DIVISION OF
ENVIRONMENTAL HEALTH

ONSITE WASTEWATER TREATMENT SYSTEMS

LOCAL AGENCY MANAGEMENT PROGRAM
(LAMP)

DECEMBER 6, 2016
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<tr>
<td>3.3</td>
<td>Annual Reporting</td>
<td>For Section 3.3 et seq, describe your program for annual reporting to Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff in a tabular spreadsheet format.</td>
<td>Section 4, pp. 33-34, Section 5, pp. 34-35, Section 7, pp. 54-55, Section 10, pp. 51, Section 12, pp. 53-55</td>
<td>Policy, LAMP, Chp 9.54</td>
<td>&quot;</td>
</tr>
<tr>
<td>3.3.1</td>
<td>Complaints</td>
<td>Include numbers and locations of complaints, related investigations, and means of resolution.</td>
<td>Section 5, pp. 35-37</td>
<td>&quot;</td>
<td></td>
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<tr>
<td>3.3.2</td>
<td>OWTS Cleaning</td>
<td>Include applications and registrations issued as part of the local cleaning registration pursuant to California Health and Safety Code §117400 et seq.</td>
<td>Section 4, pp. 33-34</td>
<td>&quot;</td>
<td></td>
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<tr>
<td>3.3.3</td>
<td>Permits for New and Replacement OWTS</td>
<td>Include numbers and locations of permits for new and replacement OWTS, and their Tiers.</td>
<td>Section 5, pp. 34-35, Section 6, pp. 35-38, Section 7, pp. 39-40</td>
<td>&quot;</td>
<td></td>
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<td>3.4</td>
<td>Permanent Records</td>
<td>Describe your program for permanently retaining records, and means of making them available to Central Valley Water Board staff within 10 working days of a written request.</td>
<td>Section 3, pp. 32-34</td>
<td>&quot;</td>
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<td>3.5</td>
<td>Notifications to Municipal Water Suppliers</td>
<td>Describe your program for notifying public well and water intake owners, and the California Department of Public Health. Notification shall be as soon as practicable, but no later than 72 hours upon discovery of a failing OWTS, as described in Sections 11.1 and 11.2, within setbacks described in Sections 7.5.6 through 7.5.10.</td>
<td>Section 6, pp. 37-38</td>
<td>&quot;</td>
<td></td>
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<tr>
<td>9.0</td>
<td>Minimum OWTS Standards</td>
<td>This Section is an introduction; we require no specific LAMP Section citation here.</td>
<td>Section 5, pp. 34 (Chapter 9.54, 9.54.040, 9.54.080)</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td>Considerations for LAMPS</td>
<td>For Section 9.1 et seq., provide your commitment to evaluate complaints, variances, failures, and inspections in Section 9.3.2 (Water Quality Assessment); and your proposed means of assessment to achieve this Policy’s purpose of protecting water quality and human health.</td>
<td>Section 5, pp. 34-35, Section 6, pp. 35-38, Section 12, pp. 54</td>
<td>Policy, LAMP, Chp 9.54</td>
<td></td>
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<tr>
<td>9.1.1</td>
<td>Degree of vulnerability due to local hydrogeology</td>
<td>Describe your commitment, and proposed means to identify hydrogeologically vulnerable areas for Section 9.3.2, after compiling monitoring data. Discuss appropriate related siting restrictions and design criteria to protect water quality and public health. Qualified professionals (“Definitions,” page 9 in the Policy) should identify hydrogeologically vulnerable areas. Such professionals, where appropriate during a Water Quality Assessment, should generally consider locally reasonable percolation rates of least permeable relevant soil horizons, best available evidence of seasonally shallowest groundwater (including, but not limited to, soil mottling and gleying, static water levels of nearby wells and springs, and local drainage patterns), threats to receptors (supply wells and surface water), and potential geotechnical issues (including, but not limited to, potentially adverse dips of bedding, foliations, and fractures in bedrock).</td>
<td>Section 3, pp. 15-26, Section 4, pp. 26-34, and Section 10, pp. 49-51</td>
<td>Policy, LAMP, Chp 9.54</td>
<td></td>
</tr>
<tr>
<td>9.1.2</td>
<td>High quality waters and other environmental conditions requiring enhanced protection</td>
<td>Describe special restrictions to meet water quality and public health goals pursuant to all Federal, State, and local plans and orders. Especially consider appropriate alternatives to those provided in Section 7.8, Allowable Average Density Requirements under Tier 1. See also: State Water Resources Control Board Resolution No. 68-16.</td>
<td>Section 3, pp. 15-25, Section 10, pp. 49-51, and Section 11, pp. 52-53</td>
<td>Policy, LAMP, Chp 9.54</td>
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### PROPOSED LOCAL CODES IN COMPLIANCE WITH OWTS POLICY GENERAL REQUIREMENTS FOR LAMPS

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<td>9.1.3</td>
<td>Shallow soils requiring non-standard dispersal systems</td>
<td>We interpret “shallow” soils generally to mean thin soils overlying bedrock or highest seasonal groundwater. Dependent on threats to receptors, highest seasonal groundwater can locally include perched and intermittent saturated zones, as well as the shallowest local hydraulically unconfined aquifer unit. See Section 8.1.5 for Minimum Depths to Groundwater under Tier 1. Qualified professionals should make appropriate determinations on the design and construction of non-standard dispersal systems due to shallow soils.</td>
<td>Section 3, 4, 11 and 10</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.1.4</td>
<td>High domestic well usage areas</td>
<td>Our key potential concerns are nitrate and pathogen transport toward receptor wells, especially in areas with existing OWTS already prone to soft failures (OWTS failures not evident at grade). Appropriate qualified professionals should consider reasonable pollutant flow paths toward domestic wells at minimum based on scientifically available nitrate concentrations in local wells, published technical literature on local wastewater and non-wastewater nitrate sources, well construction, pumping demands, and vulnerability of wells due to local hydrogeology. For pathogens, qualified professionals should ensure that field methods are sufficient to mitigate the potential for false positives.</td>
<td>Section 8, pg. 45, 50, Section 11, pg. 53</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.1.5</td>
<td>Fractured bedrock</td>
<td>Where warranted, appropriate qualified professionals should assess permeability trends of water-bearing fractures, and related potential pathways of effluent toward receptors, including but not limited to, domestic wells and surface water. The professionals should also consider potential geotechnical issues. We suggest consideration of fractured bedrock in concert with percolation rates of overlying soils; either very high or low percolation rates might warrant siting restrictions or non-standard dispersal systems. See also State Water Resources Control Board Order WQ 2014-0153- DWQ, Attachment 1, page 1-3, Item A-3.</td>
<td>Section 3, pg. 22-23, 27, and pg. 33</td>
<td>Policy, LAMP, Chp 9.54</td>
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<td>9.1.6</td>
<td>Poorly drained soils</td>
<td>Appropriate qualified professionals should give criteria for determination of representative percolation rates, including but not limited to, general site evaluation, trench logging, pre-soak and measurement methods of percolation tests, and acceptable alternatives for percolation tests.</td>
<td>Section 2, pg. 26-31, Section 6, pg. 36-37, Section 8, pg. 42-43. Section 9, pg. 47</td>
<td>Policy, LAMP, Chp 9.54</td>
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<td>9.1.7</td>
<td>Vulnerable surface water</td>
<td>Our key potential concern is eutrophication of fresh surface water. While typically with relatively low mobility in groundwater and recently informally banned in dishwasher detergents, phosphate is a common cause. At minimum, describe appropriate qualified professionals who will consider potential pathways of wastewater–sourced phosphate and other nutrients toward potentially threatened nearby surface bodies.</td>
<td>Section 9, pg. 50, and Section 11, pg. 52</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.1.8</td>
<td>Impaired water bodies</td>
<td>Wolf Creek, Nevada County, and Woods Creek, Tuolumne County will require Tier 3 Advanced Protection Management Programs. This applies to Nevada, Placer, and Tuolumne Counties. See Attachment 2 of the OWTS Policy.</td>
<td>Section 4, pg. 33, Section 8, pg. 48-50, Section 10, pg. 53</td>
<td>Not Applicable</td>
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<td>9.1.9</td>
<td>High OWTS density areas</td>
<td>Where nitrate is an identified chronic issue, at minimum, consider nitrogen loading per area; for example, see Hantzsche and Finnemore (1992), Crites and Tchobanoglous (1998), and more recent publications as appropriate.</td>
<td>Section 5, pg. 34, Section 6, pg. 38, Section 8, pg. 44-45, Section 9, pg. 50, Section 11, pg. 53</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.1.10</td>
<td>Limits to parcel size</td>
<td>At minimum, consider hydraulic mounding, nitrate and pathogen loading, and sufficiency of potential replacement areas.</td>
<td>Section 5, pg. 34, Section 6, pg. 38, Section 8, pg. 45, Section 9, pg. 50, Section 11, pg. 53</td>
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<td>9.1.11</td>
<td>areas with OWTS that predate adopted standards</td>
<td>This refers to areas with known, multiple existing OWTS.</td>
<td>OWTS prior to 1956 were not permitted by Merced County Env. Health. No known issues with multiple existing OWTS precluding adopted standards</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.1.12</td>
<td>areas with OWTS within prescriptive, Tier 1 setbacks, or within setbacks that a Local Agency finds appropriate</td>
<td>This refers to areas with known, multiple existing OWTS.</td>
<td>Section 6, pg. 35-39, Section 7, pg. 39-40, Section 8, pg. 41-45, Section 9, pg. 45-49</td>
<td>Policy, LAMP, Chp 9.54</td>
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<tr>
<td>9.2</td>
<td>Scope of Coverage: For Section 9.2 et seq, provide details on scope of coverage, for example maximum authorized projected flows, allowable system types, and their related requirements for site evaluation, siting, and design and construction requirements.</td>
<td></td>
<td>Section 5, pg. 34-35, and Section 6, pg. 35-39</td>
<td>Policy, LAMP, Chp 9.54</td>
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<tr>
<td>9.2.1</td>
<td>Installation and Inspection Permits</td>
<td>Permits generally cover procedures for inspections, maintenance and repair of OWTS, including assurances that such work on failing systems is under permit; see Tier 4.</td>
<td>Section 5, pg. 34-35</td>
<td>Policy, LAMP, Chp 9.54</td>
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<tr>
<td>9.2.2</td>
<td>Special Provision Areas and Requirements near Impaired Water Bodies</td>
<td>Wolf Creek, Nevada County, and Woods Creek, Tuolumne County will require Tier 3 Advanced Protection Management Programs. This applies to Nevada, Placer, and Tuolumne Counties. See Attachment 2 of the OWTS Policy.</td>
<td>NA</td>
<td>Not Applicable</td>
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<td>9.2.3</td>
<td>LAMP Variance Procedures</td>
<td>Variances for new installations and repairs should be in substantial conformance to the Policy, to the greatest extent practicable. Variances cannot authorize prohibited items in Section 9.4.</td>
<td>Section 10, pg. 48-52</td>
<td>Policy, LAMP, Chp 9.54</td>
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<tr>
<td>9.2.4</td>
<td>Qualifications for Persons who Work on OWTS</td>
<td>Qualifications generally cover requirements for education, training, and licensing. We suggest that Local Agencies review information available from the California Onsite Water Association (COWA), see: <a href="http://www.cowa.org/">http://www.cowa.org/</a></td>
<td>Section 8, pg. 42</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.2.5</td>
<td>Education and Outreach for OWTS Owners</td>
<td>Education and Outreach generally supports owners on locating, operating, and maintaining OWTS. At minimum, ensure that you will require OWTS designers and installers to provide owners with sufficient information to address critical maintenance, repairs, and parts replacements within 48 hours of failure; see also Tier 4. Also, provide information to appropriate volunteer groups. At minimum, we suggest providing this information on your webpage.</td>
<td>Section 7, pg. 39</td>
<td>Policy, LAMP, Chp 9.54</td>
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<tr>
<td>9.2.6</td>
<td>Septage</td>
<td>Assess existing and proposed disposal locations, and their</td>
<td>Section 5, pg. 35-38, Section 6, pg. 35-38, Section 8, pg. 41-45 and</td>
<td>Policy, LAMP, Chp 9.54</td>
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<tr>
<td>Disposal</td>
<td>adequacy.</td>
<td></td>
<td>Section 12, pg. 94</td>
<td>Policy, LAMP, Chp 9.54</td>
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<tr>
<td>9.2.7</td>
<td>Maintenance Districts and Zonal</td>
<td>These generally refer to Homeowners Associations, special maintenance districts, and similar responsible entities. Requirements for responsible entities should generally reflect the Local Agency’s judgment on minimum sizes of subdivisions that could potentially cause environmental impacts. LAMPs should ensure that responsible entities have the financial resources, stability, legal authority, and professional qualifications to operate community OWTS.</td>
<td>Section 8, pg. 49, Section 10, pg. 50-52</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
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<td>9.2.8</td>
<td>Regional Salt and Nutrient Management Plans</td>
<td>Consider development and implementation of, or coordination with, Regional Salt and Nutrient Management Plans; see also State Board Resolution 2009-0011: <a href="http://www.waterboards.ca.gov/centralvalley/water_issues/salinity/aws_regs_policies/rw_policy_implementation_mem.pdf">http://www.waterboards.ca.gov/centralvalley/water_issues/salinity/aws_regs_policies/rw_policy_implementation_mem.pdf</a></td>
<td>Section 10, pg. 50</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.2.9</td>
<td>Watershed Management Groups</td>
<td>Coordinate with volunteer well monitoring programs and similar watershed management groups.</td>
<td>Section 7, pg. 39</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.2.10</td>
<td>Proximity of Collection Systems to New or Replacement OWTS</td>
<td>Evaluate proximity of sewer systems to new and replacement OWTS. See also Section 9.4.9.</td>
<td>Section 6, pg. 39 and Section 10, pg. 51</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.2.11</td>
<td>Public Water System Notification prior to permitting OWTS Installation or Repairs</td>
<td>Give your notification procedures to inform public water services of pending OWTS installations and repairs within prescribed setback distances.</td>
<td>Section 6, pg. 38, Section 8, pg. 43-44</td>
<td>Policy, LAMP, Chp 9.54</td>
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<tr>
<td>9.2.12</td>
<td>Policies for Dispersal Areas within Setbacks of Public Wells and Surface Water Intakes</td>
<td>Discuss supplemental treatments; see Sections 10.9 and 10.10. A Local Agency can propose alternate criteria; however we will need rationale in detail.</td>
<td>Section 5, pg. 34, Section 6, pg. 38-39, Section 8, pg. 49, Section 9, pg. 50-51, Section 11, pg. 53</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.2.13</td>
<td>Cesspool Discontinuance and Phase-Out</td>
<td>Provide plans and schedule.</td>
<td>Section 4, pg. 33</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.3</td>
<td>Minimum Local Agency Management Responsibilities:</td>
<td>For Section 9.3 et seq, discuss minimum responsibilities for LAMP management. Responsibilities should generally cover data compilation, water quality assessment, follow-up on issues, and reporting to the Central Valley Water Board:</td>
<td>Section 5, pg. 34</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.3.1</td>
<td>Permit Records, OWTS with Variances</td>
<td>Describe your records maintenance; numbers, locations, and descriptions of permits where you have granted variances.</td>
<td>Section 2, pg. 15, Section 5, pg. 34-35, Section 11, pg. 52</td>
<td>Policy, LAMP, Chp 9.54</td>
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## Proposed Local Codes in Compliance with OWTS Policy General Requirements for LAMPS

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<td>9.3.2</td>
<td>Water Quality Assessment Program</td>
<td>In the Water Quality Assessment Program, generally focus on areas with characteristics covered in Section 9.1. Include monitoring and analysis of water quality data, complaints, variances, failures, and inspections. Also include appropriate monitoring for nitrate and pathogens; you can use information from other programs. We are available to provide further guidance on reporting requirements. In the interim, to assist with analyses and evaluation reports (Section 9.3.3), we suggest posting data on appropriate maps; for example consider the following links: <a href="http://www.nrcs.usda.gov/wps/portal/nrcs/site/ca/home/">http://www.nrcs.usda.gov/wps/portal/nrcs/site/ca/home/</a> <a href="http://www.cdpr.ca.gov/docs/emon/gmdwtr/gwpa_maps.htm">http://www.cdpr.ca.gov/docs/emon/gmdwtr/gwpa_maps.htm</a> <a href="http://nrcs.usda.gov/wps/portal/nrcs/site/ca/home/">http://nrcs.usda.gov/wps/portal/nrcs/site/ca/home/</a> <a href="http://www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS58.pdf">http://www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS58.pdf</a> <a href="http://www.water.ca.gov/groundwater/data_and_monitoring/northern_region/GroundwaterLevel/SacValGWContours/100x400_Wells_Spring-2013.pdf">http://www.water.ca.gov/groundwater/data_and_monitoring/northern_region/GroundwaterLevel/SacValGWContours/100x400_Wells_Spring-2013.pdf</a> <a href="http://www.water.ca.gov/waterdatalibrary/">http://www.water.ca.gov/waterdatalibrary/</a> <a href="http://www.waterboards.ca.gov/gama/docs/hva_map_table.pdf">http://www.waterboards.ca.gov/gama/docs/hva_map_table.pdf</a> <a href="http://geotracker.waterboards.ca.gov/gama/">http://geotracker.waterboards.ca.gov/gama/</a> <a href="http://msc.fema.gov/portal">http://msc.fema.gov/portal</a></td>
<td>Section 4, pg. 23-35, Section 6, pg. 38, Section 9, pg. 47, Section 12, pg. 49-52, and Section 12, pg. 53-55</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.3.2.1</td>
<td>Domestic Well Sampling</td>
<td>Apply your best professional judgment to ensure that well sampling focuses on hydrogeologically reasonable pollutant (primarily nitrate) flow paths. A qualified professional should generally design an appropriate directed, judgmental, sample (i.e., statistically non-random). Of the links provided, the Geotracker GAMA website might be particularly useful to the professional; at minimum we suggest reviews of available nitrate data in relevant domestic wells, up-gradient, within, and down-gradient of an area of interest. For some instances, for example where a developer proposes a relatively large project, a Local Agency might require a special study to distinguish between wastewater and non-wastewater sourced nitrate. In such cases, we suggest your consideration of requiring focused sampling and analyses, for example of δ¹⁸O and δ¹⁵N of nitrate (Megan Young, USGS, 2014 pers comm), and the artificial sweeteners sucralose and acesulfame-K (Buerge et al 2009, Van Stempvoort et al 2011, and more recent publications as they become available).</td>
<td>Section 12, pg. 53-55</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.3.2.2</td>
<td>Domestic Well Sampling, Routine Real Estate Transfer Related</td>
<td>This applies only if those samples are routinely performed and reported.</td>
<td>Section 12, pg. 53-55</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.3.2.3</td>
<td>Water Quality of Public Water Systems</td>
<td>Reviews can be by you or another municipality.</td>
<td>Section 12, pg. 54</td>
<td>SWRCB Drinking Water Program</td>
</tr>
<tr>
<td>9.3.2.4</td>
<td>Domestic Well Sampling, New Well Development</td>
<td>This applies if those data are reported.</td>
<td>Section 12, pg. 53-55</td>
<td>Policy, LAMP, Chp 9.54</td>
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<td>9.3.2.5</td>
<td>Beach Water Quality Sampling, H&amp;S Code §115885</td>
<td>Public beaches include those on freshwater.</td>
<td>None, no beach program at MCDEH</td>
<td>CA H&amp;S Code §115885</td>
</tr>
<tr>
<td>9.3.2.6</td>
<td>Receiving Water Sampling Related to NPDES Permits</td>
<td>This refers to existing data from other monitoring programs.</td>
<td>Section 12, pg. 54</td>
<td>NA</td>
</tr>
<tr>
<td>9.3.2.7</td>
<td>Data contained in California Water Quality Assessment Database</td>
<td>This refers to existing data from other monitoring programs.</td>
<td>Section 12, pg. 54</td>
<td>NA</td>
</tr>
<tr>
<td>9.3.2.8</td>
<td>Groundwater Sampling Related to Waste Discharge Requirements</td>
<td>This refers to existing data from other monitoring programs.</td>
<td>Section 12, pg. 54</td>
<td>NA</td>
</tr>
<tr>
<td>9.3.2.9</td>
<td>Groundwater Sampling Related to GAMA Program Annual Status Reports Covering 9.3.1-9.3.2</td>
<td>This refers to existing data from other monitoring programs. Reports are due 1 February, annually beginning one year after Regional Board approves LAMP. Every fifth year also include an evaluation report. Submit all groundwater monitoring data in Electronic Delivery Format (EDF) for Geotracker; submit all surface water data to CEDEN.</td>
<td>Section 12, pg. 54</td>
<td>NA</td>
</tr>
<tr>
<td>9.4</td>
<td>Not Allowed or Authorized in LAMP:</td>
<td>For Section 9.4 et seq, ensure that your LAMP covers prohibitions.</td>
<td>Section 4, pg. 33, Section 8, pg. 42, Section 10, pg. 49-52, Section 11, pg. 51</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.1</td>
<td>Cesspools</td>
<td>Local Agencies cannot authorize cesspools of any kind or size.</td>
<td>Section 4, pg. 33</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.2</td>
<td>Projected Flow&gt;10,000 gpd</td>
<td>Apply professional judgment to further limit projected flows.</td>
<td>Section 5, pg. 34, Section 9, pg. 47, and Section 11, pg. 54</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.3</td>
<td>Effluent Discharger Above Post-Installation Ground Surface</td>
<td>For example, Local Agencies cannot authorize effluent disposal using sprinklers, exposed drip lines, free-surface wetlands, and ponds.</td>
<td>Section 10, pg. 51</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.4</td>
<td>Installation on Slopes &gt;30% without Registered Professional's Report</td>
<td>See also earlier comments, Section 9.1.1, regarding potential geotechnical concerns.</td>
<td>Section 8, pg. 44-45, and Section 10, pg. 51</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.5</td>
<td>Decreased Leaching Area for IAPMO-Certified Dispersal System with Multiplier &lt;0.70</td>
<td>IAPMO, International Association of Plumbing and Mechanical Officials. Decreased leaching area refers to alternatives to conventional (stone-and-pipe) dispersal systems; these alternatives require relatively less area. The multiplier, &lt;1, allows for a reduction in dispersal field area relative to a conventional system.</td>
<td>Section 9, pg. 48-49</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
</tbody>
</table>
### PROPOSED LOCAL CODES IN COMPLIANCE WITH OWTS POLICY GENERAL REQUIREMENTS FOR LAMPS

<table>
<thead>
<tr>
<th>OWTS Policy Section</th>
<th>OWTS Policy Section Summary</th>
<th>Region 5 Comments (These do not replace your review of OWTS Policy. Italics and websites are specific explanations, more detailed than in the Policy.)</th>
<th>Relevant LAMP Section</th>
<th>Legal Authority/Code Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.4.6</td>
<td>Supplemental Treatments without Monitoring and Inspection</td>
<td>Therefore, ensure that the LAMP describes periodic inspection and monitoring for OWTS with supplemental treatments.</td>
<td>Section 4, pg. 33, Section 8, pg. 45, Section 10, pg. 49-51, Section 11, pg. 51</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.7</td>
<td>Significant Wastes from RV Holding Tanks</td>
<td>We interpret significant amounts to mean amounts greater than incidental dumping, such that volume, frequency, overall strength, or chemical additives preclude definition as domestic wastewater; see Definitions in OWTS Policy. See also, State Water Resources Control Board Order WQ 2014-0153-DWQ, Attachment B-2.</td>
<td>Section 5, pg. 34</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.8</td>
<td>Encroachment Above Groundwater</td>
<td>Bottom of OWTS dispersal systems cannot be less than 2 feet above groundwater, or bottom of seepage pits, less than 10 feet above groundwater. We interpret groundwater to include inter-flow and perched zones, along with the shallowest main unconfined aquifer. Degree of vulnerability to pollution due to hydrogeological conditions, Section 9.1.1, and the Water Quality Assessment, Section 9.3.2., should cover in detail means of assessing seasonally shallowest depth to groundwater.</td>
<td>Section 3, pg. 33, Section 9, pg. 37, Section 10, pg. 49</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.9</td>
<td>Installations Near Existing Sewers</td>
<td>New and replacement OWTS cannot occur on any lot with available public sewers less than 200 feet from a building or exterior drainage facility (exception; connection fees plus construction costs are greater than 2 times the replacement OWTS costs, and Local Agency determines no impairment to any drinking water.)</td>
<td>Section 6, pg. 50 and Section 15, pg. 51</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.10</td>
<td>Minimum Setbacks</td>
<td>These setbacks are from public water systems.</td>
<td>Section 8, pg. 43</td>
<td>Policy, LAMP, Chp 9.54, and 9.28</td>
</tr>
<tr>
<td>9.4.10.1</td>
<td>From Public Supply Wells</td>
<td>If the dispersal system is less than 10' in depth, then the setback must be greater than 150' from public water supply well.</td>
<td>Section 8, pg. 43</td>
<td>Policy, LAMP, Chp 9.54, and 9.28</td>
</tr>
<tr>
<td>9.4.10.2</td>
<td>If the dispersal system is greater than 10' in depth, then the setback must be greater than 200' from public water supply well.</td>
<td></td>
<td>Section 8, pg. 43</td>
<td>Policy, LAMP, Chp 9.54, and 9.28</td>
</tr>
<tr>
<td>9.4.10.3</td>
<td>From Public Supply Wells, Regarding Pathogens</td>
<td>If the dispersal system is greater than 20' in depth, and less than 600' from public water supply well, then the setback must be greater than the distance for two-year travel time of microbiological contaminants, as determined by qualified professional. In no case shall the setback be less than 200'.</td>
<td>Section 6, pg. 38</td>
<td>Policy, LAMP, Chp 9.54, and 9.28</td>
</tr>
<tr>
<td>OWTS Policy Section</td>
<td>OWTS Policy Section Summary</td>
<td>Region 5 Comments (These do not replace your review of OWTS Policy. Italics and websites are specific explanations, more detailed than in the Policy.)</td>
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<tr>
<td>9.4.10.4</td>
<td>From Public Surface Water Supplies</td>
<td>If the dispersal system is less than 1,200' from public water system’s surface water intake, within its drainage catchment, and potentially threatens an intake, then the setback must be greater than 400' from the high water mark of the surface water body.</td>
<td>Section 8, pg. 43</td>
<td>Section 8, pg. 43, Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.10.5</td>
<td>From Public Surface Water Supplies</td>
<td>If the dispersal system is greater than 1,200', but less than 2,500', from public water system’s surface water intake, within its drainage catchment, and potentially threatens an intake, then the setback must be greater than 200' from high water mark of surface water body.</td>
<td>Section 8, pg. 43</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.4.11</td>
<td>Supplemental Treatments, Replacement OWTS That Do Not Meet Minimum Setback Requirements</td>
<td>Replacement OWTS shall meet minimum horizontal setbacks to the maximum extent practicable.</td>
<td>Section 8, pg. 43, Section 9, pg. 47, Section 11, pg. 52-53</td>
<td>Policy, LAMP, Chp 9.54 and 9.28</td>
</tr>
<tr>
<td>9.4.12</td>
<td>Supplemental Treatments, New OWTS That Do Not Meet Minimum Setback Requirements</td>
<td>New OWTS shall meet minimum horizontal setbacks to the maximum extent practicable, and meet requirements for pathogens as specified in Section 10.8. and any other Local Agency’s mitigation measures.</td>
<td>Section 8, pg. 43, Section 9, pg. 47, Section 11, pg. 52-53</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.5</td>
<td>Technical Support of LAMP</td>
<td>Include adequate detail to ensure that the combination of all proposed criteria will protect water quality and public health sufficiently to warrant the Central Valley Water Board’s waiver of Waste Discharge Requirements, pursuant to §13269, California Water Code.</td>
<td>Section 8, pg. 42 and Section 10, pg. 51</td>
<td>Policy, LAMP, Chp 9.54</td>
</tr>
<tr>
<td>9.6</td>
<td>Regional Water Quality Control Board Consideration of LAMP</td>
<td>Regional Boards shall consider past performance of local programs to protect water quality. We will generally consider past performance based on our reviews of annual status and evaluation reports; see Section 9.3.3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E. Rapport, Revised 10 Feb 2015

References:


Young, Megan, USGS Menlo Park, mbyoung@usgs.gov, (650-329-4544)


SECTION 1 - INTRODUCTION, PURPOSE AND OVERVIEW

INTRODUCTION
The California Water Code authorizes the State Water Resources Control Board (SWRCB) to regulate all discharges that could affect the quality of the waters of the state. The policies of the SWRCB are implemented locally through nine regional water quality control boards. Historically, each regional board developed “basin plans” that outlined water quality objectives in their respective jurisdictions as well as policies and programs to achieve those objectives.

Discharges are regulated through the use of Waste Discharge Requirements that act as discharge permits. With regards to the regulation of wastewater in Merced County, the California Central Valley Regional Water Quality Control Board (CVRWQCB) issues discharge permits to the municipalities and special districts that operate wastewater treatment plants in the County. In addition, the CVRWQCB issues storm water permits to the incorporated cities and to the County as well as permits for the use of recycled water.

The CVRWQCB had adopted a general waiver of waste discharge requirements for septic tank and leach field systems, where such systems were regulated by the counties that used the criteria for onsite systems set forth in the Basin Plans. Pursuant to the Water Code section 13269 (b)(2), the CVRWQCB’s general waiver expired on June 30, 2004. Since expiration of the general waiver, discharges from onsite wastewater treatment systems (OWTS) have not been formally authorized by the CVRWQCB.

On June 19, 2012, The SWRCB approved Resolution 2012-0032, adopting the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (Policy). The Policy (hence forth the Policy) was approved by the Office of Administrative Law on November 13, 2012 and became effective six months later on May 13, 2013. The Policy established a risk-based tiered approach for the regulation and management of OWTS statewide and called for incorporation of the Policy requirements into regional water boards’ basin plans within a year of the policy’s effective date.

Under the tiered approach of the Policy, Tier 1 establishes minimum standards for low risk new or replacement OWTS. Tier 2 allows local agencies to develop customized management programs that address the conditions specific to that jurisdiction. These Local Agency Management Programs (LAMP) must be approved by the appropriate regional water quality control board. Tier 3 applies special, enhanced standards to both new and existing OWTS located near a water body that has been listed as impaired due to nitrogen or pathogens pursuant to Section 303(d) of the Clean Water Act. Once approved, the standards contained in an approved LAMP supersede the Tier 1 standards.

The Merced County Department of Public Health, Division of Environmental Health (MCDEH) acknowledges that the Tier 1 standards afford an essential level of public health and water quality protection, but recognizes there are elements in Tier 1 that would preclude property owners from developing on their property relative to current standards. Information presented in this LAMP will provide alternatives to these Tier 1 requirements that are just as protective to public health and water quality.

PURPOSE
The purpose of the LAMP is to set forth an alternative method for the siting, design, operation, and maintenance of OWTS than those specified in the OWTS Tier 1 Policy. The LAMP will prescribe proper mitigation measures that will provide effective sewage treatment and achieve the purpose of the Policy in protecting water quality, while allowing
current use and development of properties within all areas in Merced County. This will additionally enable MCDEH to continue to provide a consistent and feasible regulatory system for OWTS in Merced County while maintaining the highest level of ground and surface water protection.

As examples, the LAMP will address ways to implement the following development practices that deviate from the Policy:

1. The use of leaching pits and sumps in specific areas of the County, constructed to a maximum depth of 50’ below surface grade where MCDEH determines it to be necessary and appropriate.

2. The use of OWTS in cases where the percolation rate is less than or equal to one (1) minute per inch or greater than or equal sixty (60) minutes per inch by requiring a system design that mitigates any impacts and provides for effective disposal.

3. For existing parcels where the current setback requirements cannot be met, the setback requirements from the CVRWQCB’s 1994 Basin Plan document Guidelines for Waste Disposal from Land Developments (Guidelines) will be used.

4. The continued allowance of one acre parcels with private or public water and an OWTS, as appropriate, based on soil suitability and other loading studies and reliance on Advanced Treatment Units (ATU’s).

PLAN STRUCTURE
This plan is structured to include all required information as specified in the Policy relating to Tier 2 – Local Agency Management Programs. Related topics are grouped into separate sections for easier reference, as indicated in the Table of Contents.

AUTHORITY
California Water Code, Section 13260, requires any person discharging or proposing to discharge waste to file a report of waste discharge to the appropriate CVRWQCB.

California Water Code, Section 13291, requires the State Water Board to adopt regulations or standards for the permitting and operation of all OWTS in the state. On June 19, 2012, the State Water Board adopted the Policy to satisfy this requirement. The standards provided in the Policy carry the same substance as regulations and are enforceable.

The Policy provides for local agencies to submit management programs to the CVRWQCB, and once approved, manage the installation of new and replacement OWTS under that program.

Water Code section 13282, allows Regional Water Quality Control Boards to authorize a local public agency to issue permits for and to regulate OWTS “to ensure that systems are adequately designed, located, sized, spaced, constructed and maintained.” The CVRWQCB, with jurisdiction over Merced County, authorizes MCDEH to issue certain OWTS permits within unincorporated areas.

SWRCB Order WQ 2014-0153-DWQ, the General Waste Discharge Requirements for Small Domestic Wastewater Treatment Systems, dated September 23, 2014, is the general order providing directives for discharges from all types of small domestic wastewater treatment systems and is complementary to the Policy.
California Health and Safety Code, Section 5410 et seq. provides authority for local Health Officers and Directors of Environmental Health to abate discharges of “sewage or other waste, or the effluent of treated sewage or other waste in any manner which will result in contamination, pollution, or a nuisance.”

California Health and Safety Code, Section 5461 states that “Any person who discharges sewage or other waste in any manner which results in contamination is guilty of a misdemeanor.”

California Health and Safety Code, Section 106615(e) defines the scope of practice in environmental health as “the practice of environmental health by registered environmental health specialists in the public and private sector within the meaning of this article and includes, but is not limited to, organization, management, education, enforcement, consultation, and emergency response for the purpose of prevention of environmental health hazards and the promotion and protection of the public health and the environment in the following areas: food protection; housing; institutional environmental health; land use; community noise control; recreational swimming areas and waters; electromagnetic radiation control; solid, liquid, and hazardous materials management; underground storage tank control; onsite septic systems; vector control; drinking water quality; water sanitation; emergency preparedness; and milk and dairy sanitation pursuant to Section 33113 of the Food and Agricultural Code.

California Health and Safety Code, Section 106620, states “Except for the design of onsite septic systems, nothing in this article shall authorize registered environmental health specialists to design any of the fixed works defined in Section 6731 of the Business and Professions Code.”

The Policy provides a risk-based, tiered approach for the regulation of OWTS and retains implementation at the local level. The Policy also recognizes the diversity of California’s geology, hydrology, geography, and meteorology and allows local agencies to vary from the prescribed standards in the Policy under an approved LAMP that provides for alternative standards while maintaining the same level of surface and ground water protection.
SECTION 2 - HISTORY AND COUNTY CHARACTERISTICS

HISTORY OF LOCAL SEWAGE STANDARDS

Merced County records show OWTS have historically been regulated at the local level, with those systems generating significant volumes of waste or non-domestic wastes being referred to the CVRWQCB for oversight.

In the late 1940's the Dickey Water Pollution Act was established to create the California Water Pollution Control Board in response to degradation of water quality. In the early 1950s, the California Regional Water Pollution Control Board waived the filing of reports for discharges from individual sewage disposal systems in those counties having satisfactory ordinances or regulations. On December 15, 1972, the CVRWQCB incorporated the Guidelines for Waste Disposal from Land Developments into the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins. These guidelines provided standards designed to be protective of surface and ground water and public health. Shortly after, Merced County developed and implemented our Minimum Design Standards – Operation and Maintenance Site Evaluation for On-Site Sewage Disposal Systems Guidelines to be consistent with the CVRWQCB Guidelines and have implemented the requirements since that time.

Merced County has worked to maintain a consistent, comprehensive local regulatory program for OWTS while conforming to the changes outlined in the Policy and the SWRCB Order WQ 2014-0153-DWQ dated September 23, 2014 by reviewing and updating local standards and guidelines relating to OWTS and now by preparing a draft LAMP and converting the Minimum Design Standards – Operation and Maintenance Site Evaluation for On-Site Sewage Disposal Systems Guidelines to a new ordinance, Merced County Chapter 9.54 Regulation of Onsite Wastewater Treatment Systems. On December 6, 2016, the Merced County Board of Supervisors approved and adopted Merced County Code, Chapter 9.54, Regulations for Onsite Wastewater Treatment Systems, (Chapter 9.54) in transition to this LAMP and the Policy.
COUNTY CHARACTERISTICS AND COMPOSITION
The County encompasses approximately 1,237,760 total acres, or 1,934 square miles with a total population of about 268,445 (2015 Census data). Merced County was founded in 1855 and has six incorporated cities (see Figure 1).

FIGURE 1: MERCED COUNTY
Annual precipitation within Merced County varies as displayed in Figure 2 below.

**FIGURE 2: MERCED COUNTY PRECIPITATION**

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**SECTION 3 - GROUNDWATER AND HYDROGEOLOGY**

**BASIN BOUNDARIES**

As defined through the California Department of Water Resources’ Bulletin 118 (2004) and updates (2016), Merced County overlies the Los Banos Creek Valley Basin and the Turlock, Merced, Chowchilla, and Delta-Mendota Subbasins of the San Joaquin Valley Groundwater Basin (referred to collectively in this document as the Merced County Groundwater Basins (see Figure 3). Bulletin 118 delineates basins and subbasins by geologic and hydrologic barriers, with some considerations made to more easily facilitate water resources management, data analysis, and basin adjudication. The Merced County Groundwater Basins underlie approximately 1,500 square miles of the County, or roughly 77% of the total area of the County. The Turlock, Merced, and Chowchilla Groundwater Subbasins are located east of the San Joaquin River while the Delta-Mendota Subbasin and the Los Banos Creek Valley Basin are to the west of the river. The Turlock, Chowchilla, and Delta-Mendota Subbasins all continue outside of Merced County boundaries and all adjacent subbasins of the San Joaquin Valley Groundwater Basin have interconnected aquifer systems. The boundaries of each Merced County basin and subbasin are described below.
FIGURE 3: MERCED COUNTY GROUNDWATER SUBBASINS

The Turlock Subbasin, part of the San Joaquin Valley Groundwater Basin, covers the area east of the San Joaquin River, north of the Merced River, and extends out of the County lines to the north (ultimately bounded to the north by the Tuolumne River). To the east, it is bounded by the crystalline basement rock of the Sierra Nevada foothills. Merced County incorporates a portion of the Turlock Subbasin between the County line and the Merced River, which includes the Dry Creek watershed.

The Merced Subbasin, part of the San Joaquin Valley Groundwater Basin, is the largest subbasin in the County and is bounded on the west by the San Joaquin River, on the north by the Merced River, on the east to the crystalline basement rock of the Sierra Nevada foothills, and on the south by either the Chowchilla River, the County line, or the northern boundaries of the Chowchilla Water District.

The Chowchilla Subbasin, part of the San Joaquin Valley Groundwater Basin, includes a small portion of Merced County, with the majority of the subbasin to the south in Madera County. The subbasin encompasses the area east of the San Joaquin River and south of the Chowchilla River, with its northern boundary in some parts defined...
instead by the northern boundaries of the Chowchilla Water District and the County line. The Merced County portion of the subbasin is limited to the areas of the Chowchilla Water District within the County.

The Delta-Mendota subbasin, part of the San Joaquin Valley Groundwater Basin, is bounded on the east by the San Joaquin River and on the west by the Diablo Range, part of the California Coast Ranges. Tertiary and older marine sediments of the Coast Ranges define the western boundary of the Delta-Mendota Subbasin. To the east of the subbasin are the Turlock, Merced, and Chowchilla Subbasins. The basin is bounded by the Stanislaus/San Joaquin County line to the north and the Tranquility Irrigation District boundary to the south.

The Los Banos Creek Valley Basin is located in a valley within the Diablo Range in western Merced County. The subbasin is bounded by Upper Cretaceous marine sediments on the north and the Franciscan Formation to the south. Unlike the subbasins discussed above, the Los Banos Creek Valley Basin is not a subbasin of the San Joaquin Valley Groundwater Basin. Due to a lack of development in the Los Banos Creek Valley Basin, this basin is not described further in this document.

WATER BEARING FORMATIONS AND KEY CONFINING UNITS

Water bearing formations of significance in the Merced County subbasins of the San Joaquin Valley Groundwater Basin can generally be categorized into unconsolidated deposits and consolidated rocks with aquifers contained within unconsolidated rocks yielding the vast majority of groundwater supplies within the County. Consolidated rocks include the Mehrten Formation, Valley Springs Formation, Ione Formation, and Basement Complex. With the exception of the Mehrten Formation, the consolidated rocks in the area generally yield little water compared to the unconsolidated sediments. The Mehrten Formation is considered to be the oldest fresh water-bearing formation in the basin, although the underlying Valley Springs Formation produces minor quantities of water (DWR, 2006). The unconsolidated deposits grouping includes two of the most important water bearing formations, the older alluvium and the continental deposits, along with lacustrine and marsh deposits, younger alluvium, and flood-basin deposits. The continental deposits and older alluvium are the primary sources of groundwater in the County, along with some water from the Mehrten Formation. Although the lacustrine and marsh deposits, flood-basin deposits, and younger alluvium bear water, they yield little to wells (Page, 1977). The regionally extensive Corcoran Clay and shallow clay lenses act as aquitards in the subbasins, limiting the vertical migration of water.

The generalized stratigraphy of Merced County is shown in Figure 4. Two separate geologic maps cover the County and are presented in Figure 5 and Figure 6.

Typically, there are three groundwater bodies in the area: an unconfined water body, a confined water body, and the water body in consolidated rocks. Information on water bearing units and groundwater conditions was derived primarily from the California Department of Water Resources’ Bulletin 118 (DWR, 2004) and studies of local geology.
FIGURE 4: GENERALIZED STRATIGRAPHIC COLUMN OF GEOLOGIC UNITS

EXPLANATION

UNCONSOLIDATED DEPOSITS

Younger alluvium, flood-basin deposits, and older alluvium

Lacustrine and marsh deposits (E-clay)

Continental deposits

UNCONFORMITY

CONSOLIDATED ROCKS

Mehrun Formation

Valley Springs Formation

UNCONFORMITY

Lone Formation

UNCONFORMITY

PRE-TERTIARY

Basement complex

Geologic contact

Approximate base of water with specific conductance generally less than 3,000 micromhos per centimeter

FIGURE 5: GEOLOGY OF MERCED COUNTY, NORTHERN PORTION

FIGURE 6: GEOLOGY OF MERCED COUNTY, SOUTHERN PORTION

Source: Jennings and Strand, 1958)

UNCONSOLIDATED DEPOSITS

YOUNGER ALLUVIUM
Pleistocene-Holocene aged alluvium are the youngest sediments in the region and are referred to as the “younger alluvium.” Younger alluvium is composed of fine sand, sand, and gravel and is interbedded with flood-basin deposits in the west. These deposits occur as narrow bands along river channels in the area and are 100 feet at its thickest (Page and Balding, 1973). The younger alluvium yields small to moderate quantities of water because the alluvium is not completely saturated in most areas (Page and Balding, 1973).

FLOOD-BASIN DEPOSITS
Flood basin deposits in Merced County are unconsolidated deposits which include silt, clay, organic material, and fine sand of Holocene-age (DWR, 2004). In the subsurface, the flood basin deposits are interbedded with the younger alluvium. Flood basin deposits reach a maximum thickness of 100 feet. However, due to the small hydraulic conductivity of these generally clayey deposits, the flood basin deposits yield little water to wells (Page and Balding, 1973).

LACUSTRINE AND MARSH DEPOSITS
Pleistocene-aged lacustrine and marsh deposits are composed of a bed of gray and blue silt, silty clay, and clay interbedded with older alluvium (Page and Balding, 1973). Due to its clay rich composition, the lacustrine and marsh deposits restrict the vertical movement of water and function as confining beds by dividing water bearing deposits into confined and unconfined aquifers. These confining beds are further divided into the Pleistocene-aged Corcoran Clay (or “E-Clay”) and a Holocene-age shallow clay bed (Page, 1977).

The shallow clay bed is composed of oxidized sandy clay, clay, and clay with silica cemented (hardpan) intervals. This bed occurs at shallower depths than the Corcoran Clay, ranging in depth from zero to 35 ft. (Page, 1977). This bed does not yield water to wells.

The Corcoran Clay is a regionally extensive fine-grained unit that is typically present along the axis of the San Joaquin Valley (Page and Balding, 1973), including in Merced County. The diatomaceous clay unit underlies
approximately 5,000 square miles of the San Joaquin Valley. In Merced County, the Corcoran Clay is generally located along the axis of the valley, between Interstate 5 and Highway 99. The top of the Corcoran in the County ranges in depth from approximately 50 to 300 feet as shown in Figure 7, with the shallowest conditions in the east, near Highway 99, and the deepest conditions in the west, near Los Banos, Gustine, and along the Union Pacific Railroad tracks that connect those cities (DWR, 1981). The thickness of the Corcoran is also variable, ranging from zero to approximately 120 feet, as shown in Figure 8 (Page, 1986). A shallow, unconfined aquifer occurs in the unconsolidated deposits above and east of the Corcoran Clay and a confined aquifer occurs in deposits underlying the Corcoran Clay (Hamlin, 1993). The extensive drilling of wells through the Corcoran Clay is thought to have reduced the confining nature of the unit, as some water can pass through the bores in the clay (RMC, 2013).

**FIGURE 7: DEPTH TO CORCORAN CLAY IN MERCED COUNTY**

Source: DWR, 1981
OLDER ALLUVIUM

Pleistocene-Holocene aged alluvium is referred to as the “older alluvium” and is composed of beds of gravel, sand, silt, and clay. The older alluvium is most prominent in the western part of the County and underlies eroded hills and nearly flat-lying plains. These deposits range from zero to 400 feet in thickness in the northern half of the County and up to 700 feet thick in the south. In many places, the older alluvium is coarser grained than the underlying continental deposits, and this serves to define the base of the older alluvium deposits. The older alluvium is one of the most developed aquifers in the County and yields water to domestic, irrigation, industrial, and public-supply wells. Yields to wells from this aquifer historically averaged 1,900 gallons per minute (gpm), but have been as large as 4,450 gpm. The specific capacity of the wells in the aquifer is generally smaller in the east where wells penetrate older rocks and deposits than the specific capacity in the west. Smaller specific capacity in the east indicates smaller transmissivity in the area where consolidated rocks crop out (Page and Balding, 1973).
CONTINENTAL DEPOSITS
The continental deposits are of Pliocene and Pleistocene age and consist of poorly sorted gravel, sand, silt, and clay. These deposits are generally finer grained than the overlying older alluvium. The thickness of this deposit ranges throughout the County and generally thins to the north. In southern Merced County, continental deposits range from zero to 700 feet in thickness, while to the north the deposits range from zero to 450 feet. Continental deposits are one of the most productive aquifers as they yield up to 2,100 gpm (Page and Balding, 1973).

CONSOLIDATED ROCKS

MEHRTEN FORMATION
The Mehrten Formation is late Miocene to Pliocene in age and consists of fluviatile deposits of sandstone, breccia, conglomerate, tuff, siltstone, and claystone (Page and Balding, 1973). The formation ranges in thickness between approximately 200 feet thick in east Merced County to over 600 feet thick in the southwest and underlies the identifiable, nearly flat-topped hills in the east (Hamlin, 1993). The Mehrten aquifer has variable hydraulic conductivities, ranging from 0.01 to 67 feet per day (ft/day), and therefore yields from the Mehrten differ greatly. In general, according to the DWR, the Mehrten averages a yield of approximately 1,000 gpm and a horizontal transmissivity of approximately 9,100 square feet per day (ft²/day) (Page and Balding, 1973).

VALLEY SPRINGS FORMATION
The Valley Springs Formation is an Eocene-aged fluvial sequence of rhyolitic ash, sandy clay, and siliceous gravel within a clay matrix (Page and Balding, 1973). The Valley Springs Formation easily erodes to form the valleys between the Ione Formation and the overlying Mehrten Formation. The low-permeability of the formation defines the eastern edge of Merced County Groundwater Basins. The Valley Springs Formation reaches a maximum thickness of 270 feet (Arkley, 2009). This formation is a small-yield aquifer, attributed to the fine ash and clay matrix, with a moderate hydraulic conductivity and a specific capacity of approximately 30 gpm per foot of drawdown (Page and Balding, 1973).

IONE FORMATION
The Ione Formation is composed of Eocene-aged sandy clay, conglomerate beds, kaolinitic clay, and sandstone (Page and Balding, 1973; Arkley, 2009). The Ione consists predominately of fluvial deposits, but also includes lagoonal and shoreline marine deposits, as indicated by fossil pelecypods (clams) found in its uppermost layers near Merced Falls (Arkley, 2009). The formation ranges in thickness from 200 ft. up to 800 ft. in the west, in areas where the Ione is underlain by unnamed gray micaceous shale, sandstone, and conglomerate (Arkley, 2009; Page and Balding, 1973). The Ione Formation does not yield large quantities of water due to the compact nature of its sandstone and conglomerates and the clay-rich matrix. The consolidated rocks and clay of the Ione restricts the movement of water in places, and it is presumed water is perched and confined in the Ione (Page and Balding, 1973).

BASEMENT COMPLEX
The basement complex represents the oldest rocks in the area, pre-Tertiary in age (Page and Balding, 1973). This complex is composed of igneous and metamorphic rocks, specifically, strongly folded meta-andesite and slate (Arkley, 2009). The crystalline basement rock defines the eastern boundary of the groundwater/alluvial basin of the Merced Region from the fluvial and fractured rock systems of the surrounding watersheds further east. Basement complex rocks are the source rocks for the eroded sediments found west of the Sierra Nevada foothills. In areas
where the basement complex rocks outcrop near the surface, fractures within the bedrock contain sufficient groundwater for domestic or stock supplies (AMEC Geomatrix, 2009). Although faulting has occurred in the basement complex, it has not influenced the general movement of groundwater in the area (Page and Balding, 1973). While the fractures and joints in the complex yield small quantities of water, this formation is otherwise considered impermeable.

GROUNDWATER LEVEL TRENDS

Current and historical groundwater pumping rates are generally considered to exceed the sustainable yield of the underlying groundwater subbasins on an average annual basis. Groundwater overdraft is a problem specifically for southeast portions of the County near El Nido and Le Grand, as well as the Eastside Water District in the northern portion of the County. Historically and recently, subsidence has been greatest in the El Nido area and pumping depressions have also developed near Turlock and Atwater (RMC, 2013). The Merced subbasin alone saw a decrease in storage of approximately 720,000 acre-feet between 1980 and 2007, while groundwater levels in the Chowchilla subbasin declined 40 feet from 1970 to 2000 (Nolte, 2009). In response to declining groundwater levels, Merced Irrigation District implemented a series of program improvements in the 1990s to recharge the aquifer system through in-lieu and direct recharge (Nolte, 2009).

The Sustainable Groundwater Management Act of 2014 (SGMA) requires actions to be taken to achieve basin sustainability over time and was enacted to address this type of overdraft issue.

County-wide depth to groundwater level data is presented in Figure 9 and Figure 10 for the years 1963 and 1999, derived from groundwater elevation data from DWR (2015). 1999 is provided as a relatively recent period of higher groundwater elevations, while 1963 presents the period of highest groundwater elevations over DWR’s period of record, which extends to 1962. Generally, depth to groundwater increases near the Sierra Nevada and Diablo Ranges as ground surface elevation increases towards the foothills and are also influenced by groundwater extraction. Depths to groundwater reach a depth of 100 – 150 feet below ground surface (bgs) in the southeast portion of Merced County (Nolte, 2009).

Shallow groundwater in the County has caused waterlogging issues in many areas. This includes portions of the west side of the County, where tile drains are utilized to provide adequate drainage for agriculture. Additionally, there are existing and historical waterlogging conditions in the eastern portions of the County, generally between the cities of Atwater and Livingston, west of Highway 99 and north of Highway 140, which in some cases has required surface draining. These high groundwater level conditions can coexist with declining deep-aquifer conditions described earlier due to confining layers and hardpans that can slow the downward migration of groundwater, pooling water on top of these layers in what is termed a perched aquifer. Often this perched aquifer system is not utilized for supplies due to limited volumes or poor quality, resulting in preferential extraction in deeper aquifers resulting in overdraft at depth and little to no utilization of the shallowest aquifers resulting in waterlogging issues.
FIGURE 9: DEPTH TO GROUNDWATER - 1963

Source: RMC, 2016
SECTION 4 - SOILS

SOILS OVERVIEW
Merced County issues OWTS permits and provides design recommendations or restrictions for waste water treatment based on the local soil. Merced County soils can be generally divided by the San Joaquin River into two distinct units for soils and geology, east of the San Joaquin River and west of the San Joaquin River. The distinction is largely drawn from different source materials for the sediments: the Sierra Nevada on the east and the Diablo Range on the west. This, along with climatic and other differences, impacts surface soils and the geology.

Information on soils are contained within the United States Department of Agriculture – Natural Resources Conservation District’s (USDA-NRCS’s) soil surveys, with two surveys covering Merced County:

Eastern Merced: Soil Survey, Merced Area (USDA, 1991)

Western Merced: Soil Survey of Merced County, California Western Part (USDA, 1990)
Hydrologic soil groups are a classification defined by the USDA-NRCS and based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. The soils are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). “A” is classified as having a high infiltration rate, declining to “D” with the lowest, the latter having the highest potential for runoff. Figure 11 shows the distribution of these four soil types throughout Merced County. Hydrologic soil groups can help identify soils best suited for OWTS by identifying areas that may drain too slowly (e.g., D soils) or too quickly (e.g., A soils).

In addition to the hydrologic soil groups, soils are rated by USDA-NRCS based on the properties that affect absorption of the effluent, construction, maintenance of the OWTS, and public health. Factors include saturated hydraulic conductivity, depth to water table, slope, underlying absorption field, and depth to bedrock. Soils must be properly suited, or special design may be needed, as ill-fitting soils for disposal can lead to groundwater contamination or surfacing of effluent in downslope areas. Figure 12 identifies soils suitability for septic tank effluent absorption. Soils are ranked by how limited their use may be. The highest rating “not limited” indicates that the soil has features that are very favorable for the specified use. A rating of “very limited” indicates the soil has one or more features that are unfavorable for the specified use and are expected to perform poorly and require excessive maintenance. Very limited soils often cannot be overcome with soil reclamation, special design, or expensive installation procedures.

![FIGURE 11: HYDROLOGIC SOIL GROUPS](image-url)
FIGURE 12: SUITABILITY FOR SEPTIC TANK ABSORPTION FIELDS

In eastern Merced County, the soils consist of coarse sediments from volcanic and granitic material eroded and transported from the Sierra Nevada to the east via the Merced, Chowchilla, and San Joaquin Rivers (Merced County, 2012). As shown in the soil association map in Figure 13, soils in southern portion of eastern Merced County are dominated by poorly drained alkali basin soils. Inadequate drainage in these soils contributes to the shallow groundwater levels in this area, with some areas exhibiting groundwater within five feet of the ground surface (AECOM, 2009). Soils with the highest infiltration rates are confined to the northwest quadrant of eastern Merced. Hardpan layers, those found in the lacustrine and marsh deposits, act as barriers to the downward movement of water and reduce the overall permeability of the soil. The hardpan underlies most of the County and is found at shallow depths ranging from zero to 35 ft. below ground surface (Page, 1977). Hardpan layers are a major cause of the low infiltration and high runoff rates characteristic of the soils found in Merced County.

The mineral composition and manner of deposition are highly variable amongst the alluvium: some fresh and unweathered and some weathered for thousands of years. The texture ranges from clay and silt in the lower basin area to gravel and cobblestones in the terraces in the north. Soils of the alluvial fans and flood plains cover approximately 341 square miles in eastern Merced. Small alluvial fans occur along the Merced River flood plain, the San Joaquin River, and along minor streams in Merced. Most of the soils in these fans are sandy and are made up of older alluvium (USDA, 1991). Many of these floodplains were subject to flooding, like those along the Merced River flood plain, but flood control systems protect these areas from flooding and, as a result, these areas receive
very little new alluvium. The soils of alluvial fans and flood plains are typically classified in hydrologic soil groups A and B and are well drained. Group D soils are typically soils of the high and low terraces.

**FIGURE 13: USDA GENERAL SOILS OF EASTERN MERCED COUNTY**

![Soil Map of Eastern Merced County](image)

Source: USDA, 1991

**WESTERN MERCED (WEST OF THE SAN JOAQUIN RIVER)**

The soils of western Merced County are typically composed of alluvium developed from the marine sedimentary and granitic rocks of the Diablo Range. Resulting soils are predominantly finer textured than those east of the San Joaquin River, and range from loam to clay soils (Merced County, 2012). The majority of soils are very deep and poorly drained (USDA, 1990) commonly formed during seasonal flooding. Soils are categorized by geography and include the classifications of soils of the foothills of the Diablo Range, soils on the mountains and valleys of the Diablo Range, soils on terraces, and soils on alluvial plains. Only soils located at the foothills of the Diablo Range tend to be well drained (USDA, 1990). Specific soil associations identified in western Merced County are exhibited in Figure 14. Some western County soils contain high salt concentrations, and some areas exhibit toxic concentrations of selenium (Merced County, 2012).

Agricultural drainage is a major issue in western Merced County. As described by DWR (2015), the drainage problem is an outgrowth of imported water, naturally saline soils, and the valley’s distinctive geological makeup which prevents effective natural drainage in certain areas. Soils on the western side of the valley come from the marine sediments that make up the Coast Range. These soils, high in salts and trace elements, are similar to those
that occur in the ocean. Also, just below the surface of much of the valley's soil, is a shallow clay layer that obstructs vertical movement of irrigation water. As salts and minerals from surface soils are leached into the shallow groundwater, the water table rises to within a few feet of the surface and into the root zone. Unless this water is removed, crops growing in these soils eventually die. Figure 15 shows areas identified by DWR as having existing and potential drainage problems. Note that this analysis focuses on the unique drainage needs and unique federal and state involvement in those drainage needs, and, as such, does not necessarily consider drainage issues in other parts of the County.

FIGURE 14: USDA GENERAL SOILS OF WESTERN MERCED COUNTY

Source: USDA, 1990
FIGURE 15: DRAINAGE PROBLEM AREAS

Source: DWR, 2015
GROUNDWATER PROTECTION EFFORTS

Local land use ordinances, policies and activities support efforts to protect groundwater quality throughout the Basin. Merced County Well standards (Chapter 9.28 - Wells) were adopted in 1975 to ensure the adequate construction of wells to prevent contamination, pollution, and degradation of groundwater and to eliminate potential cross-connections with surface and subsurface contaminants. Merced County Well standards meet or exceed the requirements found in the California Well Standards Bulletin 74-81 and 74-90.

For areas in the County where groundwater is known to be impacted by contaminants, deeper well grout seals may be required. In addition, wells that are in a state of disrepair or are no longer used are required to be destroyed in a manner that prevents future migration of contaminants and protects groundwater.

The nature and extent of groundwater contamination issues in Merced County is monitored and tracked through the land use, site mitigation, state small public water, and emergency response programs. Groundwater quality records and data obtained through these programs are tracked using the MCDEH database and is available for evaluation and reporting purposes. Merced County has developed and adopted an Integrated Regional Water Management Plan (IRWMP) effective November 2013, a novel Groundwater Mining and Export Ordinance effective April 2015, and has recently completed a Surface Water and Groundwater Interactive Model on the Department of Water Resources IWFM platform supporting SGMA efforts (see Figure 16).

FIGURE 16: MODELING IMAGE OF THE MERCED SUBBASIN
OTHER CONSIDERATIONS RELATING TO OWTS GROUNDWATER QUALITY PROTECTION

In Merced County, most OWTS are installed in the alluvium of the basin with adequate soil thickness and separation from leach field to groundwater. Fractured rock may be found in areas of higher elevations but these areas are sparsely populated and OWTS installed at these locations are based on a site specific soil suitability study that mitigates potential impacts. OWTS located in poorly drained soils may utilize deeper leach lines with leaching pits or vertical leaching pit designs. The depth of leaching pits or sumps are at times 35 to 50 feet below surface with separation to groundwater of at least 10 feet. However, most of these areas have a separation to groundwater of at least 50 feet. OWTS installed in areas in the County with shallow depth to water are also mitigated by appropriate OWTS design (special systems). All systems installed meet a minimum separation of five feet from bottom of horizontal leach trench to seasonal high groundwater. The minimum soil cover for standard systems is at least 6” below surface for pressure systems and 12” below surface for standard gravity systems. In addition, Merced County remains predominately agricultural based and rural housing is mostly low density. Higher density subdivisions are limited in number, are located in areas with adequate soil thickness and separation to ground water, and usually utilize a centralized public water system. Where centralized public waste water is not proposed in a subdivision and certain commercial properties, MCDEH’s Nitrogen Reducing System/Advanced Treatment Systems requirements apply [implemented in 2005 and described in Merced County Code, Chapter 9.54 Regulations for Onsite Wastewater Treatment Systems (Chapter 9.54)].

Merced County follows the guidance provided by the Basin Plans and State Water Resources Control Board (SWRCB) policies in regulating OWTS with the protection and preservation of the high quality of groundwater as a goal. These policies include SWRCB Resolution 68-16 – Statement of Policy with Respect to Maintaining High Quality of Waters in California and Resolution 88-63 – Sources of Drinking Water. The groundwater in Merced County has been designated as suitable or potentially suitable, at a minimum, for municipal and domestic water supply, agricultural supply, industrial service supply and industrial process supply. Merced County has historically adopted OWTS standards as found in the Basin Plan intended to provide protection to groundwater quality, including minimum setbacks. Development projects that show potential impact to groundwater and cannot use typical OWTS are required to install alternative engineered designed systems or advance treatment units to mitigate potential impacts. Minimum setbacks from OWTS to surface waters are enforced and currently there are no 303(d) listed waterways in Merced County shown to be impacted from OWTS activities.

The suitability of a parcel for OWTS usage is determined through site specific studies that address hydraulic loading, nitrogen loading, and minimum usable disposal areas for the current and future OWTS. Chapter 9.54 requires septic tanks for all OWTS; all septic tanks must be water tight; cesspools and redwood tanks are prohibited. Any cesspool or other non-conforming septic tank is required to be destroyed under permit (Chapter 9.54). Chapter 9.54, Section 9.54.130, Conflicting regulations, indicates where there is a conflict between the regulations of this chapter and any other chapter of local, state or federal regulation, the greater or more stringent regulation or restriction shall apply and shall be enforced by persons authorized in this chapter.

Merced County’s OWTS program meets or exceeds most elements found in Tier 1 of the Policy. The few instances of deviation from Tier 1 will be itemized in detail in Section 10 of this document, along with technical support for each item.

SEPTAGE DISPOSAL

The MCDEH currently permits approximately 40 active pumper trucks and requires the septage to be disposed of at wastewater treatment plants permitted by the CVRWQCB, in accordance with California Health and Safety Code Sections 117415-117420. Required pumping reports are to be submitted to the MCDEH each month
following the pumping activity. These pumping reports are reviewed and maintained for future reference and will be utilized to satisfy reporting requirements established in the Policy.

SECTION 5 - PLAN SCOPE, AND LOCAL RESPONSIBILITY

SCOPE OF REGULATED OWTS
The MCDEH has jurisdiction over OWTS that receive only domestic wastewater from residential or commercial buildings with an average daily flow of less than 10,000 gallons per day. The RWQCB regulates larger wastewater treatment systems that treat average daily flows of 10,000 gallons or more per day and systems receiving significant amounts of waste from RV holding tanks. Most OWTS are installed using standardized designs based on percolation rates, loading rates, soil types and depth to water. Standard systems consist of shallow filter beds or leach lines depending on the area. MCDEH standard designs meet or exceed the design criteria in the Policy. Alternative Special Systems (designed by a qualified professional) are used when needed to mitigate certain issues, such as low permeability soils or shallow depth to water, and these may include mound and pressure dose systems. In addition, Alternative Treatment (ATS) or Advance Treatment (ATU) systems are utilized to address potential water quality issues.

LOCAL RESPONSIBILITY
MCDEH has regulated OWTS in Merced County for over 50 years using local guidelines and standards and regulation, and is in part, a function of our local land use processes. Chapter 9.54 provides regulations for the site evaluation, permitting, design, construction, operation, maintenance and destruction of OWTS. These regulations are in place to ensure systems are adequately designed, located, sized, spaced, constructed and maintained to prevent the creation of a nuisance, ensure there are no hazards to public health, and to protect potable water supplies, groundwater, and surface waters within Merced County boundaries.

PERMIT RECORDS AND PERMIT TRACKING
Merced County has maintained OWTS permit records since the 1950’s. Older records are stored in paper form, currently; OWTS permits starting in the mid-1990’s are maintained in a secure database. Older paper permits are currently being evaluated for indexed imaging. Records are available for review within ten days upon request through the Public Records Act process.

Since the mid 1990’s in addition to the paper permit, data relating to the location and type of permit has been collected and stored in MCDEH’s database. The database contains information in a variety of data fields that include details regarding permitting, inspections, compliance/enforcement action, complaint actions, and other OWTS details. Permits issued by the MCDEH will identify and document local OWTS activities in accordance with established Policy Tiers.

REPORTING
Merced County will submit by February 1 of each year an annual report to the CVRWQCB, organized in a tabular spreadsheet format, to include the following information:

1. The number and location of complaints.
2. The applications and registrations issued as part of the local septic tank cleaning registration program.
3. The number, location, and description of permits issued for new and replacement OWTS. The Tier the permit was issued under will also be reported. All permits issued by the MCDEH will be considered Tier 2 permits for the purposes of reporting pursuant to Policy section 3.3.3.

4. Every fifth year, an evaluation report of the local Water Quality Assessment Program (WQAP) will be submitted to the CVRWQCB. This report will evaluate the monitoring program, will assess whether water quality is being impacted by OWTS, and will identify any further actions, including changes to the LAMP, that may be warranted to protect water quality or public health.

5. The MCDEH will provide available OWTS records to the CVRWQCB within ten days of being requested. Any groundwater monitoring data generated will be submitted in electronic deliverable format for inclusion into Geotracker, surface water data will be provided in a Surface Water Ambient Monitoring Program (SWAMP) compatible format for inclusion into the California Environmental Data Exchange Network (CEDEN) where required.

6. OWTS related complaints are entered into MCDEH’s secure database. Surfacing raw sewage complaints receive immediate attention including a site inspection by MCDEH staff. Site specific conditions observed while responding to OWTS related complaints are documented in the MCDEH database, correspondence is generated and directed to the property owner requesting compliance. Notices of Violation and Notices to Abate establish compliance objectives and due dates. Compliance dates are documented in the MCDEH database. MCDEH reports regarding OWTS complaints and outcomes to the CVRWQCB will be derived from MCDEH’s database. Records are available for review within ten days upon request through the Public Records Act process.

SECTION 6 - PERMITTING, INSTALLATION, AND INSPECTION REQUIREMENTS

LAND USE PROCESS

OWTS considerations begin with each new land use project. All land use projects in Merced County are required to conform to the goals and strategies noted in the Merced County General Plan (General Plan) and the requirements in the Merced County Subdivisions and Zoning Codes. The General Plan goal for new land use projects is to provide a well-balanced and orderly development pattern to protect the County’s natural resources, public health, and the environment. The Subdivisions and Zoning Codes requires that provisions of adequate infrastructure for wastewater disposal are consistent with the General Plan’s goal and do not degrade the quality of waters of the state.

MCDEH serves as an integral part of the land use referral process in Merced County. Land use referrals are internal referrals from the Merced County Community and Economic Development Department (CEDD) to MCDEH. MCDEH sets conditions for land use proposals where OWTS are contemplated to ensure the proposed project does not cause a negative impact to public health and the environment, that adequate infrastructure for wastewater disposal is provided in accordance with the General Plan, the Subdivisions and Zoning Codes, and Chapter 9.54. CEDD is the lead agency for subdivisions of land and development projects in the unincorporated area. Land use review processes by MCDEH are initiated when CEDD refers and routes applications to MCDEH for comments and approval.

MCDEH conducts site inspections as requested by CEDD for referred subdivisions and other projects to determine the conditions required to ensure compliance with Subdivisions and Zoning Codes, including wastewater disposal. Conditions for the project’s approval are determined and submitted to the CEDD, including requirements for OWTS siting and design. Soil suitability, nitrate loading studies, and soils reports are required for projects where
an OWTS is utilized or proposed and does not fall under the jurisdiction of the CVRWQCB. Merced County Building permit reviews performed by MCDEH staff rely on similar processes.

SOIL SUITABILITY AND NITRATE LOADING STUDIES
The soil suitability, nitrate and other loading studies determines if the site conditions are suitable for the use of an OWTS based on the following criteria:

1. The intensity and extent of the existing and the proposed development project's use of septic tanks within and around the area;
2. The suitability of the soil for utilizing septic systems, including percolation rates, loading rates, and soil profiles;
3. The depth and gradient of the water table;
4. The history of past uses in the project area to assess potential problems;
5. And other information as required to determine the cumulative effect of the existing and the proposed development project on groundwater contamination, including nitrate loading estimates.

Qualified professionals performing the site evaluation activities relating to percolation tests, soil suitability/nitrate loading studies and OWTS design activities are required (i.e. - Registered Environmental Health Specialist, licensed Civil Engineer, or Professional Geologist), dependent upon the scope of work to be performed. Other than an owner/builder, persons who install and construct OWTS must have the appropriate license issued by the California State Licensing Board (CSLB). There currently are no local requirements for the training and certification of service providers, maintenance personnel, and septage pumpers and haulers.

After the project has been approved with the conditions of approval, MCDEH tracks project implementation including the OWTS permitting and construction. The CEDD and Merced County Building Division require a Certificate of Occupancy for Commercial building projects to be signed off by MCDEH before the building may be occupied. This allows the Merced County Building Division to hold up the occupancy of the building until all MCDEH’s requirements have been met.

Project referrals from outside agencies are reviewed and any action to be taken relating to sewage disposal and OWTS are provided to the referral agency. Outside agencies may include city, state, and federal government agencies, Merced County Local Agency Formation Commission (LAFCO), and the Department of Real Estate.

PERMITTING REQUIREMENTS
MCDEH issues permits for new OWTS installation, repair, replacement, and destruction. The permit specifies the location, OWTS specifications, property owner, and contractor information. Permit applications can be submitted by the property owner or a contractor licensed with the CSLB. The contractor must have an appropriate, current valid license issued from the CSLB which is verified at the CSLB website at the time of permit issuance. Permits are issued after MCDEH has determined the OWTS is compliant with established regulations (Chapter 9.54). MCDEH performs site inspections at the time the OWTS is constructed to ensure the system was installed as permitted. The MCDEH will not final an OWTS permit until the installation is complete and is in compliance with the issued permit requirements. The State Water Resources Control Board, Division of Drinking Water (DDW) will be engaged and or notified by MCDEH where drinking water systems are near or within applicable setback distances of existing or prosed OWTS in accordance with the Policy (i.e., Policy Sections 3.5, 11.1, 11.2, and 7.5.6 through 7.5.10 as examples).
Additionally, supplemental treatment as specified in 10.9 and 10.10 of the Policy will be required for OWTS that are within a horizontal sanitary setback of a public well or surface water intake point, alternatively Chapter 9.54 Special Design OWTS and Alternative OWTS in Section 9.54.080, (O), and (P), providing details for alternate siting and operational criteria for the proposed OWTS that would similarly mitigate the potential adverse impact to the public water source considering site specific criteria and conditions.

RESIDENTIAL SYSTEMS

Residential OWTS are designed based on the findings of the percolation testing, soil suitability and other studies required to be performed. Most studies find that the lots are suitable for a standard OWTS design criteria established for specific areas in Merced County.

For standard residential OWTS, sizing is based on the number of bedrooms and the hydrogeological area where the lot is located. The number of bedrooms is relative to occupancy and is indicative of potential wastewater loading. Shallow leach lines and mounded dispersal systems are common in areas with shallow depths to groundwater. Leaching pits are not allowed in shallow groundwater areas. In areas of less permeable soils, and where there is a greater separation to groundwater, deeper sumps and seepage/leaching pits may be allowed for effluent dispersal.

For residential OWTS where the soil suitability and other studies precluding a standard system use, a site specific, specially designed system is required.

COMMERCIAL SYSTEMS

Commercial OWTS are designed based on the findings of the soil suitability and other studies required to be performed at the time of the project development or prior to building permit issuance. These systems are sized either using a calculation in Chapter 9.54 or using percolation rates to determine application rates and infiltrative areas. Most OWTS designers utilize the percolation rate method consistent with Policy Section 8, Table 3. Comparing the commercial design calculations found in Chapter 9.54 to the percolation rate method indicates the Chapter 9.54 method results in dispersal system sizes that meet and often exceed those using the percolation rate method. Although the Chapter 9.54 method is more conservative, both methods are acceptable.

FAILING SYSTEMS

Failing OWTS usually become known to the MCDEH either when a voluntary repair permit application is submitted or as a complaint forwarded to MCDEH. Complaints are assigned to MCDEH staff and the property owner is issued a Notice to Abate or Notice of Violation to correct the failing septic system by obtaining a repair permit. MCDEH staff tracks and monitors compliance until a satisfactory repair is complete and the repair permit for the work has been finaled. When surfacing sewage is present, the owner is required to pump the septic tank as often as needed to prevent further surfacing of sewage until the repair is completed.

The MCDEH will notify the owner of the public water system and the SWRCB Drinking Water Program Staff as soon as practicable, but not later than 72 hours, after the discovery and confirmation of a failing OWTS that is located:

1. Within 2,500 feet of an intake point for a surface water treatment plant for drinking water;
2. In the drainage area catchment in which the intake point is located; and
3. Such that it may impact water quality at the intake point such as upstream of the intake point for a flowing water body; or
4. Within a horizontal sanitary setback from a public well.
ENFORCEMENT
The owner of any OWTS not in compliance with established laws, regulations, and standards are issued a Notice of Violation or Notice to Abate, citing the violation or violations and providing a date for compliance. If the OWTS remains out of compliance, the case is moved forward in the enforcement process, which may include the issuance of a citation, a referral to the Merced County District Attorney’s Office, action by County Counsel, involuntary abatement by the County, referral to the CVRWQCB, or other appropriate action. Prior to referral to the CVRWQCB, MCDEH may collaborate with and request technical assistance from Regional Board staff during complex and challenging enforcement efforts.

OPERATING PERMITS
In addition to the initial design, construction and permitting requirements, alternative (nitrogen reducing ATU’s), experimental and supplemental treatment systems installed in Merced County will be required to obtain a special system permit. Some OWTS will be required to submit operating and monitoring reports, including effluent sampling results, on an established frequency (i.e., annual).

PERMITTING AND NOTIFICATION OF OWTS NEAR SURFACE WATER INTAKES AND PUBLIC SUPPLY WELLS
When the MCDEH determines a permit has been submitted for an OWTS installation, including repair permits for failing systems, that is located:

1. Within 1,200 feet of an intake point for a surface water treatment plant for drinking water;
2. In the drainage area catchment in which the intake point is located; and
3. Such that it may impact water quality at the intake point such as upstream of the intake point for a flowing water body; or
4. Within a horizontal sanitary setback from a public well.

MCDEH will notify and provide a copy of the permit application to the owner of the public water system and the SWRCB Drinking Water Program Staff (if the owner cannot be found or if a large Public Water System). The permit will be issued only after all applicable conditions have been met to provide the highest protection of these sources in compliance with the SWRCB Policy.

Currently, there are five (5) public surface water treatment plants operating in Merced County that are regulated by the SWRCB Drinking Water Program. The SWRCB will provide MCDEH with the location details of surface water intakes and catchment of drainage areas for these systems through a confidentiality agreement. These are often located in rural areas or within city limits where development is most often served by public sewer systems, as such, MCDEH does not anticipate new OWTS installations or OWTS impacts bysurfacing sewage occurring within 2,500 feet of the surface water catch basin or intake points in the areas of MCDEH jurisdiction.

When an OWTS dispersal area is proposed to be installed within the horizontal sanitary setback of a public well or surface water intake point, MCDEH will require a soil suitability/nitrate loading study to determine if supplemental treatment for nitrogen and pathogens is required, in accordance with Sections 10.9 and 10.10 of the Policy, or if appropriate alternative siting and operational criteria can be proposed to similarly mitigate the potential adverse impact to the public water source. For a dispersal system exceeding 20 feet in depth proposed to be installed within 600 feet of a public well, a two-year travel time study/report, for microbiological contaminants, will be required to be conducted by a qualified professional.

Additionally, MCDEH Well standards (Chapter 9.28) require annular seals of at least 50 feet for domestic and public water system wells, more protective than the California Water Well Standards, Bulletins 74-81 and 74-90.
depths of these deeper annular seals may be preemptively mitigating possible water quality impacts by an OWTS that is located within established setbacks and may be a mitigating factor when these distances cannot be achieved for OWTS repairs and installations on existing, constrained parcels.

**PERMITTING OWTS NEAR PUBLIC SEWER AND WATER UTILITIES**

MCDEH has access to Merced County web-based mapping applications that provides information for all parcels in Merced County that may be utilized in identifying parcels within a public sewer utility district boundary. The utility company may be contacted if the sewer utility is within 200 feet of the parcel to determine if a connection could be made instead of issuing an OWTS permit as referenced in Chapter 9.54.

**SECTION 7 - REPAIR, MAINTENANCE, MONITORING, AND REPORTING REQUIREMENTS**

**OWTS REPAIR INFORMATION**

In the event a homeowner experiences a system failure, information on permitting and repairs will be available by telephone (MCDEH staff are available 24 hours a day for surfacing sewage issues) and by posting related OWTS materials on the MCDEH website. A list of OWTS contractors will be updated periodically and posted on the MCDEH website.

**VOLUNTARY MAINTENANCE PROGRAM**

Other than OWTS with alternative, advanced and supplemental treatment and holding tank only OWTS, Merced County does not currently have a local voluntary maintenance program for OWTS maintenance and reporting. Chapter 9.54 requires that owners maintain their OWTS such that the OWTS will function in a sanitary manner and will not create a nuisance or endanger others.

When conditions warrant, MCDEH may require an owner to perform a system evaluation and submit the findings to MCDEH. These evaluations would be required to be conducted by a qualified entity when examining the septic tank, and other associated appurtenances of the OWTS, for signs of deterioration, corrosion, malfunction, or failure. Modifications or repairs needed would be determined based on the results of the evaluation.

**EDUCATION AND OUTREACH**

MCDEH provides education to OWTS owners, contractors, and others in a variety of ways as described below.

**DIRECT STAFF CONTACT**

The primary method of education and outreach is by direct interaction between MCDEH staff and the public including local watershed management groups. MCDEH routinely receives and responds to phone calls and office visits by private property owners, consultants and contractors with questions about regulations and or the permit processes. As part of MCDEH’s role in the planning process, we will regularly answer questions and provide information to consultants, staff from other departments or agencies, and occasionally directly to decision makers such as members of the Planning Commission and the Board of Supervisors.

MCDEH educates property owners on matters regarding preventative management of their OWTS which can prolong the useful life of the OWTS, commonly at the time the OWTS is initially installed and when owners call in to MCDEH with concerns. In addition, MCDEH educates property owners regarding discharges prohibited per County ordinance, such as automobile and garage waste, storm drainage, solvents and toxics, solids, garbage, grease wastes, back wash from water softeners, filters, and swimming pools, and truck terminal wastes.
MCDEH WEBSITE
All OWTS permit application forms are available on the MCDEH website. In addition to standard OWTS forms, MCDEH posts or provides links to the various regulations such as the applicable sections of the Central Valley Regional Water Quality Control Board’s Basin Plan, the Policy, and the County’s OWTS ordinance.

INFORMATIONAL PAMPHLETS
Information for homeowners on the care and maintenance of their OWTS will also be available in a pamphlet format, which can be distributed during inspections, accessed at the MCDEH public counter, or downloaded from the MCDEH website. This information will include guidance to OWTS owners on steps to take within 48 hours of experiencing a failure of their system.
SECTION 8 - MINIMUM SITE EVALUATION STANDARDS, COMPARISON OF CHAPTER 9.54 TO SECTION 7 OF THE POLICY

This section of the LAMP compares the MCDEH requirements for the minimum site evaluation and siting standards with those contained in Section 7 of Tier 1 of the Policy. Each section is addressed in the table below and shows if Chapter 9.54 meets the Tier 1 requirements or if an alternative standard is used. Following this table, a narrative is presented providing more detailed discussion for each section.

<table>
<thead>
<tr>
<th>OWTS Policy for Tier 1 Section Number</th>
<th>Chapter 9.54 Meets Tier 1?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Qualified Staff</td>
<td>Met</td>
<td>Soil/Site Evaluation: Qualified professional (i.e., Licensed or registered EHS, Civil Engineer, or geologist...Soil Scientist.) Design: Qualified professional. Installer: Licensed contractor per CLSB requirements or owner/builder.</td>
</tr>
<tr>
<td>7.2 Site Evaluations</td>
<td>Met</td>
<td>A site evaluation is performed at the time the lots are created.</td>
</tr>
<tr>
<td>7.3. High Groundwater Determination</td>
<td>Met</td>
<td>Historical data and direct observation methods are primarily used.</td>
</tr>
<tr>
<td>7.4 Percolation Test Results</td>
<td>Met and Exceeds</td>
<td>Fastest Rate Allowed is 5 MPI Slowest Rate Allowed is 180</td>
</tr>
<tr>
<td>7.5.1 Setbacks to Property Line and Structures</td>
<td>Met and Exceeds</td>
<td>Minimum distance is 5 feet to property line and to structures. Variance allowed for old lots of record only when cannot meet this provision.</td>
</tr>
<tr>
<td>7.5.2 Setbacks to Water Wells</td>
<td>Met and Alternative</td>
<td>All new OWTS meet this provision. Variance allowed for old lots of record only when cannot meet this provision.</td>
</tr>
<tr>
<td>7.5.3 Setback to Unstable Land Mass</td>
<td>Met</td>
<td>Have not locally encountered this issue in the past.</td>
</tr>
<tr>
<td>7.5.4 Setback to Springs and Flowing Surface Water Bodies</td>
<td>Met and Alternative</td>
<td>All new OWTS meet this provision. Variance allowed for old lots of record only when cannot meet this provision.</td>
</tr>
<tr>
<td>7.5.5 Setback to Vernal Pools, Wetlands, Lakes, Ponds</td>
<td>Met and Alternative</td>
<td>All new OWTS meet this provision. Variance allowed for old lots of record only when cannot meet this provision.</td>
</tr>
<tr>
<td>7.5.6 Setback to Public Water Well</td>
<td>Met and Alternative</td>
<td>All new OWTS meet this provision. Variance allowed for old lots of record only when cannot meet this provision.</td>
</tr>
<tr>
<td>7.5.7 Setback to Reservoir, Lake, Flowing Water Body for OWTS within 1,200 feet of Surface Water Intake</td>
<td>Met</td>
<td>Current and new OWTS meet this provision.</td>
</tr>
<tr>
<td>7.5.8 Setback to Reservoir, Lake, Flowing Water Body for OWTS between 1,200-2,500 feet of Surface Water Intake</td>
<td>Met</td>
<td>Current and new OWTS meet this provision.</td>
</tr>
<tr>
<td>7.6 Notification of OWTS within 1200’ of Surface Water Intake</td>
<td>Met</td>
<td>Notification and permit requirements will be met for this provision.</td>
</tr>
<tr>
<td>7.7 Slope For Effluent Disposal &lt; 25%</td>
<td>Met and Exceeds</td>
<td>Chapter 9.54 allows up to 20% slope.</td>
</tr>
</tbody>
</table>
7.8 Allowable Density for Dwelling Units | Met and Exceeds | This provision is met for initial dwelling unit. Additional units allowed only upon acceptable soil suitability/nitrate loading study or ATU required.

DISCUSSION OF COMPARISON

POLICY SECTION 7.1 - QUALIFIED PROFESSIONAL – CHAPTER 9.54 MEETS REQUIREMENT
Chapter 9.54 requires a qualified professional in OWTS related work. Chapter 9.54, Section 9.54.020, Definitions states, “Qualified professional” means an individual licensed or certified by a State of California agency to design OWTS and practice as professionals for other associated reports, as allowed under their license or registration. Depending on the work to be performed and various licensing and registration requirements, this may include an individual who possesses a registered environmental health specialist certificate or is currently licensed as a professional engineer or professional geologist. For the purposes of performing site evaluations, Soil Scientists certified by the Soil Science Society of America are considered qualified professionals.” MCDEH staffing includes 12 registered environmental health specialist positions. Additionally, MCDEH contracts annually with an outside engineering and hydrogeology firm for specialized services as needed; the scope of work in the contract specifically lists OWTS policy development and implementation.

POLICY SECTION 7.2 – SITE EVALUATION: SOIL DEPTH – CHAPTER 9.54 MEETS REQUIREMENT
Chapter 9.54 requires the suitability of an area for OWTS to be determined prior to certain development projects and prior to the issuance of a building permit. Soil suitability and other loading studies are required for all new lot splits, site approvals, and certain building permits, and includes soil depth and profiles, and depth to groundwater. Most areas in Merced County used for OWTS have adequate soil depth for standard dispersal areas.

POLICY SECTION 7.3 - SITE EVALUATION: GROUNDWATER DEPTH – CHAPTER 9.54 MEETS REQUIREMENT
Chapter 9.54, Design Criteria, prohibits seepage pits in areas of normal high ground water and perched water table and requires the water table to be determined at the time when water is closest to the surface.

Chapter 9.54 prohibits the installation of dispersal systems in low areas subject to flooding or in areas where groundwater reaches the surface at certain times of the year.

Chapter 9.54 requires a soil profile and or percolation test for divisions of land or land developments at various depths of where the water table or clay strata are unknown. This information is included in the soil suitability study.

In accordance with Chapter 9.54, the depth to historical high groundwater is required to be included and evaluated as part of the soil suitability study when new lots are created. MCDEH uses a variety of historical data, such as depth to water maps, local hydrographs and static water level data from well completion reports. A site evaluation is conducted when there is a conflict between the depth of water noted from historical data and other sources or there is no historical data available. Chapter 9.54 may require a current direct observation determination in areas where the depth to water is known or suspected to be shallow to ensure the minimum setback of 5 feet from leach trench to groundwater is met.

POLICY SECTION 7.4 – PERCOLATION RESULTS - CHAPTER 9.54 MEETS OR EXCEEDS REQUIREMENT
The MCDEH accepts percolation results for percolation tests in shallow borings ranging from 1 minute per inch (MPI) to 60 MPI. In areas of less permeable soil where the shallow percolation results exceeded 60 MPI,
percolation tests are required to be performed at depths consistent with the expected design of the OWTS with a passing percolation rate not to exceed 5 to 180 MPI.

POLICY SECTION 7.5 - MINIMUM HORIZONTAL SETBACKS – CHAPTER 9.54 MEETS REQUIREMENTS FOR NEW LOTS

Overall, OWTS will meet the horizontal setback requirements specified in Tier 1. However, alternative minimum setbacks consistent with those previously established for existing old lots of record that cannot meet required setbacks may be allowed provided the Environmental Health Director finds that the use of supplemental treatment and/or alternative mitigation measures is sufficiently protective (see Table 2 – Minimum Horizontal Separation Distances, below from Chapter 9.54).

<table>
<thead>
<tr>
<th>Facility</th>
<th>Septic Tank or Sewer Line</th>
<th>Leach Field</th>
<th>Leach Pit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Well*</td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>Public Well*</td>
<td>100</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>Flowing Spring or Stream¹</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Drainage Course or Ephemeral Stream²</td>
<td>25</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Cut or Fill Bank³</td>
<td>10</td>
<td>4 x H</td>
<td>4 x H</td>
</tr>
<tr>
<td>Property Line⁴</td>
<td>25</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>Structures</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Lake, Ponds, Reservoir, Wetlands⁵</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Public Water System Surface Water Intake</td>
<td>See foot notes 6 and 7 below</td>
<td>See foot notes 6 and 7 below</td>
<td>See foot notes 6 and 7 below</td>
</tr>
<tr>
<td>Unstable Land Mass</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

¹As measured from the line which defines the limit of a 10-year frequency flood.
²As measured from the edge of the drainage course or stream.
³Distance in feet equal to four times the vertical height of the cut or fill.
⁴This distance shall be maintained when individual wells are to be installed and the minimum distance between waste disposal and well cannot be assured.
⁵As measured from the high water mark of the reservoir or flowing water body.

Where the effluent dispersal system is within 1,200 feet from a public water systems’ surface water intake point, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 400 feet from the high water mark of the reservoir, lake or flowing water body.

Where the effluent dispersal system is located more than 1,200 feet but less than 2,500 feet from a public water systems’ surface water intake point, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies, the dispersal system shall be no less than 200 feet from the high water mark of the reservoir, lake or flowing water body.

POLICY SECTION 7.6 – NOTIFICATION AND PERMITTING REQUIREMENTS FOR OWTS WITHIN 1200’ OF WATER INTAKE LINE/CATCHMENT – CHAPTER 9.54 MEETS REQUIREMENT
For new OWTS that are proposed to be installed within 1200 feet and 2500 feet of a public surface water intake line or catchment area, MCDEH will provide a copy of the permit application to the owner of the water system describing the proposal to install an OWTS. In a case where an owner cannot be identified, the notification will be made to the State Water Resources Control Board, Drinking Water Division. The agency with lead regulatory oversight of the water system will also be notified. In addition, MCDEH will ensure that the permit application includes the following:

All onsite wastewater treatment systems shall be permitted and installed as designed and approved. Any variation from approved design may require a new onsite wastewater treatment system permit and approval. The onsite wastewater treatment systems permit application shall be signed by the property owner and appropriately licensed contractor in accordance with applicable laws affirming the information provided is accurate and representative of actual site conditions, and shall include a representational detailed drawing of the subject parcel or portion thereof, the plot plan shall be drawn to reasonable scale, no larger than one (1) inch equaling fifty (50) feet with the following information:

1. Owner’s name, street address, job address and telephone number;
2. A diagram of the parcel showing all property lines, dimensions, the assessor parcel number (APN), and North arrow orientation;
3. Names of streets and roads fronting the property, and any existing and proposed internal roads and vehicle access and parking areas including driveways;
4. Dimensions, outlines, and locations of all existing and proposed structures, including hard surfaces such as patios, driveways and walks (e.g., earthen, asphalt, concrete and or gravel-covered);
5. Location of house sewer outlet and proposed location of septic tank and disposal system on the property;
6. Location and nature of any existing and proposed sewage disposal system on the property, and dedicated replacement areas in the event of system failure;
7. Location of any existing trees which may affect location of septic tank or disposal system.
8. Any prominent features on and adjacent to the property such as right-of-ways, easements, elevation changes, canals, creeks, lagoons, ponds, corrals;
9. Location of any existing or proposed well, in use or abandoned, either on this property or within 300 feet of the property lines;
10. A statement of the maximum expected waste volume per day: For dwelling units, pool houses, and/or guesthouses, provide the number of bedrooms and bathrooms (rooms with closets will be considered bedrooms for sewage disposal system design purposes);
11. Source and description of domestic water supply;
12. Any public water supply well within 200 feet and any surface water intake for a public water system within 2,500 feet;
13. Total square footage of lot, minimum useable disposal area and for all buildings;
14. Setback requirements of front, back and sides of property;
15. Name and telephone number of the preparer of the plot plan.

MCDEH will wait at least 15 days from the date the information is received by the water system owner to issue the permit. The MCDEH will consider any recommendations and comments provided by the water system owner prior to permit issuance.

**POLICY SECTION 7.7 - GROUND SLOPE < 25 PERCENT - CHAPTER 9.54 HAS ALTERNATIVE, EXCEEDS REQUIREMENT**
Chapter 9.54, special OWTS design limits are more restrictive allowing for a maximum of 20 percent for the ground slope in the dispersal field. Most OWTS in Merced County are installed in areas of little or no slope and the issue of slopes exceeding 25-30 percent rarely occurs. As this issue is rare and these current requirements are protective of any impacts, no change in local standards is warranted and the maximum allowable slope for the LAMP is 20 percent.

**POLICY SECTION 7.8 - ALLOWABLE DENSITY FOR A SUBDIVISION - CHAPTER 9.54 HAS ALTERNATIVE REQUIREMENT**

The overall annual average rainfall for the County is 8-12 inches, allowing for an average density of two and one-half (2.5) acres per single family dwelling according to Tier 1, Table 1. Merced County Chapter 9.54 allows for minimum parcel sizes of one usable net acre when utilizing a well and OWTS. In these instances MCDEH has an alternative requirement.

A minimum one acre parcel size is allowed when the parcel utilizes a special nitrogen reducing advanced treatment unit (ATU) as the OWTS and is provided water service from a private or public water system.

In addition, with the intent of providing adequate and reasonable housing, state law and local ordinance have provisions for second unit dwellings and farm labor housing to be allowed in appropriate areas. These parcels may or may not meet this requirement, depending on the parcel.

This LAMP may continue to allow the development of additional housing units over the minimum average density of 2.5 acres per single family dwelling only where a soil suitability/nitrate loading study have been conducted and shows that the area is suitable for OWTS and that any impact to groundwater has been mitigated.

**SECTION 9 - MINIMUM DESIGN AND CONSTRUCTION STANDARDS, COMPARISON OF CHAPTER 9.54 TO SECTION 8 OF THE POLICY**

**COMPARISON OF CHAPTER 9.54 TO SECTION 8 OF THE POLICY**

This section of the LAMP compares the MCDEH requirements for the minimum site evaluation and siting standards with those contained in Section 8 of Tier 1 of the Policy. Each section is addressed in the table below and shows if the MCDEH standards meet the Tier 1 requirements or if an alternative standard is used. Following this table, a narrative is presented providing more detailed discussion for each section.

**Table 7-1: Summary of Comparison**

<table>
<thead>
<tr>
<th>Policy for Tier 1 with Policy Section Number</th>
<th>Chapter 9.54 Meets Tier 1?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1.1 Qualified Professional to design OWTS</td>
<td>Met</td>
<td>Design: Qualified Professional.</td>
</tr>
<tr>
<td>Section</td>
<td>Met/Alt</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>8.1.2 No Surfacing Sewage, No Impact to Beneficial Uses of Water</td>
<td>Met</td>
<td>OWTS are sited, designed, and constructed to preventsurfacing sewage or impact to groundwater.</td>
</tr>
<tr>
<td>8.1.3 OWTS Design Criteria</td>
<td>Met</td>
<td>OWTS are designed based on domestic, low strength wastewater with flows not exceeding 10,000 gallons per day.</td>
</tr>
<tr>
<td>8.1.4 Dispersal System Soil Cover</td>
<td>Met</td>
<td>OWTS have a minimum soil cover of at least 12 inches over dispersal field and at least 6 inches for pressure distribution systems.</td>
</tr>
<tr>
<td>8.1.5 Minimum Depth to High Groundwater to Bottom of Leach Trench</td>
<td>Met and Alternative</td>
<td>The minimum distance from bottom of leach trench to seasonal high groundwater is 5 feet.</td>
</tr>
<tr>
<td>8.1.6 Minimum Trench Infiltrative Rate and Width, Maximum Application Rates</td>
<td>Met</td>
<td>Dispersal systems consist of shallow leach trenches. Sumps and seepage pits are allowed in appropriate areas. All leach trenches have a maximum width of three feet and depth of three feet with 18 inches of rock beneath the leach line. OWTS application rates meet provisions of Tier 1, Table 3 for dispersal systems.</td>
</tr>
<tr>
<td>8.1.7 Maximum Depth of Dispersal System</td>
<td>Alternative</td>
<td>Dispersal systems with sumps and seepage pits up to 50 feet in depth are allowed in certain areas.</td>
</tr>
<tr>
<td>8.1.8 100% Replacement Area</td>
<td>Met and Alternative</td>
<td>All new OWTS meet this provision.</td>
</tr>
<tr>
<td>8.1.9 Dispersal System Not Covered</td>
<td>Met</td>
<td>All dispersal systems shall not be covered or paved over.</td>
</tr>
<tr>
<td>8.1.10 Rock Fragment Content Not Exceed 50% Cobbles or Larger</td>
<td>Met</td>
<td>Dispersal systems are not installed in areas where percolation rates exceed Policy.</td>
</tr>
<tr>
<td>8.1.11 Increased Allowance for IAPMO Certified Dispersal System not allowed under Tier 1</td>
<td>Met and Exceeds</td>
<td>Dispersal systems using IAPMO Certified systems receive 0.75 credit</td>
</tr>
<tr>
<td>8.2.1 Tank Standards</td>
<td>Met</td>
<td>Tanks used for OWTS meet these provisions.</td>
</tr>
<tr>
<td>8.2.2.1 Watertight Risers</td>
<td>Met and Alternative</td>
<td>Risers are required.</td>
</tr>
<tr>
<td>8.2.2.2 Access Lids at Grade Secured</td>
<td>Met</td>
<td>MCDEH requires all access lids at grade to be locked or otherwise secured.</td>
</tr>
<tr>
<td>8.2.3 Septic Tank Approval</td>
<td>Met</td>
<td>All septic tanks are either IAPMO approved or are designed and certified by a California Registered Civil Engineer.</td>
</tr>
<tr>
<td>8.2.4 Prevention of Solids into Dispersal System</td>
<td>Met</td>
<td>Septic tanks are designed and sized for appropriate retention time. NSF/ANSI certified filters are required for new and replacement tanks.</td>
</tr>
</tbody>
</table>
8.2.5 OWTS Installer requirements

| Met | Chapter 9.54 requires installers to be a contractor in accordance with contracting law (BPC, CCR) requirements or an owner builder. |

**POLICY SECTION 8.1.1 - QUALIFIED PROFESSIONAL – CHAPTER 9.54 MEETS REQUIREMENT**

OWTS design is performed only by a qualified professional.

**POLICY SECTION 8.1.2 – NO SURFACING SEWAGE, NO IMPACT TO BENEFICIAL USES OF WATER – CHAPTER 9.54 MEETS OR EXCEEDS REQUIREMENTS**

Chapter 9.54 requires OWTS to be located, designed, and constructed in a manner to ensure that effluent does not surface at any time, and that percolation of effluent will not adversely affect beneficial uses. These provisions are discussed in more detail relating to land use development. OWTS must be operated and maintained to prevent surfacing sewage issues and water quality impacts.

**POLICY SECTION 8.1.3 – OWTS DESIGN CRITERIA – CHAPTER 9.54 MEETS REQUIREMENTS**

MCDEH has historically regulated domestic OWTS with wastewater flows up to 10,000 gallons per day and intends to continue to regulate these systems under the LAMP. Chapter 9.54 indicates residential OWTS are sized based on average daily flow of 150 gallons per bedroom per day. Tank capacity is based on 300 gallons per bedroom with a minimum tank size of 1,200 gallons. Tank components are based on peak wastewater flow rates with a minimum tank retention time of 24-hours for all sewage. Average daily flows and site specific data collected from the site evaluation are used to design dispersal system absorption areas. Package treatment plants or alternative or supplemental treatment are required to mitigate any impacts to water quality, as determined based on site specific soil suitability/nitrate loading studies.

**POLICY SECTION 8.1.4 – DISPERSAL SYSTEM SOIL COVER - CHAPTER 9.54 MEETS REQUIREMENT**

Chapter 9.54 provides for a minimum of six inches and a maximum of 24 inches of soil cover over the dispersal system. All standard dispersal systems have a minimum of 12 inches of soil cover over the dispersal system. A minimum of six inches soil cover is allowed only for pressure distribution systems.

**POLICY SECTION 8.1.5 – MINIMUM DEPTH TO HIGH GROUNDWATER – CHAPTER 9.54 MEETS MOST REQUIREMENTS AND HAS ALTERNATIVE REQUIREMENT**

Merced County meets most of the minimum depth to high groundwater requirements with the exception of the minimum depth to water based on percolation rates as shown in Table 2 of Policy Section 8. However, fast percolation rates are addressed when the initial soil suitability and nitrate loading study is conducted and mitigations are required as part of the design parameters. Mitigations can range from engineered fill in the dispersal area to the installation of a supplemental treatment system. The standard provisions for this requirement are provided below.

Chapter 9.54 prohibits the installation of dispersal systems in low areas subject to flooding or in areas where groundwater reaches the surface at certain times of the year.

Chapter 9.54 requires a minimum five foot separation from the bottom of the leach trench to groundwater.

Chapter 9.54 requires a ten foot separation from the bottom of a leaching pit and the groundwater table. Greater depths are required if the soils do not provide adequate filtration. Chapter 9.54 prohibits seepage pits in areas of normal high ground water and perched water table and requires the water table to be determined at the time when water is closest to the surface.
POLICY SECTION 8.1.6 – MINIMUM TRENCH INFILTRATIVE RATE AND WIDTH – CHAPTER 9.54 MEETS REQUIREMENT
All standard OWTS must have shallow dispersal systems to improve aerobic interchange potential. Chapter 9.54 provides for the maximum width of these leach trenches to be three (3) feet and a depth of three (3) feet with a minimum of eighteen (18) inches of drain rock under the leach line.

POLICY SECTION 8.1.6 – MAXIMUM APPLICATION RATES – CHAPTER 9.54 MEETS REQUIREMENT
Chapter 9.54 requires the design of the OWTS to be determined based on the location, type of soil and groundwater level or as determined by percolation test and/or soil profile. This section is the basis for the standardized design criteria used for residential OWTS on parcels with acceptable soil suitability and other loading study results. To determine how Merced County criteria compares to the Policy, local percolation rates and standard OWTS design infiltration can be directly compared and correlated to the application rates and infiltrative areas found in Table 3, Policy Section 8.

Commercial systems are designed based on average daily flows calculated from maximum estimated usage. Chapter 9.54 refers the California Plumbing Code which provides tables for minimum gallons per day for various fixtures and typical land uses. Dispersal system design is generated from application rates as provided for in Policy Section 8, Table 3. The minimum septic tank volume for commercial systems is determined using calculations found in Chapter 9.54 for septic tank size requirements.

POLICY SECTION 8.1.7 – MAXIMUM DEPTH OF DISPERSAL SYSTEM – CHAPTER 9.54 HAS ALTERNATIVE REQUIREMENT
Chapter 9.54 limits standard OWTS and the associated dispersal systems to shallow leach trenches up to 36 inches in total depth and 36 inches in width. Otherwise, the OWTS is considered a special system requiring a qualified professional in the design.

POLICY SECTION 8.1.8 – 100% REPLACEMENT AREA – CHAPTER 9.54 MEETS AND ALTERNATIVE REQUIREMENT EXCEEDS
Chapter 9.54 requires new OWTS to meet a minimum usable disposal area that may vary and range from 6,000 square feet to 24,000 square feet, based on percolation rates. These minimum areas are equivalent to the 100% replacement areas for domestic uses and 300% required for commercial and other uses based on standardized dispersal areas.

POLICY SECTION 8.1.9 – DISPERSAL SYSTEM NOT COVERED - CHAPTER 9.54 MEETS REQUIREMENT
Chapter 9.54 provides that no leach line shall be placed under concrete, blacktop, roadway, or structure. Leach lines and disposal fields must be maintained in an open area and not compacted. Barricades may be required to maintain this area.

POLICY SECTION 8.1.10 – ROCK FRAGMENTS NOT EXCEED 50% COBBLES OR LARGER - CHAPTER 9.54 MEETS REQUIREMENT
Although not expressly addressed in Chapter 9.54, this requirement is addressed as part of a soil suitability study, percolation testing (restricts faster infiltration/percolation rates), and site evaluation. Cobbles and other rock fragments are only found in specific, limited areas in the County (example, adjacent to the upper reaches of the Merced River near Snelling) and these areas are sparsely populated.

POLICY SECTION 8.1.11 – ALLOWANCE FOR IAPMO CERTIFIED DISPERSAL SYSTEM - CHAPTER 9.54 EXCEEDS REQUIREMENT
Chapter 9.54, Section 9.54.080, Design standards and criteria, (M), (1), (o), indicates chamber systems may be installed as an alternative to drain rock. Decreased leaching area for IAPMO certified dispersal systems, such as chambers, using a multiplier equal to and less than 0.75 may be allowed. This local requirement meets and exceeds the Policy Section 9.4.5.

POLICY SECTION 8.2.1 – PLUMBING CODE, APPENDIX K, TANK STANDARDS - CHAPTER 9.54 MEETS REQUIREMENT
Chapter 9.54 relies on Building and Plumbing codes to address septic tanks as structures thereby providing septic tank requirements that are equivalent to the provisions found in the Plumbing Code, Appendix K, K-5 Septic Tank Construction.

POLICY SECTION 8.2.2.1 – WATERTIGHT RISERS - CHAPTER 9.54 HAS ALTERNATIVE REQUIREMENT
Many septic tank installations are placed at depths such that the effluent flows by gravity to the dispersal field, usually less than two (2) feet below grade. Risers installed on tanks at this shallow depth are necessary and must be maintained to avoid creating a hazard where not maintained properly. Chapter 9.54 requires the installation of watertight risers.

POLICY SECTION 8.2.2.2 – TANK ACCESS LIDS AT GRADE SECURED - CHAPTER 9.54 MEETS REQUIREMENT
Unsafe access to septic tanks is a very serious matter and, when identified, violations are required to be abated immediately. The requirement to secure the tank access is accomplished using California Health and Safety Code Section 115700(a) – unsafe open excavation or pit. Additionally Chapter 9.54 requires secured OWTS access lids.

POLICY SECTION 8.2.3 – SEPTIC TANK APPROVAL - CHAPTER 9.54 MEETS REQUIREMENT
Chapter 9.54 provides for septic tanks to be approved by a Registered Civil Engineer and the local Building Official as septic tanks are considered structures in California Plumbing Code.

POLICY SECTION 8.2.4 – PREVENTION OF SOLIDS INTO DISPERSAL SYSTEM - CHAPTER 9.54 MEETS REQUIREMENT
Current septic tank design parameters and regular maintenance minimize the movement of solids out into the dispersal system. Filters are required in Chapter 9.54.

POLICY SECTION 8.2.5 – OWTS INSTALLER REQUIREMENTS - CHAPTER 9.54 MEETS REQUIREMENT
Chapter 9.54 requires installers to be a contractor in accordance with contracting law (Business and Professions Code and California Code of Regulations) or an owner builder.

SECTION 10 - AREAS OF CONCERN, VARIANCES, EXCEPTIONS, AND PROHIBITIONS

AREAS OF CONCERN IN THE COUNTY
Standard criteria for siting and design are intended to prevent adverse impacts on ground and surface waters from onsite sewage disposal systems. An important factor is the provision of sufficient depth of unsaturated soil below the dispersal field where filtering and breakdown of wastewater constituents can take place. Without adequate separation distance to the water table, groundwater becomes vulnerable to contamination with pathogenic bacteria and viruses, as well as other wastewater constituents (e.g., nitrogen).

Highly permeable soils (e.g., sands and gravels) also provide minimal treatment of the percolating wastewater and normally require greater separation distances to afford proper groundwater protection.
Additionally, where there is a high concentration or density of septic systems in a given area (e.g., small lot sizes), groundwater can be degraded from the accumulation of nitrate, chloride and other salts that are not filtered or otherwise removed to a significant extent by percolation through the soil. Adverse effects on groundwater quality from septic systems can show up in the form of degraded or contaminated well water supplies, or potentially as subsurface seepage into waters of the State.

Consistent and conservative planning policies and public service entity requirements have precluded any major issues with growth and development in Merced County. Historical areas of high density OWTS have been gradually served with public sewer eliminating the potential for surface sewage and water quality issues relating to OWTS. MCDEH developed a Salt and Nutrient Management technical study as part of our Integrated Regional Water Management Planning efforts for the Eastern portion of the County; a copy of the study can be found at the following link - [http://mercedirwmp.org/files/Appendix%20D%20Salt%20and%20Nutrient%20Study%20Revised.pdf](http://mercedirwmp.org/files/Appendix%20D%20Salt%20and%20Nutrient%20Study%20Revised.pdf). A County-wide Salt and Nutrient Management technical study and Plan may be considered if resources and funding are identified. The MCDEH currently partners with numerous local water districts to address water quality and management issues affecting the Subbasins, including the requirements in the Sustainable Groundwater Management Act (SGMA). A few areas of Merced County have been identified as areas of concern; the areas are displayed in the Salt and Nutrient Management Plan described above and further discussion is provided below.

### AREAS WITH HIGH OWTS DENSITY

Most areas in Merced County with higher density developments were built with the provision for public services, including some utilizing OWTS, but with water provided by a public water system. In areas with medium to higher density developments with OWTS and private domestic water wells, the minimum useable parcel size is one acre and Advanced Treatment Units (ATU) are required. These developments were processed with the benefit of soil suitability/nitrate loading studies developed by a qualified professional. In response to concerns regarding OWTS in higher density settings, MCDEH implemented a special OWTS requirement in 2005. The intent of the 2005 requirement is to reduce wastewater concentrations and protect surface and groundwater resources, particularly in higher density OWTS applications. The following conditions have been applied to all major subdivisions and certain commercial properties approved on or after November 18, 2005, as determined by the Division of Environmental Health. Merced County Code, Chapter 9.54, Section 9.54.080 Design standards and criteria describe special systems and ATUs in detail. Nitrogen-Reducing Advanced Treatment Systems are required for all major subdivisions and certain commercial properties in Merced County. Specially designed nitrogen-reducing ATU’s are required that release an effluent concentration not to exceed 50% of the influent total nitrogen concentration. The specific system that meets this requirement shall be approved by the Division of Environmental Health prior to installation. Testing and performance certification of the nitrogen-reducing system is required by a third party independent organization (e.g., State or Federal agency, college/university, NSF, ANSI, etc.). Certification shall document at least six (6) months of successful operation during which the effluent total nitrogen did not exceed fifty (50) percent of the influent total nitrogen concentration. The property owner is responsible for the proper ongoing operation and maintenance of the nitrogen-reducing system (ATU). The owner shall demonstrate to the Division of Environmental Health, the approved system was installed and is continuously operated and maintained in accordance with manufacturer’s requirements and recommendations. Performance reporting is required, with specific information and intervals (e.g., annual), to be determined by the Division of Environmental Health Director which may include, but not limited to, influent and effluent concentrations for nitrogen compounds, total suspended solids (TSS), biochemical oxygen demand (BOD), component function status, failures, and repairs.

Merced County Code, Chapter 9.54, Regulation of Onsite Wastewater Treatment Systems, requires a qualified professional in OWTS-related work. Chapter 9.54, Section 9.54.020, Definitions states, “Qualified professional” means an individual licensed or certified by a State of California agency to design OWTS and practice as professionals.
for other associated reports, as allowed under their license or registration. Depending on the work to be performed and various licensing and registration requirements, this may include an individual who possesses a registered environmental health specialist certificate or is currently licensed as a professional engineer or professional geologist. For the purposes of performing site evaluations, Soil Scientists certified by the Soil Science Society of America are considered qualified professionals.” MCDEH staffing includes 12 registered environmental health specialist positions. Additionally, MCDEH contracts annually with an outside engineering and hydrogeology firm for specialized services as needed; the scope of work in the contract specifically lists OWTS policy development and implementation.

VARIANCES AND EXCEPTIONS
Chapter 9.54 addresses OWTS variances and exceptions indicating an exception to any provision of these standards may be authorized when in the judgment of the Division of Environmental Health Director, the application of such provisions are unnecessary, or impose additional requirements if necessary to protect the quality of the water resources, public health and safety. Specific conditions or exceptions will be prescribed on the variance permit. Historically, variances and exceptions are noted on the OWTS permit; notations include the conditions and rationale for approval. MCDEH’s database generates unique identifiers for each OWTS permit issued as a “permit number” (example, ON0001234, “ON” prefix indicates the permit is an OWTS). Specified data related to each unique OWTS permit can be readily extracted from the database for reporting purposes. Section 6 of this document describes the data collected in a OWTS permit. MCDEH will add standardized codes to track and or include specific comments in the MCDEH database to assist in tracking and reporting variances and exceptions.

PROHIBITIONS
Chapter 9.54 addresses prohibited OWTS related activities and operations in Section 9.54.050 Prohibitions, indicating no person shall discharge or cause to be discharged into any onsite wastewater treatment system, any materials, including, but not limited to, pollutants, hazardous materials, or waters containing any pollutants or contamination that causes or contributes to a violation of applicable water quality standards. All sewage shall be disposed of by an approved method of collection, treatment and effluent discharge.

Chapter 9.54 addresses prohibited OWTS related activities and operations and includes sections regarding connections to public sewers, Chapter 9.54, Section 9.54.030 Sewage Disposal Systems (A)2, indicating the public sewer may be considered as not being available when such public sewer or any building or any exterior drainage facility connected thereto, is located more than two hundred (200) feet from any proposed building or exterior drainage facility on any lot or premises which abuts and is served by public sewer. If special conditions exist, the Division of Environmental Health Director may waive this requirement.

Chapter 9.54, Section 9.54.080 Design standards and criteria, J. Unacceptable Disposal Areas, indicates installation of drain fields in low lying areas and areas subject to flooding, or in areas where ground water reaches the ground surface at certain times of the year, are not acceptable unless otherwise approved by the Division of Environmental Health. The following areas are also considered unsuitable for the location of disposal areas, disposal replacement and expansion areas; areas within any easement which is dedicated for surface or subsurface improvement and any paved area, areas for vehicle parking, areas not owned or controlled by property owners unless said area is dedicated for wastewater disposal purposes, areas occupied or to be occupied by structures, and slopes for effluent disposal greater than twenty (20) percent. Section 9.54.040 prohibits at and above grade surface OWTS effluent disposal.

Additionally, Chapter 9.54.090 Implementation indicates the Division of Environmental Health shall have authority to investigate any activity subject to this chapter. Compliance with this chapter will be determined based on the submission of a technical report to the Division of Environmental Health. The Division of Environmental Health is
authorized to enforce the prohibition of any activity that is determined to be in violation of this chapter or regulations adopted by the Board of Supervisors.

**SECTION 11 - ALTERNATIVE TREATMENT SYSTEMS/SUPPLEMENTAL SYSTEMS**

Merced County, through existing land use and building permit processes, utilizes soil suitability and nitrate loading studies to define the characteristics of each parcel and determine its suitability for use with OWTS, including any potential impact to ground or surface water. At times, these studies have indicated a potential impact and alternative or supplemental treatment systems are installed as a mitigation measure. The types of alternative or supplemental treatment systems are discussed below.

**ALTERNATIVE SYSTEM TYPES**
The most common alternative systems are those that are evaluated and designed taking into consideration additional site specific characteristics and using the latest technologies and design innovations. These systems may include organic fill systems, pressure dose systems, and expanded treatment and dispersal systems.

**MOUNDED SYSTEMS**
A mounded system is a soil adsorption system that is elevated above the natural soil surface. The purpose of the design is to overcome site restrictions that prohibit the conventional use of OWTS. Such restrictions include slowly permeable soils, slowly permeable soils with high water tables, and permeable soils with high water tables. The design of the system must conform to the EPA Design Manuals and Chapter 9.54.

**PACKAGE TREATMENT PLANTS AND SUPPLEMENTAL TREATMENT PLANTS**
For parcels where a potential for groundwater impact has been identified, package treatment plants or supplemental treatment plants are used. A qualified professional is required to evaluate and design these systems. Regular monitoring and reporting may be required for these systems as well as inspection by the MCDEH.

**HOLDING TANKS**
Holding tanks with regular pumping have been used as a means for sewage management at Duck Clubs, as a temporary measure and, in very limited cases, where an OWTS could not be repaired due to limitations of the parcel. The owners of these systems are required to maintain a current contract with a licensed sewage hauler and keep pumping records available for review by the MCDEH.

**CHEMICAL TOILETS**
Chemical toilets are acceptable for temporary use only and are used for special events, agricultural field operations, and construction projects. Development projects are required to install a permanent sewage disposal system and chemical toilets are not used as a permanent method of waste management.

**PERMITTING AND CONSTRUCTION**
Chapter 9.54 requires plans for an alternative or supplemental treatment system be completed by a qualified professional and submitted to the MCDEH for review. Once approved, a construction permit is issued. The MCDEH performs inspections during the construction to ensure the system is built as approved. The MCDEH consults with CVRWQCB staff when issues or concerns arise.

**MAINTENANCE AND OPERATION**
Chapter 9.54 requires the OWTS must be operated and maintained in accordance with procedures established by the manufacturer and/or the designer. Water Code Section 13627.1 requires that persons operating the system be properly licensed with the SWRCB.

**MONITORING AND REPORTING**
The owner of a supplemental or advanced treatment unit (ATU) or system must monitor the system in accordance with the manufacturer’s or designer’s specifications. A sampling and reporting program for the system is determined at the time of the design review and approval. The MCDEH may consult with the CVRWQCB staff during this process for supplemental guidance and direction, if needed. In accordance with Chapter 9.54, sampling and reporting will be required for advanced treatment units and nitrogen reducing systems. Reports required must be submitted to the MCDEH for review to determine the system is performing as expected. Should the system not perform to the required performance standards, an evaluation of the system may be requested and changes to the system implemented.

**SECTION 12 - WATER QUALITY ASSESSMENT PROGRAM**

The purpose of this LAMP is to establish standards and policies for the installation, operation and maintenance of OWTS in order to protect water quality and public health. The water quality monitoring element is intended to track the impact of OWTS effluent on groundwater and surface water as well as the effectiveness of this LAMP in addressing those impacts over time.

Surface bodies of water will be further described in subsequent revisions to this LAMP. None of the water ways in Merced County are listed as an impaired water body from OWTS pursuant to Section 303(d) of the Federal Clean Water Act.

The water quality monitoring element of the LAMP focuses on the water resources of the County, especially in areas where higher density of OWTS are used, representing the highest risk to groundwater quality.

**MONITORING PROGRAM ELEMENTS**
The water quality assessment program consists of the following elements:

1. Water quality data collection from various sources
2. Water quality data management, tabulation, mapping and evaluation
3. OWTS permit types, volumes, and locations data management and evaluation
4. OWTS sewage complaint data management, tabulation and mapping
5. Wastewater treatment plant and alternative systems reporting evaluation
6. Septage pumping reports evaluation
7. Percolation test results, mapping and evaluation

**WATER QUALITY DATA COLLECTION**

**INDIVIDUAL WELLS**
Individual domestic wells are sampled for general minerals and inorganics, including nitrate, and bacterial analyses (Total and Fecal Coliforms) as part of all domestic well permits as required by Merced County Well standards (Chapter 9.28). Chapter 9.28 requires newly constructed domestic wells to be sampled for bacteriological and chemical analysis, including nitrate, post well development, pump installation, and disinfection to determine the
quality of the water produced by the well. The public can and does utilize MCDEH’s private well sampling program relying on MCDEH’s certified water samplers and MCDEH’s contract ELAP certified laboratory for reporting water quality to requestors. Merced County does not have a real estate transfer sampling program.

**FOOD FACILITIES**
California Health and Safety Code, Section 113869 requires food facilities utilizing individual wells to meet the requirements of transient, non-community water systems per the Safe Drinking Water Act. These systems are required to sample for nitrate every three years and for bacteria quarterly. This information is submitted to the MCDEH as part of the food protection program.

**LOCAL WATER QUALITY SURVEY PROGRAM**
MCDEH has historically and continues to sample sixteen domestic wells, with well total depths ranging from 75 to 335 feet below ground surface, on a quarterly basis, County-wide, for full general minerals and inorganics, including nitrate, specific to OWTS operation in Merced County. Five domestic wells are routinely sampled near the City of Merced, three near Atwater, two near Hilmar, two near Stevinson, two near Los Banos, one in Dos Palos, and one in Gustine. Access to the water quality survey sites are through an agreement with MCDEH and the private well owners. An enhanced water well/water quality sampling program is under consideration related to SGMA efforts in Merced County.

**OTHER SOURCES OF WATER QUALITY DATA**
Other water quality reporting sites and direct contact request for data with numerous governmental agencies can be utilized by MCDEH for OWTS program implementation related to a local Water Quality Assessment Program in complying with the Policy (e.g., GeoTracker GAMA-secure, USGS, DWR, SWRCB Division of Drinking Water, CVRWQCB Milk Cow Dairy Program - Dairy facility well sampling and reporting, etc.).

**OWTS PERMIT NUMBERS, DESCRIPTIONS, AND LOCATIONS DATA MANAGEMENT AND EVALUATION**
The MCDEH database also stores the information relating to OWTS permitting, including the total number of permits issued, the descriptions of the permits issued, and the locations of the permits issued. The number and locations of permits issued under variance are tracked in this system and can be easily exported and reported. The data can also be mapped as part of the OWTS Water Quality Assessment Program.

**OWTS SEWAGE COMPLAINT EVALUATION AND MAPPING**
The MCDEH database stores all complaint information for the MCDEH including complaints related to OWTS and suracing sewage. This information can also be exported and mapped for reporting and evaluation purposes.

**WASTEWATER TREATMENT PLANT AND SUPPLEMENTAL SYSTEMS REPORTING EVALUATION**
The data received from the monitoring and reporting from wastewater treatment plants (if any), flows equal to or less than 10,000 gallons per day, and supplemental treatment systems can be evaluated and included in the OWTS Water Quality Assessment Program.

**SEPTAGE PUMPING REPORTS EVALUATION**
The monthly septage pumping reports received at the MCDEH are maintained and archived in an imaging database and will be evaluated and included in the OWTS Water Quality Assessment Program.

**EVALUATION OF THE MONITORING PROGRAM**
As the MCDEH evaluates and prepares for the annual reporting requirement in the Policy, any trends or issues of concern that become apparent will be reviewed and the sources identified. Based on the findings, appropriate changes will be made to the program to mitigate any issues. These activities will be summarized and reported as part of the five year Evaluation and Assessment Report required to be submitted to the CVRWQCB per Section 9.3.3 of the Policy.

ANNUAL REPORTS

By February 1 of each year, the MCDEH will submit an annual report to CVRWQCB as specified by the Policy. This report will summarize the water quality data the MCDEH has collected through the OWTS Water Quality Assessment Program. Any groundwater monitoring data the MCDEH has collected for the OWTS Water Quality Assessment Program will be submitted in EDF format to be uploaded into Geo-Tracker and any surface water monitoring will be submitted to CEDEN in a SWAMP comparable format as and if required.

WATER QUALITY DATA MANAGEMENT, TABULATION, MAPPING AND EVALUATION

The water quality data received at MCDEH from private domestic wells is entered into a database management system. This database also stores information on OWTS, including percolation rates, and water wells and therefore can provide a mechanism for relational evaluations. Data can be queried, tabulated, mapped and then evaluated for trends and impacts.
SECTION 13 - REFERENCES


---. (1990) Western Merced: Soil Survey of Merced County, California Western Part