Commission Meeting Date: August 19, 2010 **Agenda Item: 7.A**

PLANNING COMMISSION AGENDA ITEM

CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Public Health Laboratory Comprehensive Plan Amendment, Rezone, and Master Development Plan Permit Public Hearings, File #201792
DEPARTMENT:	Planning and Development Services (PDS)
PRESENTED BY:	Joseph W. Tovar, FAICP, Director, PDS Steven M. Cohn, Senior Planner Steven Szafran, AICP, Associate Planner

SUMMARY

The State Public Health Laboratory (PHL) is proposing to expand its facilities over the next 20 years. To accomplish this, the following steps must be taken:

1. *Modification of Shoreline's Comprehensive Plan Policy LU-32* which limits the Public Health Lab to its existing 7.6 acre site. The PHL Master Plan encompasses 12.6 acres, so the Comprehensive Plan must be changed to permit the 5-acre expansion.
2. *A Rezone of 5 acres currently zoned as Fircrest Campus Zone*, to Public Health Laboratory Zone. This will permit the Master Plan to encompass a 12.6 acre site.
3. *Approval of a Master Plan Permit*. This permit requires approval of the City Council adopts the Plan (including the mitigations or conditions that might be imposed by the permit).

A Binding Site Plan permit is required in order to clarify the boundaries of the PHL site. The permit was issued in early August, 2010.

The Planning Commission will conduct one public hearing on August 19. At the hearing the public will be able to comment on any or all of the proposed actions. If testimony or deliberations are not concluded that evening, the Commission may choose to continue the hearing to a future date. If this happens, the date will be established and announced at the August 19 hearing.

Following the completion of the public hearing, the Planning Commission will formulate its recommendations to the City Council on: the Comprehensive Plan Amendment, the Rezone, and the Master Development Plan.

BACKGROUND

PDS staff reviewed the application materials, written comments from the public, and prepared a SEPA threshold determination. The SEPA determination is that the proposal to expand the PHL will have no significant adverse impacts, and that the road network can handle the increased traffic impacts from the added workforce at the site which will occur over a 20-year period. Therefore it is not necessary to require additional analysis from an EIS or expanded SEPA checklist.

Staff analyzed the application materials to ascertain whether the application is in compliance with the criteria for the Comprehensive Plan Amendment, Rezone, and Master Development Plan Permit. Staff concluded that the application complies with the criteria and recommends approval. Staff's analysis and initial findings, conclusions, and recommendations are attached. The Planning Commission may add, delete or modify findings following the hearings and deliberations on the proposal.

Written testimony can be submitted prior to the public hearing or provided at the hearing, and will be incorporated into the project file. The file will be available for Council review prior to its decision.

Written materials can be submitted to Steve Szafran prior to the hearing. If you have questions about items in the staff report or about the hearing process, contact Mr. Szafran at 206-801-2512 or email him at sszafran@shorelinewa.gov.

CITY OF SHORELINE
STAFF REPORT TO PLANNING COMMISSION

INITIAL FINDINGS, CONCLUSIONS AND RECOMMENDATION

PROJECT INFORMATION SUMMARY

Project Description: (1) Comprehensive Plan Amendment to modify Comprehensive Plan Policy LU 43(2) and (3) to reflect the increase of the Washington Public Health Lab Campus from 7.6 acres to 12.6 acres and decrease of the Fircrest Campus from 83 acres to 78 acres; (2) change in zoning of the 5 acres from Fircrest Campus Zone to Public Health Lab Campus Zone ; and (3) Master Development Plan Permit to guide the future of the Public Health Lab's Campus over the next 20 years.
Project File Number: 201792
Project Address: 1610 NE 150th Street, Shoreline, WA 98155
Property Owner: Washington State Public Health Lab
Staff Recommendation: Approval with conditions

FINDINGS OF FACT

Current Development

1. The subject parcel is located at 1610 NE 150th Street.

2. The Public Health Lab Campus is approximately 7.6 acres and is developed with the Public Health Lab (PHL), owned by the State of Washington. The site is zoned Public Health Lab Zone (PHZ) and has a Comprehensive Plan Land Use designation of Campus. See Attachment 1- Vicinity Map.

3. The PHL was established to provide a wide range of diagnostic and analytical services for the assessment and surveillance of infectious, communicable, genetic, chronic diseases and environmental health concerns, for the citizens of the State of Washington.

4. The site is surrounded by the Fircrest Campus to the north, east, and west. Low-density single-family homes zoned R-6 exist to the south, across NE 150th Street. Fircrest is also owned by the State of Washington.

5. Access to the PHL Campus is from primarily from NE 150th Street with secondary access from 15th Avenue NE.

6. There are existing sidewalks on 15th Ave NE, and portions of sidewalk on the north side of NE 150th Street.

7. The original public health laboratory building was constructed in 1985. The original building was single-story and 51,000 square feet.

8. In 2000 a 12,000 square foot addition for an office of newborn screening was completed.

9. In 2009, a 5,800 square foot addition for additional laboratory space was completed.

10. Current total building area is 72,500 gross square feet.

11. The PHL currently employs 140 full-time people.

12. There are 142 parking spaces on site.

History

13. The Public Health Lab was originally located in the Alaska Building in downtown Seattle then later relocated to the Smith Tower also in downtown Seattle.

14. In 1985, the Public Health Lab moved to the Fircrest Campus which was then unincorporated King County.

15. In 2006, the Department of Social and Health Services (DSHS) began a master plan process for the portions of the Fircrest Campus that are outside the Public Health Lab site boundaries.

Proposals

COMPREHENSIVE PLAN AMENDMENT

16. In order to have sufficient space to develop under the Master Development Plan, the Public Health Lab is proposing a Comprehensive Plan Amendment to modify LU 43 to read in part:
    - 2. The Fircrest Campus is an approximately ~~83~~ 78 acre site…
    - 3. Public Health Laboratory Campus: An approximately ~~7~~ 12.6 acre site

17. The Comprehensive Plan designation itself does not have to change; the five acres are already designated Campus.

REZONE

18. In conjunction with the Comprehensive Plan Amendment, the PHL is also proposing to rezone those same 5 acres from FCZ to PHZ,

MASTER DEVELOPMENT PLAN

19. The PHL has submitted a Master Development Plan (MDP or Plan) to guide the future growth of the campus for the next 15-20 years. See ***Attachment 2 (Master Plan)***. The MDP plans for future growth on 12.6 acres. Plan is divided into 5 phases which includes:

    Phase 1 - N-Wing West Addition = 2,800 square feet
    N- Wing East Addition = 4,250 square feet

    Phase 2 – Mechanical Addition = 3,750 square feet
    Loading Addition = 2,800 square feet

    Phase 3 – Administration Building = 27,000 square feet

    Phase 4 – New West Wing = 14,600
    New East Wing = 14,600
    Demo existing Q, A, and S Wings = 15,700 square feet

    Phase 5 – New Office Building = 38,000 square feet
    Remodel E and C Wings
    New Parking Garage = 200 spaces

20. Also included in the proposed master plan are new parking areas, revised loading area for the Food Lifeline building, open space and amenities for PHL Staff, landscaping, public art, and new pedestrian and vehicular circulation layout.

21. The Public Health Lab is proposing to add 190 employees to their current 140 employees for a total of 330 employees over the 20-year life of the Master Plan.

22. Parking would increase to 400 spaces from the current 142 spaces, an increase of 258 spaces over 20 years.

23. Total building area would increase to 164,500 gross square feet from the current 72,500 gross square feet.

Noticing and Procedures

24. Representatives from The Public Health Lab held a series of community meetings to guide the design process and listen to feedback from the community. Participating organizations included Briarcrest and Ridgecrest Neighborhood Associations, Fircrest School, Friends of Fircrest, Shoreline Fire Department, Shorecrest High School, King County Sheriffs' Office and the City of Shoreline. Five meetings were held (not including early community input meeting and neighborhood meeting) to discuss design options for the Public Health Lab. Those meetings were held on February 13, February 27, March 13, April 3, and May 21, 2009.

25. Staff analysis of the proposed Comprehensive Plan Amendment, rezone and Master Development Plan Permit considered information gathered from a pre-application meeting on February 5, 2009, an Early Community Input Meeting on March 5, 2009, a neighborhood meeting conducted on April 14, 2009, public comment letters, traffic reports, site visits, and meeting minutes from the Community Liaison Panel meetings.

26. A Public Notice of Application for the proposals was posted on site, mailed to all residents within 1000 feet, and advertised in the Seattle Times on May 27, 2010.

27. A Public Notice of Hearing for the proposals was also posted, mailed and advertised in the same way as above on July 26, 2010.

28. 2 comments were received during the required SEPA comment period. See ***Attachment 3 (Public Comments)***.

29. After reviewing the information in the submittal and comments, the Planning Department concluded that the impacts of the Comprehensive Plan Amendment, the rezone and the MDP did not warrant additional analysis through an Environmental Impact Statement and issued a DNS on July 21, 2010.

30. An open record public hearing for the Comprehensive Plan Amendment, rezone and the MDP is being held by the Planning Commission on August 19, 2010.

Comprehensive Plan Land Use Designations.

31. The site is designated Campus in the Comprehensive Plan. The adjacent parcel to the west, north and east have a Comprehensive Plan Land Use designation of Campus as well. Most parcels to the south, across NE 150th Street, have a Comprehensive Designation of Low Density Residential. There are High-Density Residential designated parcels on the south side of NE 150th Street adjacent to 15th Avenue NE. The Public Health Lab is proposing to increase its campus by 5 acres, thereby increasing the acreage from 7.6 acres to 12.6 acres. As noted

above, that Comprehensive Plan amendment is being considered by the Commission concurrently with the rezone and MDP. See ***Attachment 4 (Comprehensive Plan Map).***

Current Zoning and Uses

32. As part of Ordinance 507, the Public Health Lab Campus was rezoned to Public Health Lab Campus Zone (PHZ). The adjacent parcel to the west, north and east is zoned Fircrest Campus Zone (FCZ) and is developed with the Fircrest School, a home to developmentally disabled residents. Most parcels to the south are zoned R-6 and developed with single-family homes. Directly across NE 150th Street are parcels zoned R-18, and to the west of these are parcels zoned R-48 and Neighborhood Business (NB). In conjunction with the Comprehensive Plan Amendment and the MDP, the Public Health Lab is proposing to rezone 5 acres of the FCZ to PHZ, thereby increasing the PHZ from 7.6 acres to 12.6 acres. The portion proposed for rezone is currently undeveloped. See ***Attachment 5 (Zoning Vicinity Map, and Attachment 6- Proposed Zoning Maps).***

33. The Public Health Lab was established to provide a wide range of diagnostic and analytical services for the assessment and surveillance of infectious, communicable, genetic, chronic diseases and environmental health concerns, for the citizens of Washington State. The Lab also serves to coordinate and promote quality assurance programs for private clinical and environmental laboratories through training, consultation, certification and quality assurance sample programs. In addition the Lab has expanded their role in providing scientific and managerial leadership for the development of public health policy.

Impacts of the Master Development Plan Permit

34. The following table outlines the development standards for the Campus (all Campus Zones have the same standards) and the proposed Public Health Lab Master Development Plan:

	Max allowed by Ord. 507	**PHZ (proposed by applicant)**
Front, side and rear yard setback from right-of-way	None specified; City Council can determine	40’
Front, side and rear yard setbacks from R-6 Zones	20-foot setback at 35’ building height. Above 35’, a building setback ratio of 2:1.	20’ side setback from the Fircrest Campus. The PHL is not adjacent to any R-6 parcels
Max. Building Coverage	None specified; City Council can determine	50%
Max. Impervious Surface	None specified; City Council can determine	75%
Height	65’	65’ (15’ additional height for roof top equipment)
Density (residential development)	None (see footnote)	None proposed
Total Units (potential)	None	None

Footnote: Ordinance 507 limits height to a maximum of 65’ buildings and limits density to 48 dwelling units per acre for all sites designated Campus. The Comprehensive Plan does not allow residential as a use on the Public Health Lab Campus so density requirements are not applicable.

35. Traffic Impacts

    The applicant has submitted a traffic report to the City. The City Traffic Engineer has determined that the 190 new employees on the site after the completion of the Public Health Lab’s Master Development Plan will not overburden Shoreline’s transportation system. The traffic report shows that the added employees will result in modest traffic impacts over the next 15-20 years and will not require any traffic mitigation imposed by the City.

36. Safety Impacts

    A biological risk assessment was conducted in accordance with the methods and standards provided in the *Biosafety in Microbiological and Biomedical Laboratories* (BMBL) 5th Edition publication by the Centers for Disease Control (CDC) and the National Institute of Health (NIH). Among the guidelines, the BMBL provides a classification system called biosafety levels (BSLs) that are

based on risk assessments which evaluate at which BSL level the laboratory work should be conducted (BSL 1, 2, 3, or 4, indicating lowest to highest risk levels). The Public Health Lab is a BSL-3.

According to the Risk and Safety Assessment for the Washington State Public Health Laboratory, the Lab is in compliance with applicable regulations that protect laboratory workers and the community in which the laboratory operates. The Public Health Lab will continue to operate at a BSL-3 under the proposed Master Development Plan. (***See Attachment 7-Risk and Safety Assessment***).

37. Air Quality Impacts

An air quality assessment for the Washington State Public Health Laboratory was conducted during the last addition to the health lab in December 2008. The objective of the study was to obtain accurate concentration estimates at building air intakes and other sensitive locations due to emissions from various exhaust sources located on or around the lab addition.

The air quality study found that exhaust meets or exceeds design criterion for all locations tested. (***See Attachment 8-Air Quality Assessment for the Washington State Public Health Lab Addition***).

38. Employment Impacts

The Public Health Lab proposes to add 50 Public Health Lab employees to the existing 140 staff and relocate 140 DOH Epidemiology staff from the Kent, WA facility. This will bring an additional 190 jobs to Shoreline.

39. Stormwater Impacts

The applicant submitted a Master Drainage Plan for the Public Health Lab Master Plan. The Master Drainage Plan provides a general and preliminary framework for future development on the campus. Additional geotechnical investigations and other studies will be required during the actual design and permitting of each phase of the project. The City's Drainage Review Engineer reviewed and approved the Master Drainage Plan on July 19, 2010.

ANALYSIS OF PROPOSAL CRITERIA

40. The purpose of a Comprehensive Plan Amendment and rezone is to provide a mechanism to make changes to a land use designation and zoning classification. The purpose of the Master Development Plan is to define the development of property zoned campus or essential public facilities in order to serve its users, promote compatibility with neighboring areas and benefit the community with flexibility and innovation.

41. The notice and meeting requirements for the Type C actions and the Type L action have all been met in this case.

COMPREHENSIVE PLAN AMENDMENT ANALYSIS (SMC 20.30.340)

Comprehensive Plan Amendment Criteria 1: *Is the amendment is consistent with the Growth Management Act and not inconsistent with the Countywide Planning Policies, and the other provisions of the Comprehensive Plan and City policies?*

42. The amendment is consistent with the Growth Management Act; this amendment will provide more employment opportunities to meet the economic development goals of the City. The amendment will encourage development in an urban area where adequate public facilities exist.

Comprehensive Plan Amendment Criteria 2: *Does the amendment address changing circumstances, changing community values, incorporate a subarea plan consistent with the Comprehensive Plan vision or corrects information contained in the Comprehensive Plan?*

43. The amendment addresses changing circumstances. At one time, it was thought that a Fircrest-related use might expand onto this property. Now the State has concluded that Fircrest-related activities will not require use of this property which frees it to be used by another State facility.

Comprehensive Plan Amendment Criteria 3*: Will the amendment benefit the community as a whole and not adversely affect community facilities, the public health, safety or general welfare?*

44. The community will benefit if the PHL expands in order to fulfill its mission as a BSL-3 facility. The Comprehensive Plan limits development of the site to those uses required at a BSL-3 facility, which, according to the State's analysis, will not adversely affect the nearby Fircrest facilities or public health, safety or general welfare.

REZONE ANALYSIS (SMC 20.30.320)

Rezone Criteria 1*: Is the rezone consistent with the Comprehensive Plan?*

45. The rezone would implement the Comprehensive Plan text change by increasing the size of the PHL site and its associated zoning by 5 acres.

Rezone Criteria 2: *Will the rezone adversely affect the public health, safety or general welfare?*

46. By permitting uses that support the function of the PHL, the rezone will promote public health, safety and welfare.

Rezone Criteria 3: *Is the rezone warranted in order to achieve consistency with the Comprehensive Plan?*

47. The rezone would implement the Plan change.

Rezone Criteria 4: *Will the rezone be materially detrimental to uses or property in the immediate vicinity of the subject rezone?*

48. The proposed rezone will have minimal negative impacts to the properties in the immediate vicinity. It would allow uses currently permitted on the 7.6 acre PHL site. New development would likely result in more jobs; however, parking would need to be provided on site and the number of new trips would not overburden the existing street network.

Rezone Criteria 5: *Will the rezone have merit and value for the community?*

49. New jobs might provide employment opportunities for residents of Shoreline. In addition, new employees are likely to do some shopping in the immediate vicinity which would provide demand for other businesses to expand.

MASTER DEVELOPMENT PLAN ANALYSIS (SMC 20.30.353)

MDP Criteria 1: *The project is designated as either campus or essential public facility in the Comprehensive Plan and Development Code and is consistent with goals and policies of the Comprehensive Plan.*

50. The current Washington State Public Health Lab site is designated as Public Health Laboratory Campus Zone (PHZ). The Public Health Lab has applied for a Comprehensive Plan Amendment to modify policy LU-43 to expand the size of the campus from 7.6 to 12.6 acres. Assuming that change to LU-43 is approved, the plans reflected through this master development plan are consistent with the goals and the policies of the Comprehensive Plan.

MDP Criteria 2*: The master development plan includes a general phasing timeline of development and associated mitigation.*

51. The Public Health Lab has developed their plan to occur over a 20 year period. The project is outlined in 5 phases.

52. The chart below outlines the 20-year plan:

	2011-2013	2013-2015	2015-2017	2017-2019	2019-2021	2021-2023	2023-2025	2025-2027	2027-2029
Phase 1									
N-wing addition and remodel									
New sanitary sewer connection									
Phase 2									
R-wing addition									
Mechanical wing addition									
Disconnected from steam tunnel									
Phase 3									
Admin building									
New parking and entry									
Fircrest boulevard									
New power, gas and water service									
Phase 4									
Demo A and Q wings									
New South Lab wing									
New lunch and meeting rooms									
Phase 5									
Remodel E and C wings									
New office building									
New parking garage									

MDP Criteria 3: *The master development plan meets or exceeds the current regulations for critical areas if critical areas are present.*

53. There are no critical areas present on the Public Health Lab Campus.

MDP Criteria 4: *The proposed development uses innovative, aesthetic, energy efficient and environmentally sustainable architecture and site design (including low impact development stormwater systems and substantial tree retention) to mitigate impacts to the surrounding neighborhoods.*

54. Via the MDP, future development on the Public Health Lab Campus will be guided by sustainable design and construction practices. The state of

Washington requires LEED construction for all structures over 5 million dollars. The Public Health Lab intends to employ sustainable practices to steer design, construction, and site development toward not only energy efficiency, but also community interaction. See Decision Criteria item #7 for further elaboration on architectural and site design.

55. The City of Shoreline requires all stormwater improvements to be in accordance with the 2005 Department of Ecology Stormwater Manual for Western Washington. In addition, the SMC 13.10 requires an emphasis on using Low Impact Design (LID) Best Management Practices (BMP's) to convey and treat stormwater runoff.

56. The Public Health Lab proposes to install bioretention and rain garden facilities. Other LID measures may include rainwater harvesting, bioretention with full infiltration, green roofs, and the use of pervious pavers (page 3 of the Master Drainage Report) to treat onsite stormwater and runoff treatment.

57. The proposed onsite stormwater management improvements call for landscaping and open drainage areas (bioretention and rain gardens) to treat stormwater and reduce overall site paving. Each phase of the master plan will be required to provide updated survey information, geotechnical review and additional studies as needed to evaluate existing conditions and to complete the design.

58. The proposal retains 62% of the significant trees on the Campus. Retention of significant trees adds to LID measures to mitigate stormwater runoff and meets the intent of decision criteria #4.

59. In order to more fully meet criteria 4, the Planning Commission finds the following condition shall be added to the MDP:

    An updated air quality study shall be submitted and approved with each successive permit for addition to the laboratory building.

MDP Criteria 5: *There is either sufficient capacity or infrastructure (e.g., roads, sidewalks, bike lanes) in the transportation system (motorized and nonmotorized) to safely support the development proposed in all future phases or there will be adequate capacity and infrastructure by the time each phase of development is completed. If capacity or infrastructure must be increased to support the proposed master development plan, then the applicant must identify a plan for funding their proportionate share of the improvements.*

60. The Transportation Impacts Analysis submitted by Heffron Transportation, Inc. indicates no major impact to the surrounding transportation system. The Master Plan will increase site traffic by 750 vehicle trips per day with 104

new vehicle trips during the PM peak hour (25 in, 79 out). The Level of Service (LOS) for the intersections surrounding the site will be unchanged from 2019 without project to 2019 with project.

61. Part of the proposal, as set forth in the traffic report, is to install missing sidewalk sections along the north side of NE 150th Street between 15th Avenue NE and 20th Avenue NE.

MDP Criteria 6: *There is either sufficient capacity within public services such as water, sewer and stormwater to adequately serve the development proposal in all future phases, or there will be adequate capacity available by the time each phase of development is completed. If capacity must be increased to support the proposed master development plan, then the applicant must identify a plan for funding their proportionate share of the improvements.*

62. The applicant indicates that there will be sufficient capacity within public services to adequately serve the development proposal in all future phases. When the applicant submits for permits on any new or remodeled building, a water availability certificate, sewer availability certificate, and fire flow availability must accompany the application materials.

MDP Criteria 7: *The master development plan proposal contains architectural design (including but not limited to building setbacks, insets, facade breaks, roofline variations) and site design standards, landscaping, provisions for open space and/or recreation areas, retention of significant trees, parking/traffic management and multimodal transportation standards that minimize conflicts and create transitions between the proposal site and adjacent neighborhoods and between institutional uses and residential uses.*

63. The Public Health Lab has proposed various architectural and site design standards. Standards for setbacks, building mass, hardscape, parking, and site lighting can be found in ***Attachment 9 (Development and Design Standards).***

64. Proposed design standards include tree retention, new plantings, campus site design, drainage, pavement, building materials and building design. **.**

65. The Public Health Lab Campus has 319 significant trees. 119 significant trees are proposed to be removed over a 20-year time period. 200 significant trees will be retained. This is 62% significant tree retention. The Shoreline Municipal Code requires 20% significant tree retention (The code allows up to 255 trees to be removed and the Lab is proposing to cut 119). As the Campus redevelops, there will be additional landscaping planted.

66. The proposed Master Plan provides a pedestrian link from NE 150th Street through the Public Health Lab Campus to the Fircrest Campus. Open space is

provided around each of the new buildings/additions with courtyards for the Lab Staff.

67. The plan will relocate the main vehicular access to the east. The new access is named "Fircrest Boulevard" and creates better vehicular access to the Lab, the Food Lifeline warehouse and the proposed parking garage.

68. Proposed setbacks combined with landscaping provide meaningful separation from the street and proposed buildings/parking lot. The Lab is proposing a 40-foot setback from NE 150th Street and a 20-foot setback from the proposed "Fircrest Boulevard". Within those setbacks are retained significant trees, landscaping, and a pedestrian link to the Fircrest Campus.

MDP Criteria 8: *The applicant shall demonstrate that proposed industrial, commercial or laboratory uses will be safe for the surrounding neighborhood and for other uses on the campus.*

69. The Public Health Lab is not introducing any changes in use on the campus and is consistent with the PHZ zoning land use matrix. Further, the Risk and Safety Assessment completed for the PHL indicates the Lab is in compliance with applicable regulations that protect laboratory workers and the community in which the laboratory operates.

CONCLUSIONS

The Applicant has met all procedural requirements in the Development Code for all three proposals.

COMPREHENSIVE PLAN AMENDMENT

As set forth in findings of fact #42-44, the Applicant's proposed Comprehensive Plan Amendment meets the criteria set forth in SMC 20.30.340

REZONE

As set forth in finding of fact #45- 49, the Applicant's proposed rezone meets the criteria set forth in SMC 20.30.320.

MASTER DEVELOPMENT PLAN

The Applicant's proposed Master Development Plan, as conditioned by the Planning Commission, meets the criteria set forth in SMC 20.30.353.

Criteria 1: As set forth in finding of fact #50, The Public Health Lab's proposed MDP meets Criteria 1.

Criteria 2: As set forth in findings of fact #51 and #52, The Public Health Lab's proposed MDP meets Criteria 2.

Criteria 3: As set forth in finding of fact #53, The Public Health Lab's proposed MDP meets Criteria 3.

Criteria 4: As set forth in findings of fact #54-59, The Public Health Lab's proposed MDP requires future development be guided by sustainable design and construction practices, includes analysis that shows low impact development stormwater systems, and retains 60% of significant trees. The Commission concludes that, with the additional condition recommended in findings of fact #59 added to the MDP, The Public Health Lab's proposed MDP, as conditioned, meets Criteria 4.

Criteria 5: As set forth in findings of fact #60-61, The Public Health Lab's proposed MDP meets Criteria 5.

Criteria 6: As set forth in findings of fact #62, The Public Health Lab's proposed MDP meets Criteria 6.

Criteria 7: As set forth in findings of fact #63-68, The Public Health Lab's proposed MDP meets Criteria 7.

Criteria 8: As set forth in finding of fact #69, The Public Health Lab's proposed MDP meets Criteria 8.

CONDITIONS

The following are added conditions based on staff analysis, and public comment.

70. An updated air quality study shall be submitted and approved with each additional permit for addition to the laboratory building.

RECOMMENDATION

The Planning Commission recommends that the City Council approve the Comprehensive Plan Amendment, the rezone, and the Master Development Plan, as conditioned, for the Washington State Public Health Lab Campus located at 1610 NE 150th Street.

Date: _____

By: _____
Planning Commission Chair

ATTACHMENTS
Attachment 1- Vicinity Map
Attachment 2- Master Plan
Attachment 3- Public Comment Letters
Attachment 4- Vicinity Map of Comprehensive Plan Land Use Designations
Attachment 5- Vicinity Map of Zoning Designations
Attachment 6- Proposed Zoning Maps
Attachment 7- Risk and Safety Assessment
Attachment 8- Air Quality Assessment for the Washington State Public Health Lab Addition
Attachment 9- Development and Design Standards

CURRENT
PHL CAMPUS
PROPERTY

PROPOSED
ADDITIONAL
CAMPUS
PROPERTY

VICINITY
AERIAL MAP
NTS

Fircrest Campus Connection

Bike Parking

Detention Landscape Feature

Employee Entrance

Interior Courtyard Raingardens

Pedestrian Walking Path

Exterior Plaza with tables and benches

Employee exterior Plaza (controlled access)

Public Art Walk

Bermed Campus Edge

Pedestrian Campus Entry (Possible transit stop)

Two story parking garage

Solar Panel Shading over Parking Garage

Alternative Fueling Station for Fleet Parking

Controlled access

Green Roof at three story Office building

Third Floor Roof Deck

Public Meeting Room

Bike Parking

Main Entry Plaza

Native Plant Health Garden

Alternative Fueling Station

Connection to South Woods

JOHNSON SOUTHERLAND HDR

5 25 100
0 15 50 200
NTS
NORTH

WASHINGTON STATE PUBLIC HEALTH LABORATORIES

CONCEPT MASTER PLAN

April 2010

Steve Szafran

From: GARY LARSON [fastsilver43@msn.com]
Sent: Monday, May 31, 2010 5:39 PM
To: Steve Szafran
Subject: Rezone of 1610 NE 150th St.

Hello,

I am wondering if the recent proposal to rezone 1610 NE 150th St will cause more of the forested area above the lot where the state public lab is to be destroyed, and if so how much? I hope that this will not be the case at all. Please advise, thank you.

concerned,
Gary L.

Steve Szafran

From: Ken Winnick [kbwinnick@gmail.com]
Sent: Sunday, June 20, 2010 3:53 PM
To: Brian Lee; Steve Szafran
Cc: CECILY KAPLAN; janetway
Subject: Re: public health lab @ fircrest

Hi,

I recently noticed the info board at the public health lab. The comment period appears to be over, but I think it was only open for 1 or 2 weeks based on the dates of the announcements on the board.

I understand the project is seeking a finding of "non-significance" (sorry if I get some of the terminology wrong).

I quickly looked up a few documents on the web about the project.

I was not able to find is any reference to any type of air-quality and/or traffic impacts studies.

Air quality impacts seem especially important, given the fact that this lab handles (or, could handle) very toxic materials, and also that it uses ventilation hoods and other air isolation techniques.

Has there been any studies to see what would happen if there was an accidental contaminated air emission from the facility? Unless I'm misunderstanding something, I would think that an air study would be an absolute requirement for any new expansions on the site.

Has there been an air study and/or traffic study for the proposed development? If so, can you point me in the right direction?

Thanks,
Ken Winnick

PS--I live directly across the street from the lab, so naturally this is of great interest to me.

Steve Szafran

From: Ken Winnick [kbwinnick@gmail.com]
Sent: Monday, June 21, 2010 9:57 AM
To: Steve Szafran
Subject: Re: public health lab @ fircrest

Hi Steve,

One last additional question for now: You mentioned below that the risk assessment looked at "uses at the Health Lab." Does that include uses where bio-terrorism and/or other highly toxic agents are held or processed at the lab?

I've heard conflicting reports as to whether or not the lab would be used to handle highly toxic and deadly agents, but I would have to assume that it *would* in fact be used in for these materials if an emergency situation were to arise. Is that your assessment as well?

thanks again,
Ken Winnick
15307 15th Ave NE #6

On Mon, Jun 21, 2010 at 9:48 AM, Steve Szafran <sszafran@shorelinewa.gov> wrote:

Yes, the risk assessment looked at the uses at the Health Lab and how those uses would be contained if an emergency occurred. Air was one of the primary studies that occurred in that report.

I haven't issued any SEPA Determination yet. I'm still evaluating three things: traffic, safety and stormwater. The City's traffic engineer, Rich Meredith, has indicated traffic impacts from the master plan are minimal over the next 20 years and I have a meeting with the City's stormwater engineer to go over some other issues with the site. The only reason I would require an EIS is if there is an impact that cannot be mitigated through SEPA or by adding additional conditions to the master plan.

-----Original Message-----
From: Ken Winnick [mailto:kbwinnick@gmail.com]
Sent: Monday, June 21, 2010 9:41 AM
To: Steve Szafran
Subject: Re: public health lab @ fircrest

Hi Steve,

Thanks for the report, I'll have a look. By the "risk/hazard" study, are you referring to an air study?

Is the development proceeding without an EIS?

Thanks,

Ken Winnick

On Mon, Jun 21, 2010 at 9:16 AM, Steve Szafran <sszafran@shorelinewa.gov> wrote:

Thanks for your email.

Yes, air and traffic studies have been completed. Although it is too late to submit comments on the SEPA determination, it is not too late to submit comments about the Health Lab's Master Plan. Please take a look at the traffic report and send me a response. In the meantime, I will track down the risk/hazard study that was completed and send you that as well.

-----Original Message-----
From: Ken Winnick [mailto:kbwinnick@gmail.com]

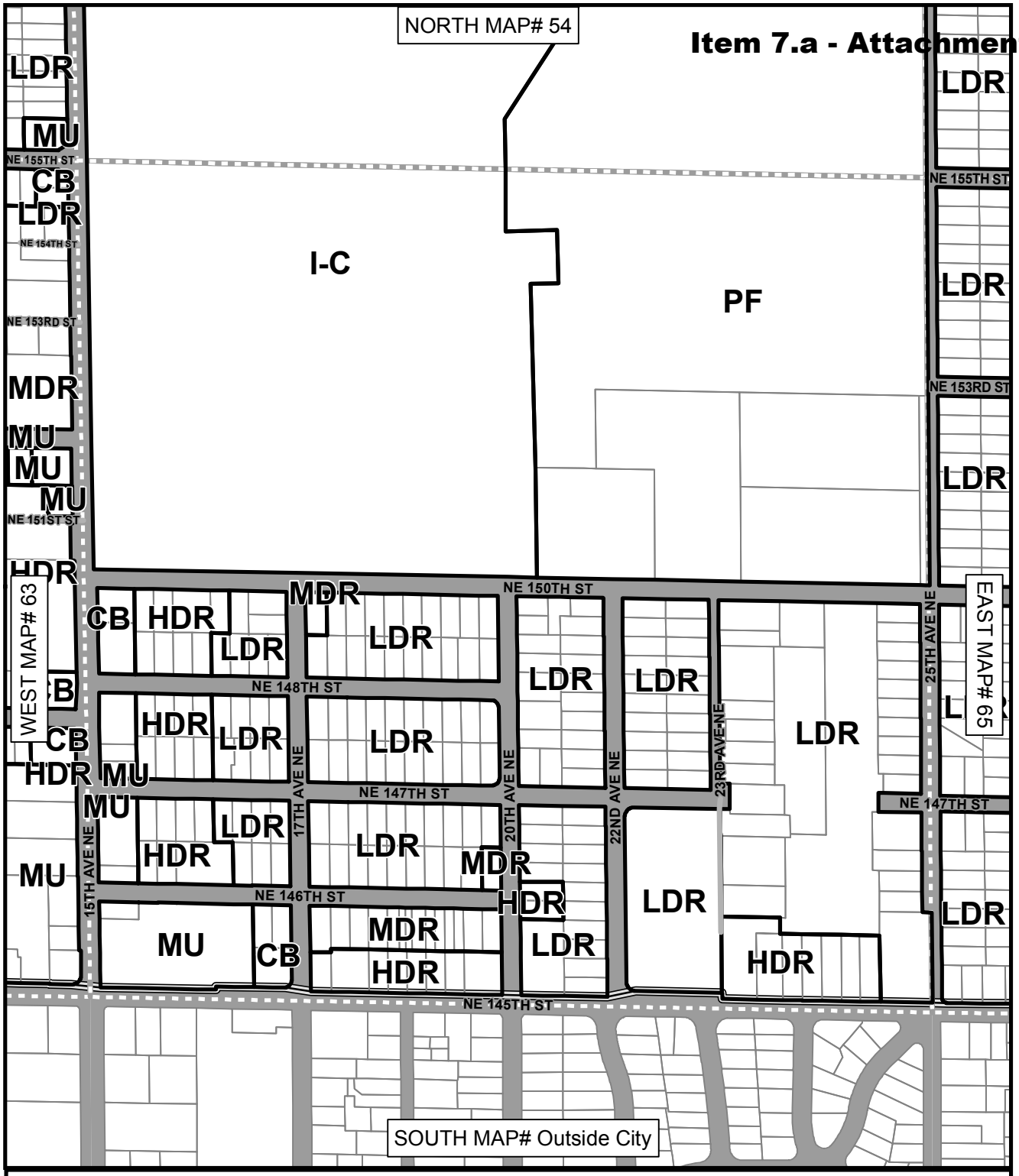
Sent: Sunday, June 20, 2010 3:53 PM
To:

Brian Lee; Steve Szafran

Cc: CECILY KAPLAN; janetway
Subject: Re: public health lab @ fircrest

Hi,

I recently noticed the info board at the public health lab. The comment period appears to be over, but I think it was only open for 1 or 2 weeks based on the dates of the announcements on the board.



CITY OF SHORELINE COMPREHENSIVE PLAN LAND USE MAP

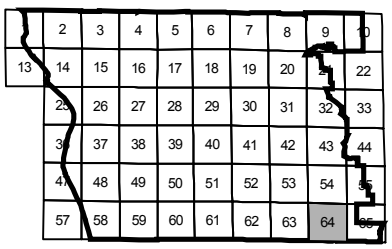
Plot Date: 5/27/2010

Land Use Designation Legend

BaSSA	Ballinager Special Study Area	**NCBD**	North City Business District
CB	Community Business	**PF**	Public Facility
HDR	High Density Residential	**PrOS**	Private Open Space
LDR	Low Density Residential	**PubOS**	Public Open Space
MDR	Medium Density Residential	**RB**	Regional Business
I-C	Institution/Campus	**SSA**	Special Study Area
MU	Mixed Use		

N

S



MAP # 64

1:3,600

0 75 150 300 450 600 Feet

Feature Legend

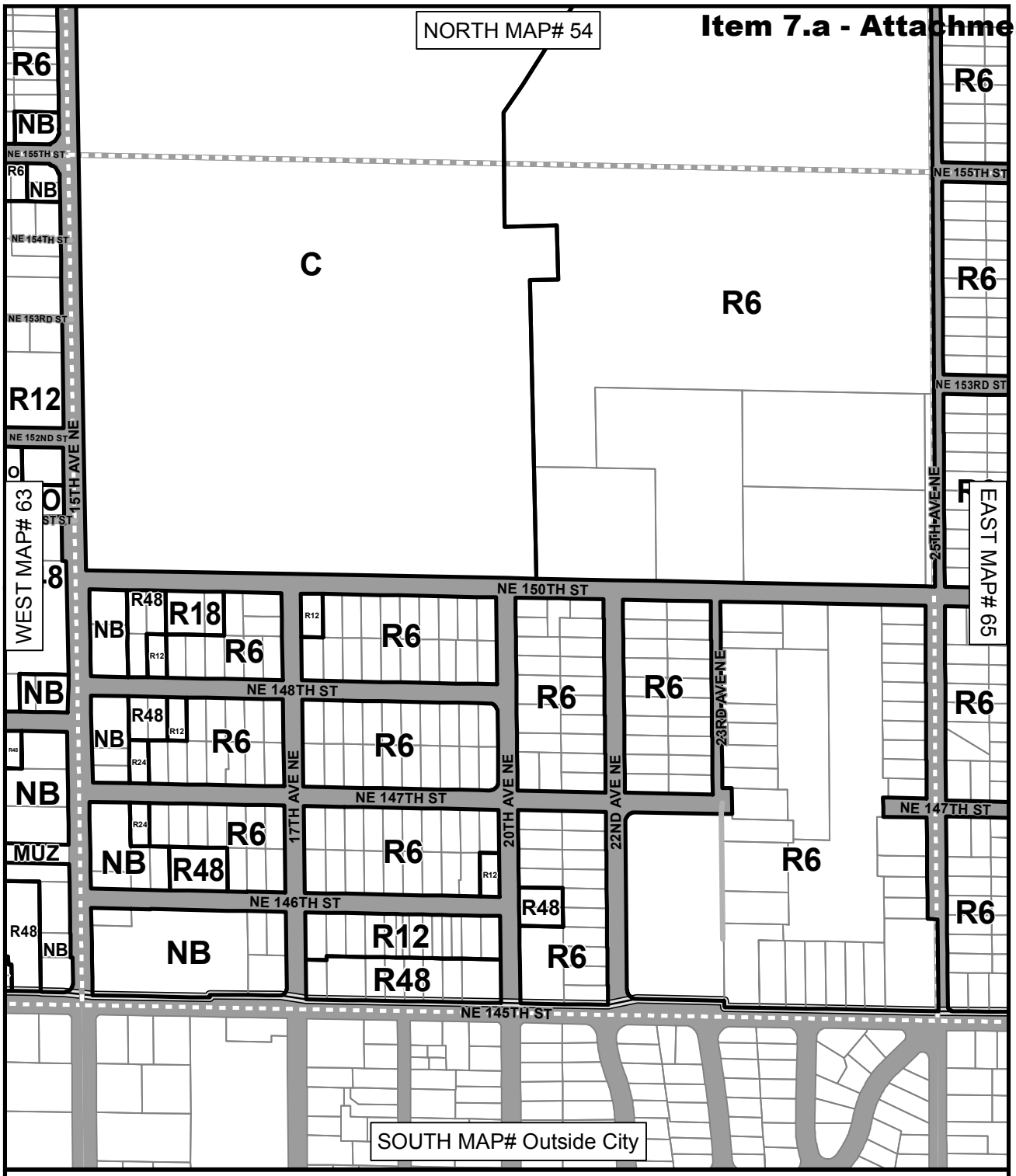
- Map Tile Lines
- City Boundary
- Unclassified ROW
- Parcel Line

No warranties of any sort, including accuracy, fitness, or merchantability, accompany this product.

Representation of official Comprehensive Plan land use map adopted by City Ordinance No. 292. Shows amendments through May 31, 2010.

SW1/4-S16-T26N-R4 E

CITY OF SHORELINE



CITY OF SHORELINE ZONING MAP

Plot Date: 7/29/2010

Zoning Legend

R4	Residential, 4 units/acre	**MUZ**	Mixed Use Zone
R6	Residential, 6 units/acre	**MUZ-CZ**	Mixed Use Zone/Contract Zone
R8	Residential, 8 units/acre	**NB**	Neighborhood Business
R12	Residential, 12 units/acre	**NCBD**	North City Business District
R18	Residential, 18 units/acre	**CB**	Community Business
R24	Residential, 24 units/acre	**O**	Office
R48	Residential, 48 units/acre	**I**	Industrial
CZ	Contract Zone	**PA**	Planned Area
C	Campus		

Feature Legend

- Map Tile Lines
- City Boundary
- Unclassified ROW
- Parcel Line

1	2	3	4	5	6	7	8	9	10
13	14	15	16	17	18	19	20	21	22
25	26	27	28	29	30	31	32	33	
36	37	38	39	40	41	42	43	44	
47	48	49	50	51	52	53	54	55	
57	58	59	60	61	62	63	64	65	

MAP # 64

1:3,600

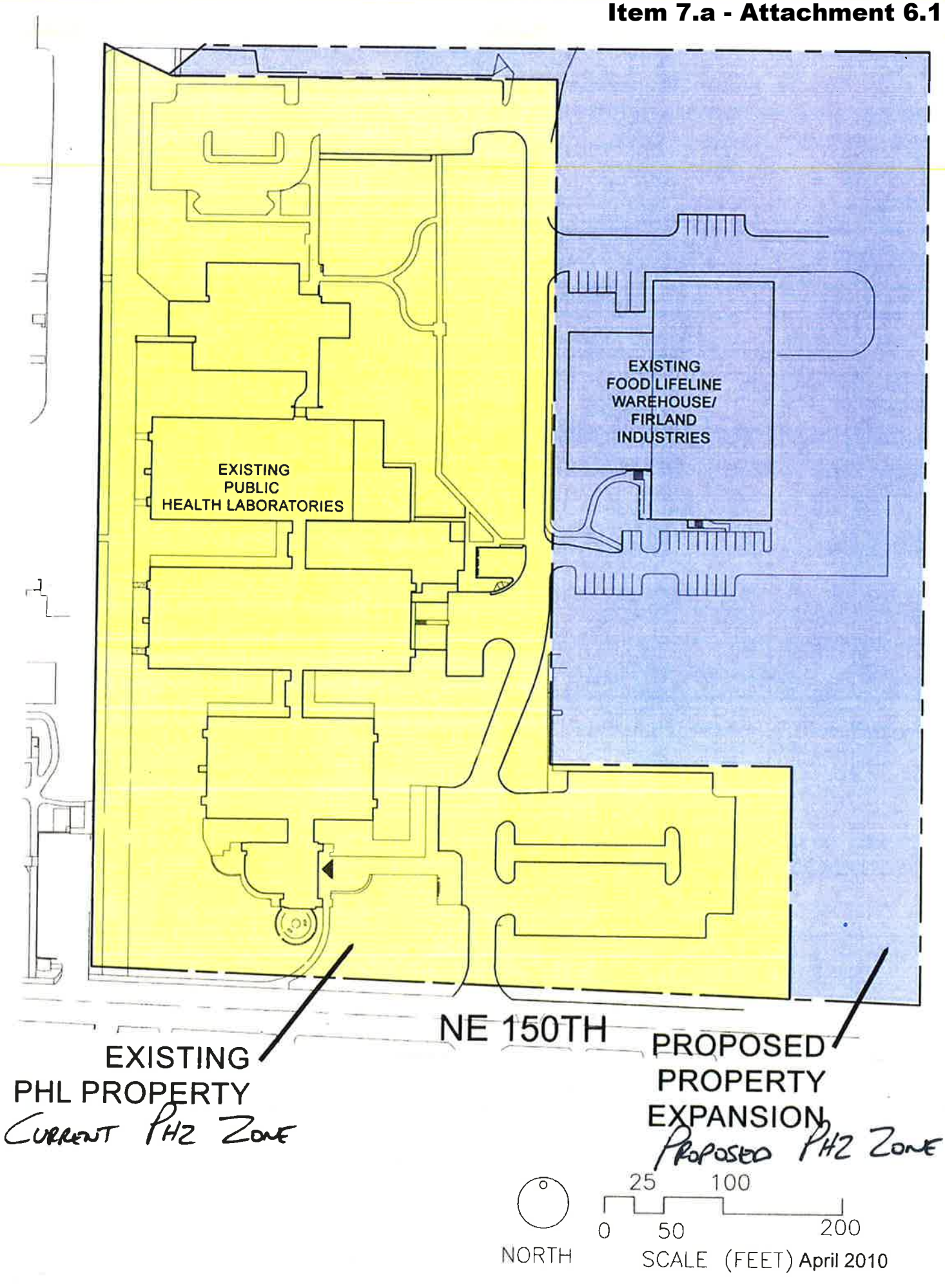
0 75 150 300 450 600 Feet

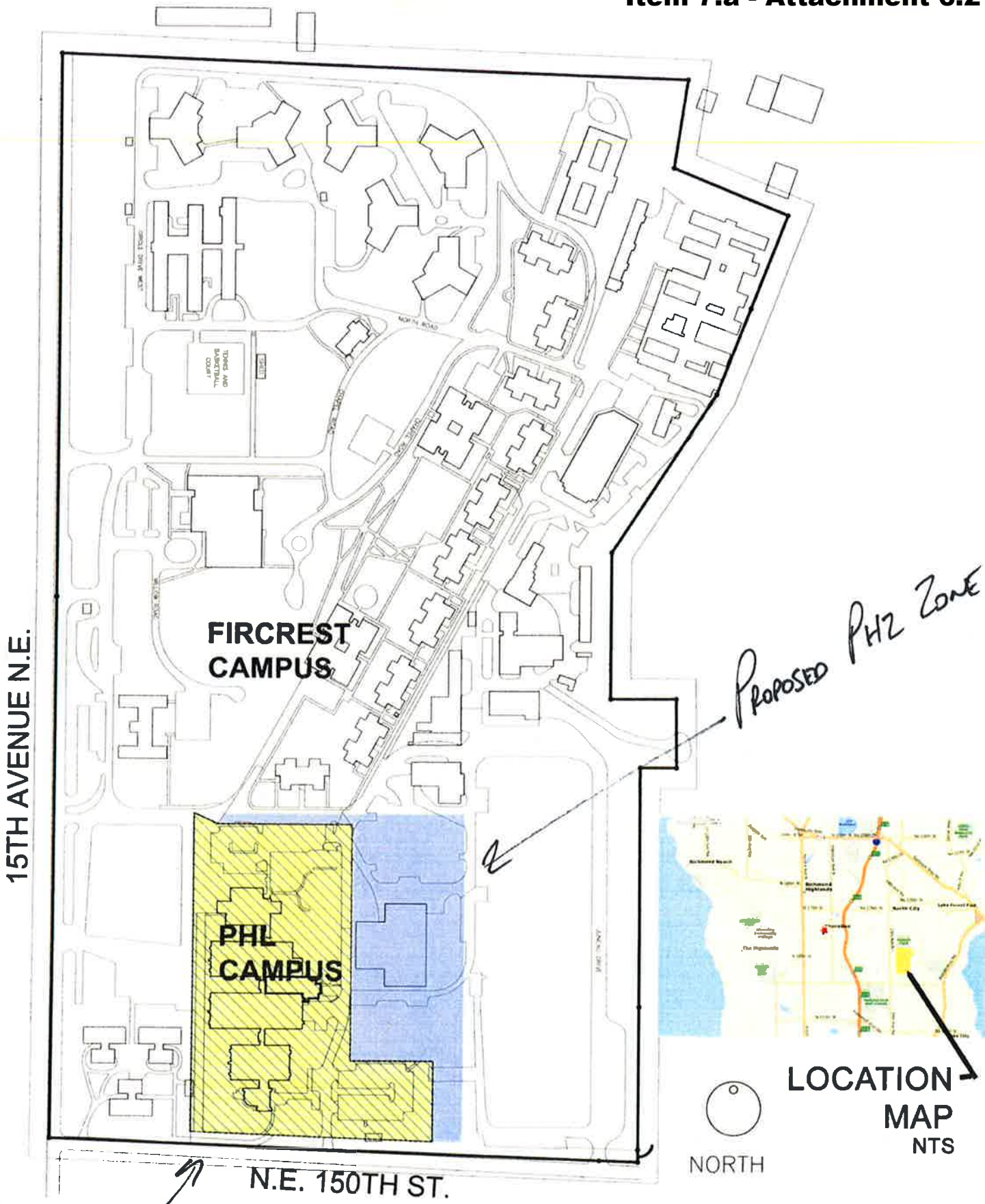
SW1/4-S16-T26N-R4 E

No warranties of any sort, including accuracy, fitness, or merchantability, accompany this product.

Representation of official zoning map adopted by City Ordinance No. 292. Shows amendments through March 16, 2010.

CITY OF SHORELINE


EXISTING
FOOD LIFELINE
WAREHOUSE/
FIRLAND
INDUSTRIES
EXISTING
PUBLIC
HEALTH LABORATORIES
NE 150TH
EXISTING
PHL PROPERTY
CURRENT PHZ ZONE
PROPOSED
PROPERTY
EXPANSION
PROPOSED PHZ ZONE
NORTH
0
25
50
100
200
SCALE (FEET) April 2010


15TH AVENUE N.E.
FIRCREST CAMPUS
PROPOSED PHZ ZONE
PHL CAMPUS
N.E. 150TH ST.
CURRENT PHZ ZONE
NORTH
LOCATION MAP
NTS

April 2010

Prepared for:
Washington State Department of Health
Olympia, Washington

FINAL
Risk and Safety Assessment
Washington State Public Health Laboratory
1610 150th Street NE
Shoreline WA 98155

Prepared by:
Kleinfelder
2405 140th Avenue NE, Suite A101
Bellevue WA 98005

November 21, 2008
Kleinfelder Project Number 96783

EXECUTIVE SUMMARY

This Risk and Safety Assessment was conducted to provide a comprehensive evaluation of potential hazards to the community posed by the presence of the Washington State Department of Health's (DOH) Public Health Laboratory (WA-PHL) located in Shoreline, Washington. Kleinfelder prepared this assessment report in accordance with the Statement of Work (SOW) under DOH Work Order #1, Contract # GA 32206, DOH #N17187. This assessment report provides information on potential hazards from biological, chemical, and radiological materials that may arise from the laboratory, as well as risks of illness, injury, or other harm to the general public who may be exposed directly or indirectly to consequences of the presence and activities of the WA-PHL.

Intro

This assessment includes both quantitative and qualitative methodologies to evaluate hazard and was performed according to accepted professional and academic industry standards by a team of professionals in the fields of laboratory biosafety, laboratory chemical hygiene, laboratory radiological safety, and laboratory risk analysis.

qualifications

Based on the risk and safety assessment described in this report, the WA-PHL is in compliance with applicable regulations that protect laboratory workers and the community in which the laboratory operates. Under normal operating conditions, the most-probable risks that may be associated with the laboratory can be efficiently mitigated by existing programs, policies, and procedures and are unlikely to pose a hazard to the surrounding community.

BACKGROUND

The WA-PHL provides a wide range of diagnostic and analytical services for the assessment and surveillance of infectious, communicable, genetic, chronic diseases and environmental health concerns, for the citizens of the State of Washington. The laboratories also serve to coordinate and promote quality assurance programs for private clinical and environmental laboratories through training, consultation, certification and quality assurance sample programs. In addition, over the last decade, the Public Health Laboratories have expanded their role in providing scientific and managerial leadership for the development of public health policy.

what the lab does

The laboratory is currently a 70,000 square-foot facility, which has operated since 1985, and contains several laboratories, (including microbiology, environmental, and newborn

Size date

1 - Redacted portions are exempt from public disclosure under RCW 42.56.420(1)(a).

screening), shipping and receiving areas, maintenance areas, storage, and office space. To facilitate program growth and changes in laboratory design standards since 1985, the DOH is planning to enlarge the existing laboratory to provide additional biosafety level 3 (BSL-3) space and replace and enlarge the existing specimen receiving area. Based on a review of the design plans and interviews of laboratory staff involved in the design, the laboratory expansion is not expected to introduce hazards different or of greater magnitude than those evaluated in this risk and safety assessment report.

Project

No new impacts

Expansion specifics

Recently, concerns have arisen regarding potential hazards to communities surrounding public health laboratories. Therefore, the DOH prepared an SOW to conduct a risk and safety assessment for the activities at the WA-PHL as they might affect the surrounding community. In addition, the DOH requested that recommendations be provided for risk management measures as they apply to any risks identified during the assessment.

Per the SOW, the following assessments were conducted:

- Evaluation of the location of the WA-PHL compared to other public health laboratories in the United States
- Biological Hazards Assessment
- Chemical Hazards Assessment
- Radiological Hazards Assessment
- Physical Hazards Assessment
- Security Vulnerability Assessment
- Earthquake Hazards
- Emergency Response Program Assessment

Summaries of these assessments are provided below.

WASHINGTON PUBLIC HEALTH LABORATORY LOCATION ANALYSIS

For comparison of the WA-PHL location to the locations of other PHLs across the country, an initial list of 56 PHLs was obtained from the Association of Public Health Laboratories (APHL) State Public Health Laboratories Emergency Contact List, August 2006. To reduce this extensive list to a size manageable under this task, a subset of 12 PHLs was identified based on two criteria: size of surrounding population and similarity of mission as compared to the WA-PHL.

1 - Redacted portions are exempt from public disclosure under RCW 42.56.420(1)(a).

Population estimates were obtained from the United States Census Bureau. According to the Census Bureau, the population of the Seattle area is 594,210. For this evaluation, areas with populations ranging from 500,000 to 800,000 were assumed to be comparable to the population surrounding the WA-PHL. Cities with populations in this range (per the Census Bureau estimates) were then compared to the APHL list of 56 public health laboratories. Cities with populations and PHL locations similar to the WA-PHL were selected for this evaluation. From this list of cities with PHLs, 12 with PHL missions similar to that of the WA-PHL were identified for the location comparison. To assess the similarity of mission, websites for each of the PHLs were accessed to obtain each PHLs individual mission.

The WA-PHL is located immediately north of the City of Seattle limits, approximately eight miles from downtown Seattle. Four other laboratories were also located just outside the major metropolitan area they are serving, ranging in distance from three to 20 miles. These outlying locations also range from small rural residential communities to areas of a more industrial nature. Eight laboratories are located in downtown/metropolitan areas of the cities served. Four are located on or near universities and have a combination of residents, students, and research facilities (including hospitals). Others are located in major downtown areas surrounded by government buildings and residential neighborhoods. Based on the comparison of the 12 labs selected for evaluation, the Shoreline lab is located in areas similar to other public health laboratories around the country.

Of the 12 laboratories selected for this evaluation, eight responded to inquiries regarding "best practices" to reduce risk and enhance community safety. None of the labs indicated that they had "best practices" to reduce risk and/or enhance community safety outside of any mandated state and/or federal regulations and/or requirements. They also did not have active community groups in the area with an interest in the operation of their local PHL.

BIOLOGICAL HAZARDS EVALUATION

Per Work Order #1, the biological risk assessment was conducted in accordance with the methods and standards provided in the *Biosafety in Microbiological and Biomedical Laboratories* (BMBL) 5th Edition publication by the Centers for Disease Control (CDC) and the National Institute of Health (NIH). Among the guidelines, the BMBL provides a classification system called biosafety levels (BSLs) that are based on risk assessments which evaluate at which BSL level the laboratory work should be conducted (BSL-1, -2,

-3, or -4, indicating lowest to highest risk levels). The BMBL guidelines provide information to architects and engineers designing and constructing laboratories for biohazards; information to scientists working with hazardous microorganisms; and information to biosafety officers on how to conduct risk assessments.

Results of the evaluation of the appropriateness of the WA-PHL BSL classification indicated that the BSLs currently in place are appropriate for the microorganisms worked with at the WA-PHL, according to the select agent classification (BMBL) and the Material Safety Data Sheets. Through direct observation, discussion with laboratory staff, and review of training materials the worker practices and procedures implemented at the WA0PHL meet the CDC/NIH published standards. In addition, the BSL-3 select agent laboratory meets or exceeds the safety requirements for a BSL-3 laboratory.

The potential for biological hazards to the community from the WA-PHL is difficult to assess because of the various protective measures in place at the WA-PHL. These include:

- Extensive training for employees as to the proper way to handle infectious microorganisms;
- Biological safety cabinets used throughout the WA-PHL to contain microorganisms worked with;
- Procedures for decontamination of infectious waste materials;
- Procedures for decontaminating equipment to be removed from a laboratory room;
- Procedures for decontamination of laboratory clothing;
- High efficiency particulate air (HEPA) exhaust filters for the BSL-3 laboratory;
- Spill response protocols;
- Controlled storage for potentially infectious waste material before pick-up by a licensed contractor.

A review of the many security programs in place at the WA-PHL indicates that access to the microorganisms stored in the BSL-3 containment laboratory would be difficult for a laboratory "outsider" to achieve. There are several checks and balances in place to reduce this type of risk. For example, only a few people have the clearances needed to work in the BSL-3 laboratory and access requires two individuals with unique keys for unlocking the laboratory doors. Card key access to the wing housing the BSL-3 laboratory is also in place.

1 - Redacted portions are exempt from public disclosure under RCW 42.56.420(1)(a).

Furthermore, due to the small quantity of select agents stored at the WA-PHL, theft of these materials is unlikely to be attractive to any group looking for potential microorganisms that could be used for terrorist actions. In addition, threat analyses conducted by federal, state, and local law enforcement concluded that there were no known criminal or terrorism threats to the WA-PHL. These agencies have also concluded that the existing security systems are adequate for this facility.

CHEMICAL HAZARD ASSESSMENT

The WA-PHL maintains an extensive inventory of liquid and solid chemicals and compressed gasses consistent with its mission and with the maintenance and repair of equipment, instruments, and the physical plant. Although the chemical inventory is extensive, the laboratory work performed generally requires only small amounts of any given chemical.

The Chemical Hygiene Plan (CHP) prepared by the WA-PHL describes the hazards of the chemicals maintained in the laboratory and procedures and programs for minimizing those hazards during the normal course of operations. The CHP forms the basis for establishing safe work practices that protect WA-PHL staff and the community. The chemical hazard assessment focused on the programs, policies, and procedures for chemical management that have been implemented by the WA-PHL and largely documented in the CHP. The chemical hazard assessment also included a risk assessment of potential releases of chemicals from the WA-PHL under various accidental or intentional hazard scenarios.

EVALUATION OF CHEMICAL MANAGEMENT PLAN

Procedures for chemical inventory, ordering, receipt, storage, distribution, use, and disposal, as identified in the CHP, were evaluated by conducting visits to the facility and staff interviews. Results of this evaluation indicated that controlled procedures are in place and are followed for these tasks. In addition, the CHP outlines the training necessary for staff that is or will be using chemicals in their work. These training programs are also followed at the WA-PHL.

The overall effectiveness of the CHP was then evaluated based on reports of incidents within the laboratory and on fire department reports documenting responses to calls from the WA-PHL. Incident reports were available for the years 2002 through 2007. Of the 47 total incidents reported, only four involved chemical exposure and only one

resulted in days away from work (Two missed work days were recorded in 2002 for an employee who received a chemical splash to the eye). In general, the number of reportable injuries each year (less than eight) has been low based on the average number of employees (144) and hours worked by all employees (between 250,000 and 300,000 hours each year). The Shoreline Fire Department provided documentation of the responses to calls from the WA-PHL since 2001. Only two fire department calls to the WA-PHL involved chemicals: in 2001, "a potentially hazardous package was not triple bagged," and in 2005, the fire department responded to an inhalation exposure to "gas and smoke." No reports of chemical releases or injuries that required aid from the fire department have been recorded. The fire department has not been called to any incidents involving releases of chemicals to the community. Results of the CHP evaluation indicate that it appears to be generally effective and adequate for the safe operation of the laboratory and protection of the community.

Based on the review of the CHP, facility visits and interviews, the following list provides recommendations for enhancing or updating the procedures already in place at the WA-PHL:

- Update the CHP to ensure that procedures, facility assets, and staff are correctly discussed and identified
- Regularly audit the chemical lifecycle across the laboratory to ensure adherence to the CHP
- Implement a computer-based chemical inventory tracking system
- Maintain appropriate chemical handling and safety training to ensure staff are proficient in the storage, use, disposal, and hazards of chemicals
- Review storage locations of chemicals to ensure that:
  - Incompatible chemicals are not stored together;
  - Storage locations are appropriately identified with signage;
  - Storage locations are secured to prevent toppling in case of an earthquake;
- Ensure chemical storage cabinets and shelves are secured to building walls to prevent toppling in an earthquake;
- Ensure liquid chemical storage areas have spill containment trays;
- Update the air dispersion modeling study performed in 1992 and prepare a report that addresses current configurations; and
- Develop a tracking system for training.

Under current programs, policies, and procedures, the WA-PHL safely manages the entire lifecycle of the chemical inventory necessary to its mission. The recommendations made here, as noted above, are enhancements and updates to a system that is already protective of worker health and safety, and the surrounding community.

Rec's to Change

RISK AND SAFETY ASSESSMENT FOR CHEMICALS

Under "most-probable" conditions, chemical releases at the WA-PHL will remain completely within the building and will be effectively mitigated under existing programs, policies, and procedures. Therefore, the chemical hazards assessment addressed the consequences of potential chemical releases from the laboratory under reasonable worst-case scenarios. Such chemical release scenarios are unlikely to occur under normal operating conditions.

Eight chemicals from the WA-PHL inventory were modeled to provide a screening-level evaluation of hazards to the public. These eight chemicals were selected based on an evaluation of:

- Relative toxicity in humans or other animals;
- Volume maintained at the WA-PHL;
- Commercial availability;
- Environmental mobility; and
- Reactivity/Stability

Chemicals evaluated were: acetonitrile, benzene, hydrochloric acid, hydrofluoric acid, nitric acid, perchloric acid, potassium cyanide, and sodium cyanide.

Three exposure scenarios were considered for chemical releases from the WA-PHL:

1. Environmental release – instantaneous release of a gas, liquid, or solid to the atmosphere that is then carried into the community by the wind.
2. Theft of a chemical and intentional release of that chemical in a nearby school
3. Theft of a chemical and intentional release of that chemical in the neighboring Fircrest swimming pool

The results of the risk assessment for the three scenarios are provided below.

1 - Redacted portions are exempt from public disclosure under RCW 42.56.420(1)(a).

Environmental Release

For the environmental release scenario under worst-case conditions, an explosion or some other event was assumed to cause the release of the entire inventory of a given chemical from the WA-PHL into the atmosphere. An air dispersion model was then used to estimate the concentrations of that chemical that might occur in the surrounding community. Such a scenario is possible, although highly improbable for reasons discussed below. Nonetheless, the modeled concentrations were then compared to health-based screening concentrations for airborne chemicals: Emergency Response Planning Guidelines (ERPGs) and Temporary Emergency Exposure Limits (TEELs). These screening levels are generally used to plan for and manage large-scale commercial or industrial accidents and large volume releases, not the small scale, small volume releases from a laboratory such as the WA-PHL. ERPGs and TEELs are further explained in the following table.

ERPGs	TEELs
ERPG-1: The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for **up to one hour** without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odor.	TEEL-1: The maximum airborne concentration below which it is believed that nearly all individuals could be exposed without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odor.
ERPG-2: The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for **up to one hour** without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.	TEEL-2: The maximum airborne concentration below which it is believed that nearly all individuals could be exposed without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.
ERPG-3: The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for **up to one hour** without experiencing or developing life-threatening health effects.	TEEL-3: The maximum airborne concentration below which it is believed that nearly all individuals could be exposed without experiencing or developing life-threatening health effects.

Based on the worst-case atmospheric chemical release scenario, none of the schools or nursing homes was located within the ERPG/TEEL-3 hazardous radius for any of the chemicals evaluated. This result indicates that the school and nursing home populations are unlikely to encounter airborne concentrations of chemicals, released in an explosion at the WA-PHL that could cause life-threatening health effects.

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Hydrochloric acid and nitric acid might reach ERPG/TEEL-2 levels at three schools and one nursing home. Hydrochloric acid and nitric acid might reach ERPG/TEEL-1 (mild health concerns that do not last or odor issues) levels at all schools and nursing homes within the vicinity of the WA-PHL.

The closest facility to the WA-PHL is Fircrest. The closest building on the Fircrest campus is 250 feet from the north end of the WA-PHL. Based on the worst-case atmospheric chemical release scenario, acetonitrile, hydrochloric acid, nitric acid, and perchloric acid might exceed ERPG/TEEL-3 levels on the Fircrest campus.

As noted above, the chemical release scenarios evaluated in this report are worst-case and are unlikely to occur under normal operating conditions at the WA-PHL. Furthermore, the release of the entire inventory of a given chemical to the atmosphere is unlikely because chemicals are stored in more than one location, which significantly reduces or eliminates the possibility of a complete inventory release. The probability of this and other release scenarios is discussed in more detail below.

Theft of Chemical/Intentional Release in a Nearby School

Acute Exposure Guideline Levels (AEGLs) were used to describe the risk to humans resulting from once-in-a-lifetime, or rare, exposure to airborne chemicals such as an intentional release in a school. AEGLs were used for the classroom scenario because these guideline levels are developed for various exposure durations from ten minutes to eight hours. The following definitions are provided by U.S. EPA:

- AEGL-1 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.
- AEGL-2 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.
- AEGL-3 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

To evaluate the intentional classroom spill scenario, the modeled concentrations that could be reached within 10 minutes of a spill were compared to the AEGL-1, -2, and -3 concentrations. Model results indicated that hydrochloric acid, hydrofluoric acid, and nitric acid could reach airborne concentrations within 10 minutes of a spill in a classroom that might cause long-lasting effects or might be life-threatening.

Theft of Chemical/Intentional release in Neighboring Fircrest Swimming Pool

Cyanide in the form of sodium or potassium cyanide was evaluated under this scenario. Assuming the total inventory of cyanide at the WA-PHL was dissolved in the Fircrest swimming pool, the dose a child swimmer might receive was estimated to be about 0.09 milligrams of cyanide per kilogram of body weight. For comparison, the estimated dose of cyanide was compared to the U.S. EPA Reference Dose (RfD) for cyanide. The RfD is considered to be an estimate of the daily dose over a lifetime of exposure at which no harmful effects would be expected in an exposed individual. The reference dose for cyanide is 0.02 mg/kg per day over a lifetime. Therefore, dissolving the entire WA-PHL inventory of cyanide into the Fircrest swimming pool may produce harmful health effects in swimmers.

Probability of the Chemical Release Scenarios Evaluated

The risk and safety assessment scope of work directed the evaluation of "most-probable" chemical release scenarios from the WA-PHL. However, the most-probable chemical release scenarios are unlikely to result in chemical releases outside the WA-PHL. Most releases are accidental spills of small volumes that are quickly managed based on spill response procedures outlined in the WA-PHL Spill Response Guide. Vapors generated from spills of volatile chemicals would either dissipate within the building indoor air space or be captured in the building exhaust system and diluted to levels below health concern. Therefore, worst-case chemical release scenarios were evaluated based on the unlikely occurrence of an explosion, either accidental or intentional, or the theft of chemicals from the laboratory and intentional release in a school classroom, or the Fircrest swimming pool.

Although not impossible, accidental or intentional explosions that could cause an atmospheric release of chemicals are low probability events for the following reasons:

- Laboratory personnel are generally trained in science and the management of chemical implemented in the WA-PHL CHP and Laboratory Safety Manual;

- The WA-PHL and DOH require chemical safety training courses for laboratory personnel and training is monitored by supervisory staff;
- The WA-PHL work spaces are designed for safe handling of chemicals;
- Based on law enforcement agency reviews, the WA-PHL has implemented appropriate levels of security to reduce the likelihood of a malevolent act by an outsider that could result in a release to the community;
- The WA-PHL does not present an attractive target based on law enforcement agency review of the laboratory and on monitoring of terrorist information exchange and communication at the Washington Joint Analytical Center; and
- Based on the security vulnerability assessment developed as part of this risk and safety assessment (Section 7); an attack on the WA-PHL is not likely because damage to or destruction of the laboratory would not result in large numbers of casualties; disruption of the local, regional, or national economy; damage to the reputation or operations of a global brand; collateral damage to a regional or national landmark; or other consequence generally associated with targets attractive to terrorist organizations.

For some of the same reasons, theft of chemicals with the intent to release them in a public place, such as a school, is a low probability event. For example, a level of security appropriate for the mission and operations performed at the WA-PHL is already in place and has been reviewed by local and federal law enforcement agencies. Furthermore, although the laboratory maintains an extensive chemical inventory, the number of the chemicals that are highly toxic is low; stocks of a given chemical are generally spread among more than one location; and many of the chemicals that would be attractive to someone with malevolent intent are available from commercial or other sources that are more accessible than those stored at the WA-PHL. Each of the chemicals evaluated in the screening level assessment can be ordered from on-line vendors or is available at hardware and home improvement stores, including hydrochloric acid, hydrofluoric acid, nitric acid, and sodium cyanide. Most of these chemicals can also be found in use at schools and businesses in Shoreline.

RADIOLOGICAL HAZARDS EVALUATION

The WA-PHL uses radionuclides for qualitatively determining the presence of disease, as components of certain instruments, as calibration tools for equipment used to quantitatively determine levels of radioactivity in environmental samples, and for training. The three primary places at which radionuclides are used are in the

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tuberculosis (Tb) laboratory, in the environmental chemistry laboratory, and in the radiation laboratory.

The WA- PHL is required to follow a number of state and federal regulations as well as internal radiation safety procedures for the storage and use of radionuclides. Pursuant to these laws and regulations, the Washington State Department of Health, Office of Radiation Protection, has issued a radioactive materials license (hereinafter, the License) to the WA-PHL (State of Washington, 2003). The License specifies maximum quantities of radionuclides that can be present at any given time. The License also specifies various requirements including training of employees, monitoring exposure to radiation, securing radionuclide samples, maintaining records, and disposing of radioactive waste.

The WA-PHL also abides by the procedures outlined in its *Radiation Safety Manual*. This manual provides guidelines for limiting exposure to radionuclides; for ordering, storing, and disposing of radionuclides; and for reporting and record-keeping. The *Radiation Safety Manual* outlines the laboratory's policy of ALARA, meaning that the goal is to keep exposure to radiation by employees, visitors, and the community "As Low As Reasonably Achievable." Furthermore, the manual serves as a source of general information about the multiple uses of radiation at the laboratory and outlines the Radiation Safety Officer's training course for employees working with radionuclides.

To assess the probability, magnitude, and consequences of accidental radionuclide releases, the radionuclide inventory for the laboratory was reviewed and compliance with appropriate regulatory requirements was evaluated. In addition, procedures for storing, using, and handling radionuclides were evaluated. Potential health implications associated with accidental or malicious, intentional, releases of radionuclides were then modeled.

Based on the inventory review performed, the laboratory is in compliance with the requirements of the License; however, revisions to the inventory system should be made. Specifically, the units in which radionuclide activities are recorded should be updated to the International System of Units (SI) and more detailed records of minor and infrequently used materials should be maintained. It was also recommended that an accurate, complete, and consistent computerized radioactive materials inventory system be developed in place of the current system. After analysis of the WA-PHL's rules, procedures, and documentation for radioactive materials, it was determined that

the WA-HL is in compliance with relevant laws and guidelines governing radioactive material.

RADIOLOGICAL RISK AND SAFETY ASSESSMENT

For the radiological risk assessment, potential health effects from accidental or deliberate releases of radioactive materials were evaluated. The risk and safety assessment scope of work directed the evaluation of "most-probable" release scenarios from the WA-PHL. However, the most-probable release scenarios are unlikely to result in radiological releases outside the WA-PHL. Therefore, worst-case release scenarios were evaluated based on the unlikely occurrence of an atmospheric release, or the theft of chemicals from the laboratory and intentional release in a school classroom or to the Fircrest swimming pool.

Four exposure scenarios were considered for radiological releases from the WA-PHL:

- Theft of radioactive material and entire inventory is dissolved and mixed into the classroom's water cooler
- Theft of one of the sealed sources used in an instrument at the WA-PHL transported to a classroom, where the seal is broken and radioactive material is released into the airspace of the classroom.
- Theft of radiological material and intentional release in the neighboring Fircrest swimming pool
- Atmospheric release of the entire radioactive inventory

The results of the risk assessment for the four scenarios are provided below.

Theft of Radioactive Material/Entire Inventory Dissolved into Classroom's Water Cooler

The classroom water cooler scenario resulted in the highest modeled dose to the exposed individuals, with a dose in the first year, close to 9 times larger than the federally mandated benchmark for licensed facilities annually to the public due to routine facility operations. However, these doses would not cause any acute effect, and the long term effect (average annual increased exposure after 50 years has passed since the event) is smaller than the effect on radiation exposures of living in Denver rather than Seattle (due to the difference in altitude and resultant higher exposure from cosmic rays), or moving to the northeast corner of Washington State from Seattle (due to the higher radon emissions from bedrock in the northeast part of the state.

Theft of Sealed Source/Transported to Classroom and Released into Classroom Airspace

This scenario resulted in exposures under (by about 10 percent) the Nuclear Regulatory Commission (NRC) annual dose limit for the public due to nuclear facility operations. Even after 50 years of remaining in the body and causing continued radiation exposure, the total dose would be less than 1/2 the dose from a single abdominal CT scan.

Theft of Radiological Material/Intentional Release in Fircrest Swimming Pool

The swimming pool scenario resulted in the lowest dose of the scenarios evaluated. External exposure from water immersion is low when the material is diluted by the volume of the pool.

Atmospheric Release of Entire Radioactive Inventory

The atmospheric release scenario resulted in a dose less than 1/10 the dose that one would receive by flying round-trip from Washington, D.C. to Los Angeles (due to cosmic radiation at high altitudes in the atmosphere).

SUMMARY OF RADIOLOGICAL HAZARDS ASSESSMENT

After analysis of the WA-PHL's rules, procedures, and documentation regarding radioactive materials handling and disposal, worker training, and contamination testing, as well as checking the final inventory summary against radioactive material possession limits, the WA-PHL has been determined to be in compliance with relevant laws and guidelines governing radioactive material. Revisions to the inventory system, however, should be made. Specifically, the units in which radionuclide activities are recorded should be updated to the International System of Units (SI) and more detailed records of minor and infrequently used materials should be maintained. Thus, it is recommended that the WA-PHL improve existing radiation inventory methods.

Public health risks were assessed by calculating the radiation doses that would result from worst-case release scenarios. The scenarios evaluated resulted in doses well below background radiation doses when averaged over a lifetime, and only one resulted in doses exceeding the NRC's annual dose limit for the public due to routine nuclear facility operations. The scenarios are sufficiently conservative to demonstrate that even in a worst case event; radiation health risks to the public would have no measurable consequence.

1 - Redacted portions are exempt from public disclosure under RCW 42.56.420(1)(a).

PHYSICAL HAZARDS EVALUATION

Physical hazards, for the purposes of the risk and safety assessment, refer to work place hazards that can adversely affect worker health and well being, and that could result in hazardous conditions that could, in turn, affect the surrounding community. The physical hazards evaluation provides a discussion of the physical hazards that are associated with operating a diagnostic microbiology laboratory based on the equipment, chemicals, and other materials necessary to the public health laboratory mission. Several sources of work place hazards were identified including biological, chemical, radiological hazards, laboratory equipment hazards, and hazards associated with the use of laboratory animals.

The WA-PHL and DOH have prepared extensive programs, policies, and procedures to protect worker health and to manage the hazards of the work place. Written documentation of these efforts is available in the laboratory safety manual, biosafety manual, chemical hygiene plan, radiation safety plan, and other written materials.

The effectiveness of worker health and safety plans was evaluated through interviews of the laboratory safety officer, training officer, risk manager, and administrative staff. OSHA reportable injuries documented on Forms 300 were also reviewed.

Overall, the WA-PHL promotes and maintains a safety culture throughout their operation. Based on document reviews and interviews, the WA-PHL is generally a safe place to work and issues that could affect worker safety are addressed quickly and effectively through formal reporting, review, and interview activities. The risk and safety assessment report offered three recommendations to enhance the safety program at the WA-PHL, including improved organization of the various safety efforts and documents, better tracking of safety training, and the establishment of a recognition program for safety performance.

SECURITY VULNERABILITY EVALUATION

The objectives of the security vulnerability assessment (SVA) were to:

1. Identify security weaknesses and vulnerabilities that could result in a release of biological material or chemicals that might impact the surrounding community following terrorist and/or sabotage activities, and
2. Evaluate countermeasures that provide protection from these potential releases.

The SVA for the WA-PHL followed four basic steps, using information obtained from interviews, site visits, and WA-PHL documents:

- Characterizing the facility by identifying assets and existing countermeasures;
- Assessing the threat by identifying potential threats that could lead to an attack on the facility assets;
- Assessing the vulnerabilities by analyzing the ability of countermeasures to detect, deter, or delay an attack, or to limit the consequences of a successful attack. This was done by considering the existing countermeasures and consequences for four security scenarios:
  1. External attack on the facility with a truck bomb and all microorganisms and chemicals are emitted to the atmosphere.
  2. Intruder removes agent or chemical from the laboratory during the night and material is introduced into a different environment.
  3. Criminal removes agent or chemical from the laboratory during the delivery of a sample and material is introduced into a different environment.
  4. Disgruntled employee removes agent or chemical from the laboratory and material is introduced into a different environment.
- Assessing additional countermeasures, by examining new or improved countermeasures that may reduce the likelihood and/or consequences of an attack.

The level of, and actions involved in, agent and chemical security should be consistent with the likelihood and potential consequences of a threat. Overall, the WA-PHL does not appear to be a high profile target nor very attractive to individuals or groups with malevolent intent. It does not have a large number of employees and does not maintain large quantities of microorganisms, chemicals, or radioactive materials. Mass casualties or extensive damage to critical infrastructure, monuments, or other structures of public value are unlikely in the event of a release, fire, or explosion. Police and counterintelligence reports indicate a low level of concern.

Several additional countermeasures that the WA-PHL could take to improve its security position were identified and are prioritized as presented on Table ES-1. Several were given a low priority because they do not appear warranted given the low potential magnitude of the consequences of a security breach. Others were identified as either medium or high priority based on the results of the consequence analysis.

EARTHQUAKE HAZARDS

A limited evaluation of the seismic design and expected seismic performance of the WA-PHL building was performed to address the risk of biological, chemical, or radiological material release to the environment as a result of an earthquake.

The objective of this evaluation was to compare the seismic design strength (or capacity) of the building to the anticipated load (or demand) that would be applied to the building in a seismic event (earthquake). Five different levels of seismic events were considered. The seismic events included the Maximum Considered Earthquake (MCE) with a return period of 2475 years; the design earthquake, which is two-thirds of the MCE; and seismic ground motions corresponding with return periods of 475, 224 and 72 years, respectively. The design earthquake corresponds to the minimum design load level required by the current building code, the 2006 International Building Code (IBC) at the subject site. Although the buildings were originally designed to older building codes (1982 Uniform Building Code for example), the design strength of each building considered was determined in accordance with the provisions of the 2006 IBC. Evaluation of the building response subjected to a wide range of ground motions was made using current code provisions.

The limited evaluation of seismic design and performance conducted for the risk and safety assessment report indicates good seismic performance with very low probability of collapse at all levels of seismic ground motions considered. Furthermore, the WA-PHL buildings present positive attributes for good seismic performance:

- Buildings are light-weight resulting in better seismic performance;
- The lateral force resisting system (LFRS) appears to have been over-designed (significantly exceeds minimum requirements), therefore, the WA-PHL building may have been designed as an essential facility;
- The buildings are symmetric and regularly shaped; and
- Stucco cladding on exterior walls and gypsum wall board finishes add to initial stiffness of the structure and enhance performance in an earthquake.

Based on the seismic performance evaluation and the conclusion that immediate occupancy is likely to be possible, the laboratory buildings are not expected to collapse up to an earthquake with a mean return period of 1,650 years (2/3 of the MCE). Although the buildings would not collapse, breaches in the building wall and roof may occur through which a release of material could occur if breaches are located near

areas where biological, chemical, or radiological materials are stored or used. A breach in a laboratory wall or roof does not necessarily mean, however, that a release will occur.

Interior storage systems (racks, shelving, cupboards, lockers, etc.) were not evaluated for seismic performance. The storage systems, however, are generally secured to interior walls, have restraint systems to limit the likelihood of materials sliding off shelves due to ground motion, and have spill containment pans for storage of liquids. These features should limit the release of hazardous materials inside the WA-PHL building. As long as the building envelope is not compromised, for example, as long as an exterior wall does not collapse or break open, releases of hazardous materials should remain inside the building and not be released to the surrounding community. Finally, based on the Chemical Hazards Assessment, the volume of chemicals maintained in the WA-PHL inventory is not likely to pose a significant hazard in the event of a Design Level earthquake. Other consequences of such an earthquake are likely to be more serious, such as widespread damage to critical infrastructure in the metropolitan Seattle area.

EMERGENCY RESPONSE PLAN EVALUATION

The objective of the emergency response plan (ERP) evaluation was to assess the WA-PHL ERP for completeness and implementation.

The WA-PHL is subject to federal rules on the possession, use and transfer of select agents and toxins promulgated in the Code of Federal Regulations (42 CFR 73). Subpart 14 specifies incident response plan requirements, and Subpart 15 provides training requirements. The WA-PHL is also subject to state rules for emergency response because of the requirement to protect the health and safety of employees during a response to the release of hazardous substances as promulgated in the Washington Administrative Code (WAC 296-824).

The September 2008 WA-PHL ERP draft, which is the most recent but admittedly incomplete version, was compared to these requirements. The draft WA-PHL ERP is scheduled to be completed by the end of 2008. Additional information for the assessment was obtained by interviews, site visits, and other WA-PHL documents.

The current version of the WA-PHL ERP has several missing, incomplete, or inconsistent sections. In its current state, the written WA-PHL ERP does not provide

adequate protection. An optimal ERP will provide the procedures to minimize the impacts to the employees, visitors, community, environment, and structures from an incident when it is fully developed, exercised, and tested.

The process used to develop the WA-PHL ERP should be modified in the following ways:

- The WA-PHL ERP should be promptly completed and a schedule established for its annual review and updating, if needed. Additional reviews may be needed when conditions change (e.g., laboratory modifications, operating procedures, or personnel responsibilities), or experience is gained through an incident or an exercise.
- The responsible manager for the WA-PHL ERP should be clarified. A single manager needs to be given clear authority and resources to complete this plan on schedule.
- Stakeholders, including first responders, nearby facilities, and the community, should be involved early in the preparation of the ERP. Understanding stakeholder input early in the process will typically reduce the overall time and budget requirements for plan completion.
- The range of facilities addressed should be expanded to include nearby facilities, the community, and the environment. Facilities are near each other and therefore may impact each other.
- The range of covered incidents should be determined in a systematic process, such as a risk assessment. This will reduce the likelihood of missing incidents that may have significant probabilities or consequences.
- Similar procedures discussed in multiple WA-PHL health and safety documents should be modified to maintain consistency. The WA-PHL may want to consider whether the same procedures need to be described in multiple documents.
- Training should be broadened to cover a larger range of potential incidents. Training and exercises are important to understand and test the plan. Exercises should include first responders (fire and police) to facilitate common understanding and communications during an actual incident.

AIR QUALITY ASSESSMENT FOR THE WASHINGTON STATE PUBLIC HEALTH LAB ADDITION

CPP Project 4535

December 2008

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EXECUTIVE SUMMARY

This report documents the wind-tunnel study conducted by CPP, Inc. on behalf of The Miller Hull Partnership, LLP (Miller Hull) for the proposed Washington State Public Health Lab Addition (Lab Addition) in Shoreline, Washington. The objective of the study was to obtain accurate concentration estimates at building air intakes and other sensitive locations due to emissions from various exhaust sources located on and around the Lab Addition. The various exhaust sources may periodically emit chemicals or other contaminants that may enter nearby buildings through air intakes, or be present at other sensitive locations, and impact staff or the general public. If adverse impacts were found, mitigation measures were evaluated.

To meet the objectives of the study, a 1:120 scale model of the Lab Addition and nearby surroundings within a 680 ft radius was constructed and placed in CPP's boundary-layer wind tunnel. Concentration measurements were obtained in the wind tunnel to define the impact of emissions from the various exhaust sources at building air intake and other sensitive locations. The conclusions of the study are listed in the following tables. Table ES-1 lists the results for planned exhaust sources on the Lab Addition, while Table ES-2 lists results for the existing exhaust sources. Mitigation measures are discussed as necessary.

Table ES-1
Public Health Lab Addition Exhaust Sources

Source Type (ID)	Stack Base Height (ft) (description)	Stack Height Above Base (ft)	Volume Flow Rate and Exit Velocity cfm (fpm)	Comment
BSL-3 Exhaust (EF-1a,1b)	15.0 (Main Roof)	13.3	7610 (4756)	Meets design criterion. [1] The highest concentration was measured at a Public Health Laboratory air intake.
BSL-2 Exhaust (EF-2a,2b)	15.0 Main Roof	5.7	3500 (3220)	Meets design criterion.[1] The highest concentration was measured at at Public Health Laboratory air intake.
BSL-2 Space Chemical Fume Hood Exhaust (EF-3a,3b)	15.0 (Main Roof)	9.7	4965 (5226)	Meets design criterion. [2] The highest concentration was measured at at Public Health Laboratory air intake.
Chemical Fume Hood Exhaust (EF-5a, 5b)	15.0 Main Roof	10.8	2000 (4651)	Meets design criterion.[2] The highest concentration was measured at at Public Health Laboratory air intake.
BSL-3 Exhaust (EF-6a,6b)	15.0 Main Roof	10.9	4600 (4842)	Meets design criterion. [1] The highest concentration was measured at at Public Health Laboratory air intake.
200hp Diesel Truck idling at the Loading Dock (DT)	0.0 (Local Grade)	10.0	Per Specs	Meets health/odor criteria for up to two diesel trucks idling simultaneously.

[1] The 2000 $\mu g/m^3$ per g/s design criterion assumes limited chemical use in an BSL hood.

[2] The 1500 $\mu g/m^3$ per g/s design criterion corresponds to the ANSI Z9.5-2003 "as installed' fume hood containment requirement and assumes chlorine and hydrogen fluoride are limited to 0.02 L.

Table ES-2
Surrounding Exhaust Sources

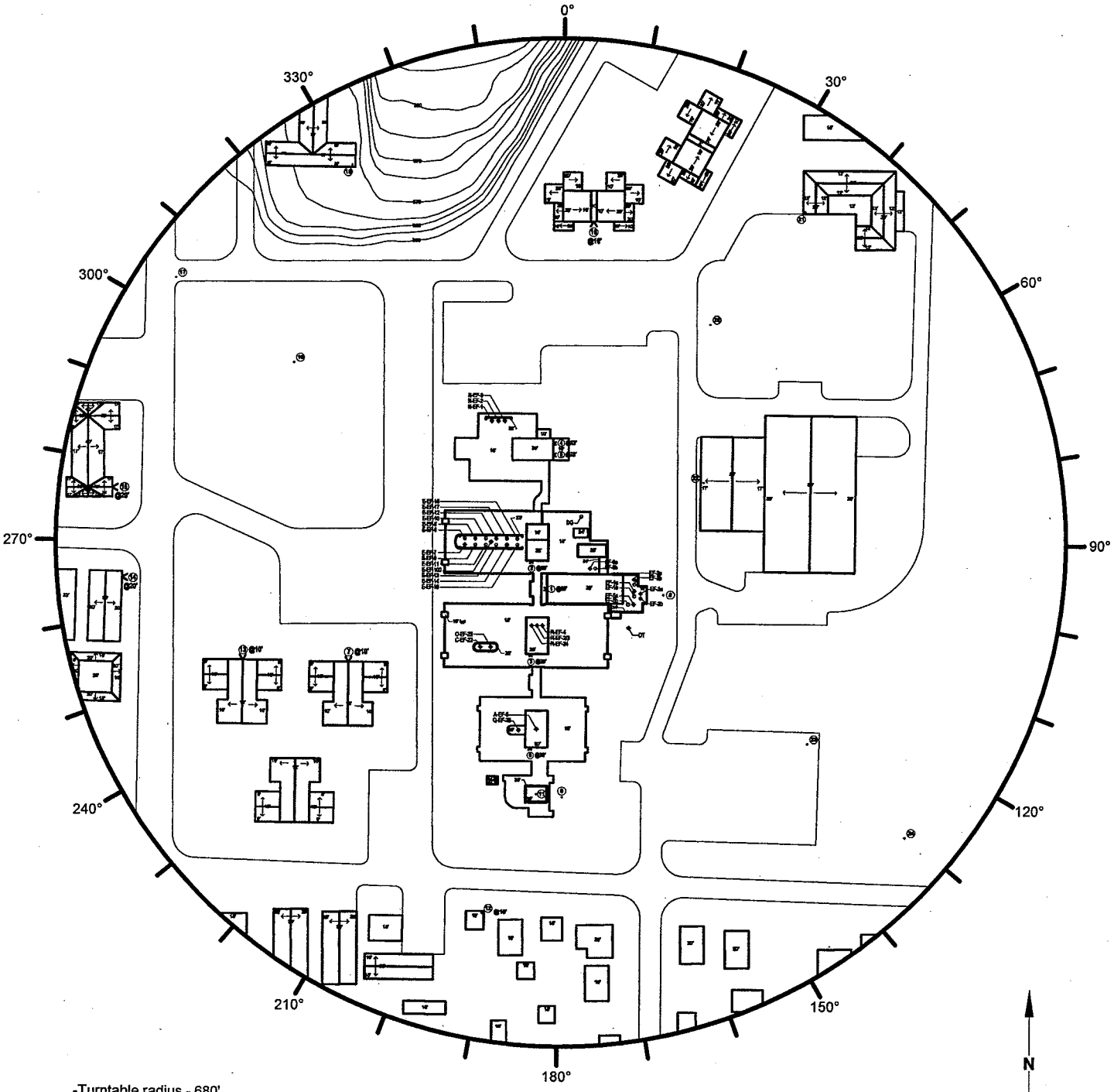
Source Type (ID)	Stack Base Height (ft) (description)	Stack Height Above Base (ft)	Volume Flow Rate and Exit Velocity cfm (fpm)	Comment
1250 KW Diesel Generator (DG)	15.0 (Main Roof)	9.0	Per specs	Health criterion is met. Odor criterion exceeded 5% of operating hours at the Lab Addition intake (20% at an existing intake). Filtered odor criterion met.[3]
All E-Wing Lab Exhausts (Based on E-EF-7; and E-EF-14)	15.0 (Main Roof)	9.0	E-EF-7 802 (3000) E-EF-14 1980 (3000)	Exceeds design criterion[2] at: PHL intake: 4% of the time; Surrounding receptors: met Mitigation: 1) Limit stored quantities;[4] or 2) Manifold stacks into to meet: 9 ft stack; 15,000 cfm volume flow 3000 fpm exit velocity.
All N-Wing West Lab Exhausts (Based on N-EF-1; and N-EF-3)	16.0 (Main Roof)	9.0	N-EF-1 2000 (3000) N-EF-3 1200 (3000)	Meets design criterion[2] at all locations evaluated.
All C-Wing Lab Exhausts (Based on C-EF-22; and C-EF-23)	15.0 (Main Roof)	7.0	C-EF-22 500 (917) C-EF-23 800 (1467)	Exceeds design criterion[2] at: PHL intake: 1% of the time; Surrounding receptor: < 0.5% of the time. Mitigation: Limit stored quantities.[4]
A-Wing Exhausts (Based on A-EF-5)	30.0 (Penthouse)	7.0	9500 (1510)	Meets design criterion[2] at all locations evaluated.

[3] This criterion assumes an 80% efficient exhaust oxidizing filter is installed at the generator.

[4] Chlorine gas – 9.26 g; hydrogen fluoride liquid: - 27 ml; hydrogen fluoride gas: 5.3 g. See Table C-1 in Appendix C.

Table ES-2
Surrounding Exhaust Sources

Source Type (ID)	Stack Base Height (ft) (description)	Stack Height Above Base (ft)	Volume Flow Rate and Exit Velocity cfm (fpm)	Comment
Q-Wing Lab Exhausts (Based on Q-EF-25)	20.0 (Step Above Main Roof)	7.0	800 (1467)	Exceeds design criterion[2] at: PHL intake: met; Surrounding receptor: < 0.5% of the time. Mitigation: Limit stored quantities.[4]
All R-Wing Lab Exhausts (Based on R-EF-2/3) R-EF-4 and R-EF-24)	29.0 (Penthouse)	7.0	R-EF-2/3 23,450 (1870) R-EF-4 2450 (1170) R-EF-24 1650 (1543)	Meets design criterion[2] at all locations evaluated.



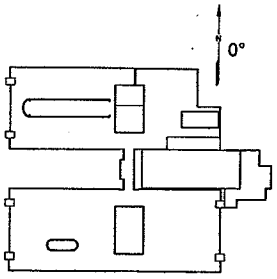
-Turntable radius - 680'
-Bldg. heights in feet above local (maximum) ground elevation.
-Architectural elevation datum = 345'

= Receptor

= Stack

= Deciduous Tree 30' (3")

0' 100' 200' 300'



N

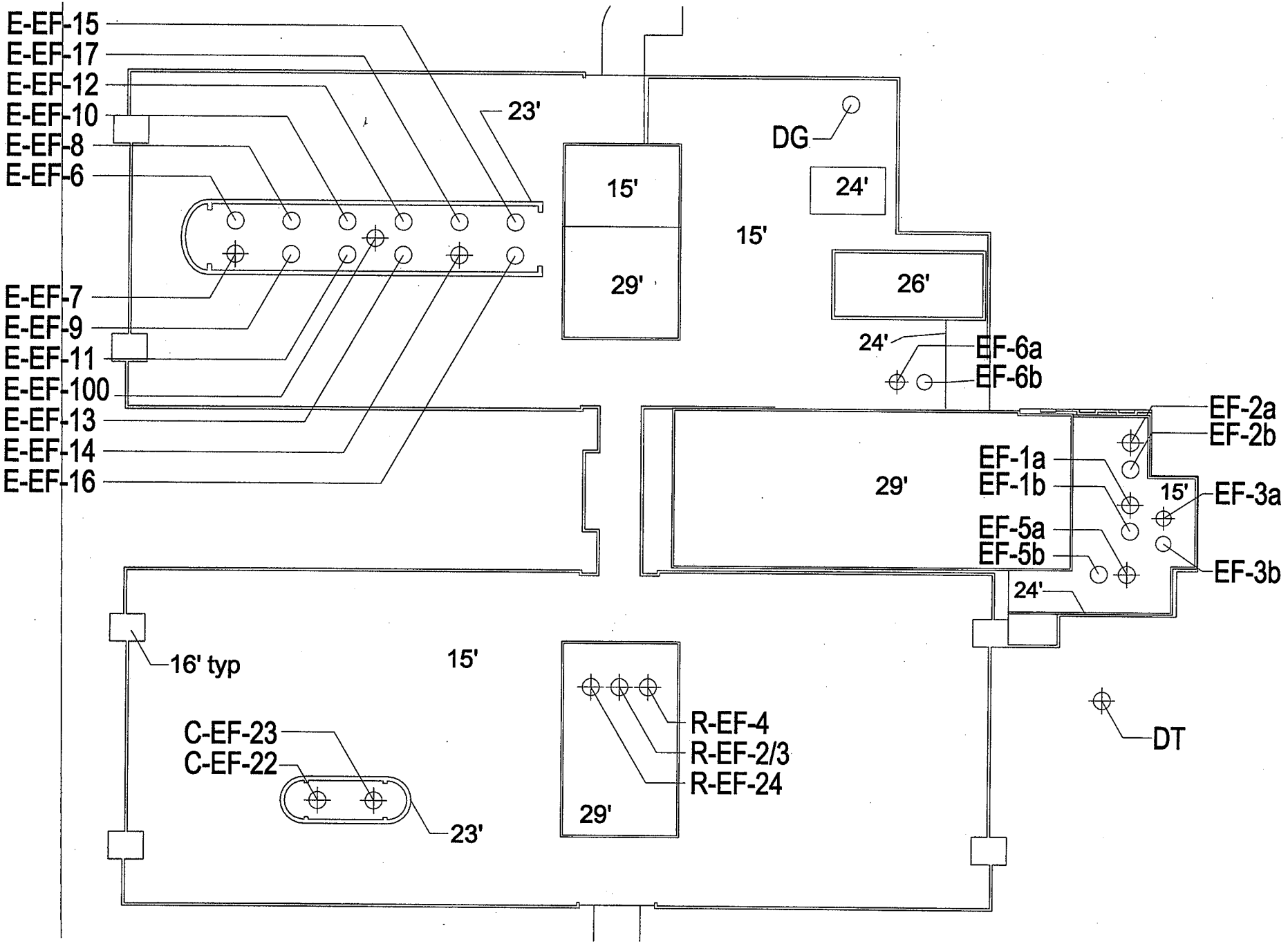

E-EF-15
E-EF-17
E-EF-12
E-EF-10
E-EF-8
E-EF-6
E-EF-7
E-EF-9
E-EF-11
E-EF-100
E-EF-13
E-EF-14
E-EF-16
23'
15'
29'
DG
24'
15'
26'
24'
EF-6a
EF-6b
EF-2a
EF-2b
EF-1a
EF-1b
29'
15'
EF-3a
EF-5a
EF-5b
EF-3b
24'
16' typ
15'
C-EF-23
C-EF-22
23'
R-EF-4
R-EF-2/3
R-EF-24
29'
DT

Table 2
Full-scale Exhaust and Modeling Information

Source Letter	Source Description	Source ID	Initial Source Height Above Base (ft)	Exit Diameter (in)	Exit Temp. (°F)	Mass Flow (lb/hr)	Volume Flow Rate (cfm)	Exit Velocity (fpm)	Source Orientation	Source Base Height Above Grade (ft)	Comment
	Lab Addition										
AA	BSL-3 Exhaust 1a	EF-1a	13.3	17.1	70.0	34,722	7,610	4,756	Vertical	15.0	Main Roof
AB	BSL-3 Exhaust 1b	EF-1b	13.3	17.1	70.0	34,722	7,610	4,756	Vertical	15.0	Main Roof
AC	BSL-3 Exhaust 2a	EF-2a	5.7	14.1	70.0	15,969	3,500	3,220	Vertical	15.0	Main Roof
AD	BSL-3 Exhaust 2b	EF-2b	5.7	14.1	70.0	15,969	3,500	3,220	Vertical	15.0	Main Roof
AE	BSL-2 Space (chemical exhaust)	EF-3a	9.7	13.2	70.0	22,654	4,965	5,226	Vertical	15.0	Main Roof
AF	BSL-2 Space (chemical exhaust)	EF-3b	9.7	13.2	70.0	22,654	4,965	5,226	Vertical	15.0	Main Roof
AH	Loading Dock - 200hp Diesel Truck	DT	10.0	3.0	300.0	318	100	2,037	Vertical	0.0	Loading Area, Grade Level
AI	Fume Hood Exhaust 5a	EF-5a	10.8	8.9	70.0	9,125	2,000	4,651	Vertical	15.0	Main Roof
AJ	Fume Hood Exhaust 5b	EF-5b	10.8	8.9	70.0	9,125	2,000	4,651	Vertical	15.0	Main Roof
AK	BSL-3 Exhaust 6a	EF-6a	10.9	13.2	70.0	20,988	4,600	4,842	Vertical	30.0	Main Roof
AL	BSL-3 Exhaust 6b	EF-6b	10.9	13.2	70.0	20,988	4,600	4,842	Vertical	30.0	Main Roof
	Existing Sources										
BA	1250 KW Diesel Generator	DG	9.0	16.0	300.0	16,861	5,300	3,783	Vertical	15.0	Main Roof
BB	E-Wing Fume Hood EF-7	E-EF-7	9.0	7.0	70.0	3,659	802	3,000	Vertical	15.0	Main Roof
BC	E-Wing Fume Hood E-EF-14	E-EF-14	9.0	11.0	70.0	9,034	1,980	3,000	Vertical	15.0	Main Roof
BD	N-Wing West Lab Exhaust	N-EF-1	9.0	11.1	70.0	9,125	2,000	3,000	Vertical	16.0	Main Roof
BE	N-Wing Central Lab Exhaust	N-EF-2	9.0	7.8	70.0	4,563	1,000	3,000	Vertical	16.0	Main Roof
BF	N-Wing East Lab Exhaust	N-EF-3	9.0	8.6	70.0	5,475	1,200	3,000	Vertical	16.0	Main Roof
BG	C-Wing Lab Exhaust EF-22	C-EF-22	7.0	10.0	70.0	3,650	800	1,467	Vertical	15.0	Main Roof
BH	C-Wing Lab Exhaust EF-23	C-EF-23	7.0	10.0	70.0	2,281	500	917	Vertical	15.0	Main Roof
BI	R-Wing Lab Exhaust EF-2/3	R-EF-2/3	7.0	47.9	70.0	106,996	23,450	1,870	Vertical	29.0	Penthouse
BJ	R-Wing Lab Exhaust EF-4	R-EF-4	7.0	19.6	70.0	11,179	2,450	1,170	Vertical	29.0	Penthouse
BK	Q-Wing Lab Exhaust EF-25	Q-EF-25	7.0	10.0	70.0	3,650	800	1,467	Vertical	20.0	Step Above Main Roof
BL	A-Wing Lab Exhaust EF-5	A-EF-5	7.0	34.0	70.0	43,346	9,500	1,510	Vertical	30.0	Penthouse
BM	R-Wing Lab Exhaust EF-24	R-EF-24	9.0	14.0	70.0	7,528	1,650	1,543	Vertical	29.0	Penthouse
	Potential Mitigation for E Wing										
BN	E-Wing Potential Mitigation Design	E-EF-100	9.0	30.3	70.0	68,441	15,000	3,000	Vertical	29.0	Main Roof

Site Parameters:

Scale Reduction:	120	
Grade Elevation (m):	105.2	345 ft msl
Typical Building Height (m):	9.1	
Ambient Temperature (°K):	294.3	70 F
Anemometer Height (m):	10.00	Snohomish County Airport
Anemometer Surface Roughness (m):	0.03	Snohomish County Airport
Site Anemometer Height (m):	10.00	
Site Surface Roughness (m):	0.35	
1 Percent Wind Speed (m/s):	12.1	Snohomish County Airport (Period of Record: 1978-2007)

Table 4
Summary of Normalized Concentration Design Criteria

Source Type	Design Criteria Type	Design Criteria ($\mu g/m^3$) / (g/s)	Basis for Design Criteria[1]
BSL Exhausts	Health/odor	2,000	20% of ASHRAE criterion - assumes limited chemical usage
	ASHRAE	400	ASHRAE (2003) example criterion for an accidental spill in a fume hood
Fume Hood Exhuasts	Alternate Health/odor	1,500	ANSI/AIHA Z9.5 "as installed" fume hood containment criterion
Existing Lab Exhausts	Alternate Health/odor	1,500	ANSI/AIHA Z9.5 "as installed" fume hood containment criterion
Loading Dock - 200hp Diesel Truck	Health	1,309,091	Odor threshold associated with NO2
	Odor	10,586	1:2000 odor dilution threshold for diesel exhaust
1250 KW Diesel Generator	Health	912	Health limit associated with NO2 emissions
	Odor	200	1:2000 odor dilution threshold for diesel exhaust
	Filtered Odor	1,000	1:400 odor dilution threshold for filtered diesel exhaust

Note:
See Section 2 and Appendix C for detailed discussion.

Table 5
Test Plan, Normalized Concentration Results
and Percent Time the Design Criteria may be Exceeded For Each Source/Receptor Combination Evaluated

Run No.	Source Letter	Source ID	Stack Height Above Base (ft)	Receptor Identification	Air Intake Operating	Wind Direction (Deg.)	Wind Speed (m/s)	(1) Max Normalized WT-Measured Concentration (µg/m³)/(g/s)	(2) Design Criteria (µg/m³)/(g/s)	(3) Design Criteria Achieved?	(4) Percent Time Design Criteria May Be Exceeded
WASHINGTON PUBLIC HEALTH LAB ADDITION											
Planned Lab Exhausts inside Screenwall											
Fume Hood - 2000 cfm / 4651 fpm									ANSI		
921	AI	EF-5a	10.8	1 - Planned AH-1	No	125	4.5	734	1,500	Yes	- - -
922	AI	EF-5a	10.8	2 - E-Wing AHU	No	115	4.5	1,337	1,500	Yes	- - -
923	AI	EF-5a	10.8	3 - R-Wing AHU	No	55	3.5	1,352	1,500	Yes	- - -
924	AI	EF-5a	10.8	7 - SW Operable Window	No	75	2.7	516	1,500	Yes	- - -
925	AI	EF-5a	10.8	10 - N Operable Window	No	175	2.1	402	1,500	Yes	- - -
926	AI	EF-5a	10.8	12 - Surrounding S	No	25	2.1	329	1,500	Yes	- - -
927	AI	EF-5a	10.8	14 - Surrounding W 1	No	90	2.1	292	1,500	Yes	- - -
928	AI	EF-5a	10.8	15 - Surrounding W 2	No	105	1.6	273	1,500	Yes	- - -
929	AI	EF-5a	10.8	21 - Surrounding NE 2	No	200	1.6	345	1,500	Yes	- - -
930	AI	EF-5a	10.8	22 - Surrounding NE 3	No	215	2.7	690	1,500	Yes	- - -
981	AI	EF-5a	10.8	23 - Surrounding SE 1	No	305	2.7	218	1,500	Yes	- - -
BSL - 3500 cfm / 3220 fpm									20% ASHRAE		
931	AC	EF-2a	5.7	1 - Planned AH-1	No	40	4.5	482	2,000	Yes	- - -
932	AC	EF-2a	5.7	2 - E-Wing AHU	No	105	4.5	1,134	2,000	Yes	- - -
933	AC	EF-2a	5.7	3 - R-Wing AHU	No	40	3.5	1,780	2,000	Yes	- - -
934	AC	EF-2a	5.7	7 - SW Operable Window	No	75	2.1	525	2,000	Yes	- - -
935	AC	EF-2a	5.7	10 - N Operable Window	No	175	2.1	452	2,000	Yes	- - -
936	AC	EF-2a	5.7	12 - Surrounding S	No	25	2.1	285	2,000	Yes	- - -
937	AC	EF-2a	5.7	14 - Surrounding W 1	No	90	1.6	386	2,000	Yes	- - -
938	AC	EF-2a	5.7	22 - Surrounding NE 3	No	225	3.5	994	2,000	Yes	- - -
BSL - 4600 cfm / 4482 fpm											
941	AK	EF-6a	10.9	1 - Planned AH-1	No	60	7.3	569	2,000	Yes	- - -
942	AK	EF-6a	10.9	2 - E-Wing AHU	No	25	9.4	1,033	2,000	Yes	- - -
943	AK	EF-6a	10.9	3 - R-Wing AHU	No	15	5.7	1,048	2,000	Yes	- - -
944	AK	EF-6a	10.9	7 - SW Operable Window	No	65	3.5	445	2,000	Yes	- - -
945	AK	EF-6a	10.9	10 - N Operable Window	No	180	3.5	275	2,000	Yes	- - -
946	AK	EF-6a	10.9	12 - Surrounding S	No	20	2.7	170	2,000	Yes	- - -
947	AK	EF-6a	10.9	14 - Surrounding W 1	No	90	2.7	323	2,000	Yes	- - -
948	AK	EF-6a	10.9	22 - Surrounding NE 3	No	235	5.7	729	2,000	Yes	- - -
Fume Hood - 4965 cfm / 5226 fpm									ANSI		
951	AE	EF-3a	9.7	1 - Planned AH-1	No	125	7.3	213	1,500	Yes	- - -
952	AE	EF-3a	9.7	2 - E-Wing AHU	No	115	7.3	580	1,500	Yes	- - -
953	AE	EF-3a	9.7	3 - R-Wing AHU	No	55	7.3	816	1,500	Yes	- - -
954	AE	EF-3a	9.7	7 - SW Operable Window	No	75	2.7	309	1,500	Yes	- - -
955	AE	EF-3a	9.7	10 - N Operable Window	No	170	2.7	212	1,500	Yes	- - -
956	AE	EF-3a	9.7	12 - Surrounding S	No	25	2.7	192	1,500	Yes	- - -
957	AE	EF-3a	9.7	14 - Surrounding W 1	No	90	2.7	259	1,500	Yes	- - -
958	AE	EF-3a	9.7	22 - Surrounding NE 3	No	225	5.7	346	1,500	Yes	- - -

Table 5
Test Plan, Normalized Concentration Results
and Percent Time the Design Criteria may be Exceeded For Each Source/Receptor Combination Evaluated

Run No.	Source Letter	Source ID	Stack Height Above Base (ft)	Receptor Identification	Air Intake Operating	Wind Direction (Deg.)	Wind Speed (m/s)	(1) Max Normalized WT-Measured Concentration (µg/m³)/(g/s)	(2) Design Criteria (µg/m³)/(g/s)			(3) Design Criteria Achieved?			(4) Percent Time Design Criteria May Be Exceeded		
BSL - 7610 cfm / 4756 fpm									20% ASHRAE								
964	AA	EF-1a	13.3	1 - Planned AH-1	No	120	12.1	327	2,000			Yes			-	-	-
965	AA	EF-1a	13.3	2 - E-Wing AHU	No	110	9.4	919	2,000			Yes			-	-	-
966	AA	EF-1a	13.3	3 - R-Wing AHU	No	55	7.3	831	2,000			Yes			-	-	-
967	AA	EF-1a	13.3	7 - SW Operable Window	No	75	4.5	308	2,000			Yes			-	-	-
968	AA	EF-1a	13.3	10 - N Operable Window	No	175	4.5	209	2,000			Yes			-	-	-
969	AA	EF-1a	13.3	12 - Surrounding S	No	25	4.5	135	2,000			Yes			-	-	-
970	AA	EF-1a	13.3	14 - Surrounding W 1	No	85	4.5	180	2,000			Yes			-	-	-
971	AA	EF-1a	13.3	22 - Surrounding NE 3	No	225	9.4	389	2,000			Yes			-	-	-
Diesel Vehicle at the Loading Dock									Health	Odor							
401	AH	DT	10.0	1 - Planned AH-1	No	40	1.0	4,472	1,309,091	10,586		Yes	Yes		-	-	-
402	AH	DT	10.0	2 - E-Wing AHU	No	125	1.0	4,170	1,309,091	10,586		Yes	Yes		-	-	-
EXISTING SOURCES																	
Diesel Generator									Health	Odor	Odor (filtered)						
501	BA	DG	9.0	1 - Planned AH-1	No	20	9.4	224	912	200	1,000	Yes	No	Yes	-	5.30%	-
502	BA	DG	9.0	2 - E-Wing AHU	No	45	9.4	355	912	200	1,000	Yes	No	Yes	-	2.50%	-
503	BA	DG	9.0	3 - R-Wing AHU	No	10	5.7	324	912	200	1,000	Yes	No	Yes	-	3.84%	-
504	BA	DG	9.0	5 - S. N-Wing AHU	No	150	9.4	627	912	200	1,000	Yes	No	Yes	-	20.46%	-
N-Wing									ANSI								
603	BF	N-EF-3	9.0	1 - Planned AH-1	No	345	2.1	966	1,500			Yes			-	-	-
801	BF	N-EF-3	9.0	7 - SW Operable Window	No	30	1.6	832	1,500			Yes			-	-	-
802	BF	N-EF-3	9.0	10 - N Operable Window	No	200	2.1	914	1,500			Yes			-	-	-
803	BF	N-EF-3	9.0	13 - Surrounding SW	No	50	1.3	700	1,500			Yes			-	-	-
804	BF	N-EF-3	9.0	14 - Surrounding W 1	No	70	1.0	519	1,500			Yes			-	-	-
805	BF	N-EF-3	9.0	15 - Surrounding W 2	No	85	1.6	574	1,500			Yes			-	-	-
806	BF	N-EF-3	9.0	16 - Surrounding WNW 1	No	110	2.1	1,302	1,500			Yes			-	-	-
807	BF	N-EF-3	9.0	17 - Surrounding WNW 2	No	115	1.3	878	1,500			Yes			-	-	-
808	BF	N-EF-3	9.0	18 - Surrounding NW	No	150	1.0	618	1,500			Yes			-	-	-
809	BF	N-EF-3	9.0	20 - Surrounding NE 1	No	250	2.1	610	1,500			Yes			-	-	-
810	BF	N-EF-3	9.0	21 - Surrounding NE 2	No	245	2.1	966	1,500			Yes			-	-	-
811	BF	N-EF-3	9.0	22 - Surrounding NE 3	No	285	2.1	848	1,500			Yes			-	-	-
812	BF	N-EF-3	9.0	23 - Surrounding SE 1	No	315	1.0	410	1,500			Yes			-	-	-
821	BD	N-EF-1	9.0	10 - N Operable Window	No	200	2.1	834	1,500			Yes			-	-	-
822	BD	N-EF-1	9.0	18 - Surrounding NW	No	150	1.3	479	1,500			Yes			-	-	-
823	BD	N-EF-1	9.0	21 - Surrounding NE 2	No	240	1.6	538	1,500			Yes			-	-	-
824	BD	N-EF-1	9.0	22 - Surrounding NE 3	No	280	2.1	600	1,500			Yes			-	-	-

Table 5
Test Plan, Normalized Concentration Results
and Percent Time the Design Criteria may be Exceeded For Each Source/Receptor Combination Evaluated

Run No.	Source Letter	Source ID	Stack Height Above Base (ft)	Receptor Identification	Air Intake Operating	Wind Direction (Deg.)	Wind Speed (m/s)	(1) Max Normalized WT-Measured Concentration (µg/m³)/(g/s)	(2) Design Criteria (µg/m³)/(g/s)	(3) Design Criteria Achieved?	(4) Percent Time Design Criteria May Be Exceeded
E-Wing											
Existing Sources									ANSI		
601	BB	E-EF-7	9.0	1 - Planned AH-1	No	305	2.7	2,837	1,500	No	4.01%
611	BB	E-EF-7	9.0	2 - E-Wing AHU	No	280	2.7	2,017	1,500	No	2.39%
841	BB	E-EF-7	9.0	7 - SW Operable Window	No	45	1.6	1,279	1,500	Yes	-
842	BB	E-EF-7	9.0	10 - N Operable Window	No	200	1.0	902	1,500	Yes	-
843	BB	E-EF-7	9.0	13 - Surrounding SW	No	60	1.0	721	1,500	Yes	-
844	BB	E-EF-7	9.0	14 - Surrounding W 1	No	90	1.0	720	1,500	Yes	-
845	BB	E-EF-7	9.0	15 - Surrounding W 2	No	105	1.0	818	1,500	Yes	-
846	BB	E-EF-7	9.0	16 - Surrounding WNW 1	No	135	1.0	617	1,500	Yes	-
847	BB	E-EF-7	9.0	18 - Surrounding NW	No	160	1.0	858	1,500	Yes	-
848	BB	E-EF-7	9.0	20 - Surrounding NE 1	No	230	1.0	843	1,500	Yes	-
851	BB	E-EF-7	9.0	21 - Surrounding NE 2	No	225	1.0	680	1,500	Yes	-
849	BB	E-EF-7	9.0	22 - Surrounding NE 3	No	255	1.0	407	1,500	Yes	-
850	BB	E-EF-7	9.0	23 - Surrounding SE 1	No	300	1.6	312	1,500	Yes	-
602	BC	E-EF-14	9.0	1 - Planned AH-1	No	310	7.3	944	1,500	Yes	-
612	BC	E-EF-14	9.0	2 - E-Wing AHU	No	295	9.4	2,708	1,500	No	1.84%
852	BC	E-EF-14	9.0	7 - SW Operable Window	No	55	1.6	492	1,500	Yes	-
853	BC	E-EF-14	9.0	10 - N Operable Window	No	190	2.1	472	1,500	Yes	-
854	BC	E-EF-14	9.0	14 - Surrounding W 1	No	90	1.0	647	1,500	Yes	-
856	BC	E-EF-14	9.0	21 - Surrounding NE 2	No	220	1.0	386	1,500	Yes	-
855	BC	E-EF-14	9.0	22 - Surrounding NE 3	No	250	2.1	433	1,500	Yes	-
Potential Mitigation											
701	BN	E-EF-100	9.0	1 - Planned AH-1	No	305	12.1	520	1,500	Yes	-
703	BN	E-EF-100	9.0	2 - E-Wing AHU	No	290	12.1	1,061	1,500	Yes	-
711	BN	E-EF-100	15.0	1 - Planned AH-1	No	305	9.4	231	1,500	Yes	-
712	BN	E-EF-100	15.0	2 - Planned AH-1	No	295	9.4	316	1,500	Yes	-
C-Wing											
604	BH	C-EF-23	9.0	1 - Planned AH-1	No	225	1.0	3,080	1,500	No	1.25%
861	BH	C-EF-23	7.0	7 - SW Operable Window	No	85	1.0	4,039	1,500	No	0.31%
862	BH	C-EF-23	7.0	10 - N Operable Window	No	190	1.0	908	1,500	Yes	-
863	BH	C-EF-23	7.0	12 - Surrounding S	No	5	1.0	1,525	1,500	No	0.15%
864	BH	C-EF-23	7.0	13 - Surrounding SW	No	90	1.0	1,952	1,500	No	0.04%
865	BH	C-EF-23	7.0	14 - Surrounding W 1	No	100	1.0	928	1,500	Yes	-
866	BH	C-EF-23	7.0	15 - Surrounding W 2	No	115	1.0	754	1,500	Yes	-
867	BH	C-EF-23	7.0	16 - Surrounding WNW 1	No	140	1.0	1,499	1,500	Yes	0.01%
868	BH	C-EF-23	7.0	18 - Surrounding NW	No	160	1.0	792	1,500	Yes	-
869	BH	C-EF-23	7.0	20 - Surrounding NE 1	No	215	1.0	706	1,500	Yes	-
870	BH	C-EF-23	7.0	22 - Surrounding NE 3	No	235	1.0	2,122	1,500	No	0.10%
871	BH	C-EF-23	7.0	23 - Surrounding SE 1	No	290	1.0	738	1,500	Yes	-
872	BH	C-EF-23	7.0	24 - Surrounding SE 2	No	300	1.0	854	1,500	Yes	-
873	BH	C-EF-23	7.0	21 - Surrounding NE 2	No	215	1.0	471	1,500	Yes	-
875	BG	C-EF-22	7.0	7 - SW Operable Window	No	85	1.0	2,633	1,500	No	0.30%
876	BG	C-EF-22	7.0	12 - Surrounding S	No	355	1.0	1,232	1,500	Yes	-
877	BG	C-EF-22	7.0	16 - Surrounding WNW 1	No	145	1.0	1,335	1,500	Yes	-
878	BG	C-EF-22	7.0	22 - Surrounding NE 3	No	235	1.0	1,288	1,500	Yes	-

Table 5
Test Plan, Normalized Concentration Results
and Percent Time the Design Criteria may be Exceeded For Each Source/Receptor Combination Evaluated

Run No.	Source Letter	Source ID	Stack Height Above Base (ft)	Receptor Identification	Air Intake Operating	Wind Direction (Deg.)	Wind Speed (m/s)	(1) Max Normalized WT-Measured Concentration (µg/m³)/(g/s)	(2) Design Criteria (µg/m³)/(g/s)	(3) Design Criteria Achieved?	(4) Percent Time Design Criteria May Be Exceeded
R-Wing									ANSI		
881	BJ	R-EF-4	7.0	7 - SW Operable Window	No	80	2.1	1,050	1,500	Yes	- - -
882	BJ	R-EF-4	7.0	10 - N Operable Window	No	185	1.0	508	1,500	Yes	- - -
883	BJ	R-EF-4	7.0	12 - Surrounding S	No	10	2.1	297	1,500	Yes	- - -
884	BJ	R-EF-4	7.0	14 - Surrounding W 1	No	95	1.3	626	1,500	Yes	- - -
885	BJ	R-EF-4	7.0	18 - Surrounding NW	No	155	1.3	468	1,500	Yes	- - -
886	BJ	R-EF-4	7.0	21 - Surrounding NE 2	No	210	1.0	554	1,500	Yes	- - -
887	BJ	R-EF-4	7.0	22 - Surrounding NE 3	No	230	2.1	530	1,500	Yes	- - -
606	BM	R-EF-24	7.0	1 - Planned AH-1	No	190	9.4	659	1,500	Yes	- - -
616	BM	R-EF-24	7.0	2 - E-Wing AHU	No	175	4.5	1,233	1,500	Yes	- - -
891	BM	R-EF-24	9.0	7 - SW Operable Window	No	80	2.1	404	1,500	Yes	- - -
892	BM	R-EF-24	9.0	14 - Surrounding W 1	No	95	1.0	459	1,500	Yes	- - -
895	BI	R-EF-2/3	7.0	7 - SW Operable Window	No	80	7.3	230	1,500	Yes	- - -
896	BI	R-EF-2/3	7.0	14 - Surrounding W 1	No	95	4.5	194	1,500	Yes	- - -
897	BI	R-EF-2/3	7.0	10 - N Operable Window	No	185	3.5	140	1,500	Yes	- - -
898	BI	R-EF-2/3	7.0	21 - Surrounding NE 2	No	210	3.5	143	1,500	Yes	- - -
899	BI	R-EF-2/3	7.0	22 - Surrounding NE 3	No	230	4.5	250	1,500	Yes	- - -
Q-Wing											
605	BK	Q-EF-25	7.0	1 - Planned AH-1	No	190	1.3	1,181	1,500	Yes	- - -
901	BK	Q-EF-25	7.0	7 - SW Operable Window	No	115	1.3	2,008	1,500	No	0.45% - -
902	BK	Q-EF-25	7.0	10 - N Operable Window	No	190	1.0	368	1,500	Yes	- - -
903	BK	Q-EF-25	7.0	12 - Surrounding S	No	15	1.3	715	1,500	Yes	- - -
904	BK	Q-EF-25	7.0	14 - Surrounding W 1	No	110	1.0	880	1,500	Yes	- - -
905	BK	Q-EF-25	7.0	18 - Surrounding NW	No	160	1.0	462	1,500	Yes	- - -
906	BK	Q-EF-25	7.0	21 - Surrounding NE 2	No	210	1.0	441	1,500	Yes	- - -
907	BK	Q-EF-25	7.0	22 - Surrounding NE 3	No	220	1.0	886	1,500	Yes	- - -
908	BK	Q-EF-25	7.0	23 - Surrounding SE 1	No	275	1.6	1,046	1,500	Yes	- - -
A-Wing											
911	BL	A-EF-5	7.0	7 - SW Operable Window	No	110	4.5	441	1,500	Yes	- - -
912	BL	A-EF-5	7.0	12 - Surrounding S	No	20	4.5	230	1,500	Yes	- - -
913	BL	A-EF-5	7.0	14 - Surrounding W 1	No	105	2.7	270	1,500	Yes	- - -
914	BL	A-EF-5	7.0	18 - Surrounding NW	No	160	1.6	213	1,500	Yes	- - -
915	BL	A-EF-5	7.0	21 - Surrounding NE 2	No	210	1.6	176	1,500	Yes	- - -
916	BL	A-EF-5	7.0	22 - Surrounding NE 3	No	215	3.5	182	1,500	Yes	- - -
917	BL	A-EF-5	7.0	23 - Surrounding SE 1	No	275	4.5	382	1,500	Yes	- - -

Notes:

1) The maximum normalized concentration (*C/m*) measured in the wind tunnel for the specific source/receptor pair.
2) The maximum acceptable *C/m* for each specific source, based on criteria discussed in Section 2.4 and Appendix C.
3) "Yes" if (1) < (2) or "No" if (1) > (2).
4) Percentage of time for which the prescribed emission scenario may produce concentrations greater than (2), based on a curve fit to all data collected for the specific source/receptor pair and the local wind frequency distribution (data tabulations are located in Appendix D).

Washington State Public Health Lab
Planning & Programming Repot

Part 4 Master Development Plan Narrative

Proposed Site Zoning Regulations

The following table illustrates the proposed zoning regulations for the property.

Zoning Restrictions

Setbacks		
Front	40 feet	
Side	20 feet	
Rear	20 feet	
Building Mass		
Building Height	65 feet	Allow roof top equipment to exceed the height limitation by 15 feet
Modulation	50 feet max of street front façade before modulation or change of materials for min. 15'.	
Coverage		
Impervious Surface	75% max	
~~Building Lot Coverage~~	50% max	
Parking and Transportation	1 stall per 500 nsf lab and 1/300 nsf for office. Provide landscape screening per current City of Shoreline requirements. Designate van pool stalls and encourage alternate means of transportation/trip reduction, provide covered bicycle parking	
Site Lighting		
Parking	Full cut off fixtures, limited to 25' tall fixtures	
Building/Security	Provide well lit pedestrian paths. No light from building fixtures to cross property line	