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(Draft) Section 5  
**ALTERNATIVE FLOOD HAZARD REDUCTION  
MEASURES**

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As discussed previously in this FHMP, flooding problems in the North Beach area are mainly localized, either along SR 109, or within small residential neighborhoods. Four sites were analyzed for the local drainage issues which were identified by the County or by local residents. Flood hazard reduction measures were conceptualized and evaluated by the consultants for constructability and the potential to improve drainage conditions. Recommended projects to reduce flooding and/or address drainage problems are presented below.

## **STRUCTURAL IMPROVEMENTS**

### ***Elevate Affected Homes and Businesses***

One structure subject to flooding was specifically reviewed in this study: Johnson's Mercantile in Copalis Beach. There may be other existing homes and businesses (including basements) affected by frequent flooding that may benefit from elevating their structures. Although the Federal Emergency Management Agency (FEMA) did not perform detailed modeling in the Study Area to establish the base flood level, they did specify the 100-year tide elevation for the Port of Grays Harbor as elevation 13.5 feet. This elevation and the FEMA floodplain mapping can be used as a basis for required bottom elevation of structures.

Since much of the area is within 100-year designated floodplains, there will still be many properties subject to shallow flooding on a less frequent basis. To protect these properties, it will be necessary to elevate the structures and possibly the septic tank drainfields. The cost of doing so will be the responsibility of the individual owner. It will be up to the individual property owner to evaluate the relative costs of elevating versus the cost of the damage resulting from flooding and determine whether or not to spend the money to make the improvements. Some owners may find it possible and less expensive to provide adequate protection for their structures by installing a low earth berm around the structures and a sump pump to remove water from inside the berm. Costs will vary widely depending on the location,

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structure and height that it must be raised. But, as a rough guideline, the cost of elevating a house may average \$20,000. The cost of elevating a drainfield or installing a mound system could cost an additional \$10,000 or more. Construction of an earth berm and installation of a sump pump may be comparable. However this approach reduces existing floodplain storage and could intensify local flooding at other nearby properties. If interested in pursuing these alternatives, property owners should contact local contractors and obtain bids for the work.

### **Local Flood and Drainage Study Sites**

Section 3 identifies a number of local flood problems within the Study Area. These include the Silver Maple Resort, Haven-by-the-Sea, Johnson's Mercantile and Rod's Resort. Where data are sufficient, the problems are quantified and solutions proposed below. The County has limited funds to address local drainage and flooding problems. Such projects are more likely to be implemented if they are initiated by and have the active support of the local residents. Local sponsorship and, where appropriate, cost sharing by the benefiting residents are encouraged by the County.

#### **Silver Maple Resort – Roosevelt Avenue**

This area lies 0.4 miles south of the center of Ocean City. It is a low spot along the east side of Highway 109 (Figure 5-1). During periods of substantial rainfall, runoff ponds in the highway drainage ditches and can enter the store at the Silver Maple Resort. The office has suffered flood damage several times in the 1990s. Several front yards and their septic systems along Roosevelt Avenue, which lies just to the south, also are periodically inundated. The drainage was visually traced, north along the highway. It eventually crosses through a culvert to the west side of the highway and continues north toward a small, unnamed stream. This stream crosses the highway via a 36-inch culvert and flows a short distance northwest into Conner Creek, just upstream of the Second Avenue crossing. Approximately 130 feet short of this unnamed creek, the highway ditch system terminates. The runoff must leave the ditch and flow across a vacant lot before finding its way into the unnamed creek. With the very gentle slope within the ditch system (on the order of 0.1 percent), the water backs up for more than 1,000 feet along the highway, contributing to the poor drainage at the Silver Maple Resort and Roosevelt Avenue.

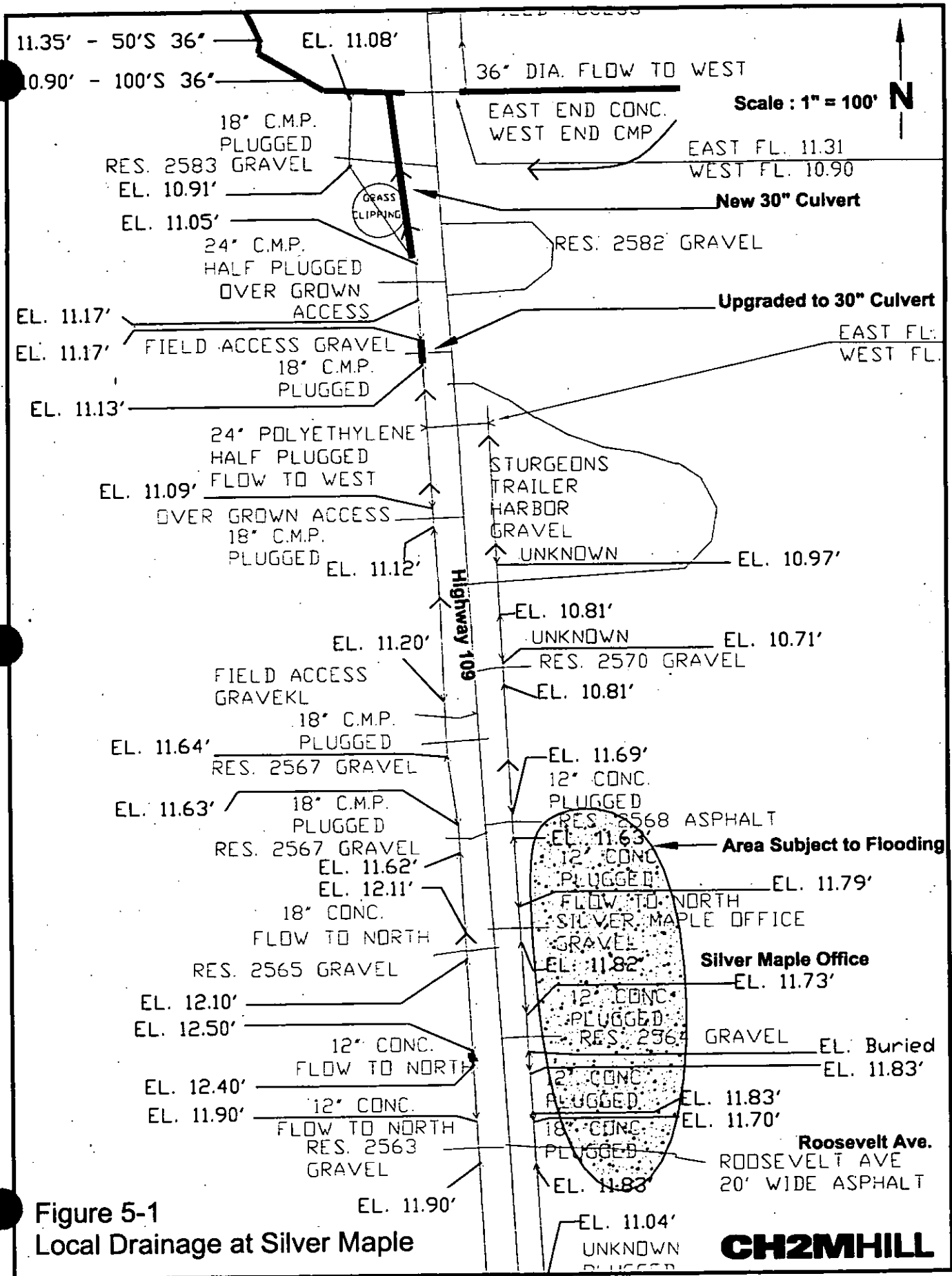


Figure 5-1  
Local Drainage at Silver Maple

The proposed improvement is straight-forward. A culvert or ditch should be constructed to convey the highway runoff the final 130 feet to the unnamed stream. The modeling indicates that a 30-inch culvert would suffice. In addition, there is an undersized 18-inch culvert a short distance upgradient from the unnamed stream. This should also be replaced with a 30-inch culvert (see Figure 5-1). This would lower the water level in the ditch by several feet and should relieve the ponded water conditions at the Silver Maple. The County survey noted that many of the driveway culverts in this drainage system were partially blocked with accumulations of sediment. It is recommended that these culverts be cleaned out to restore full flow capacity through them.

The modeling performed for Conner Creek indicates that at higher creek flows, such as the 2-year flow, temporary backwater conditions would slow drainage from this improved ditch. But these conditions would be infrequent and would last only a few days.

### **Haven-by-the-Sea**

The limitations in available County Survey Crew time prevented the gathering of adequate data to address this area. It is uncertain where runoff within this area currently flows or its ultimate discharge point(s). It is reported that an old pipe that formerly drained this area north to Heath Road had collapsed and no longer serves that function. Neither this line nor its point of collapse were found or confirmed during this study. A drainage analysis was prepared for the area. It is estimated to cover about 30 acres. A small lake lies in the east-central portion of the area, although it was not determined how much of the area drained to it. Haven-by-the-Sea is a relatively intensively developed portion of the Study Area with single family homes and extensive resort development along the western portion of the site. A hydrologic analysis was performed which provided estimates of runoff generated within the area. Peak flow estimates are as follows (see Appendix B):

- 2-year: 7 cfs
- 10-year: 10 cfs
- 25-year: 13 cfs
- 100-year: 17 cfs

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A survey was made of the drainage system in Heath Road, which lies at the north boundary of this study site. Flow is conveyed to the north side of Heath Road and heads west, into a pipe system under Sunrise Resort. As shown in Figure 5-2, a 36-inch pipe heads north from Heath Road, under the Sunrise Resort. It is reported that a new stormwater pipe system was recently installed by Sunrise Resort, leading further north (Varness, personal communication, 1999). But plans for this pipe system were not located. It is recommended that further survey work be performed to locate the old storm pipes leading north to Heath Road and to document drainage from the small lake. The design of the recent pipe installation under Sunrise Resort should be reviewed to determine if capacity exists to handle flows from Haven-by-the-Sea. With further data, the small lake could also be investigated as a possible detention pond to reduce peak flows to Heath Road and the Sunrise Resort stormwater system.

For cost estimation purposes it is assumed that the collapsed pipe within Haven-by-the-Sea should be replaced with a 24-inch diameter plastic pipe leading out to Heath Road. Estimated pipe length is 500 feet and the installation of 2 manholes is assumed.

### Johnson's Mercantile

The northern portion of the Study Area lies along the south bank of the Copalis River. There is a low spot near the Hopkins Street intersection with Highway 109 that occasionally floods. This low area lies immediately west of a store known as Johnson's Mercantile. Several catch basins in the street flow via a pipe to an outfall in the bank of the Copalis River, 400 feet to the north (Figure 5-3). This low spot is subject to ponding. From Figure 5-3 it appears that once the ponded water exceeds about 2 feet in depth, it can flow into the adjacent Johnson's Mercantile; flooding has occurred in the store in the past.

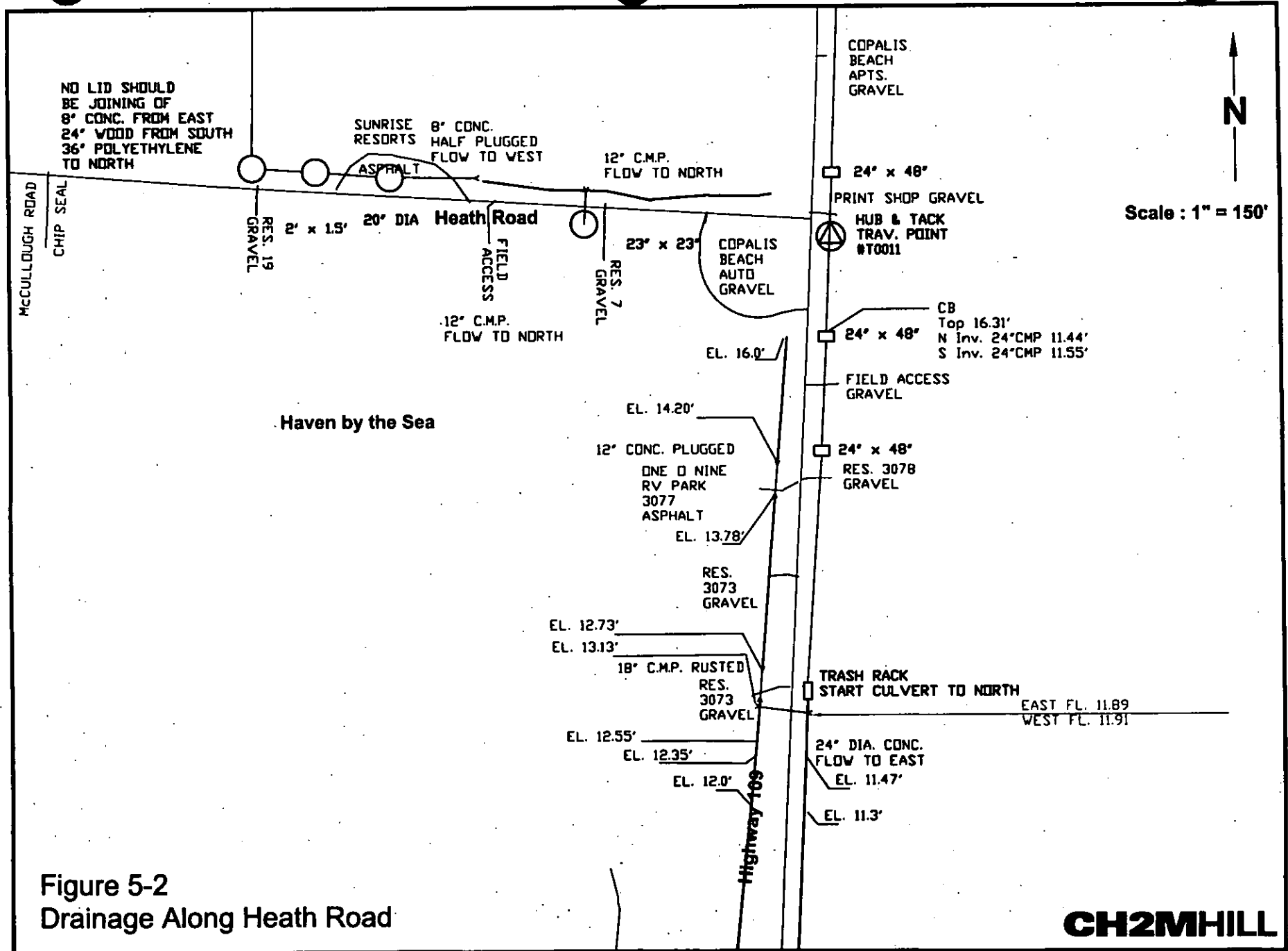


Figure 5-2  
Drainage Along Heath Road





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The top of the lowest catch basin is 9.45 feet. If the Copalis River rises above this level, backwater from the river would rise through the catch basin grate and begin to flood the street. To prevent this, a tide gate has been installed at the river outfall. A tide gate is a gate over the end of a pipe which is suspended on hinges. Gravity normally holds the gate in the closed position, against the pipe outlet. At lower river levels, water in the pipe will drain through the gate. However, at higher river levels, the external pressure against the gate will force it to shut tightly against the pipe outlet, preventing backwater from the river from flowing up the pipe. A visual inspection of the tide gate on June 24, 1999 showed it in place and in the closed position, apparently operating satisfactorily. At the point of discharge there is less than one mile to the mouth of the river at the ocean. Therefore, the river level will fluctuate with the tides. The highest tide of 1999 will be 10.2 feet (12.7 feet MLLW) in December. In all, the tide will exceed an elevation of 9.5 feet a total of 8 times in 1999. Therefore, without an operating tide gate, water could be expected to pond at the low spot a total of 8 times and reach a depth of up to 0.7 feet. Flows in the river would result in still higher water elevations. No measured flow data for the Copalis River was found, but the Grays Harbor County Flood Insurance Study identifies flood flows are follows:

- 10-year: 2,350 cfs
- 50-year: 3,510 cfs
- 100-year: 4,010 cfs

A hydraulic study of the Copalis River to determine river height was beyond the scope of this study. However, flood insurance map for the area (Panel #530057-0280B) shows the 100-year flood elevation of the Copalis River at this location to be 13.5 feet (Note: This elevation is shown as 10 feet in the Flood Insurance Map, which used an elevation datum of 1929 NGVD). Thus the value of the tide gate is apparent and it is recommended that it be examined on an annual basis to assure it is in good shape and operating correctly.

It is evident from Figure 5-3 that Highway 109 acts as a low levee, providing some protection from rising river levels. However, the lowest road elevation is 11.7 feet, adjacent to Johnson's Mercantile. If the river level exceeds this elevation, it will directly overtop the road and fill the low area south of the road. It is significant that the highest tides typically occur late in the year,

around December. The period of the year that the rivers in the region are most likely to experience high flows is from December through March. Thus there is a reasonable chance in any given year that the highest river flows will coincide with the highest tides, exacerbating flood potential.

When the tide gate is closed during periods of higher water in the river (elevation above 9-10 feet), stormwater discharge from the pipe is greatly reduced or even ceases. If this coincides with a period of heavy rainfall, the runoff will pond in the low spot. Based upon the available survey data for the site (Figure 5-3), a stage-storage table was developed showing estimates of water volume versus ponded water depth (Table 5-1). To be more accurate, additional elevation data south of Johnson's would be useful. But the available elevation data is adequate for this study.

**Table 5-1: Stage-Storage Table for the Low Spot near Johnson's Mercantile**

Elevation (stage)	Area (ft <sup>2</sup> )	Cum. Volume (ft <sup>3</sup> )	Storm Runoff (ft <sup>3</sup> ) (event)	
9.5	775			
10	2790	891		
10.5	10400	4189		
11	15500	10664		
11.5	38000	24039	24298	2-yr
			34774	10-yr
			43338	25-yr
12	57000	47789	54180	100-yr

Table 5-1 indicates that the runoff from a 2-year storm event would elevate water in the low spot to about 11.5 feet in elevation, causing local ponding 2 feet in depth. More intense storms could raise ponded water to an elevation in excess of 12.0 feet (2.5 to 3 feet in depth). Note that these depths and their associated runoff volumes are for a 24-hour storm. Such a storm would

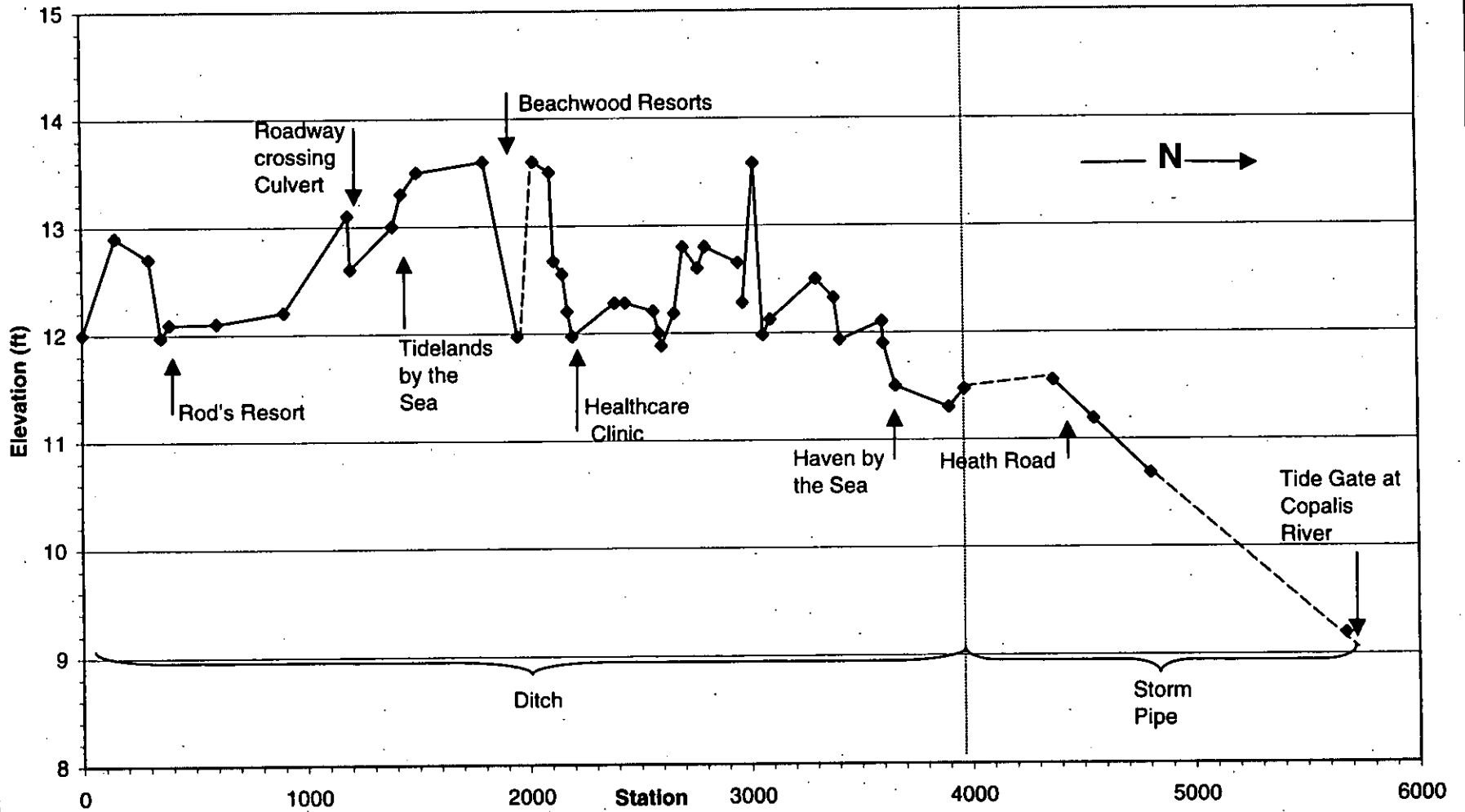
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occur across nearly two full tidal fluctuations, and this would allow some of the runoff to drain to the river during low tide. Thus the ponded depths shown in Table 5-1 are conservative.

In order to develop a reliable engineering solution, a hydraulic study of the lower Copalis River should be undertaken to more accurately factor in the effects of tide and high river flows on river elevation. It is evident that the low spot, Johnson's Mercantile and surrounding properties are all subject to periodic shallow flooding. Possible solutions could involve raising Highway 109 to protect adjacent properties from overtopping by the river and constructing a pump station to pump ponded water to the river. But the small, impacted area, about 2 acres, and the limited amount of impacted property generally make these types of measures cost-ineffective. A more direct solution would be to raise the floor elevation of Johnson's Mercantile by at least several feet, above the likely elevation of the 100-year flood, that is, above 13.5 feet. The adjacent road, Hopkins Street, is part of a looped road system serving a local neighborhood. Since there is an alternate access to the neighborhood, occasional periods of standing water on Hopkins Street are tolerable and no changes are recommended for this street.

### **Rod's Resort**

Rod's Resort lies on the west side of Highway 109, about one mile south of Copalis Beach. The owner has stated that during the last several decades the property has suffered from increasingly poor drainage conditions, possibly due to grading activities on property to the north and poor highway drainage conditions to the east. During a visual reconnaissance of this study site on March 2, 1999, the water level in the highway ditch at the east side of Rod's Resort was high and some inundation of the adjacent resort was evident. No flow in the ditch could be visually detected. The area immediately north of Rod's Resort was extensively ponded. Limited topographic information prevented a thorough evaluation of drainage within the Rod's Resort or on the adjacent property. However, the highway ditch system was extensively surveyed from the Copalis River, south, to a point 400 feet south of Rod's Resort. A profile of the ditch and pipe system is shown in Figure 5-4. The west-side ditch elevation in the vicinity of Rod's Resort is about 12 feet. It is evident that high points in the ditch system lie both north and south of Rod's Resort, inhibiting drainage from the east side (highway side) of the property. A high point of 13.6 feet lies about 1,300 feet north of the property.



**Figure 5-4**  
**Highway 109 Ditch and Pipe Profile in the Northern Portion of the Study Area**

**CH2MHill**

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Two-hundred and fifty feet south of the property the ditch hits a high point around 12.9 feet. Further south from the end of the survey at Station 0 in Figure 5-4, runoff in the ditch on the west side of the highway was observed flowing south during the March 10 reconnaissance.

It is recommended that the highway ditch south of Rod's Resort be excavated up to one foot deeper to an elevation of 12.0 feet. This will provide improved drainage to Rod's Resort, allowing runoff to flow south. The required ditch excavation is relatively minor and can be readily accomplished through scheduled ditch maintenance. For cost estimation purposes, it is assumed that 300 feet of ditch would need to be deepened an average of 0.5 feet. In addition, two days of survey crew time is assumed for support of this project.

## **NON-STRUCTURAL ALTERNATIVES**

While structural alternatives for flood hazard management address problems already identified, non-structural alternatives seek to prevent future problems by addressing the causes of flooding. They are typically focused on the regulation of land use, which is the largest controllable factor in most flooding problems. In some cases, homes and other structures are built within an identified floodplain; in others, although structures are outside the floodplain, fill or other features of development alters natural drainage courses, creating flooding up- or downstream. Development of wetlands removes the important natural floodwater storage function they provide. Overall, as well, the cumulative effects of development add impervious surface area within watersheds, increasing stormwater runoff, and result in additional fill that displaces water, diverts flow, and raises flood elevations. Addressing these issues through land use policies and regulations is a cost-effective way of helping to avoid future flooding problems that require costly capital solutions. Also effective are educational programs, which help maintain property owner awareness of the types of activities that can contribute to flooding and provide guidance on the regulations and permit processes related to flood hazard management.

It is important to note in any discussion of policy and regulatory solutions that Grays Harbor County, and particularly the coastal areas, are by nature exceptionally prone to flooding. Most of the North Beach study area is less than 20 feet above sea level, and many areas lie within designated floodplains or wetlands. Any regulations preventing development that was subject to flooding or that in some way contributed to flooding would result in unacceptably severe

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restrictions on development through much of North Beach. Thus, it must be recognized that, given the nature of the area, flooding will continue to occur to some degree if landowners are to exercise their property rights. This will be true even with strict enforcement of all existing regulations and implementation of the other measures described below.

This plan recommends that each of the non-structural alternatives presented here be implemented by Grays Harbor County.

### ***Regulate Development in Floodplains and Impacts to Drainage Courses***

Regulations are a means of limiting actions taken by individuals that may put them at risk or adversely affect others or the environment. As detailed in the Regulatory Overview of Section 3 and Appendix E of this FHMP, there are a number of federal, state, and local laws that pertain to flood hazard management. Any new development in the floodplain should strictly follow the guidelines specified in these regulations.

To reduce localized flooding, land use policies in the North Beach Area must ensure that development does not impact drainage courses and that increases in runoff are kept to a minimum. Regulations that address the goal of protecting drainage pathways should be enforced. This requires that the County:

- Identify permanent drainage pathways.
- Prevent filling or blocking of natural drainage courses. Prevent alterations or relocations of drainage courses that affect their flood carrying capacity. This can be done by vigorously enforcing the Uniform Building Code and the County Zoning Ordinance.
- Limit fill materials for new development or improvements to the minimum necessary to elevate homes and septic mound systems above the designated flood level.
- Review all filling activities for adverse downstream and upstream impacts.
- Establish policies to comply with Sections 401 and 404 of the Clean Water Act. (Related to construction measures for flood hazard protection that may affect wetlands)
- Establish policies to formalize the posting of warnings of flooding hazards during events that cause closure of roadways, bridges, or facilities.

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This alternative has the potential for the most comprehensive benefits of all of the alternatives considered.

### ***Evaluate Revisions to FEMA Floodplain Boundaries***

The special permitting requirements for development within floodplains (administered under chapter 13.07 of the County's zoning ordinance, as described in Chapter 3) apply only to those areas within the 100-year floodplain mapped by FEMA. Figure 3-3 shows the 100-year floodplain mapped for North Beach. Discussions with County staff resulted in the observation that some areas adjacent to but outside the mapped floodplain appear to experience significant flooding. Because of the dynamic nature of the coastal topography (such as beach accretion and shifting of dune locations) and the significant northward migration of Conner Creek it is likely that changes have occurred in the floodplain boundaries that are not reflected on the current maps. Computer modeling of the area using up-to-date topography and hydrologic data could establish whether additional areas should be subject to floodplain development permit requirements to protect property and safety in the floodplain area. The County should also consider adopting a policy of performing such floodplain boundary reviews on a periodic basis in coastal areas like North Beach where conditions are subject to change.

### ***Coordinate Planning with County Divisions and Other Jurisdictions***

Opportunities may exist for a coordinated process among the County's Planning, Building, and Utilities and Development divisions to ensure that all new development with the potential to experience or exacerbate flooding is reviewed for consistency with this FHMP as well as other applicable plans and regulations. It is recommended that the County include such coordination in current permit program improvements.

Because flooding occurs on a watershed basis, without respect to city and county boundaries, interjurisdictional coordination is another important aspect of flood hazard management planning. Typically, a number of public agencies are affected by, or have authority over, activities that can contribute to flooding in a given watershed. In North Beach, for example, the Washington State Department of Transportation (WSDOT) has jurisdiction over the operation and maintenance of SR 109, where many of the local drainage problems occur. Policies and processes should be established between the County and WSDOT for:

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- Notification of projects and maintenance activities that may affect flooding in areas under the other agency's jurisdiction
  - Development of mechanisms for cost-sharing on projects of mutual benefit

### ***Consider Development of Flood Storage Conservation Easements***

As noted elsewhere, much of the North Beach area consists of floodplains and jurisdictional wetlands. These areas serve as natural storage for floodwaters, and filling and development within them force the water elsewhere—often over roads or into already developed areas. To address similar issues, some jurisdictions—for example, in King County—have established natural resource conservation easements, whereby property owners can voluntarily agree to forego development in exchange for property tax reductions or other incentives. The areas thus protected will reduce future flood hazards by continuing to provide their natural storage functions, and can also provide other public benefits such as recreation. Though the effects of such voluntary programs cannot be quantified, they can be a cost-effective way of serving multiple public purposes without increasing regulation. It is recommended that the County investigate the development of such a program for interested property owners.

### ***Develop Flood Hazard Public Education Programs***

Educational programs are important tools to protect the public safety and health of citizens in flood-prone areas. It is recommended that a series of posters be developed for display in the lobbies of County offices and other public places to inform people of the local flooding issues; efforts could be coordinated with similar activities in other areas of the County such as South Beach and Grayland. Pamphlets should also be distributed to educate the public. Examples of topics to be included in the educational series are as follows:

- Flood zones: where they are and what they mean
- Potential for damages when buying/building a structure in a floodplain
- Likely impacts to roads and bridges in floodplains
- The importance of maintaining existing drainage courses, not creating any that drain wetlands, and minimizing the use of fill materials
- Impacts of flooding on water quality, including increased erosion and sedimentation, and the washing of pesticides and herbicides into the main channel



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- Measures to reduce flood hazards and minimize damages
  - Explanation of regulatory programs and permits related to improvements on private property

While education programs of this nature will serve to inform people of the dangers of construction within floodplains and the need to maintain natural drainage courses, they do not guarantee changes in existing practices. This is a choice that must be made by individuals and the community as a whole; therefore, safety, flood hazard reduction, and environmental benefits depend upon public attitudes and actions. Without significant interest or acceptance of the goals, these benefits may not be realized.

## **ENVIRONMENTAL IMPACTS**

In general, the non-structural improvements proposed will tend to enhance environmental/natural resources by furthering the protection of water quality and reducing flooding, thereby reducing resultant habitat disturbance, pollutant transport, erosion and sedimentation.

Structural alternatives may have both positive and negative impacts to water quality and fish and wildlife. Any construction project carries the risk of erosion and sedimentation into nearby surface waters from the action of wind and rain on exposed soils. However, the proposed projects are limited in scale and would have few impacts during the construction period; further, they will generally provide long-term benefits by reducing flooding, as described above for the non-structural alternatives. All capital projects with the potential for environmental effects during construction or operation will be subject to review under the State Environmental Policy Act (SEPA) to determine whether there are significant impacts requiring mitigation.

General environmental issues to be considered for any capital improvements are as follows:

- Sidecasting of excavated ditch material into wetlands is prohibited.
- All improvements must comply with regulations, policies and permitting requirements, as described in Section 3 and Appendix E of this FHMP. This may include compliance with regulations including one or more of the following:
  - Shoreline Master Program

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- Hydraulic Permit Application
  - Certification of Compliance with the Clean Water Act
  - Section 10 - Rivers and Harbors Act
  - National Environmental Policy Act
  - Washington State Environmental Policy Act
  - State Floodplain Management
  - Grays Harbor County Zoning Code and Floodplain Ordinance

## **COSTS**

### **Nonstructural**

Five recommended non-structural alternatives for the North Beach Area are program and policy recommendations. Their costs have been approximated as follows:

- **Regulate development in floodplain and impacts to drainage courses:** Regulations can be enforced under existing County regulatory programs with minimal impact to operating budgets.
- **Evaluate revisions to FEMA floodplain boundaries.**
- **Coordinate planning with County divisions and other jurisdictions.** This can be done for a minimal investment of staff time by the two jurisdictions (Grays Harbor County and WSDOT).
- **Consider the development of flood conservation storage easements.** The costs of a voluntary easement program are difficult to quantify, as participation is unpredictable; further, costs to the County would depend upon the types of incentives offered to property owners.
- **Develop flood hazard and water quality public education programs:** These programs tend to rely heavily on volunteers and can be successfully completed for approximately \$5,000 - \$10,000 per year.

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Elevating affected homes and businesses (including septic systems) will cost approximately \$20,000 to \$60,000 per structure. This cost will vary with the size of the structure, the site conditions, the elevation height required and other factors.

### **Structural**

Order-of-magnitude cost estimates were developed for the local projects discussed earlier in this section. Where the project involves a ditch or waterway, the costs do include the services of a Fish Biologist to assure that resident fish are not impacted during construction. These costs are in 1999 dollars and do not include escalation, financing costs or operation and maintenance costs. The costs are summarized below. Further detail can be found at the back of Appendix B.

- Silver Maple Resort: \$9,000
- Haven-by-the-Sea: \$33,000
- Rod's Resort: \$3,750

### **FUNDING**

Once costs are identified, there are several potential sources of funding that may be considered and evaluated. The first to be considered by most residents is property tax revenues. In Grays Harbor County, the majority of property taxes are distributed to special purposes such as schools, roads, the Port District and the cities. Only 11 percent of total property taxes are available to the County without previous designated uses. These are used to support the basic functions of County government and are placed in the general fund or the current expense fund. They support police, fire, parks, planning, administration and other basic County services. Seventy percent of these funds go to support the criminal justice system. Because of this, there is substantial competition for the remaining funds and there is generally little or no money left for special needs such as drainage and flood hazard reduction. Therefore, other sources must be considered. Other potential sources may be considered in several categories as shown in Table 5-2.

**Table 5-2  
Alternatives for Funding Flood Hazard Management Plan Implementation Measures**

<b>Primary Purpose</b>	<b>Process to Form or Obtain</b>	<b>Cost to Obtain</b>	<b>Control</b>	<b>Revenue Potential</b>	<b>Public Acceptance</b>	<b>Adverse Impacts</b>	
<b>Basic County Revenues</b>							
Current Expense	Provide general County government services.	Already exists	None	County Commissioners	Good	Competes with other County service needs.	
Road Fund	Develop and maintain roads.	Already exists	None	County Commissioners	Moderate, restricted to those services required as a result of road impacts or to provide roads.	Good	Competes with other road needs.
River Improvement Fund	Provide services related to flooding or erosion along rivers.	Commissioner vote	None	County Commissioners	Minimal, competes with other County revenues and is subject to overall tax levy lids.	Generally good	Competes with other demands for County revenues.
Bonding	To spread costs of capital projects that have long-term benefits over long periods of time.	Commissioners have limited authority to issue General Obligation Bonds and may issue revenue bonds without a public vote. A ballot is required for bonds that exceed basic limits.	Moderate, includes interest	County Commissioners	Moderate, subject to statutory limits, ability to repay and limited to capital programs.	Variable	Requires repayment in future, may limit debt available for other purposes.
Real Estate Excise Tax for CIP Related to Development	RCW 82.46 authorizes optional real estate excise taxes to fund capital projects.	Commissioner vote	Minimal	County Commissioners	Moderate	Variable	Minimal, potential voter resistance.
Conservation Futures for Open Space Acquisitions	N/A						
<b>Special Districts</b>							
Stormwater Utility	RCW 36.89 authorizes stormwater programs including capital and maintenance programs to address problems associated with stormwater runoff such as flooding and water quality.	Vote of County Commissioners	Minimal, generally includes preparation of a plan for use of the funds and a public involvement program to assess acceptance of proposal.	County Commissioners	Significant	Generally acceptable, widely implemented throughout Puget Sound region and other areas of the country.	May be perceived as another "tax" and another government bureaucracy.

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Alternatives for Funding Flood Hazard Management Plan Implementation Measures**

	<b>Primary Purpose</b>	<b>Process to Form or Obtain</b>	<b>Cost to Obtain</b>	<b>Control</b>	<b>Revenue Potential</b>	<b>Public Acceptance</b>	<b>Adverse Impacts</b>
Flood Control Zone District	RCW 86.15 authorizes formation to address flood control or stormwater related issues.	Resolution of intent, public hearing and vote of County commissioners.	Moderate, generally includes cost to prepare program proposal and conduct public involvement program to assess public acceptance.	County Commissioners	Substantial, can assess taxes or utility rates and charges.	Generally favorable if need is understood.	May be viewed as additional bureaucracy and as unnecessary.
Special District	RCW 85.38 authorizes formation to provide drainage and flood control services.	Petition, public hearing and vote of property owners affected.	Moderate, includes preparation of plan for operation, assessment role, public hearing and vote.	Three locally elected board	Moderate, based on benefit.	High if locally supported.	Narrow purpose, may conflict with broader purpose governments.
Water and Sewer Services	RCW 36.94 authorizes Counties to provide water and sewer services, may provide stormwater services by amending comprehensive sewer plan.	Amend or prepare comprehensive sewer plan, Commissioner vote.	Moderate, cost of developing or amending comprehensive sewerage plan.	County Commissioners	Moderate, may use utility rates or taxes.	Moderate.	May be viewed as another tax and unnecessary bureaucracy.
Water and Sewer Districts	RCW 56.04 authorizes formation of sewer districts. Sewer district may provide stormwater control services.	Petition, hearing, vote of affected property owners.	Moderate, cost to develop plan, assessment roll, hearing, petition and vote.	Locally elected board	Moderate.	Moderate.	May compete with other agency programs or local funding needs.
Lake Management District	RCW 36.61 authorizes formation to protect water quality of lakes, not applicable in South Beach.	Petition or resolution, public hearing and vote of property owners.	Moderate, cost to develop plan, assessment roll, hearing and vote.	County Commissioners	Moderate, subject to benefit of clean lake.	Variable depending on perceived threat to local lake.	May compete with other local funding needs.
Shellfish Protection District	RCW 90.72 authorizes formation to protect shellfish areas from pollution.	Vote of County commissioners	Minimal.	County Commissioners	High, subject to political will.	Variable, dependent on perceived threat to shellfish.	May be perceived as competing with other local funding needs.
Local Improvement District	See below.	See below.	See below.	See below	See below.	See below.	See below.
Utility Local Improvement District	RCW 36.94 authorizes to provide funding for capital improvements.	Petition or resolution, hearing and vote of affected property owners.	Moderate, cost of preparing plans, cost estimates and assessment role.	County commissioners following vote of property owners to establish.	Moderate.	Generally high because those benefiting are paying.	Minimal, cannot be used to assess those causing flood problems, only those benefiting.

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In the North Beach area, two serious drainage problems (Silver Maple Resort and Rod's Resort) are along the State Highway. These problems should be alleviated with assistance from both the State and County, using State highway and County funds as available. For the Haven-by-the-Sea Project, the formation of a Local Improvement District (LID) could be considered as a means to finance the project. However, costs to form an LID could easily amount to 50% of the construction costs for this project and may not be an efficient approach. More realistically, in order to be implemented, this project will require local initiative and a strong partnership with the County.

Because of the limited availability of outside funding, local drainage problems will generally need to be resolved locally, rather than relying on government agencies. This keeps local control of the solutions, assures response to local issues, and may result in more cost effective solutions. The most likely source for supplemental grant funding for drainage and flood related improvements is the State's FCAAP grants.

## **SCHEDULES AND LENGTH OF TIME OF BENEFITS**

If the necessary budget is available, the non-structural improvements should be implemented within the 2000 fiscal year or as soon as possible. Grant monies to help with the development of the educational program should be applied for during the next grant application period. All non-structural benefits should be ongoing efforts, and the time of benefits is expected to be indefinite. Elevating homes and businesses is an individual property owner concern. For this reason, the process will be an ongoing one that proceeds as individuals decide the process is necessary and can allocate funds accordingly. The time of benefits of elevating structures is expected to equal the life of the structure.

Final design of localized drainage improvement projects that are funded by State Road funds should be implemented as soon as funding is available. Improvements could be completed within one year of the establishment of funding. With proper maintenance, these benefits are expected to last 50 years (before the culverts and drainage structures will need to be replaced).

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Improvements that require the establishment of a local improvement district and/or grant funding will take longer to implement. Because of the need for consensus building, the petition to County Commissioners, the public hearing and property-owner vote required to establish a special district, and the length of time involved in obtaining grants, the establishment of funding for improvements could take one to two years.

## **CONFORMANCE WITH GOALS**

Comprehensive goals and objectives were developed to provide an organized framework to guide the analysis and planning processes. As set forth in Section 3, the main goals of this FHMP are as follows:

- Improve the protection of public health and safety from flooding threats in the North Beach Study Area.
- Provide practical, cost-effective solutions that will result in measurable reductions in flooding frequency, duration, and frequently flooded area damages.
- Improve County regulations and programs to control flooding impacts to future growth.

The structural and non-structural measures presented in this section achieve these goals.