APPENDIX B: PLANT LISTS FOR MCALLISTER/EATON CREEK BASIN

PLANTS OF THE NISQUALLY DELTA[1]

VASCULAR PLANTS

Scientific Name	Common Name[2]	Introduced[3]
Acer circinatum	vine maple	
Acer macrophyllum	bigleaf maple	
Achillea millefolium	common yarrow	I?
Achlys triphylla	vanilla leaf	
Actaea rubra	western baneberry	
Adenocaulon bicolor	trail plant	
Adiantum pedantum	northern maidenhair fern	
Agropyron caninum	awned wheatgrass	
Agropyron cristatum	crested wheatgrass	I
Agropyron repens	quackgrass	I
Agrostis alba	redtop, bentgrass	I
Agrostis tenuis	colonial bentgrass	I
Aira caryophyllea	silver hairgrass	I
Aira praecox	early hairgrass	I
Alisma plantago-aquatica	American water plantain	
Allophyllum divaricatum	pink false gilia	I
Alnus rubra	red alder	
Alopecurus geniculatus	water foxtail	
Alopecurus pratensis	meadow foxtail	I
Amaranthus powellii	Powell's amaranth	
Ambrosia chamissonis var. bipinnatisecta	heath burweed	
Amelanchier alnifolia	western serviceberry	
Amsinckia menziesii	Menzies' fiddleneck	
Anaphalis margaritacea	pearly everlasting	
Angelica genuflexa	kneeling angelica	
Angelica lucida	seacoast angelica	
Anthemis cotula	mayweed, dog fennel, chamomile	I
Anthriscus scandicina	bur chervil	I
Arabidopsis thaliana	thale cress	I
Arbutus menziesii	Pacific madrone	
Arctium minus	common burdock	I
Arctostaphylos uva-ursi	kinnikinnik, bearberry	
Arenaria macrophylla	large-leaved sandwort	
Artemesia suksdorfii	coastal mugwort	
Asarum caudatum	wild ginger	

Scientific Name	Common Name[2]	Introduced[3]
Aster eatonii	Eaton's aster	
Athyrium felix-femina	lady fern	
Atriplex patula	salt bush, spearscale	
Azolla mexicana	Mexican water fern	
Barbarea orthoceras	American wintercress	
Berberis aquifolium	tall Oregon grape	
Berberis nervosa	low Oregon grape	
Bidens cernua	nodding beggars-ticks	
Bidens frondosa	leafy beggars-ticks	
Blechnum spicant	deer fern	
Brassica campestris	common mustard	I
Brassica muscari	grape hyacinth	I
Bromus mollis	soft brome	I
Bromus pacificus	Pacific brome	
Bromus sitchensis	Alaska brome	
Bromus tectorum	downy cheatgrass	I
Callitriche stagnalis	pond water-starwort	I
Campanula scouleri	Scouler's harebell	
Capsella bursa-pastoris	sheperd's purse	I
Cardamine angulata	angled bittercress	
Cardamine brewerii var. *orbicularis*	Brewer's bittercress	
Cardamine oligosperma	little western bittercress	I
Cardamine pulcherrima var. *tenella*	slender toothwort	
Carex densa	dense sedge	
Carex deweyana	Dewey's sedge	
Carex lyngbyei	Lyngby's sedge	
Carex obnupta	slough sedge	
Carex oederi	green sedge	
Carex stipata	sawbeak sedge	
Ceanothus sanguineus	redstem ceanothus	
Centaurea cyanus	batchelors button	I
Centaurium umbellatum	european centaury	I
Cerastium viscosum	sticky chickweed	I
Chaenomeles japonica	flowering quince	I
Chenopodium album	lambsquarter	I
Chenopodium hybridum	sowbane, pigweed	
Chrysanthemum leucanthemum	ox eye daisy	I
Circaea alpina	enchanter's nightshade	
Cirsium arvense	Canada thistle	I
Cirsium vulgare	bull thistle, common thistle	I
Clematis vitalba	traveler's joy	I
Collomia heterophylla	varied-leaf collomia	

Scientific Name	Common Name[2]	Introduced[3]
Conium maculatum	poison hemlock	I
Conyza canadensis	horseweed	
Corallorhiza maculata	Pacific coral-root	
Cornus nuttallii	Pacific dogwood	
Cornus sericea	red osier dogwood	
Corydalis scouleri	Scouler's corydalis	
Corylus cornuta var. *californica*	hazelnut	
Cotula coronopifolia	brass buttons	I
Crataegus douglasii	black hawthorn	
Crataegus laevigata	Paul's scarlet	I
Crataegus x lavallei	Lavalle hawthorn	I
Crataegus monogyna	English hawthorn	I
Crepis capillaris	smooth hawksbeard	I
Cuscuta salina	salt marsh dodder	
Cytisus scoparius	Scotch broom	I
Dactylis glomerata	orchard-grass	I
Daucus carota	Queen Anne's lace	I
Deschampsia caespitosa	tufted hairgrass	
Dicentra formosa	western bleeding heart	
Digitalis purpurea	foxglove	I
Dipsacus sylvestris	teasel	I
Disporum hookeri	Hooker's fairybell	
Distichlis spicata	seashore saltgrass	
Draba verna var. *verna*	spring whitlow-grass	I
Dryopteris austriaca	spreading wood fern	
Eleocharis palustris	common spikerush	
Eleocharis parvula	small spikerush	
Elodea canadensis	waterweed	
Epilobium angustifolium	fireweed	
Epilobium paniculatum var. paniculatum	tall annual willow-herb	
Epilobium watsonii var. *watsonii*	Watson's willow-herb	
Equisetum arvense	common horsetail, field horsetail	
Equisetum hyemale var. *affine*	scouring rush	
Equisetum telmatein	giant horsetail	
Erodium cicutarium	stork's bill, filaree	I
Erythronium oregonum	Oregon fawn lily	
Euonymus radicans	euonymus	I
Festuca bromoides	barren fescue	I
Festuca myuros	rat-tail fescue	I
Festuca rubra	red fescue	
Fragaria vesca	woods strawberry	
Fragaria virginiana var. *glauca*	blue-leaf strawberry	

Scientific Name	Common Name[2]	Introduced[3]
Fraxinus latifolia	Oregon ash	
Galanthus nivalis	snowdrop	I
Galium aparine	cleavers	I
Galium cymosum	Pacific bedstraw	
Galium trifidum	small bedstraw	
Galium triflorum	sweetscented bedstraw	
Gaultheria shallon	salal	
Geranium dissectum	cut-leaved geranium	I
Geranium molle	dovefoot geranium	I
Geranium robertianum	Robert's geranium	I
Geum macrophyllum var. macrophyllum	Oregon avens	
Glaux maritima	milkwort, saltwort	
Glecoma hederacea	ground ivy	I
Glyceria grandis	American mannagrass	
Gnaphalium microcephalum	slender cudweed	
Gnaphalium uliginosum	marsh cudweed	I
Goodyera oblongifolia	rattlesnake plantain, evergreen orchid	
Grindelia integrifolia	Puget Sound gumweed	
Habenaria unalascensis	Alaska rein-orchid	
Hackelia deflexa	nodding stickseed	
Hedera helix	English ivy	I
Heracleum lanatum	cow parsnip	
Hieracium albiflorum	white hawkweed	
Hippuris vulgaris	common mare's tail	
Holcus lanatus	common velvet-grass	I
Holodiscus discolor	oceanspray, creambush	
Hordeum brachyantherum	meadow barley	
Hordeum jubatum	foxtail barley	
Hordeum vulgare	steptoe barley	I
Humulus lupulus	hops	I
Hydrocotyle ranunculoides	marsh-pennywort	
Hydrophyllum tenuipes	Pacific waterleaf	
Hypericum perforatum	Klamath weed, St. John's wort	I
Hypochaeris radicata	false dandelion, spotted cat's-ear	I
Ilex aquifolium	English holly	I
Impatiens noli-tangere	touch-me-not	
Jaumea carnosa	fleshy Jaumea	
Juncus articulatus	jointed rush	
Juncus balticus	baltic rush	
Juncus bolanderi	Bolander's rush	
Juncus bufonius	toad rush	
Juncus effusus	soft rush	

Scientific Name	Common Name[2]	Introduced[3]
Juncus gerardii	mud rush	I
Lactuca biennis	tall lettuce	
Lactuca muralis	wall lettuce	I
Lactuca serriola	prickly lettuce	I
Lamium hyeridum	hybrid dead-nettle	I
Lamium purpureum	red dead-nettle	I
Lapsana communis	nipplewort	I
Lathyrus latifolius	everlasting pea	I
Lathyrus polyphyllus	leafy peavine	
Lemna minor	small duckweed	
Lepidium virginicum	Virginia pepperweed	
Lilium columbianum	Columbia lily	
Liliaeopsis occidentalis	western lilaeopsis	
Linnaea borealis var. *longiflora*	western twinflower	
Lolium multiflorum	Italian ryegrass	I
Lolium perenne	English ryegrass	I
Lonicera ciliosa	orange homeysuckle	
Lonicera hispidula	hairy honeysuckle	
Lonicera involucrata	black twinberry, bearberry honeysuckle	
Lotus corniculatus	birdsfoot-trefoil	I
Lotus micranthus	small-flowered deervetch	
Lupinus bicolor	two-color lupine, miniature lupine	
Lupinus rivularis	stream lupine	
Luzula campestris	field woodrush	
Lychnis alba	white campion	I
Lycopus uniflorus	northern bugleweed	
Lysichitum americanum	skunk cabbage	
Madia maiodes	woodland tarweed	
Madia sativa	coast tarweed	
Maianthemum dilatatum	false lily-of-the-valley	
Malva neglecta	umbrella mallow, common mallow	I
Matricaria matricarioides	pineapple weed	
Medicago lupulina	black medic	I
Medicago sativa	alfalfa	I
Melilotus alba	white sweet clover	I
Melilotus indica	yellow sweet clover	I
Mentha arvensis	corn mint	
Mentha piperita	peppermint	I
Mertensia paniculata	tall mertensia	
Mimulus guttatus	yellow monkeyflower	
Mimulus moschatus	musk-flower	
Mitella caulescens	leafy mitrewort	

Scientific Name	Common Name[2]	Introduced[3]
Monotropa uniflora	indian pipe	
Montia dichotoma	dwarf montia	
Montia perfoliata	miner's lettuce	
Montia sibirica	western spring beauty, Siberian miner's lettuce	
Myosotis discolor	yellow and blue forget-me-not	I
Myosotis scorpioides	common forget-me-not	I
Myosotis verna	spring forget-me-not	
Myriophyllum hippuroides	western water-milfoil	
Narcissus sp.	daffodil	I
Nemophila parviflora var. parviflora	small flowered nemophila	
Oenanthe sarmentosa	Pacific water parsley	
Oemleria cerasiformis	indian plum	
Oplopanax horridum	devil's club	
Orthocarpus pusillus	dwarf owlclover	
Osmorhiza occidentalis	western sweet cicely	
Parentucellia viscosa	eyebright	I
Petasites frigidus	western coltsfoot	
Phalaris arundinacea	reed canarygrass	I
Philadelphus lewisii	mockorange	
Phleum pratense	common timothy	I
Physocarpus capitatus	Pacific ninebark	
Pinus contorta var. contorta	shore (lodgepole) pine	
Plantago lanceolata	English (narrow-leaved) plantain	I
Plantago major	broadleaf (common) plantain	I
Plantago maritima	seaside (maritime) plantain	
Poa pratensis	Kentucky bluegrass	I
Polygonum aviculare	yard knotweed, doorweed	I
Polygonum convolvulus	climbing bindweed, dullseed	I
Polygonum cuspidatum	Japanese knotweed	I
Polygonum lapathifolium	willow smartweed, ladysthumb	I
Polygonum persicaria	spotted ladysthumb, heartweed	I
Polypodium glycyrrhiza	licorice fern	
Polystichum munitum	sword fern	
Populus alba	white poplar	I
Populus balsamifera (P. trichocarpa)	black cottonwood	
Populus nigra var. *italica*	Lombardy poplar	I
Potamogeton crispus	curled pondweed	I
Potamogeton epihydrus	ribbon-leaved pondweed	
Potamogeton foliosus	close-leaved pondweed	
Potamogeton pectinatus	fennel-leaved pondweed	
Potentilla gracilis	slender cinquefoil	
Potentilla pacifica	Pacific silverweed	

Scientific Name	Common Name[2]	Introduced[3]
Prunella vulgaris	self-heal, healall	I
Prunus avium	cultivated cherry	I
Prunus domestica	cultivated plum	I
Prunus emarginata	bitter cherry	
Prunus laurocerasus	laurel cherry	I
Prunus virginiana	common chokecherry	
Pseudotsuga menziesii	Douglas-fir	
Pteridium aquilium	bracken	
Puccinellia nuttalliana	Nuttall's alkaligrass	
Puccinellia pauciflora	weak alkaligrass	
Pyrola asarifolia	pink wintergreen	
Pyrus communis	cultivated pear	I
Pyrus fusca (Malus fusca)	Oregon crabapple	
Pyrus malus	cultivated apple	I
Ranunculus occidentalis	western buttercup	
Ranunculus repens	creeping buttercup	I
Ranunculus sceleratus	celery-leaved buttercup	
Raphanus sativus	wild radish	I
Rhamnus purshiana	cascara	
Ribes divaricatum	straggly gooseberry	
Ribes sanguineum	red flowering currant	
Rorippa curvisiliqua var. *hispida*	western yellowcress	
Rorippa islandica	marsh yellowcress	
Rosa gymnocarpa	baldhip rose	
Rosa nutkana	Nootka rose	
Rosa pisocarpa	clustered wild rose	
Rubus discolor	Himalayan blackberry	I
Rubus laciniatus	evergreen blackberry	I
Rubus leucodermis	blackcap raspberry	
Rubus parviflorus	thimbleberry	
Rubus spectabilis	salmonberry	
Rubus ursinus	trailing (Pacific) blackberry	
Rumex acetosella	sheep sorrel	I
Rumex crispus	curly dock	I
Rumex maritimus	seaside dock, golden dock	
Rumex obtusifolius	bitterdock	
Rumex occidentalis	western dock	
Ruppia maritima	ditch-grass, wigeon-grass	
Sagittaria latifolia	broad-leaf arrowhead	
Salicornia virginica	picklewed	
Salix lasiandra	gland willow, Pacific willow	
Salix scouleriana	Scouler's willow	

Scientific Name	Common Name[2]	Introduced[3]
Salix sitchensis	Sitka willow	
Sambucus cerulea	blue elderberry	
Sambucus racemosa var. arborescens	red elderberry	
Sanicula crassicaulis	Pacific sanicle	
Satureja douglasii	yerba buena	
Scirpus maritimus	seacoast bulrush	
Scirpus microcarpus	small-fruited bulrush	
Scirpus validus	softstem bulrush	
Scutellaria galericulata	marsh skullcap	
Scutellaria lateriflora	blue skullcap	
Senecio jacobaea	tansy ragwort	I
Senecia sylvaticus	wood groundsel	I
Senecio vulgaris	common groundsel	I
Sisymbrium officianale	hedge mustard	I
Smilacina racemosa	western (false) Solomon's seal	
Smilacina stellata	starry Solomon's plume	
Solanum dulcamara	bittersweet, climbing nightshade	I
Solanum sarrachoides	hairy nightshade	I
Solidago canadensis	Canada goldenrod	
Sonchus asper	prickly sow-thistle	I
Sorbus aucuparia	european mountain ash	I
Sparganium emersum	simplestem bur-reed	
Spergula arvensis	corn spurry	I
Spergularia canadensis	Canada sandspurry	
Spergularia macrotheca	beach sandspurry	
Spergularia marina	saltmarsh sandspurry	I
Spergularia rubra	red sandspurry	I
Spiraea x vanhouttei	VanHoutte spirea	I
Spiraea douglasii var. *douglasii*	Douglas' spirea, hardhack	
Spiranthes romanzoffiana	hooded ladies' tresses	
Spirodela polyrhiza	great duckweed	
Stachys cooleyae	Cooley's hedge-nettle	
Stellaria graminea	lesser starwort	I
Stellaria humifusa	spreading starwort	
Stellaria longipes	longstalk starwort	
Stellaria media	common chickweed	I
Suaeda maritima	herbaceous seablite	
Symphoricarpos albus	common snowberry	
Symphoricarpos mollis	creeping snowberry	
Symphytum officiale	common comfrey	I
Tanecetum vulgare	common tansy	I
Taraxacum officinale	common dandelion	I

Scientific Name	Common Name[2]	Introduced[3]
Taxus brevifolia	Pacific yew	
Teesdalia nudicaulis	sheperd's cress	I
Tellima grandiflora	fringecup	
Thuja plicata	western redcedar	
Tiarella trifoliata var. trefoil	foamflower	
Tolmiea menziesii	youth-on-age, piggyback plant	
Tragopogon dubius	yellow salsify	I
Trientalis latifolia	western starflower	
Trifolium arvense	mare's-foot	I
Trifolium dubium	least hop clover	I
Trifolium hybridum	Alsike clover	I
Trifolium pratense	purple or red clover	I
Trifolium repens	white clover	I
Trifolium subterraneum	subterranean clover	I
Trifolium wormskjoldii	springbank clover	
Triglochin maritimum	seaside arrow-grass	
Trillium ovatum	western trillium	
Tsuga heterophylla	western hemlock	
Typha latifolia	broadleaf cattail	
Ulex europaeus	gorse	I
Urtica dioica var. lyallii	stinging nettle	
Vaccinium ovatum	evergreen huckleberry	
Vaccinium parviflorum	red huckleberry	
Verbascum blattaria	moth mullein	I
Verbascum thapsus	common mullein	I
Veronica americana	American brooklime	
Veronica arvensis	wall speedwell	I
Veronica serpyllifolia	thyme-leaved speedwell	
Vicia americana	American vetch	
Vicia gigantea	giant vetch	
Vicia hirsuta	tiny vetch	I
Vicia sativa	common vetch, tare	I
Vicia sativa var. angustifolia	narrow-leaved vetch	I
Vicia villosa	hairy vetch	I
Viola sempervirens	evergreen violet	
Wolffia punctata	wolffia	
Zostera marina	eelgrass	

[1] This list is compiled from A. Wiedemann; M.E. Burg et al; S.A Klotz et al; and Nisqually National Wildlife Refuge.

[2] Common names taken primarily from Niehaus & Ripper, then from Hitchcock & Cronquist

[3] "I" signifies a species that was introduced, and is not native to the South Sound area.

TYPICAL WETLAND VEGETATION IN THE MCALLISTER/EATON CREEK BASIN

	COMMON NAME	SCIENTIFIC NAME	HABITAT[1]	STATUS[2]
TREES	Big leaf maple	Acer circinatum	P	FACU
	Cascara	Rhamnus purshiana	P	NL
	Lodgepole pine	Pinus contorta	P	FAC-
	Quaking aspen	Populus tremuloides	P	FAC+
	Red Alder	Anus rubra	P	FAC
	Vine maple	Acer circinatum	P	FACU+
	Western hemlock	Thuja plicata	P	FACU-
SHRUBS	Bog birch	Betula pumila	P	OBL
	Indian plum	Oemlaria cerasiformis	P	NL
	Red elderberry	Sambucus racemosa	P	FACU
	Red osier dogwood	Cornus stolonifera	P	FACW
	Salmonberry	Rubus spectabilis	P	FAC
	Western spirea	Spirea douglasii	P	FACW
	Willow species	Salix spp.	P	OBL-FACW
FORBS & AQUATICS	Baltic rush	Juncus balticus	E	OBL
	Bulrush species	Scirpus spp.	E,P	OBL
	Cattail	Typha latifolia	P	OBL
	Duckweed species	Lemna spp.	P	OBL
	Eelgrass	Zostera marina	E	OBL
	Fleshy jaumea	Jaumea carnosa	E	OBL
	Lyngbye's sedge	Carex lyngbyei	E	OBL
	Pondweed species	Potamogeton spp.	P	OBL
	Saltgrass	Distichlis spicata	E	FACW
	Sand spurry	Spergularia marina	E	OBL
	Sedge species	Carex spp.	E,P	OBL-FACU
	Skunk cabbage	Lysichiton americanum	P	OBL
	Virginia glasswort	Salicornia virginica	E	OBL
	Water-hemlock	Cicuta douglasii	P	OBL
	Water lilly species	Nymphaea spp.	P	OBL
	Water parsley	Oenanthe sarmentosa	P	OBL

[1] P = Palustrine, E = Estuarine

[2] OBL = Obligate Wetland, FACW = Facultative Wetland, FAC = Facultative, FACU = Facultative Upland, NL = Not Listed

APPENDIX C: SURFACE SOIL HYDROLOGICAL CHARACTERISTICS AND OCCURRENCE IN MCALLISTER/EATON CREEK BASIN FROM THE 1990 SOIL SURVEY OF THURSTON COUNTY, WA

Soil map unit	Soil name	Depth, inches	Permeability, in/hr	Soil survey map number[1]						Hydrologic Class[2]
				9	10	14	15	19	20	
2,3	Alderwood gravelly sandy loam	0 - 30	2.0 - 6.0	X	X	L	S	X		C
14	Bellingham silty clay loam	0 - 5 5 - 60	0.6 - 2.0 0.06 - 0.2			S				C
20	Cagey loamy sand	0 - 60	6.0 - 20			S			S	C
29	Dupont muck	0 - 7 7 - 17 17 - 60	0.6 - 2.0 0.2 - 0.6 0.6 - 2.0						X	D
30	Dystric xerochrepts	0 - 30	0.6 - 2.0			S				D
33,34,35	Everett gravelly sandy loam	0 - 3 3 - 60	0.6 - 2.0 6 - >20	S	X	L	L	S	X	A
38,40	Giles silt loam	0 - 60	0.6 - 2.0					X		B
44	Hoogdal silt loam	0 - 10 10 - 25	0.6 - 2.0 0.06 - 0.2				S			C
46,47,48	Indianola loamy sand	0 - 6	2.0 - 6.0	S		X	L	L	X	A
51,52	Kapowsin silt loam	0 - 30	0.6 - 2.0				X	X	X	D
65	McKenna gravelly silt loam	0 - 9 9 - 36	0.6 - 2.0 0.06 - 0.2			S				D
69,70	Mukilteo muck	0 - 60	0.6 - 2.0			X		S	S	D
73,74	Nisqually loamy fine sand	0 - 31	2.0 - 6.0	X		X	S	L	L	B
76	Norma silt loam	0 - 8 8 - 60	0.6 - 2.0 2.0 - 6.0	S		S	S	S	S	D
106	Shalcar Variant muck	0 - 20 20 - 60	0.6 - 2.0 0.06 - 0.2						S	D
107	Skipopa silt loam	0 - 18 18 - 60	0.6 - 2.0 <0.06			S				D
109	Spana gravelly loam	0 - 38	2.0 - 6.0	X		X	X	X	X	D
110	Spanaway gravelly sandy loam	0 - 20	2.0 - 6.0	L	S	L	L	X	X	B
120	Tisch silt loam	0 - 11 11 - 50	0.6 - 2.0 0.2 - 0.6						X	D
126,127, 128	Yelm fine sandy loam	0 - 46	2.0 - 6.0				X	X	X	C

[1] Soil portion relative to other soils in study area as follows: S - small, less than 50 acres; X - average; L - large

[2] Hydrologic class indicating infiltration capacity from high (Class A) to low (Class D)

APPENDIX D: REGULATORY AUTHORITY

This section reviews past and present federal, state, and local policies and regulations guiding flood control and floodplain management, water quality management, stormwater management, and related land use planning and management in Thurston County and Lacey.

D-1 FEDERAL REGULATORY AUTHORITY MANAGEMENT

D-1.1 National Flood Insurance Act (1968)

The National Flood Insurance Act of 1968 established the National Flood Insurance Program (NFIP), administered at the national level by the Federal Insurance Administration, a division of the Federal Emergency Management Agency (FEMA). The state Department of Ecology (DOE) coordinates the NFIP in Washington State. The purpose of this program is to encourage local land-use management of floodplains and other flood prone areas. The program emphasizes regulating development rather than physically controlling floods, and offers federally subsidized flood insurance for local property owners, to induce local management to participate in the program.

Floodplain management regulations include zoning, subdivision or building requirements, and special-purpose floodplain ordinances. To participate in the NFIP, a community must prohibit new construction within the floodway and require new buildings in the flood hazard area to be flood-proofed to the 100-year flood level. These regulations apply to existing buildings only at the time they are substantially improved.

In 1972 and 1973 all cities, towns, and counties were reviewed for their susceptibility to flooding and a flood hazard boundary map was created. This map also serves as a preliminary assessment of the flood hazard boundaries of a community. In Thurston County, the following communities have flood hazard areas within their boundaries: unincorporated Thurston County, Olympia, Lacey, Tumwater, Tenino, and Bucoda. All these jurisdictions now participate in the National Flood Insurance Program.

FEMA issues the community's Flood Insurance Rate Map (FIRM) after conducting a flood insurance study. The FIRM is used to determine the degree of flood hazard and corresponding actuarial flood insurance premium rates for specific properties. Thurston County's FIRM was last updated December 1, 1982. These maps are available for public inspection at Thurston County's Storm and Surface Water Utility or can be ordered from FEMA for a small fee.

D-1.2 Flood Disaster Protection Act (1973)

The Flood Disaster Protection Act of 1973 mandates the purchase of flood insurance by residents as a condition of federal funding for acquisition or construction of buildings in the

floodplain. No federal financial assistance can be provided for the permanent repair or reconstruction of insurable buildings in the floodplain if a presidentially declared flooding disaster occurs in a non-participating community. Eligible applicants in these communities may still receive forms of disaster assistance that are not related to permanent repair and reconstruction of buildings.

D-1.3 Clean Water Act

In March 1988 the Administrator of the Environmental Protection Agency formally designated Puget Sound as an estuary of national significance under Section 320 of the Clean Water Act, as amended by P.L. 100-4 (the Water Quality Act of 1987). This made Puget Sound part of a nationwide program to develop management plans for the protection of the nation's estuaries. The Puget Sound Water Quality Authority, together with EPA Region 10 and the Washington Department of Ecology, co-manage the Puget Sound Estuary Program. Section 320 requires the development of a comprehensive conservation and management plan (CCMP) for each designated estuary. The designation of Puget Sound recognized the 1987 Puget Sound Water Quality Management Plan as a partial CCMP. The 1991 plan later became the CCMP for Puget Sound.

D-1.4 National Pollution Discharge Elimination System

The 1987 amendment to the Federal Clean Water Act required EPA to write regulations for stormwater discharges associated with industrial activity and municipal storm sewer systems. The ruling became final November 13, 1990 with an effective date of December 17, 1990. National Pollutant Discharge Elimination System (NPDES) permits for discharges from municipal separate storm sewer systems prohibit non-stormwater discharges into the storm sewers; and require measures to reduce the discharge of pollutants to the maximum extent practicable. These measures include management practices; control techniques and system, design and engineering methods; and other provisions appropriate for the control of such pollutants.

The NPDES permits for discharges from municipal separate storm sewer systems are conditioned to specific sites. The permit application allows municipal applicants to propose appropriate management programs for controlling pollutants in discharges from their municipal systems. The proposed management program must include: structural and source control measures to reduce pollutants in runoff from commercial and residential areas; maintenance activities; planning procedures to develop, implement, and enforce controls for new development; and water quality impact assessments for flood management projects. The program also must contain a method to detect and remove illicit discharges, monitor and control pollutants from municipal landfills, and control pollutants in construction site runoff, including non-structural and structural management practices.

NPDES permits are currently only required of jurisdictions with populations greater than

100,000; however, smaller jurisdictions will be required to apply for NPDES permits starting in late 1993.

D-2 STATE REGULATORY AUTHORITY

D-2.1 Flood Control Assistance Account Program (86.26 RCW)

The Flood Control Assistance Account Program (FCAAP) provides local jurisdictions with assistance to maintain flood control facilities and prepare comprehensive flood control plans. The purpose of the plans (as defined in RCW 86.26.105) are to establish the need for flood control maintenance work; consider alternatives to in-stream flood control work; identify and consider potential impacts of in-stream flood control work on the state's resources; and outline the stream's floodway.

The Washington State DOE administers FCAAP, which has provided approximately four million dollars statewide during each of the last two biennia. Counties are eligible for up to $500,000 per biennium in FCAAP grants. The counties are responsible for administering grants to all eligible municipal corporations within the county. No municipal corporation can apply directly to the state for a FCAAP grant.

Under FCAAP guidelines, construction of new facilities is not eligible for FCAAP funding since the program is intended to restore, maintain, and repair natural conditions, works, and structures. The amount of program funding for any non-emergency project cannot exceed 50% of the total cost including planning and design costs. A maximum of 80% for emergency projects and up to 75% of comprehensive flood control management plan preparation costs are allowed by FCAAP.

Funding of emergency projects requires the declaration of an emergency by the appropriate local authority. The maximum amount of money available for emergency projects statewide is $500,000 per biennium. The maximum amount of emergency funds initially available for any one county is $150,000 per biennium; however, if the total is not used by other counties and emergency work in a county exceeds $150,000, that county can request additional emergency funds. Payment from the emergency fund is allocated on a first-come first-serve basis.

D-2.2 State Floodplain Management Act (86.16 RCW)

Originally named the Flood Control Zone Act of 1935, this regulation gave the state the authority to form flood control zones along streams and rivers, to control stream systems for the protection of life and property, the preservation of public health, and the preservation of the natural resources of the state. The act specifies state regulatory authority over all waters in Washington's designated flood control zones, including the authority to regulate construction and planning within floodplains and floodways.

The statute has been extensively revised since passage of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. In 1987, the statute was renamed "Floodplain Management" and the state's permitting responsibility was abolished. Under the new version of the statute, the state Department of Ecology (DOE) is responsible for coordinating the floodplain management regulations required for participation in the National Flood Insurance Program (NFIP).

Generally, the DOE acts in an oversight capacity with respect to local governments. The DOE helps local governments, at their request, to prepare and enforce floodplain management ordinances. In turn, local governments must submit any new floodplain management ordinance or amendment to the DOE for approval within thirty days.

The Floodplain Management Act gives the DOE the authority to supervise all dams and obstructions in streams, and regulate flows to minimize potential downstream flood damages. The DOE accomplishes this through minimum state requirements for floodplain management that exceed the minimum federal requirements for participation in NFIP. Local governments may adopt floodplain management ordinances or requirements that exceed the DOE requirements. The act also gives the DOE the authority to examine and approve or reject future developments and modifications to existing developments located within a floodway, although this power is rarely exercised. Both state and local floodplain management regulations are based on Federal Emergency Management Agency (FEMA) maps that designate special flood hazard areas (100-year floodplains). A community's participation in this program is required for its residents and property owners to be eligible for federally subsidized flood insurance.

D-2.3 Puget Sound Water Quality Authority (90.70 RCW)

The Puget Sound Water Quality Act of 1985 created the Puget Sound Water Quality Authority (PSWQA) to "develop a comprehensive plan for water quality protection in Puget Sound to be implemented by existing state and local government agencies". PSWQA developed the Puget Sound Water Quality Plan of 1986, which identified urban stormwater as a significant source of pollution in Puget Sound, and recommended watershed action plans to address this and other concerns. The Henderson Inlet Watershed Action Plan was developed under this mandate, and adopted in 1989.

The 1991 Puget Sound Water Quality Management Plan recommends implementing watershed action plans to reduce urban runoff and nonpoint pollution, and improve shellfish protection. The 1991 plan aims to provide long-term protection for the region's aquatic resources. This plan contains fifteen programs for cleaning up and preventing pollution of Puget Sound, including programs to manage nonpoint source pollution and stormwater and combined sewer overflows.

A cooperative watershed management program established committees to prioritize watersheds in each on the 12 Puget Sound counties, including Thurston County. Thurston

County's watershed ranking project assigned top priority to the Woodland and Woodard creek watersheds, and the Henderson Inlet Watershed Action Plan recommended developing basin plans for those two basins.

D-2.4 State Planning Enabling Act (36.70 RCW)

The State Planning Enabling Act authorizes local governments such as Thurston County and the cities of Lacey and Olympia to conduct land use planning and regulation. The act requires local jurisdictions to prepare comprehensive plans that contain land use elements that designate the proposed general distribution, location, and extent of uses of land. Included in this element are standards of population density and building intensity and estimates of future population growth. This element contains provisions for protecting the quality and quantity of ground water used for public water supplies.

The act was amended in 1984 and 1985 to require the land use elements under the Comprehensive Plan to include a review of drainage, flooding and stormwater runoff, and provide guidance for corrective actions to mitigate or clean discharges that pollute Puget Sound or waters entering Puget Sound.

D-2.5 Forest Practices Act (76.09 RCW)

The Forest Practices Act, administered by Department of Natural Resources, governs the conditions under which land may be logged. A Class 4 Forest Practices Act permit is required for converting land from forestry to urban uses and is subject to county review. The county may require the applicant to submit a drainage plan and an erosion control plan under certain conditions.

D-2.6 Growth Management Act (HB 2929)

The Growth Management Act of 1990 requires local jurisdictions to plan for growth and allows the charging of impact fees for mitigation of development.

The Growth Management Act of 1990 (House Bill 2929) requires updating existing comprehensive land use plans to reflect a coordinated and consistent effort among jurisdictions. The goals adopted by the act include encouraging urban growth development where adequate public facilities and services exist; reducing urban sprawl; encouraging efficient transportation systems; providing affordable housing to all economic segments of the population; promoting economic opportunity; providing compensation for private property taken for public use; processing of permits in a timely and fair manner; maintaining and enhancing natural resource-based industries; encouraging the retention of open space and conservation of habitat; protecting the environment and quality of life; encouraging the involvement of citizens in planning activities; ensuring public facilities and services are

adequate; and encouraging the preservation of historical relics. These goals are the impetus for amendments to the 1988 Thurston County Comprehensive Plan and the city of Lacey Comprehensive Plan.

D-2.7 Washington State Shoreline Management Act

The purpose of the Washington State Shoreline Management Act (SMA) is to protect the public interest in public resources such as water, fish, wildlife, and associated habitat, by regulating public and private development in shoreline areas. The SMA defines state policy and authorizes the implementing regulations adopted as Washington Administrative Code (WAC 90.58). It defines several shoreline designations; provides guidance to DOE and local jurisdictions on procedures, rules, and plans for shoreline activities; establishes time lines for developing local shoreline management plans; and identifies activities exempt from shoreline permits.

The SMA includes significant regulatory requirements for all major shorelines including the ocean coastline, Puget Sound, the Strait of Juan de Fuca, lakes of 20 acres or larger, rivers and streams with mean annual flows of 20 cubic feet per second or greater, and their associated wetlands. The area of jurisdiction includes associated wetlands, floodplains, and all land within 200' of the ordinary high water mark of the shoreline. Thus, any public or private action proposed in floodways and many actions proposed in the flood fringe of most rivers and larger streams in the county are subject to SMA regulations. McAllister Creek is regulated by the SMA.

The SMA requires cities and counties to adopt local shoreline master programs that include policies and regulations for land use in shoreline areas. Thurston County and Lacey have adopted the Shoreline Master Program as mandated by the SMA.

D-2.8 State Environmental Policy Act (43.21C RCW)

The Washington State Environmental Policy Act (SEPA) of 1971 provides a process to analyze the environmental impacts of public and private development. Extensive amendments enacted in 1983 apply to all agencies of state and local government. SEPA shapes state and local government decisions on public projects and publicly regulated private projects by requiring consideration of environmental impacts. The most recent implementing rules were adopted by DOE in 1984.

SEPA does not create a permitting process. It gives local jurisdictions the authority to review proposals and evaluate their potential environmental impacts, in conjunction with existing policies, regulations, permits, approvals and/or licenses. Information provided during the SEPA process helps agency decision-makers and the general public understand how a project would affect the environment.

D-2.9 Washington State Hydraulic Code (75.20 RCW)

Washington State Hydraulic Code requires the Department of Fisheries (DOF) and the Department of Wildlife (DOW) to regulate activities within marine and fresh waters of the state. The Hydraulic Code Rules (Chapter 220-11 WAC) describe specific requirements of the regulation. The Hydraulic Code is jointly administered by the DOF and the DOW.

The primary function of the Hydraulic Code is to protect the states fisheries resources, including spawning and rearing habitat. Therefore, any shore protection works, including dikes or in-stream work such as gravel removal require approval from either the DOF or the DOW. The Hydraulic Code also requires approval for any work within the high water areas of state waters, which often includes wetlands and floodplains. The hydraulic approval requirements apply only to a small portion of the total area of the floodplain.

D-3 LOCAL REGULATORY AUTHORITY

D-3.1 Flood Control Zone Districts (86.15 RCW)

Local Flood Control Zone Districts (FCZDs) may be established through RCW 86.15 in 1961, for the purpose of "undertaking, operating or maintaining flood control projects or storm water control projects" for the counties of the state. A zone may be formed by a majority vote of the county legislative authority, or by a petition signed by 25 percent of the electors within a proposed zone, based on votes cast in the last county general election. The County Commissioners can establish a county-wide FCZD, which could then be divided into sub-zones. Establishment of any FCZD is dependent on the approval of all the cities, towns and districts within the proposed zone boundaries.

FCZDs are quasi-municipal corporations, legally separate from counties. The County Commissioners and Executive, working through the county engineers, administer FCZDs. The County Commissioners may also choose to appoint an unpaid advisory committee for each district.

The County Commissioners may authorize improvements within the zone or any participating zones through resolution. The resolution specifies that a comprehensive plan of development for flood control has been prepared, and that the proposed improvements contribute to the goals of that plan; that the plan has been submitted to the state DOE ninety days before initiating the improvement; that engineering plans and studies for the improvement are on file with the county engineer; that estimated costs for the improvement are available; and that the improvement will benefit either a single zone, two or more zones, or the county as a whole.

D-3.2 Flood Emergency Operations Plan

The Thurston County Emergency Operations Plan provides for management of county

emergency operations. Natural and human caused disasters may occur with little or no warning. Natural disasters which pertain to this report are floods and storms. The emergency plan is based on the assumption that the county may be subjected to floods from a number of rivers and\or heavy rainfall, which may occur as often as once a year. Floods have historically affected both people and property, and caused extensive damage to certain areas of the county. Severe storms include wind, rain, snow, or hail, and could be accompanied by cold waves, ice, or flooding. The greatest impact/damage is usually to property.

The basic emergency plan determines the authorities and references, defines operational situations, identifies the county government emergency organization, assigns emergency responsibilities, and provides a concept of operations, including operations from a county emergency operations center. The annexes amplify the basic plan and outline the direction and control required by county departments to accomplish their emergency responsibilities.

The emergency plan represents the combined planning efforts of Thurston County Emergency Management, the State Division of Emergency Management, and Region 10 of the Federal Emergency Management Agency. It meets the requirements of RCW 38.52, and is compatible with the Washington State Comprehensive Emergency Management Plan and the laws of the State of Washington.

D-3.3 Thurston County Comprehensive Plan

The Board of Thurston County Commissioners adopted the current Comprehensive Plan by Resolution No. 8932, June 6, 1988, to provide a legally recognized framework for making decisions about land use in Thurston County.

The plan establishes a policy for storm water management, with the objective that "jurisdictions sharing watersheds should coordinate, and development practices should be promoted which do not lead to surface or ground water degradation or chronic flooding from storm water". The plan further outlines actions needed to accomplish this objective, including support for implementing stormwater management programs, watershed planning, correction of polluted runoff, stream and wetland assessment, public education, and comprehensive drainage design standards.

The plans also establish general boundaries and development guidelines for growth and rural areas. Guidelines for more detailed land use is provided by geographic area Sub-Area plans. Various ordinances reflect the Comprehensive Plan's components with regards to zoning, building and subdivision standards, and drainage design and erosion control.

The county and cities started a growth management program because of rapid growth in the unincorporated urban area around Lacey, Olympia, and Tumwater. A memorandum of understanding was signed in 1983 which established an Urban Growth Management Area to focus development in a specified "urban area" and provide efficient public services. It

emphasized compatible urban development standards and coordinated utility and land use planning. The 1983 memorandum was updated and expanded in 1988, to place more emphasis on phasing of growth. Policies for joint city-county plans through the Thurston County Regional Planning Department were initiated to achieve greater reliability of plans as areas annex to the cities.

D-3.4 Thurston County Storm and Surface Water Utility

The Board of Thurston County Commissioners established the Storm and Surface Water Utility by Resolution No. 8069, April 1985, to plan, design, operate, and manage storm and surface water controls.

D-3.5 City of Lacey Stormwater Management Program

The city of Lacey has maintained a stormwater management program since January 1987. The Lacey program was initiated because of increasing concerns over water quality and quantity impacts and the recognition of a moral obligation to reduce those impacts.

D-3.6 Interlocal Agreement

An interlocal agreement adopted in 1987 assigns joint responsibility for surface water management in Woodland and Woodard creeks drainage basins to Thurston County and the cities of Olympia and Lacey. The interlocal agreement establishes joint benefits and obligations for developing a hydrologic model of the basins, developing this basin plan, developing a nonpoint source pollution control program, and other related stormwater planning activities.

Local share of the costs were based on the acreage of each jurisdiction contained in the basins with the county contributing 71%, the city of Lacey 24%, and the city of Olympia 5%. An agreement between the County and the United States Geological Society (USGS) in March of 1988 initiated hydrologic modeling of the basins with USGS funding 50% of the cost.

D-3.7 Drainage Design and Erosion Control Manual for Thurston County and the cities of Lacey, Olympia, and Tumwater

Thurston County (by Resolution #9859) and the cities of Lacey, Olympia and Tumwater adopted nearly identical drainage ordinances in 1991. The ordinances establish standards for construction of drainage facilities including minimum standards for detention/retention and stormwater treatment.

D-3.8 Thurston County Storm and Surface Water Advisory Board

On May 29, 1990, by Resolution #9514, Thurston County established a Storm and Surface Water Advisory Board (SSWAB) to provide public involvement and accountability for the stormwater utility and to provide recommendations to the Board of County Commissioners regarding the utility.

Thurston County began to prepare the McAllister/Eaton Creek Comprehensive Drainage Basin Plan in September 1989. This plan, when approved by the Washington Department of Ecology and adopted by the cities and county, will fulfill the requirements of the DOE Centennial Clean Water Fund grants. The plan will also achieve the intent of the stormwater utilities through comprehensive planning and development of a facility construction plan to reduce or control erosion, pollution and danger to health, life and property in Thurston County. The SSWAB reviewed and commented on each draft of the plan throughout the process, and was represented on the McAllister/Eaton Creek Citizens advisory Task Force. The SSWAB was instrumental in developing the Cooperative Management Plan (Chapter 8).

D-3.9 Environmentally Sensitive Areas (Critical Areas)

Chapter 20.36 of the Thurston County Zoning Ordinance No. 6708 contains the current Environmentally Sensitive Areas (ESA) regulations. In Lacey Title 14.24 covers the ESA, and in Olympia Chapter 18.76 describes the ESA. The purpose of an ESA is to preserve the beneficial functions of these areas, and minimize the potential dangers and public costs caused by inappropriate use of such areas. The ESA accomplishes this purpose through regulation of uses and activities in, near, or directly affecting such areas.

Thurston County is currently amending existing ESA ordinances to satisfy the requirements of both the 1991 Puget Sound Water Quality Management Plan and the Growth Management Act guidelines for Critical Areas. Included in the new amendments are sections dealing with: Review Standards, Special Reports, Aquifer Protection Areas, Flood Hazard Areas, Landslide Hazard Area, Significant Wildlife Habitat Areas, Special Plants and Plant Communities, Special Management Areas, Streams, and Wetlands. For the purpose of this plan only the Flood Hazard Areas, Streams, and Wetlands will be discussed.

Flood Hazard Areas. Those lands which can be expected to flood at a frequency of once every 100 years or have a one percent or greater chance of flooding in any one year are designated flood hazard areas. The proposed Critical Areas Ordinance permits most of the uses and activities within a floodway that are currently allowed. Uses allowed within a flood hazard area shall be limited to low intensity land uses which will not create additional hazards to life or property and which maintain the natural functions of floodplains.

Streams. Streams are defined as those areas where surface waters flow sufficiently to produce a defined channel or bed. A defined channel or bed is an area which

demonstrates clear evidence of the passage of water and includes but is not limited to bedrock channels, gravel beds, sand and silt beds, and defined-channel swales. The channel or bed need not contain water year-round. This does not include irrigation ditches, canals, storm or surface water runoff devices or other artificial watercourses unless they are used by salmon.

The proposed Critical Areas Ordinance limits uses and activities within a stream or its buffer to low intensity land uses which will not degrade the natural functions of the stream. These natural functions include controlling siltation, minimizing turbidity, protecting nutrient reserves, maintaining stream flows, preserving natural flood storage capacity, protecting fish bearing water, providing ground water recharge, and protecting wildlife habitat associated with this area.

Streams are defined as Type 1 through Type 5 following the criteria established by the Washington Department of Natural Resources, WAC 222-16-020. Associated buffers for these stream types range from 25 feet to 100 feet to retain the natural functions.

Wetlands. Thurston County, Lacey, Olympia and Tumwater define wetlands according to the definition in the National Clean Water Act. Thurston County, Lacey, and Tumwater currently regulate only those wetlands larger than 1 acre, and Olympia regulates wetlands larger than 1/4 acre. The proposed Critical Areas Ordinance would regulate wetlands of 1/4 acre and larger in Thurston County. Regulated wetlands generally include swamps, marshes, bogs, and similar areas.

To assist in the preparation of the Environmentally Sensitive Areas Ordinance, the Thurston Regional Planning Commission (TRPC) developed a pilot project which formulated and documented a process for aerial photograph interpretation, and produced a draft wetland and riparian corridor map which is available in the Regional Planning Department.

Currently, natural wetlands may not be used to control or treat stormwater runoff. Early research results by the Puget Sound Wetlands and Stormwater Management Research Program (Reinelt, et al, 1990) indicates that uncontrolled stormwater discharges have a significant impact on natural wetlands. The trend in protecting wetlands is to require peak flow control and stormwater treatment prior to discharge to a wetland. These requirements probably will not be imposed on all wetlands, but only those wetlands designated for protection by local governments.

D-3.10 Vegetation Protection and Land Clearing and Grading Ordinances

Thurston County SSWAB initiated a vegetation protection ordinance in 1991 at the request of the County Commissioners, whose purpose was to establish standards and administrative

procedures to control clearing and other land-disturbing activities which damage or destroy vegetation. The draft ordinance went through two public hearings, and was sent back to the Planning Department for revision. The revision process has been repeatedly postponed since then, due to higher priority planning projects facing state-mandated Growth Management deadlines. In the meantime, vegetation clearing and grading are regulated by the county's grading and erosion control ordinances.

The city of Lacey regulates vegetation removal through the Tree and Vegetation Protection and Preservation Ordinance, LMC Chapter 14.32. Lacey regulates grading through the Land Clearing Ordinance, LMC Chapter 14.03. The basic elements of Lacey's ordinances include:

All land clearing, including the removal or destruction of vegetation, shall require a vegetation removal permit unless the activity is exempted. Categories allowed in the exemption are agriculture, forest practices, mineral extraction, small scale clearing, removal of hazardous trees and noxious weeds, emergencies, utility easements, cemetery maintenance and grave excavation, and soil tests. Standards and procedures for the application of the proposed ordinance include project design and execution; erosion control measures; protection of adjacent property; approval of a vegetation removal permit in conjunction with a building site application or permit; minimizing clearing for roads and utilities; specific requirements for preservation of vegetation; require a plan for clearing on unstable slopes; pre-development protection methods; criteria for replacement of vegetation; and protection of Environmentally Sensitive Areas, buffers, and high risk areas. Specific questions about the Vegetation Protection Ordinance should be referred to the Regional Planning Department or the city of Lacey.

D-4 PERMITS AND REGULATIONS FOR DEVELOPMENT AND LAND USE

The purpose of this section is to provide an overview of existing federal, state, and local regulations that affect resource areas subject to stormwater runoff and flood protection which may limit activities in the floodplain. Recommendations for changes to these existing regulations and ordinances for the three jurisdictions relative to resource protection within the basin are in Chapter 6 & 7.

The counties and cities of Washington State are required by state and federal agencies to adopt specific regulations relating to development. These regulations include development of a comprehensive plan, zoning, subdivision code, floodplain management ordinance, building code, and Shoreline Master Program. The discussion below focuses on categories of regulations pertinent to surface water management including flood control and floodplain management, federal permits and requirements, resource and shoreline management, and land use management.

D-4.1 Federal Permits and Requirements

D-4.1.1 Clean Water Act - Section 404(b)(1)

The US Army Corps of Engineers (COE) has been regulating navigable waters of the United States for over 100 years. Section 404 of the Clean Water Act of 1972 supplemented the Corps' traditional permitting program regarding activities in navigable waters to require Section 404 permits for the discharge of dredged or fill material into all waters of the United States. The 1970s brought about a new era of COE regulatory jurisdiction that broadened responsibility to water quality in addition to navigation.

Waters of the United States as defined by the Rivers and Harbors Act of 1899 include adjacent wetlands and tributaries to navigable waters of the United States and other waters, the degradation or destruction of which could affect interstate or foreign commerce. As defined by the COE, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include marshes, swamps, bogs, and similar areas. Fill material is defined as material used for replacing aquatic areas with dry land or changing the bottom elevation of a water body. Dredged material is material removed from wetlands, stream, or lakes. The COE uses the rules established in section 404 (6)(1) "Guidelines of the US Environmental Protection Agency" to determine if a permit should be issued.

There are two types of permits that may be required from the COE by Section 404 of the Clean Water Act. These are Nationwide Permit 26 and the Individual Permit.

Nationwide Permit. Nationwide Permit 26 applies to fills involving one to ten acres of isolated wetlands or adjacent wetlands located above the headwaters (adjacent to a water body that has an average annual flow of less than 5 cubic feet per second). Applying for the Nationwide Permit involves notifying the COE for a review of the potential environmental impacts. The review also involves notification of the US Environmental Protection Agency (EPA), the US Fish and Wildlife Service, the National Marine Fisheries Service, and the Washington State Department of Ecology (Ecology). The COE uses the feedback provided by the other regulatory agencies to base their decision of acceptance or denial of the Nationwide Permit. If the Nationwide Permit is denied, the applicant can appeal the decision by application for an Individual Permit.

Individual Permit. The COE requires an Individual Permit for the discharge of dredged or fill materials within the previously defined jurisdiction of the COE that does not fit the criteria for a nationwide permit.

In their evaluation of an Individual Permit, the COE must decide whether the benefits of the project outweigh the predicted environmental impacts. The COE evaluation is known as a public interest review and the process includes the following steps:

1. Preapplication meetings with the COE and other resource agencies (optional).

2. Submittal of a permit application to the COE.

3. Distribution of a COE public notice for a 30-day period for review by federal, state, and local permitting agencies, tribes, interest groups and the general public.

4. Consideration of all comments received from notified agencies, tribes, interest groups, and general public.

5. The applicant may be required to submit additional information by the COE for further consideration.

6. The COE decides whether to prepare an Environmental Assessment and Finding of No Significant Impact, or to prepare a Federal Environmental Impact Statement.

7. A public hearing is held, if needed.

8. The COE prepares the appropriate decision documentation.

9. The District Engineer makes the decision to approve or reject the permit application.

10. The permit is issued or denied and the applicant is advised of the decision.

The 10-step procedure outline above for the public interest review is a synopsis of the steps described in an Information Paper published by the COE in January 1989, titled "Permit Requirements for Wetland Fill Projects."

D-4.1.2 Rivers and Harbors Act - Section 10

Section 10 of the Rivers and Harbors Act prohibits the unauthorized obstruction or alteration of navigable waters of the United States without a permit from the COE. The provisions apply to all structures or work below the mean high water mark of navigable tidal waters and the ordinary high water mark of navigable fresh waters. The provisions also apply to proposed actions "in, over or affecting" navigable waters.

D-4.1.3 Clean Water Act - Section 401

A Water Quality Certification is a statement, similar to a permit, issued by DOE that an activity requiring a federal permit (such as a Section 404 Permit) will comply with water quality standards and discharge limitations for waters of the State of Washington (WAC 173-201). The Certification is required by federal law as a prerequisite to obtaining a federal

permit. Usually, the federal agency notifies DOE that application has been made for a federal permit.

Structural flood control measures such as stream bank protection and in-stream gravel removal have the potential to create temporary in-stream turbidity (sedimentation) in excess of state water quality standards during the construction period. Such projects will require a Temporary Modification of Water Quality Criteria (also referred to as a "short-term exception to water quality standards"). For stream bank protection and gravel removal projects, a modification will be required before DOE can issue a water quality certification. Each such certification is reviewed and issued on an individual basis as an administrative order, and includes specific limitations on how and when construction activities may be carried out.

D-4.2 State Permits and Requirements

D-4.2.1 State Environmental Policy Act

All proposed public or private projects must submit a SEPA Environmental Checklist. These are administered by the Thurston Regional Planning Council in Thurston County. Some projects are categorically exempt from the SEPA process. Most categorical exemptions use size criteria to differentiate between an exempt or nonexempt action. Exempted projects include most single-family homes, commercial buildings under 4,000 square feet, parking lots for 20 cars or less, and any landfill or excavation of 100 cubic yards or less.

The Environmental Checklist is not a permit. It is a tool that the local jurisdictions use to review the environmental impacts of a proposal, and insure that the proposal conforms to existing policies and regulations. The Checklist requires a full disclosure of a proposal's likely environmental impacts, and a description of measures to prevent or mitigate those impacts. Proposals likely to have a significant adverse impact on the environment are required to prepare an Environmental Impact Statement (EIS).

Agencies or local governments may deny permits or other approvals under SEPA if the proposal is likely to cause significant adverse environmental impacts that cannot be prevented or mitigated. SEPA rules emphasize developing mitigation measures to avoid or reduce environmental impacts. These may be required under SEPA as conditions for receiving related permits.

D-4.2.2 Shoreline Permits under the Shoreline Management Act

Developments on the shores of the ocean, Puget Sound, the Strait of Juan de Fuca, lakes of 20 acres or larger, rivers and streams with mean annual flows of 20 cubic feet per second or greater, and their associated wetlands are all subject to Shoreline Permit requirements. The area of jurisdiction includes associated wetlands, floodplains, and all land within 200' of the

ordinary high water mark of the shoreline. In general, any action within such a shoreline area requires a Shorelines Permit.

Shoreline permits are issued by the planning departments of Thurston County, Lacey, and Olympia. The permit requirements are contained in zoning overlays, and they apply in addition to any other local regulations. Any project that has a total cost or fair market value over $2,500 or that materially interferes with the normal public use of the water or shorelines requires a substantial development permit, with certain exceptions. However, all development and land use must conform to the master program.

D-4.2.3 Hydraulic Project Approval Permits

Any shore protection works, including dikes or in-stream work such as gravel removal require a Hydraulic Project Approval Permit (HPA) permit from either the Department of Fisheries (DOF) or the Department of Wildlife (DOW). Generally, the DOF takes the lead for the HPA in waters containing salmon. In fresh waters without salmon, the DOW takes the lead. Although not directly aimed at the protection of wetlands or floodplains, the HPA is required for any work within the high water areas of state waters, which often includes wetlands and floodplains.

Hydraulic Code Rules (WAC 220-110) contain technical provisions that may apply to different types of projects. Depending upon the individual proposal and site-specific conditions, these technical provisions may be included in the HPA as permit conditions. Special permit provisions may also be included where site-specific conditions warrant them.

The DOF recently began implementing its own special stormwater requirements whenever a Hydraulics Permit Application is submitted. Although primarily focused towards new developments, the stormwater requirements can be applied to any project where a permit is required.

D-5 LOCAL PERMITS AND REQUIREMENTS

D-5.1 Vegetation Protection Ordinances

Thurston County initiated a vegetation protection ordinance whose purpose is to establish standards and administrative procedures to control clearing and other land-disturbing activities which damage or destroy vegetation. Chapter 14.32 of the City of Lacey was adopted for the purpose of issuing land clearing permits. Chapter 18.76 establishes these guidelines for the city of Olympia.

All land clearing, including the removal or destruction of vegetation, shall require a vegetation removal permit unless the activity is exempted. Categories allowed in the exemption are agriculture, forest practices, mineral extraction, small scale clearing, removal

of hazardous trees and noxious weeds, emergencies, utility easements, cemetery maintenance and grave excavation, and soil tests. Standards and procedures for the application of the proposed ordinance include project design and execution; erosion control measures; protection of adjacent property; approval of a vegetation removal permit in conjunction with a building site application or permit; minimizing clearing for roads and utilities; specific requirements for preservation of vegetation; require a plan for clearing on unstable slopes; pre-development protection methods; criteria for replacement of vegetation; and protection of Environmentally Sensitive Areas, buffers, and high risk areas. Specific questions about the Vegetation Protection Ordinance should be referred to the Regional Planning Department or the city of Lacey.

D-5.2 Zoning Ordinances

The Thurston County Zoning Ordinance and Comprehensive Plan are used to regulate development in potential hazardous areas such as floodplains and landslide zones. The city of Lacey uses the Buildings and Construction code, Title 14 to define these areas and the city of Olympia defines zoning in Title 12. The regulations take the form of density and construction limitations. Identification of specific hazard zones within the Woodland/Woodard Creek Basins are recorded on the Thurston County wetlands and 100-year floodplain maps available in the Thurston County Regional Planning Office.

D-5.3 Drainage Design and Erosion Control

The Drainage Design and Erosion Control Manual for Thurston County and the Cities of Lacey, Olympia, and Tumwater contains specific design standards and requirements for drainage and erosion control on new developments and remodels. This is available from the Thurston County Public Works Storm and Surface Water Utility, the Lacey Public Works Water Resources Program, and the Olympia Public Works Water Resources Program.