

11/2 R

Puget Sound Power & Light Company Puget Power Building Bellevue, Washington 98003 (206) 454-6363

October 27, 1978

PLN-203

Director of Nuclear Reactor Regulation  
Attention: Mr. William H. Regan, Jr., Chief  
Environmental Projects Branch 2  
Division of Site Safety and  
Environmental Analysis

U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Subject: Puget Sound Power & Light Company  
Skagit Nuclear Power Project, Units 1 & 2  
Docket Numbers 50-522 and 50-523  
NRC Letter to Mr. J. E. Mecca, Puget Power,  
from Mr. Wm. H. Regan, Jr., of the NRC on  
the Geological Aspects of Alternative Sites,  
dated July 7, 1978.

Dear Mr. Regan:

The intent of this communication is to completely close out the information gathering phase of the enclosure to the above referenced NRC letter.

Attached please find a revised bibliography which reflects additional references provided the NRC on October 16, 1978. Those references denoted by an asterisk were provided to the NRC on October 16, 1978 or are enclosed.

The attached bibliography supersedes that which accompanied our September 25, 1978 communication.

We have reviewed the most current information submitted and, as indicated in our September 25, 1978 letter, the review has not altered our earlier assessment of the Skagit Site. A written assessment of the alternative site geology material, per your request, is in preparation and will be provided during the week of November 6, 1978.

If you have any questions regarding this material, please contact me.

Very truly yours,

*J. E. Mecca*  
J. E. Mecca, Manager  
Nuclear Licensing & Safety

Attach.  
cc: Correspondence List  
ASLB Correspondence List

781108 0153



Mr. Richard L. Black  
NRC Legal Staff  
U. S. Nuclear Regulatory Commission  
Office of the Executive Legal Director  
Washington, D. C. 20555

Mr. Roger M. Leed, Esq.  
Suite 610  
1411 Fourth Avenue Building  
Seattle, Washington 98101

Mr. Nicholas D. Lewis  
Chairman  
Washington State Energy Facility  
Site Evaluation Council  
820 East Fifth Avenue  
Olympia, Washington 98504

Mr. Robert C. Schofield, Director  
Skagit County Planning Department  
120 West Kincaid Street  
Mount Vernon, Washington 98273

Mr. Robert Lowenstein  
Lowenstein, Newman, Reis & Axelrad  
1025 Connecticut Avenue N. W.  
Suite 1214  
Washington, D. C. 20036

Mr. F. T. Thomsen  
Perkins, Coie, Stone, Olsen & Williams  
1900 Washington Building  
Seattle, Washington 98101

CFSP and FOB  
c/o E. Stachon & L. Marbet  
19142 South Bakers Ferry Road  
Boring, Oregon 97099

Mr. Richard M. Sandvik, Esq.  
Assistant Attorney General  
State of Oregon  
Department of Justice  
500 Pacific Building  
520 S. W. Yamhill  
Portland, Oregon 97204

Mr. Richard D. Bach, Esq.  
Rives, Bonyhadi & Drummond  
1400 Public Service Building  
920 S. W. 6th Avenue  
Portland, Oregon 97204

Mr. H. H. Phillips, Esq.  
Vice President and Corporate Counsel  
Portland General Electric Company  
121 S. W. Salmon  
Portland, Oregon 97204

Mr. Samuel W. Jensch, Esq., Chairman  
Atomic Safety and Licensing Board  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Dr. Frank F. Hooper, Member  
Atomic Safety and Licensing Board  
School of Natural Resources  
University of Michigan  
Ann Arbor, Michigan 48104

Mr. Gustave A. Linenberger, Member  
Atomic Safety and Licensing Board  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Mr. Alan S. Rosenthal, Chairman  
Atomic Safety and Licensing Appeal Panel  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555



ALTERNATE SITES BIBLIOGRAPHY

1. Algermissen, S.T., Stepp, J.C., Rinehart, W.A., Arnold E.P.  
Studies in Seismicity and Earthquake Damage Statistics, 1969,  
Appendix B  
Coast and Geodetic Survey, 1969
2. Amuedo, Curtis L., et al.  
Review of ERTS Imagery, Northwestern Washington and Southern  
British Columbia, for the Skagit Nuclear Power Plant Site
3. Armentrout, John M.  
Molluscan Biostratigraphy and Paleontology of the Lincoln  
Creek Formation (Late Eocene-Oligocene), Southwestern Washington  
Ph.D Dissertation, University of Washington, 1973
4. Armentrout, John M.  
Molluscan Biostratigraphy and Paleontology of the Lincoln Creek  
Formation (Late Eocene-Oligocene), Southwestern Washington  
University of Washington, Abstract
5. Armentrout, John M.  
Cenozoic Stratigraphy of Southwestern Washington,  
Field Trip Number 9, GSA Seattle Meeting, 1977
6. Armstrong, J.E., Crandell, Easterbrook, Noble  
Lake Pleistocene Stratigraphy and Chronology in Southwestern  
British Columbia and Northwestern Washington  
GSA, Vol. 76, P. 321-330, 1965
7. Bonini, W.E., et al.  
Complete Bouger Gravity Anomaly Map of Washington  
State of Washington, Div. of Geology and Earth Resources  
Geologic Map GM-11, 1974
8. Bechtel, Inc.  
Report of Geological Reconnaissance for Six Potential Power Plant  
Sites in Western Washington, 1973
9. Bechtel Corp.  
Cherry Point Site Geologic Investigation  
September, 1967
10. Beikman, H.M. Gower & Dana  
Coal Reserves of Washington  
Washington State, Division of Mines and Geology, 1961
11. Beikman, H.M., Rau, W.W., Wagner, H.C.  
The Lincoln Creek Formation, Grays Harbor Basin, Southwestern  
Washington  
USGS Bulletin 1244-I, 1967

12. Bostrom, R.C., Couch, R.W., Rasmussen, N.H., Sherif, M.  
An Observation Program on Level Changes and the Incidence of  
Seismicity in the Puget Sound Area  
The Trend in Engineering, Quarterly Journal of the University  
of Washington College, 1968
13. Carlson, R.L.  
Bouger Gravity Map of Northwestern Washington  
M.S. Thesis, University of Washington, 1972, Geophysics
14. Collier, A.J.  
Coal Resources of Cowlitz River Valley, Cowlitz and Lewis  
Counties, Washington  
USGS Bulletin No. 531, 1913
15. Crandell, D.R.  
Potential Hazards from Future Eruptions of Mt. Rainier, Washington  
USGS Miscellaneous Geo. Invest. Map I-836, 1973
16. Crandell, D.R.  
Preliminary Assessment of Potential Hazards from Future Volcanic  
Eruptions in Washington  
USGS, Map MF-774, 1976
17. Crandell, D.R., Mullineaux, D.R.  
Mt. St. Helens Volcano: Recent and Future Behavior  
Science, Vol. 187
- \*18. Crandell, Dwight R. and Mullineaux, Donald R.  
Potential Hazards from Future Eruptions of Mt. St. Helens  
Volcano, Washington,  
USGS Open File Report 76-491, (1976)
19. Crandell, Dwight R., et al.  
Quaternary Stratigraphy and Extent of Glaciation in the Mount  
Rainier Region, Washington  
Geological Survey Professional Paper 847
20. Crosson, R.S.  
Compilation of Earthquake Hypocenters in Western Washington  
State of Washington, DNR, Div. of Geology and Earth Resources  
Info. Circular 53 - 1970-1972  
Info. Circular 55 - 1973  
Info. Circular 56 - 1974
21. Crosson, et al.  
Compilation of Earthquake Hypocenters in Western Washington 1975,  
1976 and 1977
22. Crosson, Robert S.  
Small Earthquakes, Structure, and Tectonics of the Puget Sound  
Region  
Bulletin of the Seismological Society of America, Vol. 62, No. 5,  
pages 1133-1171, October 1972
23. Danes, Zdenko F.  
Gravity Results in Western Washington  
American Geophysical Union, Vol. 50, No. 10, page 548, October 1969

24. Danes, Bonno, Brau, Gilhan, Hoffman, et al.  
Geophysical Investigation of the Southern Puget Sound Area,  
Washington  
Journal of Geo. Res., Vol. 70, No. 22, 1965
25. Danner, W.R.  
An Introduction to the Stratigraphy of Southwestern British  
Columbia and Northwestern Washington
26. Drill Logs  
Oil and Gas Well Logs Within Five Miles of Goshen and Cherry  
Point Sites - from various sources, including Livingston, V.E.  
Jr. Oil and Gas Exploration in Washington  
1900-1957: Washington Division of Geology and Earth Resources  
Info. Circular 29, 1958
27. Earthquake Engineering Group, University of Washington  
An Observation Program on Level Change and the Incidence of  
Seismicity in the Puget Sound Area
28. Easterbrook, Don J.  
Stratigraphy and Palynology of Late Quaternary Sediments in the  
Puget Lowland, Washington  
Geological Society of America Bulletin, Vol. 85, pages 587-602,  
10 figures, April 1974
29. Easterbrook, Donald J.  
Late Pleistocene Glacial Events and Relative Sea-Level Changes  
in the Northern Puget Lowland, Washington  
Geological Society of America Bulletin  
Vol. 74, pages 1465-1484, three figures, 3 pls., December 1963
30. Easterbrook, D.J.  
Pleistocene Chronology of the Puget Lowland and San Juan Islands,  
Washington  
GSA Bulletin, Vol. 80 pages 2273-2286, 1969
31. Easterbrook, D.J.  
Map Showing Percolation Rates of Earth Materials in Western  
Whatcom County, Washington  
USGS Misc. Geo. Invest. Map I-854-A, 1973
32. Easterbrook, D.J.  
Geologic Map of Western Whatcom County, Washington  
USGS Misc. Invest. Map I-854-B, 1973
33. Easterbrook, D.J.  
Map Showing Slope Stability in Western Whatcom County, Washington  
USGS Misc. Invest. Map I-854-C, 1976
34. Easterbrook, D.J.  
Map Showing Engineering Characteristics of Geologic Materials,  
Western Whatcom County, Washington  
USGS Misc. Invest. Map I-854-D, 1976



- \*35. Fox, Kenneth F. Jr., et al.  
Plutonism and Orogeny in North-Central Washington-Timing and Regional Context,  
Geological Survey Professional Paper 989, 1977
36. Frazer Sheet  
Canadian Geological Society Open File Map, 1973
- \*37. Glover, Sheldon L.  
Oil and Gas Possibilities of Western Whatcom County,  
Report of Investigations No. 2  
Division of Geology  
State of Washington, (1935)
- \*38. Gower, Howard D.  
Tectonic Map of the Puget Sound Region, Washington, Showing Locations of Faults, Principal Folds and Large-Scale Quaternary Deformation,  
USGS Open File Report 78-426, (1978)
39. Hawkins, N.H. and Crosson, R.S.  
Causes, Characteristics and Effects of Puget Sound Earthquakes  
U.S. Nat. Conf. on Earthquake Engineering, 1975
- \*40. Heller, Paul  
Pleistocene Geology and Related Landslides in the Lower Skagit and Baker Valleys, North Cascades, Washington  
Western Washington University Masters Thesis 1978
- \*41. Henderson, John R., et al.  
Aeromagnetic Maps of the:  
Onalaska Quadrangle Lewis County, Washington,  
Map GP 189, 1958  
Centralia Quadrangle Lewis County, Washington,  
Map GP 188, 1958  
Adna Quadrangle Lewis County, Washington,  
Map GP 187, 1958  
Pe Ell Quadrangle Pacific and Lewis Counties, Washington,  
Map GP 186, 1958
42. Henricksen, D.A.  
Eocene Stratigraphy of the Lower Cowlitz River - Eastern Willapa Hills Area, Southwestern Washington  
State of Washington, Division of Mines and Geology, 1956
43. Hopkins, W.S. Jr.  
Subsurface Miocene Rocks, British Columbia - Washington, A Palynological Investigation  
GSA Bulletin, Vol. 79, pages 763-768, 1968
44. Huntting, et al.  
Geologic Map of the State of Washington  
State of Washington, 1961

45. Hyde, J.H. and Crandell, D.R.  
Origin and Age of Postglacial Deposits and Assessment of Potential Hazards from Future Eruptions of Mount Baker, Washington  
USGS, Open File Report 75-286, 1975
46. Hyde, Jack, H.  
Upper Pleistocene Pyroclastic - Flow Deposits and Lahars South of Mount St. Helens Volcano, Washington  
Geological Survey Bulletin 1383-B
- \*47. Jenkins, Olaf, P.  
Geological Investigation of the Coal Fields of Skagit County, Washington  
State of Washington Bulletin No. 29, 1924
- \*48. Jenkins, Olaf, P.  
Geological Investigation of the Coal Fields of Western Whatcom County, Washington  
State of Washington Bulletin No. 28, 1923
49. King, P.B.  
Tectonic Map of North America  
1969
50. Livingston, V.E.  
Coal in Washington  
Energy Resources of Washington, DNR, Division of Geology and Earth Resources, Info. Circular 50, 1974
51. Livingston, V.E.  
Geology and Mineral Resources of the Kelso-Cathlamet Area, Cowlitz and Walikiakum Counties, Washington  
Washington State, Division of Mines and Geology, Bulletin 54, 1966
- \*52. Lovseth, Timothy Peter  
The Devils Mountain Fault Zone, Northwestern Washington,  
University of Washington, Masters Thesis, 1975
- \*53. MacLeod, N.S., et al  
Geologic Interpretation of Magnetic and Gravity Anomalies in the Strait of Juan de Fuca, U.S. - Canada,  
Canadian Journal Earth Science, 14,223-238, 1977
54. Miller, G.M.  
Western Extent of Mid-Cretaceous Thrusting in Whatcom and Skagit Counties, Washington  
GSA Cordilleran Sect., Abstract, 1969
55. Miller and Misch, P.  
Early Eocene Angular Unconformity at Western Front of Northern Cascades, Whatcom County, Washington  
AAPG Bulletin 47, 1963
56. Misch, P.  
Dextral Displacements of Some Major Strike Faults in the North Cascades  
Geological Society of Canada, Symposium Abstract 1977



57. Misch, P.  
Tectonic Evolution of the Northern Cascades of Washington State  
Canadian Inst. Univ. Metall. Spec. Vol. 8, 1966
58. Misch, P.  
Bedrock Geology of the North Cascades  
GSA Guidebook, Seattle Meeting, 1977
- \*59. Moen, Wayne S.  
Geology and Mineral Deposits of the North Half of the Van Zandt  
Quadrangle, Whatcom County, Washington, State of Washington  
Division of Mines and Geology, Bulletin No. 50, 1962
60. Moen, W.S.  
Mineral Resource Map of Washington  
Washington State, NR, Division of Geology and Earth Resources  
GM-22
61. Moen, W.S.  
Mines and Mineral Deposits of Whatcom County, Washington  
Washington DNR, Bulletin 57, 1969
- \*62. Molenaar  
Nooksack River Basin Maps  
State of Washington  
Department of Conservation Division of Water Resources June, 1960  
Plate 1 Geologic Map  
Plate 2 Geologic Cross Sections  
Plate 3 Ground-Water Supply
63. Myers, D.A.  
Availability of Ground Water in Western Cowlitz County, Washington  
State of Washington, Department of Ecology, Water Supply  
Bulletin No. 35, 1970
64. Othberg, K. et al.  
Thickness of Unconsolidated Sediments, Puget Lowland, Washington  
State of Washington, Division of Geology and Earth Resources,  
Geologic Map GM-12, 1974
65. Palmer, P.  
Investigation of Tectonic Deformation in the Puget Lowland,  
Washington  
State of Washington, DNR, Division of Geology and Earth Resources  
Open File Report OF-77-6, 1977
66. Palmer, P. and Siegfried, R.T.  
Investigation of Tectonic Deformation in the Puget Lowland,  
Washington  
State of Washington, DNR, Division of Geology and Earth Resources,  
1978
- \*67. Pease, Maurice H. Jr., and Hoover, Linn,  
Geology of the Doty-Minot Peak Area, Washington  
Oil and Gas Investigations, USGS Map OM188, 1957

68. Rasmussen, N.H., Millard, R.C., Smith, S.W.  
Earthquake Hazard Evaluation of the Puget Sound Region  
Washington State  
Geophysics Program, University of Washington
69. Riddihough, R.P.  
A Model for Recent Plate Interactions Off Canada's West Coast  
Canadian Journal of Earth Sciences, Vol. 14, 1977
70. Roberts, Albert E.  
Geology and Coal Resources of the Toledo-Castle Rock District  
Cowlitz and Lewis Counties, Washington  
Geological Survey Bulletin 1062
71. Rogers, Garry C. and Hasegawa, Henry S.  
A Second Look at the British Columbia Earthquake  
of June 23, 1946, Bulletin of the Seismological Society of  
America,  
Vol. 68, No. 5, pp 653-675, June 1978
- \*72. Schriener, Alexander, Jr.  
Gravity Study of the Southern Skagit River Delta, Washington,  
University of Washington  
Bachelor of Science Thesis, 1976
73. Snavely, Parke D. et al.  
Geology and Coal Resources of the Centralia - Chehalis  
District, Washington  
Geological Survey Bulletin 1053
- \*74. Snavely, Parke D., Jr., and Wagner, Holly C.  
Tertiary Geologic History of Western Oregon and Washington,  
State of Washington  
Division of Mines and Geology, Report of Investigation No. 22, 1963
- \*75. State of Washington,  
Department of Ecology  
Coastal zone Atlas of Washington, Vol. 1, Whatcom County,  
Publication No. DOE 77-21-1, 1977
- \*76. State of Washington  
Water Resources of the Nooksack River Basin and Certain Adjacent  
Streams,  
Water Supply Bulletin No. 12  
Department of Conservation  
Division of Water Resources, (1960)
77. Stepp, J.C.  
Analysis of Completeness of the Earthquake Sample in the Puget  
Sound Area and Its Effects on Statistical Estimates of Earthquake  
Hazard  
National Oceanic and Atmospheric Administration Environmental  
Research Laboratories

- \* 78. Sceva, Jack E.  
Preliminary Report on the Ground-Water Resources of Southwestern Skagit, County, Washington  
Department of Conservation and Development  
Division of Hydraulics  
State of Washington, 1950
79. Stuart, David J.  
Gravity Study of Crustal Structure in Western Washington  
Geologic and Hydrologic Sciences, Articles 147-292
80. Sylvester, et al.  
The Determination of Active Earth Zones in Puget Sound, Washington, by Means of Continuous Seismic Profiling
81. Terich, T.  
Coastal Processes of the Whatcom County Mainland  
1977
82. Thompson, G.A. and Robinson, R.  
Gravity and Magnetic Investigation of the Twin Sisters Dunite, Northern Washington  
GSA Bulletin, Vol. 86, page 1413, 1975
83. Thompson, G.A.  
Aeromagnetic and Bouguer Gravity Map of Twin Sisters Dunite, Northwestern Washington  
USGS, Geophy. Invest. Map GP-901, 1973
84. Ulrich, Franklin P.  
Reporting and Northwest Earthquake from the Scientific Point of View  
United States Coast and Geodetic Survey, Seismological Field Survey
85. USGS  
Aeromag Map of the Bellingham Area, Washington  
USGS OF-78-354
86. USGS  
A Study of Earthquake Losses in the Puget Sound, Washington Area  
USGS Open File Report 75-375, 1975
87. Vance, Joseph A.  
The Stratigraphy and Structure of Orcas Island, San Juan Islands, Field Trip Number 5, GSA Seattle Meeting, 1977
88. Vonheeder, E.R.  
Coal Reserves of Whatcom County, Washington  
Washington State, DNR, Division of Geology and Earth Resources  
Open File Report OF-75-9, 1975
89. Vonheeder, E.R.  
Whatcom County Coal Resources (a set of five maps)  
State of Washington, Division of Geology and Earth Resources 1977  
Open File Report OF-77-3



\*90. WPPSS Nuclear Project No. 3 PSAR Plates.

Fig. 2.5.13	Regional Tectonic Provinces
Fig. 2.5.E.5	Side-Looking Airborne Imagery Lineaments
Fig. 2.5.E.9	Earth Resources Technology Satellite Lineaments
Fig. 2.5.H.2	Earthquake Activity within 70 miles of Site
Fig. 2.5.51a	Hypocentral Depths of Earthquakes within 70 miles of Site

91. Weigle, J.M. and Foxworthy, J.M.  
Geology and Ground-Water Resources of West-Central Lewis County,  
Washington  
State of Washington, Division of Water Resources, 1962
92. Weissenborn, A.E.  
Geologic Map of Washington  
USGS Misc. Geo. Invest. Map I-583, 1969
- \*93. Wilson, Daniel L.  
The Origin of Serpentinities Associated with the Shuksan Metamorphic  
Suite Near Gee Point, Washington,  
Western Washington University, Masters Thesis, 1978
94. Wolfe, Edward W. et al.  
Sedimentary and Igneous Rocks of the Grays River Quadrangle,  
Washington  
Geological Survey Bulletin 1335
95. Wurden, F.H. and Ford, D.M.  
Jackson Prairie Gas Storage Project, Chehalis, Washington  
Washington Geologic Newsletter, Vol. 5, No. 3, 1977

\*Denotes that the material was provided to the NRC on 10/16/78  
or is hereto enclosed.