Eastsound

Water Supply Report and Recommendations

&

Abbreviated Coordinated Water System Plan

Eastsound Water Supply Coordinating Committee

Public Review Draft

March 2008

Eastsound Water Supply Coordinating Committee,
December 2005 – March 2008

Matt Zybas (chair and member through 2006)
Terry Wiliams (member through 2006)
Bob Eagan, co-chair
Gulliver Rankin, co-chair
Paul Kamin
Mike Stolmeier
Perry Pruett
Lisa Byers

Staff:

Vicki Heater and Mark Tompkins,
San Juan County Health and Community Services

Doug Kelly, Sound Hydrogeology

Funding for this planning work was provided by the Washington State Department of Ecology under RCW 90.82, the Watershed Plan Act.

Eastsound Water Supply Report and Recommendations,
and
Abbreviated Coordinated Water System Plan

Executive Summary

Section I. Background and setting
- A. Purpose for planning and characteristics of the Eastsound basin
- B. Aquifer conditions
- C. Water system history
- D. Group B and individual water systems
- E. Water rights
- F. Sewer District history
- G. Stormwater management

Section II. Water supply report and recommendations
- A. How this plan was developed
- B. Aquifer monitoring
- C. Aquifer protection: On-site septic systems, other sources of contamination, seawater intrusion, regulatory conflicts
- D. Stormwater
- E. Committee recommendations

Section III. Eastsound Abbreviated Coordinated Water System Plan
- *A. Service boundaries*
- B. Timely and reasonable service
- *C. Design guidelines*

Figure 1. Eastsound: boundaries and well locations, August 2004
Figure 2. Revised Eastsound Aquifer Critical Water Resource Area, May 2006
Figure 3. Eastsound Sewer and Water District boundaries and on-site septic system locations
Figure 4. Cross section of the geology of the Eastsound basin
Figure 5. Eastsound Groundwater Monitoring Network
Figure 6. Geology
Figure 7. Drainages and wetlands
Figure 8. Soils
Figure 9. Recharge
Figure 10. Land Use designations
Figure 11. EWUA Wellhead Protection Program: Potentiometric Surface
Figure 12. EWUA Wellhead Protection Program: Delineation Summary

Executive summary.

"Compared to all the other options[1], groundwater is the most reliable and affordable water source available to Eastsound." Paul Kamin, Manager, Eastsound Water Users Association.

This plan is the result of on-going local water resource planning under the county's Water Resource Management Committee, which is committed to a program of adaptive management: monitoring, analysis, and policy development. The work has been funded by the Department of Ecology's under RCW 90.82, The Watershed Act.

In May, 2005, the Eastsound Water Users Association petitioned the Board of Health to declare the Eastsound Aquifer and drainage basin a Critical Water Resource Area (SJCC 8.06), which was endorsed by the Water Resource Management Committee, the Eastsound Planning Review Committee, and the East Orcas Water Supply Planning Committee. In June of 2005, the County Commissioners passed Resolution 68-2005, declaring the Eastsound Aquifer Critical Water Resource Area and calling for the development of this Plan.

The WRMC identified the need to protect the Eastsound Aquifer from contamination and establish control over exempt well drilling in the Eastsound area, based on concerns about limitation of the Aquifer's capacity. During monthly meetings, community workshops, and many discussions about the growth pressures impacting Eastsound it became apparent that protection of the aquifer involved three major infrastructure entities: water supply, sewer service, and stormwater management.

One of three non-municipal communities designated as an Urban Growth Area in the State (Lopez Village is another), Eastsound is an unincorporated town, with none of the authority and resources that towns need to function. As a result, utilities such as Eastsound Water Users Association and Eastsound Sewer and Water District perform a difficult balancing act, sometimes cooperating and sometimes competing for available resources to provide service to their customers. The Eastsound community both needs and has concerns with the county's involvement in these basic services. To paraphrase committee member Bob Eagan during one discussion: Eastsound is becoming a municipality; we just need to see that no more damage is done in the mean time.

This plan is a transition to on-going planning and monitoring work for Eastsound, including revision of the Eastsound Subarea Plan, implementation of the County's stormwater utility, revisions to the County's Critical Areas Ordinance (particularly the Critical Aquifer Recharge Areas section), and compliance with the Growth Management Hearings Board provisions for Eastsound. This plan will directly affect Eastsound Water Users Association's Water System Plan, which will be completed in June 2008.

Three conditions became apparent during this project that set the direction of the committee's discussions:

[1] These include desalinization of seawater, wastewater treatment, and purchasing, treating and conveying surface water.

- During this planning process EWUA demonstrated its willingness and ability to provide service and new well siting regulations came into effect. This combination substantially curtailed the drilling of exempt domestic wells, and increased EWUA's capacity to provide for the future.

- Major developed areas with non-rural densities are not connected to the Eastsound sewer and present a threat to groundwater quality.

- Stormwater management in Eastsound is not being addressed in a comprehensive manner, taking into consideration site-specific conditions or sub-basin impacts to recharge rates and water quality.

This planning process has been limited by the lack of current planning documents by the Eastsound Sewer and Water District and Eastsound Water Users Association, and by the scarcity of data about the Eastsound Aquifer. Updates to sewer and water system plans, and data collection have been initiated. An on-going review of the information from these efforts will be an important part of implementing this plan.

All full discussion of the solutions developed by the Eastsound Water Supply Committee is located on pages 13 to16. In brief, these include:

- Adoption of an Abbreviated Coordinated Water System Plan to establish EWUA as the sole purveyor in their service area and set standards for timely and reasonable service.
- Agreements between EWUA and the County regarding service, between EWUA and ESWD regarding long-term management of senior water rights, and between the State and County regarding water right priorities in Critical Water Resource Areas.
- Long-term data collection and analysis of aquifer conditions to direct EWUA's and the County's planning processes, including stormwater management.
- A study of nitrate contamination risk to the aquifer from on-site septic systems.
- On-going public information and education about aquifer conditions and monitoring of activities that pose a risk of contamination.
- Recommendations to direct future stormwater planning for the Eastsound basin.

Section I. Background and setting

A. Purpose for planning and characteristics of the Eastsound basin

This plan was developed in response to the need for coordinated, active protection and management of the Eastsound aquifer. There are multiple factors that pose a threat to the aquifer, which is located beneath the growing community of Eastsound. The responsibility for protecting this valuable source of water lies with various public and private agencies, and with the individuals who reside within its boundaries.

Public agencies with roles in protecting Eastsound's water supply include Department of Ecology; State Department of Health; San Juan County Health and Community Services, Community Development and Planning, and Public Works; and Eastsound Sewer and Water District as the senior water rights holders. Eastsound Water Users is the community's primary water purveyor and a private non-profit association with the largest water rights holdings. It is one of the goals of this Plan to more clearly define the responsibilities of these agencies.

Eastsound is located in between two bodies of seawater, East Sound and the Straits of Georgia, and between two bedrock outcrops, Double Hill and Buck Mountain. It was founded in 1873 and by the 1900s the area was cleared and planted with orchards. It was, and is, the commercial center of Orcas Island, with stores, churches, restaurants, hotels and inns. It is unincorporated, with boundaries and regulations established by two county planning designations: the Eastound Subarea Plan and Eastsound Village Urban Growth Area.

The basin between Buck Mt. (1500') and Double Hill (450') is comprised of deposits from the Fraser glaciation and includes unconsolidated glaciomarine outwash and glacial drift. These deposits are over 300 feet thick in some areas, and consist of layers of sand and gravel overlain with silty sand, clay, and till. Bedrock occurs at the base of these deposits, and there are bedrock outcrops along much of the northern shoreline, and at the southern end of the Eastsound Village core, terminating at Madrona Point. This basin is approximately 1400 acres with an elevation variation of zero to 100 feet.

Two major watershed areas drain to the north, starting at an elevation of 100' north of the Orcas School. Smaller watershed areas drain to Fishing Bay and through the wetland complex at Ship Bay. Cross sections developed from well logs indicate that the aquifer follows a similar flow direction to the north, mimicking the surface drainage. Several large wetland systems are located within this area, where the soil is comprised of low permeability till and clay. Rainfall averages 30-32 inches annually (Golder, 2007 from USGS).

Soils in the area consist of a combination of well-drained sandy loams and poorly drained till. Table 1, on page 2, shows major characteristics of Eastsound's soils based on the NRCS 2007 soil survey. This survey is a useful tool for planning purposes, but site conditions can be much more complicated. The majority of the soils in the area are considered high recharge soils and all of the soils are considered very limited for on-site septic drainfields. (See Figure 8. Eastsound Soils)

Table 1. Eastsound Basin Soil Conditions (2007 Soil Survey)

	Hydrologic Group	Drainage class	Septic suitability	Depth to restrictive layer	Flooding/ponding
1. Bazal-Mitchellbay complex	D	Poorly to somewhat poorly drained	Very limited	20-40"	None/frequent (Bazal) None/occasional (Mitchellbay)
2. Cady-Rock Outcrop complex	D	Well drained (Cady)	Very limited	Bedrock at 10-20"	None/none
3. Coveland loam	B	Somewhat poorly drained	Very limited	40-60"	None/frequent
4. Deadmanbay-Morancreek complex	D (Deadmanbay), C (Morancreek)	Somewhat poorly drained (Deadmanbay), moderately well drained (Morancreek)	Very limited	40-60" (Deadmanbay), none (Morancreek)	None/none (both)
5. Doebay-Cady-Rock outcrop complex	C (Doebay), D (Cady)	Well drained (both)	Very limited	Bedrock at 20-40" (Doebay), Bedrock at 10-20" (Cady)	None/none (both)
6. Everett sandy loam	A	Somewhat excessively well drained	Very limited	None	None/none
7. Indianola loamy sand	A	Somewhat excessively well drained	Very limited	None	None/none
8. Mitchellbay-Sholander-Bazal complex	D (all)	Somewhat poorly drained (Mitchellbay and Sholander), poorly drained (Bazal)	Very limited	20-40" (Mitchellbay and Bazal), 40-60" (Sholander)	None/occasional (all)
9. Roche-Killebrew	C (Roche), D (Killebrew)	Moderately well drained (Roche), somewhat poorly drained (Killebrew)	Very limited	20-40" (both)	None/none (both)
10. Roche-Killebrew-Rock outcrop complex	See above -----	----------	------	----------	----------
11. Shalcar muck	D	Very poorly drained	Very limited	None	None/frequent
12. Sholander-Spieden complex	D (both)	Somewhat poorly drained (Sholander), poorly drained (Spieden)	Very limited	40-60" (Sholander), none (Spieden)	None/occasional (Sholander), None/frequent (Spieden)

From: NRCS Survey Area Version 4, 02/14/2007

The information in this table is compiled from reports available through the Natural Resources Conservation Service. The information indicates dominant soil conditions but does not eliminate the need for onsite investigation.

Hydrologic Groups:

A. (Low runoff potential). The soils have a high infiltration rate even when thoroughly wetted. They chiefly consist of deep, well drained to excessively drained sands or gravels. They have a high rate of water transmission.

B. The soils have a moderate infiltration rate when thoroughly wetted. They chiefly are moderately deep to deep, moderately well drained to well drained soils that have moderately fine to moderately coarse textures. They have a moderate rate of water transmission.

C. The soils have a slow infiltration rate when thoroughly wetted. They chiefly have a layer that impedes downward movement of water or have moderately fine to fine texture. They have a slow rate of water transmission.

D. (High runoff potential). The soils have a very slow infiltration rate when thoroughly wetted. They chiefly consist of clay soils that have a high swelling potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. They have a very slow rate of water transmission.

B. Aquifer conditions.

The sediments in the Eastsound basin consist of layers that transmit ground water at different rates, possess different storage capacities, and can either convey or restrict recharge or infiltration by contaminants. The Eastsound Aquifer may actually consist of several separate aquifers that may be interconnected. A water bearing zone occurs in a layer of sand and gravel from zero to 60 feet below sea level. This zone lies beneath various layers of clay, clayey-sand and silty-sand that are as much as 100 feet thick and help to protect the aquifer(s) from contamination (See Figure 4. Cross Section of the Geology of the Eastsound Basin).

Recharge is water that travels past the soil layer, or root zone, to become groundwater. All recharge in San Juan County occurs from local rainfall. In an island setting, aquifers flow seaward to discharge along the shore. Recharge areas are characterized by having a higher water-level elevation in an aquifer. During 1997-98 the US Geological Survey conducted a study to determine recharge capacity in the county which included collecting and analyzing data for precipitation, runoff, air temperature, surface geology, soil cover, vegetation, and topography. These recharge estimates were used by water resource planners working with Eastsound Water Users Association to calculate the withdrawal capacity of the Eastsound Aquifer, which in similar aquifers is roughly 25% of total recharge, since some water is retained in the aquifer and the rest flows to the sea. They concluded available recharge to be 35 to 40 million gallons per year (MG/yr), which is half the water right allocation available to EWUA (73 MG/yr). However, without a rigorous three-dimensional model of the aquifer, considerable uncertainty exists.

A 1997 Wellhead Protection Investigation for EWUA calculated aquifer flow based on water levels in three of EWUA's well fields (Figures 11 and 12). This study concluded that recharge to the Terrill Beach wells most likely originates southeast of the wells at the base of Buck Mountain. Surface infiltration and also, possibly, fractures in the bedrock, recharge these wells, which have water levels at the surface. Recharge to the Blanchard Road well field most likely originates southwest on a 200-foot-high plateau, which receives direct infiltration from rainfall as well as surface runoff and leakage from Lookout an Double hills.

C. Water system history.

Eastsound Water Users Association filed Articles of Incorporation on April 7, 1955 with an initial membership of forty and a single well for water supply after the voters of the Eastsound Sewer and Water District declined to approve a bond referendum that would have created a public water district. As membership increased, additional wells were constructed to augment the supply.

Growth and a three year drought from 1978 to 1980 resulted in a Department of Social and Health Services connection moratorium from July 1980 to August 1981. A result of the moratorium was the construction of the Purdue Lake surface water treatment plan, which was brought on-line in May, 1986. The added capacity from Purdue Lake did not relieve the pressure for very long. In 1998, EWUA's last water system plan was approved. At that time they were serving 650 residential services and an uncalculated number of non-residential, and were approved for 1000 equivalent residential units (ERUs or calculated connections, including both residential and non-residential use). By 1999, the Association was forced to impose their own moratorium on the sale of connections, because connection limits were reached. Careful efforts to account for water use and capacity succeeded in approval of additional connections in 2001. As of November 2007, the Association serves 1089 active ERUs and is approved for 1266. The new water system plan may increase the approved system capacity. To put these numbers into perspective: the Town of Friday Harbor provides for 1475 total calculated connections.

Growth of EWUA membership and water demand has been substantial since 1998, when the last water system plan was approved, and the Association has been actively working to provide additional capacity. During this time EWUA has hired several consulting firms to evaluate water supply capacity and potential new sources. The Association has applied for several additional water rights from surface water and groundwater sources, which may help to alleviate the concerns about the capacity of

the Eastsound Aquifer to provide the amount of water allocated in ground water rights. EWUA was granted a water right change in 2006; so that water can be withdrawn from anywhere in the aquifer area, rather than just specific well fields and new wells have been constructed to improve the pumping capacity and water quality. In addition, new wells have been constructed, purchase of the Greer wells has been completed and a revised agreement to lease the original Eastsound Sewer and Water District's water rights was signed in the spring of 2007.

D. Group B and individual water systems.

There are 10 Group B water systems within the EWUA service area and at least 130 wells. Within the Eastsound Village UGA there are two Group B systems and at least 40 individual, exempt wells. Since well records are only available since 1972, one can reasonably assume there are at least twice as many wells the in the area. The recent wells and Group B water systems are partially a result of the EWUA's difficulties providing service. Some areas, particularly on the steep sides of Buck Mountain, are almost completely developed with private and small community system wells.

In some areas, particularly on small lots, these wells pose a risk of contamination for the user and the Aquifer where surface activities such as the use and improper disposal of hazardous chemicals or high density of on-site septic systems may introduce toxic materials sub-surface. Recent changes in County well-siting regulations now significantly restrict well development on these small lots; however, an inventory of existing wells and their status is needed. Many exempt wells are not in use and should be decommissioned, although the cost for this process is considerable.

EWUA's hydrogeologist, Craig Russell, estimates that Group B and private exempt[1] wells have a combined annual withdrawal impact on the Eastsound Aquifer of five million gallons. These withdrawals are a concern for EWUA, which holds rights for all the currently-estimated capacity of the Aquifer. Cooperation with exempt well owners is needed to determine the actual impact of these wells, and to coordinate withdrawal if it is determined that Aquifer capacity is limited. Metering and recording water use is the most important step exempt well owners can take to document their water right and work with EWUA to manage the Aquifer.

E. Water rights.

Under state law water rights can be allocated only if four standards are met:

- Is the water available?
- Will it be put to beneficial use?
- Will the new right impair prior rights?
- Is the use detrimental to the public interest?

Eastsound Water Users Association leases and owns the majority of the water rights for the Eastsound Aquifer and, as a result, is obliged under state law to provide water service within their service boundaries with strict standards for water use efficiency. The Association is concerned about the many exempt wells in its service area, which do not have the same requirements. Exempt wells, however, must meet the four standards

[1] Exempt wells are allowed up to 5000 gallons per day for single family and group domestic use, stockwatering, and commercial irrigation. They are exempt from the requirement to obtain a water right permit only, and must meet the same standards for allocation.

for water right allocation, and are vulnerable to having their use curtailed if they impair prior rights, which in this case would be EWUA.

Water rights are allocated based on actual use. In the case of exempt wells, the law allows up to 5000 gallons per day, but this amount is rarely used. Without data to prove use, such as meter readings, Ecology generally assumes that domestic use from an exempt well is between 250 and 350 gallons per day. With an aquifer as limited as Eastsound's, metering use is one of the most effective tools available for establishing water rights and planning for future demand.

Court decisions have established that the only avenue for determining the status of senior water rights is through litigation. The State is hampered in overseeing the impact of exempt well use as a result. When sufficient data is collected to determine the capacity of the Eastsound Aquifer, an allocation strategy will be needed, or the basin will need to be closed to new water supply development.

Table 2. Eastsound basin water right permits and certificates for groundwater (does not include exempt wells)

DOCUMENT NUMBER	DOCUMENT TYPE	PURPOSE	PRIORITY DATE	GPM	ACRE FEET	Primary/ Secondary	Section	BUSINESS NAME
G1-00426	Permit	DM	9/7/1971	11	1.5		11	Marlo,Inc.
G1-00426	Permit	DM	9/7/1971	11	1.5		11	Marlo, Inc.
G1-*00106SWRIS	Certificate	Irr - DM	5/2/1945	15	14	Primary	14	Campbell FR
G1-*00106SWRIS	Certificate	Irr - DM	5/2/1945	15	14	Primary	14	Campbell FR
G1-*03683CWRIS	Certificate	DM	6/21/1954	50	80	Primary	13	Eastsound Water District
G1-*08652CWRIS	Certificate	DS	4/11/1967	2.5	1	Primary	14	Leatherwood Fred
G1-00376C	Certificate	MU	4/15/1970	25	40	Supplemental	11	Eastsound Water Users
G1-00426CWRIS	Certificate	DM	9/7/1971	11	1.5	Primary	11	Marlo Inc
G1-00438CWRIS	Certificate	DM	7/7/1970	25	40	Supplemental	13	Eastsound Water District
G1-00713CWRIS	Certificate	DM	6/5/1970	30	6	Primary	14	JMB Co Inc
G1-21830CWRIS	Certificate	MU	6/21/1974	75	100	Primary	11	Eastsound Water Users
G1-23144CWRIS	Certificate	MU	6/9/1978	20	32	Supplemental	13	Eastsound Water Users
G1-23705GWRIS	Certificate	Irr - DM	11/12/1980	25	5	Primary	11	Vanwingerden HM
G1-23705GWRIS	Certificate	Irr - DM	11/12/1980	25	5	Primary	11	Vanwingerden HM
G1-23903CWRIS	Certificate	DM	8/10/1981	40	43	Primary	11	Eastsound Water Assn

DM= Domestic Multiple; MU = Municipal; DS = Domestic Single; Irr-DS = Irrigation and Domestic Single

Table 3. Groundwater applications in the Eastsound Basin, currently under review.

File #	Person	Doc	Priority Date	Purpose	GPM	Section
G1-25871	Eastsound Water Users Association	NewApp	9/4/1990	MU	45	11
G1-26707	BALLANGER BRUCE & DONNA	NewApp	8/14/1992	DM	40	11
G1-27704	Eastsound Water Users Association /previous Greer	NewApp	2/12/1996	DM	40	12
G1-27705	Eastsound Water Users Association /previous Hart	NewApp	2/12/1996	DM	47	12
G1-27760	DOTY RICHARD, VELMA, RICK	NewApp	9/10/1996	IR,DM	20	

F. Sewer District history.

The Eastsound Water District was incorporated in Washington State during the 1930s, but in the 1950s, the District was unable to get voter approval for issuing bonds to upgrade and expand the system and water service was taken over by Eastsound Water Users Association with wells and water rights leased from the District. In the mid-1970s, Eastsound Village was experiencing serious problems with septic tank failure and raw sewage discharging into East Sound, endangering public health and causing a moratorium on development. As an existing legal entity, the District was pressed to serve Eastsound with sewer service. In 1975, with support from the County Health Officer and Ecology staff, a certificate of necessity for the operation of a wastewater system was issued by the Department of Ecology to the District. The Eastsound community approved the creation of a Utility Local Improvement District and the District became Eastsound Sewer and Water District. By 1980, a wastewater treatment facility was constructed and operating.

In the mid-1980's the District was approached by Washington State Ferries to provide sewer service to Orcas Village, and with support from the Department of Ecology and Department of Transportation, the District took on the administration and operation of the Orcas Village Sewer System.

As a form of government with legal responsibilities and authority, the Eastsound Sewer and Water District has considerable power to address many of the infrastructure needs of Eastsound. At this time the District provides sewer service and holds the oldest water rights in the Eastsound Basin, but in the future could address water supply, maintenance of on-site septic systems, pollution control, and natural and constructed drainage systems (stormwater) (RCW 57.08.005).

G. Stormwater management.

Stormwater management was not addressed in the county's early planning stages, but by 1983, studies were begun to model flows for needed facilities in the Eastsound Village core. The San Juan County Watershed Action Plan (2000) identified East Sound as the county's highest priority watershed, with threats from development in the Eastsound Village causing concern about runoff into Fishing Bay. In 2005, the County completed a Long Range Drainage Plan for Eastsound Village Urban Growth Area, which is a thorough analysis of sub-basins in the area and potential for using both on-site, low-impact strategies and conventional conveyances, where needed.

The Drainage Plan recommends setting targets to maintain the quality, quantity, and rate of runoff as close to predevelopment conditions as possible. In this document, the focus is on impacts to the marine receiving waters, but the standards apply to protection of aquifer recharge conditions as well. The goals of the Drainage Plan are to set up a comprehensive stormwater management program for Eastsound, provide interim guidance for orderly development, and to comply with GMA requirements. It also makes the following recommendation to address organizational difficulties being presented by infrastructure needs for stormwater and also sewer and water service:

- Incorporate and manage all infrastructure needs, including utilities.
- Form a Local Utility District and manage all utilities.
- Form a drainage district.
- Form a sewer/water district.

Section II. Water Supply Report and Recommendation

A. How this plan was developed.

This plan is part of the on-going implementation of the San Juan County Water Resource Management Plan (2004) and was the number one early action recommend inthe East Orcas Water Supply Report and Recommendations (2006). The process involved declaring the Eastsound Aquifer a Critical Water Resource Area (SJCC 8.06) and initiating a public process to develop water system coordination, protection standards for the aquifer, and to study long-term sustainability. The Board of County Commissioners issued this declaration on June 28, 2005. The Eastsound Water Supply Coordinating Committee was formed and held its first meeting in January of 2006. The following rules and laws form the legal background for this planning:

The Watershed Act (RCW 90.82)

- Funds and supports a local planning process so that citizens and local government can determine the management of water within the water resource area.

Critical Water Resource Area (SJC Code 8.06.070)

- Allows the County Board of Health to declare an area a Critical Water Resource Area when the resource is threatened

Abbreviated Coordinated Water System Plan (RCW 70.116)

- Establishes a committee representing water purveyors, the county, and interested parties
- Requires three elements: design standards, service area boundary (existing and future), service policies (review process)

Municipal Water Law (SESSHB 1338)

- Defines municipal water rights and assures "certainty and flexibility" of water rights
- Requires water use efficiency
- Water right place of use is defined as the service area in the approved water system plan
- Requires duty to serve

Early meetings of the Eastsound Water Supply Coordinating Committee included discussions with state and county staff about stormwater issues and low impact development options, the Coordination Act and process that is required to develop an Abbreviated Coordinated Water System Plan, aquifer monitoring and the results of an analysis of Critical Aquifer Recharge Areas. The committee soon began discussions about local issues, including a long history of working on stormwater issues in the community and concerns about contamination risks from on-site septic systems. Committee members voiced frustration with high turnover rates of key county staff, and lack of coordination with Eastsound Water Users Association and Eastsound Sewer and Water District when issuing development permits. To address concerns raised about risks from on-site septic systems a geographic (GIS) analysis was developed showing the density of systems within the current and future service area currently designated by

the District (Figure 3). The District is developing the Eastsound Sewer Plan and these boundaries will be reviewed during this process.

The following problem statement was approved by the committee in August of 2006:

Problem Statement for the Eastsound Water Supply Coordinating Committee, August, 2006

The Eastsound Water Supply Coordinating Committee was formed to develop strategies to assure a safe, continuous supply of drinking water from the aquifer serving the growing community of Eastsound. The problems that are facing the community include:

- There is an inadequate understanding of the true capacity of the Eastsound Aquifer, and concerns that water rights may be oversubscribed.
- Significant growth is being directed to Eastsound.
- There are insufficient measures in place to assure protection of the aquifer and to manage withdrawal.
- Eastsound Water Users Association (EWUA) is responsible for serving the Eastsound area. However, as a private association, EWUA does not have the authority it needs to protect and manage its service area.

Specific problems that have been identified are listed below. As planning progresses some of these issues may be resolved and new ones discovered. This problem statement is intended to guide the committee's work and inform the community.

Coordination:

- The development of individual and small community systems within EWUA's service boundaries raises concerns about possible impairment of EWUA's water rights, oversight and management of the resource, the stability of EWUA's customer base, and meeting the standard of service required in an Urban Growth Area.
- EWUA and the county are required by state law to develop concurrent policies so that building and land use regulations are coordinated with service availability.

Aquifer monitoring:

- Several recent reports by consultants indicate that the aquifer may be limited to the amount of water allocated in EWUA's water rights.
- Long-term data collection from wells in the aquifer is needed to adequately quantify the amount of water available.

Stormwater management:

- All of the Eastsound Aquifer is located in a Critical Aquifer Recharge Area.
- The Eastsound Aquifer is a sole source aquifer (recharge is solely from local rainfall).
- Eastsound is located over the Eastsound Aquifer, which is a source of many existing and future potential sources of contamination to the aquifer, as well as construction of impervious surfaces which limit recharge and increase contaminant loading.
- Potential contamination from on-site sewage treatment and disposal systems is a concern. Nitrate levels in some areas indicate potential problems.

The maps of wells and small water systems within the Association's service area and on-site septic systems within the District's service area identify the struggle these service providers have had meeting growth demand in Eastsound (Figures 1, 2, 3). After months of discussion and debate about the issues, some solutions slowly emerged. Better coordination between county permitting processes and commitment to service are needed. This commitment must come from the service providers and the county, which has designated Eastsound as an urban growth area. Current water system and sewer plans, with concurrence and support from the county for implementation, are essential.

A workshop was held in January, 2007 to present the planning project and collect comments from the community; and, a joint workshop with the Eastsound Planning Review Committee on stormwater issues took place on June 22nd, 2007.

Some of the solutions that have developed during this time include:

- During this planning process Eastsound Water Users Association chose to become the sole water purveyor for their service area for all new development, rather than allowing "temporary, interim" options for water supplies, such as hauled water, exempt wells, and satellite management. This puts the responsibility for service on the Association. However, with support from the County through the permit process, it will effectively eliminate new domestic well construction in the EWUA service area. There remains an issue to the development of new irrigation or industrial wells in EWUA's service area, which may need to be reviewed as better data about the Aquifer's capacity is developed.

- Concern about the capacity of the aquifer is being addressed by a well monitoring network jointly managed by EWUA and Health and Community Services. An examination of nitrate risk potential and initial groundwater modeling will be completed by summer of 2008.

- The Eastsound Sewer District is actively working to connect areas with a high-density of on-site septic systems, and in the fall of 2007 decided to offer long-term payment options to homeowners in areas they determined to be at risk.

B. Aquifer monitoring.

A long-term groundwater monitoring was set up in the Eastsound basin in the spring of 2008. At this time the network consists of 13 wells (See Figure 5. Eastsound Groundwater Monitoring Network). In addition to the long-term monitoring, a nitrate analysis will be completed by June of 2008, and a groundwater model developed to begin evaluating the conditions and capacity of the Eastsound Aquifer. The following protocol was developed and approved by Ecology as part of the grant program funding this project.

Sampling Procedures

Wells will be equipped with dedicated data loggers (Solinst and Pine brands), in level and temperature (LT) or level, temperature, and conductivity (LTC) models. Initially, data loggers will record water level measurements hourly to allow evaluation of tidal influence. The sampling frequency will be evaluated as part of the annual report.

The data loggers are cabled but not vented; therefore barometric data loggers will be required to correct for atmospheric variation. Initially, one barometer will be installed at Eastsound and one at Lopez Village. More may be added later as the network expands.

Hand measurements will be measured using Waterline steel tape. Depth to water measurements will be made from the same surveyed location at the top of the casing. The well head elevations for all wells currently proposed for inclusion in the groundwater monitoring network were surveyed by San Juan County staff as part of a previous project. The survey was completed using the county datum.

Once data loggers are installed, field staff will initially visit each well monthly to evaluate any issues that may arise with the monitoring equipment. Once issues have been resolved, downloads will be completed quarterly. Depending on staff availability and monitoring system requirements, downloads may be increased to semi-annually.

In addition, field staff will collect water quality samples annually, which will be sent to an accredited laboratory and analyzed for the parameters shown in Table 2. Data loggers will be downloaded before any groundwater samples are collected.

TABLE 2. LABORATORY ANALYSIS PARAMETERS

Parameter	Units	Method
Alkalinity	mg/l	SM2320
Calcium	mg/l	200.7, 6010B
Chloride	mg/l	300.0, 9056
Electrical Conductivity	us/cm	SM2510 B
Flouride	mg/l	300.0, 9056
Iron		
Magnesium	mg/l	200.7, 6010B, 200.8, 6020
Manganese		
Nitrate (total)	mg/l	300.0, 9056
Potassium	mg/l	200.7, 6010B
Sodium	mg/l	200.7, 6010B
Sulfate	mg/l	300.0, 9056

C. Aquifer protection.

On site septic systems, Eastsound Sewer and Water District, and risk of nitrate contamination in the Eastsound area

In the Eastsound area, wastewater is treated by a combination of on-site septic systems and a step-sewer system operated by Eastsound Sewer and Water District. The sewer district has been in operation since 1970s and currently has 421 commercial and residential customers. Many property owners in the area have installed on-site septic systems where cost and/or availability of sewer service discouraged connection. Until the Growth Management process designated the urban growth area in 2000, no county regulations or policies were in place to require connection to the sewer system in the unincorporated area of Eastsound or the adjacent high-density (1/4-acre to 1-acre) residential subdivisions. Permits for on-site septic systems have been required since 1972. Prior to that time it was common for the county to create subdivisions without addressing capacity for sewage disposal. Health Department files show 271 septic permits for parcels in the ESWD combined service areas, 116 within the UGA. (See Figure 3.)

Eastsound is located in an area with high recharge soils, which are sands and gravels that allow rapid flow of surface water into the underlying aquifer. This creates conditions where surface contamination, or wastewater from drainfields, can easily infiltrate water underground. This vulnerability to contamination is often identified through nitrate testing, which is an indicator of overall ground-water quality (USEPA, 1996).

Nitrate is a form of nitrogen that is produced by inorganic fertilizers, decaying organic matter, wastewater, animal manure, sewage, and, in some cases, nitrogen-fixing vegetation and geologic formations. Nitrate is mobile in water and can easily move into aquifers. Nitrate is a concern because of health risks associated with elevated levels, which can interfere with the blood's ability to absorb oxygen, causing illness and death in infants. The maximum contaminant level for nitrate in drinking water is 10 mg/l. Because nitrate is stable and easily moves in water, it is considered to be an indication of other potential contaminants.

Properly constructed and maintained on-site septic systems treat wastewater for bacteria and pathogens, but are not required to treat for nitrate or other contaminants that can move downward into aquifers. This contamination is expected to be mitigated

through dilution; however, in areas of high density and high recharge contamination can occur. Other contaminants that pose this risk include heavy metals and pharmaceuticals.

The US Geologic Survey reports that nitrate concentrations at or above 3 mg/l are above background levels in the Puget Sound Basin and indicate impact from human activities (FS 061-97, 1997). Washington State Department of Health considers nitrate levels at 5 mg/l or greater in groundwater an indication of high susceptibility to contamination (DOH SWAP, 2005). Eastsound Water Users Association has been actively monitoring nitrate levels in their production wells since 1999 and results of these tests are shown in graphs 1-3. Nitrate levels vary with seasonal recharge rates and testing several times a year is necessary to get an accurate picture of the problem. These results raise concerns regarding well #7, located on Blanchard Road. There is also a Group B well 1000 feet south of well #7, with nitrate results of 4.5 mg/l, in October 2002, and 3.19 mg/l, in May 2006.

In the fall of 2007, the County Hydrogeologist evaluated nitrate contamination risks in the Eastsound basin and concluded that without better data on the flow of water through the aquifer it is impossible to draw conclusions; however, two factors are cause for concern: 1) the flow appears to be very low, which means that contamination is not easily flushed out of the system, and 2) the area is in a bedrock bowl, which can concentrate contaminants such as nitrate, which does not degrade once it gets below the root zone.

In order to better manage the operation of on-site septic systems, San Juan County's Environmental Health (Health and Community Services) section, working with a citizen advisory committee, developed an On-Site Sewage System Operation and Maintenance (O&M) plan that was adopted by the San Juan County Board of Health on July 23, 2007 and accepted by Washington State Department of Health (DOH) shortly thereafter. The O&M plan was written into county code in late 2007.

The O&M plan will not directly address nitrate contamination, since nitrate treatment is not required by regulation, but it has provided an up-to-date database of septic systems county-wide and will be a valuable tool as nitrate risk studies are developed. The O&M plan is designed to provide effective management of on-site sewage disposal systems countywide. Effective management will help identify and correct failing systems, eliminate public health hazards and protect water quality.[2] The O&M plan requires a routine inspection every three years of conventional gravity systems and annually for alternative systems. The required inspections are on a phased implementation schedule with the first notifications being mailed out in December of 2007 and inspections expected to begin in early 2008.

Other sources of contamination

Commercial and industrial activities and agricultural practices are other sources of contamination. There is little agriculture at this time, although historically it was a major commercial fruit growing area. The Washington State Department of Health lists EWUA's wells number 12 and 8 on Terrill Beach Road as high risk for contamination because of the proximity of the former OPALCO plant, gas stations and other activities, particularly involving leaking underground fuel storage. The Blanchard Road wells are considered low to moderate risk from industrial contamination. EWUAs new wells have not been evaluated at this time.

---

[2] San Juan County Health & Community Services On-site Sewage System Operation & Maintenance Plan

A wellhead protection program is required for EWUAs wells to meet state requirements for source protection. This includes an inventory of potential sources of contamination and time-of-travel estimates should leaks or spills occur. Time-of-travel can be defined using a fixed radius of 600-feet, or by delineating the direction of aquifer flow. EWUA hired AGI consultants in 1997 to do a delineation of their three well fields. Appendix B, shows the delineated zones of influence for EWUA's Blanchard Road and Terrill Beach Road well fields.

Stormwater runoff is another source of contamination in this urbanized area, where roads and parking areas accumulate petroleum products, heavy metals, bacteria, and nutrients. Generally, these contaminants are channeled through stormwater drainage systems; but, flooding can have a direct impact on insufficiently protected wells. Risk to aquifer contamination from stormwater depends on the degree of contamination and access to the aquifer, either through direct recharge or poorly-constructed wells.

Seawater intrusion

Seawater intrusion is the replacement of fresh groundwater with seawater adjacent to the shoreline interface. It is a concern as a contaminant, increasing sodium levels and causing water to become unpalatable. However, the real concern is when intrusion is caused by lowering the groundwater levels. At this time, there is no indication of seawater intrusion in the Eastsound Aquifer, but this critical indicator will be an important threshold for future water resource management.

Regulatory conflicts

The Eastsound Sewer (and Water) District has a current service area that includes the core of Eastsound. Their future original service area, which is east and west, includes several ¼- to 1-acre lot subdivisions. Since 2000, the County has been working with the Eastsound community to designate an Urban Growth Area that corresponds with Eastsound's growth patterns. This controversial process has resulted in 3(?) different boundaries for the UGA. The current UGA boundary coincides with ESWD's 1977 ULID boundary. This creates a serious conflict for ESWD, because RCW 36.70A.110 (Growth Management Act) does not allow sewer service outside of UGAs, except when "necessary to protect basic public health and safety and the environment . . ." County code allows for a variance for sewer extension, but ESWD would prefer that there were no hurdles to supplying service in their future service area.

D. Stormwater.

The Eastsound Water Supply Advisory Coordinating Committee, in conjunction with members of the Eastsound Planning Review Committee and others, developed the following list of current issues for stormwater management in Eastsound and the list of recommendations in the following Section.

Current Understandings

1. There is limited understanding of the areas where aquifer recharge is actually occurring. Substantial areas of Eastsound have thick layers of clay and hardpan under the top layers of pervious soils. These areas may deter aquifer recharge, or redirect flow some distance to recharge areas.

2. A stormwater system that conveys runoff to the Sound without consideration to aquifer recharge has the potential to reduce recharge and have an adverse effect on available groundwater withdrawal rates.

3. Access to the full existing water rights DOE approved for both ESWD and EWUA has been shown by EWUA to be the most affordable source of future capacity when compared to water from Cascade Lake, desalinization, or expansion of existing surface water reservoirs.

4. Where soil conditions are appropriate, Low Impact Development techniques that reduce run off, provide for bio-filtration, and support groundwater recharge have been shown to provide a cost effective alternative to traditional stormwater collection, retention and discharge techniques.

5. Existing Eastsound stormwater infrastructure is only 15% developed; this is an important turning point in planning for the future. Current plans for stormwater projects in Eastsound may not be the most viable solution to the community's needs.

E. Committee recommendations.

The committee recommends the following action to address contamination risks to the Eastsound Aquifer:

1. San Juan County Health and Community services should continue to track nitrate levels from available public water supplies. When nitrate test results exceed 2 mg/l, all systems should test annually, at a minimum. When nitrate test results equal or exceed 5 mg/l, testing should be conducted quarterly.

2. For a period of two years, San Juan County should sponsor voluntary nitrate testing of private wells in the aquifer to increase available data and better understand the presence and risk of nitrate contamination. Eastsound Water Users Association should act as the lead organization to facilitate and process samples from private wells that are volunteered for testing.

3. Eastsound Water Users Association and Eastsound Sewer and Water District should work with County staff to establish an education program to inform their customers about proper use of chemicals, fertilizer, and other hazardous waste in the Eastsound basin, and to partner with the County to promote regular hazardous waste disposal events.

The committee recommends the following actions to address high-density on-site septic system development in the Eastsound basin:

1. Health and Community Services, in cooperation with ESWD should continue to develop accurate, detailed mapping of sewer and on-site septic system impacts, and highlight areas of concern.

2. Eastsound Sewer and Water District should continue their leadership efforts to develop sewer system service into the areas of high-density on-site septic system development (See Figure 3.). Efforts to expedite hook-up to the sewer

system and a reduction in Eastsound's dependence on aging septic systems are a key step to protecting the community's groundwater supply.

3. Eastsound Sewer and Water District and San Juan County should partner to access available grants and low interest funding (Public Works Trust Fund, State Revolving Loan Funds, Rural Community Development) to help support and accelerate plans to expand the sewer system's reach within its service area, and to provide the most cost-effective connection-fee options to households that are required to hook up.

4. Health and Community Services should identify where on-site septic systems that are at risk or are unknown, and include these areas in the "sensitive area" designation in the new Operation and Maintenance Program, with specific recommendations to include inspections during Phase 1 of the Program.

5. Community Development and Planning should change the County Unified Development Code Section 18.60.250, that creates barriers to sewer system expansion, to support ESWD's ability to serve their service area and protect the Eastsound Aquifer.

6. In order to facilitate cooperation with county permitting processes, Eastsound Sewer and Water District should develop maps of service boundaries, distance to sewer lines, and policies regarding timely and reasonable service.

7. Health and Community Services should issue no new on-site septic system permits in the ESWD service area, unless service cannot be provided following timely and reasonable service guidelines.

8. Health and Community Services should require failing on-site septic systems within the ESWD service area to connect to the sewer system rather than issuing permits for repair or replacement following timely and reasonable service guidelines.

The committee makes the following recommendations for future stormwater management in the Eastsound basin:

1. Protection of the quality and quantity of water recharging the Eastsound Aquifer should be considered a highest priority for stormwater management facilities.

2. A stormwater management plan that includes specific sub-basin management goals should be developed for the Eastsound basin, following the framework presented in the Long Range Drainage Plan for Eastsound Village Urban Growth Area, 2005.

3. The County Stormwater Utility should develop a capital facilities plan for stormwater management in the Eastsound basin.

4. County should quickly move to identify and map the specific areas where aquifer recharge is taking place in Eastsound.

5. County should identify or formulate ways in which these recharge areas in Eastsound can be protected from development that would either compromise

their capacity to provide for recharge and/or that could create a contamination risk from stormwater run off

6. The County would benefit from a better understanding of the capacity of its existing Eastsound wetlands to help with treatment and management of stormwater.

7. Eastsound stormwater planning should recognize that on-site detention and treatment of stormwater, while potentially desirable and cost effective, may not be possible on all sites due to thick impervious clay soil layers that are commonly found beneath the areas top soils.

8. Eastsound stormwater planning should be based on best practices to manage the challenges of stormwater in a way that protects the community's groundwater supply, wetlands, and near-shore marine environment in a cost effective way. Pressing but short-term GMA compliance issues, while important, are secondary to the long-term environmental concerns associated with stormwater.

9. The current county method of managing stormwater, one property and one project at a time, has serious limitations, and is not cost effective. A more comprehensive plan is needed that looks towards the planned build out of the community, and the stormwater needs at the time of build out.

10. The county should consider revisions to the stormwater utility resolution that includes a sunset clause on the funding of the utility, and the formation of a stormwater advisory group to provide technical expertise and recommendations to the county council. These were recommendations that were endorsed and proposed by the initial citizen's advisory group that worked to develop the stormwater utility vision.

11. Low Impact Development techniques that reduce runoff provide for bio-filtration, and support groundwater recharge should be encouraged in county code where soil conditions are appropriate.

The committee makes the following recommendations for management responsibilities for the Eastsound Aquifer:

1. Eastsound Water Users Association and Eastsound Sewer and Water District are the only service providers in Eastsound. In order to serve the community and manage growth in cost-effective and orderly manner, and to provide the highest level of protection to the groundwater resource, a joint operating agreement or memorandum of agreement should be developed that identifies the roles and responsibilities of each organization and designates the "lead agency" for working on resource protection and allocation issues.

2. San Juan County should enter into service agreements with both ESWD and EWUA to better delineate the roles each entity will play in protecting the community's groundwater resources, and in providing service to the Eastsound community. Such an agreement should include each party's efforts to reduce the potential for legal actions over access to water rights.

3. All private well owners should begin metering their water use to document their actual water right and cooperate with EWUA in managing the

Eastsound Aquifer. SJC should lead an effort to encourage meter installation in existing wells to accompany the new requirement to meter new wells. If possible, EWUA should take the lead on this project in order to install meters on private wells at an affordable cost.

4. Within five years of adoption of this Plan, or as soon as the data and analysis is available, the Water Resource Management Committee should review the status of the Eastsound Aquifer capacity and water right allocations in the Eastsound basin and make a recommendation to the County and State regarding water right allocations in Eastsound, including strategies for groundwater withdrawal management, water right reservations and, if necessary, closing the basin to further water supply development.

5. The Water Resource Management Committee should review the status of implementation of this Plan annually, make recommendations for further actions, and include an update in its annual report to the County Council and Board of Health.

Section III. Eastsound Abbreviated Coordinated Water System Plan

A. ***Service boundaries for Eastsound Water Users Association, as submitted in the 2008 Water System Plan.***

B. **Guidelines for Timely and Reasonable Service, as adopted by the EWUA Board.**

C. ***Design guidelines for new water supply development in the EWUA Service area, as developed by EWUA.***

Eastsound Water Users Association
Physical Location: 286 Enchanted Forest Road Unit B-102
Mailing and Billing Address: PO Box 115 Eastsound, WA 98245
Phone: (360) 376-2127 Fax: (360) 376-3650

Timely and Reasonable Service Policy

EWUA's Timely and Reasonable Service Policy has been developed to comply with the Public Water System Coordination Act and the Municipal Water Law. The purpose is to "ensure that developer, utilities and local permitting agencies work together to determine the most appropriate way to provide safe and reliable water service for a particular development."

It is the intent of EWUA's Timely and Reasonable Policy to protect the water supply for its existing members, for those persons with whom EWUA shares groundwater resources, and to provide for fair and reasonable access to EWUA service for those who may seek service in the future.

As detailed under previous contractual agreement with EWUA, Buck Mountain Owners Association members maintain the right to develop their own water supplies and will not be compelled by EWUA to purchase membership to EWUA.

Timely Service:

EWUA will provide a determination regarding the availability of Membership in EWUA within 60 days of the filing of a request for a Membership. The following is the process for Applying for a Membership. :

1. Anyone seeking service must submit a complete Membership Packet, which is available at the EWUA office. Within 60 days EWUA will render a decision regarding the availability of Membership and will communicate this decision to the Applicant in writing. Under the EWUA bylaws all new Memberships require the approval of the EWUA board of directors. This 60-day time limit can be extended only in the event of circumstances beyond the reasonable control of EWUA.
2. After the EWUA Board approves the granting of a new Membership by making a Membership Offer, the Applicant and EWUA will complete the required documentation, including recording of property easements, and making the initial Membership payment. Failure to provide the necessary documentation or to make the initial Membership payment within the 60 days of a Membership Offer will result in termination of the Membership Offer. This 60-day period can be extended in the event of circumstances beyond the reasonable control of EWUA or Applicant.

3. EWUA will issue a Membership Certificate within 30 days of receipt of the initial Membership payment. The Membership Certificate can be relied upon by Applicant to document water availability.
4. A request for service hook-up requires an EWUA staff hydraulic analysis of the site, approval of the water system design and hook up and completion of any required main extensions (at the expense of the member/developer). EWUA will complete its hydraulic analysis and document review within 30 days of receipt of complete documentation, such as necessary site plans, surveys, topographical maps, and other system design documents.
5. A service hook up can be scheduled only after the steps in paragraph 4., above, have been completed. EWUA will complete hook-ups within 30 days of request, unless extreme weather or other circumstances beyond the control of EWUA prevent work from being performed.
6. Members have the right to file an appeal regarding EWUA's timely delivery of service with the San Juan County Health Department. (SJC Health will have to develop their procedures for handling such appeals)

Reasonable Service:

EWUA is committed to the good faith effort to expand the capacity of its system to provide service for its existing members and also to meet the service needs within its Service Area as may be necessary to accommodate the build-out contemplated by the Eastsound UGA.

EWUA acknowledges its "duty to service" obligations as provided by the Washington Municipal Water Law.

EWUA is also committed to make reasonable efforts to provide future capacity without jeopardizing or impairing the quality of the Eastsound Aquifer.

In the interest of providing full disclosure and notice to all existing and future members, EWUA offers the following comments:

The substantial growth expected in Eastsound creates major challenges for EWUA due to limits to water supply, and system infrastructure.

<u>The Ability to Provide Service As Impacted by Lack of Water Sources</u>

There is a finite supply of fresh water, suitable for drinking water purposes, on Orcas Island. It is highly likely that at some point in time, EWUA will not be able to provide service to all potential applicants within the EWUA Service Area due to a lack of suitable water resources.

EWUA has made multiple applications to Department of Ecology to secure additional water rights to meet the build-out projections of its service area. Timing of DOE decisions regarding water rights may impact EWUA ability to fulfill its duty to serve.

Specifically, delay or denial of service may be required until Dept of Ecology acts on pending water rights applications or other sources of water are developed by EWUA.

There are also conditions regarding the use of the Eastsound Aquifer that may adversely impact EWUA's ability to serve its existing and future members. Specifically, EWUA may be unable to fully exercise its Senior and Junior water rights in the Eastsound Aquifer due to possible over subscription of water rights and competing uses by others including "exempt" wells and the limitations inherent in the recharge capacity of the Eastsound Aquifer.

See EWUA bylaws and membership conditions for additional policies, procedures and conditions.

Be advised that San Juan County has adopted a Policy Regarding Future Development of New Public Water Systems In Eastsound.

Guidelines for Reasonable Service as it is impacted by infrastructure expenses

EWUA has existing infrastructure to affordable deliver reliable water serve to most of its Service Area. However, in parts of the more remote, and least developed regions of EWUA's Service Area substantial costs may be required by a prospective member in order to extend EWUA's distribution system to the property being developed and for which new water service is being sought. In such cases where the cost of main extension to the far side of property line exceeds the cost of the ERU's required for serving the development, a property owner will not be required to hook up to EWUA, and may purse the development of a private well or alternative water source.

Condition on Development of Alternative Water Service

It is the intent of the San Juan County Health Department to require that future development in the EWUA Service Area should be serviced by an EWUA membership, as long as service is available. To accomplish this goal, EWUA understands that SJC will not support the expansion of existing Class B water systems, or the development of new Class A or B water systems if EWUA has the capacity to provide service.

Should EWUA be unable to provide service to a prospective member in a timely or reasonable fashion, the prospective member may be granted the right by San Juan County to pursue development of an alternative water source and service. In order for an alternative water system to be approved, it must be in compliance with SJC Code for APPROVAL OF NEW GROUNDWATER SOURCES. This code requires that the San

Juan County Hydrogeologist must determine that such development would not impair EWUA's or any other private water system's ability to exercise their senior water rights. SJC Health department may choose to charge the property owner for the hydrogeologist's time associated with such study.

1. EWUA and all other water systems in the EWUA service area shall be notified, in writing, 90 days in advance of plans to develop an alternative water system.

2. Any new Water System being developed within EWUA's service area must be built to standards prescribed by EWUA.

3. Any new Water System being developed with EWUA's service area must also either enter into a agreement with EWUA to manage the system, or receive EWUA approval for their system management plan.

Figure 1. Eastsound Aquifer boundary, well locations, water system boundaries, and critical water resource area. 8/04

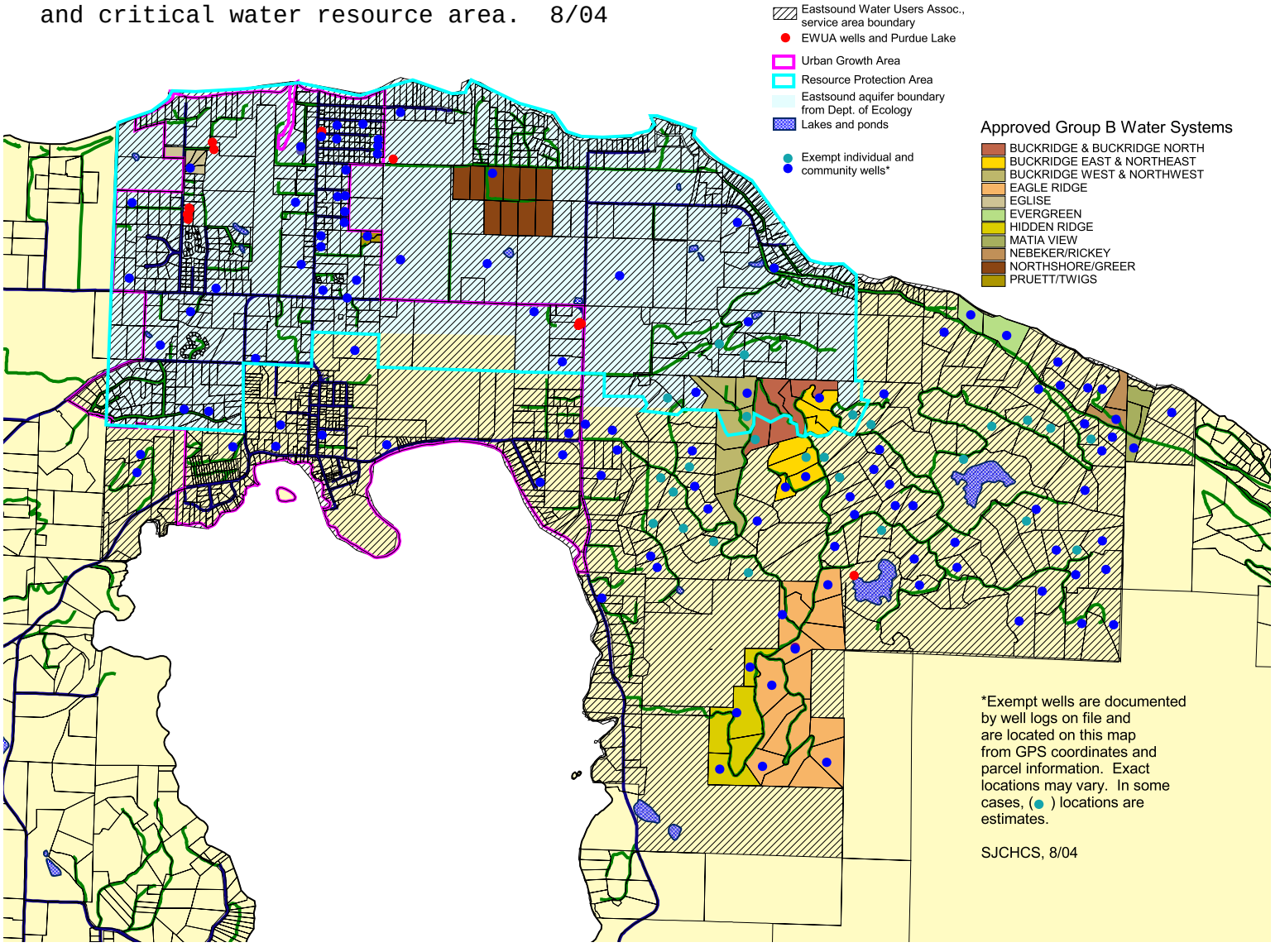


Figure 2.

REVISED EASTSOUND AQUIFER CRITICAL WATER RESOURCE AREA
Adopted by the Eastsound Water Resource Coordinating Committee, 5/11/2006

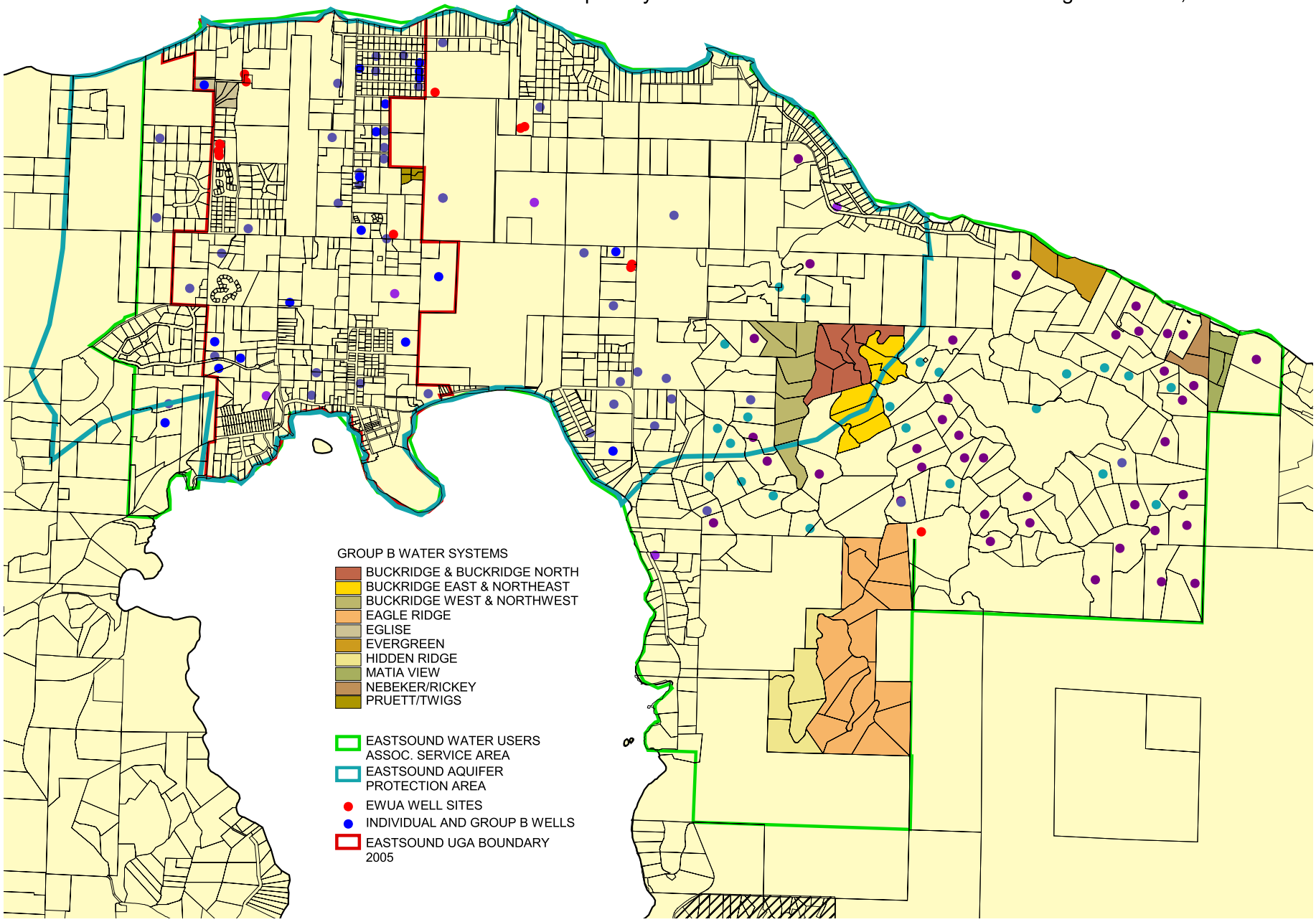


Figure 3.

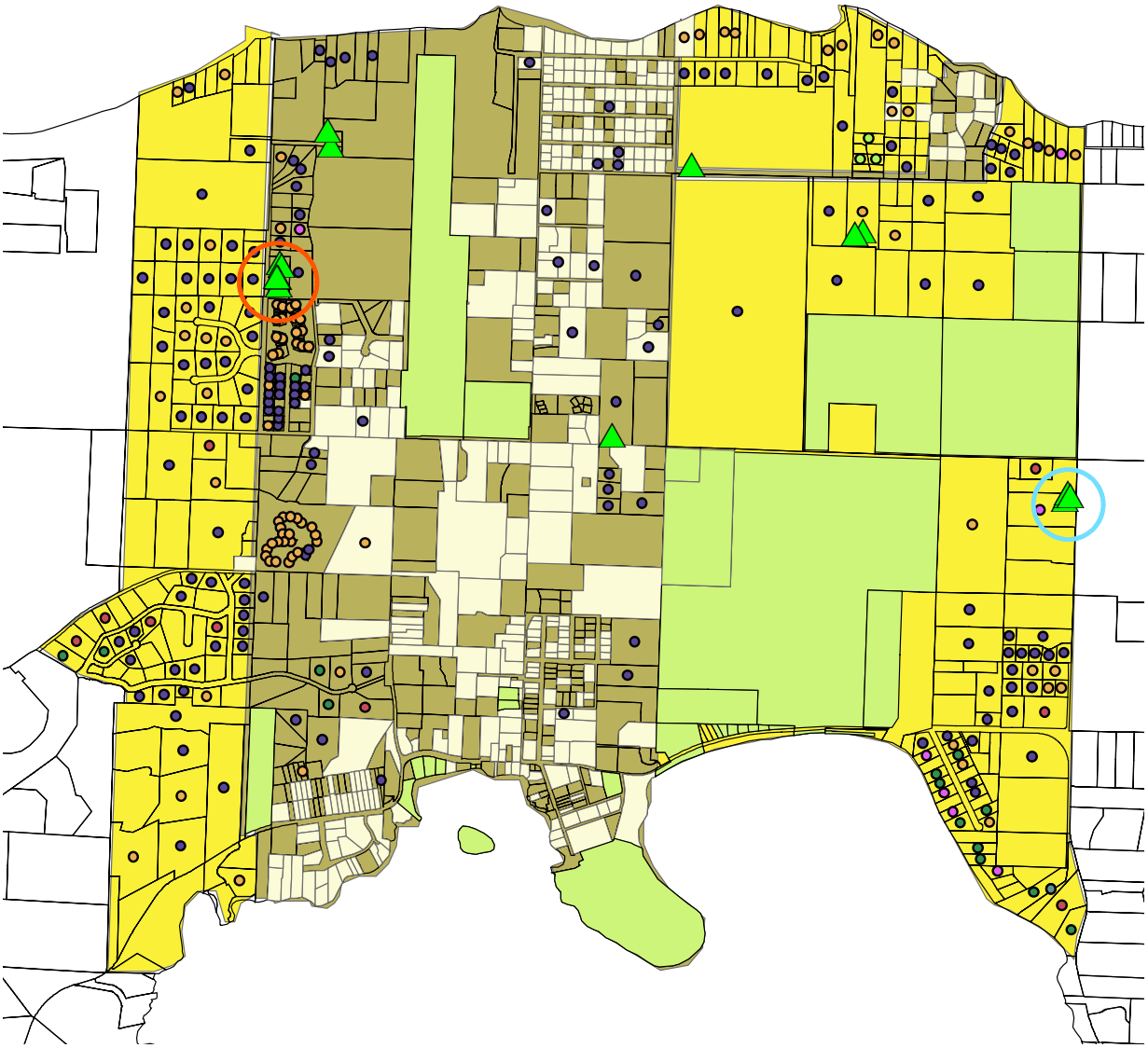
Eastsound Sewer and Water District Boundaries, Parcels Connected and On-Site Septic Systems Installed

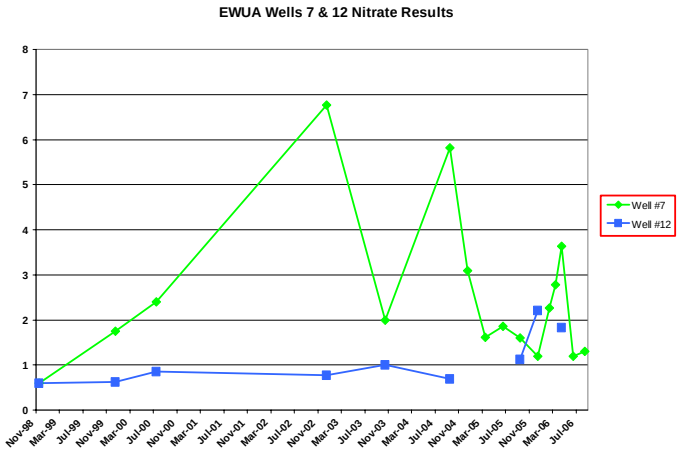
Septic System Types

- Community Drainfield
- Mound
- Other
- Pressure Distribution
- Sand Filter
- Standard

ESWD Boundaries

- ESWD Current Area
- ESWD Future Area
- Parcels connected to ESWD
- Public or Preservation status
- EWUA Wells





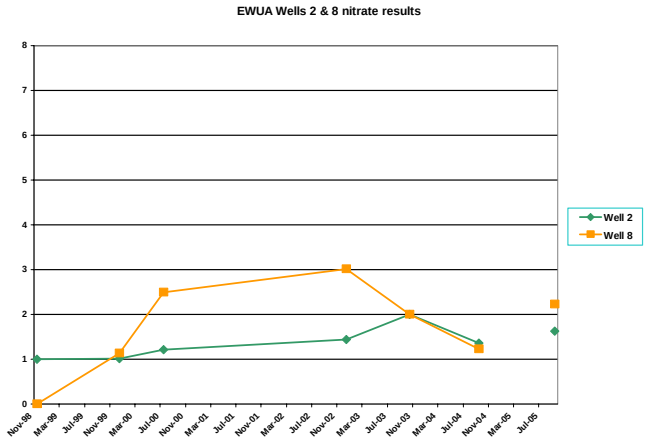
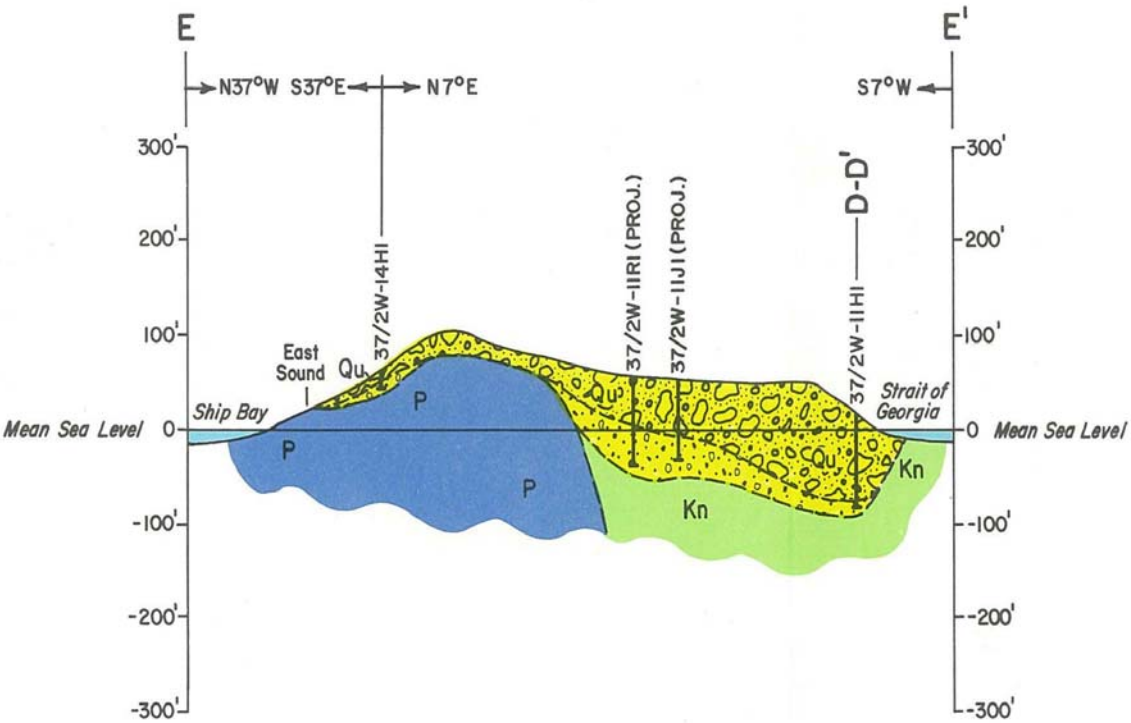
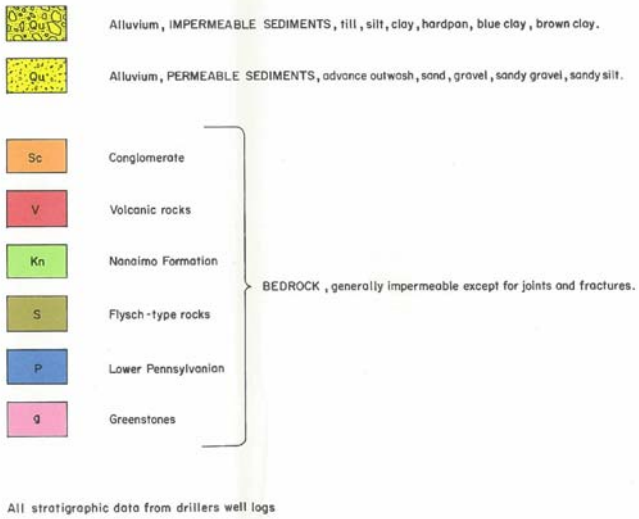


Figure 4.





Cross section of the geology of Eastsound. Line E, E^1 represents a south to north cross section of the Eastsound basin. Note that the section of permeable (water bearing) deposits lies below sea level between rock outcrops along the shoreline. From DOE Water Supply Bulletin 46, 1975, Whetten and Russell.

Figure 5.

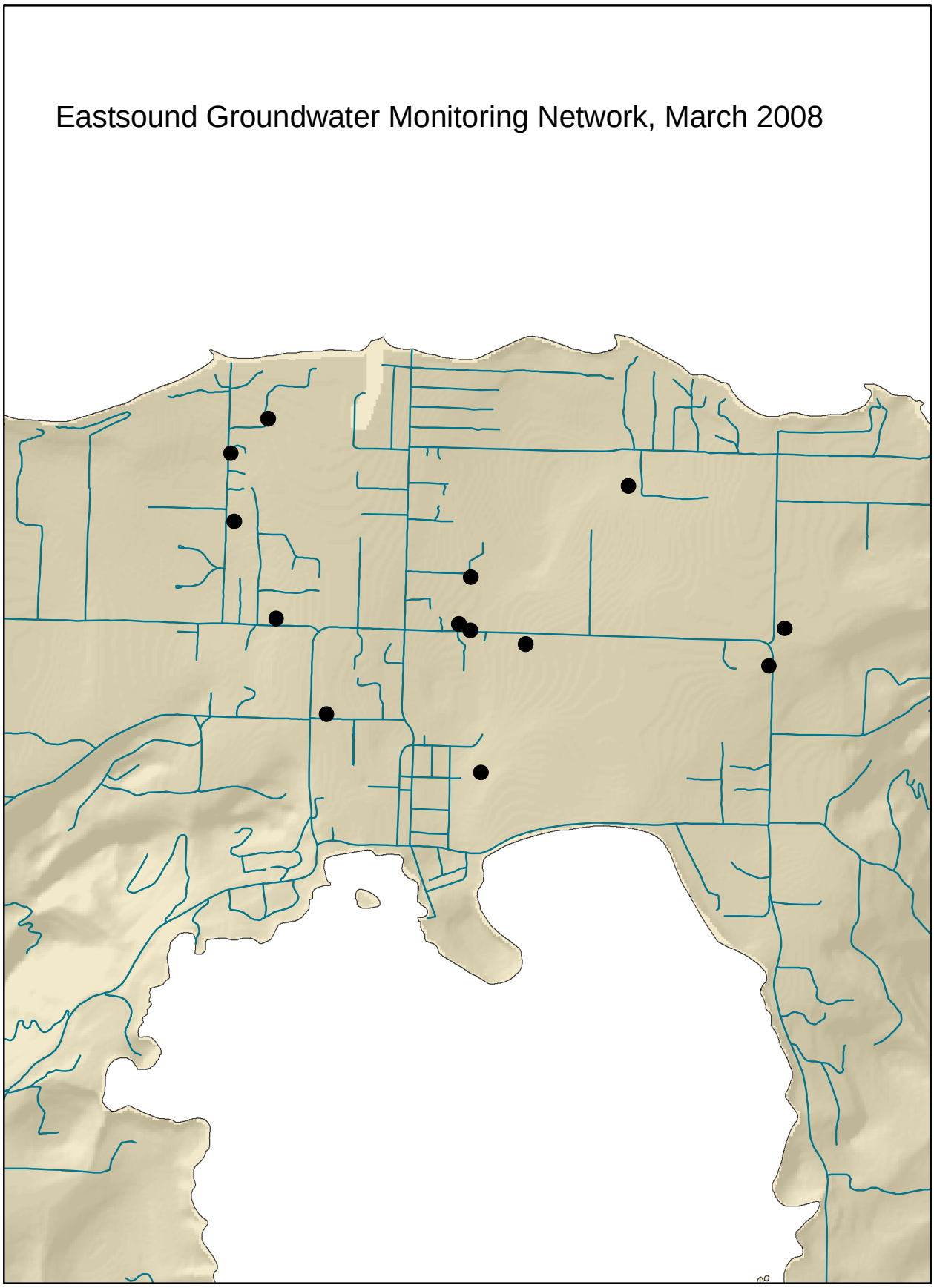
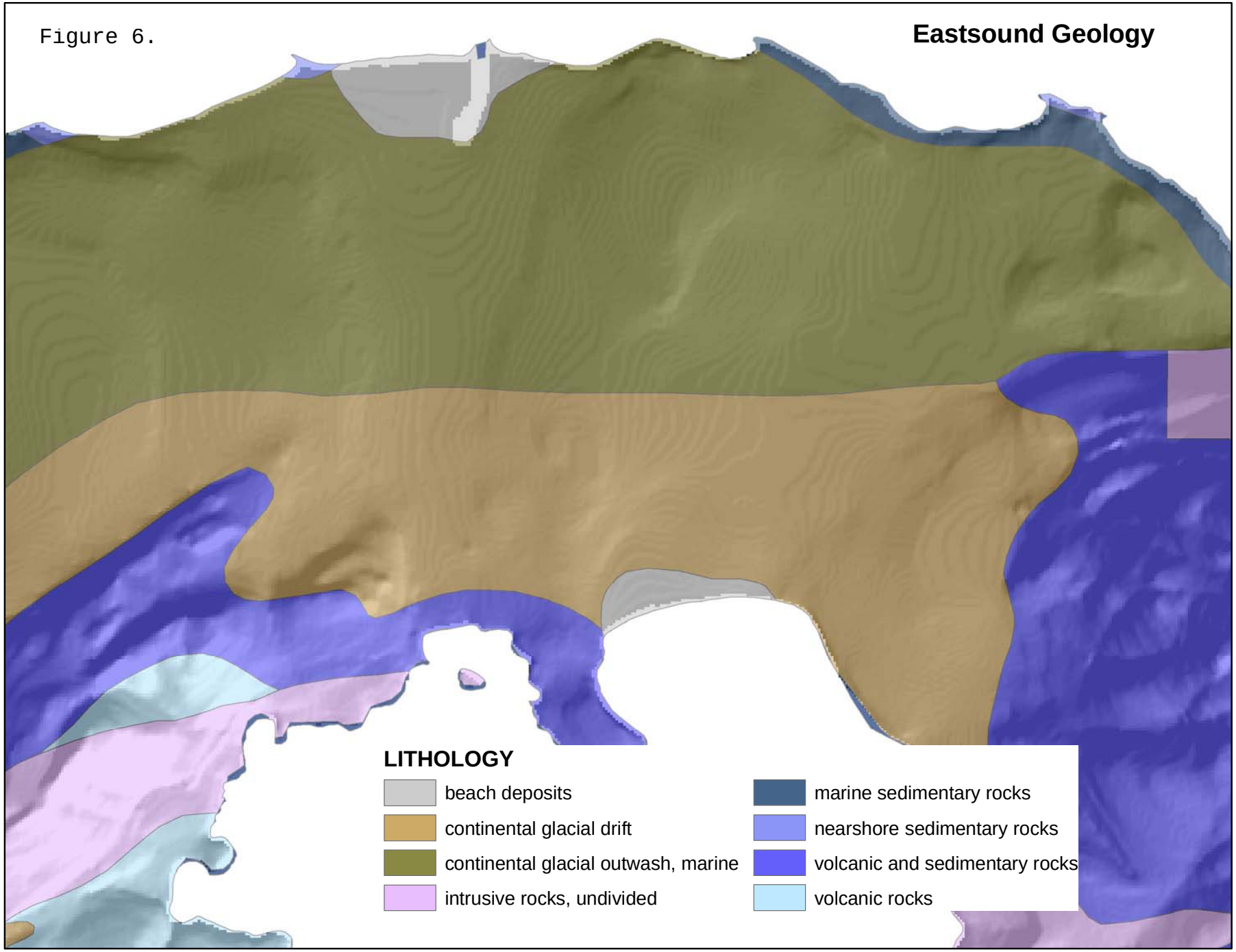


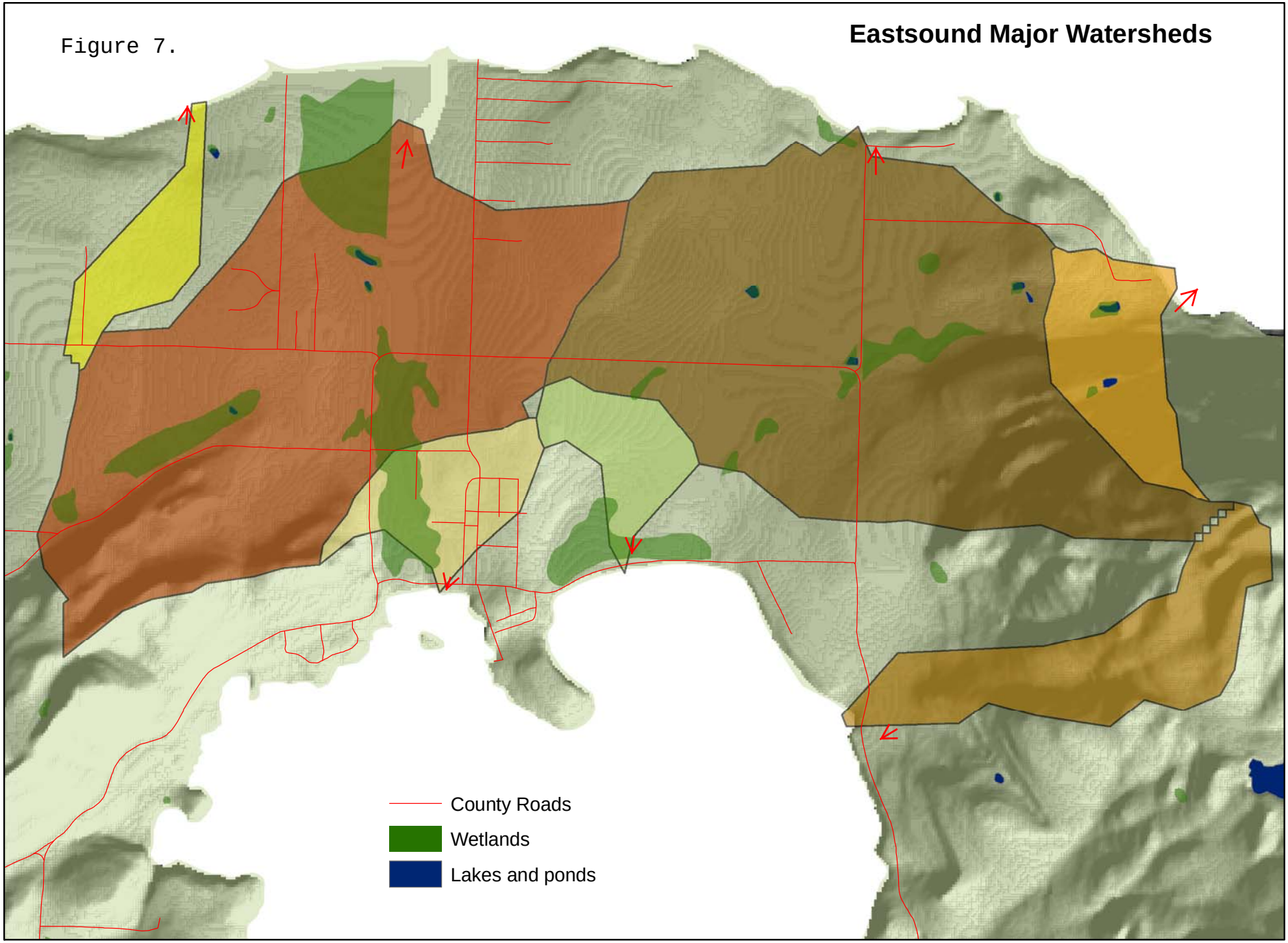
Figure 6.



SJC HCS 8-07: From DNR 1999

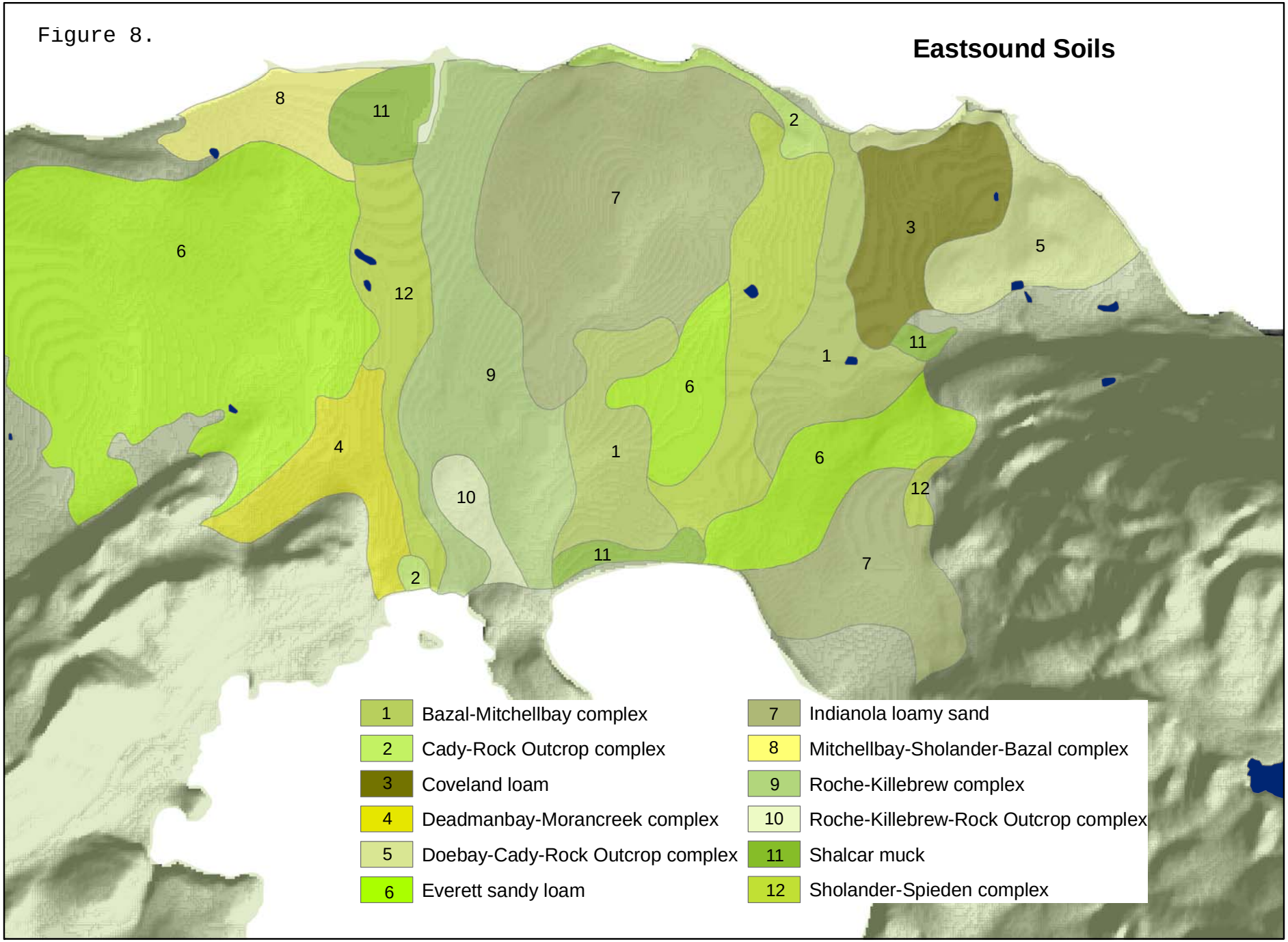
Figure 7.

Eastsound Major Watersheds



SJC HCS 8-07: From SJC Watershed Action Plan 2000

Figure 8.



SJC HCS 8-07: From NRCS 2007

Figure 9.

Eastsound Recharge: USGS 2000 values in inches per average year

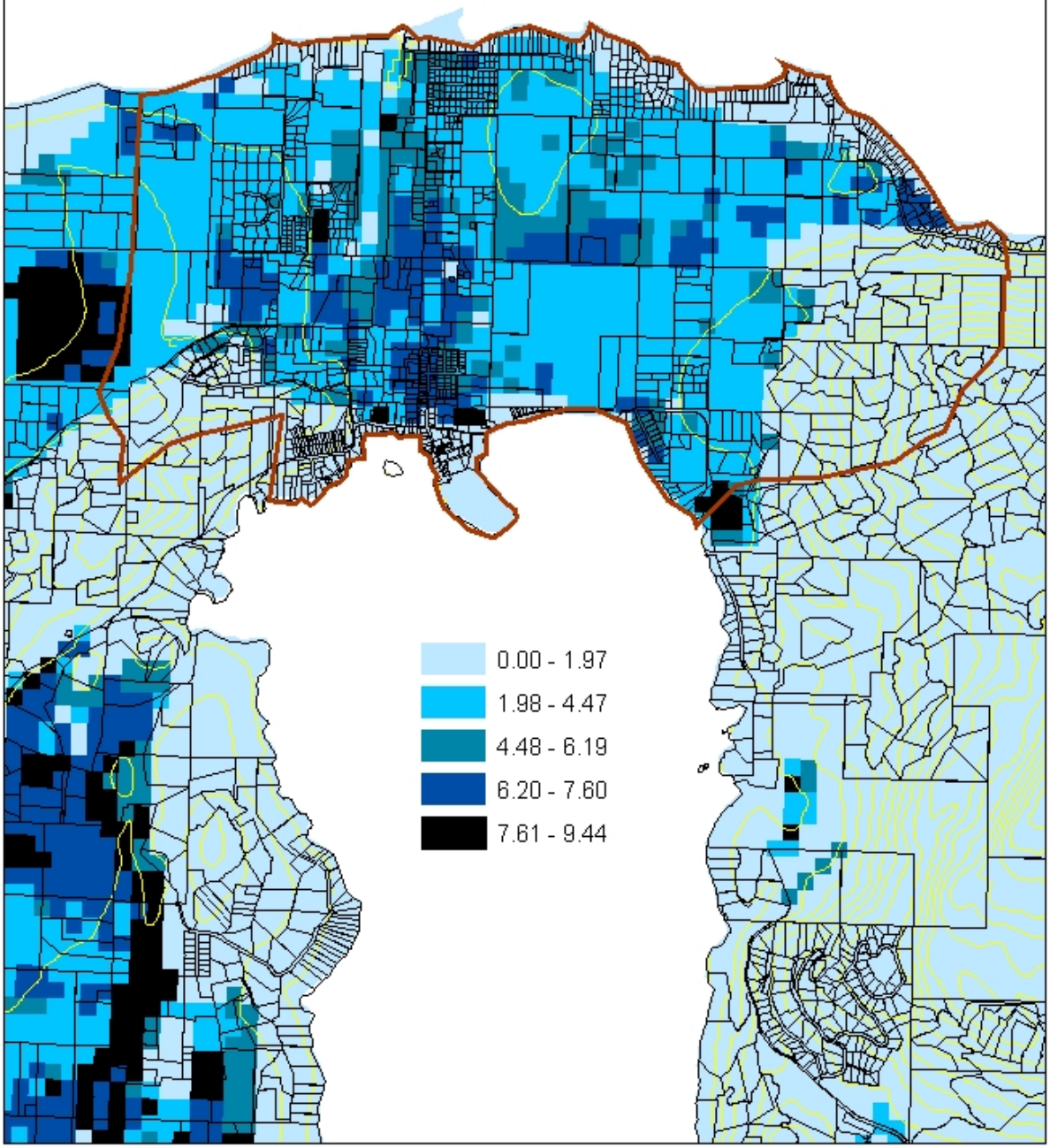


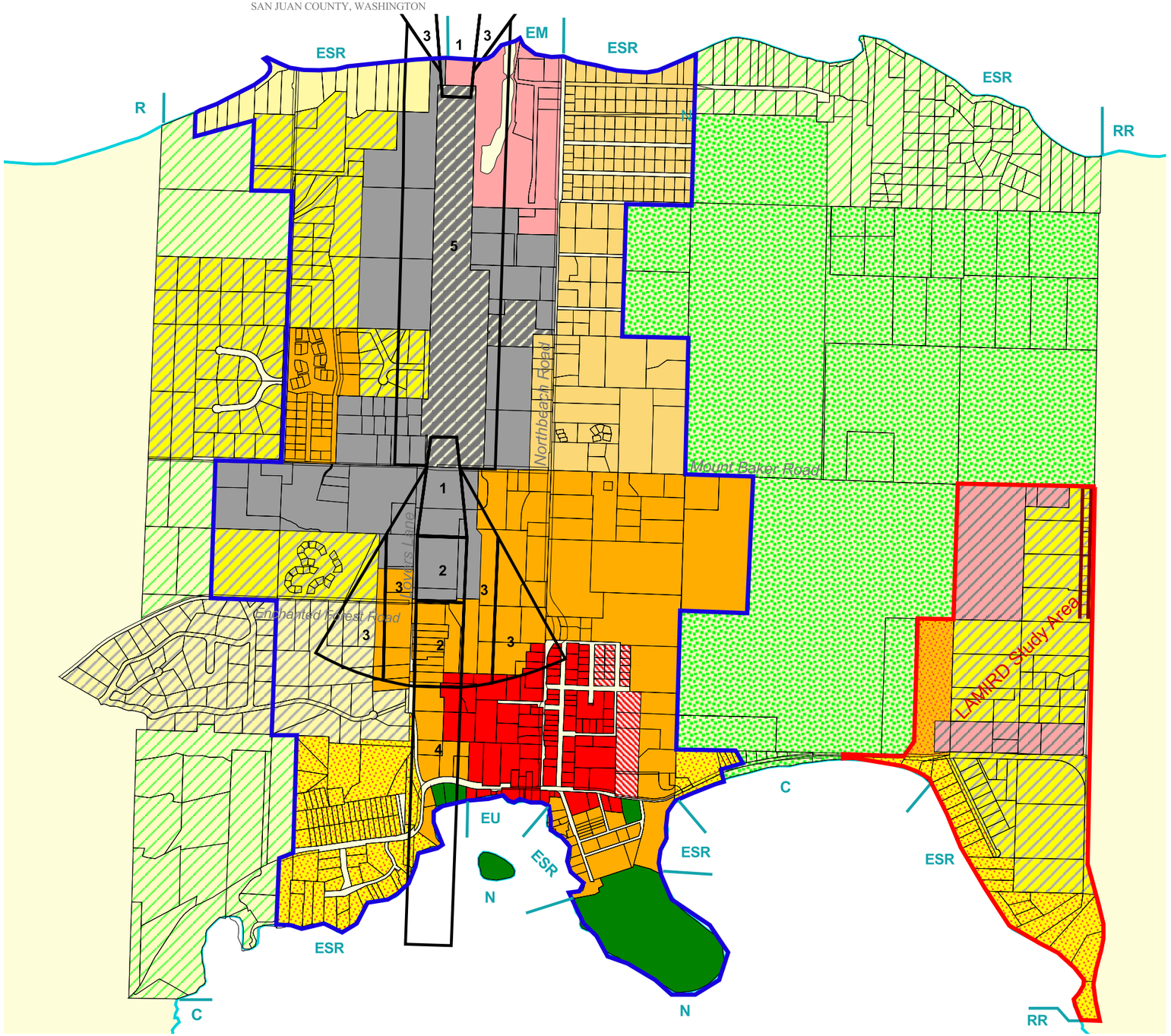
Figure 10.

Attachment A

Eastsound

Subarea Plan Official Map

SAN JUAN COUNTY, WASHINGTON



In the Subarea Plan, "Eastsound" refers to the entire planning area, while "the Village" means the commercial center, or Village Commercial District.

Subarea Plan Designation

- Urban Growth Area Boundary
- Eastsound Residential 1/acre (max. 1 unit/acre)
- Eastsound Residential 1/acre P*
- Eastsound Residential 2/acre
- Eastsound Residential 2/acre P*
- Eastsound Residential 4/acre P*
- Eastsound Residential 4-12/acre (min. 4 - max. 12 units / acre; see SJCC 16.55.240
- Village Residential (min. 4 - max. 12 units / acre)
- Village Commercial (min. 4 - max. 40 units / acre)
- Village Commercial Limited (see SJCC 16.55.210.D.3)
- Marina (max. 6-8 units / acre)
- Service Park (residential use allowed only as accessory to commercial, institutional or industrial use)
- Service and Light Industrial (residential use allowed only as accessory use to commercial, institutional or industrial use)
- Eastsound Airport District (no residential development is allowed)
- Natural (max. 1 unit per parcel)
- 50-foot buffer (see SJCC 16.55.240.E.11)

* In compliance with GMA requirements, site planning and review is required to ensure that the development will not preclude a density of at least 4 units per acre.

- Eastsound Rural (max. 1 unit / 5 acres)
- Eastsound Rural Residential (max. 1 unit / 5 acres)

Shoreline Master Program Designation

EU	Eastsound Urban	C	Eastsound Conservancy
EM	Eastsound Marina	N	Eastsound Natural
ESR	Eastsound Residential		

The Shoreline Management Act and Shoreline Master Program apply to all shorelines within 200 feet landward of the ordinary high water mark, and everything seaward of that line. Below the line of extreme low tide, the Aquatic designation applies. All small islands, rocks and reefs whose designations are not shown on this map are designated Conservancy if in private ownership, or Natural if they are in public ownership.

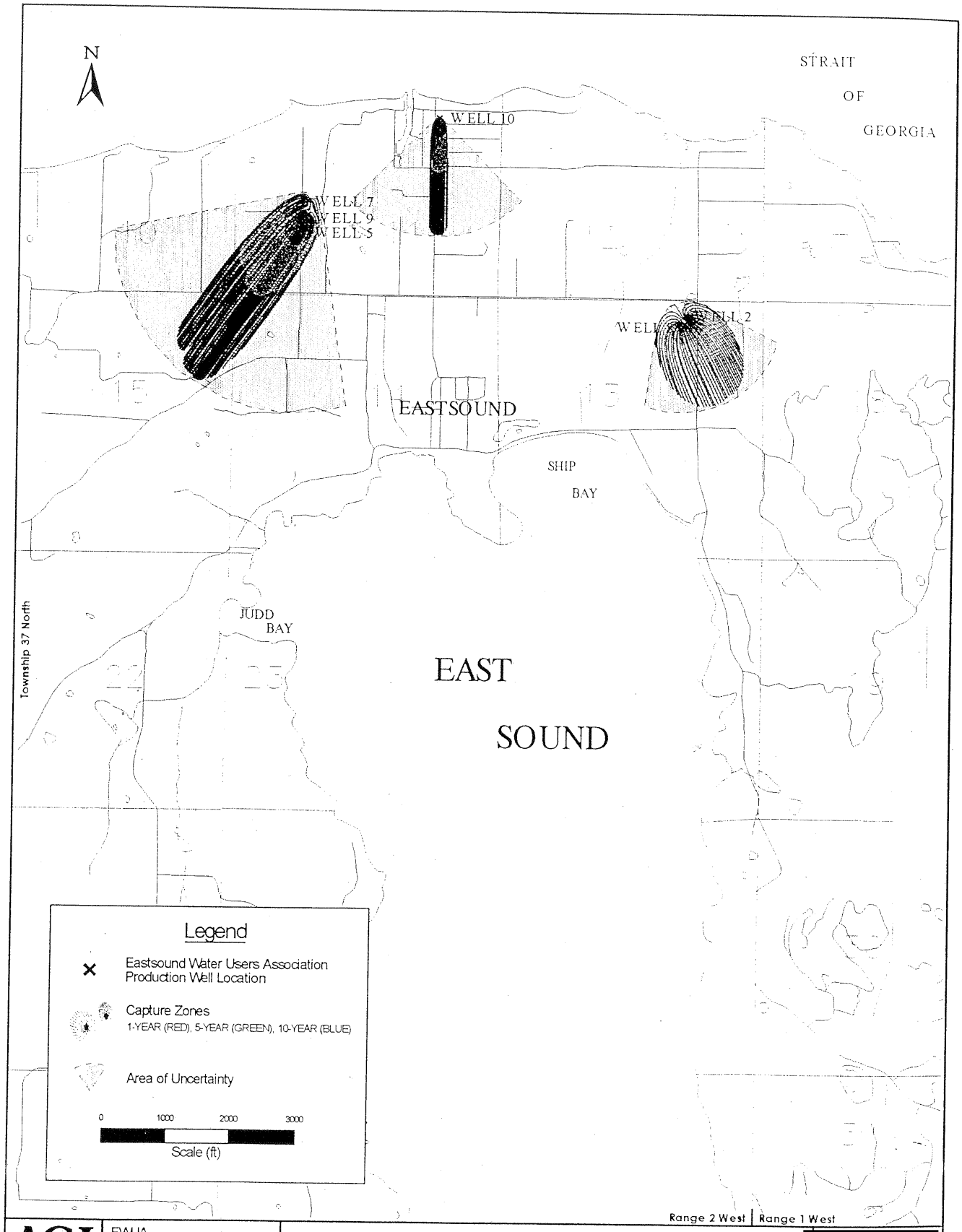
1-5 Aircraft Accident Safety Zones
(see also Federal Aviation Administration (FAA) Airspace Zones)

As adopted

N

500 0 500 1000 Feet

10
1
Acres

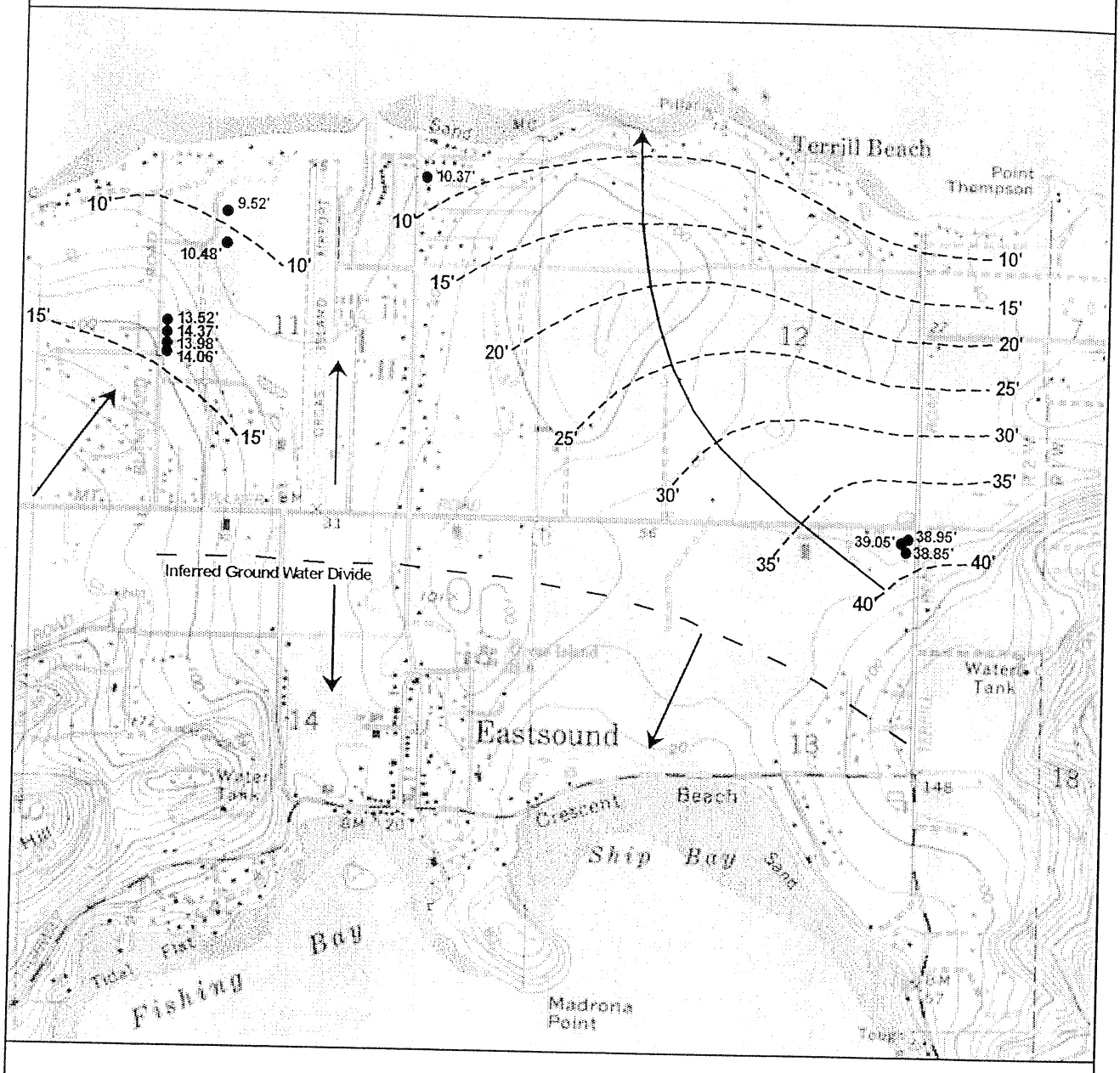


AGI TECHNOLOGIES

EWUA
Wellhead Protection Program
Project #16,106.001

WHPA Delineation Summary
1-, 5-, and 10-year Capture Zones

Figure 11.



14.06'	Water Level Elevation in Feet (April 1997)
10'	Elevation of Water Level Contour
	Water Level Contour (Below Sea Level Aquifers)
	Inferred Ground Water Divide
	Inferred Ground Water Flow Direction

N

0 1000 2000 3000
Scale (ft)

AGI TECHNOLOGIES

EWUA
Wellhead Protection Program
Project #16.106.001

Potentiometric Surface

Figure 12.