pedestrians would be directed to sidewalks along public roadways surrounding the site. Existing sidewalks could accommodate the increased pedestrian volumes. • Localized increases in pedestrian activity from nearby parking areas to the construction site would also occur, resulting in increased pedestrian traffic crossing at the 15th Ave. NE midblock crossing. Impacts are not anticipated to be significant due to existing pavement treatments and signage.	• Pedestrian activity along the east side of Brooklyn Ave. NE and the west side of 15th Ave. NE would have increased exposure to construction activities, and two new conflict points for pedestrians and vehicles would be created by construction access to the site via Brooklyn Ave NE.	• No new development would occur under Alternative 3 and there would be no construction-related pedestrian facility impacts.
Bike Facility Impacts	• Two bicycle parking facilities within the construction area would be temporarily relocated near the project site during construction. Also, the ramp to the Hitchcock Bridge would be demolished at the beginning and rebuilt at the end of the project. Demolition of the bridge ramp could take up to two weeks and would require the temporary closure of the sidewalk on the south side of NE Pacific St.	• Increased conflicts between construction traffic along Brooklyn Ave. NE would occur during construction, particularly at the two new construction access points.	• No new development would occur under Alternative 3 and there would be no construction-related bike facility impacts.
Parking Impacts	• Parking demand within the site vicinity would increase due to construction employees parking in the area and potential construction equipment staging. Up to 150 construction employees are anticipated during peak activity periods. Employees would be accommodated in the W28 lot to the west of the site, or within another parking area near the site during periods of high activity surges. The W28 lot capacity would be maximized through the use of valet services. Trailer parking for construction vehicle	• Parking in the W24 and W28 lots would be displaced and users of these heavily used lots would be reassigned to lots in the site vicinity. Also, parking currently allocated to Agua-Verde would be displaced; provisions for replacement parking would be made. Construction worker parking would likely be accommodated within the 11 existing University parking lots located within 1,200 feet of the site. During peak construction activity, regular users of those lots would be displaced to other lots on campus, which	• No new development would occur under Alternative 3 and there would be no construction-related parking impacts.

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
	staging would occur in lot W24. Existing users of both parking lots (including Aqua-Verde) would be temporarily relocated to nearby facilities.	could result in additional walk times for individuals. In addition, due to a limited amount of site area available for construction staging, Alternative 2 would result in increased displacement of on-street parking and vehicle/equipment movement on public streets when compared to Alternative 1.	
Traffic Safety Impacts	• Traffic would increase as a result of construction activity, resulting in a proportional increase in potential vehicle collisions and vehicle pedestrian exposure. Overall increases to traffic volumes would fall within the range of typical daily volume fluctuations. Also, construction would be temporary, and measures would be taken to redirect pedestrian and bicycle traffic, and manual control (flagger) would be exercised at key conflict locations. Therefore, significant safety impacts are not anticipated.	• Safety impacts would generally be related to construction vehicle activity, which could result in a proportional increase in the likelihood of vehicle collisions and vehicle pedestrian exposure similar to that described for Alternative 1. As with Alternative 1, increases in construction traffic volumes would fall within typical daily fluctuations. Proposed manual traffic control (flagger) at the site construction access from Brooklyn Ave. NE would minimize potential safety impacts from construction access driveways onto NE Boat St.	• No new development would occur under Alternative 3 and there would be no construction-related traffic safety impacts.
Transit Impacts	• Indirect impacts to pedestrian and bicycle access to bus stops and general traffic volume-related impacts could occur. One public transit bus stop (near the Hitchcock Bridge ramp) would be temporarily relocated for two weeks, and intermittent lane closures along NE Pacific St. could delay bus routes. Such delays would generally not last any longer than one-day. Also, one Dial-a-Ride stop in the site vicinity would be relocated during much of the construction period.	• Indirect impacts to pedestrian and bicycle access to bus stops and general traffic volume-related impacts could occur. The construction of two temporary construction access points would temporarily impact a current layover space for King County Metro.	• No new development would occur under Alternative 3 and there would be no construction-related transit impacts.
Trees	• The approximately 49 existing trees on the project site would be removed and new trees would be planted along the east and west sides of the Portage Bay Vista. Tree replacement would be intended to meet or exceed the City of Seattle's tree replacement requirements and would be in accordance with the University's Tree Management Plan.	• The approximately 20 existing trees on the project site and approximately 10 street trees would be removed during construction. As with Alternative 1, tree replacement would be intended to meet or exceed the City of Seattle's tree replacement requirements and would be in accordance with the University's Tree Management Plan.	• No new development would occur under Alternative 3 and there would be no impacts to trees.

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
Cultural Resources	• Archival research and field studies (including surface and subsurface surveys on the site) were completed and determined that the proposed construction of the project would not be anticipated to impact cultural or archaeological resources and no further cultural resource work is recommended.	• Similar to Alternative 1, proposed construction under Alternative 2 would not be anticipated to impact cultural or archaeological resources.	• No new development would occur under Alternative 3. There would be no impacts associated with cultural resources.
Other Construction Impacts	• Construction activities would result in temporary impacts to groundwater at the site. A temporary dewatering system would be provided, and on-site water treatment and storage would likely be required. The proposed ARCF would be designed as a waterproof structure with a subsurface drain system to minimize the potential for the building to obstruct groundwater flow.	• Construction activities could encounter groundwater, but at a lesser potential than under Alternative 1. A temporary dewatering system would be provided during construction. Because the proposed building would be an above-grade structure, it is likely that no subsurface drain system would be required.	• No new development would occur under Alternative 3. There would be no impacts associated with other construction activities.
	• Construction activities and equipment could temporarily affect views of and across the site, including views of Portage Bay through the Portage Bay Vista. It is anticipated that this would only affect a portion of the site, and that partial views would continue to be available during construction. Visual impacts would be temporary and views would be enhanced subsequent to construction activities; as a result no significant construction-related visual impacts are anticipated.	• Construction activities and equipment located onsite could temporarily affect views across the site towards Portage Bay. Views in this area are already limited due to existing development and vegetation, and no significant impacts would be anticipated.	• No new development would occur under Alternative 3. There would be no impacts associated with other construction activities.
	• Construction of the proposed ARCF building as an underground structure would result in a higher level of seismic stability due to the surrounding soil around the building compared to an above ground building.	• The above ground construction of the ARCF under Alternative 2 would result in a structure that would potentially be more prone to seismic activity than Alternative 1.	• No new development would occur under Alternative 3.
Cumulative Impacts	• Phases of several other construction projects in the site vicinity could overlap with construction of the ARCF Project. All	• Cumulative impacts would occur as described for Alternative 1.	• No new development would occur under Alternative 3. There would be no cumulative construction impacts.

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
	temporary construction activities associated with other projects would occur in compliance with applicable UW and/or City of Seattle regulations and guidelines, and all area projects would prepare Construction Management Plans to mitigate potential transportation issues during construction.		
3.2 - LAND USE			
Temporary Construction-Related Impacts	• Construction-related impacts would include: temporary closure of the area to open space and circulation uses, and impacts to surrounding University, commercial, and marine uses related to dust from clearing, grading, and excavation; emissions from construction vehicles and equipment; increased noise levels; vibration from grading activity and heavy equipment use; and increased traffic associated with construction vehicles and workers.	• Construction-related impacts under Alternative 2 would displace existing parking and academic uses on the site. Temporary construction-related impacts to surrounding uses would be similar to those described for Alternative 1, although less excavation would occur because of the above grade placement of the ARCF under Alternative 2.	• No new development would occur under Alternative 3. There would be no temporary construction-related impacts.
Direct Impacts (conversion of uses)	• Under Alternative 1, the ARCF would include approximately 95,700 sq. ft. of building development. A two-level, 90,000 sq. ft. below-grade facility would be provided on the site. Visible above-grade features of the project would include a 66-ft. tall, 4,200 sq. ft. mechanical tower, and a 1,500 sq. ft. entrance pavilion. The existing below-grade loading dock adjacent to Hitchcock Hall would be modified to accommodate increased traffic and a below-grade Animal Receiving Dock. Existing ground-level uses on the site would be retained including the Portage Bay Vista, pedestrian/bicycle circulation and replacement landscaping.	• Three existing buildings would be demolished and approximately 90 surface parking stalls removed to convert the site into new academic/research uses. Existing buildings and parking areas would be permanently displaced and it would be necessary for the University to work with existing users to find suitable relocation ares prior to development. Depending on the relocation site for the parking areas, the displacement could result in a reduction in available parking for the South Campus area. Under Alternative 2, the ARCF building would be an above grade, two-story, 90,000 square foot facility. Impervious area on the site would remain similar to existing conditions, but the building area on site would increase.	• No new development would occur under Alternative 3. Existing uses on both sites would continue as under existing conditions.

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
Project Features/ Characteristics	• The design of Alternative 1 includes features to enhance compatibility with existing surrounding land uses that include below-grade placement of the building, protection and improvement of the Portage Bay Vista, replacement landscaping, and pedestrian circulation.	• The assumed design of Alternative 2 includes features to minimize potential land use conflicts with surrounding uses that include building orientation, design and materials, landscaping and open space and street improvements. The facility's height, bulk, and scale would generally be less than most existing buildings in the surrounding area.	• No new development would occur under Alternative 3. On the Proposed Action site, existing pedestrian pathways would not be improved and landscaping and grading of the Portage Bay Vista would not be enhanced.
	• Development of the ARCF under Alternative 1 would create a centralized facility (and loading dock) that would be located adjacent/proximate to research uses which would enhance efficiencies and transportation of research materials between the ARCF.	• Development of the ARCF would create a less centralized facility that would result in reduced efficiencies for research operations, and well as potential additional safety issues due to the need to transport materials across 15th Avenue NE to existing research facilities.	• No new development would occur under Alternative 3.
Relationship to Surrounding Uses	• Activity levels on the site (i.e., noise and vehicle/ pedestrian traffic associated with employees, students, and academics) could increase. However, because the facility would largely be below grade, such increases would generally only be apparent at the building entrances and the existing, improved loading dock. Overall, activity levels would be consistent with other existing academic/research campus uses in the vicinity.	• Activity levels (i.e., noise and vehicle/ pedestrian traffic associated with site population) could decrease slightly compared to existing conditions. As with Alternative 1, activity levels would be consistent with other existing academic/research uses in the vicinity.	• No new development would occur under Alternative 3. Activity levels on both sites would remain similar to existing conditions.
Indirect Impacts	• Alternative 1 would replace existing, non-compliant facilities with new facilities and expand existing ARCF uses. This would partially divert population from other areas of campus, and increase the net population. Facility occupants (anticipated at approximately 40 individuals), would not be expected to result in increased demand for services. Minimal increases in pedestrian and vehicular traffic would result, and existing campus infrastructure could	• Indirect impacts would be similar to Alternative 1. As with Alternative 1, the demand for services or need for additional infrastructure is not expected to increase.	• No new development would occur under Alternative 3. There would be no indirect impacts.

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
	accommodate any such minor increases.		
3.3 – AESTHETICS			
Temporary Construction-Related Impacts	• Construction activities would temporarily affect the aesthetic character of the site and surrounding area. Measures to control air, noise, light, and other construction related disturbances could lessen aesthetic impacts.	• Temporary construction activities could affect the character of the site and surrounding area generally as described for Alternative 1. Measures to control impacts would be generally as described for alternative 1.	• No construction activity would occur under Alternative 3 and there would be no temporary construction-related impacts.
Aesthetic Character	• Under Alternative 1 a two level, 95,700 square foot building would be constructed below grade. Visible above-grade features of the facility would be located outside of the Portage Bay Vista and would include a 66 ft. tall mechanical tower and an entrance pavilion; the Portage Bay Vista would be retained. The surface level portion of the site would continue to serve as the Portage Bay Vista, east/west pedestrian corridor and open space area.	• Under Alternative 2 a new, two-story (30 to 40 ft. tall), 90,000 sq. ft. above grade building would be developed. In general, the building would be similar to or less than the height of existing surrounding buildings.	• No new development would occur and the aesthetic character of the Proposed Action and Alternative 2 sites would remain in existing conditions.
	• The aesthetic character of the site would reflect a winding pathway and replacement landscaping. The Stronghold sculpture would be resituated within the northwest portion of the Portage Bay Vista. The visual corridor associated with the Portage Bay Vista would be retained.	• The aesthetic character of the site would reflect the new two story building with a primary entrance at the northeast corner of the site, loading and service from Brooklyn Avenue NE in the northwest portion of the site; new landscaping; and, a pedestrian path (NE Skamania Lane) along the northern site boundary.	• No new development would occur and the aesthetic character of the Proposed Action and Alternative 2 sites would remain in existing conditions.
	• New landscaping would include trees along the western and eastern edges of the site and replacement lawn/grass areas to create an open concept. Additional landscaping could be provided in the future similar to the level illustrated in the DEIS.	• Landscaping and open space areas along the north and south ends of the site would provide a visual buffer between the new building and adjacent uses.	• No new development would occur and the aesthetic character of the Proposed Action and Alternative 2 sites would remain in existing conditions.

	Alternative 1 Proposed Action	Alternative 2 Alternate Site	Alternative 3 No Action Alternative
Potential Views to the Site	• Views of the Alternative 1 site would remain similar to existing conditions (reflecting open space in an urban campus environment). Views of and through the Portage Bay Vista would remain.	• Views of the Alternative 2 site would change with the addition of the two-story ARCF facility that could partially block views of surrounding buildings. The overall visual character of the views would remain that of an urban campus environment with a slight increase in density of development.	• No new development would occur under Alternative 3. Views of both sites would remain in existing conditions. The visual character of the Portage Bay Vista would not be improved with new lawn, landscaping or plaza areas

Construction

Mitigation Measures

The following measures would be implemented to mitigate potential construction impacts from the development of the proposed UW ARCF. These mitigation measures would be applicable for both Alternative 1 and Alternative 2, unless noted otherwise.

Air Quality

The following measure would be implemented to mitigate potential construction-related air quality impacts from the development of the UW ARCF.

- Site development would adhere to the Puget Sound Clean Air Agency (PSCAA) regulations regarding demolition activity and fugitive dust emissions, including: wetting of exposed soils, covering or wetting of transported earth materials, washing of truck tires and undercarriages prior to travel on public streets, and prompt cleanup of any materials tracked or spilled onto public streets.

- The University and project contractor would coordinate to temporarily duct and protect air intakes of adjacent buildings to minimize the potential for the intake of fugitive dust and exhaust fumes.

- A temporary asphalt roadway would be provided through the Alternative 1 site to provide access for construction vehicles and equipment which would reduce the amount of dust and dirt that would be generated by construction vehicles and equipment accessing the site.

Greenhouse Gas Emissions

The following measure would be implemented to mitigate potential GHG emission impacts from the development of the UW ARCF.

- Continued implementation of the University's Transportation Management Plan (TMP) would reduce vehicle trips to the campus (including the ARCF site), thereby reducing GHG emissions. Implementation of a Construction Management Plan would also help to control transportation issues during construction and could reduce construction-related GHG emissions.

Noise

Because of the proximity of academic, research and commercial uses near the site, the University agrees that the mitigation of construction-related noise impacts is important and they are committed to the measures listed below. The following measures would be

implemented to mitigate potential construction-related noise impacts from the development of the UW ARCF Project.

- Most construction activities would be limited to standard construction hours between 7 AM and 6 PM on weekdays and 9 AM and 6 PM on Saturdays.
- Deliveries would generally be scheduled during daytime hours.
- Placement of materials and backing up of trucks could be done without warning beepers (with a flagger walking behind the vehicle).
- Alternate white noise backup warning systems would be installed (as allowed by Washington State construction safety regulations, WAC 296-155-605).
- Low noise portable air compressors would be used where feasible.
- Nighttime activities would not exceed allowable noise levels.
- The use of noise impact-type equipment, such as pavement breakers, pile drivers, jackhammers, sand blasting tools, and other impulse noise sources would be limited to work activity between 8 AM and 5 PM on weekdays.
- Whenever appropriate, hydraulic impacts tools with electric motors would be substituted to further reduce demolition and construction-related noise.
- Loud talking, music, or other miscellaneous noise-related activities would be limited.
- Construction noise would be reduced with properly sized and maintained mufflers, engine intake silencers, engine enclosures, and turning-off idling equipment.
- Truck haul routes would be jointly developed by the UW, SDOT and DPD and approved by SDOT.

Vibration

The following measures would be implemented to mitigate potential construction-related vibration impacts from the development of the UW ARCF.

- The project manager would work with individual research uses to define specific vibration criterion for the researchers in the vicinity of the site, where appropriate.
- Vibration levels would be monitored at sensitive receptors during all construction activities to validate predicted vibration levels and provide a real-time notice when construction activities create higher vibration levels than anticipated. Vibration sensors would be installed in existing buildings surrounding the project site to provide continuous vibration monitoring during the construction process. The sensors would have the ability to send notifications if vibrations levels exceed a specific limit for the surrounding buildings. This information would be used to determine when and how additional mitigation measures below would be implemented.

- For construction activities that are predicted to generate a high potential for vibration impacts at sensitive uses, the Contractor would coordinate with the University of Washington and the researchers to schedule activities such that sensitive experiments are not conducted simultaneously with vibration-intensive construction activities.
- For impacts to researchers using routine laboratory equipment and optical imaging tools, instruments could be remounted on air isolation tables to attenuate the construction-generated vibration levels, allowing research to continue without degradation.
- For impacts to researchers that cannot be addressed by the identified mitigation measures, the researchers or facilities could be temporarily relocated during the vibration generated construction activities.

- To the extent feasible, prefabrication of construction materials would be conducted at an off-site location to reduce to the amount of work on-site and the associated vibration impacts. Anchors for hangers in the structure could also be preinstalled to eliminate the need for drilling into concrete onsite.
- To the extent feasible, construction activities would utilize practices that would minimize vibration, such as the use of sawcutting for concrete removal in lieu of using impact tools.
- Orientation would be provided for all construction workers to inform them of the importance of minimizing impacts to adjacent buildings, including vibration.
- Advanced notification would be provided to surrounding buildings and uses to inform them of construction activities that would cause vibration (e.g., drilling of soldier piles). Early notification would allow surrounding uses to prepare in advance of potential vibration activities.

Transportation

Alternative 1 Mitigation Measures

The following measures would be implemented to mitigate potential construction-related transportation impacts from the development of the UW ARCF under Alternative 1.

- Manual traffic control would be implemented at both construction access points along NE Boat Street to minimize impacts to traffic. Manual traffic control would reduce the length of time construction vehicles might wait for gaps in opposing traffic to enter and exit the sites, reduce the likelihood of inbound construction vehicles blocking eastbound traffic and reduce the likelihood of long outbound vehicle queues forming that could impact construction activity. This added level of traffic control would also manage pedestrian, bicycle, and vehicular traffic at this location, thereby minimizing the potential conflicts between these three modes.

- Intermittent lane closures are anticipated to be temporary in nature, lasting no more than one day and would occur during non-peak traffic conditions. Brief lane closures throughout the area may occur to accommodate short-term construction activities. This would result in some delay to traffic on these roadways. Potential impacts would be reduced by planning for the activity to occur only during off-peak periods when possible. Impacts of lane closures would be mitigated through implementation of a Traffic Control Plan which requires additional permitting from the Seattle Department of Transportation (SDOT).
- A neighborhood communication plan would be developed for purposes of communicating upcoming construction activities that may impact travel on the street system surrounding the project.
- Haul trucks would be marshalled to/from the site to minimize the likelihood and potential impacts associated with simultaneous arrivals or departures.
- Temporary pathways and/or pedestrian wayfinding signage would be constructed and implemented to direct pedestrians to routes not impacted by construction. In general, pedestrians that would use the east-west pedestrian corridor located within the construction area would be redirected to the existing sidewalks along NE Pacific Street, 15th Avenue NE, and NE Boat Street. During the two-week period that the sidewalk on NE Pacific Street is closed, pedestrians could be rerouted through the Island I-Wing Rotunda located east of the project site. This building can provide a north/south pedestrian connection from NE Columbia Road to NE Pacific Street. These detour routes will be prepared and approved by the City of Seattle as part of the sidewalk closure process and would maintain ADA accessible routes. University of Washington has developed a Campus Mobility Route Map (http://www.washington.edu/admin/ada/mmap.pdf) for the area. These identified ADA accessible routes would be maintained or alternative routes identified as part of the wayfinding and mitigation plans.
- Detours would be in place for bicycles during the period of the NE Pacific Street sidewalk and east-west pedestrian corridor closure. These detour routes would be prepared in coordination with and approved by the City of Seattle as part of the sidewalk closure process. In general, it is anticipated that bicyclists would be routed to 15th Avenue NE, then NE Boat Street if approaching from the west or NE Columbia Road approaching from the east.
- Bicycle parking areas displaced during construction (lockers and racks) would be relocated in the same general area as the current locations. The bicycle lockers and racks located on the northwest corner of the construction site would be relocated south along the Foege Biosciences building, near the east/west pedestrian corridor. These areas would not be impacted by construction and can accommodate the

additional bike lockers. The bike shelter located adjacent to Hitchcock Hall would be relocated to Annex 4 area.[1]

- Bicycle parking demand would be monitored during construction.
- Depending on construction phasing and corresponding construction worker employment levels, the contractor would utilize valet parking to maximize the parking supply available in the W28 parking lot. With valet parking under peak construction worker parking demand, the W28 parking lot is anticipated to accommodate the peak construction worker parking demand.
- Parking previously provided to Agua-Verde would be relocated in a phased manner to other adjacent parking lots in the site vicinity on a temporary basis.
- Due to the proximity of the construction activity to the NE Pacific Street frontage, a covered walkway would be installed along the project perimeter. Due to the resulting sidewalk width at this point, bicyclists would be required to dismount and walk their bike through the area.
- The transit stop located along the south side of NE Pacific Street would be temporarily relocated near the Hitchcock Bridge ramp during the demolition period. This temporary relocation would be in effect for up to two weeks.
- The Dial-a-Ride stop, located along the south side of NE Pacific Street immediately east of 15th Avenue NE (#128), would be relocated to another existing stop at the University Transportation Center along southbound 15th Avenue NE south of NE Pacific Street (stop #77).

Alternative 2 Mitigation Measures

The following measures would be implemented to mitigate potential construction-related transportation impacts from the development of the UW ARCF under Alternative 2.

- Impacts to the surrounding street system by the construction vehicle access driveways, haul route, and ingress/egress construction vehicles accessing the construction site could be reduced through the use of manual traffic control at both construction access points along Brooklyn Avenue NE. This manual traffic control at both locations is anticipated to reduce the length of time construction vehicles might wait for gaps in opposing traffic to enter and exit the sites, reduce the likelihood of inbound construction vehicles blocking eastbound traffic and reduce the likelihood of long outbound vehicle queues forming that could impact construction activity. This added level of traffic control would also manage pedestrian, bicycle, and vehicular traffic at this location, thereby minimizing the potential conflicts between these three modes.

[1] The Annex 4 area will be demolished as part of the ARCF project.

- A neighborhood communication plan would be developed for purposes of communicating upcoming construction activities that may impact travel on the street system surrounding the project.
- Include additional pedestrian protection along the Brooklyn Avenue NE and 15th Avenue NE project frontages that include construction barriers or covered walkways. Alternatively, these sections of the sidewalk could be closed temporarily and pedestrians rerouted to the opposite sides of both impacted streets during construction activities.
- Parking previously provided to Agua-Verde will be relocated in a phased manner to other adjacent parking lots on a temporary basis.
- The layover space currently allocated for King County Metro will be reduced to accommodate the temporary access points. On-going coordination with King County Metro will be required to determine if adequate space will remain once the temporary driveways are constructed. If additional space is needed, additional areas will be identified for layover space. As noted previously, on-street parking exists along Boat Street, west of Brooklyn Avenue. This curb space could be repurposed during the construction period and be used for Metro layover space.

Trees

No Exceptional Trees are located on the site. However, the following measure would be implemented to mitigate potential construction-related tree impacts from the development of the UW ARCF.

- Tree removal and replacement would be intended to meet or exceed the City of Seattle's tree replacement requirements and be in accordance with the University's Tree Management Plan.

Cultural Resources

The following measure would be implemented to mitigate potential construction-related impacts to cultural resources.

- In the event that archaeological deposits are inadvertently discovered during construction, ground-disturbing activities would be halted immediately and the University of Washington would contact DAHP and interested Tribes, as appropriate. If ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity that may cause disturbance to those remains would cease and the area would be secured and protected from further disturbance. In addition, the finding of remains would be reported to the county coroner and local law enforcement.

Other Construction Impacts

The following measures would be implemented to mitigate other potential construction-related impacts from the development of the UW ARCF.

- A temporary dewatering system would be provided during construction of the ARCF to accommodate a discharge rate of at least 50 GPM, which would account for any short-term increases in water discharge rates. Water collected by the temporary dewatering system would discharge to a University-owned stormwater outflow.

- To minimize the potential for the proposed ARCF structure to obstruct groundwater movement and reduce the risk of water intrusion into the structure under Alternative 1, a subsurface drain system would be provided, including a full-coverage wall drainage against the shoring wall which would connect to a groundwater sump/pump located under the loading dock. Groundwater would be discharged to the University-owned 24-inch direct discharge stormwater main.

- As part of excavation activities under Alternative 1, the foundation walls and footings for the William H. Foege Building, Hitchcock Hall and the loading dock would be exposed and examined for damage. Damage from construction to the waterproofing systems would be repaired immediately. The footings for some of these structures would need to be modified, at which time patching of the waterproofing would be performed. Additional examination of the condition of the existing waterproofing systems would be performed to identify any other potential areas for waterproofing repairs.

- In the event that contaminated soils are encountered during construction, such soils will be handled consistent with applicable regulations.

Significant Unavoidable Adverse Impacts

Construction of the proposed Animal Research and Care Facility Project would result in some construction-related air quality, GHG emissions, noise, vibration, transportation and tree impacts that would be unavoidable with the proposed project. However, with the implementation of proposed mitigation measures, construction activities would not be anticipated to result in significant impacts to surrounding uses.

Land Use

Mitigation Measures

The following measures could be implemented to mitigate potential land use impacts from the development of the UW ARCF. These mitigation measures would be applicable for both Alternative 1 and Alternative 2, unless noted otherwise.

- Development of the ARCF would be consistent with applicable provisions of the *CMP-Seattle 2003*.

- Landscape design features under Alternative 1 would be incorporated into the design of the ARCF.

- The below-grade placement of the facility under Alternative 1 would preserve the Portage Bay Vista and east/west pedestrian corridor.

- ARCF functions would be consolidated in one location and would address existing deficiencies in care, space, and capacity.

Significant Unavoidable Adverse Impacts

Development of the ARCF would result in the temporary displacement of existing open space and pedestrian and bicycle circulation uses on the site during construction. The project would result in an increase in activity in the area. However, with the implementation of the proposed mitigation measures and provisions required by the *CMP-Seattle 2003*, no significant land use impacts would be anticipated.

Aesthetics

Mitigation Measures

The following mitigation measures are proposed for development of the ARCF project. These mitigation measures would be applicable for both Alternative 1 and Alternative 2, unless noted otherwise.

- The development of the ARCF under Alternative 1 would retain views of/through the Portage Bay Vista by placing the majority of the building underground. Above ground portions of the building would be located outside of the Portage Bay Vista, and be designed to blend into the façade of existing buildings.

- New landscaping would be provided on the Portage Bay Vista under Alternative 1. The proposed landscape design would be approved by the UW Landscape Advisory Committee. This committee includes experts in planting, botany, landscape architecture, urban design, horticulture, art, architectural history, and grounds maintenance.

- Project tree replacement would be anticipated to meet or exceed City of Seattle tree replacement requirements and would be in accordance with the University's Draft Tree Management Plan.

Significant Unavoidable Adverse Impacts

The proposed ARCF project would be developed below-grade in order to preserve views across the Portage Bay Vista, and visible above grade features of the ARCF would be confined to the east portion of the site outside of the Portage Bay Vista. On the Alternative 2 site, the assumed building would intensify the level of development in the area; however, the height of the facility would generally be consistent with other buildings in the surrounding area and changes to the overall visual character of the Southwest Campus would be consistent with urban development of the City and this area. Significant adverse visual impacts would not be anticipated.

CHAPTER 2

Description of Proposed Action and Alternatives

CHAPTER 2
PROJECT DESCRIPTION

This chapter of the Final Environmental Impact Statement (FEIS) describes the Proposed Actions (Alternative 1) for the University of Washington Animal Research and Care Facility (ARCF) Project. A description of Alternative 2 (alternate site) and Alternative 3 (No Action Alternative) is also provided in this chapter. A detailed description of the affected environment, environmental impacts, mitigation measures, and significant unavoidable adverse impacts is provided in **Chapter 3** of the DEIS. Updated information provided subsequent to the issuance of the DEIS is indicated by shaded text.

2.1 PROJECT SUMMARY

The fundamental mission of the University of Washington is to provide education, research and public service at a nationally competitive level for the citizens of Washington State. To support the research being conducted by the University of Washington Health Sciences Department, including the Department of Comparative Medicine (DCM) and the Washington National Primate Research Center (WaNPRC), the University has proposed the new ARCF to meet the specialized building and research requirements of these departments. Currently, existing research and animal housing functions are situated in various locations throughout the campus and Health Sciences Complex. In addition, the DCM and WaNPRC have experienced animal housing capacity issues due to a lack of adequate space which has hampered their ability to function and meet demand.

Existing decentralized facilities generally account for approximately two-thirds of the identified regulatory[1] deficiencies (non-compliance) at the University's animal care and use program, even though they house only three percent of the animal population; these facilities have also been difficult and costly to maintain at the same high standards of animal care provided in centralized facilities. In order to upgrade currently non-compliant facilities, increase holding and procedure space, and provide a new centralized resource for the DCM and the WaNPRC, the University of Washington proposes to construct a modernized and centralized facility to provide a productive and healthy working environment for staff, researchers, and animals, while providing adequate space and flexibility for housing animals.

Under the Proposed Action, the two-level ARCF would be constructed below-grade on the proposed site (which includes the Portage Bay Vista) and would contain approximately

[1] Regulatory agencies that reviewed the University's facilities included the Association for the Assessment and Accreditation of Laboratory Animal Care, International (AAALAC) and the National Institute of Health (NIH).

90,000 square feet of below-grade building space (approximately 43,000 square feet on each level, plus an additional 4,000 square feet for the expanded loading dock area). Minor above-grade development would total 5,700 square feet outside of the Portage Bay Vista boundaries and would consist of an approximately 66-foot high, 4,200-square foot utility/exhaust tower[2] for air intake and exhaust in the northeast corner of the proposed building (adjacent to Hitchcock Hall), as well as an approximately 1,500-square foot above-grade entrance pavilion to provide access to the ARCF via the below-grade access corridor. In total, approximately 95,700 square feet of building development would be constructed under the project. Once construction of the building is complete, the Portage Bay Vista would be replaced and include pedestrian access and replacement landscaping. The existing view corridor created by the Portage Bay Vista would remain as part of this project.

2.2 BACKGROUND

University of Washington Campus Master Plan

The University of Washington (UW) was founded in 1861 as a public research and education institution and currently has campuses in Seattle, Tacoma, and Bothell. The University conducts master planning to guide future development on all campuses. In January 2003, the University of Washington adopted the *Campus Master Plan-Seattle Campus* (*CMP-Seattle 2003*), a conceptual plan that establishes guidelines and policies for up to three million square feet of building area housing academic, research, education, and support uses. This plan was approved by the University of Washington Board of Regents and the City of Seattle. All new University of Washington – Seattle Campus development considers the guidelines and requirements of the *CMP-Seattle 2003.*

For planning purposes, the *CMP-Seattle 2003* divided the Seattle Campus into five different areas including the Central, West, South, Southwest, and East campus sectors. Each area is characterized by their varying structures and uses and each area follows a list of objectives that represent ideas for future development. The Southwest Campus, which contains the proposed ARCF site, consists of approximately 30 acres and is bordered by Pacific Street to the north, Portage Bay to the south, the connection with the South Campus at the Portage Bay Vista to the east, and 6th Avenue NE to the west. The *CMP-Seattle 2003* indicates that the Southwest Campus includes a significant public resource, the Portage Bay shoreline and vista.

The *CMP-Seattle 2003* also indicates the amount of new development allowed in each sector during the 10-year planning period covered in the document. The *CMP-Seattle 2003* indicates that approximately 390,000 gross square feet (GSF) of new development would be

[2] The proposed utility/exhaust tower would be approximately 66 feet in height (equal to the adjacent Hitchcock Hall). Exhaust stacks would extend an additional 16 feet to the approximate height of the Hitchcock Hall mechanical penthouse.

allocated between the Southwest and South Campus. However, the *CMP-Seattle 2003* also indicates that "*gross square footages do not include potential new construction below-grade*[3]" and as part of the Development Standards, the *CMP-Seattle 2003* includes an adjustment and exception to the Post-Secondary Facilities Inventory and Classification Manual (FICM)-GSF for the Campus Master Plan that states "*The Campus Master Plan GSF will not include the gross floor areas/portions of areas of the building that are entirely below the existing grade."*[4] The Alternative 1 site (which includes the Portage Bay Vista) is not identified as a development site and the proposed development of the ARCF below-grade under the Proposed Action would not count towards the development that was allocated to the Southwest Campus in the *CMP-Seattle 2003*.

Primary goals of the *CMP-Seattle 2003* for the Southwest Campus include:

- Maintaining the current uses along the waterfront (the Portage Bay shoreline and vista, University facilities leased for private houseboats, private boat moorages, and the Jensen Motor Boat Company);
- Maintaining the maritime character of the area; and,
- Meeting the University of Washington's needs for the area.

Other specific objectives identified for the Southwest Campus include the following:

- Take advantage of the shoreline and reopen views to the water where possible;
- Develop a coherent assemblage of buildings and open spaces, both as a long range vision and at intermediate stages of development;
- Improve pedestrian routes along the water;
- Create additional open spaces;
- Complete the Car Top Boat Launch and Portage Bay Vista; and,
- Protect views from the Portage Bay Vista.

The proposed ACRF (Alternative 1 – Proposed Action) site is also located immediately adjacent to the South Campus area which is generally characterized by the University of Washington Medical Center, Magnuson Health Sciences Center and the Oceanography and Fisheries Buildings.

As indicated above, the *CMP-Seattle 2003* identifies approximately 70 potential development sites throughout the campus, and includes guidelines and policies for

[3] *CMP-Seattle 2003*, page 86.
[4] *CMP-Seattle 2003*, page 128.

development on these sites. The *CMP-Seattle 2003* does not specifically identify the proposed ARCF site (including the Portage Bay Vista) as a potential development site; however, the development of below-grade structures is not counted toward the overall development totals for the campus and is not required to be located on identified potential development sites. Development on the proposed ARCF site would be consistent with the objectives for the Southwest Campus in that it would protect and maintains views across the Portage Bay Vista and create enhanced open space areas and improved pedestrian routes.

The Alternative 2 site is identified in the *CMP-Seattle 2003* as Development Site 45S, which is intended to accommodate approximately 110,800 square feet of academic or transportation uses and could allow a building of up to 50 feet in height. Specific recommendations for Development Site 45S as identified in the *CMP-Seattle 2003* include:

- Developing a pedestrian extension to Skamania Lane;
- Integrate Skamania Lane extension with a potential Sound Transit Plaza; and,
- Develop open space as a connection to the Brooklyn Avenue NE street end, an extension to the waterfront and as part of the open space along NE Boat Street.

University of Washington Research Departments

The University of Washington DCM provides education and research opportunities in the use of animals in biomedical research, testing and education, while also offering training for veterinarians in the diagnosis, treatment and prevention of the disease of laboratory animals. Comparative medicine encompasses the various disciplines that are involved in the development, maintenance and use of animal models of human and animal physiology and disease conditions. Areas of current research interests include enteric disease, lymphocyte biology, biology of aging, mouse genomics, generation and characterizations of transgenic animal models, somatic cell gene transfer, and animal models of gene therapy. The DCM is primarily housed within the T-wing of the Health Sciences Complex, with additional laboratories in the K-wing and I-court.

The WaNPRC is a research unit of the University of Washington Health Sciences Department and conducts biomedical research that is directed towards significant human health issues and nonhuman primate health biology. Research conducted by the WaNPRC supports translational and pre-clinical biomedical research utilizing nonhuman primates with an emphasis in the areas of AIDS-related research, developmental biology, functional genomics, immunology, reproductive biology, neurophysiology, international studies, transplantation and stem cell biology, virology, and development of primate disease models. The WaNPRC is headquartered in the Warren G. Magnuson Health Sciences Center, with additional leased facilities in South Lake Union and Belltown.

The disposal of animal remains is a necessary part of the research process and is handled as part of the University of Washington Infectious Waste Management Plan (April 2014), which

is consistent with applicable state and local regulations and addresses federal guidelines for research as defined by the National Institute of Health (NIH) and the Center for Disease Control. Pursuant to this Plan, all animal remains will continue to be collected by a University contracted vendor and no incineration will occur on campus.

Environmental Review

A programmatic Environmental Impact Statement (EIS) completed for the *CMP-Seattle 2003* analyzed potential impacts for general development (not specific projects) and development potential for the entire campus. The *CMP-Seattle 2003* EIS is incorporated by reference in this EIS per WAC 197-11-635. This previous EIS is available for public review at the University's Capital Projects Office.

The University of Washington determined that this proposal may have potential significant adverse impacts to the environment. On April 24, 2014, the University of Washington issued a combined Determination of Significance and Request for Scoping Comments on the proposal. In response to the Request for Scoping Comments, approximately 110 public comments were received during the scoping period.

Public Outreach

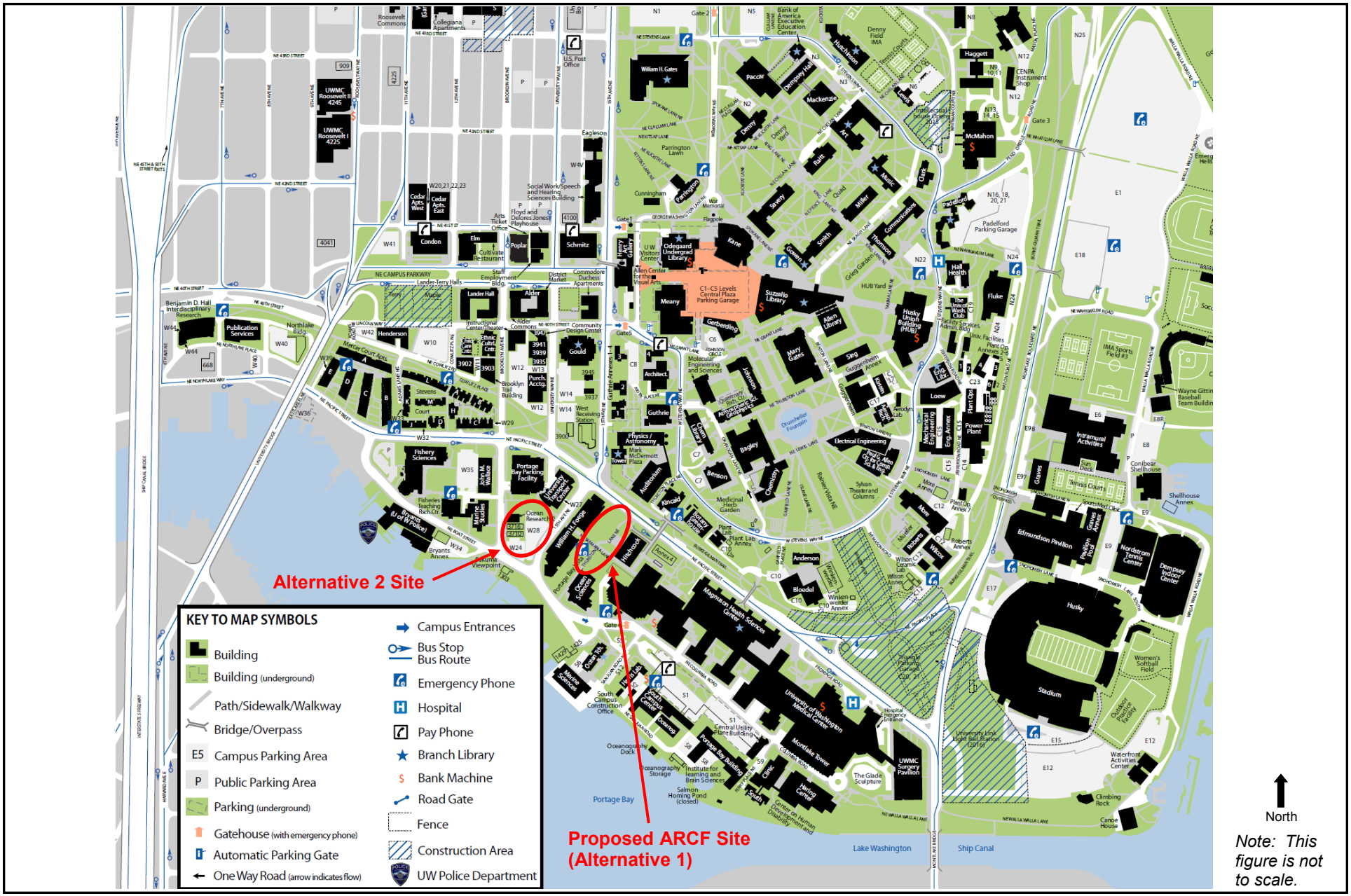
The University of Washington, including the DCM and the WaNPRC, strives to provide transparency regarding program missions and objectives. For the ARCF Project, the University of Washington conducted public outreach forums to describe anticipated range of medical research methods and receive public comments; presented the project to the Faculty Council on University Facilities and Services in November 2012; briefed the City-University Community Advisory Committee in November 2013; sent outreach email broadcast in April 2014; and, held a public open house in June 2014. A second open house was held in September 2014. Additionally, the Health Sciences Administration maintains updated information on the ARCF Project on its publically-accessible website.

2.3 EXISTING SITE CONDITIONS

Alternative 1 – Proposed Action

Existing Site and Surrounding Uses

The Alternative 1 – Proposed Action site is located in the central portion of the University of Washington's Southwest Campus area and includes the Portage Bay Vista. The site is generally bounded by NE Pacific Street to the north, Hitchcock Hall to the east, NE Boat Street to the south, and the William H. Foege Building to the west (see FEIS **Figure 2-1** for a map of the campus and FEIS **Figure 2-2** for an aerial photo of the site and surrounding area).



Source: University of Washington, 2014.

EA Engineering, Science, and Technology, Inc.

FEIS Figure 2-1
Campus Map

Proposed ARCF Site (Alternative 1)
Alternative 2 Site

Note: This figure is not to scale. North

Source: Google Earth and EA Engineering, 2014.

EA Engineering, Science, and Technology, Inc.

FEIS Figure 2-2
Aerial Photo

The Alternative 1 site is located at and below-grade, under the Portage Bay Vista, which provides open space, views and pedestrian circulation. The site is generally comprised of vegetated open space area (primarily grass/lawn) and paved pathways, which provide connections between NE Pacific Street, NE Boat Street, Foege Hall, and Hitchcock Hall. The "Stronghold" sculpture is located in the central portion of the site and serves as a small gathering area with views towards Portage Bay. The Portage Bay Vista provides a visual corridor though the western portion of the site and was a requirement as part of the *15th Avenue Street Vacation Property Use and Development Agreement (PUDA) between the University of Washington and the City of Seattle* (August 18, 2000). Per the Agreement, the Portage Bay Vista requires an approximately 110-foot wide by approximately 600-foot long uninterrupted visual corridor between NE Pacific Street and Portage Bay.

Circulation

The Alternative 1 site contains the Portage Bay Vista east/west pedestrian corridor, which is the major east/west connection through the south campus from the University Transportation Center/Portage Bay Parking Facility (to the west of the site) to and through the Health Sciences Complex (to the east of the site), and to the University of Washington Medical Center (UWMC). The east/west pedestrian corridor was also a requirement of the *15th Avenue Street Vacation PUDA*. Multiple pathways traverse through the site and provide connections to the adjacent areas including NE Pacific Street, NE Boat Street, 15th Avenue, Hitchcock Hall, the Health Sciences Complex, Foege Hall and the University Transportation Center/Portage Bay Parking Facility.

A pedestrian/bicycle ramp extends from the northwest corner of the site (adjacent to Hitchcock Hall) to the Hitchcock Bridge, which provides a connection with the Burke Gilman Trail. This ramp provides grade-separated access to the Burke Gilman Trail; however, according to the University's Campus Mobility Map the ramp is only considered "usable" which indicates that the ramp is not fully compliant with ADA accessibility guidelines.

While the site currently provides several circulation options for pedestrians and bicycles, not all of these routes are considered ADA accessible. The west/east connection between the University Transportation Center/Portage Bay Parking Facility and the Health Sciences Complex is fully ADA accessible. However, the north/south connection between NE Pacific Street and NE Boat Street is considered to be too steep to serve as an ADA accessible pathway. In addition, access to the site from the north and south of NE Pacific Street, including the ramp connection to the NE Pacific Street overpass to the northeast of the ARCF site, are not fully compliant with federal ADA accessibility guidelines.

Loading Dock

An existing, underground loading dock is located beneath a portion of the Alternative 1 site and is accessed from NE Boat Street and Columbia Road to the south of the site. The existing loading dock provides loading vehicle access for the William H. Foege Building, Hitchcock Hall, and the H-wing and K-wing of the Health Sciences Complex.

Vehicle Parking

While there is no vehicle parking currently provided on the Alternative 1 site, the existing University Transportation Center/Portage Bay Parking Facility is located to the west of the site, beyond Foege Hall and 15th Avenue NE. The Portage Bay Parking Facility includes approximately 990 parking stalls and provides parking for the South Campus area, including Foege Hall, Hitchcock Hall, the Health Sciences Complex, and the University of Washington Medical Center.

Bicycle Parking

Covered bicycle parking for approximately 24 bicycles is located on the site, adjacent to the west side of Hitchcock Hall. Bicycle lockers and uncovered bicycle racks for approximately 31 bicycles is also located at the northeast corner of Foege Hall, adjacent to the site.

Utilities

Existing civil utilities including stormwater drainage, water, and sanitary sewer are all available at the Alternative 1 site. A description of these existing utilities is provided below.

Stormwater

The University of Washington owns and maintains stormwater drainage facilities on the site; stormwater facilities located in the NE Boat Street right-of-way are owned by Seattle Public Utilities (SPU). There are three existing stormwater drainage systems on the site, all of which eventually discharge to the SPU stormwater drainage system in the NE Boat Street right-of-way.

- The Hitchcock Hall stormwater system collects stormwater runoff from the west side of Hitchcock Hall and routes it around the north edge of the building to a 24-inch storm main to the east of Hitchcock Hall.
- The Ocean Sciences North stormwater system collects subsurface drainage from the loading dock and stormwater runoff from the area between Hitchcock Hall and the Ocean Sciences Building and conveys it to the 16-inch stormwater main running southeast through the vacated 15th Street.
- The Foege Building stormwater system collects stormwater runoff from the remainder of the site and conveys it via a 12-inch stormwater main south through the site. This system crosses over the top of the loading dock.

Groundwater is also anticipated to be present at the site and is located at an elevation of approximately 26 feet at the north side of the proposed building footprint (approximately 42 feet below ground surface) and at an elevation of approximately 25 feet at the south side of the proposed building footprint (approximately 32 feet below ground surface).

Water Service

An existing Campus Master Water Meter is located at the northwest corner of the proposed ARCF site. Water service to the west of this meter (upstream) is owned by SPU; water service to the east of this meter (downstream) is owned by the University of Washington. Downstream of the master water meter, a 12-inch university main runs along the south edge of NE Pacific Street.

Midway through the proposed ARCF site, a 10-inch ductile iron loop-line connects to the south and travels the length of the site before bending and heading east along the south edge of the Ocean Sciences Building. This 10-inch line travels over the existing loading dock in a recess in the loading dock roof structure. In addition, at the northwest corner of the ARCF site, two ductile iron water services (eight-inch and six-inch lines) branch off of the 10-inch loop-line to provide service to the Foege Building.

Sanitary Sewer Service

The University of Washington owns and maintains sanitary sewer facilities on the proposed ARCF site, while SPU owns and maintains the sewer facilities in the NE Boat Street right-of-way and King County Metro owns and maintains the 108-inch sewer trunk main in the NE Pacific Street right-of-way. There are two existing sanitary sewer systems on the Alternative 1 site, both of with are located south of the loading dock. An eight-inch sewer line that serves the Ocean Sciences building runs north and south, midway between the Ocean Sciences Building and the Foege Building. A ten-inch sewer line serves the Foege Building and runs north and south along the eastern edge of the Foege Building. Both of these systems gravity drain towards the SPU sewer system in the NE Boat Street right-of-way which discharges to a sanitary sewer lift station west of the site.

Additional sanitary sewer facilities in the vicinity of the site include a ten-inch force main to the southeast in the vacated 15th Street easement that connects to a gravity system east of Hitchcock Hall, and an eight-inch sewer line on the east side of Hitchcock Hall that connects with the 108-inch sewer main in the NE Pacific Street right-of-way.

Natural Gas Service

Natural gas service in the site vicinity is provided by Puget Sound Energy (PSE) and there are two existing natural gas service lines on the proposed ACRF site. A three-inch stub extends from NE Boat Street on the south side of the Ocean Sciences Building and dead-ends approximately 75 feet south of the loading dock. An additional service line extends from the four-inch PSE main in the NE Boat Street right-of-way to serve the Foege Building (the size of this line is unknown).

Alternative 2 – Alternate Site

Existing Site and Surrounding Uses

The Alternative 2 site is located in the University of Washington's Southwest Campus area and is generally bounded by the Portage Bay Parking Facility and University Transit Center to the north, 15th Avenue NE to the east, NE Boat Street to the south, and Brooklyn Avenue NE to the west (refer to FEIS **Figure 2-1** for a campus map and FEIS **Figure 2-2** for an aerial photo of the Alternative 2 site and surrounding area).

The Alternative 2 site is primarily comprised of existing gravel parking areas (parking area W24 and W28) and includes approximately 90 parking spaces. Three existing buildings are located along the western edge of the site, including two single-story brick buildings and the two-story Oceanography Research Building.

Circulation

Vehicular access to the Alternative 2 site is provided from the south via NE Boat Street. An existing alley connects the site with NE Boat Street and provides vehicular circulation through the site and access to the existing on-site parking areas. A pedestrian pathway is located at the northern edge of the site and serves as a connection to the east/west pedestrian corridor which connects the adjacent Portage Bay Parking Facility with William H. Foege Hall, the Portage Bay Vista, Hitchcock Hall, the UW Health Sciences Center and UWMC to the east, as well as the Fisheries and Marine Sciences Buildings to the west. Existing sidewalks are also located adjacent to the Alternative 2 site along 15th Avenue NE, Brooklyn Avenue NE and NE Boat Street.

Vehicle Parking

As described above, the Alternative 2 site contains two existing University parking areas (W24 and W28) and includes approximately 90 parking spaces. The Portage Bay Parking Facility is also located to the north of the site and includes approximately 990 parking spaces.

Bicycle Parking

Uncovered bicycle parking facilities for approximately 11 bicycles are currently located on the Alternative 2 site, adjacent to the Ocean Research 2 Building. In addition, several bicycle parking areas are provided within the adjacent Portage Bay Parking Facility and the University Transit Center.

Utilities

Stormwater

Existing stormwater on the Alternative 2 site is generally conveyed and discharged to a 48-inch stormwater drain that is located to the west of the site in the Brooklyn Avenue NE right-of-way. Typical of most University uses, most stormwater is conveyed separately to Portage Bay, or to the City of Seattle storm drainage system.

Water Service

Water service for the Alternative 2 site is provided by the City of Seattle and is located in several locations surrounding the site, including an existing water main located in the Brooklyn Avenue NE right-of-way, as well as within 15th Avenue NE to the east of the site and NE Pacific Street to the north.

Sanitary Sewer Service

An existing 15-inch sanitary sewer main is located to the west of the Alternative 2 site, within the Brooklyn Avenue NE right-of-way. The University of Washington owns and maintains its own sanitary sewer system, and it contributes to the City of Seattle collection system with treatment and disposal at Metro's West Point sewage treatment facility.

2.4 PROJECT GOALS AND OBJECTIVES

The fundamental mission of the University of Washington is to provide education, research, and public service at a nationally competitive level for the citizens of Washington State. The development of the ARCF is intended to further the University's mission and the goals for the project include the following:

- Replace currently non-compliant animal research labs and facilities with new "state of the art" facilities.
- Create a safe and healthy working environment for staff, researchers and animals.
- Provide a new centralized resource for the University of Washington Health Sciences Administration, the DCM and the WaNPRC.
- Provide amenities that assist in retaining and recruiting staff, including adequate offices and teaming spaces, which also instill confidence in the research community that the animals are well cared for.
- Allow flexibility for housing animals to allow the facility to respond to changing animal species population and census projections within the facility.
- Provide sufficient storage space to reduce operational time for staff to locate materials and provide a safer, more ergonomically friendly environment.

2.5 ALTERNATIVES

For the purposes of environmental review, two development alternatives are analyzed in this DEIS, including Alternative 1 – Proposed Action and Alternative 2 – Alternate Site. The Proposed Action would include development of the proposed ARCF within a below-grade structure in the Portage Bay Vista area between the William H. Foege Building and Hitchcock Hall. Alternative 2 (Alternate Site) would include development of the ARCF as part of an above-grade structure on Development Site 45S as listed in the *CMP-Seattle 2003*. The following provides a description of development under Alternatives 1 and 2.

Alternative 1 – Proposed Action

Overview

In order to replace currently non-compliant facilities, and provide new centralized holding and procedure space for the University of Washington Health Sciences Administration, the DCM and the WaNPRC, the University of Washington proposes to construct a modernized and consolidated facility to provide a productive and healthy working environment for staff, researchers, and animals. The two-level, approximately 90,000-square foot ARCF building would be constructed below-grade on the site. Access to the ARCF would be provided from a below-grade access corridor adjacent to the loading dock or from within the William H. Foege Building's secure, existing animal holding and procedure space. Above-grade development on the site would include an approximately 66-foot high, 4,200-square foot utility/exhaust tower for air intake and exhaust in the northeast corner of the proposed building, adjacent to Hitchcock Hall. An above-grade entrance pavilion would also be located above the southeast corner of the building and would connect to the access corridor adjacent to the building. The entrance pavilion would include an approximately 1,500-square foot above-grade structure to provide access to the proposed building via the access corridor. In total, approximately 95,700 square feet of building development would be constructed under the project. Subsequent to construction of the proposed building, replacement landscaping would be planted on the site and pedestrian pathways would be provided. The existing view corridor through the site towards Portage Bay would also be maintained as part of the project. Research uses within the proposed ARCF would continue to follow the University's Infectious Waste Management Plan as it relates to the disposal of animal remains and no onsite incineration would occur. The proposed ARCF would also comply with the applicable Regulations for Shipping Regulated Medical/Biohazardous Waste by Contracted Carrier which is managed by the University's Environmental Health and Safety Department.

Location

The Alternative 1 site is located in the University of Washington's Southwest Campus area within an existing open space area between Hitchcock Hall and the William H. Foege Building. The site is generally bounded by NE Pacific Street to the north, Hitchcock Hall to

the east, NE Boat Street to the south, and the William H. Foege Building to the west (see FEIS **Figures 2-1** and **2-2** for maps of the site location and vicinity).

Design Concept

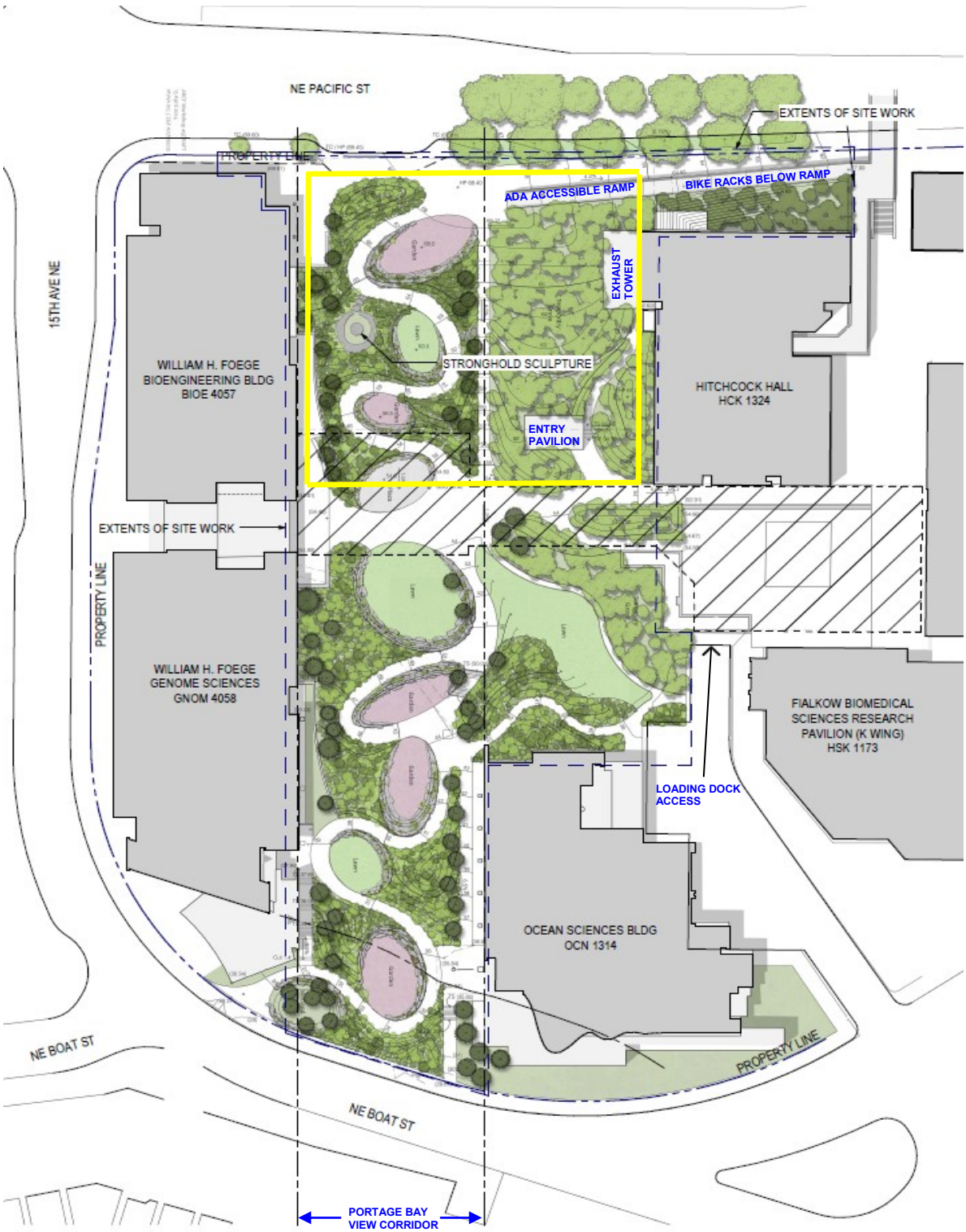
Under the Proposed Action, the approximately 95,700-square foot UW ARCF building would include two below-grade levels, each of which would contain approximately 43,000 GSF of building space for medical research uses. Modifications and connections to the existing adjacent loading dock area would also be provided, including an east/west connection between the William H. Foege Building, the proposed ARCF building, and Hitchcock Hall. Above-grade development on the site would include an approximately 4,200-square foot utility/exhaust tower, as well as an approximately 1,500-square foot entry pavilion. The design concept for the Proposed Action contains three distinct elements: Level 1 (upper level) – Small Animal Program; Level 2 (lower level) – Large Animal and Non-Human Primate Program; and, the Loading Dock. **Table 2-1** provides a summary of proposed building area (GSF) for the ARCF building (see FEIS **Figure 2-3** for a site plan).

TABLE 2-1
PROPOSED UW ARCF BUILDING AREA

Building Use	Alternative 1 (GSF)
Above-Grade	
Utility/Exhaust Tower	4,200
Entry Pavilion	1,500
Above-Grade Sub-total	*5,700*
Upper Level	
Office Space	3,000
Research/Research Support Space	40,000
Expanded Loading Dock	4,000
Upper Level Sub-total	*47,000*
Lower Level	
Office Space	3,000
Research/Research Support Space	40,000
Lower Level Sub-total	*43,000*
Total	**95,700**

Source: ZGF, 2014.

Level 1 (upper level) would primarily include building space for the Small Animal Program and would be designed to connect with the William H. Foege Building and the expanded loading dock and access corridor area (see FEIS **Figure 2-4** for an illustration of the upper level floor plan). Research space rooms would be provided throughout the northern and central portion of the upper level and would be paired next to research support space. Storage and laundry facilities would be provided in the southwest corner of the upper level. Offices, locker rooms for male and female staff members, technology area rooms and a copy room area would be located along the southern end. A conference room and break room would be located in the southeast corner, along with the main entry to the ARCF building.



Note: This figure represents conceptual landscaping at the time of DEIS issuance. Conceptual landscaping has been updated for this FEIS in Figure 2-6.

Source: ZGF LLP, 2014.

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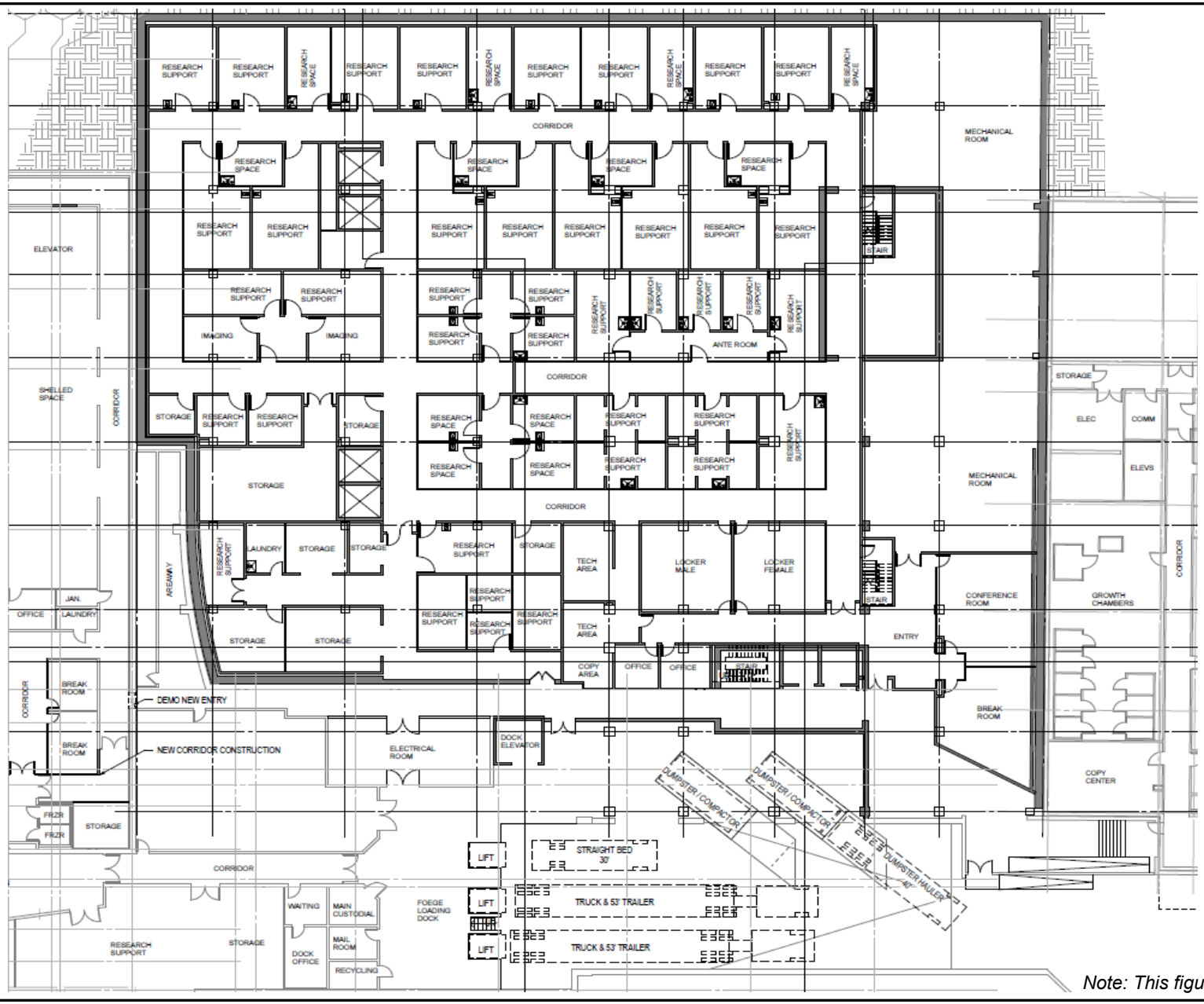
FEIS Figure 2-3
Alternative 1 Site Plan



Note: This figure is not to scale.

Source: ZGF LLP, 2014.

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FEIS Figure 2-4

Alternative 1 Upper Level Floor Plan

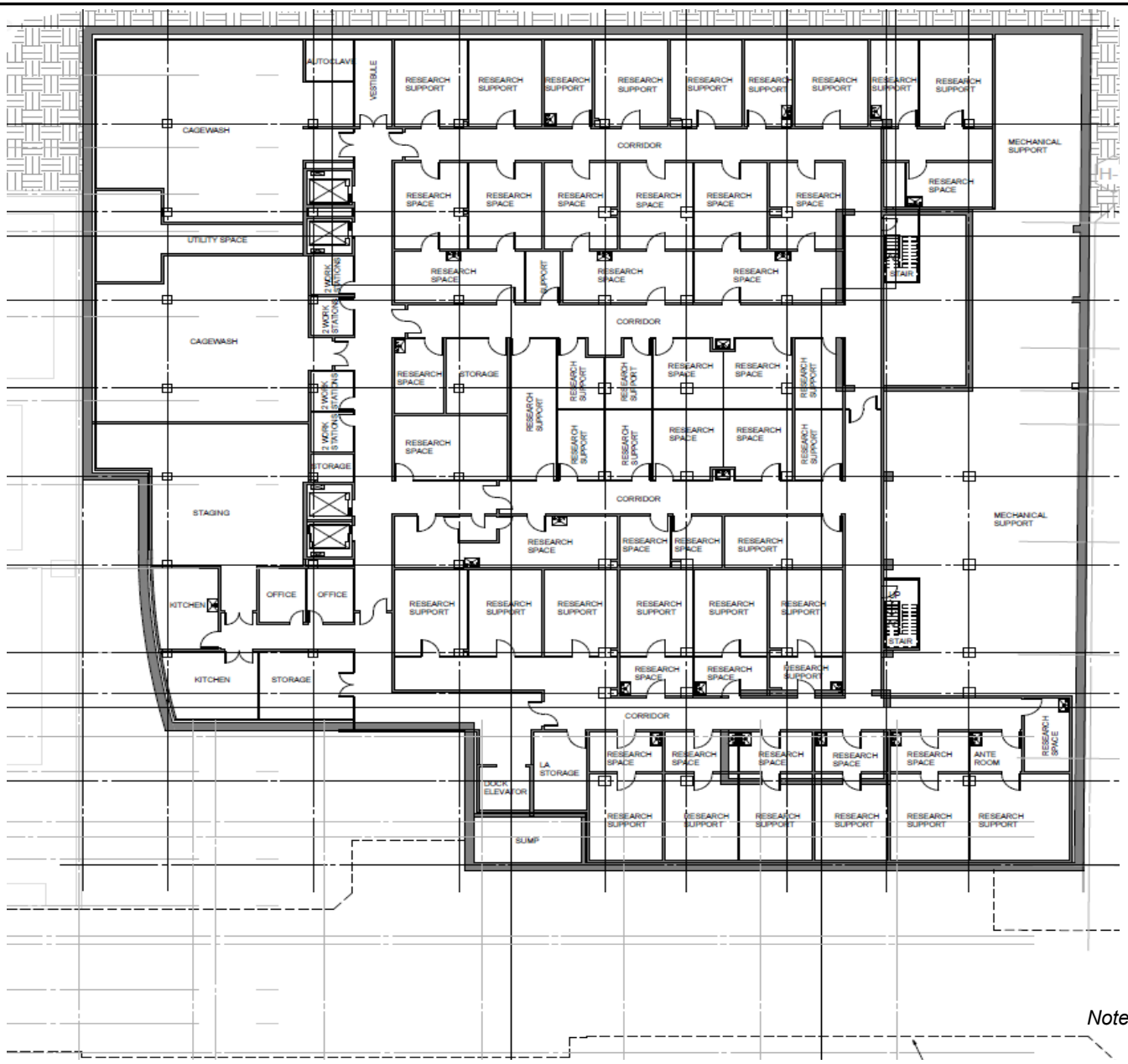
The mechanical room would be located along the majority of the eastern portion of the upper level, along with two stairway areas and an elevator to access the lower level. In addition, the upper level would be connected to the existing, adjacent loading dock (located south of the proposed ARCF building) which would be modified to accommodate the increased traffic (deliveries, shipping, etc.), accommodate the proposed east/west connection corridor, and improve pedestrian safety (see additional discussion below on the proposed modifications to the loading dock).

Access to the ARCF would be provided through a secure entrance on the upper level which would connect to the proposed below-grade access corridor (adjacent to the loading dock) that would link the William H. Foege Building and the ARCF with the Health Sciences Complex to the east. Additional access on the upper level would be provided within the William H. Foege Building's existing animal holding and procedure spaces.

Level 2 (lower level) would primarily include space for the Large Animal Program and the Non-Human Primate Program (see FEIS **Figure 2-5** for an illustration of the lower level floor plan). Research space rooms would be centrally located within the lower level, as well as along the north and south perimeter of the level. Research space rooms would generally be paired with adjacent research support space rooms. Two cagewash rooms would be located along the western perimeter of this level. A staging room, storage areas, workstations, kitchens and offices would also be located within this portion of the lower level. The eastern portion of the lower level would primarily consist of mechanical space, as well as two stairways to connect with the upper level.

A proposed utility/exhaust tower would be constructed at the northeast corner of the ARCF building, adjacent to Hitchcock Hall. The proposed structure would provide space for utility, mechanical and exhaust equipment to serve the ARCF building. The approximately 4,200-square foot utility/exhaust tower would have a footprint of approximately 30 feet by 50 feet and would be equal in height to the adjacent Hitchcock Hall (approximately 66 feet). Exhaust stacks would extend another 16 feet and would be approximately the same height as the Hitchcock Hall mechanical penthouse. The utility/exhaust tower would be monolithic (opaque) with the exception of two louvered areas that would be approximately 400 square feet with minimal glazing. The tower would be clad in a combination of masonry, metal panel and glass that would be similar to Hitchcock Hall.

An above-grade entrance pavilion would be provided on the eastern portion of the site and would be located outside of the Portage Bay Vista View Corridor to maintain views towards Portage Bay. The entrance pavilion would be located above the southeast corner of the building and would include an approximately 1,500-square foot above-grade structure to provide access to the proposed access corridor adjacent to the ACRF. The entrance pavilion would be approximately 17 feet in height and would be a primarily glass and metal structure.



Note: This figure is not to scale.

Source: ZGF LLP, 2014.

EA Engineering, Science, and Technology, Inc.

FEIS Figure 2-5

Alternative 1 Lower Level Floor Plan

Two emergency exit stairwells would be provided to allow direct, emergency egress from the ARCF through the entrance pavilion as well as the proposed utility/exhaust tower adjacent to Hitchcock Hall. These emergency exit stairwells would be discretely located and would have minimal exterior hardware.

Loading Dock

As part of the development of the ARCF, the existing loading dock would be modified to accommodate the increased traffic (deliveries, shipping, etc.) and the proposed east/west below-grade connection corridor. This corridor would provide a connection between William H. Foege Hall, the ARCF, Hitchcock Hall and the Health Sciences Complex, and would provide access to the primary entry to the ARCF (at the southeast corner of the building). All material arriving and leaving the site would move through the connector corridor to and from the loading dock. The loading dock would continue to provide general delivery and loading functions for existing adjacent uses that currently utilize the dock (i.e., William H. Foege Hall, Hitchcock Hall, and the Health Sciences Complex). The loading dock area would also include an enclosed Animal Receiving dock which would provide appropriate security for when animals are brought to the ARCF. The loading dock would include a coiling door that would provide a secure barrier at the entrance. Protocols during animal loading and unloading would require that the door be closed during animal transfers to create a secure, enclosed area. Access to the loading dock would continue to be provided from NE Boat Street.

Landscaping and At-Grade Features

The landscaping and at-grade design under the Proposed Action would be consistent with the University of Washington's landscape design standards and is centered around a winding, pathway for the Portage Bay Vista that connects the site from NE Pacific Street to NE Boat Street and allows for cross connections between the William H. Foege building and Hitchcock Hall (see the Circulation discussion below for further details). The proposed pathway would provide pedestrian/bicycle circulation through the site and the Portage Bay Vista area. The existing lawn area on the site would be removed as part of construction and replaced with landscaped shrubs and a mix of strategically placed gardens, lawn and plaza areas that would be situated adjacent to the winding pathway (see FEIS **Figure 2-3** for an illustration of the proposed landscape plan from the DEIS).

The proposed Portage Bay Vista lawn and plaza areas would enhance the visual appearance of the area and provide new space for informal seating and relaxation areas, as well as new areas for small outdoor department gatherings or other small events. Seating areas would be provided within the plaza area and along the pathway in certain locations.

Subsequent to the issuance of the DEIS, the landscaping design for the site was updated to reflect a more open concept with potentially fewer shrubs and trees (see FEIS **Figure 2-6** for an illustration of the updated landscape plan). New trees would be provided along the western edge of the site adjacent to the William H. Foege Building, as well as along a portion of the eastern edge of the site adjacent to the proposed utility tower. Open space areas on the site would be planted with new lawn sod, similar to the existing conditions to provide space for gatherings, relaxation and other activities. Additional landscaping could also be provided on the site in the future similar to the level depicted in the DEIS.

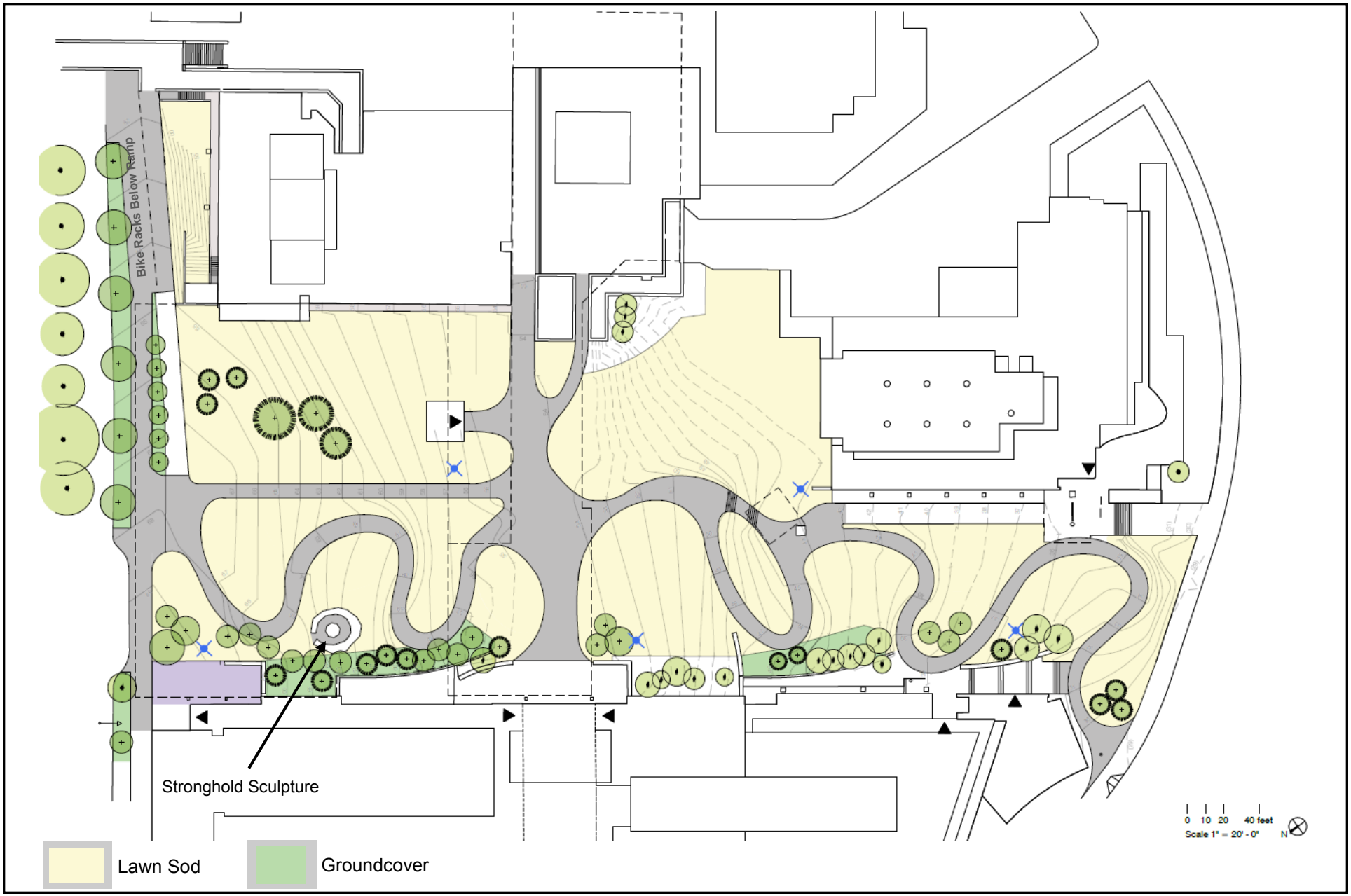
As part of development on the site, approximately 49 existing trees would be removed during the construction activities on the site. None of these trees would qualify as an "Exceptional Tree"[5], with the possible exception of a Lodgepole Pine that is located on the eastern portion of the site and exceeds the City's six-inch threshold. Subsequent to the development of the Proposed Action, new trees would be planted along the east and west sides of the Portage Bay Vista, adjacent to the William H. Foege building and Hitchcock Hall to soften the architectural edges on the site, while also maintaining the view corridor to Portage Bay. Tree replacement on the site would be anticipated to meet or exceed the City of Seattle tree replacement requirements and would be in accordance with the University's Tree Management Plan.

In addition, to accommodate construction activities on the site, the existing "Stronghold" sculpture would be temporarily decommissioned pursuant to the re-siting protocol outlined in the *ArtsWA Care* manual to ensure that the sculpture is appropriately preserved and protected during the construction process. Subsequent to construction activities on the site, the "Stronghold" sculpture would be relocated approximately 60 feet to the northeast of its current location (see FEIS **Figures 2-3** and **2-6** for the location of the "Stronghold" sculpture).

Pedestrian/Bicycle Circulation

The Portage Bay Vista serves as a significant point of entry for faculty, staff and students traveling from the Portage Bay Parking Facility and William H. Foege Building to the Health Sciences Complex and Medical Center. However, the existing site contains several constraints that limit the accessibility of the site, including steep pathways and pathways that are not compliant with accessibility requirements. The proposed project would enhance the accessibility through the site by providing a winding pathway from NE Pacific Street to NE Boat Street. Several east/west pathways would also provide connections through the site to Hitchcock Hall, the Health Sciences Center, the Medical Center and the Ocean Sciences Building.

[5] City of Seattle Department of Planning and Development – Director's Rule 16-2008.



Source: ZGF LLP, 2014.

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FEIS Figure 2-6
Alternative 1 Updated Landscape Plan

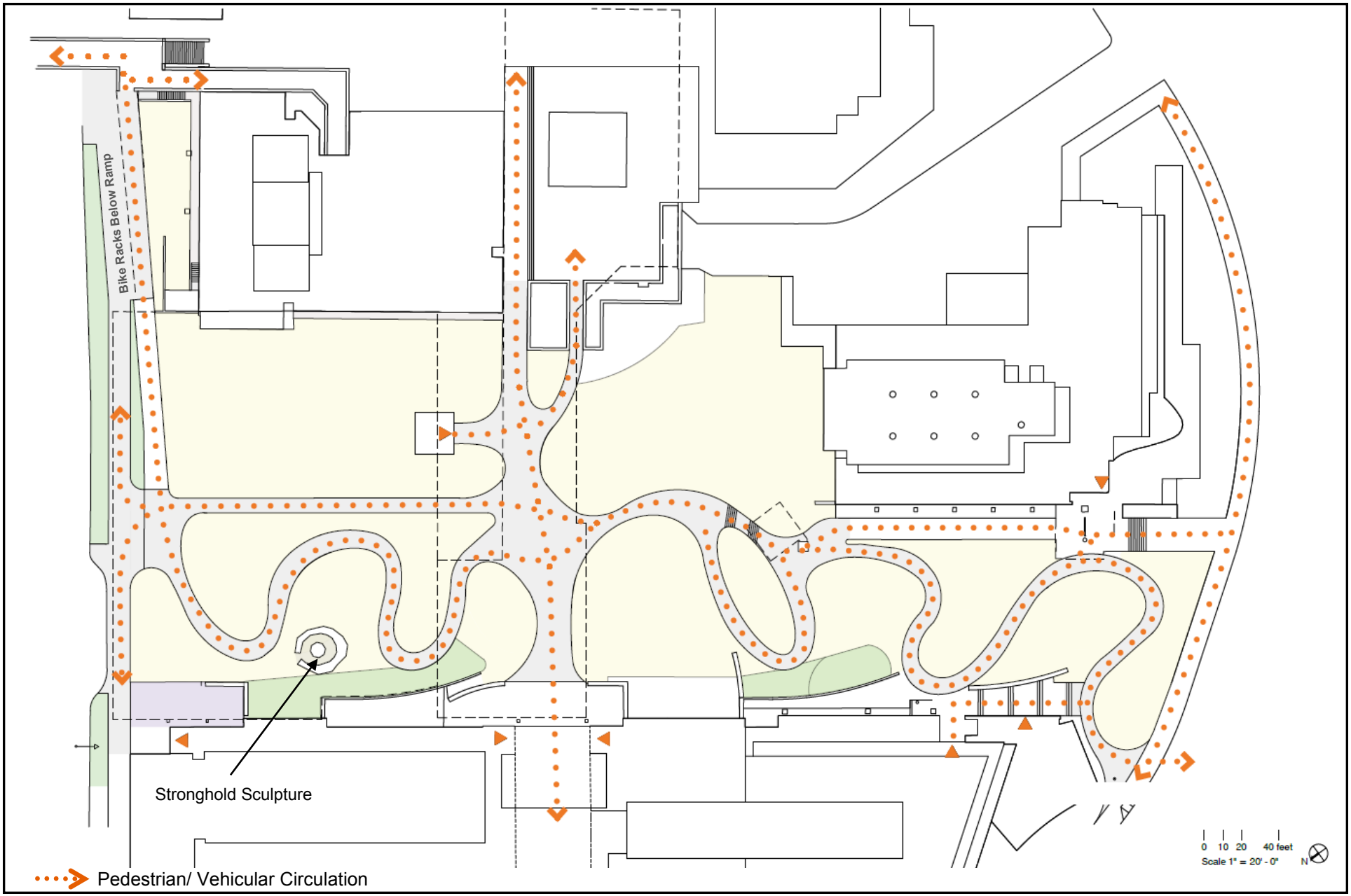
The existing ramp that connects NE Pacific Street with the Burke Gilman Trail via the Hitchcock Bridge would be reconstructed as part of the Proposed Action to allow for ADA accessibility. The new ramp would be constructed to the northeast of the ARCF site at a five percent slope to comply with ADA guidelines. A new planter would also be provided between the ramp and NE Pacific Street, as well as new street trees. In addition, the ramp along NE Boat Street would be replaced with a five percent sloped walkway to comply with ADA guidelines. New plantings would also be provided along NE Boat Street (see FEIS **Figure 2-7** for a map of the proposed onsite pedestrian/bicycle circulation).

Vehicle and Bicycle Parking

As under the existing conditions, and as is the case for numerous buildings on the University of Washington campus per the University's Transportation Management Plan (TMP), no on-site vehicle parking would be provided as part of the proposed project. The closest parking to the ARCF building is the Portage Bay Parking Facility which is located to the west of the site (beyond 15th Avenue NE) and includes approximately 990 parking stalls. The Portage Bay Parking Facility primarily serves the West Campus and South Campus area.

Development of the Proposed Action would result in the temporary displacement of existing bicycle parking areas located to the west of Hitchcock Hall. Approximately 24 bicycle parking stalls would be temporarily displaced during the construction process. Existing bicycle parking to the east of the William H. Foege Building (approximately 31 parking stalls) would also be temporarily displaced during construction; these bicycle parking stalls would be replaced in kind in a similar location subsequent to construction of the proposed ARCF building.

Subsequent to construction of the ARCF building, new covered bicycle parking would be provided adjacent to Hitchcock Hall to replace the existing displaced covered bicycle parking, as well as provide additional parking stalls to accommodate the proposed ARCF building. Based on the University of Washington Transportation Services Standards, bicycle parking should be provided to accommodate 10 percent of a building's population. Given that the proposed ARCF building would contain approximately 42 staff members, the project should provide approximately 5 additional bicycle parking stalls, in addition to the 24 existing covered stalls that would be temporarily displaced during construction. Accordingly, the proposed project would provide 30 new covered bicycle parking stalls to the north of Hitchcock Hall and adjacent to the ramp to the Hitchcock Bridge and Burke Gilman Trail; a secondary, potential location for the proposed covered bicycle parking could be in existing plaza space to the south of Hitchcock Hall.



Source: ZGF LLP, 2014.

EA Engineering, Science, and Technology, Inc.

FEIS Figure 2-7

Alternative 1 Pedestrian/Bicycle Circulation Plan

Utilities

Stormwater

Because the proposed ARCF building would be constructed below-grade, stormwater from the proposed development would generally consist of drainage from paved walkways and plaza areas, as well as landscaping and lawn areas. Stormwater from the site would be collected in a series of catch basins and area drains and would be conveyed via gravity flow to the onsite drainage system which flows to the south towards NE Boat Street. Because no pollution generating surfaces would be created on the site, no water quality facilities would be required or proposed. In addition, existing stormwater facilities disturbed during construction would be replaced in kind, including laterals, mains, catch basins, roof leaders, and subsurface drainage systems.

The proposed ARCF building would be constructed as a waterproof structure and as such, no permanent subsurface drainage system would be installed for the building. A subsurface perimeter drain would be constructed above the groundwater table to collect incidental surface infiltration. This system would consist of a four-inch perforated pipe around the perimeter of the structure surrounded by six inches of free-draining sand and gravel. The drainage system would be tight-lined to the existing on-site drainage system.

Groundwater is present at the site and it is anticipated that construction of the ARCF would result in minor, localized changes to the groundwater elevations adjacent to the building. At most, the groundwater elevations could rise by up to two feet in the immediate vicinity of the building. To minimize the potential for the structure to obstruct groundwater movement and to reduce the risk of water intrusion into the structure, a subsurface drain system would be provided, including a full-coverage wall drainage against the shoring wall which would connect to a groundwater sump/pump located under the loading dock. Groundwater would be discharged to the University-owned 24-inch direct discharge stormwater main. In addition, as part of the construction, the proposed project would replace the existing foundation waterproofing system for Hitchcock Hall to enhance the foundation waterproofing. The William H. Foege Building foundation waterproofing is still relatively new; however, it would be protected during construction and patched as necessary.

Water Service

Under the Proposed Action, domestic water service and fire service would be provided to the proposed ARCF building from the existing 12-inch campus water loop system through the site; the loop would be relocated to accommodate and serve the proposed building. The campus water loop system would remain functional for the duration of the construction period in order to serve adjacent buildings. It is anticipated that the existing water system has adequate pressure and flow to serve the proposed building. An existing fire hydrant is located adjacent to NE Pacific Street, as well as adjacent to NE Boat Street. It is anticipated

that at least one new fire hydrant would be provided as part of the proposed project and hydrant spacing would comply with current Fire Code requirements.

Sanitary Sewer Service

Sanitary sewer for the proposed ARCF building would be collected and conveyed to the existing sanitary sewer system in the vicinity of the project. Potential discharge options for sanitary sewer include the following:

- Connect to the existing eight-inch sewer service line located south of the existing loading dock. The upper level of the proposed building could gravity flow to the discharge point; however, the lower floor would require a pump to lift effluent to the sanitary sewer line. In addition, this sewer service line is tributary to an SPU sanitary sewer lift station that is at or near capacity.
- Connect to the existing eight-inch sewer service line located to the east of Hitchcock Hall. Effluent from the proposed building would require pumping to reach the existing line. This connection option would also require routing the new sewer discharge around Hitchcock Hall.
- Create a new direct discharge to Metro's 108-inch trunk sewer main on the north side of NE Pacific Street. Effluent from the lower floor would require a pump to reach the sewer main. Additional considerations would include the condition of the main, the type of effluent that would be discharged to the main and additional utility work in NE Pacific Street.

Separate connections for building waste and acid waste (from laboratory spaces) would be provided for the ARCF building. The exact location of these connections would be coordinated as part of the plumbing design for the proposed building.

Natural Gas Service

Natural gas service for the proposed ARCF building would be provided from the existing service stubs that are located to the south of the loading dock area.

Construction Activities and Schedule

As indicated earlier in this chapter, the majority of the proposed ARCF would be constructed below the existing ground level, with above-ground construction generally limited to an entry pavilion, a utility/exhaust tower and landscaping/walkway improvements. The following describes construction activities as they relate to demolition, grading, vibration/noise/dust, and construction traffic (see Section 3.1, **Construction Impacts**, for further details on construction activities and potential construction impacts associated with the project). It is anticipated that construction of the proposed ARCF would start in October 2014 and that the building would be operational in May 2017.

Demolition

Demolition activities on the Alternative 1 site would include the demolition and removal of all existing landscaping, trees, and paved pathways onsite, as well as the removal of the existing curb and sidewalk to the north of the site, adjacent to NE Pacific Street. The existing Stronghold sculpture would be dismantled during the demolition process pursuant to the re-siting protocol outlined in the *ArtsWA Care* manual to ensure that the sculpture is appropriately dismantled and protected during the construction process. The sculpture would be stored until construction of the ARCF building is complete, upon which time the sculpture would be relocated to the northeast of its existing location.

Grading

Grading activities on the site would require approximately 84,000 cubic yards of excavation and approximately 3,150 cubic yards of fill. Excavated material would be disposed of at an approved site. The source of fill material is unknown at this time, but would be from an approved and suitable source. During excavation and construction activities, it is anticipated that groundwater would be encountered on the site. Existing ground surface on the site ranges from elevation 68 feet at the north of the proposed building footprint to elevation 57 feet at the south end; groundwater on the site is located at approximately elevation 26 feet. Given that the depth of excavation would vary from elevation 9 feet to 12 feet (approximately 14 to 17 feet below the existing groundwater level), the groundwater table would be temporarily lowered to at least two feet below the bottom of the excavation (approximately elevation 7 feet) during the construction process.

Groundwater flow during construction would vary with excavation depth and precipitation and it is anticipated that the average discharge rate would be approximately 5 to 20 gallons per minute (GPM). A temporary dewatering system would be provided to accommodate a discharge rate of at least 50 GPM, which would account for any short-term increases in water discharge rates. A combination of vacuum dewatering points and deep wells would be provided for construction dewatering, and onsite water treatment and storage would likely be required; it is anticipated that water would be discharged to a University-owned stormwater outflow.

As described above, the proposed ARCF would be designed as a waterproof structure and lateral and hydrostatic groundwater pressures would be incorporated into the design and calculations for the waterproof structure (in order to account for seasonal groundwater variations, the design groundwater table for the structure would be elevation 27 feet at the north end of the building and elevation 25 feet at the south end). To minimize the potential for the proposed structure to act as a dam to groundwater movement and reduce the risk of water intrusion into the structure, a subsurface drain system would be provided, including a full-coverage wall drainage against the shoring wall which would connect to a groundwater sump/pump located under the loading dock. Groundwater would be discharged to the University-owned 24-inch direct discharge stormwater main. In addition, as part of the construction, the proposed project would replace the existing foundation

waterproofing system for Hitchcock Hall to enhance the foundation waterproofing. The William H. Foege Building foundation waterproofing is still relatively new; however, it would be protected during construction and patched as necessary.

Vibration, Noise and Dust

During the development of the proposed ARCF it is anticipated that vibration, noise and dust from construction-related activities could potentially impact surrounding University uses. Construction vibration and noise levels would be anticipated to be similar to other on-campus development projects in recent years; however, potential vibration and noise impacts could occur to surrounding uses due to their proximity to the project site. Existing sensitive on-campus uses in the vicinity of the site include the following: the William H. Foege Building (Bioengineering and Genome Sciences Departments), Hitchcock Hall (Biology Department), Ocean Sciences Building, the Health Sciences Complex J-Wing (Biochemistry, Microbiology, and Pharmacology Departments) and K-Wing (Molecular Biotechnology and Pharmacology Departments), the Physics and Astronomy Building (Physics and Astronomy Departments), and Kincaid Hall. Vibration and noise would occur as a result of construction activities and equipment operation, including but not limited to excavation activities (excavators, soil conveyors, etc.), drilling rigs, mobile crane engines, construction truck and trailer operations, forklift operations, air compressors, and concrete pumps. Vibration associated with construction activities would be minimized by the proposed structural systems design that would avoid pile driven approaches and includes precast systems for columns and horizontal structural elements, which would reduce onsite construction activities and construction time. Additional mitigation measures have been identified to minimize potential vibration impacts (see Section 3.1, **Construction Impacts**, for further details).

Construction activities on the site would generate air pollutants as a result of fugitive dust from earthwork/excavation activities, as well as other construction-related activities. Nearby buildings such as the William H. Foege Building, Hitchcock Hall, the Ocean Sciences Building and the Health Sciences Complex could be sensitive to fugitive dust due to their proximity to the project site; it is likely that the air intakes of adjacent buildings (in particular the William H. Foege Building) would be temporarily ducted and protected to minimize the intake of exhaust fumes during construction activities. Pedestrians and bicyclists in the site vicinity could also be sensitive to fugitive dust from the site. During construction, dust control measures would be implemented to minimize the amount of fugitive dust from the project site. Such measures would include the provision of a temporary asphalt roadway onsite to minimize dust and dirt tracked off-site, keeping soils moist during excavation activities and washing truck tires onsite prior to traveling onto public roadways.

Truck, Vehicle, and Pedestrian/Bicycle Circulation

Construction truck traffic would enter the site at the southwest corner from NE Boat Street via 15th Avenue NE to access the load, unload and laydown area which would be located to

the south of the proposed building footprint area. Construction trucks would exit the site at the southeast corner of the site and travel via NE Boat Street and 15th Avenue NE towards NE Pacific Street.

During construction, sidewalks would remain open for pedestrian use surrounding the site, including along 15th Avenue NE, NE Pacific Street and NE Boat Street. Pedestrian access to the William H. Foege Building would remain available at the southeast corner of the building. The Ocean Sciences Building would remain accessible from the southwest corner of the building as well. Access from the west side of Hitchcock Hall would be closed for the duration of construction; however, the building would be accessible from the east and south sides. Vehicle and bicycle access along NE Boat Street and Columbia Road would continue to be available during the construction process; however, construction vehicles would use NE Boat Street to access the ARCF site.

Alternative 2 – Alternate Site

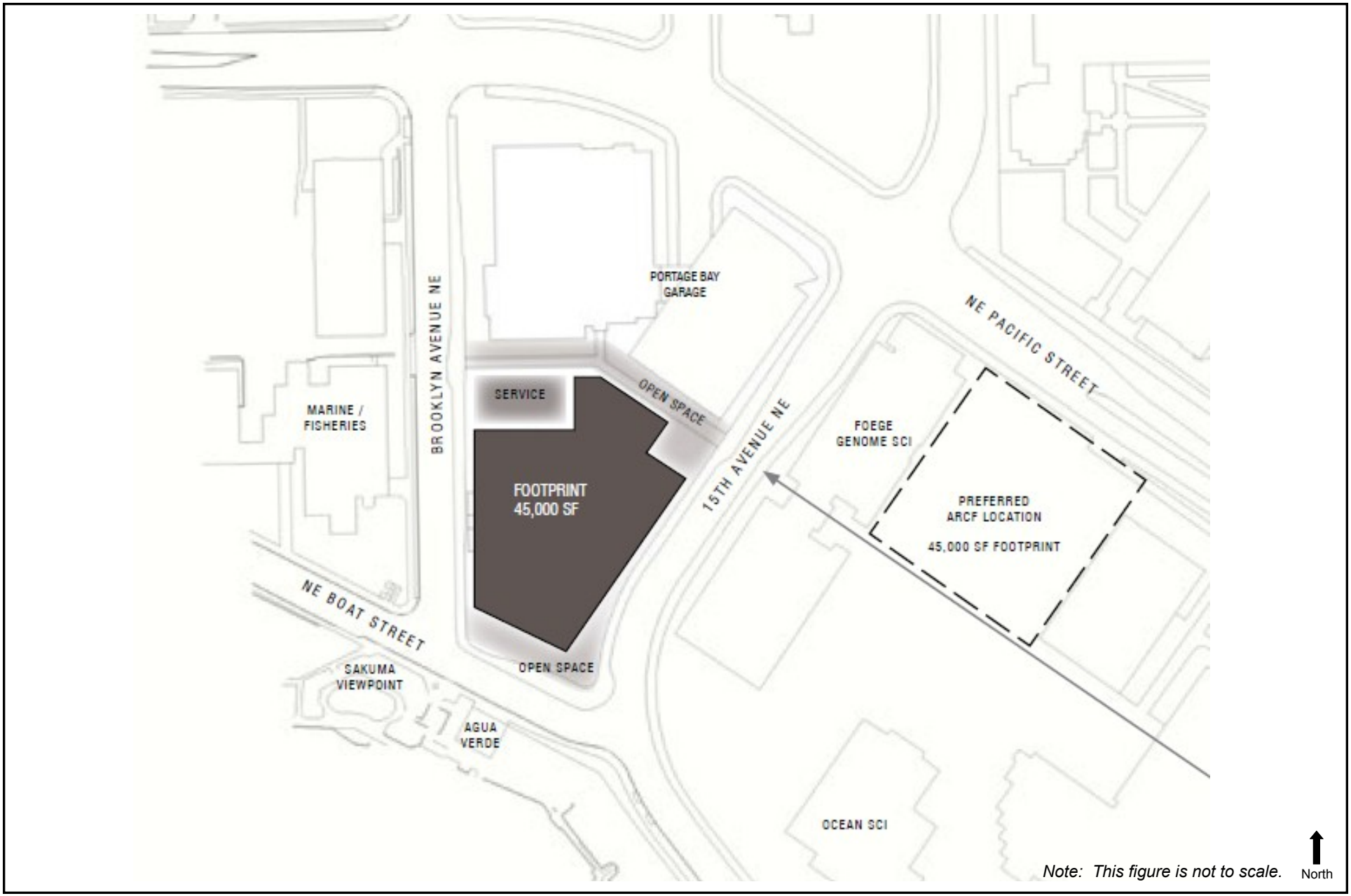
Location

The Alternative 2 site is identified as Development Site 45S in the *CMP-Seattle 2003* and is located in the University of Washington's Southwest Campus area to the south of the Portage Bay Parking Facility and University Transit Center, and west of 15th Avenue NE (refer FEIS **Figures 2-1** and **2-2** for maps illustrating the Alternative 2 site location). The Alternative 2 site is primarily comprised of existing surface parking areas (parking lot W24 and W28). Three existing buildings are also located along the western edge of the site, including the Oceanography Research Building.

Design Concept

Under Alternative 2, the ARCF would be constructed as an above-ground structure on Development Site 45S. The two-level building would contain approximately 90,000 GSF of above-grade and below-grade building space (approximately 45,000 GSF on each level) and would be approximately 30 to 40 feet tall. The design concept for Alternative 2 would be generally similar to Alternative 1 and would include the Small Animal Program on one level and the Large Animal and Non-Human Primate Program on another level (see FEIS **Figure 2-8** for a generalized site plan of Alternative 2).

The primary entrance to the building would be located in the northeast corner of the site; secondary access would be provided in the southwest corner of the site. Loading areas and service facilities for the ARCF under Alternative 2 would be provided in the northwest corner of the site with access from Brooklyn Avenue NE. However, due to the site location for Alternative 2, there would be no below-grade connection with William H. Foege Building, Hitchcock Hall and the Health Science Complex, or shared loading dock facilities. Loading Dock



Source: ZGF LLP, 2014.

EA Engineering, Science, and Technology, Inc.

FEIS Figure 2-8
Alternative 2 Site Plan

The loading dock under Alternative 2 would be located above-grade at the northwest corner of the building. Access to the loading dock and service entry for the building would be provided off of Brooklyn Avenue NE

Landscaping

Consistent with the recommendations for Development Site 45S in the *CMP-Seattle 2003*, Alternative 2 would include open space areas along the north and south ends of the site. Open space along the north end of the site would be adjacent to Skamania Lane and would enhance the east/west pedestrian connection through the site. Open space on the south end of the site would enhance the Brooklyn Avenue NE street end and could serve as an extension of the waterfront. Landscaping within open space areas under Alternative 2 would be consistent with the University of Washington's landscape design standards and it is anticipated that landscape areas would likely include native plant species or plants that are tolerant to the Pacific Northwest climate.

Circulation

Circulation though the Alternative 2 site would continue to be provided by Skamania Lane which is located along the northern boundary of the site and provides a pedestrian and bicycle connection to the east and west (i.e., William H. Foege Building, Hitchcock Hall, Health Sciences Complex, Fisheries and Marine Sciences Buildings, etc.). As described above, the area adjacent to Skamania Lane would be maintained as open space and landscaped with new plants and shrubs to enhance the area.

Vehicle and Bicycle Parking

Similar to Alternative 1, no onsite vehicle parking would be provided under Alternative 2 and approximately five bicycle parking stalls would be provided on the site to accommodate the ARCF. Vehicle parking for the Alternative 2 site would be provided by the adjacent Portage Bay Parking Facility which is located to the north of the site and includes approximately 990 parking stalls, as well as bicycle parking facilities. The Portage Bay Parking Facility primarily serves the West Campus and South Campus areas.

Utilities

Stormwater

It is anticipated that stormwater from the Alternative 2 site would be conveyed and discharged to a 48-inch stormwater drain that is located to the west of the site in the Brooklyn Avenue NE right-of-way.

Water Service

Water service for the Alternative 2 site would be provided from an existing water main located in the Brooklyn Avenue NE right-of-way. Additional water mains are also located within 15th Avenue NE to the east of the site and NE Pacific Street to the north, and could potentially serve the site.

Sanitary Sewer Service

Sanitary sewer service for the Alternative 2 site would be provided by an existing 15-inch sanitary sewer main located to the west of the site, within the Brooklyn Avenue NE right-of-way.

Construction Activities and Schedule

It is anticipated that construction activities under Alternative 2 would be generally similar to those described under Alternative 1; however, it is assumed that Alternative 2 would require less excavation (approximately 30,000 cubic yards, compared to approximately 84,000 cubic yards under Alternative 1) due to the fact that the building would be constructed above-grade. Similar to Alternative 1, construction of the ARCF building under Alternative 2 could take approximately 2 years, with the building potentially operational by the end of 2016.

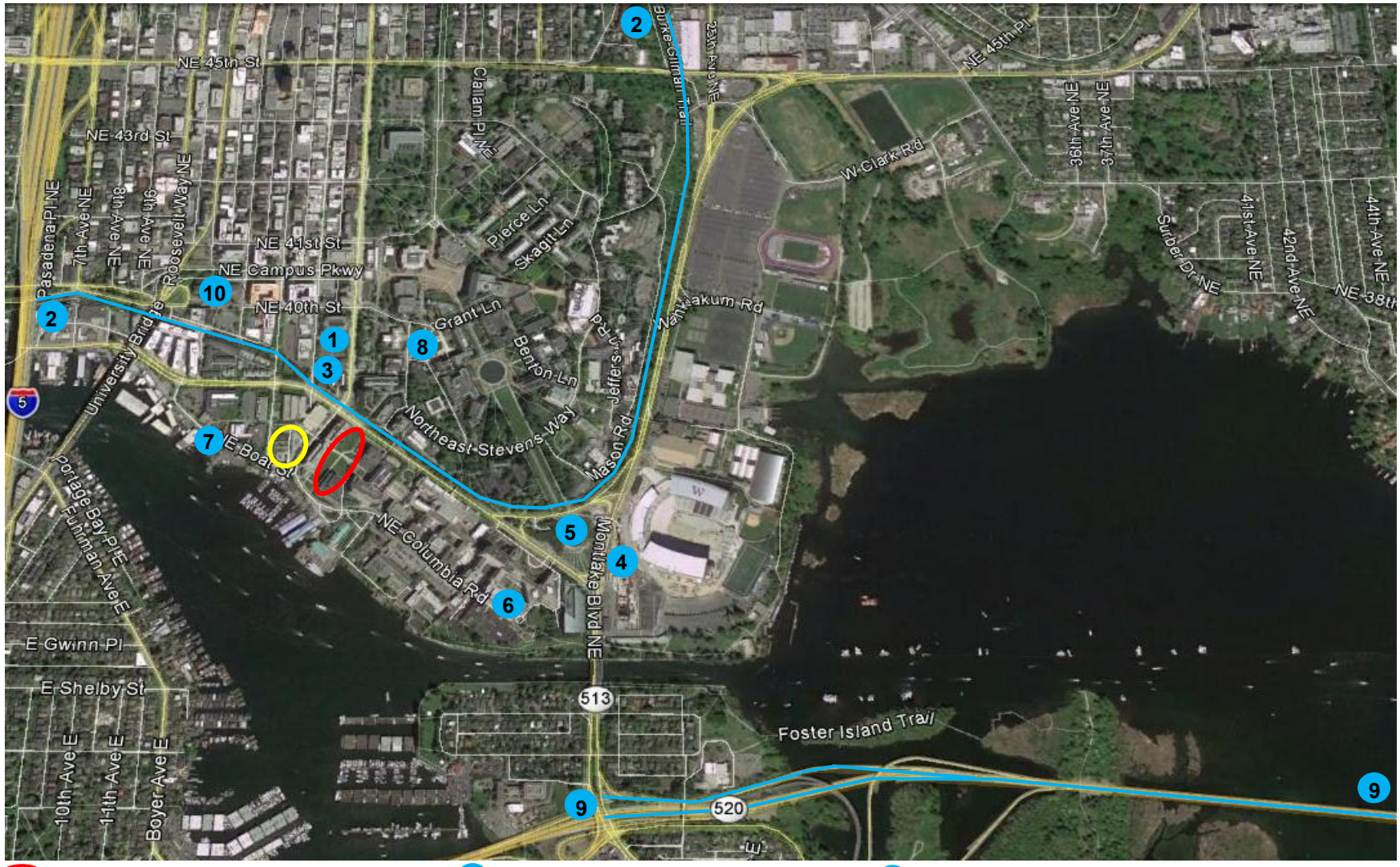
Alternative 3 – No Action Alternative

Under Alternative 3 – No Action Alternative, the ARCF would not be constructed and the proposed site would remain in its primarily vegetated condition with existing pathways. The DCM and WaNPRC would remain in their existing locations and would continue to experience capacity and space deficiencies.

2.6 SEPARATE ACTIONS/PROJECTS

- In addition to the Proposed Action, there are several separate actions/projects in the site vicinity that are currently under construction or are anticipated to be under construction during the development timeframe for the proposed project. These projects include the University of Washington Police Department Building Project, University of Washington Burke Gilman Trail Project, the University of Washington Southwest Campus Central Utility Plant Project, the Sound Transit University of Washington Station Project, the University of Washington Rainier Vista/Montlake Triangle Project, the University of Washington Medical Center Phase 2 Project, and the Bryant Building Park Project (see FEIS **Figure 2-9** for a map of the separate action/project locations).

University of Washington Animal Research and Care Facility Project
Final EIS



- UW ARCF Project Site (Alternative 1)
- UW ARCF Alternative 2 Site
- 1 UW Police Department Building Project
- 2 UW Burke Gilman Trail Project
- 3 UW Southwest Utility Plant Project
- 4 Sound Transit UW Station Project
- 5 UW Rainier Vista Project
- 6 UW Medical Center Phase 2 Project
- 7 Bryant Building Park Project
- 8 UW Molecular Nano-Tech. Engineering Project
- 9 SR 520 Bridge Replacement Project
- 10 UW Maple and Terry Halls Project

North

Note: This figure is not to scale.

Source: Google Earth and EA Engineering, 2014.

EA Engineering, Science, and Technology, Inc.

FEIS Figure 2-9

Separate Actions/Projects Map

- The **University of Washington Police Department Building Project** would be located south of Gould Hall and would consist of a three-story, approximately 29,241-square foot of building. The proposed building would provide space for approximately 93 staff members and would include offices, a dispatch/communications center, records storage, identification lab, evidence storage, community multi-purpose rooms and fleet parking. The construction period for this project is anticipated to be from April 2015 to September 2016.

- The **University of Washington Burke Gilman Trail Project** would include improvements to the 1.7-mile University-owned portion of the trail from Pasadena Place NE to NE 47th Street. The improvements would be designed to improve safety and accommodate existing/future traffic flows and include trail widening and consolidated intersections/connections with the trail. The initial phase of the project would occur from 15th Avenue NE to Rainier Vista. Four additional phases would occur in the future, including Pasadena Place NE to University Bridge, University Bridge to Brooklyn Avenue NE, Brooklyn Avenue NE to 15th Avenue NE, and Rainier Vista to NE 47th Street. The initial phase is anticipated to be completed in May 2015; construction of future phases would occur once funding is available.

- The **University of Washington Southwest Campus Utility Plant Project** would be located to the south of the proposed Police Department Building (near the intersection of University Way NE and NE Pacific Street) and would provide process chilled water and emergency power to portions of the South and West campus. The building would be approximately 20,000 square feet and would include one below-grade level and one above-grade level. The construction period for this project is anticipated to be from March 2015 to July 2016.

- The **Sound Transit University of Washington Station Project** is located adjacent to Husky Stadium and is part of the University Link Light Rail Extension which connects the University of Washington with Capitol Hill and Downtown. The University of Washington Station would consist of a single above ground entrance to connect with the light rail tunnel and would serve approximately 25,000 riders by 2030. Construction of this project is currently underway and is anticipated to be completed by September 2016.

- The **University of Washington Rainier Vista/Montlake Triangle Project** would modify the pedestrian connection between the Sound Transit University of Washington Station and the University of Washington campus. The modified connection would include a pedestrian/bicycle bridge over Montlake Boulevard that would connect the University Station with the Montlake Triangle, establishment of a Rainier Vista land bridge spanning a lowered NE Pacific Place, and a modified Burke

Gilman Trail. The construction of this project has begun and is anticipated to be completed by September 2016.

- The **University of Washington Medical Center Phase 2 Project** is located at the southern portion of the Medical Center and would include the buildout of three bed floors and the operating rooms suite within the new Montlake Tower (Phase 1) and would renovate approximately 125,000 square feet within the existing Cascade and Pacific Towers. Construction of this project is currently underway and is anticipated to be completed by June 2017.

- The **Bryant Building Park Project** would include the development of a new park at the current Bryant Building location (adjacent to Portage Bay) to serve as a park replacement for existing park property that was converted to non-park use as part of the WSDOT SR-520 Bridge Project. Construction of this project would occur subsequent to the completion of the proposed Police Department Building Project; however, the specific timeline is unknown at this time.

- The **University of Washington Nano-Technology Engineering Sciences Building Project** site is located to the north of the existing Molecular Engineering Building (east of Stevens Way and south of Grant Lane). The proposed building was analyzed as part of the *University of Washington Molecular Engineering Facility Supplemental EIS (2009)* and would include a five-story, approximately 80,000-square foot building with research, laboratory and faculty/staff office uses. It is anticipated that construction would begin in January 2015 and would be completed in September 2016.

- The **SR-520 Bridge Replacement Project** is currently under construction and is located to the south and southeast of the University of Washington. The project includes the development of a new floating bridge and highway with six lanes (two general purpose lanes and one HOV/transit lane in each direction). Construction activities closest to the University of Washington would be associated with the West Approach Bridge North portion of the project, which would connect the floating bridge to the existing SR 520 roadway. In addition to the bridge connection, the West Approach Bridge North project will provide improvements for local streets (Montlake Boulevard East and 24th Avenue East), Arboretum trail improvements and a new stormwater treatment facility at the former MOHAI site. Construction is anticipated to be completed in the spring of 2016 (*WSDOT 2014*).

- The **University of Washington Maple and Terry Halls Project** includes the demolition of the existing Terry Hall and 1101 Café building and construction of two new buildings for student housing. The new eight story buildings will include five-stories of housing, two lower stories for student common areas and administrative offices, and below-grade parking. In total, the buildings would contain approximately

440,000 square feet of building area with space for approximately 1,150 beds. Construction is currently underway and scheduled to be completed in July 2015.

Other potential projects in the area include the University of Washington Life Sciences Building Project (potentially located immediately east of Kincaid Hall) and the Computer Sciences and Engineering II Hall Project. The funding status and construction schedule for these potential projects is not known at this time.

Temporary construction activity associated with any of these separate actions/projects would occur in compliance with applicable University of Washington, City of Seattle, and other relevant regulations. Additionally, each project would prepare a Construction Management Plan to control and mitigate potential transportation issues during the construction process.

2.7 BENEFITS AND DISADVANTAGES OF DEFERRING IMPLEMENTATION OF THE PROPOSAL

The benefits of deferring approval of the Proposed Actions and implementation of development of the ARCF include the deferral of:

- Temporary displacement of existing open space and circulation on the site.
- Potential temporary construction impacts associated with vibration, noise, air pollution and traffic.

The disadvantages of deferring approval of the Proposed Actions and development of the ARCF include the deferral of:

- The opportunity to develop a new animal research and care facility and centralize existing research functions that are currently spread throughout the campus.
- The opportunity to enhance the open space and pedestrian circulation through the site, including providing accessible pathways.
- Replacement of currently non-compliant facilities with new "state of the art" facilities.

CHAPTER 3

Updated Project Information and Errata

CHAPTER 3
UPDATED PROJECT INFORMATION/ERRATA

This chapter of the Final Environmental Impact Statement (FEIS) describes project information that was updated subsequent to the issuance of the Draft Environmental Impact Statement (DEIS), and identifies corrections and updates to the DEIS based on comments that were received during the DEIS public comment period.

3.1 UPDATED PROJECT INFORMATION/ERRATA

Subsequent to the issuance of the DEIS, information regarding the proposed ARCF Project was updated based on the continued evolution of the proposed ARCF Project design, as well as comments received on the DEIS. The following provides a description of the information that has been updated subsequent to the issuance of the DEIS.

3.1.1 Construction Impacts

Cultural Resources

In response to a comment on the DEIS from the Washington State Department of Archaeology and Historic Preservation (DAHP), an *Archaeological Inventory and Cultural Resources Report* was completed for the proposed ARCF project (see **Appendix B** for the full report). Archival research and field studies were conducted as part of the report to determine the potential for impact to cultural resources. Archival research was conducted for the project to include any records for locations within ½ mile of the project site, including archaeological site records, cultural resource survey reports, historic property inventory (HPI) forms, historic register information and cemetery records. No archaeological resources had been previously identified on or adjacent to the project site. Archival research indicated that a portion of the site was identified as a previous Native American trail that was part of a heavily used transportation corridor between Shilshole Bay and Lake Washington; however, no evidence of this trail remains on the site.

Surface and subsurface surveys were also conducted as part of the *Archaeological Inventory and Cultural Resources Report* (**Appendix B**). The surface survey was intended to identify cultural resources visible above ground, as well as marked utilities and other areas of disturbance. Numerous underground utilities and underground facilities were observed on the project site, including sewer lines, an underground loading dock, an underground pedestrian tunnel, and an underground generator. Portions of the site had also been previously excavated for the construction of buildings adjacent to the site, as well as the former route of 15th Avenue NE, which used to run directly north-south through the project site.

Due to the presence of extensive existing underground utilities and underground facilities, only one shovel probe was excavated on the site to test for subsurface archaeological materials. The shovel probe was excavated from the southern portion of the site and included fill dirt and debris that was indicative of building demolition. Bricks, asphalt, concrete, oxidized metal wire nails, glass and plastic were found within the excavation. No prehistoric or historic-era materials were found.

Based on archival research and field studies, the proposed project is not anticipated to impact cultural or archaeological resources and no further cultural resources work is recommended. However, based on the cultural resources analysis prepared for this FEIS, the following mitigation measure has been identified.

- In the event that archaeological deposits are inadvertently discovered during construction, ground-disturbing activities would be halted immediately and the University of Washington would contact DAHP and interested Tribes, as appropriate. If ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity that may cause disturbance to those remains would cease and the area would be secured and protected from further disturbance. In addition, the finding of remains would be reported to the county coroner and local law enforcement.

Alternative 2

Due to the limited size and associated limited amount of site area available for construction staging on the Alternative 2 site, it is anticipated that construction vehicles and construction materials would be staged off the site, likely along NE Boat Street as described in the DEIS (Section 3.1, Construction Impacts). The necessary off-site staging under Alternative 2 would result in the temporary displacement of on-street parking in the site vicinity, including along NE Boat Street, and vehicle/equipment movement on public streets between the Alternative 2 site and the off-site staging area. Because the Alternative 1 site size and configuration allows for a substantial amount of on-site staging, the amount of off-site parking loss and movement of construction vehicles/equipment on public streets would be greater under Alternative 2 than Alternative 1.

The above ground construction of the ARCF building under Alternative 2 would also result in a structure that would potentially be more prone to seismic activity than Alternative 1. This is due to the fact that underground structures in areas with suitable soils (Alternative 1) have an increased level of seismic stability associated with the surrounding soil around the building compared to above ground buildings (Alternative 2).

3.1.2 Land Use

Alternative 2

As noted in the DEIS, the Alternative 2 site contains three existing buildings, including the Oceanography Research 2 Building (approximately 3,999 square feet) and two buildings that house the Washington Sea Grant offices (approximately 3,897 square feet and 3,371 square feet, respectively). The site also includes two gravel parking areas (University parking areas W24 and W28) which contain approximately 90 parking spaces. Development of the ARCF building on the Alternative 2 site would result in the permanent displacement of the Oceanography Research 2 Building, the Washington Sea Grant Offices and University parking areas W24 and W28. It would be necessary for the University to work with existing users to find suitable relocation areas prior to development on the Alternative 2 site. Depending on the relocation site selected for University parking areas W24 and W28, the displacement of these parking areas could result in a reduction in parking that would be available in the South Campus area. As a result, Alternative 2 would result in a greater level of displacement impacts than Alternative 1.

Development of the ARCF at the Alternative 2 site would result in a less centralized facility when compared to Alternative 1. Due to the location of the Alternative 2 site, research uses to the east (including the William H Foege Building, Hitchcock Hall, and the Health Sciences Center) would be required to transport research materials from the ARCF across 15th Avenue NE to the existing research facilities. Transportation of these materials would result in reduced efficiencies for research operations, as well as potential additional safety issues when compared to Alternative 1.

The less centralized facility under Alternative 2 would also result in potential loading dock issues and inefficiencies because a separate, above-grade loading dock would be required for the ARCF building under Alternative 2. As a result, the loading dock under Alternative 2 would have no internal connection to existing research uses to the east of the site (including the William H Foege Building, Hitchcock Hall, and the Health Sciences Center) which would result in inefficiencies in transporting research materials between the loading dock and other research areas.

3.1.3 Aesthetics

Aesthetic Character

Subsequent to the issuance of the DEIS, the landscape plan for the proposed ARCF was modified (see FEIS **Figure 2-6** for an illustration of the updated landscape plan). The updated landscape plan for the site would include a more open concept with potentially fewer shrubs and trees. As noted in FEIS **Figure 2-6**, landscaping including new trees would be provided along the western edge of the Portage Bay Vista and would provide a vegetative screen for the William H. Foege Building while also maintaining the views

through the Vista towards Portage Bay. New trees would also be provided on the eastern edge of the site (outside of the Portage Bay Vista) to provide a vegetative screen for the proposed utility tower. Remaining open space on the site would be planted with grass/lawn areas which would provide space for gatherings, relaxation and other activities. Additional landscaping could also be provided in the future similar to the level illustrated in the DEIS (refer to DEIS Figure 2-6).

Views to the Site

In a response a comment from the University of Washington City University Community Advisory Committee (CUCAC), an additional visual rendering of the proposed ARCF was completed to illustrate the potential view to the south from the NE Pacific Street sidewalk adjacent to the site (see FEIS **Figure 3-1** for an illustration of this visual rendering). With the proposed ARCF project, the view from this location would be similar to DEIS Figure 3.3-2 and includes the Portage Bay Vista open space area and pedestrian pathways in the foreground view. The proposed ARCF entrance pavilion would be located on the edge of the mid-field view (to the left), along with open space areas, pedestrians pathways, the "Stronghold" sculpture and the William H. Foege building. The Ocean Sciences and Portage Bay would be visible in the background view. In general, the view through the site and the Portage Bay Vista would remain similar to the existing conditions and views of Portage Bay would continue to be provided with the project.

Visual renderings for DEIS Viewpoint 1 (Mark McDermott Plaza – north of the proposed ARCF site) and DEIS Viewpoint 2 (NE Boat Street – south of the proposed ARCF site) have also been updated in this FEIS to reflect the modifications to the proposed landscape plan and provide additional details on the proposed above-ground building elements.

The updated visual rendering from DEIS Viewpoint 1 (FEIS **Figure 3-2 -** which updates DEIS Figure 3.3-2) would be similar to the DEIS and include the Portage Bay Vista open space area and pedestrian pathways. The proposed ARCF entrance pavilion would be visible at the edge of the mid-field view (to the left), as well as pedestrian pathways, open space area, the "Stronghold" sculpture and the existing William H. Foege building. Views through the site and towards Portage Bay would remain similar to the existing conditions and would continue to be unobstructed consistent with the *CMP-Seattle 2003*.

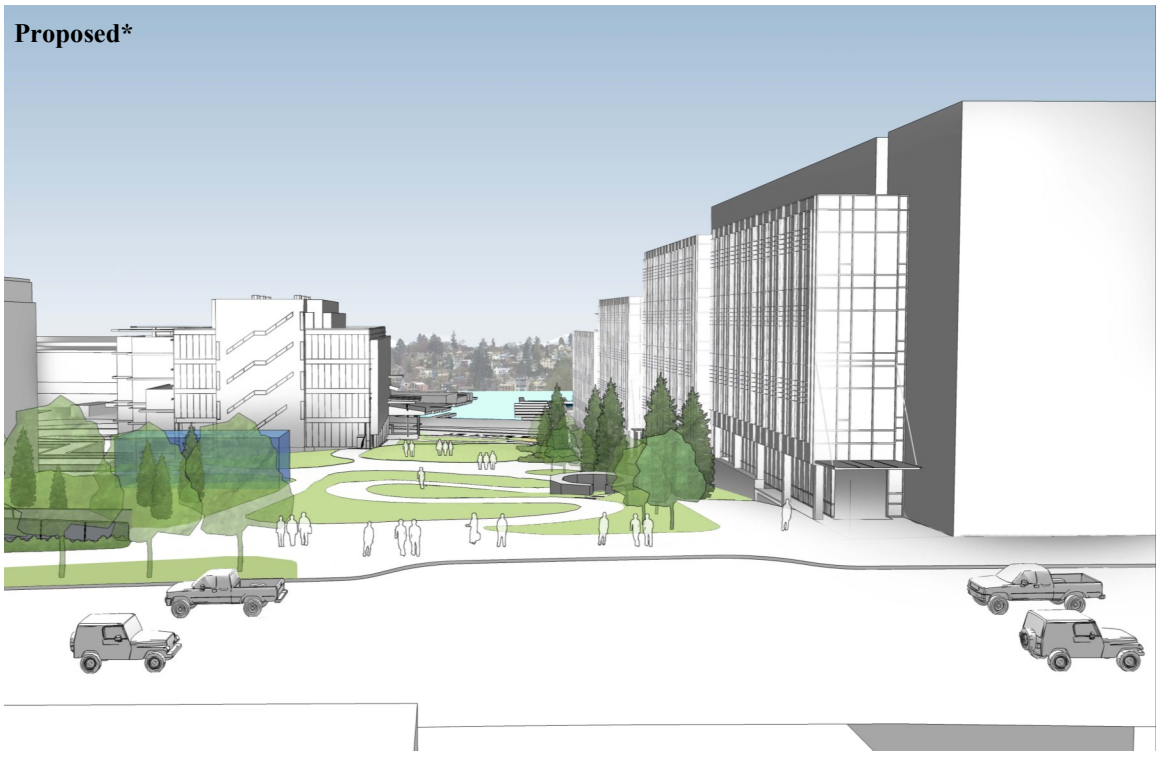
The updated visual rendering from DEIS Viewpoint 2 (FEIS **Figure 3-3** – which updates DEIS Figure 3.3-3) would remain generally similar to the DEIS and include the Portage Bay Vista open space area framed by existing buildings (the William H. Foege building and Ocean Sciences building). The proposed ARCF entrance pavilion and a portion of the ARCF exhaust tower would be visible on the edge of the background view (to the right). As described in the DEIS, the visual character from this viewpoint would remain as an open space view corridor within an urban university campus environment.

**The landscaping depicted in this visual simulation is conceptual, and is not representative of final location, size, or type of vegetation that would be provided on the site.*

Source: ZGF LLP, 2014.

EA Engineering, Science, and Technology, Inc.

FEIS Figure 3-1
Alternative 1—NE Pacific Street Looking South



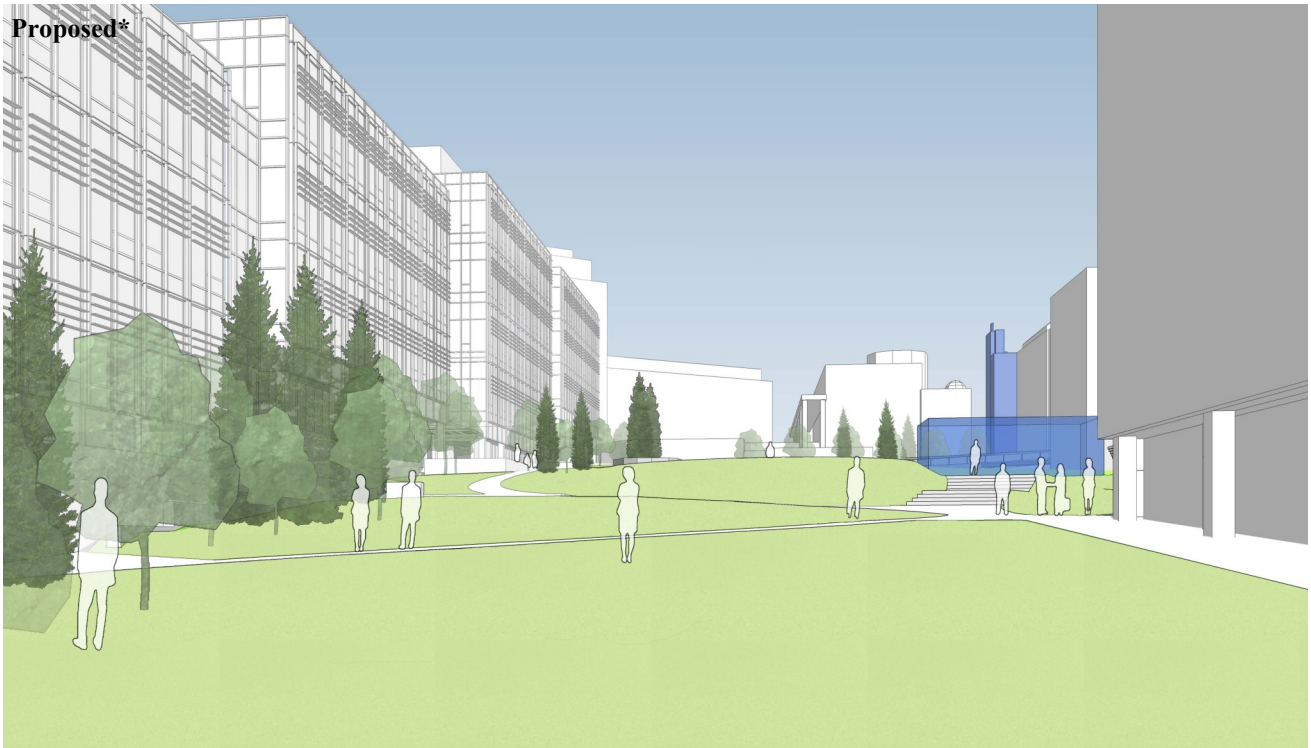
**The landscaping depicted in this visual simulation is conceptual, and is not representative of final location, size, or type of vegetation that would be provided on the site.*

Source: ZGF LLP, 2014.

EA Engineering, Science, and Technology, Inc.

FEIS Figure 3-2

Alternative 1— Updated Viewpoint 1 (DEIS Figure 3.3-2)
—Portage Bay Vista Looking Southwest



**The landscaping depicted in this visual simulation is conceptual, and is not representative of final location, size, or type of vegetation that would be provided on the site.*

Source: ZGF LLP, 2014.

EA Engineering, Science, and Technology, Inc.

FEIS Figure 3-3

Alternative 1—Updated Viewpoint 2 (DEIS Figure 3.3-3)
—Southwest End of Site Looking Northeast

CHAPTER 4

Comment Letters and Responses

CHAPTER 4
COMMENT LETTERS AND RESPONSES

This chapter of the Final EIS (FEIS) contains comments that were received on the Draft EIS (DEIS) and provides responses to the comments.

A total of 10 letters with comments regarding the DEIS and the analysis of environmental impacts were received during the public comment period on the DEIS. Each letter is included in this section of the FEIS. Comment letters/numbers appear in the margins of the letters commentary and are cross-referenced to the corresponding responses. Responses are provided directly after each letter/transcript commentary.

In addition, a total of 31 letters and emails were also received during the public comment period that were expressions of opinion, subjective statements and/or against the Proposed Action. A petition in opposition to the animal research use associated with the Proposed Action was also created via the website Change.org and included approximately 2,600 signatures at the close of the public comment period. These comment letters/emails and petition against the proposed use are acknowledged and have not been reprinted in this FEIS. A response to those comments is included at the end of this chapter.

The following comment letters related to the specific information contained in the University of Washington Animal Research and Care Facility DEIS were received:

Draft EIS Comment Letters		Page
DEIS Letter 1:	Washington State Department of Archaeology and Historic Preservation	4-2
DEIS Letter 2:	University of Washington City University Community Advisory Committee	4-4
DEIS Letter 3:	University of Washington Department of Biology	4-7
DEIS Letter 4:	The Humane Society of the United States	4-19
DEIS Letter 5:	Jonathan Grindell	4-35
DEIS Letter 6:	Brandon Juhl	4-37
DEIS Letter 7	Sarah Olson	4-39
DEIS Letter 8	Amanda Schemkes	4-42
DEIS Letter 9	Larry Stalnaker & Marilyn Evenson	4-45
DEIS Letter 10	Allison Vasallo	4-47

Comment Letters and Petition Against the Proposed Use

Comment Response 4-49

DEPARTMENT OF
ARCHAEOLOGY &
HISTORIC PRESERVATION
Protect the Past, Shape the Future

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

August 18, 2014

Ms. Jan Arntz
Environmental Planner
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In future correspondence please refer to:
Log: 081814-10-UW
Property: University of Washington Animal Research and Care Facility construction
Re: Survey Requested

Dear Ms. Arntz:

We have reviewed the materials forwarded to our office for the proposed project referenced above. The area proposed for this action has the potential for archaeological resources due to the depth of excavation and the proximity of the site to the historic shoreline of Portage Bay. Further, the scale of the proposed ground disturbing actions would destroy any archaeological resources present. Identification during construction is not a recommended detection method because inadvertent discoveries often result in costly construction delays and damage to the resource. Therefore, we recommend a professional archaeological survey of the project area be conducted prior to ground disturbing activities. We also recommend consultation with the concerned Tribes' cultural committees and staff regarding cultural resource issues. **1**

If any federal funds or permits are involved Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations, 36CFR800, must be followed. This is a separate process from SEPA and requires formal government-to-government consultation with the affected Tribes and this agency. We would appreciate receiving any correspondence or comments from concerned tribes or other parties concerning cultural resource issues that you receive. **2**

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment on this project and we look forward to receiving the survey report. Should you have any questions, please feel free to contact me. **3**

Sincerely,

Russell Holter
Project Compliance Reviewer
(360) 586-3533
russell.holter@dahp.wa.gov

RESPONSE TO DEIS LETTER 1

Washington State Department of Archaeology and Historic Preservation

1. Subsequent to the issuance of the DEIS, an *Archaeological Inventory and Cultural Resources Report* was completed for the proposed ARCF project (see **Appendix B** for the full report). Archival research and field studies were completed as part of the report to determine the potential for impact to cultural resources. Archival research was conducted for the project to include any records for locations within ½ mile of the project site, including archaeological site records, cultural resource survey reports, historic property inventory (HPI) forms, historic register information and cemetery records. No archaeological resources had been previously identified on or adjacent to the project site. Archival research indicated that a portion of the site was identified as a previous Native American trail that was part of a heavily used transportation corridor between Shilshole Bay and Lake Washington; however, no evidence of this trail remains on the site.

   Surface and subsurface surveys were also conducted as part of the *Archaeological Inventory and Cultural Resources Report* (**Appendix B**). The surface survey was intended to identify cultural resources visible above ground, as well as marked utilities and other areas of disturbance. Numerous underground utilities and underground facilities were observed on the project site, including sewer lines, an underground loading dock, an underground pedestrian tunnel, and an underground generator. Portions of the site had also been previously excavated for the construction of adjacent buildings, as well as the former route of 15th Avenue NE, which used to run directly north-south through the project site.

   Due to the presence of extensive existing underground utilities and underground facilities, only one shovel probe was excavated on the site to test for subsurface archaeological materials. The shovel probe was excavated from the southern portion of the site and included fill dirt and debris that was indicative of building demolition. Bricks, asphalt, concrete, oxidized metal wire nails, glass and plastic were found within the excavation. No prehistoric or historic-era materials were found.

   The proposed project is not anticipated to impact cultural or archaeological resources and no further cultural resources work is recommended. In the event that archaeological deposits are inadvertently discovered during construction, ground-disturbing activities should be halted immediately and the University of Washington should contact DAHP and interested Tribes, as appropriate. If ground-disturbing activities encounter human skeletal remains during construction, then all activity must cease and the area must be secured and protected from further disturbance. In addition, the finding of remains must be reported to the county coroner and local law enforcement.

2. No federal funds or permits will be required for the proposed ARCF project.

3. Comment Acknowledged.

August 12, 2014

CUCAC Meeting

Comments on the Draft Environmental Impact Statement for the Animal Care and Research Facility:

1. More information and design detail on the above ground entry. The graphics in the Draft EIS show everything screened with landscaping. The Final EIS should provide detail regarding what this element of the project will look like without the landscape screening. **1**
2. A view point and impact analysis should be added from the perspective from the sidewalk on NE Pacific Street looking down the Vista. **2**
3. More information should be provided on the exhaust vents in terms of bulk, scale, design detail, etc. without landscaping to better access the impacts to the Vista and Hitchcock Hall. **3**
4. In the pdf version – page 21contains the statement that views will be enhanced. In what ways will the views be enhanced? Will it be from additional landscaping, the rest areas, etc? **4**
5. The Draft EIS states that only one lane on NE Pacific Street will be closed at any time and that closures will only last one day at a time. What guarantees this and what is the impact if lane closures last longer than anticipated. **5**

RESPONSE TO DEIS LETTER 2

University of Washington City University Community Advisory Committee

1. Comment acknowledged. As indicated on page 2-19 of the Draft EIS, and clarified on page 3-2 of this Final EIS, "landscaping and at-grade design under the Proposed Action is consistent with the University of Washington's landscape design standards and would include a pathway for the Portage Bay Vista that connects NE Pacific Street with NE Boat Street, and allows for cross connections between the William H. Foege building and Hitchcock Hall." Additionally, as indicated on page 3.3-3 of the Draft EIS (and page 3-2 of this Final EIS), visible above-grade features of the proposed Animal Research and Care Facility would be located outside of the Portage Bay Vista, and would include a mechanical tower for air intake/exhaust and an entry pavilion

   Subsequent to issuance of the Draft EIS, the landscape design has been refined and the level of landscaping provided on the site could reflect a more open concept than described in the Draft EIS, with potentially fewer shrubs and trees. Accordingly, the Alternative 1 landscape Plan (**Figure 2-6**) and Alternative 1 Pedestrian/Bicycle Circulation Plan (**Figure 2-7**) have been updated and are included in Chapter 2 (Project Description) of this Final EIS. In addition, Figures 3.3-2 and 3.3-3 from the Draft EIS have been updated to illustrate a more limited amount of landscaping and provide a conservative worst-case depiction of the above-grade elements of the Animal Research Care Facility. Specific building design renderings for the above-grade elements are not available at this time as the final design for these elements have not been completed; however, the proposed design will be reviewed by the University of Washington Architectural Commission.

2. Draft EIS Figure 3.3-2 from the Mark McDermott Plaza (adjacent to the Physics/Astronomy Building) northeast of the Portage Bay Vista was intended to illustrate views from the north, including the view from the NE Pacific Street sidewalk. However, as requested in the comment, this Final EIS includes a new figure illustrating the view from the NE Pacific Street sidewalk looking south down the Portage Bay Vista (**Figure 3-2**) As illustrated in the figure, no above grade portions of the Animal Research and Care Facility would be located within the Portage Bay Vista.

   Please note that the landscaping depicted in this new figure (**Figure 3-2**), as well as figures 3.3-2 and 3.3-3 from the Draft EIS have been updated to illustrate a more limited amount of landscaping to provide a conservative worst-case depiction of the above-grade elements of the Animal Research and Care Facility. As illustrated in new **Figure 3-2**, on an overall basis the view through the site, including the Portage Bay Vista, would remain similar to existing conditions, with new landscaping, pedestrian paths and plazas located in the Vista. The proposed entry pavilion would be visible to the east (outside of the Portage Bay Vista) and would be smaller in scale than the existing buildings boarding the Portage Bay Vista. To the extent that landscaping is provided, landscaping around the perimeter of the entry pavilion would soften the view of the structure.

3. As indicated in response to comment 2 of this letter, DEIS Figures 3.3-2 and 3.3-3 have been updated to illustrate a more limited amount of landscaping to provide a conservative worst-case depiction of the above-grade elements of the Animal Research and Care Facility (see **Figure 3-3** and **Figure 3-4**, respectively). As indicated in the updated figures, the view down the Portage Bay Vista would remain similar to existing conditions, with no new building development. The proposed entry pavilion would be visible to the east of the Vista, with a smaller bulk and scale character than existing buildings bordering the Vista. The proposed utility tower would be visible, and would generally appear as an extension of Hitchcock Hall. To the extent provided, landscaping around the perimeter of the exhaust tower would soften the view. Specific building design renderings for the above-grade elements are not available at this time as the final design for these elements have not been completed; however, the proposed design will be reviewed by the University of Washington Architectural Commission.

4. As indicated on page 3.2-21 of the Draft EIS, "*the design of the proposed Animal Research and Care Facility would build upon the unique identity of the site by maintaining the Portage Bay Vista and enhancing the visual appearance of the site through the provision of new landscaping and plaza areas.*" The above statement in the Draft EIS was intended to indicate that no new above-grade structures associated with the Animal Research and Care Facility would be located in the Portage Bay Vista (maintaining the existing view) and new paths, landscaping and plazas would be provided which would generally enhance the visual character of the area.

5. As indicated in Section 3.1 (Construction) of the Draft EIS, a Traffic Control Plan (Plan) administered by the Seattle Department of Transportation (SDOT) stipulating the number and duration of temporary lane closures would be required. The Plan would include provisions limiting temporary closures on NE Pacific Street to one lane lasting one day at a time. Any change to Plan would require approval from SDOT.

   Additionally, the University of Washington strives to limit on-campus traffic disruptions as much as possible, and would not permit the closure of more than one lane on NE Pacific Street at any one time.

DEPARTMENT OF BIOLOGY
UNIVERSITY of WASHINGTON

ARCF DETERMINATION OF SIGNIFICANCE AND REQUEST FOR COMMENTS ON SCOPE OF SEIS

Jan Arntz, Environmental/Land Use Compliance Officer
Capital Projects Office
Box 352205
Seattle. WA 98 195-2205
4/25/14

Dear Jan

The Department of Biology has several concerns for the construction of the UW Animal Research Care Facility, Tracker 203928, since Hitchcock Hall is adjacent to the construction site.

Chiller relocation: construction involves relocation of the 300 ton chiller which provides AC cooling to Hitchcock Hall. An operational chiller is essential 24/7 to maintain a contemporary, viable science environment throughout the building for Biology research and teaching. The construction schedule suggests significant down time for the chiller relocation and building air conditioning during the peak cooling season of the summer months. We anticipate significant impact to federally funded research operations, including HHMI and Paul G. Allen Distinguished Investigator awardees. **1**

Vibration: research labs in Hitchcock Hall may be adversely impacted by vibration generated by the nearby construction. Information on likely levels of construction generated vibration would be needed to determine whether project mitigation of these impacts would be necessary. **2**

Noise: teaching in Hitchcock Hall is very vulnerable to noise interference. Information on likely levels of construction generated noise would be needed to determine whether project mitigation of these impacts would be necessary, feasible, or permissible with careful scheduling etc. Hitchcock Hall serves as the principal teaching laboratory building for the largest undergraduate major at the UW — Biology, with 1700 majors. Enrollment is approximately 3000 students per quarter. Any restriction of student access, or any increase in noise and other disturbance from construction, could have a serious negative impact on the UW's instructional mission. **3**

Water intrusion: we understand that large amounts of water currently travel unimpeded through the construction site and that ARCF will amount to a large dam forcing the water to find a course elsewhere. Naturally, Biology hopes the revised water movement is not through Hitchcock Hall below ground mechanical and occupied rooms. The upper basement floor houses the UW Burke Museum Herbarium which houses roughly 600,000 dried research specimens from the past 100 years. Many of the specimens are irreplaceable and of historic value. Water intrusion into the Herbarium would be a national scientific disaster from a research perspective. **4**

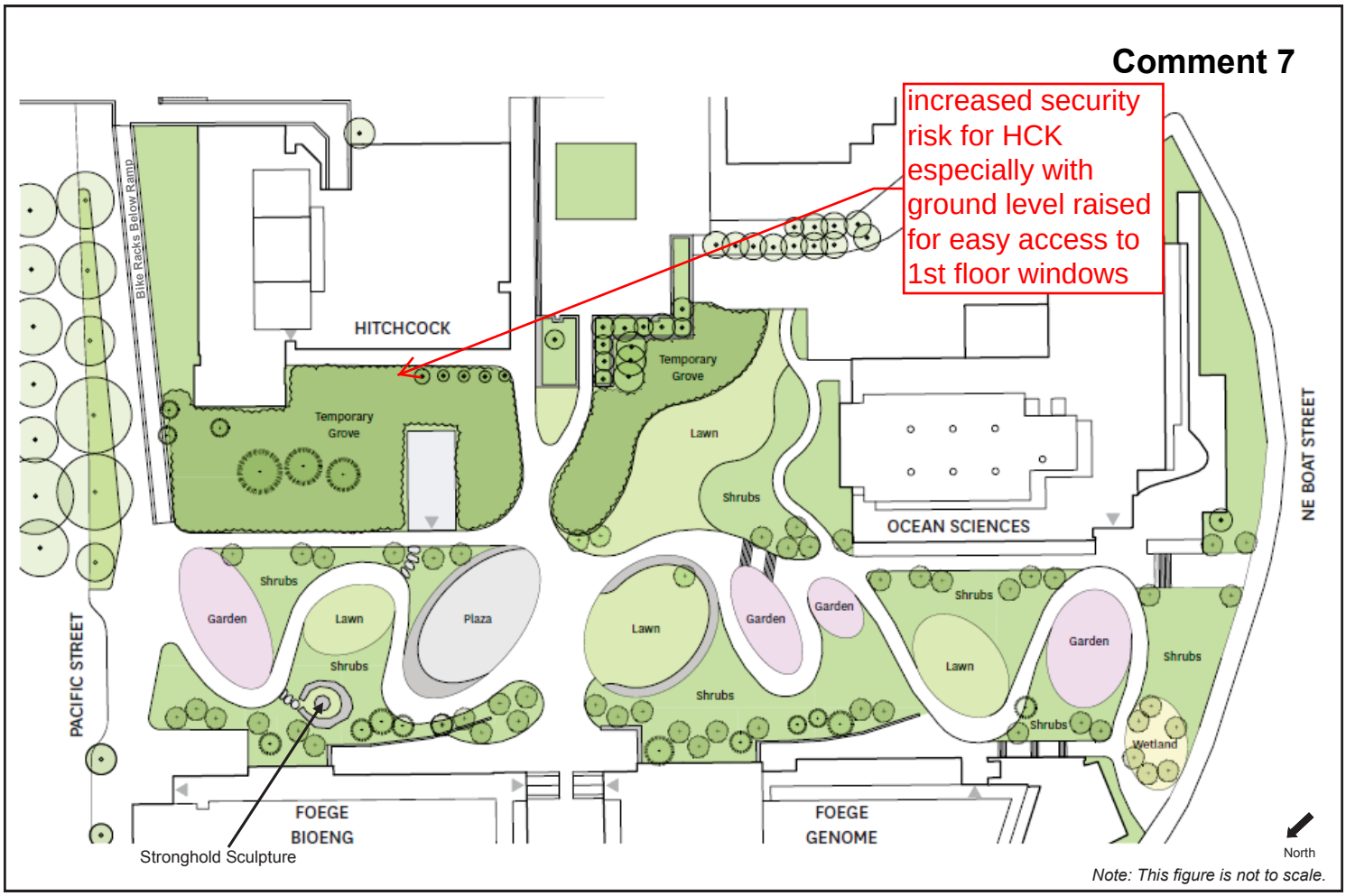
Lesser impacts:

Pedestrian overpass ramp: there is concern that removal of the pedestrian overpass ramp during construction may result in adverse impacts to Hitchcock Hall. It is anticipated there will be increased pedestrian and bicycle traffic through the building. Thousands of students, faculty, staff and visitors use the bridge daily as they move between north campus and the Health Sciences Buildings. Many, who would normally use the ramp, will now travel through Hitchcock Hall as an alternate route around the construction. **5**

Smoking area: the construction site plan appears to remove the smoking area just outside the Hitchcock Hall south patio. As smokers accommodate this change, secondary smoke may become an issue for occupants inside Hitchcock Hall, J-wing, K-wing and Foege. **6**

Robert Goff, Manager
Box 351800 102 Hitchcock Hall Seattle, WA 98195-1800
206.685.3787 fax 206.685.1728 rwgoff5@uw.edu

As part of their comment letter, the Department of Biology also submitted comments that were directly embedded within the Draft EIS document. These comments are attached to this letter.



Source: ZGF LLP, 2014.

EA Engineering, Science, and Technology, Inc.

Figure 2-6
Alternative 1 Landscape Plan

and create security risks for 1st floor of HCK

Comment 8

As part of development on the site, approximately 49 existing trees would be removed during the construction activities on the site. None of these trees would qualify as an "Exceptional Tree"[5], with the possible exception of a Lodgepole Pine that is located on the eastern portion of the site and exceeds the City's six-inch threshold. Subsequent to the development of the Proposed Action, new trees would be planted along the east and west sides of the Portage Bay Vista, adjacent to the William H. Foege building and Hitchcock Hall to soften the architectural edges on the site, while also maintaining the view corridor to Portage Bay. Tree replacement on the site would be anticipated to meet or exceed the City of Seattle tree replacement requirements and would be in accordance with the University's Tree Management Plan.

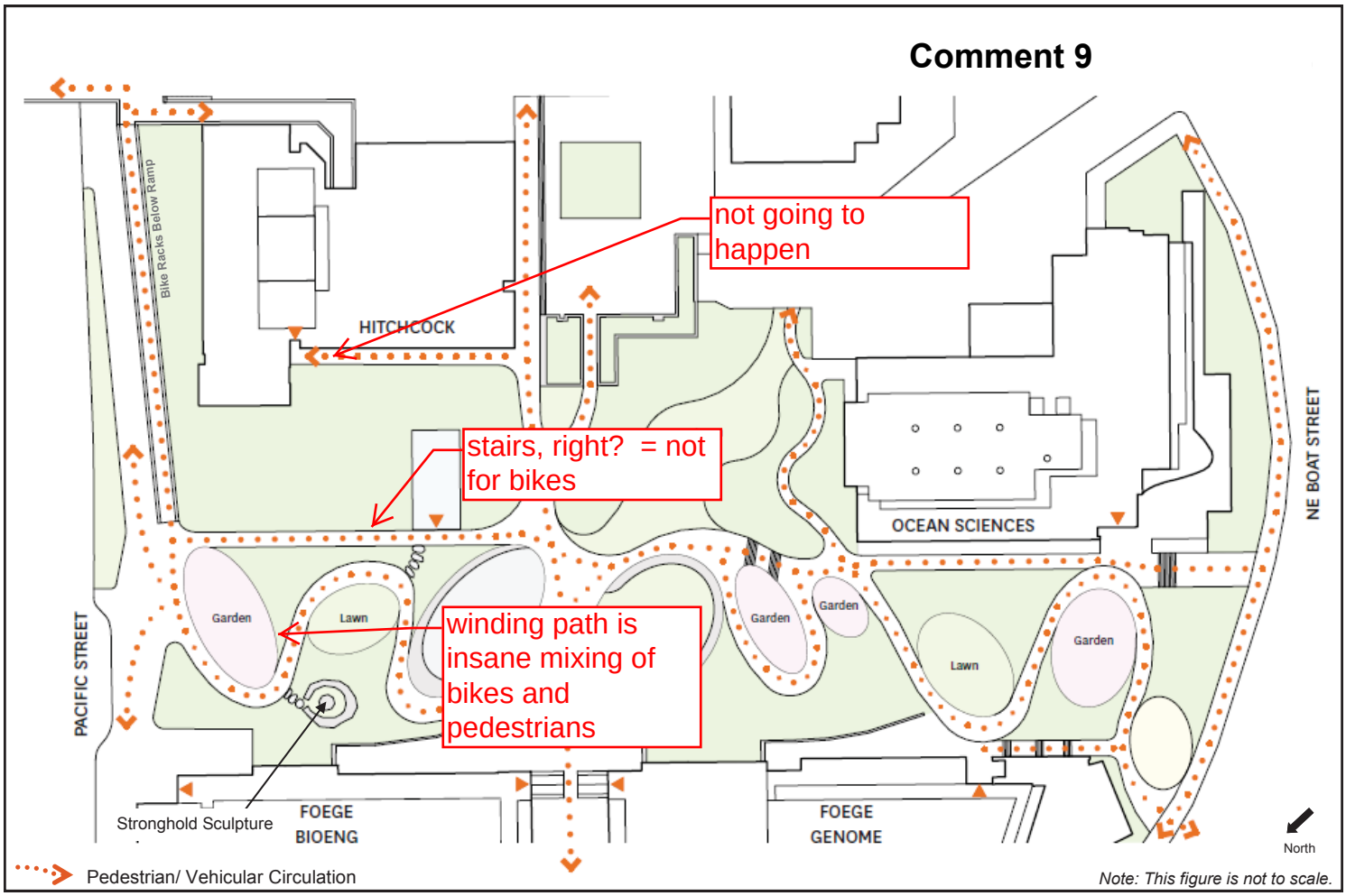
In addition, to accommodate construction activities on the site, the existing "Stronghold" sculpture would be temporarily decommissioned pursuant to the re-siting protocol outlined in the *ArtsWA Care* manual to ensure that the sculpture is appropriately preserved and protected during the construction process. Subsequent to construction activities on the site, the "Stronghold" sculpture would be relocated approximately 60 feet to the northeast of its current location (see **Figures 2-3** and **2-6** for the location of the "Stronghold" sculpture).

Pedestrian/Bicycle Circulation

The Portage Bay Vista serves as a significant point of entry for faculty, staff and students traveling from the Portage Bay Parking Facility and William H. Foege Building to the Health Sciences Complex and Medical Center. However, the existing site contains several constraints that limit the ADA accessibility of the site, including steep pathways and pathways that are not compliant with accessibility requirements. The proposed project would enhance the accessibility through the site by providing a winding pathway from NE Pacific Street to NE Boat Street which would be compliant with ADA guidelines. Several east/west pathways would also provide connections through the site to Hitchcock Hall, the Health Sciences Center, the Medical Center and the Ocean Sciences Building.

The existing ramp that connects NE Pacific Street with the Burke Gilman Trail via the Hitchcock Bridge would be reconstructed as part of the Proposed Action to allow for ADA accessibility. The new ramp would be constructed to the northeast of the ARCF site at a five percent slope to comply with ADA guidelines. A new planter would also be provided between the ramp and NE Pacific Street, as well as new street trees. In addition, the ramp along NE Boat Street would be replaced with a five percent sloped walkway to comply with ADA guidelines. New plantings would also be provided along NE Boat Street (see **Figure 2-7** for a map of the proposed onsite pedestrian/bicycle circulation).

[5] City of Seattle Department of Planning and Development – Director's Rule 16-2008.



Source: ZGF LLP, 2014.

EA Engineering, Science, and Technology, Inc.

Figure 2-7
Alternative 1 Pedestrian/Bicycle Circulation Plan

The primary vehicular access to the site and vicinity is provided from NE Boat Street to the south, via 15th Avenue NE. An underground loading dock, which serves William H. Foege Hall, Hitchcock Hall and the H & K Wings of the Magnuson Health Sciences Center, is accessed off of NE Boat Street.

Groundwater is present at the site and is located at approximately elevation 26 feet at the north side of the proposed building footprint (approximately 42 feet below ground surface) and approximately elevation 25 feet at the south side of the proposed building footprint (approximately 32 feet below ground surface).

Alternative 2 – Alternate Site

The Alternative 2 site is located in the University of Washington's Southwest Campus area and is generally bounded by the Portage Bay Parking Facility and University Transit Center to the north, 15th Avenue NE to the east, NE Boat Street to the south, and Brooklyn Avenue NE to the west.

The Alternative 2 site is primarily comprised of existing gravel parking areas (parking area W24 and W28) and includes approximately 90 parking spaces. Three existing buildings are located along the western edge of the site, including two single-story brick buildings and the two-story Oceanography Research Building.

Vehicular access to the Alternative 2 site is provided from the south via NE Boat Street. An existing alley connects the site with NE Boat Street and provides vehicular circulation through the site and access to the existing on-site parking areas.

3.1.2 Environmental Impacts

Alternative 1 – Proposed Action

if demonstrations occur, south entrances of HCK are much more vulnerable than previous

Comment 10

Construction Activities

Under the Proposed Action, the majority of the ARCF building would be constructed below the existing ground level, with above-ground construction generally limited to an entry pavilion, a utility/exhaust tower (the above-ground structures would be located outside of the Portage Bay Vista) and landscaping/walkway improvements. It is anticipated that construction of the proposed ARCF would start in October 2014 and that the building would be operational in May 2017.

Demolition activities on the Alternative 1 site would include the demolition and removal of all existing landscaping, trees, and paved pathways onsite, as well as the removal of the existing curb and sidewalk to the north of the site, adjacent to NE Pacific Street. The existing "Stronghold" sculpture would be dismantled during the demolition process pursuant to the re-siting protocol outlined in the *ArtsWA Care* manual to ensure that the sculpture is appropriately dismantled and protected during the construction process. The

this measure is of no consequence since same as academic workday

Comment 11

- Most construction activities would be limited to standard construction hours between 7 AM and 6 PM on weekdays and 9 AM and 6 PM on Saturdays.
- Deliveries would generally be scheduled during daytime hours.
- Placement of materials and backing up of trucks could be done without warning beepers (with a flagger walking behind the vehicle).
- Alternate white noise backup warning systems would be installed (as allowed by Washington State construction safety regulations, WAC 296-155-605).
- Low noise portable air compressors would be used where feasible.
- Nighttime activities would not exceed allowable noise levels.
- The use of noise impact-type equipment, such as pavement breakers, pile drivers, jackhammers, sand blasting tools, and other impulse noise sources would be limited to work activity between 8 AM and 5 PM on weekdays.
- Whenever appropriate, hydraulic impacts tools with electric models would be substituted to further reduce demolition and construction-related noise.
- Loud talking, music, or other miscellaneous noise-related activities would be limited.
- Construction noise would be reduced with properly sized and maintained mufflers, engine intake silencers, engine enclosures, and turning-off idling equipment.
- Truck haul routes would be jointly developed by the UW, SDOT and DPD and approved by SDOT.

Vibration

The following measures would be implemented to mitigate potential construction-related vibration impacts from the development of the UW ARCF.

- The project would work with individual research uses to define specific vibration criterion for the research uses in the vicinity of the site, where appropriate.
- Vibration levels would be monitored at sensitive receptors during all construction activities to validate predicted vibration levels and provide a real-time notice when construction activities create higher vibration levels than anticipated. Vibration sensors would be installed in existing buildings surrounding the project site to provide continuous vibration monitoring during the construction process. The sensors would have the ability to send notifications if vibrations levels exceed a specific limit for the surrounding buildings. This information would be used to determine when and how additional mitigation measures below would be implemented.

- For construction activities that are predicted to generate a high potential for vibration impacts at sensitive uses, the Contractor would coordinate with the University of Washington and the researchers to schedule activities such that sensitive experiments are not conducted simultaneously with vibration-intensive construction activities.
- For impacts to researchers using routine laboratory equipment and optical imaging tools, instruments could be remounted on air isolation tables to attenuate the construction-generated vibration levels, allowing research to continue without degradation.
- For impacts to researchers that cannot be addressed by the identified mitigation measures, the researchers or facilities could be temporarily relocated during the vibration generated construction activities.

Comment 12

so are isolation tables all that's needed to resolve high risk situations noted above in the data?

- To the extent feasible, prefabrication of construction materials would be conducted at an off-site location to reduce to the amount of work on-site and the associated vibration impacts. Anchors for hangers in the structure could also be preinstalled to eliminate the need for drilling into concrete onsite.
- To the extent feasible, construction activities would utilize practices that would minimize vibration, such as the use of sawcutting for concrete removal in lieu of using impact tools.
- Orientation would be provided for all construction workers to inform them of the importance of minimizing impacts to adjacent buildings, including vibration.
- Advanced notification would be provided to surrounding buildings and uses to inform them of construction activities that would cause vibration (e.g., drilling of soldier piles). Early notification would allow surrounding uses to prepare in advance of potential vibration activities.

Transportation

Alternative 1 Mitigation Measures

The following measures would be implemented to mitigate potential construction-related transportation impacts from the development of the UW ARCF under Alternative 1.

- Manual traffic control would be implemented at both construction access points along NE Boat Street to minimize impacts to traffic. Manual traffic control would reduce the length of time construction vehicles might wait for gaps in opposing traffic to enter and exit the sites, reduce the likelihood of inbound construction vehicles blocking eastbound traffic and reduce the likelihood of long outbound vehicle queues forming that could impact construction activity. This added level of traffic control would also manage pedestrian, bicycle, and vehicular traffic at this location, thereby minimizing the potential conflicts between these three modes.

RESPONSE TO DEIS LETTER 3

University of Washington Department of Biology

1. It is anticipated that the existing chiller will be relocated during the winter of 2014/2015 when it is not required for cooling Hitchcock Hall. Down time would be limited by installing new piping, electrical service, controls, etc. so that the chiller would be offline for a minimal amount of time. The relocation is planned to occur during a weekend to minimize the disruption of weekday activities and would also be scheduled when there is no football game at the stadium to further minimize impacts.

2. The Draft EIS included an analysis of potential vibration impacts associated with construction of the ARCF (DEIS Section 3.1, **Construction Impacts**). Increased vibration levels would vary depending on the types of construction activities on site and the potential risk for vibration impacts would also vary based on the type of research/academic activity. Mitigation measures to minimize potential vibration impacts to surrounding uses were identified in the DEIS and included the following:

    - The project would work with individual research uses to define specific vibration criterion for the research uses in the vicinity of the site, where appropriate.

    - Vibration levels would be monitored at sensitive receptors during all construction activities to validate predicted vibration levels and provide real-time notice when construction activities create higher vibration levels than anticipated. Vibration sensors would be installed in existing buildings surrounding the project site to provide continuous vibration monitoring during the construction process. The sensors would have the ability to send notifications if vibration levels exceed a specific limit for the surrounding buildings. This information would be used to determine when and how additional mitigation measures below would be implemented.
        - For construction activities that are predicted to generate a high potential for vibration impacts at sensitive uses, the Contractor would coordinate with the University of Washington and the researchers to schedule activities such that sensitive experiments are not conducted simultaneously with vibration-intensive construction activities.
        - For impacts to researchers using routine laboratory equipment and optical imaging tools, instruments could be remounted on air isolation tables to attenuate the construction-generated vibration levels, allowing research to continue without degradation.
        - For impacts to researchers that cannot be addressed by the identified mitigation measures, the researchers or facilities could be temporarily relocated during the vibration generated construction activities.

- To the extent feasible, prefabrication of construction materials would be conducted at an off-site location to reduce to the amount of work on-site and the associated vibration impacts. Anchors for hangers in the structure could also be preinstalled to eliminate the need for drilling into concrete onsite.
- To the extent feasible, construction activities would utilize practices that would minimize vibration, such as the use of sawcutting for concrete removal in lieu of using impact tools.
- Orientation would be provided for all construction workers to inform them of the importance of minimizing impacts to adjacent buildings, including vibration.
- Advanced notification would be provided to surrounding buildings and uses to inform them of construction activities that would cause vibration (e.g., drilling of soldier piles). Early notification would allow surrounding uses to prepare in advance of potential vibration activities.

With the identified mitigation measures, significant impacts to the research uses in Hitchcock Hall and other adjacent buildings are not anticipated.

3. As noted in the Draft EIS (Section 3.1, **Construction Impacts**), localized sound levels would temporarily increase during the construction process. Mitigation measures were identified in the Draft EIS to minimize the potential impacts of construction noise on adjacent academic and research uses, including:

    - Placement of materials and backing up of trucks could be done without warning beepers (with a flagger walking behind the vehicle).
    - Alternate white noise backup warning systems would be installed (as allowed by Washington State construction safety regulations, WAC 296-155-605).
    - Low noise portable air compressors would be used where feasible.
    - Nighttime activities would not exceed allowable noise levels.
    - The use of noise impact-type equipment, such as pavement breakers, pile drivers, jackhammers, sand blasting tools, and other impulse noise sources would be limited to work activity between 8 AM and 5 PM on weekdays.
    - Whenever appropriate, hydraulic impacts tools with electric models would be substituted to further reduce demolition and construction-related noise.
    - Loud talking, music, or other miscellaneous noise-related activities would be limited.
    - Construction noise would be reduced with properly sized and maintained mufflers, engine intake silencers, engine enclosures, and turning-off idling equipment.

In addition, the project would coordinate with adjacent building users and monitor noise levels in adjacent buildings during the construction process to minimize disruption to teaching activities in Hitchcock Hall and ensure that construction activities are in compliance with applicable University noise regulations. With the identified mitigation measures, significant noise impacts to uses in Hitchcock Hall would not be anticipated.

4. Provisions for controlling groundwater and providing a pathway for groundwater around the ARCF building have been incorporated into the project design. The system has been designed so that hydraulic pressure on the surrounding buildings would be no greater or less than existing conditions. Temporary dewatering wells would be provided throughout the construction process to lower the ground water level during construction. A permanent dewatering system would also be provided so that there would be no change in ground water elevation. As a result, sub-grade waterproofing systems for adjacent buildings would not be anticipated to experience any increases in hydrostatic pressure or increases in groundwater elevation. In addition, any existing waterproofing for Hitchcock Hall and other adjacent buildings that would be exposed during construction would be protected, patched and/or replaced, as necessary to maintain their integrity.

   The stormwater management plan for the site would also address subgrade and surface stormwater. Rainwater that falls on the site would be infiltrated or captured and treated before it would be discharged to an existing stormwater utility line. These methods would minimize potential flooding risks, as well.

5. As noted in the Draft EIS (Section 3.1, **Construction Impacts**), the Hitchcock Bridge ramp along the south side of NE Pacific Street would be temporarily removed during construction to allow for the development of a new, ADA accessible ramp. Detours, temporary pathways and associated signage would be implemented during the construction process to direct pedestrians and bicycles to alternate routes surrounding the project site.

6. The existing smoking area that is adjacent to the Hitchcock Hall south patio would be relocated during construction to a courtyard area between Hitchcock Hall and the J and K Wings of the Magnuson Health Sciences Center. The temporarily relocated smoking area would be more than 25 feet from building entrances, outdoor air intake vents, and operable windows.

7. Comment acknowledged. The existing 1st floor/ground floor level windows of Hitchcock Hall, and numerous other buildings in the site vicinity on campus, are currently accessible from the ground level adjacent to buildings. The University of Washington and University of Washington Police Department maintain security measures and surveillance for existing campus buildings to minimize potential security risks.

8. Comment acknowledged. See the response to Comment 7 of this letter.

9. Comments acknowledged.

10. Comment acknowledged. The University of Washington currently maintains a multi-level security plan for situations such as demonstrations and would continue to utilize those procedures, if necessary.

11. Comment acknowledged. The primary intention of the referenced mitigation measure is to limit noise levels during sleeping and other quiet times at area residential uses. See the response to Comment 3 for further details on construction noise and mitigation measures.

12. As noted in the Draft EIS mitigation measures (Section 3.1, Construction Impacts), if potential vibration impacts to existing research uses cannot be addressed by the identified mitigation measures (instruments and equipment remounted on air isolation tables to attenuate vibration levels), then those specific uses could be temporarily relocated to a new area for the duration of vibration-generating construction activities.

THE HUMANE SOCIETY
OF THE UNITED STATES

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Executive Summary

The Humane Society of the United States (HSUS) is submitting these comments in regards to the Environmental Impact Statement of the proposed University of Washington Animal Research and Care Facility. The HSUS supports Alternative 3 for not proceeding with construction of an animal care and research facility at the Seattle campus. Our organization has concerns about 1) critical information that appears to be missing from the Draft EIS and 2) environmental risks associated with Alternatives 1 and 2 for water, air, soil, wildlife habitats, wildlife and environmental health in Washington State.

Given the mandate to use the best available science and strong evidence for the management of environmental risk and its impacts for the safety and well-being of the environment, people and wildlife, we ask that state and municipal authorities asked to consider this proposed project reject Alternatives 1 and 2 on the basis of the draft EIS.

1

Comments on the Draft Environmental Impact Study by the University of Washington for proposed construction of an Animal Care and Research Facility at the Seattle Campus

The Humane Society of the United States is the nation's largest animal protection organization, with members and supporters in the state of Washington.

The HSUS has reviewed the Draft EIS for the proposed ARCF presented by the University of Washington. On behalf of our members and supporters in Washington State, we support Alternative 3 strongly and exclusively to not proceed with construction of this facility. Critical information appears to be missing from the Draft EIS, and there are environmental risks associated with Alternatives 1 and 2 for water, air, soil, wildlife habitats, wildlife and environmental health in Washington State.

Our comments are divided into two sections regarding 1) the content of the Draft EIS and its implications for the public review process and 2) environmental impacts associated with Alternatives 1 and 2 for proposed ARCF.

1) The HSUS has serious concerns about the content of the Draft EIS its implications for the public review process

2

Critical information appears to be missing from the EIS such that other documents from the UW, as well as external records from the City, County, State and Federal agencies, are necessary to thoroughly and critically evaluate the draft EIS. These limitations impede the ability of HSUS as well as other concerned stakeholders to fully and rightfully participate in the review of the EIS during the short 30-day comment period allotted.

2100 L Street, NW Washington, DC 20037 t 202.452.1100 f 202.778.6132 humanesociety.org

We conclude that the missing information could potentially bias parties against Alternative 3, which calls for **not** constructing the proposed facility.

Stakeholders might decide to tolerate certain risks or costs on the basis of future benefits, because other alternatives are presented as risky, because alternatives are unknown to them or some combination thereof. Information in the Draft EIS needs to be complete, accurate and clear. We fear this may not be the case for the current review. Information that is vital to considering risks, benefits, and alternatives appear to be missing from the Draft EIS. If the costs of a value proposition to stakeholders are understated and the benefits overstated, stakeholders don't have a fair chance to evaluate the offer.

2 Cont.

Here are three specific examples:

A. The Draft EIS states that the Washington National Primate Research Center (WaNPRC) has a shortage of space for housing and conducting experiments on nonhuman primates (NHPs). This claim is inconsistent with a number of facts that do not appear in the draft EIS:
   - All National Primate Research Centers, including WaNPRC are supported by the National Institutes of Health (NIH). A trend of decreasing federal funding support for and demand for the products and services of NPRCs in general has developed in the recent past and is expected to continue. For example, the NPRC associated with Harvard University, one of the most prestigious institutions in the world, will be closed by 2015 and others have decreased size and/or operations—in some cases euthanizing a large number of animals considered to be "surplus." While this trend was addressed in documents recently submitted to the NIH (see attached document numbered as page 262), this factor is not explained in the Draft EIS.
   - According to UW records recently submitted to the United States Department of Agriculture (USDA) and the NIH, only approximately half of the NHPs kept in the WaNPRC's existing facilities are used in experiments annually (see attached document with the heading "colony statistics") .
   - The WaNPRC has multiple NHP breeding facilities outside of Washington State in addition to a subcontract with a Snohomish County facility for housing NHPs. Claims of space constraints and immediate needs for space on campus *per se* could seem out of proportion for those considering the Draft EIS because the existence of additional facilities and larger geographical scale of WaNPRC operations not detailed in the draft EIS (see attached documents pertaining to the Principal Investigator named Martha Somerman).

3

B. The UW claims that the proposed facility will ensure compliance with laws and regulations. There is considerable evidence to the contrary. Likewise, presenting the proposed facility as a solution ignores the role of practice and other human elements of compliance. New facilities can meet engineering standards and building regulations, but cannot, in fact, guarantee compliance. New facilities have not resulted in superior compliance for the UW in the past.
   - Non-compliance items under the NIH Guide for the Care and Use of Animals and violations of the Animal Welfare Act have occurred in both new and old facilities and in centralized and non-centralized locations for animal research and housing at the UW over the last 20 years.
   - The WaNPRC's last major expansion was the Western Avenue facility for ABSL2/2+ and ABSL3 experiments approximately 15 years ago. That "state-of-the-art" facility was found to have serious compliance issues not long after beginning operations, including the use of tape on the floor to divide space for the purposes of biosafety.

4

- The UW's facility South Lake Union includes some laboratories for animal experiments. It was out of compliance for biosafety, animal experiments, environmental health and safety and occupational safety within weeks of becoming operational. The facility remained out of compliance for months despite the involvement of the Directors for multiple oversight departments.

4 Cont.

C. Arguments for the environmental risks and costs associated with the proposed facility include avoiding negative economic consequences as well as realizing positive economic impacts, as revenue for the UW and state. While financial arguments seem to be central to consideration of the Draft EIS, known concerns about the economic risks for Alternatives 1 and 2 are not clearly detailed.

- As noted above, the WaNPRC receives funding from the NIH. In 2011-2012, approximately 96% of funding came from NIH. A grant application recently submitted to that same agency noted,

  *"Current funding trends suggest NIH will be, **<u>at best</u>**, only able to support current commitments with little budgetary room for expansion." (emphasis added-see attached document numbered as page 262)*

  In other words, the one source that accounts for almost all (>95%) of WaNPRC's current funding is not only <u>not expected to scale with the proposed facility</u>, there is a good chance that it will not even continue at present levels.
- Elsewhere in the same application, the WaNPRC noted that increased private funding could potentially be pursued if new space was secured, i.e. the proposed ARCF. Intending to seek new funding after construction is insufficient and not the same thing as actually seeking it or successfully securing it beforehand.
- The WaNPRC acknowledged that it has "no existing programs" to pursue the new, alternative sources of income that they want to fill their funding gaps and that pursuing such "opportunities" in the future would take "considerable time to develop."

5

Taking on financial or environmental costs for the proposed facility that are absolutely certain when the purported benefits are decidedly uncertain, lacking in current capacity and requiring "considerable time to develop" if at all is a different sort of value proposition for stakeholders that does not appear to be fully documented in the Draft EIS.

2) Negative environmental impacts and risks associated with Alternatives 1 and 2

Some environmental costs and risks associated with approving the proposed facility at either Site in the EIS are irreversible. The water, air and soil pollution and other negative environmental impacts for wildlife and wildlife habitat caused during construction of and then by the ongoing operations of the new facility exceed purported benefits. Thus, the HSUS rejects Alternative 1 and Alternative 2 and supports Alternative 3 for not constructing the proposed facility.

6

A. Site Location and position of proposed ARCF under Alternatives 1 and 2

We would note that while the University of Washington is under contract with the city that limits the construction of an above grade building at the sites in question, this does not mean that an underground location is appropriate for managing environmental risks, let alone the alternative that

7

would be ideal or preferred in lieu of the contract. In fact, a subterranean structure could increase certain risks owing specific vulnerabilities to seismic events, geological characteristics, and proximity to a major body of water and groundwater, certain types of extreme weather events and so on. The fact that a facility can be built underground, or that a contract does not permit an above grade facility at a particular site does not make an underground facility at a location a good alternative, let alone the best one.

7 Cont.

B. Environmental risks of ABSL research of proposed ARCF under Alternatives 1 and 2

Beyond the immediate environmental impacts of construction and presence of the facility at environmentally sensitive sites selected for Alternatives 1 and 2, we have concern about risks inherent in the activities that will take place once construction is complete. In particular, research with animals involving chemicals and bio hazardous materials carry special risks. For example research on nonhuman primates requires Biosafety Level 2+ practices. This is because there are risks to human and public health and the same risks may impact animals inside and outside the laboratories. For example potentially hazardous materials may need to be transported from the subterranean facility on the shores of Lake Union to incinerators, large autoclaves or other disposal facilities. While risks would be higher within and around a site, they are not necessarily exclusive to it. Because of the location identified under both Alternative 1 and Alternative 2 and the normal movements of people and vehicles, in the event of a major breech caused by a catastrophe such as an earthquake or even a relatively small one that began as a result of a small human error, risk could expand quickly.

8

C. Environmental risks to water under Alternatives 1 and 2

Because of the location of both Alternative 1 and Alternative 2 near Lake Washington and the surrounding wetlands, as well as the presence of groundwater, the HSUS is concerned about negative environmental impacts on water, especially as it relates to wildlife and wildlife habitat. The vulnerability of the sites for Alternatives 1 and 2 to major weather events and risks that are expected to increase and shift dramatically as a result of climate change add to our concern. The potential for contamination or other negative impacts on water could be detrimental for aquatic and terrestrial wildlife in this area.

9

D. Air

At the completion of some experiments, animal tissues and other materials associated with experiments on animals have to be incinerated due to biosafety requirements. Though the University's EIS points out that a new incinerator is not planned for the new facility, they acknowledge that materials will have to be incinerated and that they will maintain an existing contract with an outside facility for this purpose. We would point out that this only serves to shift the air impacts to another geographic location and does not eliminate the impact. In fact, the off-site handling could be said to increase negative environmental impacts for air because of the increased geographic area exposed to risk. It is also reasonable to anticipate an absolute increase in risk. In the event that the projected increases of 100% in swine, 20% in NHPs, and approximately 10% in rodents[1] come to pass if the proposed facility is constructed and becomes operational as described in Alternative 1 or Alternative 2, demand for the use of the incinerators and resultant air pollution will increase accordingly.

10

E. Waste streams

[1] Dougton, S. (Nov 14, 2013) "UW approves new animal-research facility" online at http://seattletimes.com/html/localnews/2022261727_animallabxml.html

Animal waste streams from the subterranean facility are also of concern. Animal waste streams can contain materials such as feces that can be hazardous due to exposures of chemicals or other bio hazards. Large animals such as pigs and monkeys create large volumes of waste that can contain chemical toxins, drugs and pathogens used in experiments as well as pathogens that are natural to these animals. The management of these waste streams is always a concern but the management of these waste streams in a subterranean facility adjacent to a large body of water in an area with significant storm water and seasonal runoff poses particular concern. **11**

F. High population density and transit volume as risk factors for Alternatives 1 and 2

A number of other urban communities have objected to the construction of high biosafety level laboratories in densely populated areas because the environmental and health risks posed are increased by virtue of the fact that so many people are in the immediate area. We would note that many animals also live in this area including wild animals and companion animals. In fact the citizens of Seattle and King County were opposed to the construction of a similar laboratory on the University of Washington campus just years ago owing to the environmental impact risks. This opposition ultimately led to the university's decision not to build the facility. Those same risks continue to be of serious concern now. The sites identified for Alternatives 1 and 2 and their respective loading docks are of special concern relative to transit and transportation. The daily volumes of automobiles, bicycles and pedestrians as well as the number of public transit stops and routes in the vicinity have recognized importance for road congestion. However, when we consider the volume of people who work, study and visit this part of the UW campus and who live or do business nearby, the many ways that they can move to and from and around the sites for Alternative 1 and Alternative 2 also create a risk matrix for the spread of toxins or pathogens from the proposed Center to surrounding areas of the campus, Seattle and King County and beyond. **12**

3) Summary and recommendations

In light of our review and the concerns we have raised in our comments, the HSUS is strongly opposed to both Alternative 1 and Alternative 2 and exclusively supports Alternative 3 not to proceed with any construction of the ARCF. We have detailed concerns with the Draft EIS and review process itself, as well as specific concerns about a range of risks to a heavily populated area associated with Alternatives 1 and 2 for the proposed ARCF. **13**

Given the mandate to use the best available science and strong evidence for the management of environmental risk and its impacts for the safety and well-being of the environment, people and wildlife, we ask that state and municipal authorities asked to consider this proposed project, reject Alternatives 1 and 2 on the basis of the draft EIS and support Alternative 3.

Thank you for your time and consideration of this matter.

Sincerely

Kathleen Conlee
Vice President, Animal Research Issues

to measure success of this effort. It is expected the process improvement efforts will continue throughout the course of the requested funding period.

Another selected area of emphasis for the Office of the Director pertains the University of Washington financial system. The University is in the initial stages of restructuring its financial model to an Activity Based Budgeting System (ABB). This system is expected to redefine resource distribution within the University to more closely align actvities with the income they generate. While largely undefined at this point, it is clear that future financial success of the WaNPRC model will, in part, depend on successful integration into the ABB model. The Office of the Director, in conjunction with its Associate and Assistant Directors, will be fully invested in UW developmental efforts around the ABB. This effort has just begun and is expected to last through the requesting funding period.

Diversification of the funding portfolio will be an important initiative to secure the Center's financial future. Current funding trends suggest NIH will be, at best, only able to support current commitments with little budgetary room for expansion. The Director will pursue strategic initiatives to expand both the size and scope of Center funding through development of programs for advancement, intellectual property, and private partnerships. The Director will lead a team of Center staff with advancement and IP experience to leverage existing UW resources to establish formative programs. The Primate Center has no existing programs in these areas but they represent opportunities and the UW has advancement and IP offices to support program development. While it is recognized these programs may require considerable time to develop into major contributors, efforts will be undertaken and sustained through the requested funding period to increase funding support for the future.

In addition, the Office of the Director will pursue expansion of the privately-funded portion of the research portfolio as additional space becomes available. Competing resource needs and limited space have minimized opportunities for privately-funded research relationships. As additional space becomes available through Center expansion initiatives, the Office of the Director will pursue opportunities to expand private support of the research enterprise, providing additional funding and diversification.

Facilities and Planning: The Office of the Director will continue supervision of efforts directed towards specific issues of facilities likely to directly impact Center operations and programs. Specific Objectives related to Facilities include:

1. Expanding the central UW commitment for financial support for proactive maintenance
2. To continue efforts to provide opportunities for WaNPRC expansion

As described above (Progress, Facilities and Planning), the WaNPRC successfully garnered central UW funding support for facilities deficiencies identified through the IACUC and AAALAC site visit process. For the coming funding period, the Office of the Director will seek to extend this support to an ongoing, **Proactive Maintenance Program**. Proactive facilities maintenance is not only more cost-effective but ultimately reduces the number and gravity of deficiencies during regulatory site visits. The Director, working closely with other Center staff, will coordinate with the UW Office of Health Sciences Administration, Strategic Planning and Budget, and the

COLONY STATISTICS

Base Colony Only

Note: These animals are supported by NCRR Comparative Medicine.

Genus Species	1Breeding Colony				2Assigned To Experimental		Transferred		3Total Colony Census
	M	F	4U	Total	AIDS	Non-AIDS	5In	6Out	
MACACA FASCICULARIS	0	0	0	0	34	76	66	14	110
MACACA MULATTA	15	37	12	64	118	118	55	22	300
SAIMIRI SCIUREUS	0	0	0	0	0	10	1	0	10
PAPIO ANUBIS	0	0	0	0	0	8	0	36	8
MACACA NEMESTRINA	101	294	34	429	92	173	167	69	694
	116	331	46	493	244	385	289	141	1,122

1 - Total number of animals in breeding colony including adult breeding animals and designated juvenile replacements at time of report.
2 - Total number of animals assigned to experimental protocols at time of report.
3 - Total nmber of animals in Center's P51 supported colony.
4 - Sex undetermined.
5 - Total number of animals transferred into colony from outside sources during the reporting period.

Program Director/Principal Investigator (Last, First, Middle): Somerman, Martha J.

PROJECT SUMMARY (See instructions):

This grant requests 5 years of funding support for continuing operation of the Washington National Primate Research Center at the University of Washington (WaNPRC). The goal of this proposal is to support a broad-based research resources program, providing biomedical scientists the opportunity to conduct research using nonhuman primate (NHP) models for human health-related and NHP biologic issues. This goal will be attained through support for scientific intellectual resources, administration, animal support resources, facilities, and operations. Support is requested for translational and pre-clinical resource support in AIDS-related research, Neuroscience, NHP Systems Biology, Developmental and Reproductive Biology, and Global Programs (Research Cores). New research initiatives will develop novel NHP models and expand related research resources, including additional core scientists. Support for research resource related studies is requested to provide innovative research directions and better characterization of the NHP model. The WaNPRC will focus on efficient access to Center resources, with particular emphasis placed on support for affiliate research activities. This proposal also includes support for a broad program of animal care and technical support for breeding, housing, and research activities (Primate Resources Division), including both domestic and international sites of operation. Administrative support is requested to ensure appropriate management of Center finances and operations, focusing on improved efficiency and effective support for research activities. Support is requested for WaNPRC breeding colonies located in Seattle, WA and at our locations in New Iberia, LA and Alice, TX. All primates in WaNPRC facilities are housed and cared for under conditions that meet or exceed NIH standards per the Guide for the Care and Use of Laboratory Animals, ILAR recommendations, and the AAALAC accreditation standards for NHPs. All lentivirus-infected primates are housed in ABSL2/3 containment facilities with appropriate biosafety procedures. The University of Washington, including the WaNPRC, is fully accredited by AAALAC International.

RELEVANCE (See instructions):

The Washington National Primate Research Center provides the necessary non-human primate disease models for a variety of diseases and conditions that affect humans such as HIV/AIDS, influenza, Parkinson's disease, and neonatal asphyxia. The availability of these models allows for the development of preventive and interventive medicine and medical techniques to improve public health.

PROJECT/PERFORMANCE SITE(S) (If additional space is needed, use Project/Performance Site Format Page)

Project/Performance Site Primary Location			
Organizational Name: Washington National Primate Research Center			
DUNS: 605799469			
Street 1: 1705 NE Pacific St.		Street 2: Box 357330	
City: Seattle	County: King		State: Wa
Province:	Country: USA		Zip/Postal Code: 98195-7330
Project/Performance Site Congressional Districts: WA-007			

Additional Project/Performance Site Location			
Organizational Name: New Iberia Research Center			
DUNS: 799451273			
Street 1: University of Louisiana at Lafayette		Street 2: Box 13610	
City: New Iberia	County: Lafayette		State: LA
Province:	Country: USA		Zip/Postal Code: 70562-3610
Project/Performance Site Congressional Districts: LA-007			

Program Director/Principal Investigator (Last, First, Middle): Somerman, Martha J.

Use only if additional space is needed to list additional project/performance sites.

Additional Project/Performance Site Location

Organizational Name: Oregon Health and Sciences University
DUNS: 096997515
Street 1: 3181 SW Sam Jackson Park Road | Street 2:
City: Portland | County: Multnomah | State: OR
Province: | Country: USA | Zip/Postal Code: 97006-3448
Project/Performance Site Congressional Districts: OR-001

Additional Project/Performance Site Location

Organizational Name: SNBL USA, Ltd
DUNS:
Street 1: 6605 Merrill Creek Parkway | Street 2:
City: Everett | County: Snohomish | State: WA
Province: | Country: USA | Zip/Postal Code: 98203
Project/Performance Site Congressional Districts: WA-002

Additional Project/Performance Site Location

Specific Animal Location

State: TX
Zip/Postal Code: Specific Animal

Additional Project/Performance Site Location

Organizational Name:
DUNS:
Street 1: | Street 2:
City: | County: | State:
Province: | Country: | Zip/Postal Code:
Project/Performance Site Congressional Districts:

Additional Project/Performance Site Location

Organizational Name:
DUNS:
Street 1: | Street 2:
City: | County: | State:
Province: | Country: | Zip/Postal Code:
Project/Performance Site Congressional Districts:

RESPONSE TO DEIS LETTER 4

The Humane Society of the United States

1. Comment acknowledged. The preference for Alternative 3 (No Action) is noted.

2. Comment acknowledged.

   The response to this comment is organized in the areas of: **SEPA EIS Scope**; **SEPA Cost-Benefit Analysis Provisions**, and **Animal Research and Care Facility Public Process**.

   SEPA EIS Scope. A primary purpose of a project-specific Environmental Impact Statement (EIS) prepared under the provisions of the Washington State Environmental Policy Act (SEPA) is to inform decision-makers, agencies and the general public of the potential for significant environmental impacts associated with construction and operation of a proposal (WAC 197-11-400). Where significant environmental impacts associated with construction and operations of the proposal are identified, mitigation measures to address the impacts should be identified (WAC 197-11-440(6)(C)(iii).

   Prior to preparation of the Animal Research and Care Facility Draft EIS, the University of Washington (as SEPA lead agency) conducted a 21-day public scoping period to assist in the identification of the elements of the environment to be analyzed in the EIS (WAC 197-11-408). An intent of the EIS scoping period is to narrow the scope of the EIS to the probable significant adverse impacts and reasonable alternatives.

   Approximately 110 public comments were received during the SEPA EIS scoping period. Based in part on SEPA public scoping, the elements of the environment identified for analysis in the EIS were Construction (including traffic, noise, vibration, groundwater, and air quality), Land Use and Aesthetics.

   As indicated above, a SEPA EIS is intended to focus on those elements of the environment where significant impacts are probable. The elements of the environment identified for analysis in the Animal Research and Care Facility EIS were Construction (including traffic, noise, vibration, groundwater, and air quality), Land Use and Aesthetics. Other elements of the environment (such as Environmental Health, Seismic Hazards and Plants & Animals) are not anticipated to result in probable significant impacts and were not carried forward for analysis in the EIS. For example, significant impacts associated with Environmental Health (biomedical functions and waste) are not considered probable due to: **1)** the proposed Animal Research and Care Facility would not represent a new type of biomedical use on the campus; **2)** the proposed Animal Research and Care Facility would result in only a modest potential to increase the level of biomedical research on the campus; **3)** the proposed centralization of existing decentralized facilities would improve the University of Washington's ability to manage biomedical functions and waste; **4)** the proposed Animal Research and Care Facility would represent an upgrade to current facilities; **5)** current

incineration protocols would continue with no new incineration facilities on the site; and, **6)** all operations associated with the Animal Research and Care Facility would comply with University of Washington provisions for the containment, storage, treatment and disposal of hazardous materials, including the University of Washington Infectious/Biomedical Waste Management Plan and the University's Regulations for Shipping Regulated Medical/Biohazardous Waste by Contracted Carrier.

SEPA Cost-Benefit Analysis Provisions. According to SEPA rules, an environmental impact statement is not required to evaluate or document all of the possible effects and considerations of a decision or to contain the balancing judgments that must ultimately be made by the decision makers. Rather, a SEPA EIS analyzes environmental impacts and should be used by decision makers, along with other relevant considerations, in making a decision on a proposal (WAC 197-11-448(1)). Examples of information that is not required or appropriate for analysis in a SEPA EIS include: methods of financing proposals, economic competition, and social policy (such as welfare policies and non-construction aspects of education and communication) (WAC 197-11-448(3)). Additionally, a cost-benefit analysis is not required by SEPA (WAC 197-11-450).

Consistent with SEPA rules, the Animal Research and Care Facility Draft EIS focused on the environmental impacts and mitigation associated with construction and operation of the proposed facility. The elements of the environment analyzed in the Draft EIS consisted of Construction, Land Use and Aesthetics consistent with SEPA EIS scoping. Chapter 2 (Project Description) of the Draft EIS includes a summary of the University of Washington's fundamental mission and research program objectives for the Animal Research and Care Facility. Consistent with SEPA rules, the EIS does not evaluate the merits of the University of Washington's identified fundamental mission, research program objectives, or funding.

Animal Research and Care Facility Public Process. The Draft EIS does include a summary of the public process conducted by the University of Washington regarding the mission and objectives of the Animal Research and Care Facility project. As indicated on page 2-5 of the Draft EIS, "the University of Washington, including the Department of Comparative Medicine and the Washington National Primate Research Center, strives to provide transparency regarding program missions and objectives. For the Animal Research and Care Facility Project, the University of Washington conducted public outreach forums to describe the anticipated range of medical research methods and receive public comments; presented the project to the Faculty Council on University Facilities and Services in November 2012; briefed the City-University Citizens Advisory Committee in November 2013; sent outreach email broadcast in April 2014; and, held a public open house in June 2014. A second open house was held in September 2014. Additionally, the Health Sciences Administration maintains updated information on the ARCF Project on its publically-accessible website."

3. The comments regarding funding and the need for the proposed Animal Research and Care Facility are noted. As indicated in response to comment 2 of this letter, an intent of a

project-specific EIS prepared under the Washington State Environmental Policy Act (SEPA) is to inform decision-makers, agencies and the general public of the potential for significant environmental impacts associated with construction and operations of a proposal. It is not the intent of a SEPA EIS to evaluate the merits of a project's mission, objectives or funding. Please refer to response to comment 2 of this letter for additional discussion.

4. The comments regarding the lack of need for the proposed Animal Research and Care Facility to meet compliance objectives are noted. As indicated in response to comment 2 of this letter, it is not the intent of an EIS prepared under the Washington State Environmental Policy Act (SEPA) to evaluate the merits of a projects mission or objectives. Please refer to response to comment 2 of this letter.

5. The comments regarding funding trends are noted. As indicated in response to comment 2 of this letter, it is not the intent of a project-specific EIS prepared under the Washington State Environmental Policy Act (SEPA) to evaluate the merits of a project's anticipated funding. Please refer to response to comment 2 of this letter.

6. The preference for Alternative 3 (No Action) is noted. As indicated in response to comment 2 of this letter, a cost-benefit analysis is not required (or appropriate) for analysis in an EIS prepared under the Washington State Environmental Policy Act (SEPA). Consistent with SEPA rules, the Animal Research and Care Facility Draft EIS focused on the environmental impacts and mitigation associated with construction and operation of the proposed facility. Consistent with SEPA rules indicating that an EIS should focus on those elements of the environment where significant impacts are probable, the elements of the environment analyzed in the Draft EIS consisted of Construction (including traffic, noise, vibration, groundwater, and air quality), Land Use and Aesthetics. Please refer to Section 3 of the Draft EIS for the environmental analysis of construction and operations of the proposed Animal Research and Care Facility.

   As indicated in response to comment 2 of this letter, significant impacts to plants & animals are not considered probable and the Plants & Animals element of the environment was not carried forward for analysis in the EIS. Significant impacts to Plants & Animals are not probable due to: **1)** the site does not contain natural plant or animal habitat; **2)** no known natural plant or animal habitat is located immediately adjacent to the site; and, **3)** new landscaping would be provided on the site which could represent enhanced plant/animal habitat on the site.

7. The comments regarding the underground nature of the proposed Animal Research and Care Facility are acknowledged. The response to this comment is organized in the areas of: **Site Groundwater**; **Potential for Flooding from Portage Bay**, and **Seismic Hazards**.

   Site Groundwater - Section 3.1 of the Draft EIS describes and evaluates the potential impacts associated with construction of the Animal Research and Care Facility. Construction-related impacts associated with air quality, greenhouse gases, noise, vibration,

transportation, trees, groundwater and views were analyzed. Where impacts were identified, mitigation measures were identified.

As described on page 2-26 of the Draft EIS, the existing groundwater level at the site ranges from elevation 25 to 27 feet, and the proposed below-grade structure would include a finished floor elevation of approximately 17 feet. Thus, an approximately 8 to 10-foot portion of the proposed structure would be below the existing groundwater level. Similar to the below-grade levels of the adjacent William H. Foege Building and Hitchcock Hall, and the underground loading dock, the proposed Animal Research and Care Facility would be designed as a durable waterproof structure using state of the art technologies that include systems to ensure redundancy and early leak detection, as well as meeting applicable local and state regulations.

Section 3.1-3 (Construction Mitigation Measures) identified, among other measures, the following: "To minimize the potential for the proposed ARCF structure to obstruct groundwater movement and reduce the risk of water intrusion into the structure under Alternative 1, a subsurface drain system would be provided, including a full-coverage wall drainage against the shoring wall which would connect to a groundwater sump/pump located under the loading dock. Groundwater would be discharged to the University-owned 24-inch direct discharge stormwater main."

Potential for Flooding from Portage Bay – The water level of Portage Bay, Lake Washington and Lake Union (referred to herein as Portage Bay) is regulated by the US Army Corps of Engineers (US Corps) by adjusting the amount of water released to Puget Sound at the Hiram M. Chittenden Locks[1]. In general, the water level of Portage Bay is maintained at approximately elevation 20 in the winter and approximately elevation 21.9 in the summer. During the winter months when rainfall levels and the potential for flooding from Portage Bay are highest, the US Corps monitors and adjusts the release of water to maintain the desired level.

As indicated in Section 3.1 of the Draft EIS, the site surface elevation ranges from 57 feet at the southern end to 68 feet at the northern end, compared to the Portage Bay water level ranging from elevation 20 (winter) to elevation 21.9 (summer). The proposed finished floor level of the below-grade structure (lowest portion of the proposed structure) would be elevation 17.

Given the distance of the site from Portage Bay (approximately 1/10 mile – 500 feet), the fact that the water level of Portage Bay is maintained at the desired level by the US Corps, and the site elevation for the ARCF building ranges from 57 to 68 feet (approximately 35 to 48 feet above the Portage Bay water level depending on the area of the site and the time of the year), there is little to no potential for Portage Bay flooding to affect the site.

[1] *The water elevation of Puget Sound is approximately 20 feet lower than Lake Washington/Portage Bay/Lake Union.*

Please note that the Alternative 2 site is located closer to Portage Bay (approximately 200 feet) and is at a lower elevation (site elevation ranging from approximately 30 to 56 feet) than the proposed site.

Seismic Hazards – As indicated in response to comment 2 of this letter, an intent of the EIS scoping period is to narrow the scope of the EIS to those elements of the environment where probable significant adverse impacts could occur. Significant seismic impacts are not considered probable and Seismic Hazards was not carried forward for analysis in the EIS. Significant impacts associated with seismic hazards are not considered probable for the following reasons: **1)** there are no known faults underlying the site and the risk of surface rupture is low; **2)** the glacially overconsolidated soils below the groundwater table are very dense and are not susceptible to liquefaction; **3)** because the soils are not susceptible to liquefaction there is no lateral spreading hazard[2]; **4)** the proposed structure would be below-grade which would minimize potential structural damage during a seismic event; and, **5)** the proposed structure would be designed according to the applicable seismic design parameters.

8. Comments acknowledged. As indicated in response to comment 2 of this letter, a purpose of an environmental impact statement under SEPA is to focus on those elements of the environment where significant impacts are probable. The element of the environment Environmental Health was not anticipated to result in probable significant impacts due to: **1)** the proposed Animal Research and Care Facility would not represent a new type of biomedical use on the campus; **2)** the proposed Animal Research and Care Facility would result in only a modest potential to increase the level of biomedical research on the campus; **3)** the proposed centralization of existing decentralized facilities would improve the University of Washington's ability to manage biomedical functions and waste; **4)** the proposed Animal Research and Care Facility would represent an upgrade to current facilities; **5)** current incineration protocols would continue with no new incineration facilities on the site; and, **6)** all operations associated with the Animal Research and Care Facility would comply with University of Washington provisions for the containment, storage, treatment and disposal of hazardous materials, including the University of Washington Infectious/Biomedical Waste Management Plan and the University's Regulations for Shipping Regulated Medical/Biohazardous Waste by Contracted Carrier.

   As indicated on page 2-19 of the Draft EIS, "the loading dock would include a coiling door that would provide a secure barrier at the entrance. Protocols during animal loading and unloading would require that the door be closed during animal transfers to create a secure, enclosed area." Page 2-13 of the Draft EIS indicates that "research uses within the proposed ARCF would continue to follow the University's Infectious Waste Management Plan as it relates to the disposal of animal remains and no onsite incineration would occur." The proposed site location and centralization of animal research functions could minimize the

[2] *Lateral spreading is caused by liquefaction or a reduction of shear strength of soil within or under a slope.*

amount/distance of necessary animal and waste transportation compared to current conditions.

As indicated in response to comments 2 and 7 of this letter, the site and proposed facility design are not anticipated to result in the potential for seismic or flooding impacts beyond that exhibited by typical sites/buildings on the University of Washington campus.

9. Comments acknowledged. As indicated in response to comment 6 of this letter, a purpose of an environmental impact statement under SEPA is to focus on those elements of the environment where significant impacts are probable. Significant probable environmental impacts to plants & animals are not anticipated, and the Plants & Animals element of the environment was not carried forward for detailed analysis in the EIS for the following reasons: **1)** the site does not contain natural plant or animal habitat; **2)** no known natural plant or animal habitat is located immediately adjacent to the site; and, **3)** new landscaping would be provided on the site which could represent enhanced plant/animal habitat on the site. Please note that there is no known wetland habitat area on or immediately adjacent to the site.

   Please refer to response to comment 7 of this letter for a discussion on site groundwater conditions and the potential for flooding from Portage Bay.

10. Comments acknowledged. As indicated in response to comment 2 of this letter, a purpose of an environmental impact statement under SEPA is to focus on those elements of the environment where significant impacts are probable. Significant probable environmental impacts to biomedical functions and waste are not anticipated, and the Environmental Health element of the environment was not carried forward for detailed analysis in the EIS for the following reasons: **1)** the proposed Animal Research and Care Facility would not represent a new type of biomedical use on the campus; **2)** the proposed Animal Research and Care Facility would result in only a modest potential to increase the level of biomedical research on the campus; **3)** the proposed centralization of existing decentralized facilities would improve the University of Washington's ability to manage biomedical functions and waste; **4)** the proposed Animal Research and Care Facility would represent an upgrade to current facilities; **5)** current incineration protocols would continue with no new incineration facilities on the site; and, **6)** all operations associated with the Animal Research and Care Facility would comply with University of Washington provisions for the containment, storage, treatment and disposal of hazardous materials, including the University of Washington Infectious/Biomedical Waste Management Plan and the University's Regulations for Shipping Regulated Medical/Biohazardous Waste by Contracted Carrier.

    Please note that the amount and types of animals utilized are primarily a function of the type of research conducted and would not be directly dictated by the proposed ARCF.

11. The comments related to biomedical waste and surface water/groundwater are acknowledged. Please refer to response to comment 2 of this letter for a discussion on

biomedical functions and waste, and response to comment 7 of this letter for a discussion on groundwater and the potential for flooding at the site.

12. The comments related to biomedical functions and waste are acknowledged. Please refer to response to comment 2 of this letter for a discussion on biomedical functions and waste.

    Existing animal research and housing facilities on the University of Washington campus are located in an urban campus environment exhibiting urban levels of pedestrian and vehicle traffic similar to the campus environment at the proposed ARCF site. Thus, the proposal would not represent the new introduction of animal research/housing use to a busy urban environment.

    As indicated on page 2-12 of the Draft EIS, the following goals/objectives for the ARCF focus on improved safety and operations:

    - Replace currently non-compliant animal research labs and facilities with new "state of the art" facilities.
    - Create a safe and healthy working environment for staff, researchers and animals.
    - Provide a new centralized resource for the University of Washington Health Sciences Administration, the DCM and the WaNPRC.
    - Provide amenities that assist in retaining and recruiting staff, including adequate offices and teaming spaces, which also instill confidence in the research community that the animals are well cared for.
    - Allow flexibility for housing animals to allow the facility to respond to changing animal species population and census projections within the facility.
    - Provide sufficient storage space to reduce operational time for staff to locate materials and provide a safer, more ergonomically friendly environment.

13. Comments regarding the preference for Alternative 3 (No Action) are noted. Please refer to response to comments 2, 6 and 7 of this letter, and Chapter 3 of the Draft EIS, for discussions on the analyses conducted for this SEPA EIS.

From: Jonathan Grindell
To: Jan Arntz-Richards
Subject: ARCF Environmental Impact Public Comment
Date: Monday, August 25, 2014 3:16:07 PM

Hi Jan,

I pose several questions about the environmental impact of the ARCF.

1. Seattle prides itself as being "eco-friendly". How can a facility that will lead to so much toxic medical lab waste fit into this? 1
2. The animals have no voice. How can their concerns be addressed? I have seen videos of primates throwing feces at workers in the labs. I would equate this with opposition to the lab. 2
3. Where is the vast majority of funding coming from? Is this a carbon-offset to the environment available? 3

Thanks,

Jonathan Grindell
Resident of Cascadia

RESPONSE TO DEIS LETTER 5

Jonathan Grindell

1. As noted in the Draft EIS (DEIS Chapter 2, Project Description), all research uses within the proposed ARCF would continue to follow the University of Washington's Infectious/Biomedical Waste Management Plan (April 2014), which is consistent with applicable state and local regulations and addresses federal guidelines for research as defined by the National Institute of Health (NIH) and the Center for Disease Control. The proposed ARCF would also comply with the University's Regulations for Shipping Regulated Medical/Biohazardous Waste by Contracted Carrier. Please also refer to the Response to Letter 4 (The Humane Society of the United States), Comment 2 for further discussion on environmental health.

2. Comment acknowledged.

3. Funding for the development of the ARCF building is being provided by the University of Washington's internal lending program. Please refer to the response to Letter 4 (The Humane Society of the United States) Comment 2 and 3 for further details.

From: Brandon Juhl
To: Jan Arntz-Richards
Subject: please don"t expand UW"s animal testing facilities
Date: Monday, August 25, 2014 4:09:16 PM

The University is proposing to construct a new facility in which to subject even more animals (cats, dogs, primates) to invasive, painful medical procedures. These are not only cruel and unethical, but useless. Over 90% of medical treatments tested on non-human animals fail when they get to human clinical trials. The only way you're going to know what a particular chemical or procedure will do to/for a human is to try it on a human. We don't try to learn whale biology by studying eagles. We don't try to learn about ants by studying jellyfish. Trying to learn about human physiology by studying any species other than humans is a waste of time, and a cruel one at that. 1

What has the UW done to ensure that negative environmental impacts of the construction of the new facility (and its continuing operations) are mitigated? 2

Did the UW consider expanding non-animal-research-based scientific research, and if so, what did it find? If not, why not?

Has the UW really considered the concerns of the public, including pressure to consider alternatives to using animals in research? Members of the Board of Regents admitted to not doing outside research about the lab, animal testing, or alternatives to animal testing and did not consider much of the public comment submitted to them prior to voting for the ARCF. Why is this? 3

--Brandon Juhl

RESPONSE TO DEIS LETTER 6

Brandon Juhl

1. Comment acknowledged.

2. The Draft EIS identifies potential environmental impacts associated with the development and operation of the proposed ARCF building. In accordance with the Washington State Environmental Policy Act, including EIS scoping for the project, the environmental elements analyzed in the Draft EIS included construction impacts (air quality, greenhouse gas emissions, noise, vibration and transportation), land use, and aesthetics. As part of the analysis, mitigation measures were identified for potential impacts associated with the proposed ARCF building. See DEIS Section 3.1, Construction Impacts, for further details on potential construction-related impacts and associated mitigation measures.

3. Comment acknowledged.

   It should be noted that a separate public outreach process has been conducted by the University of Washington regarding the mission and objectives of the Animal Research and Care Facility Project and the Draft EIS includes a summary of that process. As indicated on page 2-5 of the Draft EIS, "the University of Washington, including the Department of Comparative Medicine and the Washington National Primate Research Center, strives to provide transparency regarding program missions and objectives. For the Animal Research and Care Facility Project, the University of Washington conducted public outreach forums to describe the anticipated range of medical research methods and receive public comments; presented the project to the Faculty Council on University Facilities and Services in November 2012; briefed the City-University Citizens Advisory Committee in November 2013; sent outreach email broadcast in April 2014; and, held a public open house in June 2014. A second open house was held in September 2014. Additionally, the Health Sciences Administration maintains updated information on the ARCF Project on its publically-accessible website."

From: Sarah Olson
To: Jan Arntz-Richards
Subject: Environmental Impact of ARCF - Do NOT Build the New Lab
Date: Tuesday, August 26, 2014 2:38:46 PM

Hello Jan,

My name is Sarah Olson and I am a junior at the University of Washington. As co-president of the Campus Animal Rights Educators student organization and a student at UW as well as a Seattle resident, I would like to share my thoughts on the construction of the new ARCF with you.

Building the ARCF is not in the best interest of the University of Washington. As a student who loves her school, it saddens me to see the university move in this direction.The construction and implementation of the new lab be environmentally degrading to the area near UW. As a school committed to sustainability we should not be investing time, money, energy and *resources* into a new building used for science that will most likely be phased out in the near future. When speaking with the Board of Regents earlier this year, they admitted to me that it would be possible that the university would phase out animal research within the next ten years and decisions on how to then use the building designed for that purpose had yet to be made. This comment came about when I asked the Board if they had considered the use of alternatives to animal research, which they admitted they had not done prior to committing millions of dollars towards this building. The Board said they would love to see alternatives being used - the type of science students and the public want to see - yet by committing to building this lab they did not pave the way towards the inevitable and desired future of science at UW. **1**

Which brings me to my next concern: the building of this lab will spark protest not only from students but from the greater Seattle community. In an already busy area, we as students do not need anymore traffic or general congestion when getting to classes - especially classes far from the main campus where tardiness is frowned upon. We as students will fight for what we want and what is right - the phasing out of animal test subjects and the implementation of alternatives - but doing so will change the environment of our campus and our relationship with the area and administrators. **2**

We do not need precious resources and energy put towards a new building that many students feel is morally wrong and do not support. We do not need a new building that has potential to damage the nearby water and land environments during construction. We do not need a building that will produce tremendous amount of waste - some toxic. We do not need the new ARCP, so please do not build it. **3**

Yours sincerely, concerned student,
Sarah Olson

RESPONSE TO DEIS LETTER 7

Sarah Olson

1. Comment acknowledged. An intent of a project-specific EIS prepared under the Washington State Environmental Policy Act (SEPA) is to inform decision-makers, agencies and the general public of the potential for significant environmental impacts associated with construction and operations of a proposal. Consistent with the SEPA rules, it is not the intent of a SEPA EIS to evaluate the merits of a project's mission, objectives or funding

   A separate public outreach process has been conducted by the University of Washington regarding the mission and objectives of the Animal Research and Care Facility Project and the Draft EIS includes a summary of that process. As indicated on page 2-5 of the Draft EIS, "the University of Washington, including the Department of Comparative Medicine and the Washington National Primate Research Center, strives to provide transparency regarding program missions and objectives. For the Animal Research and Care Facility Project, the University of Washington conducted public outreach forums to describe the anticipated range of medical research methods and receive public comments; presented the project to the Faculty Council on University Facilities and Services in November 2012; briefed the City-University Citizens Advisory Committee in November 2013; sent outreach email broadcast in April 2014; and, held a public open house in June 2014. A second open house was held in September 2014. Additionally, the Health Sciences Administration maintains updated information on the ARCF Project on its publically-accessible website."

2. The comment related to the potential for protest is noted. As noted in the Draft EIS, potential construction-related transportation impacts (including pedestrian and bicycle access to the site and surrounding areas) were analyzed and potential mitigation measures were identified, including temporary pathways and detours around the site, as well as wayfinding signage. Subsequent to construction, the proposed ARCF site would provide enhanced accessibility to surrounding areas through the development of a winding pathway between NE Pacific Street and NE Boat Street, and several east/west pathways. The existing ramp from the southside of NE Pacific Street to the Hitchcock Bridge would also be reconstructed to allow ADA accessibility.

3. Potential construction-related impacts to groundwater and potential impacts to land uses in the site vicinity were analyzed in the Draft EIS (refer to DEIS Section 3.1, Construction Impacts and DEIS Section 3.2, Land Use, respectively); mitigation measures were also identified for potential groundwater and land use impacts.

   As noted in the Draft EIS (DEIS Chapter 2, Project Description), research uses within the proposed ARCF would continue to follow the University's Infectious/Biomedical Waste Management Plan (April 2014) which is consistent with applicable state and local regulations and addresses federal guidelines for research as defined by the National Institute of Health (NIH) and the Center for Disease Control. The proposed project would

also comply with the University's Regulations for Shipping Regulated Medical/Biohazardous Waste by Contracted Carrier. Please refer to the response to Letter 4 (The Humane Society of the United States), Comments 2 and 7 for discussion on the potential impacts associated with biomedical waste and groundwater conditions.

From: amanda schemkes
To: Jan Arntz-Richards
Subject: Comment re: Animal Research and Care Facility
Date: Tuesday, August 26, 2014 7:53:10 PM

I am writing to express my concerns about the proposed Animal Research and Care Facility, and to ask the Environmental and Land Use Compliance office to not allow plans to build this facility to go any further.

The approval of plans for the ARCF have so far been problematic. The Board of Regents voted to approve the plans, even though multiple members of the Board admitted that they relied only on information from the UW's animal research faculty (no outside information) in making their vote, they did not publicly discuss the approval at the meeting during which they approved the facility, they did not address public comments made in opposition to the lab, they admitted to not knowing information about the trend among other universities (including Harvard) to move away from primate and other animal research even though such information was sent to them prior to their vote, and they admitted to not being aware of the advancements in alternatives to using animals in research or the unreliability in data of using animals. At meeting at which the Board approved the facility plans, the room was lined with concerned members of the community holding signs asking the Board to vote "NO" on the lab, two people spoke during the comment period to give reasons why the Board should vote no, and there was absolutely no public support FOR the facility expressed in the meeting, yet the Board approved the facility without addressing the public concern or engaging in any discussion for the public to see. 1

Now for this period of public commenting in regard to the environmental impact, the issue of public involvement in this decision has again become problematic. There are two different comment deadlines listed, making it unclear to the public when they have to submit comments by. Additionally, the impact statement is lengthy and technical, and the public was given less than a month to read, interpret, and submit comment. 2

Animal research facilities are highly controversial -- especially as a higher and higher percentage of the population no longer approves of using animals (particularly primates) in research -- and so the UW should place heightened concern on how the public and the community feels about the UW actually looking to expand the number of animals that it uses in research. To highlight, the UW is looking to expand the number of animals, even as animal research becomes more and more outdated and many other universities are moving away from using animals and instead investing in innovative, cutting-edge methods that don't use animals and that are leading towards a future of more reliable science.

In addition to animal research placing UW in the past -- something contrary to the reputation it wants to have in the research field -- the UW's history of using animals in research has brought a lot of negative attention to the university. The UW has violated the federal Animal Welfare Act on multiple occasions, and activists have brought negative media attention to the school each time. As long as the UW continues to use animals in research, activists will continue to bring attention to the school for doing so, and the building of this new facility would only heighten that and remind the public of the UW's poor record of animal care. Now with the new facility plans -- where primates will be kept on the lowest level of an underground facility and emergency exits are limited -- how can primate safety be ensured? What if there were a fire or flooding -- how would the animals be evacuated safely? The UW 3

already has a record of non-compliance with federal standards for animal care. Has a new facility that is not for animals been considered? Has a facility that doesn't include primates been considered?

So far it appears as though those involved in animal research at the UW have pushed these new facility plans through, even though that is only in their interests rather than in the interest of the UW and community as a whole. I am an alumni of the UW -- and so are my dad, sister, and brother. I would have currently been a law student at the UW, but because of the UW's involvement in animal research, I chose to attend law school at Seattle University instead, and my family of alumni supported that decision. Additionally, I work in different ways with several animal advocacy groups -- The Bunny Alliance, Action for Animals, the Northwest Animal Rights Network, the National Lawyers Guild's Animal Rights Activism Committee, the Student Animal Legal Defense Fund, Stop Animal Exploitation Now, among others. All of these groups have expressed their opposition to this new facility, and there is an even broader public opposition to the facility.

3 Cont.

Please, consider how much the building of this facility would be a step in the wrong direction for the UW and pose hazards to the environment, animals, and the community.

Sincerely,

Amanda Schemkes

RESPONSE TO DEIS LETTER 8

Amanda Schemkes

1. Comment acknowledged. An intent of a project-specific EIS prepared under the Washington State Environmental Policy Act (SEPA) is to inform decision-makers, agencies and the general public of the potential for significant environmental impacts associated with construction and operations of a proposal. Accordingly, an intent of the EIS is to inform future decisions made by the University of Washington and other decision-makers.

   Additionally, a separate public outreach process has been conducted by the University of Washington regarding the mission and objectives of the Animal Research and Care Facility Project and the Draft EIS includes a summary of that process. As indicated on page 2-5 of the Draft EIS, "the University of Washington, including the Department of Comparative Medicine and the Washington National Primate Research Center, strives to provide transparency regarding program missions and objectives. For the Animal Research and Care Facility Project, the University of Washington conducted public outreach forums to describe the anticipated range of medical research methods and receive public comments; presented the project to the Faculty Council on University Facilities and Services in November 2012; briefed the City-University Citizens Advisory Committee in November 2013; sent outreach email broadcast in April 2014; and, held a public open house in June 2014. A second open house was held in September 2014. Additionally, the Health Sciences Administration maintains updated information on the ARCF Project on its publically-accessible website."

2. The date of the Draft EIS issuance (July 29, 2014) and the date that public comments on the Draft EIS were due (August 28, 2014) were both identified in the Draft EIS. Thus, a 30-day public comment period (July 29th through August 28th) was provided for the Draft EIS, pursuant to WAC 197-11-502(5)(b).

3. Your comment regarding the lack of need for the proposed Animal Research and Care Facility and the ability to meet compliance objectives are noted. As indicated in the Response to Letter 4 (The Humane Society of the United States) Comment 2, the primary purpose of a project-specific EIS under SEPA is to disclose environmental impacts anticipated with construction and operations of a proposal. It is not the intent of a SEPA EIS to evaluate the merits of a project's mission or objectives. Please also refer to the response to comment 1 of this letter for a discussion on the public process conducted in regards to the proposed mission and objectives of the ARCF project.

From: Larry Stalnaker
To: Jan Arntz-Richards
Subject: Fw: new research facility
Date: Sunday, August 03, 2014 6:31:10 AM

These are my comments due by August 27th regarding the Draft Environmental Impact Statement regarding ARCF at UW. I cannot reiterate enough about all the fines UW has paid out for violating the USDA's AWA. The cruelty & neglect of the animals is unconscionable. 1

The damage to the surrounding land & water resulting from animal experimentation is to be considered. The earth is polluted enough. 2

Please deny this proposal.
Thank you.
Marilyn Evenson
Tacoma, WA

On Tuesday, May 13, 2014 11:14 AM, Larry Stalnaker wrote:

Dear Ms. Arntz,

The UW Board of Regents recently approved plans for a new animal laboratory which will allow the university to increase the number of primates & other animals used to be subjected to suffering, pain, stress, loneliness, neglectful care, & even death. I am emailing to protest. 3

Animal research is becoming outdated, archaic, & scientifically useless. Today there are many non-animal alternatives that are phasing out cruel animal experiments. The USDA, NIH, FDA, scientists, & other experts & studies are realizing chimpanzees are poor models for human research. They are urging facilities to use alternatives that are more accurate, less costly, & far more humane.

Besides the animal suffering, there will be a detrimental impact on the environment by constructing an underground facility that will produce hazardous waste including chemicals, sick & dead animals, & animal waste. 4

The public has a negative view of the UW for building a facility that harms the environment, & continues to use animals in spite of many citations by the USDA for violating the AWA. 5

Please do not approve this facility.
Thank you & a reply would be appreciated.

Marilyn Evenson
Tacoma, WA

RESPONSE TO DEIS LETTER 9

Larry Stalnaker & Marilyn Evenson

1. Comment acknowledged.

2. Potential construction-related impacts to groundwater and potential impacts to land uses in the site vicinity were analyzed in the Draft EIS (refer to DEIS Section 3.1, Construction Impacts and DEIS Section 3.2, Land Use, respectively); mitigation measures were also identified for potential groundwater and land use impacts. Please also refer to the Response to Letter 4 (The Humane Society of the United States), Comments 2, 6, and 7 for discussions on potential impacts to groundwater, plants, and animals.

3. Your comment regarding the lack of need for the proposed Animal Research and Care Facility is noted. As indicated in the Response to Letter 4 (The Humane Society of the United States) Comment 2, the primary purpose of a project-specific EIS under SEPA is to disclose environmental impacts anticipated with construction and operations of a proposal. It is not the intent of a SEPA EIS to evaluate the merits of a project's mission or objectives. Please also refer to the response to comment 1 of this letter for a discussion on the public process conducted in regards to the proposed mission and objectives of the ARCF project.

4. As noted in the Draft EIS (DEIS Chapter 2, Project Description), research uses within the proposed ARCF would continue to follow the University's Infectious/Biomedical Waste Management Plan (April 2014) which is consistent with applicable state and local regulations and addresses federal guidelines for research as defined by the National Institute of Health (NIH) and the Center for Disease Control. The proposed ARCF would also comply with the University's Regulations for Shipping Regulated Medical/Biohazardous Waste by Contracted Carrier. Please also refer to the Response to Letter 4 (The Humane Society of the United States), Comment 2 for further discussion on environmental health.

5. Comment acknowledged.

From: Allison Vasallo
To: Jan Arntz-Richards
Subject: concerns about the Animal Research and Care Facility
Date: Tuesday, August 26, 2014 2:50:30 PM

Hi Jan,

I just want to voice my concern, and opposition, to the installation of the ARCF at the university. 1

In short, I am opposed the ARCF's installation for environmental and even educational/technical reasons. If you have time to read through longer emails by tomorrow, here's my reasoning:

Environmental: Transporting (fossil fuels), feeding (food waste), and disposing (biohazardous waste) the quantity of animals (and all their excrement) that this facility could hold will result in unnecessary pollution and waste. 2

Educational/technical: UW is a well-known and renown medical school. When I've brought up the ARCF with my friends in Seattle, they were shocked because they had assumed UW was progressive in its practices, especially being in such a progressive city. Many other well-known medical schools, including but not limited to Yale, Stanford, Harvard, Tufts, and Duke, have eliminated live animal testing and instead use state of the art and cost efficient models and simulators without compromising the quality of education. (http://www.neavs.org/alternatives/in-education) 3

I could go on longer, but I'm sure you have plenty more emails to read.

Thank you Jan for taking the time to read my message. I look forward to hearing the results of the EIS on the ARCF.

Sincerely,

Allison Vasallo

RESPONSE TO DEIS LETTER 10

Allison Vasallo

1. Comment acknowledged.

2. As noted in the Draft EIS (Chapter 2, **Project Description**), research uses within the proposed ARCF would continue to follow the University's Infectious/Biomedical Waste Management Plan (April 2014) as it relates to the disposal of animal remains and other hazardous waste, as well as other applicable University procedures and standards for the transportation and management of research uses and hazardous materials. The University's Infectious/Biomedical Waste Management Plan is consistent with applicable state and local regulations and addresses federal guidelines for research as defined by the National Institute of Health (NIH) and the Center for Disease Control. The proposed ARCF would also comply with the University's Regulations for Shipping Regulated Medical/Biohazardous Waste by Contracted Carrier. Please also refer to the Response to Letter 4 (The Humane Society of the United States), Comment 2 for further discussion on environmental health.

3. Your comment regarding the lack of need for the proposed Animal Research and Care Facility is noted. As indicated in the Response to Letter 4 (The Humane Society of the United States) Comment 2, the primary purpose of a project-specific EIS under SEPA is to disclose environmental impacts anticipated with construction and operations of a proposal. It is not the intent of a SEPA EIS to evaluate the merits of a project's mission or objectives. Please also refer to the response to comment 1 of this letter for a discussion on the public process conducted in regards to the proposed mission and objectives of the ARCF project.

RESPONSE TO COMMENTS AGAINST THE PROPOSED USE

A total of 31 letters and emails were also received during the public comment period that were expressions of opinion, subjective statements and/or against the Proposed Action; a petition in opposition to the animal research use associated with the Proposed Action was also created via the website Change.org and included approximately 2,600 signatures at the close of the public comment period. A summary of the petition statement is included below:

> *Testing on primates and other animals is not only morally repugnant, but has also been widely demonstrated to be a poor predictor of the human reactions it is intended to simulate….Simply put, animal testing is bad science. Therefore, it is neither our right nor our obligation to hold innocent animals captive to perform cruel and unnecessary tests on them…..Please stop the plans for the construction of the proposed ARCF. Constructing a hidden facility for the purpose of testing on innocent primates and other animals is morally repugnant, scientifically unsound, and damaging to the reputation of the University of Washington as a whole.*

Comments from the letters, emails and petition referenced above are acknowledged and have not been reprinted in this FEIS. A response to those comments is included below.

According to the State of Washington SEPA rules, an environmental impact statement is not required to evaluate or document all of the possible effects and considerations of a decision or to contain the balancing judgments that must ultimately be made by the decision makers. Rather, a SEPA EIS analyzes environmental impacts and should be used by decision makers, along with other relevant considerations, in making a decision on a proposal (WAC 197-11-448(1)). Examples of information that is not required or appropriate for analysis in a SEPA EIS include: methods of financing proposals, economic competition, social policy (such as welfare policies and non-construction aspects of education and communication) (WAC 197-11-448(3)), and cost-benefit analyses (WAC 197-11-450).

Consistent with SEPA rules, the Animal Research and Care Facility Draft EIS focused on the environmental impacts and mitigation associated with construction and operation of the proposed facility. The elements of the environment analyzed in the Draft EIS consisted of Construction, Land Use and Aesthetics consistent with SEPA EIS scoping. Chapter 2 (Project Description) of the Draft EIS includes a summary of the University of Washington's fundamental mission and research program objectives for the Animal Research and Care Facility. Consistent with SEPA rules, the EIS does not evaluate the merits of the University of Washington's identified fundamental mission, research program objectives, or funding. As such, comments regarding the proposed use of the project have been noted without further response.

It should be noted that a separate public outreach process has been conducted by the University of Washington regarding the mission and objectives of the Animal Research and Care Facility Project and the Draft EIS includes a summary of that process. As indicated on page 2-5

of the Draft EIS, "the University of Washington, including the Department of Comparative Medicine and the Washington National Primate Research Center, strives to provide transparency regarding program missions and objectives. For the Animal Research and Care Facility Project, the University of Washington conducted public outreach forums to describe the anticipated range of medical research methods and receive public comments; presented the project to the Faculty Council on University Facilities and Services in November 2012; briefed the City-University Citizens Advisory Committee in November 2013; sent outreach email broadcast in April 2014; and, held a public open house in June 2014. A second open house was held in September 2014. Additionally, the Health Sciences Administration maintains updated information on the ARCF Project on its publically-accessible website."

CHAPTER 5

Acronyms and References

CHAPTER 5
ACRONYMS

AAALAC	Associated for the Assessment and Accreditation of Laboratory Animal Care
ADA	Americans with Disability Act
ARCF	Animal Research and Care Facility
CIG	Climate Impacts Group
CMP	Campus Master Plan
CO2	Carbon dioxide
CPP	King County Countywide Planning Policies
CUCAC	City University Community Advisory Committee
dBA	Decibels
DCM	Department of Comparative Medicine
DEIS	Draft Environmental Impact Statement
DPD	Department of Planning and Development
EIS	Environmental Impact Statement
FICM	Facilities Inventory and Classification Manual
IPCC	Intergovernmental Panel on Climate Change
GHG	Greenhouse gas
GMA	Growth Management Act
GPM	Gallons per minute
GSF	Gross square feet
NIH	National Institute of Health
MIO	Major Institution Overlay
MTCO2e	Metric Ton Carbon Dioxide Equivalent
PPV	Peak particle velocity
PSCAA	Puget Sound Clean Air Agency
PSE	Puget Sound Energy
RMS	Root Mean Square
SDOT	Seattle Department of Transportation

SEPA	State Environmental Policy Act
SMC	City of Seattle Municipal Code
SOG	Slab-on-grade
SPU	Seattle Public Utilities
TMP	Transportation Management Plan
USEPA	United States Environmental Protection Agency
UWMC	University of Washington Medical Center
VC	Vibration Criteria
WAC	Washington Administrative Code
WaNPRC	Washington National Primate Research Center
WCI	Western Climate Initiative
WSDOT	Washington State Department of Transportation

REFERENCES

Climate Impacts Group. Climate Impacts in Brief. http://www.cses.washington.edu/cig/pnwc/ci.shtml

City of Seattle. *Comprehensive Plan – Toward a Sustainable Seattle.* December 13, 2004.

City of Seattle. Director's Rule 16-2008: Designation of Exceptional Trees. Department of Planning & Development. April 1, 2009.

City of Seattle. *City of Seattle Municipal Code*. http://clerk.ci.seattle.wa.us/~public/code1.htm.

City of Seattle. *Seattle's Community Carbon Footprint*. October 29, 2007.

City of Seattle. *University Community Urban Center Plan*. August 29, 1998.

City of Seattle and University of Washington. *15th Avenue Street Vacation Agreement*. August 18, 2000.

Hart Crowser. Draft Geotechnical Engineering Design Study, University of Washington Animal Research and Care Facility, Seattle Washington. January 17, 2014.

Intergovernmental Panel on Climate Change (IPCC). 2007a. Fourth Assessment Report. (February 2, 2007).

Intergovernmental Panel on Climate Change (IPCC). 2007b. Summary for Policymakers. (April 30, 2007).

Manning, Jay. Ecology Memo RE: Climate Change – SEPA Environmental Review Proposals. April 30, 2008.

University of Washington. *Campus Master Plan – Seattle Campus (CMP – Seattle)*. 2003.

University of Washington. *Campus Tree Care Plan.*

University of Washington. *Transportation Management Plan (TMP)*. 2003

ZGF Architects. *University of Washington ARCF Predesign Report*. October 22, 2013.

U.S. Environmental Protection Agency. 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*. Prepared by Bolt, Beranek and Newman (Contract 68-04-0047). December 31, 1971.

U.S. Environmental Protection Agency; Office of Noise Abatement & Control. 1972. *Noise Pollution*.

U.S. Environmental Protection Agency; Office of Noise Abatement & Control. 1978. *Noise: A Health Problem*.

Washington State Department of Transportation (WSDOT). SR 520 Bridge Replacement Program Website http://www.wsdot.wa.gov/Projects/SR520Bridge/default.htm. 2014.

APPENDIX A

FEIS Distribution List

	Everyone gets a letter, +	Organization	First Name	Last Name	Title or Dept	Address	PO Box	City	State	Zip
		Government Agencies								
1	1 CD + SEPA Reg + Description + Public Notice	Dept. of Planning & Development	SEPA	Public Info Center	City of Seattle	700 - 5th Ave	PO Box 34019	Seattle	WA	98124-4019
2	1 CD + HARDCOPY	University Dist. Comm Srvc Cntr				4534 University Way NE		Seattle	WA	98105
3	1 CD + SEPA Reg + Description + Public Notice	SEPA Center			Dept of Natural Resources		PO Box 47015	Olympia	WA	98504-7015
4	2 CDs + 1 HARDCOPY + SEPA Reg + Description + Public Notice	Dept. of Ecology SEPA Unit			Environmental Review Section		PO Box 47703	Olympia	WA	98504
5	CD	Seattle Fire Department			Fire Chief	301 Second Ave S		Seattle	WA	98104
6	CD	Environmental Protection Agency	Region X	Environmental Impact	Evaluation Branch	1200 - Sixth Ave		Seattle	WA	98104
7	CD	Seattle & King County - Public Health			Director	401 - 5th Ave., Suite 1300		Seattle	WA	98104-2674
8	CD	Seattle City Light			Environ. & Safety Division	700 - 5th Ave, # 3200	PO Box 34023	Seattle	WA	98104-4023
9	CD	Sound Transit Link	Perry	Weinberg	Director, Office of Environmental Affairs and Sustainability and Senior Legal Counsel	401 S. Jackson St	Union Station	Seattle	WA	98124-4019
10	CD + HARDCOPY	Dept. of Planning & Development	Stephanie	Haines			PO Box 34019	Seattle	WA	98124-4019
11	CD	King County Metro Transit	Mike	Usen	Senior Environmental Planner	201 S. Jackson St.	MS KSC-TR-0431	Seattle	WA	98104-3856
12	CD	Puget Sound Clean Air Agency			Exec. Director	1904 Third Ave. #105		Seattle	WA	98101-3317
13	CD	WA St. Dept. of Transportation	Ramin	Pazooki			PO Box 330310	Seattle	WA	98133-9710
14	CD	Dept. of Planning & Development	Cliff	Portman			PO Box 34019	Seattle	WA	98124-4019
15	CD	Seattle Public Utilities	Jalainne	Madura	SEPA Coordinator	700 - 5th Ave., 44th FL	PO Box 34018	Seattle	WA	98124-4018
16	CD	Dept. of Neighborhoods	Steve	Sheppard	Seattle Municipal Tower	700 - 5th Ave, #1700	PO Box 94649	Seattle	WA	98124
17	CD	Dept. of Planning & Development	Diane	Sugimura	City of Seattle		PO Box 34019	Seattle	WA	98124-4019
18	CD	Muckleshoot Indian Tribe	Isabel	Tinoco	Dir. Of Nat. Res., Fisheries Dept	39015 - 172nd Ave SE		Auburn	WA	98002
19	CD	Office of Archeology & Hist. Preservation	Russell	Holter	Preservation Design Reviewer	1063 S. Capital Way, #106	PO Box 48343	Olympia	WA	98504-8343
20	CD	Seattle Dept of Transportation	Goran	Sparrman	Interim Director		PO Box 34996	Seattle	WA	98124-4996
21	CD	Seattle Dept of Parks & Recreation	Christopher	Williams	Superintendent	100 Dexter Ave N		Seattle	WA	98109-5199
22	CD	Seattle Police Department					PO Box 34986	Seattle	WA	98124-4986
		Community Clubs								
23	CD	Hawthorne Hills Community Council								
24	CD	Laurelhurst Community Club	Jeannie	Hale		3425 W. Laurelhurst Drive NE		Seattle	WA	98105
25	CD	Wedgwood Community Council		President		PO Box 15770		Seattle	WA	98115
26	CD	Eastlake Community Council	Owen	Reese		117 E. Louisa St., #1		Seattle	WA	98102
27		Eastlake Community Council	Zac	Eskenazi						
28	CD	The Ave Group	Patty	Whisler		6349 Sand Point Way NE		Seattle	WA	98115
29	CD	View Ridge Community Club			President		PO Box 15218	Seattle	WA	98115-0218
30	CD	Montlake Community Club				1618 E. Calhoun		Seattle	WA	98112
31	CD	Northeast District Council				4534 University Way		Seattle	WA	98105
32	CD	Ravenna Eckstein Comm Ctr				6535 Ravenna Ave NE		Seattle	WA	98115
			Ted	Hunter	tph@soundlowcenter.com					
		CUCAC								

33	CD	University Park Community Club	Ruedi	Risler	risler@uw.edu	5256 - 19th Ave NE		Seattle	WA	98105
34	CD	Wallingford Community Council	Mark	Christiansen	mwchristiansen@gmail.com	3933 Bagley Avenue		Seattle	WA	98105
35	CD	University Park Community Club	Barbara	Quinn	Barbara_Quinn@gmail.com	5264 16th Ave NE		Seattle	WA	98105
36	CD	UW Faculty Senate Representative	Ashley	Emery	Professor, UW Mech. Eng		Box 352600			
37	CD	University Dist. Comm. Council	Matthew	Fox	mattfoxseattle@hotmail.com	c/o 4534 University Way NE		Seattle	WA	98105
38	CD	University Dist. Comm. Council	Jorgan	Bader	Alternate					
39	CD	Ravenna Bryant Community Assoc	Brett	Frosaker	bforsaker@gmail.com	7046 - 19th Ave NE		Seattle	WA	98115
40	CD	Montlake Community Club	Lionel	Job	lnljob@gmail.com	2016 23rd Ave		Seattle	WA	98122
41	CD	Montlake Community Club			Alternate					
42		Laurelhurst Community Club								
		Alt Laurelhurt Community Club	Heather	Newman		3503 NE 44th Street		Seattle	WA	98105
43	CD	Laurelhurst Community Club	Jean	Amick	jeangamick@gmail.com	3008 Laurelhurst DR NE		Seattle	WA	98105
44		Laurelhurst Community Club	Jeannie	Hale		3425 W. Laurelhurst DR NE		Seattle	WA	98105
45	CD	UW Staff Representative	Jan	Arntz			Box 352205			
		UW Staff Representative	Kerry	Kahl	Senior Director, Enterprise Risk Mngment	B36 Gerberding	Box 351248			
46	CD	Roosevelt Neighbor's Association	Dave	Eckert	david@eskimo.com	6207 12th Avenue NE		Seattle	WA	98105
47	CD	Roosevelt Neighbors Alliance	Eric	Larson		5015 - 9th Ave NE		Seattle	WA	98105
48	CD	U-District Partnership	Douglas (Doug)	Campbell		4108 University Way NE		Seattle	WA	98105
		U-District Partnership	Louise	Little	CEO, University Bookstore	4326 University Way NE		Seattle	WA	98105
49	CD	UW At-large Representative	Alex	Bolton		Box 351271		Seattle	WA	98105
50	CD	Portage Bay Roanoke Community Council	Betty	Swift		1213 E. Shelby St., Slip 15		Seattle	WA	98102
51	CD	Staff Alt	Kerry	Kahl			Box 351248	Seattle	WA	
52	CD (2nd address)	Staff At Large - Alt	Ray	Larson			Box 352166	Seattle	WA	
53	CD	GPSS Representative	Emma	Slager	GPSS Representative	ejslager@uw.edu	Box 352238			
		GPSS Representative-Tertiary Contact	Austin	Wright-Pettibone	Tertiary Contact					
54	CD	UW Student Representative	Shivani	Changela changela@uw.edu	Dir. Of Comm. Relations	Husky Union Building 121		Seattle	WA	98195
55	HARDCOPY (PAPER ENV)	Eastlake Community Council	Chris	Lehman	Alternate	2370 Yale Avenue E		Seattle	WA	98102-3310
		Eastlake Community Council	David	Gee						
		Libraries								
56	CD + HARDCOPY	Seattle Public Library	Montlake	Branch		2401 - 24th Ave E.		Seattle	WA	98112
57	CD + HARDCOPY	Seattle Public Library	University	Branch		5009 Roosevelt Way NE		Seattle	WA	98105
58	CD + HARDCOPY	Seattle Public Library	Central	Library	Documents Dept.	1000 Fourth Ave		Seattle	WA	98104-1193
59	CD + HARDCOPY	UW Health Sciences Library					Box 357155			
60	CD + HARDCOPY	UW Suzzalo Library	Tom	Wallace	Reference Division		Box 352900			
61	CD + HARDCOPY	UW Suzzalo Library	Carla	Rickerson	NW Collection		Box 352900			
		University of WA								
62	CD + V'Ella letter	Office of Regional Affairs	Theresa	Doherty			Box 351243			
63	CD + V'Ella letter	Office of Planning & Budgeting	Kristine	Kenney	University Landscape Architect		Box 359445			
64	CD + V'Ella letter	College of Built Environments	John	Schaufelberger	Dean		Box 355726			

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65	CD + V'Ella letter	Facilities Services	Charles	Kennedy	Assoc. VP		Box 352215
66	CD + V'Ella letter	Office of Planning & Budgeting	Rebecca	Barnes	University Architect		Box 359445
67	CD + V'Ella letter	University Police	John	Vinson	Chief		Box 355200
68	CD + V'Ella letter	Office of Environmental Stewardship and Sustain	Claudia	Frere	Manager		Box 351248
69	3 copies of everything + 3 CDs + 3 HARDCOPIES	CPO	Jan	Arntz	Environmental Planner		Box 352205
70	CD	Facilities Services	John	Chapman			Box 352160
71	LETTER only	CPO	Richard	Chapman	Assoc. VP		Box 352205
72	CD	Real Estate Office	Jeanette	Henderson	Director		Box 359446
73	CD	Office of Regional Affairs	Aaron	Hoard	Deputy Director		Box 351243
74	CD	CPO	Alan	Nygaard	Director, Business Services		Box 352205
75	CD	CPO	John	Palewicz	Director		Box 352205
76	CD	CPO	Steve	Tatge	Director		Box 352205
77	CD	AG	Quentin	Yerxa	Assistant Attorney General		Box 359475
78	CD	Parking Services					Box 351105
79	CD	Engineering Services					Box 352165
80	CD	Facilities Services					Box 354285
81	CD + HARDCOPY + SEPA Reg + Description + Public Notice	SEPA Public Information Center			Ofc of Pub. Rec & Open Pub. Mtgs		Box 354997
		Newspapers					
	Email Ad letter + Notice	Seattle Times		Don't print these labels			
	Email Ad letter + Notice	Daily Journal of Commerce		Just email the papers w/			
	Email Ad letter + Notice	UW Daily		their personalized letter			
	Email Ad letter + Notice	University Week		and the Public notice			
	Email Ad letter + Notice	UW Tacoma Ledger					
	Email Ad letter + Notice	UW Bothell Husky Herald					
		Others					
		See attached list from Jan specific to a job					
	Leave these notes here to jog Jan's memory re: who needs to receive what, but these will be entered in a separate list	Clients Surrounding Uses/Depts Committee Members CPO Director and Unit Manager Businesses Architects? Etc.					
		SEPA Advisory Committee					
82	CD	SEPA Advisory Committee Member	Placeholder	Don't send w/o a name	ASUW Representative	1 already sent to ASUW	Box 352238
83	CD	SEPA Advisory Committee Member	Rob	Lubin			Box 355842

84	CD	SEPA Advisory Committee Member			ASUW	Box 352238
85	CD	SEPA Advisory Committee Member	John	Shaheen		Box 355212
86	CD (2nd copy - don't send)	SEPA Advisory Committee Member	Kristine	Kenney		Box 359445
87	CD	SEPA Advisory Committee Member	Dave	Lundstrom	Mgr., Environmental Program Office	Box 354110
88	CD	SEPA Advisory Committee Member	Dave	Ogrodnik		Box 352165
89	CD	SEPA Advisory Committee Member	Frieda	Taub		Box 355100
90	CD	SEPA Advisory Committee Member	Jane	Koenig		Box 357234
91						
		Additional Notification				
		See tabs for specific Project additions				

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APPENDIX B

Cultural Resources Report

DRAFT—Archaeological Inventory for the University of Washington Animal Research and Care Facility Construction Project, City of Seattle, King County, Washington

Submitted to:
EA Engineering, Science and Technology, Inc.

Submitted by:
Historical Research Associates, Inc.
Carol Schultze, PhD, RPA
Alexander Stevenson, MA

Seattle, Washington
September 2014

Historical Research Associates, Inc.

This report was prepared by HRA Principal Investigator Carol Schultze, PhD, RPA, and Alexander Stevenson, MA, who meet the Secretary of the Interior's professional qualifications standards for archaeology. This report is intended for the exclusive use of the Client and its representatives. It contains professional conclusions and recommendations concerning the potential for project-related impacts to archaeological resources based on the results of HRA's investigation. It should not be considered to constitute project clearance with regard to the treatment of cultural resources or permission to proceed with the project described in lieu of review by the appropriate reviewing or permitting agency. This report should be submitted to the appropriate state and local review agencies for their comments prior to the commencement of the project.

Executive Summary

Engineering, Science and Technology, Inc. (EA), is proposing to build a new Animal Research and Care Facility (ARCF) for the University of Washington (UW) (the Project). EA has contracted Historical Research Associates, Inc. (HRA), to conduct Archaeological Inventory for the Project. HRA conducted archival and field studies of the Area of Impacts (AI) of the Project. This included research using the Washington State Department of Archaeology and Historic Preservation's online database of archaeological resources, evaluation of historic maps and photographs, and consultation with UW representatives. Prior to fieldwork, HRA contacted Washington State on-call to have utility locations marked. Fieldwork consisted of pedestrian survey and subsurface investigation where ground disturbance had not been demonstrated.

The AI has been subjected to a variety of ground disturbing events, including excavation of the entire northern two-thirds of the lot for the construction of adjacent buildings. At that time, a loading dock, generator, and pedestrian tunnel were installed as permanent underground facilities. Additionally, until the 1980s, there were residential buildings on the southern half of the project area, and 15th Avenue NE crossed the AI. Archival research indicates that a Native American trail crossed the AI in the past, however no evidence was observed likely due to the disturbance.

No intact sediments were found or are anticipated within the AI. No further archaeological work is recommended. Should the project be redesigned in a way that will cause impacts to areas not considered in this study, additional archaeological inventory would be recommended.

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1. Introduction and Project Description

Engineering, Science and Technology, Inc. (EA), is proposing to build a new Animal Research and Care Facility (ARCF) for the University of Washington (UW) (the Project). EA has contracted Historical Research Associates, Inc. (HRA), to conduct Archaeological Inventory for the Project. The Project is located on the UW campus in Township 25 North, Range 04 East, Sections 16 and 17 of King County, Washington (Figure 1-1).

Under the proposal, a two-level ARCF would be constructed below-grade on the proposed site. Excavation will be to depths that vary from 9 to 12 feet (ft) below current grade. The final construction would contain approximately 90,000 square ft of below-grade building space and expanded loading dock area. Minor above-grade development consist of an approximately 66 ft high, 4,200-square-ft utility/exhaust tower for air intake and exhaust in the northeast corner of the proposed building (adjacent to Hitchcock Hall), as well as an approximately 1,500-square-ft above-grade entrance pavilion to provide access to the ARCF via the below-grade access corridor. In total, approximately 95,700 square ft of building development would be constructed under the project.

1.1 Regulatory Context

The project is subject to regulatory compliance under the Washington State Environmental Policy Act (SEPA). It is also required to comply with Washington State regulations RCW 27.53, regarding Archaeological Sites and Resources, and RCW 27.44, concerning Indian Graves and Records. Consistent with a 2003 campus-wide programmatic Environmental Impact Statement (EIS), the UW determined, on April 24, 2014, that this project would have the potential for significant adverse impacts to the environment. On August 18, 2014, the Washington State Department of Archaeology and Historic Preservation (DAHP) recommended that an archaeological survey of the AI be conducted prior to ground disturbing activities (Holter 2014).

1.2 Area of Impacts

The Project includes construction of the ARCF building, as well as above-ground disturbance associated with landscaping and the installation of new bike parking facilities. For this inventory, HRA used as the Area of Impact (AI) a project approach that takes into account direct impacts where ground disturbance associated with building construction will take place (Figure 1-2).

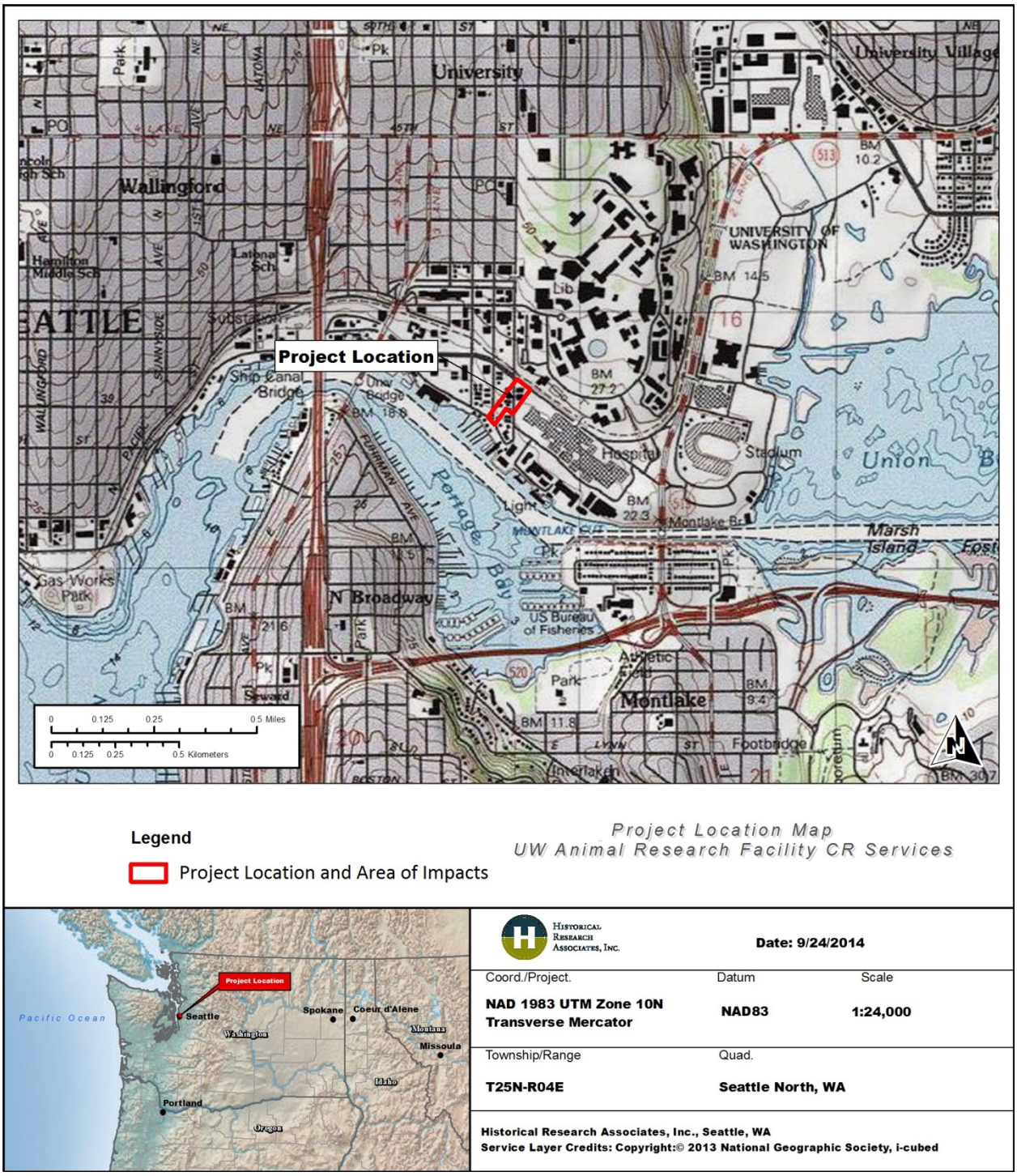

Figure 1-1. Location of the Project Area of Impacts and vicinity.

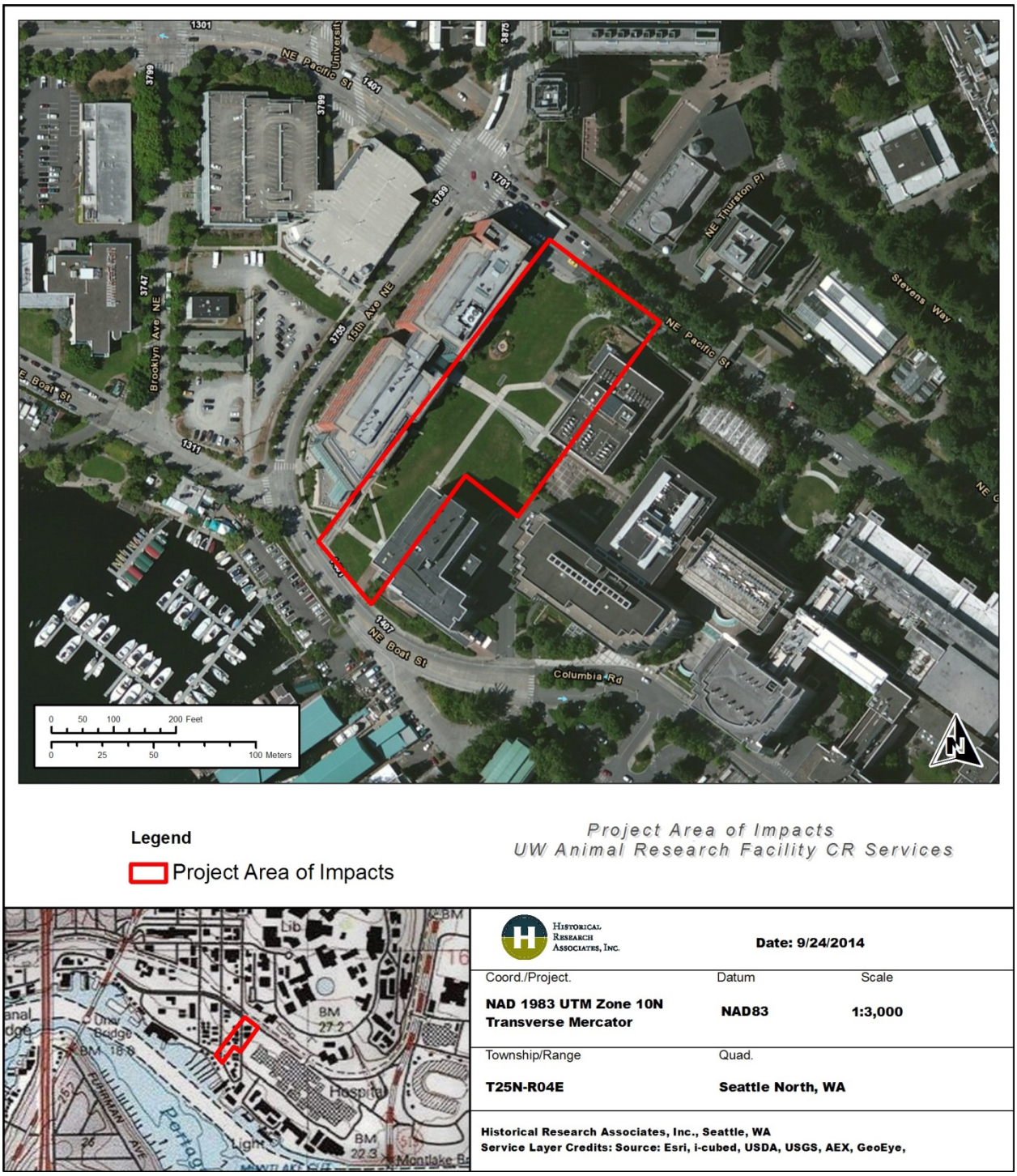

Figure 1-2. Area of Impacts for the Project.

2. Archival Research

This chapter provides a review of archival data including previous cultural resources surveys; documented archaeological sites, historic sites, structures, and objects; and historic maps. Understanding previous cultural resource surveys and known cultural resources in the vicinity of a project is important for understanding how intensively work has been conducted in the area. This archival research is necessary for developing expectations for this Project, which will be outlined in Section 5.

2.1 Research Methods and Materials Reviewed

HRA archaeologist Carol Schultze, PhD, RPA, conducted an archival record search for records pertaining to locations within ½ mile (mi) of the AI. Schultze searched DAHP's online database (WISAARD) for archaeological site records, cultural resource survey reports, historic property inventory (HPI) forms, historic register information, and cemetery records. A statewide archeological predictive model on DAHP's WISAARD was reviewed for probability estimates for archaeological resources, and to aid in developing the field strategy.

2.2 Archival Research Results

2.2.1 Previous Cultural Resources Studies

Twenty-two previous cultural resource studies were conducted within ½ mi of the Project (Table 2-1). These studies have included both surface and subsurface survey. None of these studies has identified archaeological resources within or adjacent to the AI (but see Section 2.2.2 below). These studies have identified and recorded historic buildings within the AI.

Table 2-1. Previous cultural resources studies within 0.5 mi of the AI.

Reference	NADB#	Title	Distance from AI	Cultural Materials Identified Within or Adjacent to the AI
Courtois et al. 1998	1339816	*Sound Transit Central Link Light Rail Draft Environmental Impact Statement Historic and Archaeological Technical Report*	Adjacent	None
Courtois et al. 1999	1339836	*Central Link Light Rail Transit Project Final Environmental Impact Statement Technical Report*	Adjacent	None
Rooke 2002	1341144	*Letter to Jay Grenfell regarding Cingular Wireless Tower WA-539 (Cavilier Apartments)*	0.5 mi north	Eight previously inventoried historic properties, no new cultural materials observed
Courtois & Associates 2003	1350148	*Preliminary Report on University of Washington Main Campus Seattle-Significant Buildings and Features Completed Prior to 1953, in Select Campus Area*	>0.1 mi east	Several historic properties discussed, limited fieldwork conducted-no historic properties identified adjacent to Project
Emerson 2009a	1352771	*Letter to Adam Escalona regarding SE01126A UW Medical BB Tower*	0.2 mi southeast	UW Medical BB Tower
Emerson 2009b	1352800	*Letter to Adam Escalona regarding SE01124A Suzzallo Library*	0.5 mi northeast	Suzzallo Library
BOLA 2008a	1353338	*Johnson Annex-UW Historic Resources Addendum*	~ 0.5 mi north	Archival research only for Johnson Annex; no fieldwork and no new resources
BOLA 2008b	1353339	*Cunningham Hall-UW Historic Resources Addendum*	0.5 mi north	Archival research only for Cunningham Hall; no fieldwork and no new resources
BOLA2010	1353812	*Husky Union Building-UW Historic Resources Addendum*	0.5 mi northeast	Archival research only for Cunningham Hall; no fieldwork and no new resources
Elder 2011	1682027	*Cultural Resources Investigations at the Bryant Building Section 6(f) Replacement Site*	0.5 mi southwest	Brick, mortar, concrete, glass, ceramic, and metal fragments, one wire nail, charcoal, and slag in fill deposits

Table 2-1. Previous cultural resources studies within 0.5 mi of the AI.

Reference	NADB#	Title	Distance from AI	Cultural Materials Identified Within or Adjacent to the AI
Elder and Reed 2011	1682029	*Results of Archaeological Monitoring of Geotechnical Borings within the SR520 Limits of Construction*	0.5 mi southeast	None
Elder et al. 2011a	1680657	*Section 106 Technical Report (Volume I Archaeology and Volume II Built Environment) SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*	0.5 mi southeast	Montlake Boulevard Pedestrian Overpasses (North and South) and Bloedel Hall are eligible under Criterion C; the Burke-Gilman Trail was previously determined not eligible
Elder et al. 2011b	1681090	*Section 106 Technical Report (Volume I Archaeology) SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*	0.5 mi southeast	This is part of the larger report compiled in Elder et al. 2011a
ICF and Gray Lane 2011	1681089	*Section 106 Technical Report SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*	0.5 mi southeast	This is part of the larger report compiled in Elder et al. 2011a, no specific historic properties discussed
Minor and Meijer 2011	1680887	*Cultural Resource Inventory for Anderson Hall, University of Washington Campus, Seattle, Washington*	0.4 mi east	Archival research only for Anderson Hall; no fieldwork and no new resources. Anderson Hall was previously determined eligible for NRHP by DAHP in December 2002, an updated HPI form was completed
Walker Gray et al. 2011	1681091	*Section 106 Technical Report (Volume II Built Environment) SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*	0.5 mi southeast	This is part of the larger report compiled in Elder et al. 2011a
Elder and Cascella 2013	1683661	*SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project Corridor Archaeological Landform Sensitivity Assessment*	0.5 mi southeast	None

Table 2-1. Previous cultural resources studies within 0.5 mi of the AI.

Reference	NADB#	Title	Distance from AI	Cultural Materials Identified Within or Adjacent to the AI
Stevenson and Dellert 2013	1684507	*University of Washington Burke-Gilman Trail, Rainier Vista to 15h Avenue NE Segment, Cultural Resources Inventory Project, Seattle, King County, Washington*	Adjacent	None
Stevenson and Little 2014a	1685157	*Archaeological Inventory for the University of Washington Burke-Gilman Trail, Brooklyn Avenue NE to 15th Avenue NE (Garden Reach) Segment, City of Seattle, King County, Washington*	0.1 miles northwest	None
Stevenson and Little 2014b	1685154	*Archaeological Inventory for the University of Washington Burke-Gilman Trail, University Bridge to Brooklyn Avenue NE (Neighborhood Reach) Segment, City of Seattle, King County, Washington*	0.2 mi north	None
Stevenson and Little 2014c	1685155	*Archaeological Inventory for the University of Washington Burke-Gilman Trail, Pasadena Place NE to University Bridge (Northlake Reach) Segment, City of Seattle, King County, Washington*	0.4 miles northwest	None
Stevenson et al. 2014	1685156	*Cultural Resources Inventory for the University of Washington Burke-Gilman Trail, Rainier Vista to Northeast 47th Street (Forest Reach) Segment, City of Seattle, King County, Washington*	0.5 miles east	None

2.2.2 Previously Recorded Archaeological Sites

Two isolates and three archaeological sites have been documented within 0.5 mi of the AI (Table 2-2). One site (45KI957, UW Greenhouse Site) is a prehistoric lithic scatter located on an eroded slope above the Burke-Gilman Trail, behind the Botany Greenhouse. Materials observed were two quartzite flakes and a chert projectile point mixed with historic-period debris (iron fragments, hardware, gardening tags, and ceramic sherds) in redeposited soils. The soil was most likely redeposited during construction of the former railroad line that the Burke-Gilman Trail currently resides on and disturbed during use of the greenhouse (Louderback and Jolivette 2009). This site is located 0.1 mi east of the AI.

Table 2-2. Previously recorded archaeological isolates and sites within 0.5 mi of the AI

Site Number and Name	Site Type/Description	Distance from AI	Eligibility for NRHP	Reference
45KI952	Historic Bottle Isolate, circa 1920s to early 1930s	0.5 mi southeast	Not Evaluated	Boggs 2009a
45KI955	Historic Public Works	0.5 mi southeast	Not Evaluated	Boggs 2009b
45KI957 *UW Greenhouse Site*	Multicomponent-Prehistoric Lithic Material and Historic Debris	0.1 mi east	Not Evaluated	Louderback and Jolivette 2009
45KI1201 *University landfill*	Refuse Scatter, Dump Site	0.5 mi northeast	Not Evaluated	Lockwood 2014
45KI1181	Prehistoric Isolate, Basalt Flake	0.5 mi northwest	Not Eligible	Stevenson and Little 2014b

One isolate (45KI952) is an amber glass bottle circa 1920s–1930s. The bottle has a circular suction mark with feathering at the base, indicative of the Owen's Automatic Machine, used exclusively by Owen's-Illinois Glass Company. The bottle was found in fill during construction excavation, approximately 4 ft below ground surface (Boggs 2009a). In the same general location as 45KI952, the remnants of an abandoned wood stave pipeline and associated metal pipeline were identified as Site 45KI955. The metal pipeline was directly above and ran parallel to the wooden pipe, so it was thought to be a replacement/improvement. The pipeline is probably associated with the sewage system constructed in Seattle during the early 1900s, as its trajectory was downhill toward Hudson Bay (Boggs 2009b).

Site 45KI1201 is a currently abandoned landfill on 166 acres of reclaimed marshland, which operated between 1926 and 1966. It was capped with fill in 1973 and now is the site of recreational fields, facilities, and parking for the UW (Lockwood 2014). Isolate 45KI1181 was a single isolated basalt flake recovered from fill soils in a shovel probe located along the north edge of the Burke-Gilman Trail. No additional cultural materials were found in shovel probes within a 5 meter radius (Stevenson and Little 2014b)

2.2.3 Cemeteries

No cemeteries were identified within the ½-mi radius search of the Project.

2.2.4 Historic Buildings, Structures, and Objects

Three previously recorded buildings, structures, and objects (BSOs) were identified within the AI (Table 2-3). Of these, only Bagley Hall has been found eligible for listing in the National Register of Historic Places (NRHP) by the State Historic Preservation Office (SHPO). The UW segments of the Burke-Gilman Trail were found ineligible for listing by SHPO in 2013. Surveyor Sonja Molchany recommended that the Northern Pacific Railroad Bridge was ineligible in 2013, but the resource's eligibility has not yet been determined by SHPO.

Table 2-3. Historic-era BSOs within 0.5 mi of the AI.

Historic/Common Name	Description	Eligibility for NRHP	Reference
Bagley Hall	Built in 1909 as the Fine Arts Pavillion for the Alaska-Yukon-Pacific Exposition by architects Howard and Galloway.	Nominated	Corley 1969
Burke-Gilman Trail (University District Segments)	Paved bicycle and pedestrian pathway constructed atop a former railroad grade, with a single span concrete arch viaduct near Rainier Vista area.	Not Eligible	DAHP 2013a
Northern Pacific Railroad Bridge	Former railroad bridge dating from 1914, now used as a pedestrian bridge and part of the Burke-Gilman Trail.	Recommended Not Eligible	DAHP 2013b

2.2.5 Historic-Period Map Research

General Land Office (GLO) plats

Historic nineteenth-century plats created by the United States Geological Survey (USGS) General Land Office (GLO) depict no structures in the AI. The only cultural feature is a Native American overland trail used to travel between Portage Bay (Lake Union) and Lake Washington, which runs directly through the AI (Figure 2-1). A USGS land classification sheet produced from an 1887 survey shows the future UW campus to be "cut areas not restocking" (USGS 1890). This is likely in anticipation of further development by the burgeoning City of Seattle.

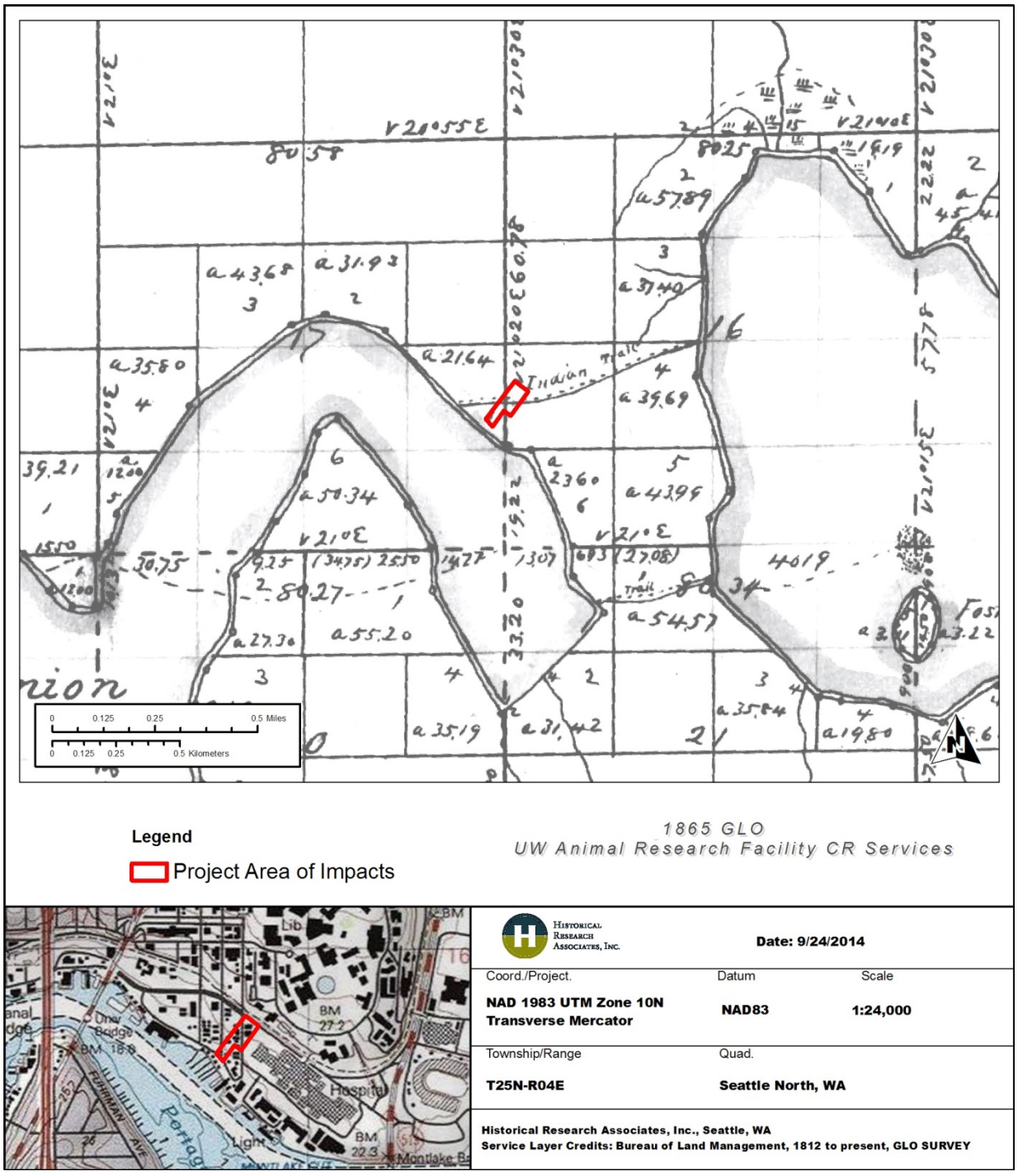

Figure 2-1. Native American trail locations relative to the AI (USGS 1865).

2.2.6 Sanborn Maps

The area surrounding the UW was not included on early Sanborn Map Company maps. The earliest Sanborn map to include the UW was created in 1905 (Sanborn 1905). This map includes nine buildings on the campus, but does not include the AI. The southern portion of campus, including the AI, is included first on the 1919 Sanborn map (Sanborn 1919). This map includes the Northern Pacific Railroad Company (NPRR) alignment (which is south of the AI), and highlights the growth of the UW campus north of the AI, but little development within the AI. Between 1919 and 1930, four buildings were built on the UW campus in the vicinity of the AI (Sanborn 1930). These buildings included buildings for the College of Forestry, the Medicinal Garden Department, a theater, and a small unknown building near 15th Avenue NE.

2.2.7 DAHP Predictive Model

The DAHP predictive model for archaeological sites is based on statewide information, using large-scale factors. Information on geology, soils, site types, landforms, and from GLO maps was used to establish or predict probabilities for archaeological resources throughout the state. The DAHP model uses five categories of prediction: Low Risk, Moderately Low Risk, Moderate Risk, High Risk, and Very High Risk. The DAHP predictive model map indicated that the AI is located in a Very High Risk area. However, given the previous modifications in the vicinity with the construction of railroad lines, roadways, and the university, and the land alterations associated with the Alaska–Yukon–Pacific Exposition (AYPE), the probability for intact archaeological resources is low to moderate.

3. Environmental Context

This chapter provides a brief overview of the local environment, including historic modification to this landscape and natural resources. Understanding the local environment including geology, climate, flora, and fauna is important for understanding how people used the landscape in the past. This environmental context is necessary for developing expectations for this Project, which will be outlined in Section 5.

3.1 Topography and Geology

The AI is located on the southern portion of the UW campus, approximately 0.5 mi northwest of the Montlake Cut and 0.1 mi east of the modern-day shoreline of Lake Union, approximately 33 ft above mean sea level (amsl).

The AI is located within the Southern Puget Sound Basin, a portion of the Puget Trough Physiographic Province (Franklin and Dyrness 1973). The north-south trough of the Puget Lowland separates the Olympic Mountains to the west from the Cascade Range on the east. The lowland was carved out during the last major glaciation of western Washington which ended approximately 16,000 years before present (B.P.) (Alt and Hyndeman 1995; Booth et al. 2004; Dethier et al. 1995; Easterbrook and Rahm 1970:49; Galster and Laprade 1991:249). As glaciers retreated, they left thick sediment deposits. This sediment forms the parent material of many soils throughout this part of King County, including the AI (Snyder et al. 1973). Sediments at the surface across the AI are glacial till deposited during the Vashon Stade of the last major glaciation (Booth et al. 2009). As glaciers retreated, the land on which they rested began to rebound, and would have become available for colonization by plant and animal communities as the climate began to ameliorate.

3.2 Climate and Vegetation

Between approximately 13,000 and 12,000 years ago, the region had developed a much cooler and drier climate, which supported an ecosystem characterized by lodgepole pine (*Pinus contorta*), sedges (*Cyperaceae* sp.), sage (*Artemisia*), and a variety of grasses and herbs. After 12,000 years ago, the climate warmed while continuing to dry, and Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and red alder (*Alnus rubra*) joined the developing parkland forest. By around 6,000 years ago, the climate of the region had cooled and moistened to levels comparable to today's maritime regime, producing the current western hemlock (*Tsuga heterophylla*) vegetation zone. Presently, uplands are moderately to heavily forested with Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*). Red alder (*Alnus rubra*) and big-leaf

maple (*Acer macrophyllum*) represent secondary species in forested habitats and are dominant in disturbed areas (Barnosky 1984; Barnosky et al. 1987; Brubaker 1991; Whitlock 1992).

3.3 Fauna

During the late Pleistocene, western North America would have provided habitat for a number of animal taxa not found in the region after about 11,000 B.P. (Gilmour 2011). These animals would have done well in the developing forested parkland environment in the Puget Sound region, which would have provided food for both grazers and browsers and, in turn, food for large carnivores. Climatic changes undoubtedly reduced the habitat for these animals, which would eventually become extinct across the North American landscape.

Throughout the Holocene, and prior to extensive Euroamerican influence in the area, larger terrestrial mammals would have included elk (*Cervus elaphus*), deer (*Odocoileus* spp.), black bear (*Ursus americanus*), coyote (*Canis latrans*), and mountain lion (*Felis concolor*) (Johnson and Cassidy 1997). Smaller mammals that inhabited the area included snowshoe hare (*Lepus americanus*), raccoon (*Procyon lotor*), and beaver (*Castor canadensis*) (Kruckeberg 1991; Larrison 1967). Avifauna found in the Puget Sound region include raptors such the bald eagle (*Haliaeetus leucocephalus*) and waterfowl (*Aix* and *Anas* species). Freshwater fish including trout (*Salmo* sp.), suckers (*Castomidae* spp.) and minnows (*Gila* sp.) would have been readily available in in Lake Washington and Lake Union. Pacific salmon and trout (*Onchorhynchus* spp.), including land locked Kokanee (*O. nerka*), would have also been readily available in the region and from waterways near the AI (Berge and Higgins 2003; WDFW 2012). Freshwater mussels (*Unionidea*) are found in Lake Washington and Lake Union (Xerces 2010).

4. Cultural Context

This chapter provides a brief overview of nearly 14,000 years of human occupation in North America, focusing specifically on western Washington and the Puget Sound area where possible. Understanding the history of human occupation and land use in an area is crucial for understanding how archaeological data is important and what kinds of archaeological sites may be encountered during a project. This context is necessary for outlining the current state of knowledge about past lifeways and contributes to the development of expectations for this Project, which will be discussed in Section 5.

4.1 Precontact Background

The current understanding of Pacific Northwest precontact lifeways is derived from the archaeological record, which is constantly changing as our knowledge grows. How archaeologists see archaeological data is conditioned by a number of factors, including natural (e.g., rising sea levels) and cultural (e.g., excavation, curation) processes, which selectively modify what remains for modern investigators to be seen (Schiffer 1996). New discoveries can either change or reinforce prior notions of human lifeways, but the continually growing body of archaeological data helps give archaeologists a better understanding of the past (Trigger 2006).

In order to organize current knowledge of Pacific Northwest precontact lifeways, numerous investigators have proposed chronologies for the region's archaeological record (e.g., Ames and Maschner 1999; Kidd 1964; King 1950). Ames and Maschner's (1999) chronology is used here to structure discussion of precontact archaeology and inferred lifeways. Their chronological sequence is divided into three basic developmental periods: Paleoindian, Archaic, and Pacific. The archaeological evidence from these periods suggests a gradual shift from small nomadic groups relying on generalized hunting and gathering to larger sedentary groups with increased social complexity and specialized reliance on marine and riverine resources (Ames and Maschner 1999). In essence, the archaeological record in the region documents a shift from foraging to collecting strategies (Binford 1980) and cultural change toward ethnographically observed lifeways.

4.1.1 Paleoindian (~12,500 B.C. to 10,500 B.C.)

Evidence for late Pleistocene occupation of western North America comes from a very small number of archaeological sites, including Paisley 5-miles Cave in Oregon (Gilbert et al. 2008) and sites on California's Channel Islands (Erlandson et al. 2011). Data from these sites have reinforced the idea that these first inhabitants of the region lived in small groups, were probably highly mobile, and followed the migration patterns of animals across the landscape. Mounting evidence (e.g.,

Dillehay et al. 2008) suggests that occupants of the "new world" exploited both marine and terrestrial environments, contrary to long held hypotheses (e.g., Martin 1967). Up to now, no archaeological sites dating to the late Pleistocene have been discovered in the Puget Sound region.

Among the earliest sites in the Pacific Northwest are those that date to the early Holocene Clovis Tradition. These are associated with Clovis points, an iconic large spear point found across much of North America during this time (Meltzer and Dunnell 1987; Osborne 1956). These sites represent the remains of mobile hunting activities and are relatively scarce in the Pacific Northwest. Clovis points have been recovered from sites across the Puget Sound, including Olympia (Osborne 1956). Other early western Washington sites dating to this period include the Manis Mastodon Site (45CA218) near Sequim, and 45KI839 on Bear Creek in Redmond. The Manis Site dates to roughly 13,800 B.P., and consists of the remains of a mammoth found in a peat bog with a human-made bone point lodged in a rib fragment (Waters et al. 2011). Site 45KI839 dates to approximately 10,000 o 12,000 B.P., and consists of a highly diverse stone tool kit (Kopperl et al. 2010). This site has been interpreted as a short term occupation site and has yielded evidence of mammal, fish, and plant exploitation. The Manis and Bear Creek Sites have demonstrated that the earliest inhabitants of western Washington demonstrate use of diverse toolkits and subsistence strategies, signaling an excellent working knowledge of the landscape and available resources.

4.1.2 Archaic (10,500 B.C. to 4400 B.C.)

Sites dating to the Archaic period, especially prior to 5000 B.P., are rare, at least in part because of natural processes, like sea level rise, have obscured sites that are currently underwater. The current view of this period is generally one of stasis, but this is likely at least partially conditioned by the paucity of sites dating to this period.

Lifeways during the Archaic period are thought to have changed little from the Paleoindian period. In essence, people are thought to have hunted game and lived in small highly mobile egalitarian groups, as foragers (Binford 1980). Microblades and leaf shaped projectile points (i.e., Cascade points) have been used to argue for Archaic period occupation across Western (e.g., Chatters et al. 2011; Greengo and Houston 1965). Identifiable faunal remains are rare at Archaic period sites, making inferences about subsistence difficult, but mammal and fish remains have been reported from Archaic period sites in the Puget Sound region (Chatters et al. 2011; Elder, personal communication 2013; Stilson and Chatters 1981).

The most discussed sites dating to the Archaic period are often referred to as "Olcott" sites (Kidd 1964). These sites typically lack good absolute dates, are highly disturbed, are located near rivers, and contain expedient tools such as scrapers, flaked cobbles, and debitage in addition to large lanceolate and stemmed projectile points. Much discussion of these sites has taken place in the last 50 years (e.g., Chatters et al. 2011; Dancey 1969; Kidd 1964; Morgan 1999; Stilson and Chatters 1981). The sites were thought to represent short-term camps where hunting and game processing was the primary focus of activity (Kidd 1964). Investigators like Dancey (1969), Morgan (1999), and others

have refuted Kidd's (1964) initial interpretation, and Chatters et al. (2011) have recently suggested that "Olcott" sites represent the cultural remains of a group of people well adapted to unpredictability who used both plants and animals but were still highly mobile.

A number of Archaic period sites have been recorded in King County. Greengo and Houston (1965) excavated at the Marymoor site, located in Marymoor Park, during the 1950s. This site yielded a large array of Archaic period artifacts, including large projectile points, modified cobbles, and microblades. The earliest component of the West Point site complex (discussed below) also falls into the Archaic period.

4.1.3 Pacific (4400 B.C. to A.D. 1775)

Based on the archaeological record, the Pacific period is the most culturally dynamic precontact period in the Pacific Northwest (Chatters 1987; Larson and Lewarch 1995; Lewarch 2006). Over time, changing technologies and site locations suggest increased sedentism and specialization in the use of particular environments and resources (Ames and Maschner 1999). During this period, evidence of exploitation of the littoral environment increases, and shell middens become a prominent site type across Puget Sound. After about 5000 B.P., populations on or near the Puget Sound coast grew and became more complex in organization. Technological organization and subsistence practices became increasingly complex during the Pacific period as well. During this period, there is apparent increasing emphasis on the use of plants including berries and root-vegetables (e.g., Elder and Sparks 2010). Social stratification and inequality, a hallmark of Northwest coast cultures, is thought to be less pronounced in the Puget Sound than in other parts of the Pacific Northwest; however, objects like labrets, indicative of social stratification, appear early in the Pacific period in the Puget Sound at sites like West Point (45KI248) (Larson and Lewarch 1995). By shortly after 2500 B.P., a variety of bone, chipped stone, and groundstone artifacts represent coastal marine-oriented cultures and inland hunting/fishing/gathering cultures (Ames and Maschner 1999; Nelson 1976, 1990).

Shell midden sites dating to the past several thousand years have been recorded in and around the Puget Sound area. The most well studied shell middens are found around Seattle. The West Point site complex (45KI428 and 45KI429), located at Discovery Park in West Seattle, have been interpreted as long-term camping and food-processing activity areas (Larson and Lewarch 1995). Five distinct cultural components indicate use of the sites between 4200 and 200 B.P. These sites included a number of personal items, including beads, bracelets, and labrets, which may be related to developing social inequality in the region (Ames and Maschner 1999). The West Point sites also yielded a highly diverse tool kit, including bone as well as ground and chipped stone implements used for capturing and processing prey (Larson and Lewarch 1995). The highly diverse faunal assemblage includes sea mammals, fish, terrestrial mammals, birds, and shellfish, indicating exploitation of a number of available niches.

4.2 Ethnographic Background

The AI is located within the traditional territory of the Duwamish Indians, members of the Coast Salish cultural group that spoke Southern Lushootseed (Suttles 1990). The Duwamish traditionally lived in winter villages on the shores of Elliott Bay, Salmon Bay, Lake Washington, and Lake Union, as well as along the Black, Cedar, and Duwamish Rivers (Ruby and Brown 1992; Stevens 1854; United States Court of Claims 1927). Ethnographer T. T. Waterman (in Hilbert et al. 2001:15–16), who worked in the Puget Sound region during the 1920s, pointed out that the Duwamish, like other groups, identified themselves in relation to their local geography. For example, a group who lived in the vicinity of the AI around Lake Union identified themselves as the *Xa^{3}tcua'bc* (Waterman orthography), or "people of the small lake." While this distinction is taken into account ethnographically, these groups have historically been grouped into a larger entity (the Duwamish) based on shared culture and language.

Ethnographic and archaeological evidence suggests that the Salish Lushootseed-speaking Duwamish, whose name means "inside [the bay] people," practiced their life way of hunting, fishing, and gathering for centuries before contact with white settlers (Hilbert et al. 2001). Duwamish settlement and subsistence were inextricably linked throughout the year.

The Duwamish, like other Coast Salish groups, spent the majority of the winter inside large longhouses made from cedar planks that had "shed" roofs, which Waterman and Greiner (1921) note were common among tribes around the Sound. These houses could be massive, providing room for very large extended families and much of the food they would need for the cold months. The houses were often arranged into villages of two to five structures. The Duwamish occupied extended family villages and established a flexible system of intermarriage with the surrounding peoples, including the Sammamish and Snohomish (Ruby and Brown 1992). Winter was spent engaged in storytelling and ceremonial performances (Amoss 1972).

During spring, fall, and summer, people from the winter villages dispersed to hunt, fish, and gather plant foods for immediate consumption and winter storage (Buerge 1984; Haeberlin and Gunther 1930). Summer camps usually consisted of small, temporary reed or grass-mat structures occupied by a single family, although several families might join together to build a larger mat house (Haeberlin and Gunther 1930; Suttles 1990; Suttles and Lane 1990). Upland forested environment not only attracted and supported deer and elk populations for hunting, but likely also provided a variety of plant resources such as berries, nuts, and root foods.

T. T. Waterman (Hilbert et al. 2001) identified several Duwamish ethnographic place names in the vicinity of the AI. He described identifiable physical locations along the lake shores and nearby landforms. Approximately 1 mi northwest of the AI is a location called *waq̓waq̓ab*, translated as "like a frog." At this location, a small creek drains into Portage Bay. Along the Portage Bay shoreline, and approximately 0.5 mi west of the AI, Waterman's informants identified a small promontory (now the location of the UW Boat Club) as *sq^{w}icqs*, "down river promontory." The

marsh between Laurel Point and the UW, now filled in, and the location of parking lots for the UW and Husky Stadium, was known as *sluʔwiɬ*, translated as "perforation for a canoe." A village with at least five longhouses was located here, along with a fish weir. This is the closest identified village, roughly 2 mi away, to the AI. The small cove west of Laurel Point was referred to as *ʔadid(a)*, or "dear me/for gosh sakes"(Hilbert et al. 2001:77–80; Thrush 2007:251). This location is 0.5 mi from the AI. An "Indian Trail" depicted on the 1865 GLO connects Lake Washington and Lake Union and passes directly across the AI (USGS 1865). This trail, along with one located slightly farther to the south, both likely canoe portage routes, is evidence of the heavily used transportation corridor stretching between Shilshole Bay and Lake Washington, bringing people from neighboring tribes into and through the AI vicinity (Miller and Blukis Onat 2004:70; USGS 1865).

4.3 Historic Background

European visitation to the Puget Sound region began in 1792 when George Vancouver and his crew explored the region. Within the next 100 years, native populations would plummet due to repeated outbreaks of introduced diseases such as small pox, influenza, and typhoid fever (Boyd 1990; Suttles and Lane 1990). Fort Nisqually, located approximately 40 mi southeast of the Duwamish headwaters, was established as a trading post by the Hudson's Bay Company in 1833. The Treaty of Washington in 1852 conveyed the territory to the United States, and the Donation Land Claim Act drew settlers into land occupied by the Duwamish and their neighbors. In 1855, members of the Duwamish and neighboring Puget Sound tribes signed the Treaty of Point Elliott, which provided for the removal of tribal members to reservations, including the Port Madison Reservation (Suquamish/Fort Kitsap). Some Duwamish people continued to live in and around Seattle, maintaining friendly relations, working for, and trading with incoming settlers. Many others, meanwhile, relocated to the Port Madison Reservation, but due to undesirable conditions were compelled to leave. Many then attempted to return to their ancestral lands, and a few were able to claim or purchase land (Ruby and Brown 1992; Thrush 2007).

Tribal lands and fishing rights continued to be eroded through the late 1800s and 1900s, culminating, in the late 1900s, in a series of lawsuits and court cases that upheld certain treaty rights (Marino 1990; Ruby and Brown 1992). The Duwamish Tribe is not currently federally recognized, but continues to fight for this distinction.

The first Euroamerican settlers in the vicinity of the AI were the Denny Party, who arrived in 1851. Within a decade, the 302 ambitious settlers living in Seattle had requested and been granted the right to open the State University in the young city. In 1861, the first university building was constructed on 10 acres of "Denny's Knoll," which would eventually become Seattle's commercial downtown district. The population of Seattle boomed in the following decades, to over 40,000 by the late 1880s. The city needed a university as well a major rail line; over the next decade, it would get both (Bagley 1929).

In 1885, the Seattle, Lake Shore & Eastern Railroad (SLS&E) Company became a corporation. The company formed as a result of the efforts of Thomas Burke, a local judge, and Daniel Gilman. Although Seattle was a vibrant city during the late 1880s, major rail road companies like NPRR had yet to build a line through the town. Gilman and Burke, along with others, saw this as an opportunity, and built the SLS&E line to connect the burgeoning city to Canada. After years of dispute between NPRR and the city, the SLS&E line eventually became incorporated into the NPRR line in 1892. The line was acquired by NPRR in 1913 (Bagley 1929).

The present UW campus location was selected in the early 1890s (Courtois & Associates 2003). In 1891, William Boone was the first architect to develop a campus plan (Figure 4-1). While his plan was never realized, it illustrates hypothetical building placement and also appears to show that the campus was forested at the time of his design. Construction on the campus began with the building of Denny Hall in 1895, followed by at least seven more buildings, including Lewis and Clark Halls, the Observatory, the Assay Laboratory (now demolished), Water Tank (later Chimes Tower, demolished), Powerhouse (demolished), and the Armory and Gymnasium (Bagley 1929; Courtois & Associates 2003:2; Johnston 2001:1–4).

The UW and the surrounding residential and commercial districts grew rapidly during the twentieth century (Courtois & Associates 2003). This growth came with a necessary expansion of public utilities to supply electricity, water, and sewer services to the buildings surrounding Lake Washington and Lake Union (Seattle Public Utilities 2013). Waterlines, natural gas lines, and a number of other utilities including fiber optic and electrical lines were installed in the vicinity of the AI during the late twentieth century (Jacobs, personal communication 2013; Seattle Public Utilities 2013).

The NPRR continued heavy use of the line until 1963 (City of Seattle 2011). The NPRR merged with two other railroad companies, Burlington and The Great Northern, in 1970, and the new company, the Burlington Northern Railroad, abandoned the line that would become the Burke-Gilman Trail in 1971. In conjunction with this development, waterlines, natural gas lines, and a number of other utilities including fiber optic and electrical lines were installed in the vicinity of the AI during the late twentieth century (Jacobs, personal communication 2013; Seattle Public Utilities 2013).

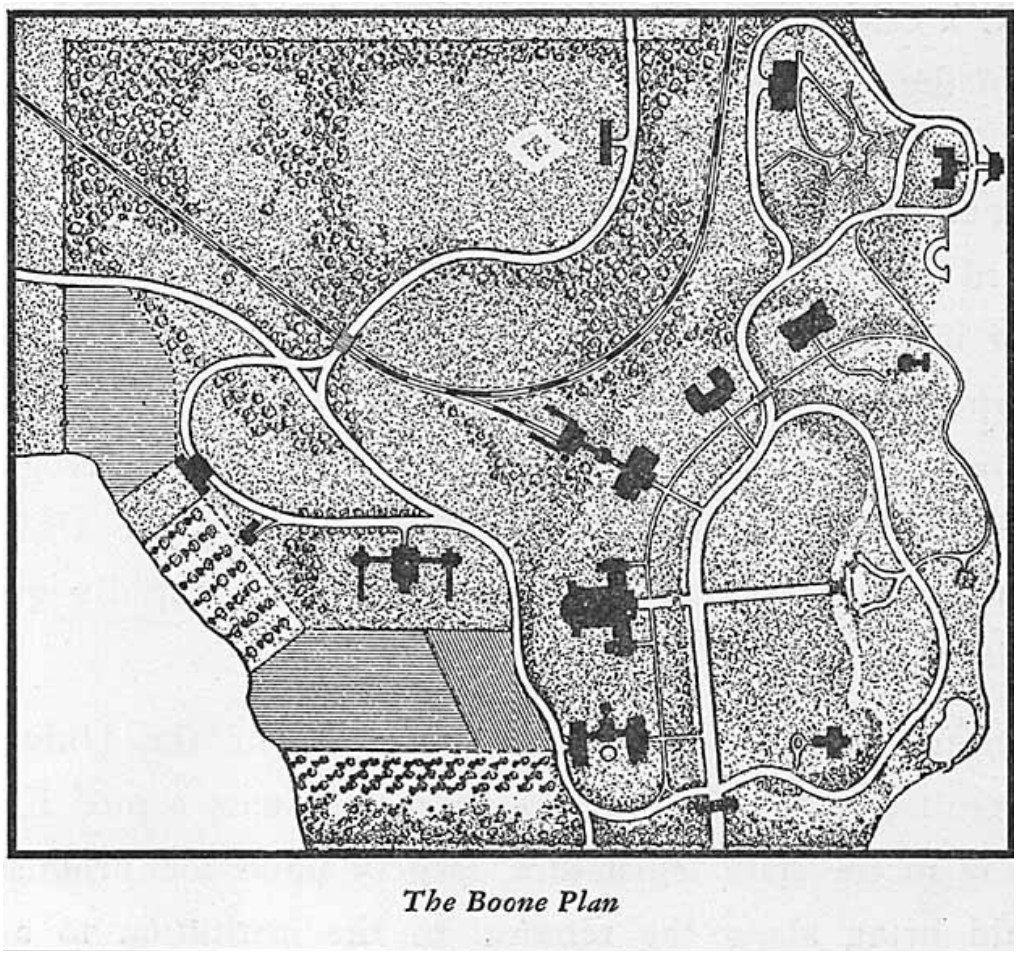

Figure 4-1. The Boone Plan of the UW Campus ca. 1890 (UW Special Collections).

5. Expectations for Prehistoric, Ethnographic Period, and Historic Period Cultural Resources

Based on archival research, as well as the environmental and the cultural settings of the AI, there is a moderate to high probability for observing precontact to ethnohistoric period cultural remains. Settings similar to that of the AI would have been the focus of hunting and gathering activities and would have been ideal locations for long term occupation as well. Expected artifacts and features would relate to these activities. Although the AI has been the subject of significant development over the past 120 years, anticipated materials could include fragments of fire-modified rock (FMR), either singly or in intact clusters (sometimes with charcoal and/or oxidized soils), indicating the presence of cooking or processing hearths; lithic and/or bone tools and tool fragments; and isolated bone tools and tool fragments.

The likelihood of finding historic-period archaeological remains is moderate to high, given the use of the AI in the history of the development of Seattle. Historic features and artifacts encountered would likely be associated with the SLS&E railroad and NPRR and with the early buildings of the AYPE and UW campus. Artifacts and features may include railroad spikes, brick, nails, glass and metal refuse, building foundations, and objects related to operation of the railway (e.g., portions of signals).

Because the area surrounding and including the AI is mapped geologically as glacial sediment and till (Booth et al. 2009), intact archaeological deposits should be found at or near the surface. Glacial sediment has no potential to contain deeply buried cultural materials.

6. Field Strategy and Methods

6.1 Archaeological Inventory

Surface and subsurface survey were performed along the AI in order to identify archaeological materials and to assess the potential of the AI to contain archaeological materials.

6.1.1 Surface Survey

An HRA archaeologist walked parallel transects along the length of the AI. Surface survey was designed to identify cultural resources visible above ground, as well as marked utilities and other evidence of disturbance. Representative photographs were taken during the course of the survey in order to document the landscape (Figure 6-1).

Figure 6-1. Overview of the AI; view to the north.

6.1.2 Subsurface Survey

Shovel probes (SP) were excavated across the AI in order to identify buried cultural resources. Shovel probes were only excavated in unpaved areas where utilities were not located. Sediments recovered from each SP were screened through ¼-inch hardware mesh. Observations regarding SP sediments were documented on standardized forms. These observations included sediment grain size (e.g., sand, silt), gravel size and shape, contacts (e.g., abrupt, diffuse), color, presence of water, presence of roots, signs of soil development, origin of sediment, and disturbance. Cultural materials recovered during SP excavation were noted. Precontact, historic, and modern artifacts were photographed from multiple angles. GPS points were taken for each SP in order to document their locations. Shovel probe excavation was terminated when impassible objects (e.g., large cobbles, wood) were encountered or when *in situ* (i.e., in place/not disturbed) glacially deposited sediment was encountered. Shovel probes were excavated to approximately 90 centimeters (cm) if no impassable objects were encountered and the depositional origin of the encountered sediment was not known.

7. Archaeological Inventory Results

7.1 Surface Survey

Fieldwork was carried out on September 18, 2014. HRA archaeologist Carol Schultze visited the AI and observed surface and subsurface conditions. Schultze walked the AI in north–south and east–west transects spaced at less than 5 meters (m). The ground was planted in landscaping grass where not paved in pedestrian paths. A paved rain shelter for bicycles covered a portion of the northeastern part of the AI.

Underground sewer lines had been marked on the grass running north–south on both the eastern and western edges of the lawn (Figure 7-1). There were a large number of metal sewer grates and utility covers scattered across the AI. Figure 7-2 shows the locations of all the covers to utility access locations and sewer grates. Additional underground utility markings were seen on the ground surface. The utility access locations are indicative of a more extensive network of utilities below ground. The ground surface was noted to be irregular. It was apparent that the AI was disturbed, and that there would not be many places where shovel probes could be excavated without impacting underground utilities.

Figure 7-1. Locate mark and water utilities covers; view to the northeast.

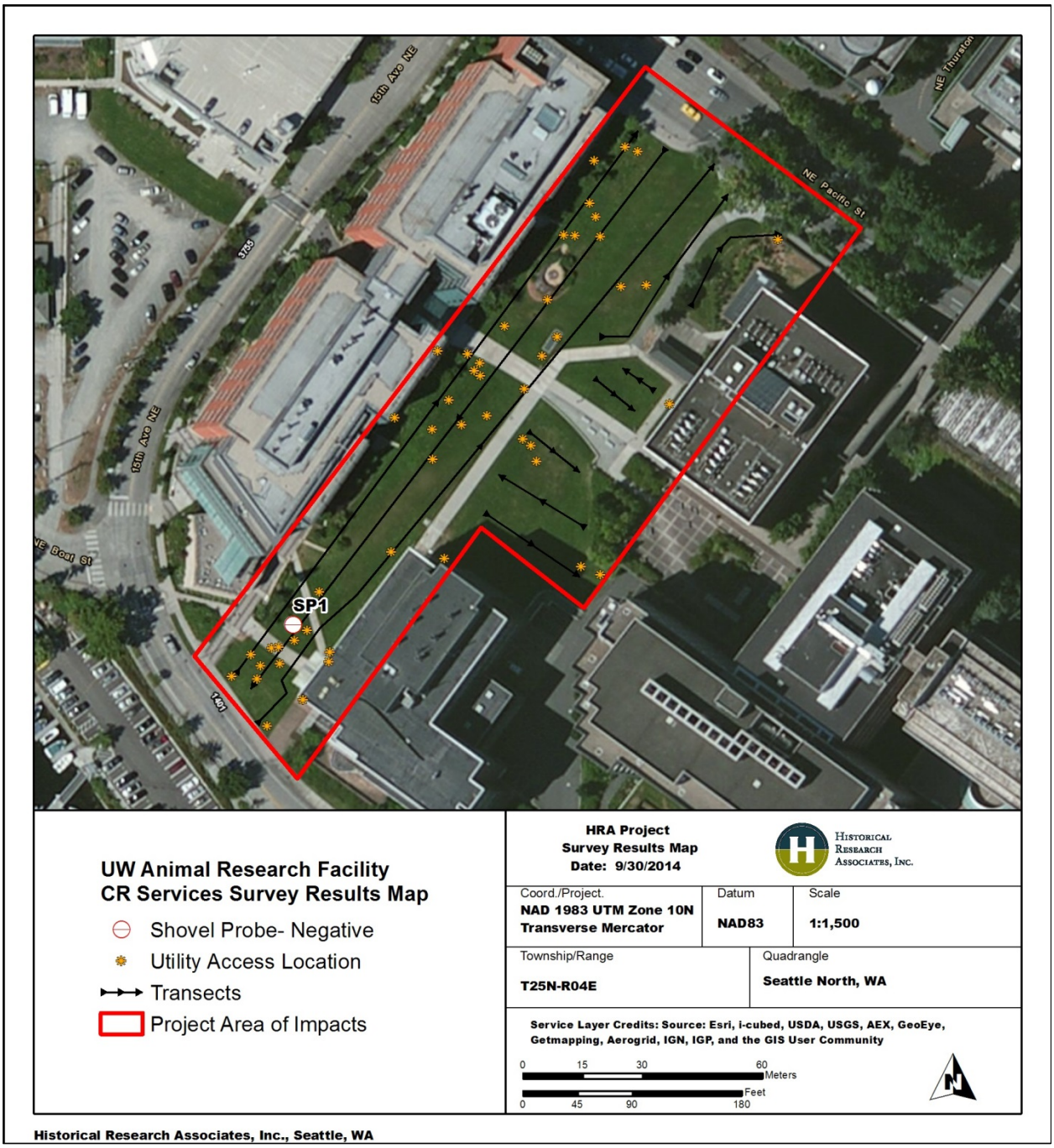

Figure 7-2. Map showing Transects, Shovel Probe location, and ground disturbance in the form of covers and grates indicative of subsurface sewer and utilities.

Jeff Angeley, Senior Project Manager of the UW Major Projects Group, met Schultze in the field at 10 am. They walked the AI again and Angeley pointed out additional areas of subsurface disturbance. The information he provided gave insight into the extent of previous ground disturbance within the AI. The following information was gathered during discussions with Mr. Angeley.

A large vent/grate in the center of the property corresponds to an underground generator (Figure 7-3), which is in the vicinity of a loading dock that runs below the western half of the AI. There is also an underground pedestrian tunnel that crosses the AI (Figure 7-4).

The construction of buildings adjacent to the AI on both sides was done using a step-back technique, which involved cutting a sloped bank down to the level of foundation work and filling it back in later (Figures 7-5 and 7-6). The loading dock was built underneath the ground surface at that time. Therefore, at least two-thirds of the northern portion of the AI have been completely excavated and refilled in the past.

Additionally, the route of 15th Avenue NE used to run directly north–south across the AI (Figure 7-7). It formed a city block with University Avenue NE, which also used to run north–south to the water at Portage Bay. This city block, which now comprises the southern half of the AI, was built up in student housing, similar to a pair of buildings still standing along University Avenue NE (Figure 7-8). These residences were demolished at the time the road was diverted, sometime in the 1980s.

Figure 7-3. Underground generator vent in center of AI; view facing south.

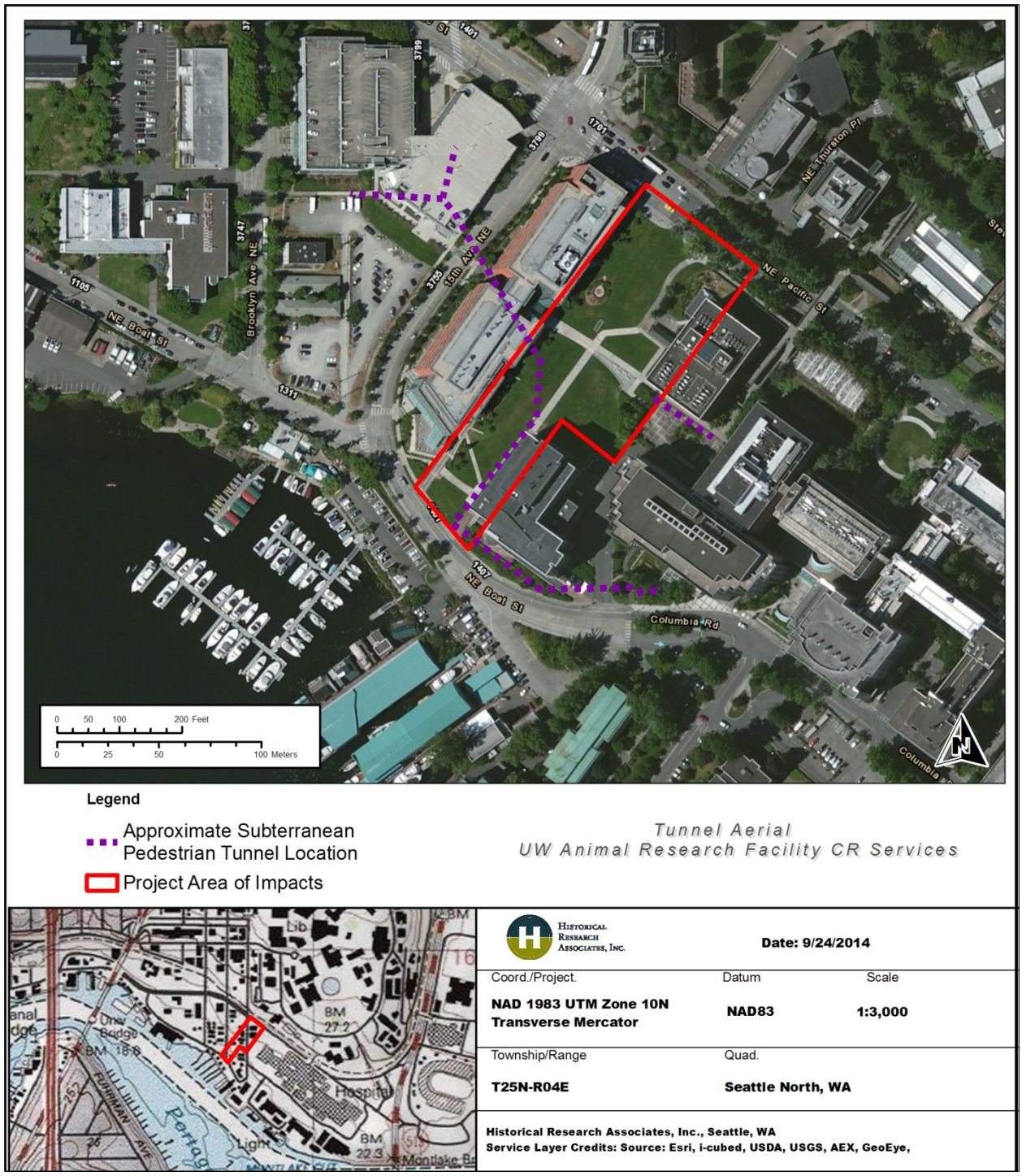

Figure 7-4. Approximate location of subsurface pedestrian tunnel through AI.

Figure 7-5. Subsurface disturbance during the construction of buildings adjacent to the AI; view to the south (photo courtesy of Jeff Angeley).

Figure 7-6. Construction of loading dock beneath current ground surface; view to the east (photo courtesy of Jeff Angeley).

Figure 7-7. Path of 15th Avenue NE prior to realignment of road.

Figure 7-8. Photo of extant buildings along University Avenue NE; view to the southeast.

7.2 Shovel Probes

As there were very few locations that were not marked by underground utilities or known to be underlain by facilities, such as the generator or tunnel, it was only possible to excavate a single Shovel Probe (SP) to test for subsurface archaeological materials. This SP was placed in the center of the southern portion of the AI, south of the area that would have been completely dug out during the construction of the adjacent buildings (see Figure 7-2). This is within the area that was a residential city block between 15th Avenue NE and University Avenue NE prior to the re-routing of the roads.

Sediment observed in SP1 included fill dirt and debris indicative of building demolition (Table 7-1; Figure 7-9). Bricks, asphalt, concrete, oxidized metal wire nails, glass, and plastic were found. None of these objects were temporally diagnostic, but appeared consistent with building materials of the later twentieth-century (Figure 7-10). No prehistoric or historic-era cultural materials were found.

Table 7-1. Shovel probe results.

Shovel Probe	Maximum Depth Below Surface	Description	Cultural Materials Identified
1	60 cm	0-10 cmbs: Landscaping grass, sod and root mass in a tan sand with a many angular gravels – *grass* 10-23 cmbs: Dry grayish tan medium coarse grain sand with many medium-size angular and rounded cobbles – *fill dirt* 23-38 cmbs: Gray silty coarse sand intermixed with construction debris and many rounded cobbles and pebbles – *fill dirt* 38-60 cmbs: Grayish brown coarse sand with a decreasing quantity of rounded cobbles – *alluvium* Halted due to large rock	10 cm to 38 cm: 4 brick fragments; 2 chunks of concrete; 2 pieces of rusted metal;2 pieces of asphalt;1 piece of red (automotive) glass; 1 piece of clear glass; 1 piece of hard white plastic.

Figure 7-9. Shovel Probe 1 at 60 cm.

Figure 7-10. Temporally non-diagnostic construction debris found in Shovel Probe 1.

8. Summary and Recommendations

8.1 Archaeological Resources

The AI has been subjected to multiple large- and small-scale disturbances as a result a variety of construction projects and utility installations. These include:

- Disturbance along the former path of 15th Avenue NE running directly north–south across the AI;
- Disturbance from the construction and demolition of residences along the former route of 15th Avenue NE;
- Complete excavation of the northern two-thirds of the AI to depths greater than 10 ft in conjunction with the construction of buildings adjacent to the AI;
- The installation of an underground loading dock;
- The installation of an underground generator; and
- The installation of an underground pedestrian tunnel.

There are facilities below the ground surface across a majority of the AI. No historic or prehistoric artifacts were found and no intact cultural deposits are anticipated across any part of the AI. Although archival research indicates that a Native American trail crossed the AI in the past, no evidence of this remains. No further cultural resources work is recommended.

8.2 Accidental Discovery of Archaeological Resources

In the event that archaeological deposits are inadvertently discovered during construction in any portion of the AI, ground-disturbing activities should be halted immediately, and the UW should be notified. The UW would then contact DAHP and the interested Tribes, as appropriate.

8.3 Discovery of Human Remains

Any human remains that are discovered during construction of the Project will be treated with dignity and respect. The affected Native American Tribes are the Duwamish, Suquamish, and Muckleshoot Indian Tribes.

If ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity that may cause further disturbance to those remains **must** cease, and the area of the

find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains **must** be reported to the county coroner **and** local law enforcement in the most expeditious manner possible. The remains should not be touched, moved, or further disturbed.

The county coroner will assume jurisdiction over the human skeletal remains, and make a determination of whether those remains are forensic or non-forensic. If the county coroner determines the remains are non-forensic, they will report that finding to DAHP. DAHP will then take jurisdiction over those remains and report them to the appropriate cemeteries and affected tribes. The State Physical Anthropologist will make a determination of whether the remains are Indian or non-Indian, and report that finding to any appropriate cemeteries and the affected tribes. DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.

9. References Cited

Alt, D. D., and D. W. Hyndeman
1995 *Northwest Exposures: A Geologic Story of the Northwest*. Mountain Press Publishing Co., Missoula, Montana.

Ames, K. M, and H. D. G. Machner
1999 *Peoples of the Northwest Coast: Their Archaeology and Prehistory*. Thames and Hudson, London, England.

Amoss, P.
1972 *Coast Salish Spirit Dancing: The Survival of an Ancestral Religion*. University of Washington Press, Seattle.

Bagley, C. B.
1929 *History of King County*, Vols. 1 and 3. S.J. Clarke Publishing Company, Seattle, Washington.

Barnosky, Cathy W.
1984 Late Pleistocene and Early Holocene Environmental History of Southwestern Washington State, U.S.A. *Canadian Journal of Earth Science* 21:619–629.

Barnosky, C. W., P. M. Anderson, and P. J. Bartlein
1987 Chapter 14: The Northwestern U.S. During Deglaciation; Vegetational History and Paleoclimatic Implications. In *The Geology of North America, Volume K-3: North America and Adjacent Oceans During the Last Deglaciation*, edited by W. F. Ruddiman and Herbert E. Wright, Jr., pp. 289–321. Geological Society of America, Boulder, Colorado.

Berge, H. B., and K. Higgins
2003 *The current status of kokanee in the greater Lake Washington Watershed*. King County Department of Natural Resources and Parks, Water and Land Resources Division, Seattle, Washington

Binford, L. R
1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1): 4–20.

Boggs, B.
2009a *45KI952 State of Washington Archaeological Isolate Inventory Form*. Paragon Research Associates, Seattle, Washington. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

2009b *45KI955 State of Washington Archaeological Site Inventory Form*. Paragon Research Associates, Seattle, Washington. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

BOLA
2008a *Johnson Annex-UW Historic Resources Addendum*. BOLA Architecture and Planning. Prepared for the University of Washington, Seattle.

2008b *Cunningham Hall-UW Historic Resources Addendum.* BOLA Architecture and Planning. Prepared for the University of Washington, Seattle.

2010 *Husky Union Building-UW Historic Resources Addendum.* BOLA Architecture and Planning. Prepared for the University of Washington, Seattle.

Booth, D. B., K. G. Troost, and S. A. Schimel
2009 *Geologic Map of Northeastern Seattle, King County, WA.* United States Geological Society, Denver, Colorado.

Booth, Derek B., Kathy Goetz Troost, John J. Clague, and Richard B. Waitt
2004 The Cordilleran Ice Sheet. In *The Quaternary Period in the United States,* edited by A. R. Gillespie, S. C. Porter, and B. F. Atwater, pp. 17–43. Developments in Quaternary Science 1, series editor Jim Rose. Elsevier Science, New York, New York.

Boyd, R. T.
1990 Demographic History, 1774–1874. In *Northwest Coast*, edited by Wayne Suttles, pp. 135–148. Handbook of North American Indians, Vol. 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Brubaker, Linda B.
1991 Climate Change and the Origin of Old-Growth Douglas-Fir Forests in the Puget Sound Lowland. In *Wildlife and Vegetation of Unmanaged Douglas-Fir Forests*, edited by Leonard F. Ruggiero, Keith B. Aubry, Andrew B. Carey, and Mark F. Huff, pp. 17–24. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-285.

Buerge, D.
1984 The Lost Tribes of Lake Washington: Reconstructing the prehistoric world of the Lake People. *Seattle Weekly* (August 1–7):29–33.

Chatters, J. C.
1987 Tualdad Altu: A 4th Century Village on the Black River, King County, Washington. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Chatters, J. C., J. B. Cooper, P. D. LeTourneau, and L. C. Rooke
2011 *Understanding Olcott: Data Recovery at 45SN28 and 45SN303, Snohomish County, Washington.* On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

City of Seattle
2011 Burke-Gilman History. Electronic document, http://www.seattle.gov/transportation/burkegilmantrailhistory.htm, accessed June 10, 2013.

Courtois & Associates
2003 *Preliminary Report on University of Washington Main Campus Seattle-Significant Buildings and Features Completed Prior to 1953, in Select Campus Area.* Courtois & Associates, Seattle, Washington. Prepared for Sound Transit, Central Puget Sound Regional Transit Authority, Seattle, Washington.

Courtois, S. L., K. H. Krafft, C.Wickwire, J. C. Bard, and R. McClintock
1998 *Sound Transit Central Link Light Rail Draft Environmental Impact Statement Historic and Archaeological Technical Report.* Courtois and Associates, Seattle, Washington, and CH2M Hill, Inc., Bellevue, Washington. Prepared for Central Puget Sound Regional Transit Authority, Seattle, Washington.

1999 *Central Link Light Rail Transit Project Final Environmental Impact Statement Technical Report*. Courtois and Associates, Seattle, Washington, and CH2M Hill, Inc., Bellevue, Washington. Prepared for Central Puget Sound Regional Transit Authority, Seattle, Washington.

Corley, Margaret
1969 *Bagley Hall 45KI151. National Register Nomination*. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Dancey, W. S.
1969 *Archaeological Survey of Mossyrock Reservoir*. Reports in Archaeology No. 3. University of Washington Press, Seattle.

Dethier, D. P., F. Pessl, Jr., R. F. Keuler, M. A. Balzarini, and D. R. Pevear
1995 Later Wisconsinan Glaciomarine Deposition and Isostatic Rebound, Northern Puget Lowland, Washington. *Geological Society of America Bulletin* 107(11):1288–1303.

Department of Archaeology and Historic Preservation (DAHP)
2013a *Bloedel Hall-Historic Property Inventory Report*. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington. Accessed May 14, 2013.

2013b *Burke-Gilman Trail/Rainier Vista-Historic Property Inventory Report*. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington. Accessed May 14, 2013.

Dillehay, T. D., C. Ramirez, M. Pino, M. B. Collins, J. Rossen and J. D. Pino-Navarro
2008 Monte Verde: Seaweed, Food, Medicine, and the Peopling of South America. *Science* 320:784–786.

Easterbrook, D. J., and D. A. Rahm
1970 *Landforms of Washington: The Geologic Environment*. Union Printing Co., Bellingham, Washington.

Elder, J. T.
2011 *Cultural Resources Investigations at the Bryant Building Section 6(f) Replacement Site*. ICF International, Seattle, Washington. Prepared for Washington State Department of Transportation, Seattle.

Elder, J. T., and M. Cascella
2013 *SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project Corridor Archaeological Landform Sensitivity Assessment*. ICF International, Seattle, Washington. Prepared for Washington State Department of Transportation, Seattle.

Elder, J. T., and P. Reed
2011 *Results of Archaeological Monitoring of Geotechnical Borings within the SR520 Limits of Construction*. ICF International, Seattle, Washington. Prepared for Washington State Department of Transportation, Seattle.

Elder, J. T., and M. S. Sparks
2010 *Tacoma/Pierce County HOV Program Archaeological Data Recovery Report*. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Elder, J. T., S. Schneyder, M. Cascella, A. E. Stevenson, K. Perkins, C. W. Gray, C. Hetzel, S. Orton, and L.D. Price
2011a *Section 106 Technical Report (Volume I Archaeology and Volume II Built Environment) SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*. ICF

International and Gray Lane Preservation, Seattle, Washington. Prepared for Washington State Department of Transportation, Seattle.

Elder, J. T., S. Schneyder, M. Cascella, A. E. Stevenson, and K. Perkins
2011b *Section 106 Technical Report (Volume I Archaeology) SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*. ICF International, Seattle, Washington. Prepared for Parametrix, Inc., and Washington State Department of Transportation, Seattle.

Emerson, Stephen
2009a *Letter to Adam Escalona regarding SE01126A UW Medical BB Tower*. Archisto Enterprises Letter Report. April 17, 2009. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

2009b *Letter to Adam Escalona regarding SE01124A Suzzallo Library*. Archisto Enterprises Letter Report. April 25, 2009. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Erlandson, J. M., T. C. Rick, T. J. Braje, M. Casperson, B. Culleton, B. Fulfrost, T. Garcia, D. A. Guthrie, N. Jew, D. J. Kennett, M. L. Moss, L. Reeder, C. Skinner, J. Watts, and L. Willis
2011 Paleoindian Seafaring, Maritime Technologies, and Coastal Foraging on California's Channel Islands. *Science* 331:1181–1185.

Franklin, J. F., and C. T. Dyrness
1973 *Natural Vegetation of Oregon and Washington*. USDA Forest Service, General Technical Report PNW-8.

Galster, R. W., and W. T. LaPrade
1991 Geology of Seattle, Washington, United States of America. *Bulletin of the Association of Engineering Geologists* 28(3):235–302.

Gilbert, M. T. P., D. L. Jenkins, A. Götherstrom, N. Naveran, J. J. Sanchez, M. Hofreiter, P. F. Thomsen, J. Binladen, T. F. G. Higham, Robert M. Yohe II, R. Parr, L. S. Cummings, and E. Willerslev
2008 DNA from Pre-Clovis Human Coprolites in Oregon, North America. *Science* 320:786–789.

Gilmour, D. M.
2011 Chronology and Ecology of Late Pleistocene Megafauna in the Northern Willamette Valley, Oregon. Unpublished Master's Thesis, Portland State University, Portland, Oregon.

Greengo, R. E., and R. Houston
1965 *Excavations at the Marymoor Site*. Magic Machine Press.

Haeberlin, H., and E. Gunther
1930 *The Indians of Puget Sound*. University of Washington Press, Seattle.

Hilbert, V., J. Miller, and Z. Zahir
2001 *Puget Sound Geography: Original Manuscript from T. T. Waterman*. Zahir Consulting Services, Federal Way, Washington.

Holter, Russell
2014 Survey Requested, University of Washington Animal Research and Care Facility Construction. Letter to Jan Arntz, University of Washington, Seattle, Washington. August 18, 2014.

ICF International and Gray Lane Preservation Planning (ICF and Gray Lane)
2011 *Section 106 Technical Report SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project.* ICF International and Gray Lane Preservation Planning, Seattle, Washington. Prepared for Washington State Department of Transportation, Seattle.

Johnson, R. E., and K. M. Cassidy
1997 *Terrestrial Mammals of Washington State: Location Data and Predicted Distributions. Vol. 3 Washington State gap analysis – Final Report*. Edited by K. M. Cassidy, C. E. Crue, M. R. Smith, and K. M. Dvornich. Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle.

Johnston, Norman J.
2001 *University of Washington*. Princeton Architectural Press, New York.

Kidd, Robert S.
1964 A Synthesis of Western Washington Prehistory from the Perspective of Three Occupation Sites. Unpublished Master's Thesis, Department of Anthropology, University of Washington, Seattle.

King, Arden
1950 Archaeology of the San Juan Islands: A Preliminary Report of the Cattle Point Site. In *Indians of the Urban Northwest*, edited by Marian W Smith, pp. 131–146. Columbia University Press, New York.

Kopperl, R. E., C. J. Miss, and C. M. Hodges
2010 Results of Testing at the Bear Creek Site 45-KI-839, Redmond, King County, Washington. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Kruckeberg, Arthur R.
1991 *The Natural History of Puget Sound Country*. University of Washington Press, Seattle.

Larrison, Earl J.
1967 *Mammals of the Northwest: Washington, Oregon, Idaho, and British Columbia*. Seattle Audubon Society, Seattle, Washington.

Larson, Lynn L., and Dennis E. Lewarch (editors)
1995 *The Archaeology of West Point, Seattle, Washington: 4,000 Years of Hunter-Fisher-Gatherer Land Use in Southern Puget Sound Volume 1, Parts 1 and 2*. Larson Anthropological Archaeological Services, Ltd., Seattle, Washington. Prepared for King County Department of Metropolitan Services, Seattle, Washington. Submitted to CH2M Hill, Bellevue, Washington.

Lewarch, D. E.
2006 Renton High School Indian Site (45KI501) Archaeological Data Recovery, King County, Washington. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Lockwood, Chris
2014 *45KI1201- University Landfill Site. State of Washington Archaeological Site Inventory Form.* On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Louderback, L., and S. Jolivette
2009 *45KI957 State of Washington Archaeological Site Inventory Form.* Burke Museum, Seattle, Washington. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Marino, C.
1990 History of Western Washington Since 1846. In *Northwest Coast*, edited by Wayne Suttles, pp. 169–179. Handbook of North American Indians, Vol. 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Martin, P. S.
1967 Prehistoric overkill. In *Pleistocene Extinctions: The Search for a Cause*, edited by P. S. Martin, and H. E. Wright, Jr., pp. 75–120. Yale University Press, New Haven, Connecticut.

Meltzer, D. J., and R. C. Dunnell
1987 Fluted Points from the Pacific Northwest. *Current Research in the Pleistocene* 4:64–67.

Miller, Jay, and Astrida R. Blukis Onat
2004 *Winds, Waterways, and Weirs: Ethnographic Study of the Central Link Light Rail Corridor.* BOAS, Inc., Seattle, Washington. BOAS Project No. 20005.Submitted to Sound Transit, Central Light Link Rail.

Minor, K., and P. Meijer
2011 *Cultural Resource Inventory for Anderson Hall, University of Washington Campus, Seattle, Washington.* Peter Meijer, Architect PC, Portland, Oregon. Prepared for University of Washington, Seattle.

Morgan, V. (editor)
1999 *The SR-101 Sequim Bypass Archaeological Project: Mid- to Late-Holocene Occupations on the Northern Olympic Peninsula, Clallam County, Washington.* Volume 1. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Nelson, Charles M.
1976 The Radiocarbon Age of the Biderbost Site (45SN100) and Its Interpretive Significance for the Prehistory of the Puget Sound Basin. *Washington Archaeologist* 20(1):1–17.

1990 Prehistory of the Puget Sound Region. *In Northwest Coast*, edited by Wayne Suttles, pp. 481–484. Handbook of North American Indians, Vol. 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Osborne, D.
1956 Early Lithic in the Pacific Northwest. *Research Studies of the State College of Washington* 24:38–44.

Rooke, Lara
2002 *Letter to Jay Grenfell regarding Cingular Wireless Tower WA-539 (Cavilier Apartments).* Cascadia Archaeology, Seattle, Washington. Submitted to Vertex Engineering Services, Inc., Burlingame, California.

Ruby, R. H., and J. A. Brown
1992 *A Guide to the Indian Tribes of the Pacific Northwest, Revised Edition.* University of Oklahoma Press, Norman, Oklahoma, and London, England.

Sanborn Map Company
1905 *Seattle, Washington: Volume 3 1904-1905*. Sanborn-Perris Map Company, the Sanborn Map Company, Sanborn Library, LLC. Electronic document, http://www.spl.org/default.asp?pageID=collection_db_list&dB.P.age=9#Maps%20(Local%20History), accessed May 29, 2013.

1919 *Seattle, Washington: Volume 4 1905-1950*. Sanborn-Perris Map Company, the Sanborn Map Company, Sanborn Library, LLC. Electronic document, http://www.spl.org/default.asp?pageID=collection_db_list&dB.P.age=9#Maps%20(Local%20History), accessed May 29, 2013.

1930 *Seattle, Washington: Volume 10 1905-March 1951*. Sanborn-Perris Map Company, the Sanborn Map Company, Sanborn Library, LLC. Electronic document, http://www.spl.org/default.asp?pageID=collection_db_list&dB.P.age=9#Maps%20(Local%20History), accessed May 29, 2013.

Schiffer, Michael B.
1996 *Formation processes of the archaeological record*. University of Utah Press, Salt Lake City.

Seattle Public Utilities
2013 Utility Locate Map for UW Burke-Gilman Trail Expansion Project. On file at Historical Research Associates, Inc., Seattle, Washington.

Snyder, D. E., P. S. Gale, and R. F. Pringle
1973 *Soil Survey: King County Area, Washington*. USDA Soil Conservation Service.

Stevens, I. I.
1854 Report on Tribes between the Head of Navigation of the Mississippi River to the Pacific Ocean: Indian Tribes West of the Cascades. Letter from Isaac I. Stevens, Governor and Superintendent of Indian Affairs, Washington Territory to George W. Maypenny, Commissioner of Indian Affairs, Washington D. C., 16 September. In *Message from the President of the United States to the Two Houses of Congress, Part 1*, pp. 392-459. A.O.P. Nicholson Printer, Washington, D.C.

Stevenson, A., and J. Dellert
2013 *University of Washington Burke-Gilman Trail, Rainier Vista to 15h Avenue NE Segment, Cultural Resources Inventory Project, Seattle, King County, Washington*. Historical Research Associates, Inc. Seattle, Washington. Submitted to the University of Washington, Seattle.

Stevenson, A., and K. Little
2014a *Archaeological Inventory for the University of Washington Burke-Gilman Trail, Brooklyn Avenue NE to 15th Avenue NE (Garden Reach) Segment, City of Seattle, King County, Washington*. Historical Research Associates, Inc. Seattle, Washington. Submitted to the University of Washington, Seattle.

2014b *Archaeological Inventory for the University of Washington Burke-Gilman Trail, University Bridge to Brooklyn Avenue NE (Neighborhood Reach) Segment, City of Seattle, King County, Washington*. Historical Research Associates, Inc. Seattle, Washington. Submitted to the University of Washington, Seattle.

2014c *Archaeological Inventory for the University of Washington Burke-Gilman Trail, Pasadena Place NE to University Bridge (Northlake Reach) Segment, City of Seattle, King County, Washington*. Historical Research Associates, Inc. Seattle, Washington. Submitted to the University of Washington, Seattle.

Stevenson, A., K. Little, and S. Molchany
2014 *Cultural Resources Inventory for the University of Washington Burke-Gilman Trail, Rainier Vista to Northeast 47th Street (Forest Reach) Segment, City of Seattle, King County, Washington*. Historical Research Associates, Inc. Seattle, Washington. Submitted to the University of Washington, Seattle.

Stilson, M. L., and J. C. Chatters
1981 *Excavations at 45-SN-48N and 45-SN49A, Snohomish County, Washington*. On file at the Department of Archaeology and Historic Preservation, Olympia, Washington.

Suttles, W.
1990 Environment. In: *Northwest Coast,* edited by Wayne Suttles, pp. 16–29. Handbook of North American Indians, Vol. 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Suttles, W., and B. Lane
1990 Southern Coast Salish. In *Northwest Coast*, edited by Wayne Suttles, pp. 485–502. Handbook of North American Indians, Vol. 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Thrush, C.
2007 *Native Seattle: Histories from the Crossing-Over Place*. University of Washington Press, Seattle.

Trigger, B.
2006 *A History of Archaeological Thought*. Second Ed. Cambridge University Press, Cambridge, England.

United States Court of Claims
1927 Number of Duwamish Villages on Duwamish River and Lake Washington. In the Court of Claims of the United States, the Duwamish et al. Tribe of Indians v. the United States of America, Claimants Exhibit w-2, filed October 2, 1927. Records Group 123. Records of the U.S. Court of Claims No. F.-275. On file at the National Archives and Records Administration, Washington, D.C.

United States Geological Survey (USGS)
1865 General Land Office Map, Township 25 North, Range 4 East, Willamette Meridian. On file at the Washington State Department of Natural Resources, Olympia.

1890 General Land Office Map, Township 25 North, Range 4 East, Willamette Meridian. On file at the Washington State Department of Natural Resources, Olympia.

Walker Gray, C., C. Hetzel, Me. Cascella, S. Orton, and L. D. Price
2011 *Section 106 Technical Report (Volume II Built Environment) SR520 Bridge Replacement and HOV Program, I-5 to Medina: Bridge Replacement and HOV Project*. ICF International and Gray Lane Preservation Planning, Seattle, Washington. Prepared for Washington State Department of Transportation, Seattle, Washington. Submitted to Vertex Engineering Services, Inc., Burlingame, California.

Waterman, T. T., and R. Greiner
1921 *Indian Houses of the Puget Sound*. Museum of the American Indian, New York.

Waters, M. R, T. W. Stafford Jr., H. G. McDonald, C. Gustafson, M. Rasmussen, E. Cappellini, J. V. Olsen, D. Szklarczyk, L. J. Jensen, M. T. Gilbert, and E. Willerslev
2011 Pre-Clovis Mastadon Hunting 13,800 Years Ago at the Manis Site, Washington. *Science* 334: 351–353.

Washington Department of Fish and Wildlife (WDFW)
2012 Fish Washington: Lake Washington. Electronic document, http://wdfw.wa.gov/fishing/washington/37/, accessed May 29, 2013.

Whitlock, C.
1992 Vegetational and Climatic History of the Pacific Northwest during the last 20,000 Years: Implications for Understanding Present-Day Biodiversity. *The Northwest Environmental Journal* 8:5–28.

Xerces
2010 Unpublished Data from the Xerces Society, www.xerces.org Portland, Oregon.