

APPENDIX E

Earth Element Technical Memorandum

TECHNICAL MEMORANDUM

TO: Mike Blumen, Blumen Consulting Group, Inc.

FROM: David Fischer, P.E.

DATE: September 24, 2008

RE: **PREFERRED ALTERNATIVE EVALUATION – EARTH ELEMENT
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
NEW WHATCOM REDEVELOPMENT PROJECT
PORT OF BELLINGHAM
BELLINGHAM, WASHINGTON**

INTRODUCTION

This technical memorandum has been prepared to briefly summarize the “earth element” evaluation identified in the Draft Environmental Impact Statement (DEIS), and provide a discussion of the applicability of that earth element evaluation to the proposed Preferred Alternative for the New Whatcom Redevelopment (New Whatcom) project in Bellingham, Washington. We understand that this technical memorandum will support the preparation of the earth element of the Supplemental EIS (SEIS) for the project.

This document has been prepared for the Port of Bellingham (Port) and the City of Bellingham (City) to support the New Whatcom Master Development Plan. Additional site-specific subsurface investigations and geotechnical engineering analyses should be conducted as part of the specific design and permitting of infrastructure and buildings associated with future site development.

SUMMARY OF DEIS EARTH ISSUES AND EVALUATION

Landau Associates’ Earth Element Technical Report (Landau Associates 2007) provided background information to support the preparation of the earth element of the DEIS, and discussed the affected environment, impacts, and mitigation measures for geologic hazards, construction impacts, and operational impacts associated with the four alternatives included in the DEIS.

Affected Environment

The Affected Environment section of the 2007 DEIS Earth Element Technical Report included a discussion of existing site conditions, geology, groundwater, and geologic hazards that might be associated with site redevelopment. The geologic hazards included:

- Settlement
- Landsliding and steep slopes
- Seismic hazards (including ground shaking and ground motion amplification, ground rupture, liquefaction and lateral spreading, and tsunamis)
- Landfill areas
- Erosion hazards
- Coal mine hazards
- Sea level rise.

Impacts

The Impacts section of the 2007 DEIS Earth Element Technical Report evaluated the potential effects that the existing earth environment at the site might have on redevelopment under the DEIS Alternatives, as well as the effect of construction, operation, and maintenance of the Alternatives on the earth environment. These impacts included both short-term construction impacts and long-term operational impacts. An impact such as potential liquefaction of existing soils would be an example of an impact associated with the existing environment. Pile-driving noise and vibration would be examples of construction-related impacts. Long-term operational impacts would be those associated with the specific land use and are likely to be negligible and indistinguishable for the earth environment.

The potential impacts associated with future site redevelopment under the DEIS Alternatives included those associated with:

- Geologic hazards (see listing above)
- Groundwater impacts
- Construction impacts (including erosion, excavations, dewatering, placement of structural fill, preloading, and deep foundations such as driven piles and drilled shafts)
- Operational impacts (including traffic vibrations and landfill gas control).

The Impacts section of the 2007 DEIS Earth Element Technical Report also discussed the relative impacts by alternative, as well as certain indirect/cumulative impacts. The report concludes that while there could be the potential for impacts both during construction and as part of operation of the redevelopment, typical geotechnical engineering design and construction measures could be implemented to preclude significant adverse impacts in all areas noted above.

Mitigation Measures

The Mitigation Measures section of the 2007 DEIS Earth Element Technical Report included a discussion of various mitigation measures to limit the potential for significant impacts associated with the DEIS Alternatives.

Specific foundation support systems to be used for onsite improvements would be determined as part of the specific design and permit process for infrastructure and individual buildings associated with future site development. Site-specific studies and evaluations would need to be conducted in accordance with City of Bellingham Municipal Code requirements and the provisions of the most recent version of the International Building Code (IBC). Seismic design using the most recent design codes and generally accepted engineering standards and practices would need to be conducted during the design phase of the future site improvements. This includes conducting site-specific seismic analyses when appropriate and using the most recent version of the IBC, which contains provisions to address life safety issues and incorporates data obtained from recent seismic events in the seismic design standards. Other measures were listed to address potential impacts related to erosion, slope instability, landfill hazards, settlement, vibrations from pile driving, sea level rise, etc.

Significant Unavoidable Adverse Impacts

It was concluded that methods are available to build out the New Whatcom site under each EIS alternative without resulting in significant unavoidable adverse impacts.

PREFERRED ALTERNATIVE

The Preferred Alternative represents a further refinement of the EIS Alternatives in the DEIS.

Based on the information provided in the DEIS, ongoing public input, additional analysis and master planning, and coordination between the Port and the City, as well as other agencies, groups and stakeholders, the Port staff prepared a recommended proposal to serve as the Preferred Alternative for analysis in the SEIS. The Preferred Alternative is based on a modified street grid for long-term redevelopment of the Waterfront District. The new grid would be rotated at the top of the bluff that currently divides the Waterfront District from the existing downtown in order to provide efficient connection to the city and cost-effective engineering solutions for bridging the bluff and the Burlington Northern Santa Fe railroad corridor. The Preferred Alternative would feature approximately 2.7 million square feet of mixed-use redevelopment by 2016, and approximately 6.0 million square feet of mixed-use redevelopment by 2026; at buildout, the Preferred Alternative would provide 33 acres of open space and parks.

The Preferred Alternative is intended to be a medium-density, sustainable development that features a diversity of uses that are complementary to the downtown Bellingham Central Business District; an infrastructure network that integrates with and connects the waterfront to surrounding areas; and a system of parks, trails, and open space that opens up the waterfront to the community. Redevelopment under the Preferred Alternative would be within the range of redevelopment assumed for the EIS Alternatives in the January 2008 DEIS. Redevelopment under the Preferred Alternative would mix and match elements of the EIS Alternatives. As an example, the redevelopment density under the Preferred Alternative would be comparable to that under EIS Alternatives 2/2a (up to 6 million square feet of office, institutional, marine, industrial, residential, and retail uses). The amount of parks, trails, and habitat area under the Preferred Alternative would be similar to that assumed under Alternative 1 (approximately 33 acres).

Supplemental Evaluation Summary

A brief summary of the supplemental evaluation of the Preferred Alternative is presented below.

Affected Environment

The existing conditions and geologic hazards at the site have not substantially changed as part of the Preferred Alternative and are, therefore, not discussed further in this technical memorandum.

Impacts

The Preferred Alternative does not raise any new or different issues related to the geotechnical conditions of the site. The potential impacts associated with the Preferred Alternative are, therefore, similar to those discussed for the DEIS Alternatives.

With respect to sea level rise, the 2007 DEIS Earth Element Technical Report concluded that a reasonable estimate of potential sea level rise in Bellingham Bay by 2100 was considered to be up to approximately 2.4 feet (about 29 inches) above current levels. In a January 2008 report by the University of Washington and the Washington State Department of Ecology (UWCIG and Ecology 2008), a medium estimate of potential sea level rise in Washington State by 2100 was reported at 13 inches, and a very high, low probability estimate of potential sea level rise by 2100 was reported at 50 inches. Thus, the 2.4 ft of potential sea level rise included in the DEIS is still considered a reasonable estimate of potential sea level rise in Bellingham Bay by 2100 for use in the SEIS evaluation. The revised grading plan for the Preferred Alternative would effectively mitigate the long-term potential impact of sea level rise.

Mitigation Measures

All mitigation measures discussed in the DEIS Alternatives would also apply to the Preferred Alternative.

The revised grading plan associated with the Preferred Alternative includes placement of imported fill to construct the associated roadway network, to accommodate an environmental cap in areas of the site that would be retained as parks and open spaces, to accommodate building and parking structures, to minimize unnecessary excavation work within areas of completed site remediation for utilities and foundations, and to mitigate the potential impact of a long-term sea level rise in Bellingham Bay.

Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts have been determined for the earth element of the SEIS for the Preferred Alternative for the New Whatcom Redevelopment project.

REFERENCES

Landau Associates. 2007. Technical Memorandum: *Earth Element Technical Report, New Whatcom Redevelopment Project, Port of Bellingham, Bellingham, Washington*. From David Pischer, P.E. to Mike Blumen, Blumen Consulting Group. December.

UWCIG and Ecology. 2008. Report: *Sea Level Rise in the Coastal Waters of Washington State*. University of Washington Climate Impacts Group and Washington State Department of Ecology. January.

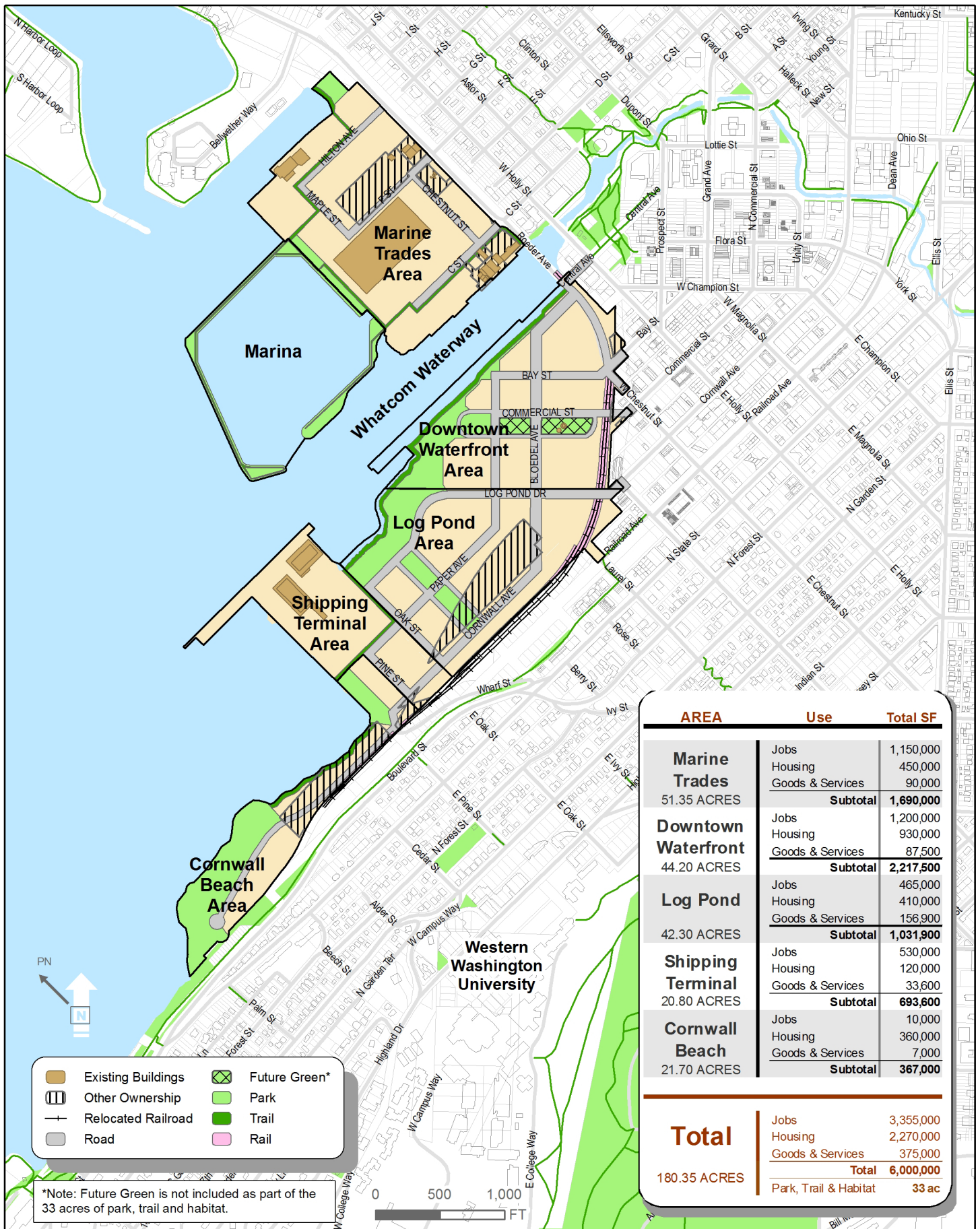


Figure 1
Preferred Alternative
2026



AREA	Use	Total SF
Marine Trades 51.35 ACRES	Jobs	1,150,000
	Housing	450,000
	Goods & Services	90,000
	Subtotal	1,690,000
Downtown Waterfront 44.20 ACRES	Jobs	1,200,000
	Housing	930,000
	Goods & Services	87,500
	Subtotal	2,217,500
Log Pond 42.30 ACRES	Jobs	465,000
	Housing	410,000
	Goods & Services	156,900
	Subtotal	1,031,900
Shipping Terminal 20.80 ACRES	Jobs	530,000
	Housing	120,000
	Goods & Services	33,600
	Subtotal	693,600
Cornwall Beach 21.70 ACRES	Jobs	10,000
	Housing	360,000
	Goods & Services	7,000
	Subtotal	367,000
Total 180.35 ACRES	Jobs	3,355,000
	Housing	2,270,000
	Goods & Services	375,000
	Total	6,000,000
	Park, Trail & Habitat	33 ac

Figure 2
Straight Street Grid Option
2026

New Whatcom
Redevelopment EIS