



SOLANO COUNTY

Local Agency Management Program

Onsite Wastewater Treatment Systems

ENVIRONMENTAL HEALTH SERVICES DIVISION

04/18/2016



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I. INTRODUCTION AND SCOPE:

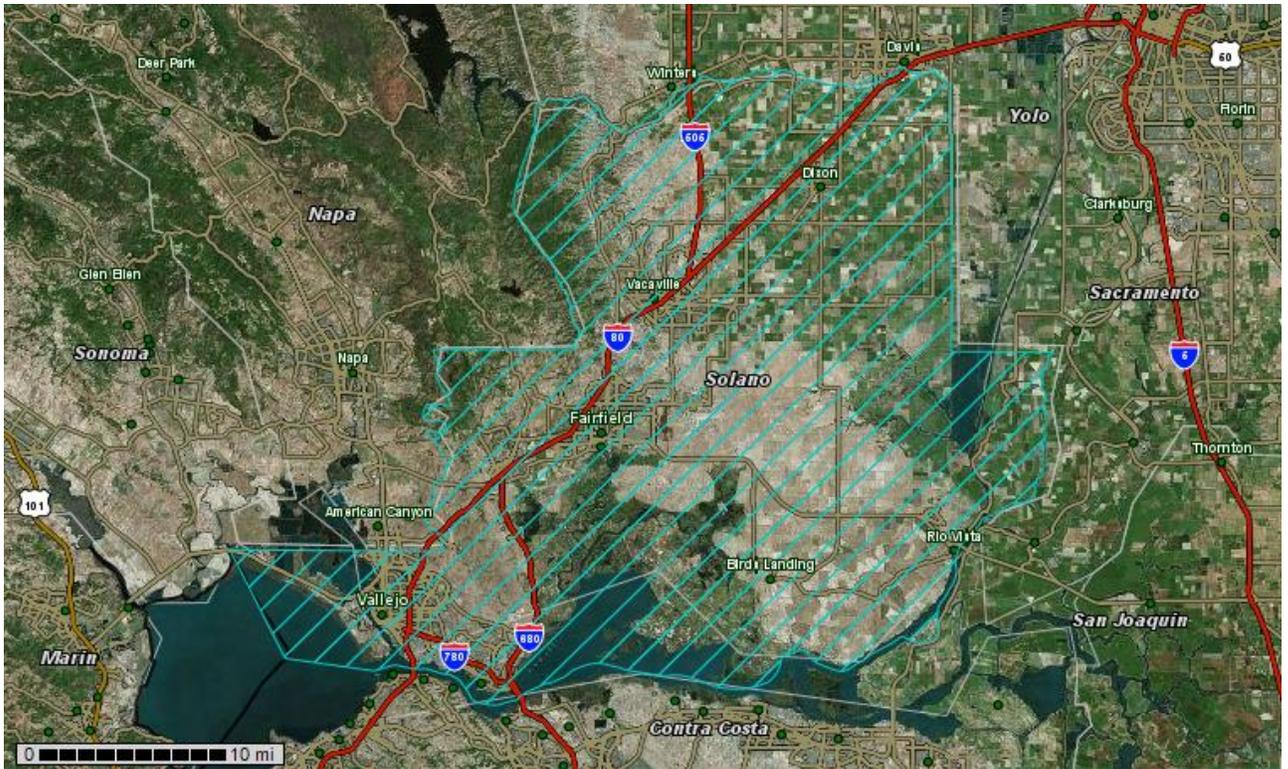
A. Purpose:

The Solano County Local Agency Management Program Plan (LAMP) describes how Solano County's Onsite Wastewater Treatment System (OWTS) program is in compliance with the State Water Resources Control Board *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems*, dated July 2012 (POLICY) and applicable Basin Plan policies adopted by the Central Valley and San Francisco Bay Regional Water Quality Control Boards. The LAMP describes standards and procedures for reviewing and approving OWTS for individual lots and subdivisions in Solano County. The LAMP demonstrates that the Solano County OWTS regulatory program is protective of public health and the environment by ensuring the proper treatment and disposal of liquid waste through the appropriate siting, design, installation, maintenance, and monitoring of OWTS given the specific geologic, hydrologic, and soil characteristics of Solano County.

B. Geographical Setting:

Located approximately 45 miles northeast of San Francisco and 45 miles southwest of Sacramento, Solano County is bordered by Napa, Yolo, Sacramento, and Contra Costa counties. The county covers 909.4 square miles, including 84.2 square miles of water area and 675.4 square miles of rural land area. The County includes seven incorporated cities - Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville and Vallejo - and the unincorporated areas.

Both the California Regional Water Quality Control Board, Central Valley Region and the California Regional Water Quality Control Board, San Francisco Bay Region have jurisdiction within the boundaries of Solano County. The Central Valley Regional Water Quality Board has jurisdiction in Vacaville, Dixon, Rio Vista and the unincorporated areas around these cities. The San Francisco Bay Regional Water Quality Control Board has jurisdiction in Suisun City, Fairfield, Benicia, Vallejo, and unincorporated areas around these cities.



Map showing the Boundaries and Geographical Area of Solano County. The shading indicates LAMP Applicability. See section C 1&2 for applicability within incorporated cities.

C. **Introduction and Applicability:**

Solano County maintains a city-centric development policy, which has resulted in the majority of the population residing within city limits and using city services, including public sewer systems. The California Department of Finance estimates the total population of Solano County is 429,522 in the 2015. The majority of residents live within the incorporated cities estimated at 95% and estimate of 5% or 19,939 resided in the unincorporated areas of the county.

The Solano County Environmental Health Services Division is responsible for regulating OWTS located in all the unincorporated areas of Solano County, and, on a case-by-case basis, within incorporated cities as described in this section.

The Environmental Health Services Division is one division within the Department of Resource Management (DRM). DRM also consists of the Building and Safety Division, Planning Division, Public Works Divisions, and the Parks and Recreation Division. DRM is responsible for regulating land use and building permits within unincorporated Solano County, and the divisions within DRM work closely together to review these projects to provide coordinated comments, conditions and oversight. More information about DRM can be found at www.solanocounty.com/depts/rm/default.asp.

The LAMP will apply through all of unincorporated Solano County. The LAMP will also apply in the incorporated cities of Solano County where the following conditions occur:

1. The applicable incorporated city does not have an approved Local Agency Management Program for their jurisdiction, **and**
2. The applicable permitting authority within an incorporated city provides written deferral to Solano County to include an OWTS project under jurisdiction of the Solano County OWTS program.

The LAMP does not apply to the following:

1. Individual OWTS that are installed or designed predominantly for recreational vehicle wastewater, commercial/ industrial wastewater including food processing, and winery wastewater from commercial development in areas not served by public sewer without specific authorization from the applicable Regional Water Quality Control Board.
2. Community sewage disposal systems including public sewer systems and community on-site sewage disposal systems.

The LAMP will be applicable under certain conditions: (1) with authorization from the applicable Regional Water Quality Control Board, the OWTS project will be under the jurisdiction of Solano County LAMP for application/plan review, issuing authorization to construct, and construction inspections; (2) the wastewater is low strength black water from lavatories and toilets at commercial facilities; (3) high strength liquid waste from commercial food facilities with a BOD of <900 mg/l/day that are connected to a grease separator before discharging to a disposal area; and (4) gray water that is discharged in compliance with state law or regulation.

D. Supporting Regulatory Documents:

The LAMP relies upon the following Solano County Codes:

www.codepublishing.com/ca/solanocounty/

1. Solano County Code, Chapter 6.4, Sewage Standards, that addresses the siting, design, construction, operation and maintenance of OWTS.
2. Solano County Code, Chapter 25, Chemical Toilets, Domestic Septage Land Application, and Biosolids Land Application that addresses standards for businesses engaged in liquid waste pumping from OWTS.
3. Solano County Code, Chapter 26, Subdivisions, that addresses standards for subdivisions including size of parcels with OWTS.

E. General Overview and Types of OWTS, Scope and Coverage:

Solano County Code, Chapter 6.4 provides requirements for OWTS proposed as part of subdivision of land, a building permit, a land use permit, or replacement, upgrade, and/or repair of an existing system discharging 2,500 gallons per day (gpd) or less. Solano County Code authorizes Environmental Health Services Division (EHSD) to oversee domestic type wastes in excess of 2500 gpd and not to exceed 10,000 gpd with approval of the LAMP by the California Regional Water Quality Control Board and as per EHSD Policy # LW-93-02. Therefore, Solano County Code currently meets the standards within the POLICY.

Solano County Code, Chapter 6.4 provides requirements for the following types of OWTS:

1. Standard Systems: OWTS that use gravity to disperse effluent throughout the disposal field, and in which no pretreatment device is utilized are standard systems. This includes OWTS that use a pump to transport effluent received from the septic tank to an uphill disposal field where the effluent is then dispersed by gravity into an absorption field.



Example of the installation of a standard system

2. Alternative Systems: OWTS that use an advanced method of effluent treatment and/or distribution, and are designed by a Professional Engineer (civil), Certified Engineering Geologist or Registered Environmental Health Specialist licensed/registered in the State of California. An alternative system is designed to mitigate soil and/or groundwater

conditions that render a lot inappropriate for a standard septic system, or to mitigate severely inadequate replacement area for repair or replacement of an existing, improperly functioning on-site sewage disposal system.



Photo shows the squirt test for an alternative OWTS using a sand filter system as a pretreatment prior to the disposal field

3. Experimental System: OWTS that: (a) are alternative systems installed into areas where surface and/or subsurface conditions do not comply with the standard in Solano County Code, Chapter 6.4 and/or (b) are not allowed for individual on-site sewage disposal for subdivision of land or new construction without being approved and under permit from the Regional Water Quality Control Board having jurisdiction; and/or (c) use construction materials other than those noted for standard systems and non-experimental alternative systems in Solano County Code, Chapter 6.4



Example of the installation of a drip disposal field

4. Prohibitions:

Solano County Code, Chapter 6.4 does not allow OWTS to include:

- Evapo-transportation systems unless designed by a Professional Engineer, Certified Engineering Geologist, or Registered Environmental Health Specialist, and meets Regional Water Quality Control Board and Drinking Water Division of State Water Resources Control Board standards for reuse.
- Leach (Seepage) pits with a width greater than 3 feet and a depth greater than 5 feet,
- Waste Disposal wells
- Cesspools,
- Composting toilets,
- Incineration systems,
- Wetlands.

Areas to be excluded from OWTS installation:

- Areas known to be subject to erosion, slope instability, or within identified landslide-prone areas.
- Low swampy areas, areas with permanent or intermittent springs, areas with a high groundwater (permanent, fluctuating, seasonal, or perched) within two feet of the ground surface, areas which are subject to standing water, or areas which are subject to flooding by storms having a recurrence interval of less than ten (10) years.
- Portion of the lot in which there is ledge rock, hard pan, soils with a percolation test results greater than 120 minutes per inch (mpi), or other impervious formations within two (2) feet of ground surface will not be acceptable as an area for installation, expansion, or replacement of an individual sewage disposal system.
- Installations into areas with fractured rock, or with 50% or more rock, within two feet of ground surface.
- Installation into areas with percolation test results less than 1 mpi,
- Areas of excessive slopes steeper than 50% grade (2:1 slope horizontal to vertical).

5. Appeals/Variances

- The Environmental Health Manager or his designee may allow variances to setbacks and other provisions including allowance for the use of fiberglass and poly tanks in limited access areas;
- The Environmental Health Manager or his designee may allow variances for structures that have been destroyed due to fire and natural disaster and which cannot be reconstructed in compliance with OWTS standards
- Any person may appeal decisions of the Environmental Health Services Division to the Environmental Health Manager. The appeal must be in writing and submitted with 10 days of the decision, stating reasons and including supporting documentation.
- Any decision of the Environmental Health Manager may be appealed to the Director of the Department, and ultimately the Board of Supervisors who will set the date and time of the hearing. All appeals are to be submitted in writing to the Environmental Health Services Division within 10 days of the decision. When the appeals are made to the Board of Supervisors, the Clerk of the Board sets the time and place of hearing, and provides notice to the appellant and the department.

II. SITING AND DESIGN:

A. Site Evaluation:

An OWTS site evaluation must be performed:

1. By an OWTS consultant who is a licensed Professional Engineer (Civil), Professional Geologist, Certified Engineering Geologist, Registered Environmental Health Specialist, or a Certified Professional Soil Scientist.
2. Under inspection by the Environmental Health Services Division. This includes prior notification to the Environmental Health Services Division to ensure that staff is available to witness the site evaluation.
3. Prior to the issuance of any permits to construct, expand, modify, or replace an OWTS, or approval of a lot line adjustment or tentative subdivision map. The exception to this is when Environmental Health Service Division reviews existing soil data and approves modification of an existing system that is functioning properly, including expanding the disposal area or the replacement of a septic tank.

All aspects of an OWTS site evaluation are performed by the OWTS consultant and will include an on-site review of surface features and conditions which shall include one or more soil evaluations within the boundaries of the area of the on-site sewage disposal system proposed for construction, expansion, alteration, replacement, or repair. Soil characteristics, including texture, color, structure, plasticity, and porosity of each horizon, shall be evaluated to determine permeability.

The OWTS consultant will identify limiting conditions including, but not limited to; bed rock, hard pan, ground water, saturated soils, impermeable soil layers, and observed free water.

The OWTS consultant will prepare a site evaluation report that includes all data relative to the proper placement, design and operation of an on-site sewage disposal system, including, but not limited to, percolation tests, soil profiles, hydrometer tests, depth to groundwater, slope measurements and surface water flow for each proposed sewage disposal system or lot to demonstrate compliance with these standards. All data, whether used in the final design of the disposal field or rejected, shall be included in the report.

The standards require the report be signed by the consultant responsible for the site evaluation and include their license/registration number. The OWTS consultant will submit the site evaluation to Environmental Health Services Division for review. After reviewing the site evaluation report, the Environmental Health Services Division may require additional information including a follow up technical report prepared by a Certified Soil Scientist, Certified Engineering Geologist, Professional Geologist, or Registered Professional Engineer to address soil limitations and/or slope instability.

B. Hydro Geologic Evaluation:

To verify adequate separation of OWTS from groundwater, the OWTS consultant will estimate the highest anticipated level of groundwater by identifying the highest extent of soil mottling to natural grade observed in a soil profile, or by direct observation of stabilized groundwater levels.

If the consultant uses, or Environmental Health Services Division requires direct observation of groundwater levels, the consultant will use performance wells or piezometers to collect measurements every 2 weeks during the wet weather period between October 15th and March 15th. The wet weather period may be extended earlier or later depending on weather patterns and with approval of the Environmental Health Services Division. The consultant may propose alternate wet weather groundwater plans provided the groundwater monitoring plan will capture seasonal high groundwater elevation in the proposed primary and reserve disposal fields.

The OWTS standards require that at least one direct observation well is constructed in each initial and replacement areas. The OWTS consultant will accurately depict the location of the well(s) on all site plans submitted to the Environmental Health Services Division prior to the approval of the OWTS.

Where a conflict exists between the depth of groundwater observed through direct observation during wet weather conditions and the depth at which soil mottles are observed, the direct observation of actual groundwater levels will govern.

In the case of a proposed subdivision, if the Environmental Health Services Division determines that there is a potential for significant degradation or impact to the elevation of groundwater or the surface water supplies, the Solano County OWTS standards require the applicant to submit a hydrogeological evaluation of the projected cumulative impacts of the project to the entire drainage basin. The applicant must provide a groundwater evaluation identifying the existing and potential groundwater aquifers, and focus on aquifers with a greater potential for water quality impacts from the proposed project. The applicant must provide information on: drainage basin area, saturated thickness, transmissivity, flow contours, existing water quality, seasonal depth to water table, ultimate density of soil absorption systems based on current land use planning for the groundwater basin being evaluated, and any other data as deemed necessary by the Environmental Health Services Division.

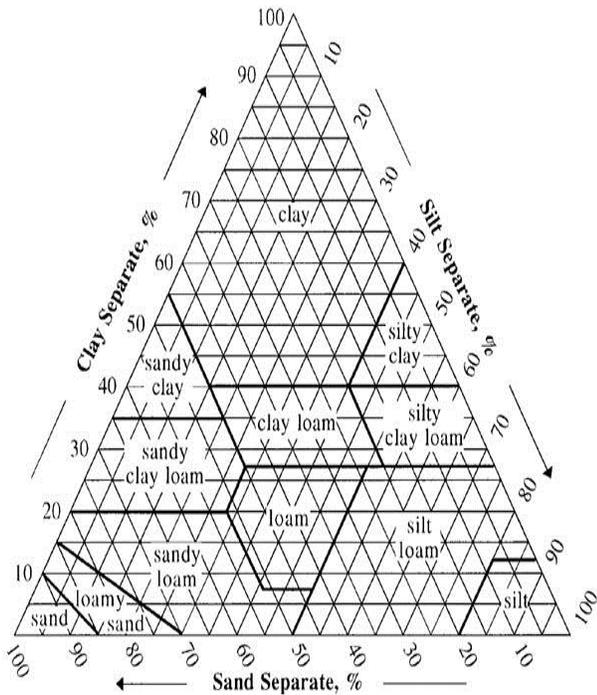


Illustration of USDS Soil Triangle

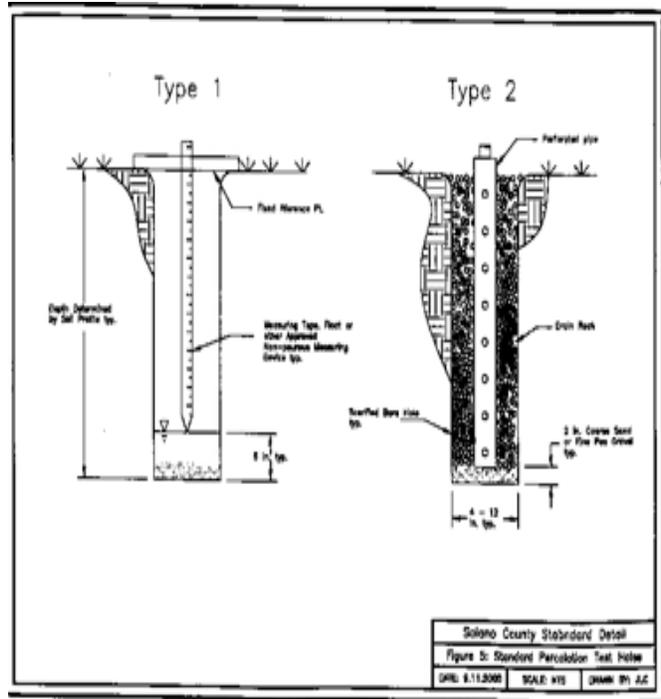


Illustration of Percolation Test Holes

Land Use Projects with Onsite Wastewater Treatment Systems:

Solano County Code Chapter 6.4 specifies that the Environmental Health Services Division will review land use projects, subdivisions including tentative maps, and proposed lot line adjustments, prior to approval.

The applicant and/or owner of the property shall be responsible for supplying any and all information, testing, and consent to inspect, as required by the Environmental Health Services Division, to verify that the subdivisions or lot line adjustments comply with applicable codes, rules and regulations. The Environmental Health Services Division reports its conclusions together with any conditions necessary to ensure compliance with all applicable codes, rules and regulations to the Planning Division or other responsible agency.

D. Domestic Wells and Parcel Size

Solano County standards address the concern of high usage of domestic wells in areas that use OWTS by regulating parcel size, and are more protective of public health and the environment by requiring less density for a subdivision than the average densities per subdivision specified in the POLICY.

Solano County Code, Chapter 26 requires that where sewage disposal is not by means of a sewer operated by public sewer agency, it shall be by means of an OWTS located entirely on the lot generating the sewage.

Each proposed lot within a subdivision that is not served by a public sewer system will meet the following minimum site and design criteria:

1. Lots served by both an individual water supply and an OWTS shall not be less than 5 acres.
2. Lots, which are served by OWTS and community water supplies operated by a public agency or utility district shall not be less than 2.5 acres. Where a planned unit development process (parcel overlay) is proposed along with community water supply, then each lot may be not less than 1 acre provided the overall density of the project will not be less than one dwelling unit per 2.5 acres.
3. Parcels that meet the above, but have limiting conditions on site must be of sufficient size in order to meet the required setbacks to accommodate the conventional site development.

A detailed discussion of Solano County OWTS standards for subdivision lot size can be found in the Solano County Code section 6.4-31 and Solano County Code section 26-82.

E. General Design Standards:

1. All new, expanded, modified, repaired, or replacement OWTS will be in a location for which the applicant has obtained site evaluation data for the use in the design and installation of the system.
2. A replacement area equivalent to 100% of the initial system area conforming to the standards is required for every lot served by an OWTS.
3. Soil Texture Zones are those described in the USDA Soil Textural Triangle.
4. The percentage of coarse fragments throughout the effective soil depth will not exceed fifty (50%) percent by volume as retained on a #10 sieve.
5. Percolation Rates in the disposal field area and the effective soil depth within the disposal area shall not be less than one minute per inch or more than 60 minutes per inch.

There is an exception for alternative and experimental OWTS: the percolation test results throughout the disposal field area and required effective soil depth will not be less than one minute per inch or more than 120 minutes per inch.

6. Slope. Currently the OWTS standards require native slopes not be more that 25%. Other slope limitations may apply depending on the type of on-site sewage disposal system proposed. Lots may not be graded or altered in any manner to accommodate the slope requirement and leach lines will not be installed in areas of excessively concave slopes. Solano County Code meets and exceeds the provisions within the POLICY.
7. Areas of filled soil or unstable soil formations will not be used for a disposal field site. The on-site sewage disposal system shall be located and installed in natural, undisturbed and unobstructed ground or earth.

There is an exception for fill placed for ten or more years that is stable, with a soil evaluation indicating characteristics acceptable for installation of an OWTS such as approved structure, texture, consistency, pore space, percolation rate.

8. No grading shall occur in the area of the proposed or installed on-site sewage disposal system or replacement area.
9. An individual on-site sewage disposal system shall only be installed on the same lot as the structure to which it is connected.
10. Disposal fields and replacement areas shall be maintained so as to facilitate aerobic treatment and the evapotranspiration of wastewater.
11. Disposal fields will not be reduced in lineal feet for the use of chamber systems.
12. OWTS will be located so as to be accessible for maintenance or repair. Septic tanks, dosing tanks, and interceptors will be located so as to readily allow pumping and maintenance. Pressure distribution lines shall be located to accommodate monitoring and flushing of the lines.
13. Septic Tanks shall be constructed of reinforced concrete. Fiberglass or polyethylene tanks may be installed where concrete tanks are not feasible because of access limitations, slopes, or safety concerns, only with the approval of Environmental Health Services Division.

Solano County OWTS standards require that non typical standard leach field design, alternative, experimental, and pump systems be designed by an OWTS Designer who is a Professional Engineer, Certified Engineering Geologist, or Registered Environmental Health Specialist. The OWTS Designer will use the site evaluation data discussed previously for the design of the disposal system to ensure maximum equal distribution of wastewater through-out the disposal area. Solano County Code, Chapter 6.4 discusses the use of these types of components and systems:

1. Standard leach field systems
2. Non-typical standard leach fields
3. Pressure Distribution systems
4. At Grade systems
5. Mound systems
6. Sand Filtration system
7. Aerobic Treatment units (ATU)
8. Nutrient treatment devices (typically nitrates)
9. Grease interceptors

10. Dosing tanks

11. Experimental systems including constructed wetlands which are used when other options for correction of sewage systems failure on existing lots have been exhausted

Solano County OWTS standards describe that experimental systems will not be used as a method for individual on-site sewage disposal for proposed lots except upon approval by the Environmental Health Services Division and under permit by the Regional Water Quality Control Board.

Experimental systems may be approved as the method of individual on-site sewage disposal under certain exceptional circumstances only:

1. Their use will not create a potential health hazard or contaminate the environment; and
2. 200% replacement area exists on the lot to install a conventional or alternative system in conformance to these standards; or
3. They are used as a modification/repair of an existing, failing individual on-site sewage disposal systems; or
4. They are used as a pretreatment device for a standard or alternative system where no pretreatment device is necessary, or as an additional pretreatment device in conjunction with a non-experimental system already utilizing a non-experimental pretreatment device

Solano County OWTS standards also address the use of sealed vaults including portable toilets in the following circumstances:

1. Temporary works sites, such as construction site, special events, and agricultural operations.
2. Campgrounds, rest stops, fishing piers, or similar facilities operated and maintained by a government agency that are remote or located on a site not suitable for an OWTS.
3. Existing residential or commercial operations where a severe sewage disposal failure has occurred and there is not a feasible alternative for repair.
4. Intermittently used non-residential, non-commercial structures such as duck clubs in the primary area of the Suisun Marsh, where: a) a site evaluation demonstrates conditions that prohibit the installation of an OWTS; b) the operators have installed appropriate high-level alarms; and c) the operators provide evidence of a maintenance contract with a licensed liquid waste pumper.



Side wall of trench used for Site Evaluation



Photo illustrating Site Evaluation Process

Solano County OWTS standards require that any person proposing to develop any property utilizing an OWTS, whether for new construction, remodel, addition, or replacement must submit copies of the general site layout, the detailed OWTS drawn to scale, and floor plan for the proposed development to the Environmental Health Services Division. The plans must be complete, and must clearly show the exact locations of the following whether existing or proposed:

1. Parcel number and address if applicable;
2. Name, address and telephone number of property owner;
3. Name, address, and telephone number of the person preparing the application package;
4. A vicinity map and the scale used;
5. Lot dimensions including all property lines, setbacks, easements, right-of-ways, and side yards;
6. Vehicle traffic areas whether paved or unpaved;
7. Structures including pools, dwellings, and auxiliary buildings;
8. Any hazardous materials storage including fuel tanks;
9. Animal enclosures;
10. Plumbing including existing and proposed stub outs and water lines;
11. Existing and proposed wells, springs, neighboring wells, streams, ditches, canals, ponds, and any other body of water located within 100 feet of the property line;
12. Areas subject to flooding, ravines, bluffs, cut banks, and the slope;
13. Trees and utilities with 10 feet of the actual or proposed sewage disposal areas.

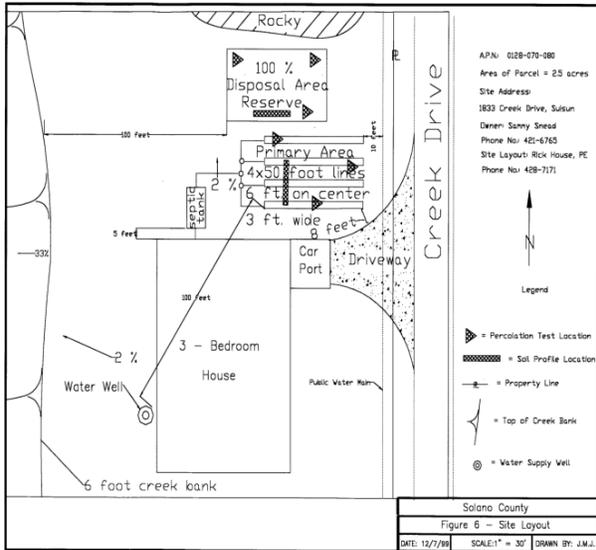


Illustration showing typical site diagram

Photo showing consultant beginning site evaluation

Each project will have a site evaluation unless the project does not cause any increase in the potential generation of sewage and Environmental Health Services Division has conducted an inspection and verified that the project will not significantly impact the existing OWTS or the replacement area for the OWTS. The one exception to this is for addition of one bedroom to residences that have a current permit and existing site evaluation data. In these cases, no new additional site evaluation will be required. For a detailed discussion of building permits, new construction, additions, and replacement structures please review Solano County Code, Chapter 6.4.

The Solano County Building Division routes all Building Applications to the Environmental Health Services Division for review. Environmental Health reviews each application to determine whether there is a need to (1) modify/upgrade an existing OWTS; (2) install a new OWTS; (3) perform a site evaluation to identify a replacement area; (4) conform the project to all septic and well setbacks.

Solano County OWTS standards specify the minimal horizontal separation between the components of the OWTS including the required reserve area. These setbacks are detailed in Table 1.

Table 1: Minimum Setback Requirements, Chapter 6.4

	Septic Tanks, Interceptor, Dosing Tanks, Holding Tank, Distribution	Disposal Field, Replacement Area	Solid Piping (ABS or Cast Iron)	Solid Piping (PVC or other)
Wells, abandoned wells, springs	100 feet ¹	100 feet	25 feet	50 feet
Bays, streams, rivers, ditches, canals, culverts or 10 year flood plains (2)	100 feet ¹	100 feet	25 feet ³	50 feet
Ephemeral streams, rivers, unlined ditches, unlined canals, or unlined culverts (2)	50 feet	50 feet	25 feet ³	50 feet
Lined ditches, lined canals, or watertight culverts or conduits	15 feet	15 feet	10 feet ³	10 feet
Lake or reservoir (2)	100 feet	100 feet	25 feet	50 feet
Property line (public water supply and no on-site well)	10 feet	10 feet	10 feet	10 feet
Property line (neighboring lot on-site well or spring water supply)	25 feet	25 feet	10 feet	10 feet
Structures and foundations	5 feet	10 feet	0 feet	5 feet
Swimming Pool. Lined pond or lined basin	15 feet	15 feet	5 feet	5 feet
Areas subject to vehicular traffic	5 feet	5 feet	0 feet if sand packed	5 feet
Cut or fill banks, cuts, or steep slopes(4)	4 x height (50 feet maximum)	4 x height (100 feet maximum)	0 feet	10 feet
Easements and rights of way (5)	5 feet	5 feet	5 feet	5 feet

Notes:

(1) May be reduced to fifty (50') feet if the tank passes a field test to verify it is water tight.

- (2) As measured from the highest water level obtained.
- (3) Variance may be granted for creek crossings if pipe is pressure tested and adequately protected.
- (4) Distance in feet equals four times the vertical height of the cut bank, fill bank, or escarpment.
- (5) Unless easement is specifically and solely designated for an on-site sewage disposal system.

Where adverse conditions exist, Solano County Code allows the Environmental Health Services Division to increase the minimum horizontal separation distances pertaining to the construction of the OWTS. The Environmental Health Division (EHSD) is requiring setbacks of septic tank and disposal field to be 150 feet from a public water system pursuant to EHSD Policy # LW-93-02.

Solano County OWTS standards also establish soil depths for each limiting condition. Table 2 details limiting conditions:

Table 2: Soil Depth below Absorption Field to Limiting Condition, Chapter 6.4

Soil texture¹	Percolation Rate Minutes per inch (mpi)	Depth to groundwater	Depth to other limiting factor
Sand, Loamy Sand	1 mpi – 5 mpi	20 feet ²	5 feet ³
	6 mpi- 60 mpi	5 feet ³	5 feet ³
Sandy Loam, Sandy Clay Loam, Loam	6 mpi – 60 mpi	5 feet ³	5 feet ³
	61 mpi- 120mpi	3 feet ⁴	3 feet ⁴
Sandy Clay, Clay Loam, Clay, Silty Clay, Silty Clay Loam, Silt Loam, Silt	6 mpi – 60 mpi	5 feet ³	5 feet ³
	61 mpi- 120mpi	3 feet ⁴	3 feet ⁴

Notes:

1. Soil texture of the most limiting soil layer in the active leaching layers directly below proposed disposal fields (within two feet to five feet below trench bottom depending on the type of system
2. If an alternative system is used then the depth may be reduced to two to five feet dependent on the system proposed. Pretreatment and de nitrification may be required for any allowed reduction of setback.
3. Separation distances may be reduces to three feet if pressure distribution is used or two feet if a pretreatment device approve by Environmental Health Services Division is used before disposal by pressure distribution
4. Applies to sites approved for alternative systems utilizing pressure distribution methods and can be reduced if a pretreatment device is used before disposal of effluent into soil.

In summary, Solano County OWTS standards meet the intent of the POLICY and the Basin Plans of both California Regional Water Quality Control Boards.

Solano County OWTS standards are protective of public health and the environment by; (1) requiring a site evaluation for a new OWTS or the repair, replacement, modification of an existing system; (2) identifying replacement areas with **at least** 100 % the size of the initial disposal area in case of the initial system failure during the site evaluation process; (3) requiring consultants with specific credentials to design systems; (4) allowing the use of alternative systems such as pressure dose, ATU/nutrient treatment system, sand filter, at grade, mound system etc; (5) allowing the use of experimental systems only with at least 200% replacement area for non-experimental systems; (6) not allowing unacceptable designs such as: Evapotranspiration systems, leach pits, cesspools, composting toilets and incineration systems.

For a detailed discussion of OWTS system designs and specification see Solano County Chapter 6.4.

F. Impaired Water Bodies

Within Solano County, currently the OWTS Policy identifies the Napa River on Table 6 as a 303(d) water body for nitrogen. The Regional Water Board at its February 2014 meeting approved a proposal to delist Napa River for nutrients, and to remove it from the impaired water body list. Napa River will most likely be removed out of the impaired water body list once the US EPA approves the request. Meanwhile, Solano County has not identified any OWTS systems located near the Napa River. All identified dwellings and commercial structures along the Napa River are on sewer operated by Vallejo Sanitation and Flood District.

G. Installation Near Existing Sewers:

Solano County OWTS standards require a connection to a public sewer for all proposed lots, new development, additions, or remodels that propose to generate wastewater, and for existing structures requiring repairs to septic system if sewer is available.

Solano County OWTS standard also define the sewer is available if: (1) It is within 200 feet of the property line; (2) The structure is within 1000 feet of the property; and (3) There is willingness by the agency in control of the sewer to permit connection to the sewer main.

Solano County will not issue permits for the installation, repair, replacement, or expansion of an OWTS if a sewer is deemed to be available. Solano County OWTS standards do not apply to community sewage disposal systems including public sewer systems that are subject to Regional Water Quality Control Board review and approval. For a more detailed discussion see Solano County Code Chapter 6.4.

H. Inspection, Construction and Enforcement:

The Environmental Health Services Division references the *Onsite Wastewater Treatment Systems* by US EPA dated 2002, *Onsite Wastewater Treatment Systems* by Bennette D. Burks and Mary Margaret Minnis dated 1994, Product information and design specification for OWTS manufacturers and distributors, *Environmental Engineering and Sanitation* by Joseph Salvado 4th edition or later as references for OWTS within Solano County.

The Environmental Health Services Division tracks all complaints regarding the discharge of sewage and the failure of OWTS through the Department's internal database. Each location is provided a unique tracking number and information related to the type of the complaint and actions to abate are saved and can be readily recalled as needed. Environmental Health staff responds to all complaints of failed OWTS and the discharge of sewage by conducting inspections, documenting site conditions, and issuing a Notice of Violation specifying corrective actions as needed. For OWTS the typical corrective actions include stopping the discharge and obtaining a permit to repair or replace the OWTS.

The Environmental Health Services Division addresses OWTS malfunction, poor performance, or failure by:

1. Responding to complaints of failing systems and/or unpermitted repairs;
2. Permitting of OWTS installations, modifications, expansions, or repairs;
3. Conducting construction inspections including, a preconstruction meeting, inspecting open trenches, inspecting rock and pipe, conducting other inspections as necessary for the system and a final construction inspection;
4. Reviewing the design consultants certification that the OWTS has been installed according to standards and permit conditions;
5. For an alternative system, issuing an operation & maintenance permit;
6. Performing an annual inspection that includes a review of the performance and conditions of many alternative and experimental systems;
7. Issuing septic tank destruction permits and conducting inspections;
8. Requiring maintenance and performance monitoring at least annually by the property owner, licensed contractor, or OWTS consultant;
9. Triennially requiring the maintenance and performance monitoring done by an OWTS consultant or licensed contractor knowledgeable in the permitted OWTS.

Solano County OWTS standards require an applicant to obtain a permit for the installation, repair, replacement, expansion, modification, or destruction of an OWTS. The standards provide that the contractor, property owner, or any other person must not violate or fail to comply with

any construction permit condition, and require that only the work specifically authorized by the construction permit may be performed.

Solano County OWTS standards provide the following exceptions from permitting:

- Clearing stoppages in pipes as long as OWTS is undisturbed;
- Cleaning each septic tank, dosing tanks, interceptor, holding tank or other sewage receptacle that is pumped by a sewage disposal service that is permitted by Solano County;
- Exposing portions of the OWTS to evaluate its performance or operation as long as it is not damaged, altered, modified, or repaired;
- Repairing Risers and lids;
- Repairing Effluent filters;
- Repairing Sanitary tees;
- Repairing Distribution boxes

The Environmental Health Services Division may address malfunctioning or failing systems by denying, suspending, or revoking a permit for: (1) not complying with standards; (2) a failing or abandoned OWTS; (3) providing false information; (4) failing to comply with monitoring or maintenance requirements. The OWTS standards prohibit the surface discharge of sewage. The OWTS standards provide that any person, firm, corporation, will be deemed guilty of an infraction and subject to a fine. For more detailed discussion of these activities see Solano County Code, Chapter 6.4.



Photo illustrating an inspection during construction



Photo illustrating inspection of Installed components

I. Operation and Maintenance Program

Solano County implements a comprehensive operation and maintenance program through the following methods:

1. Education of OWTS Owners.

The Environmental Health Services Division maintains information on its website to educate OWTS owners on proper operation and maintenance. This information can be found at:

http://www.solanocounty.com/depts/rm/environmental_health/

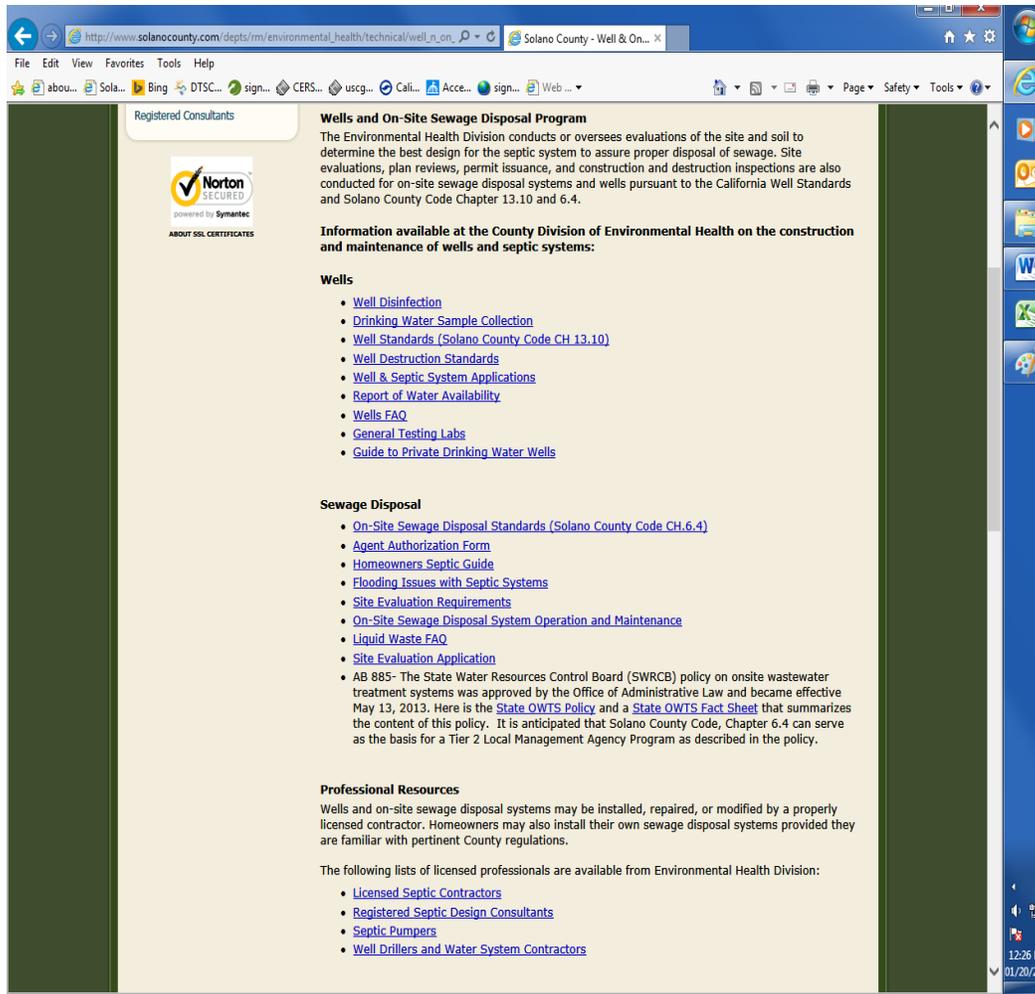
The information provides general guidance to all OWTS owners on proper operation and maintenance of OWTS. Solano County also maintains electronic databases that the public can access which has documents (permits, design, and site map) specific to the permit for the specific OWTS. Solano County requires that homeowners with engineered OWTS to provide operation permit and all conditions to a subsequent property owner or tenant within 60 days of the date of transfer of the property.

2. Public Outreach:

The Environmental Health Services Division provides information on Solano County OWTS standards, general soil characteristics, and general ground water depths, as well as information on specific parcels to consultants, contractors, property owners, and prospective buyers and their representatives in person, by telephone, and by email. Solano County EHSD is on-call 24/7 to respond to sewage releases in both incorporated and unincorporated areas of Solano County.

The Environmental Health Services Division has OWTS file information in a digital imaging format that is available for review at the public counter and in a dedicated file review room. Environmental Health Service Division provides public information from these files by email as describe above, or US Mail upon request.

The Environmental Health Services Division portion of the Solano County website has FAQs on OWTS; lists of OWTS consultants, licensed septic contractors, licensed septic pumpers that work within the county; information for owners on maintenance of OWTS; and site evaluation information. The Environmental Health Services Division interacts with the Suisun Resource Conservation District regarding OWTS within the primary marsh and the use of holding tanks/seal vaults for use by duck clubs and other hunting clubs with the Suisun Marsh. The Environmental Health Services Division has not previously coordinated well monitoring programmatically with any watershed management group.



Screen shot of Solano County Website with discussion of sewage disposal and OWTS Policy

3. Operation and Maintenance Permit:

Solano County Code, Chapter 6.4 ensures that all engineered OWTS, including experimental systems, are routinely evaluated for performance by requiring each OWTS owner with an alternative or experimental system to maintain a valid operation permit for the OWTS. The Operation and Maintenance Permit is renewed annually. As part of Operation and Maintenance Program each owner must complete and submit a maintenance report for their system and provide a copy of this report to the Environmental Health Services Division.

Triennially, the owner must hire a manufacturer trained service technician to perform inspection and maintenance on each system subject to these requirements.

Solano County OWTS standards require Environmental Health Services Division to review performance of all alternative and experimental OWTS annually. This evaluation consists of a file review and/or on-site inspections of the system. The Environmental Health Services Division will communicate information to the OWTS owner by sending letters on OWTS maintenance and provide information and training during inspections.

III. WATER QUALITY IMPACTS:

A. Licensing:

Solano County OWTS standards and State Laws require the following certification, licensing, or registration, of the professionals involved in the installation, modification, repair, upgrade, and maintenance of OWTS:

1. *OWTS Consultant*--The OWTS consultant will be a Professional Engineer, Professional Geologist, Certified Engineering Geologist, or Registered Environmental Health Specialist certified/ registered by the State of California or a Certified Professional Soil Scientist certified by the Soil Science Society of America.
2. *OWTS Designer* --The designer is an OWTS consultant who is a Professional Engineer, Certified Engineering Geologist, or Registered Environmental Health Specialist certified/registered by the State of California.
3. *OWTS Installer* --A contractor licensed by State of California as a General Engineering contractor (Class A), General Building contractor (Class B), Sanitation System contractor (C-42), or a Plumbing contractor (C-36) that conforms to Business and Professions Code sections 7056, 7057, and 7058.
4. *OWTS Service Providers* – The OWTS standards currently require maintenance and performance monitoring done by a licensed consultant or contractor with knowledge of OWTS triennially for operating, monitoring, and maintaining an OWTS according to the Policy and Solano County Code.

An exception to this is that the property owner, as an owner builder, is allowed by law to install his/her own OWTS under permit with inspections from the Environmental Health Services Division and perform annual maintenance to their alternative or experimental OWTS.

Currently, the Solano County requires as built plans and operation and maintenance manuals for all engineered OWTS as part of the required design consultant's certification for each system. Solano County will require operation and maintenance manuals for all OWTS.

B. Liquid Waste Disposal and Disposal Capacity:

Environmental Health Services Division regulates liquid waste pumping within the political boundaries of Solano County pursuant to Solano County Code, Chapter 25 and the Health and Safety Code. Environmental Health Services Division inspects and issues permits for liquid waste pumping/portable toilet companies that work within Solano County. The Environmental Health Services Division receives pumper reports from the City of Vacaville Wastewater Treatment Plant, which accepts liquid waste from pumper trucks. Environmental Health Services Division enters this data into an EXCEL spreadsheet to track the disposal and to use as a monitoring tool for the indication of failing septic systems.

The Environmental Health Services Division will assess the county's liquid waste disposal capacity by performing the following actions:

1. Survey the POTW capacity within Solano County.
2. Determine the total volume of septic waste from pumper truck manifests.
3. Survey Septic Pumper firms permitted by Solano County to verify septic waste disposal locations in and outside Solano County.
4. Consult with the Solano County Planning Division to derive the total housing stock in unincorporated Solano County and use an average capacity per house with an average pumping frequency to determine septic waste volume per year. This estimate will be compared to septic waste volume calculated from pumper truck manifests and the POTW disposal capacity.



Example of typical type of pumper truck used to transport liquid waste

C. Cumulative Impacts:

Solano County OWTS standards define a community sewage disposal system as a system that accepts sewage from two or more lots and is owned, operated, and maintained according to the Solano County General Plan by a government agency, public utility, maintenance district, or other similar entity approved by the Local Agency Formation Commission. Community sewage disposal systems must be approved and operated under permit from the applicable California Regional Water Quality Control Board.

Solano County OWTS standards address nutrient and salts by prohibiting the discharge of waste to an OWTS from roofs, water softeners, and swimming pool filters. Solano County OWTS standards allow the Environmental Health Division to require the use of treatment devices to reduce nitrogen to protect ground water from nitrates. When Environmental Health Services Division receives an application to repair or modify an existing OWTS on an existing non-conforming lot with shallow ground water and/or restricting soil conditions, then the repair or modification may be required to include the addition of a pretreatment device and the property owner must obtain an annual Operation and Maintenance Permit. Within Solano County, the known area with high nitrate levels in groundwater is in the Dixon area. The Central Valley Regional Water Quality Control Board has identified the sources of nitrate being predominantly from sources other than OWTS. These include large commercial and municipal discharges

under permit by the State of California, agricultural chemical companies, and the use of synthetic fertilizers in farming operations. In the Dixon area, OWTS are dispersed throughout the area on large lots as required by Solano County Code. Therefore; Solano County OWTS standards continue to protect public health and the environment.

D. Public Water Systems

Solano County does not have any Public Water System intakes within 2500 feet of an OWTS. However, if a Solano County receives a project that is within 2500 feet of a Public Water System intake, then the Environmental Health Division will notify the public water system owner/operator and the SWRCB Division of Drinking Water of the proposed project to get their comments as required in the State OWTS Policy. Solano County currently does not allow the use of seepage pits or waste wells, and currently does not allow disposal at depths of 10 feet or greater. Hence the requirement for notification of a Public Water System within 600 feet of such a system is not applicable in Solano County. Environmental Health Services Division currently notifies the OWTS Designers of the 150 feet setback to public drinking water systems. When an OWTS is proposed within 150 feet of a public water system, the Environmental Health Services Division will notify the owner/operator of the public water system as well as the State Water Resources Control Board, Division of Drinking Water prior to issuing the construction permit and require advance treatment unit (ATU). Environmental Health Services Division will notify both the public water system operation and the SWRCB, Division of Drinking Water within 72 hours of determining there is a failing OWTS within 150 feet of a public water well. Solano County sewage standards cover this process of notification during permit process. Therefore, Environmental Health Services Division procedures meet the standards to address notice regarding OWTS

meeting
proximity
standards
in the
POLICY.



detailed

Illustration of well pad, pressure tank and water storage tank for a public drinking water system

E. Monitoring and Reporting:

The Environmental Health Services Division will use the following types of data for the water quality-monitoring program:

1. Complaint investigation reports;
2. Operation and maintenance inspection reports;
3. Data in the SWAMP database;
4. Data contained in the GAMA database;
5. Operation and maintenance reports submitted to Solano County by owners and service providers annually and triennially including any influent or effluent data;
6. Examine frequency of septic pump outs on a given lot using our established spreadsheet;
7. Use repair permits and inspection reports;
8. Laboratory data received, as courtesy copy, from Public Drinking Water Systems;
9. Laboratory data received, as a courtesy copy, from private well owners who voluntarily submit data;
10. The laboratory data received, as courtesy copy, from NPDES and WDR permitting requirements;
11. Any laboratory data received as a part of a report submitted as borings/ well permit requirements;
12. Any laboratory data from monitoring wells, storm water, surface water bodies, and as permit conditions of the Solano County's Biosolids land application program;
13. Laboratory reports associated with new building permits;

Therefore, the Environmental Health Services Division's water quality monitoring program meets the POLICY and the Basin Plan policies of the applicable California Regional Water Quality Control Boards.

GeoTracker GAMA - Mozilla Firefox
 geotracker.waterboards.ca.gov/gama/gamamap/public/?CMD=runreport&myaddress=SOLANO+ COUNTY

Most Visited | Most Visited | BBB Consumer and Bu... | Getting Started | Latest Headlines | Welcome to Facebook
 GEOTRACKER GAMA HOME | GAMA HOME | SWRCB HOME | HOTSPOT LEGEND | TRANSLATION TABLE | CONTACT US | HELP

GEOTRACKER GAMA

LOCAL INFORMATION

CITY
UNINCORPORATED

COUNTY
SOLANO - [VIEW WATER REPORTS](#)

GROUNDWATER BASIN
SACRAMENTO VALLEY - SOLANO (5-21.66)

[VIEW 363 ENVIRONMENTAL MONITORING WELL BORING LOGS](#)

- SUPPLY WELLS - CDPH (within one mile of actual location)
- SUPPLY WELLS - OTHER (within 1/2 mile of actual location)
- ▲ MONITORING WELLS - REGULATED SITES (exact locations displayed)
- ICONS WITH A CIRCLE AROUND THEM SIGNIFY A CLUSTER OF WELLS

ADDITIONAL TOOLS

DEPTH-TO-WATER

DEPTH-TO-WATER CHANGE

GROUNDWATER ELEVATION

* Comparison concentration is 45 MG/L (MCL).
[Click here](#) for more information.

Map | Satellite | Hybrid | Terrain

Map data ©2012 Google - Terms of Use

MAP SIZE: 640x480 46 MATCHING WELLS FOR NITRATE AS NO3

DATASETS - ADDITIONAL INFORMATION

ENVIRONMENTAL MONITORING:

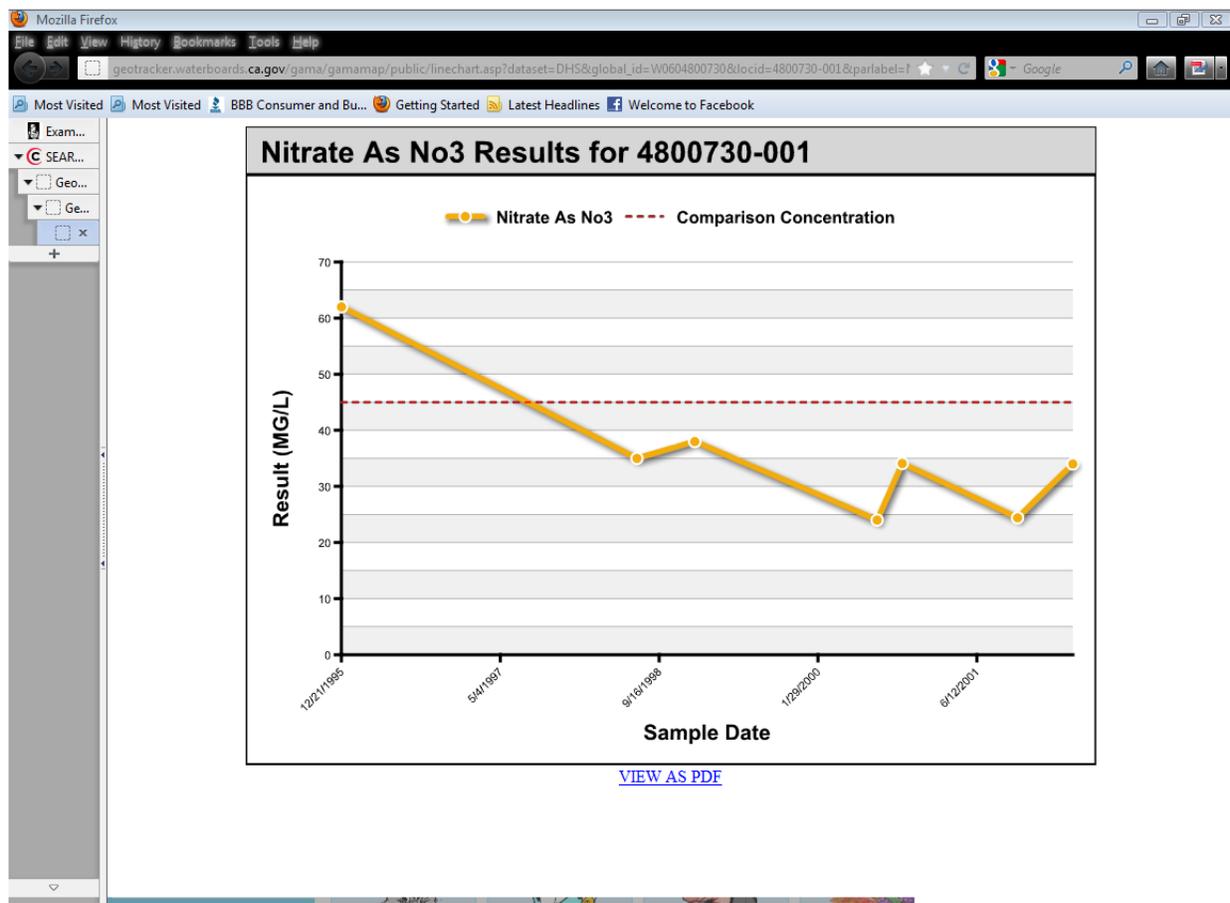
Monitoring Wells - Water Board Regulated Sites

SUPPLY WELL S:

Supply Wells - CDPH GAMA - SWRCB Domestic GAMA - USGS GAMA - LLNL DPR DWR

GIS LAYER - SELECTING A GIS LAYER WILL LIMIT YOUR QUERY TO RESULTS IN THAT GIS LAYER

Screen shot of Geotracker GAMA webpage that will be used as a component of monitoring



Screen shot illustrating monitoring data from GAMA webpage showing a decreasing trend

G. Record Retention:

The Environmental Health Services Division maintains complaint records including notice of violations, inspection reports, correspondence, permits, site evaluations and system designs. Initially maintained as hard copy, these records are retained permanently as imaged documents. The Environmental Health Services Division has a record retention policy and regularly provides documents pursuant to the California Public Records Act. Environmental Health Services Division will provide documentation to the applicable California Regional Water Quality Control Board pursuant to the California Public Records Act and Environmental Health Services Division Policy LW-91-01.

H. Reporting:

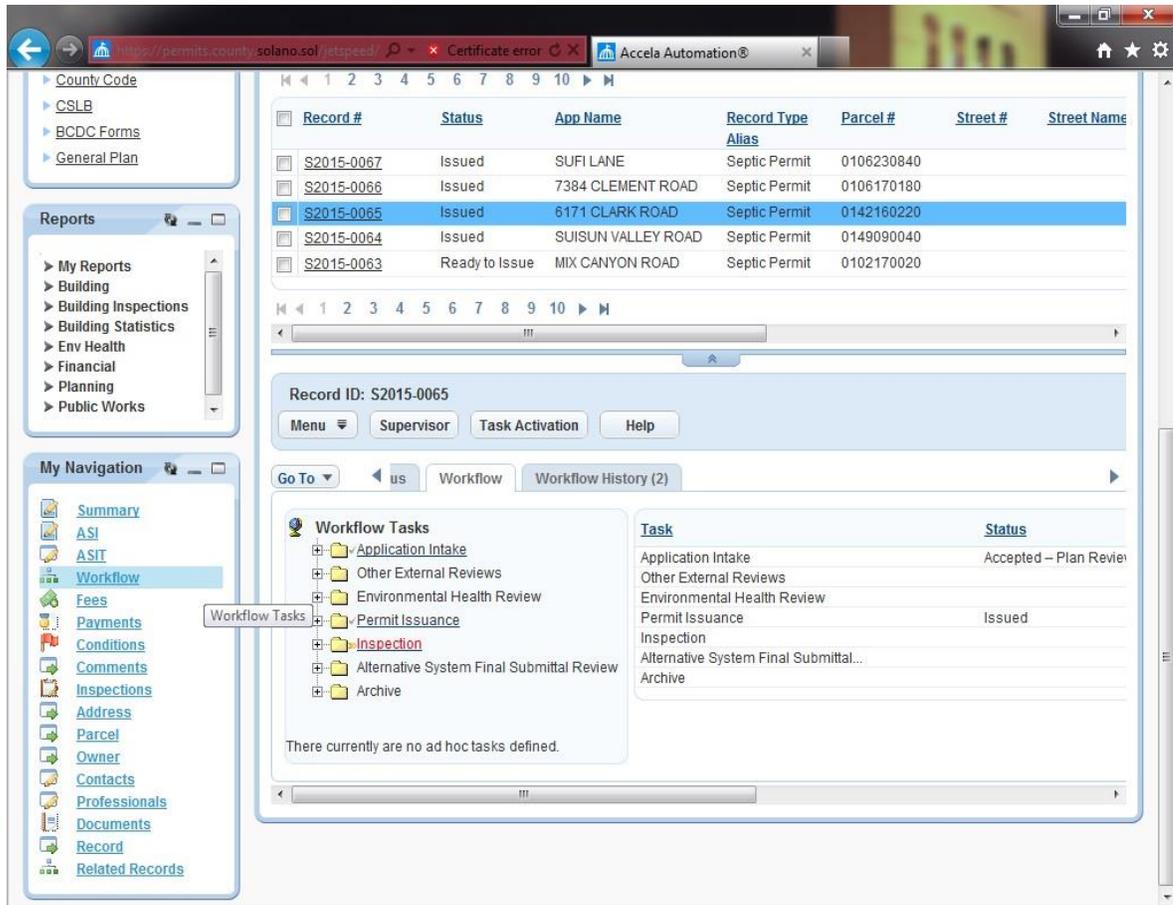
The Environmental Health Services Division will submit an Annual Summary Report by February 1, each year to the applicable California Regional Water Quality Control Board. The annual report will include the following:

1. The location and type of complaints investigated during the year and how the complaints were resolved
2. Discussion of the application and registration for septic tank cleaners (Pumpers)

3. The number, location and description of new, modification/upgrade, and repair permits issued and under which Tier.

The Environmental Health Services Division will submit a Monitoring and Analysis or Water Quality report that includes the following:

1. The review of water quality data described above.
2. The review of complaints in the past five years that involve OWTS.
3. The review of OWTS failures (repairs).
4. The review of O&M inspection findings.
5. An assessment of the water quality within Solano County based on data from the water quality monitoring program.



Screen shot illustrating county database used for tracking septic construction permits and field activities

Solano County will provide requested documents/information to the applicable California Regional Water Quality Control Board according to the time lines specified in the State OWTS Policy and by State law.

IV. SUMMARY:

Solano County OWTS standards are protective of public health and environment and meet the POLICY's OWTS Tier 2 standards and the Basin Plan policies of the applicable California Regional Water Quality Control Boards by:

- Addressing areas vulnerable to OWTS Pollution;
- Identifying limiting conditions during site evaluations;
- Requiring site evaluations to be performed by licensed/registered consultants;
- Requiring septic designs to be performed by Certified Engineering Geologist, Registered Environmental Health Specialist, or a Professional Civil Engineer;
- Requiring enhanced protection by the use of advanced treatment and denitrification units;
- Responding to complaints of failing OWTS;
- Requiring failing OWTS to be destroyed, repaired, or replaced under permit;
- Addressing shallow soils, poor drained soils, and fractured bedrock;
- Addressing high OWTS density by requiring increased lot size and specifying the use of a hydrological study of the cumulative impact of a proposed subdivision;
- An established operation and maintenance program that requires permitting, annual maintenance, routine inspections, and triennial maintenance by a service provider;
- The use of holding tanks in environmental sensitive areas such as the Suisun Marsh; and
- Not allowing cesspools and seepage pits;

References

- *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems*, State Water Resource Control Board, June 19, 2012
- *Onsite Wastewater Treatment System Policy, Draft Substitute Environmental Document*, State Water Resources Control Board, June 6, 2012
- *Environmental Engineering and Sanitation*, Joseph Salvato, 4th Edition
- *Design Manual --- Onsite Wastewater Treatment and Disposal Systems*, United State Environmental Protection Agency, October 1980
- *Onsite Wastewater Treatment Systems Manual*, United States Environmental Protection Agency, February 2002
- http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/basin_plan/web/bp_ch5.shtml#5.2.7

- http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/basin_plan/web/res/res_79-5.pdf
- http://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/083105-bp/05_implementation_plans.pdf
- <http://water.epa.gov/infrastructure/septic/manuals.cfm>