CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

MEETING OF APRIL 19-20, 2017
BARSTOW

ITEM 7
WORKSHOP - DOMESTIC WASTEWATER SEWAGE TREATMENT PLANT STATUS IN THE LAHONTAN REGION

CHRONOLOGY	
September 2016	Workshop – Onsite Wastewater Treatment System Policy (OWTS) Policy Implementation

BACKGROUND

This is a new informational item concerning regulated domestic sewage treatment plants in the Lahontan region. This item follows the September 2016 workshop on the State Board's Onsite Wastewater Treatment System Policy.

By implementing the requirements of the California Water Code (Porter-Cologne Water Quality Act) and the Water Quality Control Plan for the Lahontan Region (Basin Plan), the Water Board has adopted various permits, including National Pollutant Discharge Elimination System permits for surface water discharges, waste discharge requirements (WDRs) and water recycling requirements (WRRs) for domestic sewage discharges to land and groundwater. These regulatory measures were written at different times, for a wide range of flows, regarding a multitude of facility treatment types and thus have different permit and monitoring requirements. This item is intended to provide the Water Board with a better understanding of:

- Regulated facilities - where they are located, and
- Current issues - staff recommendations for future oversight to improve water quality protection and increase efficiencies and effectiveness.

The Board will have opportunity to provide input to staff regarding how the regulatory program for domestic wastewater sewage treatment operates and indicate where it would like to see improvements in the future.

ISSUES

There are several key issues requiring attention:

- A need to better understand the treatment performance levels at various plants in order to gauge the potential of treated wastewater to pollute groundwater when discharged.
- A large number of mid- and small-sized plants that contribute an unquantified amount and degree of pollution to groundwater.

- Smaller plants take a larger portion of staff resources to regulate.
- There is an increasing need to work with local and other state agencies in order to improve effluent quality, timing, and need for additional regulation considering, for example, effects on local drinking water supplies.
- Smaller communities likely will have difficulty upgrading their facilities based solely on the income that they receive from user fees.

DISCUSSION

This is an informational Board item and focuses on the current state of the domestic sewage wastewater treatment facilities throughout the Lahontan region. It focuses on the Water Board's authority, the current regulatory structure and processes, and the relationship regarding how water quality monitoring and water quality standards work together.

Nitrate Pollution
Starting in the 1970s, regulatory prohibitions required community sewer collection and sewage treatment systems. For example, in the Lake Tahoe area, wastewater was exported out of the basin to reduce nutrient loading and improve lake clarity. After groundwater monitoring wells were required, a number of facilities were also required to upgrade treatment for nitrogen removal. Some facilities were required to clean up nitrate polluted groundwater and provide replacement water where supply wells were contaminated. Recently, revised Board orders have incorporated nitrogen effluent limitations. Staff recommends a general order with an option to impose nitrogen limits at smaller facilities should conditions warrant this action.

Increased Demand in Southern Portion of the Region
As the population in the southern portion of the Lahontan region grows, there is a pressing need to focus on new facilities while re-prioritizing work at other facilities throughout the region. Staff must re-allocate and re-adjust our workload and priorities in order to maintain a consistent level of water quality protection at facilities throughout the Region.

Workload and Resource Allocation
There are an increasing number of proposed new smaller package plants that accompany the construction and rapid development of new subdivisions and commercial projects. Individually, each of these smaller facilities utilizes roughly the same staff-time allocation as each of the larger municipal facilities.

Over the next five to ten years, staff intends to focus on new facilities and mid-sized facilities that can control and tailor their respective treatment and disposal infrastructure to improve water quality, based on their respective threat to water quality. Staff intends to combine a collaborative approach, revision of permits, and/or appropriate enforcement tools to maintain and improve the level of compliance at such facilities using existing staff resources.

RECOMMENDATION
This is an information item only. The Water Board may provide direction to staff, as appropriate.

ENCLOSURE	ITEM	BATES NUMBER
1	Staff Report – Domestic Wastewater Sewage Treatment Plants in the Lahontan Region	**7 - 7**
2	Staff Presentation – Status of Domestic Wastewater Sewage Treatment Plants in the Lahontan Region	**7 - 75**

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ENCLOSURE 1

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STAFF REPORT ON DOMESTIC WASTEWATER SEWAGE TREATMENT PLANTS IN THE LAHONTAN REGION

April 2017

Report to the Lahontan Regional Water Quality Control Board
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Executive Officer

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Table of Contents

Executive Summary

This report for the Lahontan Regional Water Quality Control Board (Water Board) reviews the current state of the regulatory program for domestic wastewater in the region. Laws granting the Water Board's authority and the regulatory tools generally used for the protection of water quality are summarized. The report also provides an analysis, inventory, and physical overview of the regulated wastewater treatment facilities. Five key recommendations are made to improve core regulatory efficiency and groundwater protection.

Introduction

The purpose of this report is to give an overview of domestic wastewater treatment plant regulation in the Lahontan Region. Domestic wastewater management includes individual onsite wastewater treatment systems (OWTS), sewage collection systems, and recycled water treatment and use applications. This report focuses on Water Board regulated individual wastewater treatment plants – both Publically Owned Treatment Works (POTWs) and private plants.

In the wastewater program, Water Board staff follows these priorities:

1. Respond to public health and safety issues;

2. Ensure safe drinking water is provided when private domestic supplies are affected by municipal and domestic sewage disposal;

3. Improve source control through enhanced treatment or disposal/reuse practices;

4. Recommend appropriate enforcement actions for sites with known groundwater pollution to compel improvements;

5. Respond to violations of a Board Order that threatens groundwater;

6. Conduct routine tasks to meet State Water Quality Control Board (State Water Board) performance targets such as updating waste discharge requirements (WDRs), performing inspections, reviewing monitoring and other technical reports, and responding to discharger requests; and

7. Require remediation of polluted groundwater.

Water Board Authority

The California Water Code (Porter-Cologne Water Quality Act, established in 1969) requires Water Board regulation of all discharges of domestic wastewater that may affect surface waters or groundwater. In the Lahontan region, the *Water Quality Control Plan for the Lahontan Region* (Basin Plan) designates present and potential beneficial

uses of surface waters and groundwater that includes municipal and domestic water supply, amongst other uses (Chapter 2), establishes narrative and numerical water quality objectives to protect designated beneficial uses (Chapter 3), and implementation plans to protect beneficial uses and achieve water quality objectives (Chapter 4). Within Chapter 4, section 4.4 outlines the structure for regulating municipal and domestic wastewater, including effluent limitations (numeric and narrative), and land and surface water disposal of sewage effluent. The Water Board issues permits for discharges to federal surface waters in accordance with the Clean Water Act under delegated authority from the United States Environmental Protection Agency.

Current Regulatory Structure and Processes

The Water Board's regulatory program requires dischargers to comply with water quality objectives by establishing effluent and receiving water limitations in general or individual Board Orders. California's regulatory program differs from most other state programs by prescribing a performance-based program in which the Water Board may order compliance with an order; but may not mandate design, location, type of construction, nor particular manner nor method of compliance. The Water Board implements enforcement authority actions, as allowed by the California Water Code, using progressive enforcement tools.

The Waste Discharge Requirements Program regulates most domestic wastewater discharges through individual WDRs issued by the Water Board or through Notices of Applicability (NOAs) signed by the Executive Officer to enroll discharges under state or regional board adopted general orders. Other domestic wastewater related activities are also covered, such as most sewer collection systems and uses of recycled water. A more detailed discussion regarding OWTS and local agency management plans (LAMPs) can be found in the Staff Report titled *Lahontan Water Quality Control Board Status of Implementing the State Board's Onsite Wastewater Treatment System for (OWTS) Policy*, also called septic systems, which was heard by the Board on September 15, 2016.

Recycled Water

In order to lessen the demand on groundwater supplies in the Lahontan region, wastewater management agencies are pursuing water conservation, wastewater recycling, and groundwater recharge activities. Further, the State Board adopted a policy encouraging recycling of wastewater on January 9, 2013. The State's regulatory process for recycled water is divided into functions assigned to the State Board's Division of Drinking Water (DDW) and the Water Board. California Code of Regulations, title 22, defines regulations for level of treatment and disinfection, effluent limitations for coliform, and use area requirements. The DDW must approve an Engineering Report before recycled water uses can be allowed. The treatment and use area requirements of the approved Engineering Report must be imposed in orders issued by the Water Board.

Water Quality Standards

When establishing WDRs, the Water Board must make findings consistent with State Board Resolution 68-16, "Statement of Policy with Respect to Maintaining High Quality Waters in California." When considering authorizing water quality degradation, explicit findings must be made regarding the feasibility of achieving the highest water quality possible while maintaining beneficial use protection and providing the maximum benefit to the people of the state.

Water quality objectives are intended to protect the public health and welfare, and to maintain or enhance the designated beneficial uses of the water. The water quality objectives also provide the basis for detecting any future trend toward degradation or enhancement of basin waters and provide the allowed assimilative capacity when comparing water quality data. The Basin Plan's water quality objectives for groundwater are generally set to meet the current drinking water standards or maximum contaminant levels (MCLs) for drinking water protection. In the past, the Water Board has set receiving water limits in WDRs as the water quality objectives.

Historically, the Water Board routinely established effluent limitations in WDRs based on the federal secondary wastewater treatment requirements for biochemical oxygen demand (BOD), total suspended solids (TSS), pH, and dissolved oxygen. Nitrogen effluent limits were rarely established, although dischargers were required to ensure that wastewater discharges did not exceed the receiving water quality objective of 10 milligrams per liter (mg/L) nitrate as nitrogen in groundwater for protection of drinking water uses. More recent Water Board orders contain time schedules for either: 1) meeting nitrogen effluent limitations or 2) controlling effluent disposal management to prevent pollution (e.g. appropriate farming practices).

Water Quality Monitoring

The Basin Plan addresses two points crucial to the protection of domestic wastewater, including:

1. Basic data needed to evaluate potential threats to groundwater quality and beneficial uses. This information, typically submitted with the application, should characterize hydrogeology, soil characteristics, groundwater location and elevation, groundwater quality, groundwater movement, water well locations and construction, groundwater extractions, land use, waste discharges, potential and existing pollution sources, concentrated areas of septic systems, and extent of any contamination; and

2. Treatment system effluent and receiving groundwater quality monitoring is essential to determine to what extent groundwater beneficial uses and water quality are threatened and to evaluate the effectiveness of any action implemented to protect beneficial uses and water quality. The Water Board may or may not require effluent and/or groundwater monitoring depending on the circumstances.

Water Board staff has identified the need to gather consistent and more comprehensive information concerning nitrate concentrations in groundwater associated with discharges of domestic wastewater in order to identify and respond to groundwater degradation before it impacts drinking water supplies throughout the region. In addition to conducting water quality analyses, the Water Board has developed publically available geospatial data repository, GEOTRACKER, which can support improved technical analyses and tracking of groundwater quality trends. GEOTRACKER currently serves as a repository for data from drinking water wells regulated by DDW, and other monitoring well data from the United States Geological Survey, Department of Water Resources, Mojave Water Agency, responsible parties engaged in site cleanup, and others. The State Board will be requiring all sewage treatment entities regulated by the Water Board to enter groundwater data into GEOTRACKER. State approved commercial water quality laboratories currently upload analytical data to GEOTRACKER for entities under Water Board Cleanup and Abatement (CAO) orders. Dischargers or their consultants will also have to upload groundwater monitoring well and elevation data to GEOTRACKER.

Facility Description by Location

This report discusses methods of treatment and disposal and the impacts of waste loading (flows and nitrate concentrations) on groundwater in millions of gallons per day (MGD).

Table 1 - Summary of Facilities – North and South Lahontan

Sites in Lahontan Basins	Flow > 10 MGD	Flow < 10 & > 1 MGD	Flow < 1 & > 0.5 MGD	Flow < 0.5 & > 0.01 MGD	Flow < 0.01 MGD	Total Sites	Recycled Water Producers	Facilities With Total Nitrogen or Nitrate Limits
South	3	16	27	20	15	81	17	4
North	0	4	4	6	10	24	3	3

Table 1, above, describes the number, size, and general location of facilities within the Lahontan region, how many produce recycled water, and how many have nitrogen effluent limits. The enclosed maps (A through H) show facility locations.

Facility Description by Treatment Type

Although this report does not describe wastewater processes in detail, the treatment processes involve the following various components:

- Primary – physical separation of floatable and settleable material;
- Secondary – biological reduction of organic matter;
- Tertiary – filtration to remove suspended particulates;
- Disinfection – to remove pathogens;
- Nitrogen reduction – to reduce nutrients; and
- Solids handling – to dispose biosolids.

The spectrum of facilities include evaporative ponds, lined ponds, unlined ponds or open pits, stabilization ponds, oxidation ponds, facultative ponds, septic tanks, septic tanks to disposal ponds, package plants, large municipal plants with trickling filters, membrane filtration, activated sludge chambers, concrete basins, and clarifiers.

Effluent Monitoring and the Nitrogen Cycle

Depending upon the type and level of wastewater treatment, the form of nitrogen being discharged to groundwater will vary. As such, it is important to require the monitoring of all nitrogen species, namely ammonia, organic nitrogen, and nitrate. Existing Board Orders do not contain consistent monitoring requirements, and some Board Orders only require nitrate monitoring, which may miss other forms of nitrogen that can be impacting the groundwater.

Human liquid waste contains predominantly ammonia and solid waste as organic nitrogen. Wastewater treatment systems can reduce effluent nitrogen concentrations by hastening decomposition of such wastes and converting nitrogen into nitrogen gas or converting nitrogen into its organic components that can be settled out and removed as biosolids before treated effluent is discharged to groundwater. Where wastewater systems rely only on settling and percolation ponds, nitrogen loading to groundwater can cause pollution.

Facility Description by Disposal Type

Methods of disposal include percolation ponds, lined evaporation ponds, below ground infiltration systems, or recycled water uses (irrigation of land, disposal to constructed or natural wetlands or ponds). Two facilities in the Lahontan region currently discharge effluent to surface waters under a Water Board adopted federal National Pollutant Discharge Elimination System (NPDES) permits: Susanville Sanitary District and Victor Valley Waste Water Reclamation Authority.

Facility Description by Flow

Figure 1 illustrates the number of regulated facilities with respect to plant flow. This figure shows that, based on the design flow rate of all the facilities, the larger number of mid-sized plants contribute an equal or greater waste flow and loading than the three largest plants in the region (flows greater than 10 MGD). In the past, Water Board staff oversight was directed towards ensuring that the three largest facilities were in compliance with their Board Orders. Inspecting and monitoring of these facilities has been helpful in evaluating past performance, evaluating current performance, and planning for future regulatory practices, including assisting Water Board staff in the prioritization and allocation of staff resources. However, current water quality improvement efforts are directed towards the mid-sized facilities that have older permits, need monitoring program improvements, and may require treatment plant upgrades to improve performance. Future efforts will continue Water Board staff oversight of the mid-sized facilities and, as resources allow, begin to address the smaller facilities.

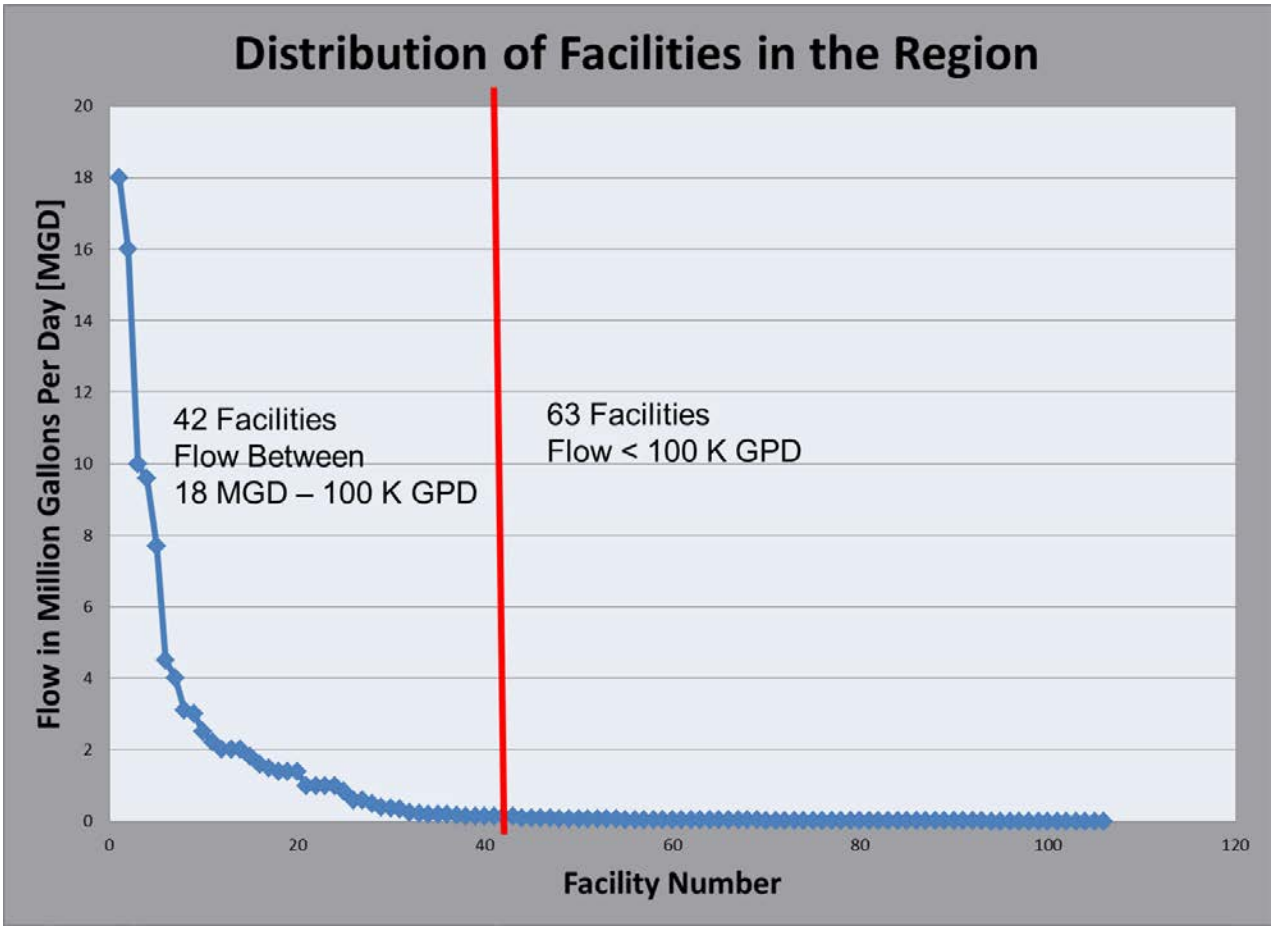

Figure 1 – Facilities in Lahontan by Design Flow

Inventory of Facilities in the Region

Water Board staff conducted an analysis of the most current effluent and groundwater quality data available from the municipal and domestic wastewater treatment plants and summarized the information in Tables 1 and 2, Figure 1, and the enclosed Tables A and B, and Location Maps A through H.

Water Board staff has focused its efforts for the last 15 years on the largest facilities in the Lahontan region due to the effluent disposal methods, large and frequent spills, and inadequate treatment methods that resulted in both surface water and groundwater pollution. The Water Board used various regulatory tools to work with the large facilities to improve treatment and disposal methods, increase recycled water use, and, in some cases, provide replacement water to individuals with groundwater wells polluted or threatened by waste discharges. Water Board staff is now shifting attention to the moderately sized facilities because of their potential to cause degradation, pollution or negative impacts to the assimilative capacity of groundwater basins. In the next few years, this rationale will ensure that we are taking the next step to protect groundwater resources. Additionally, although there are a large number of smaller facilities (flows of less than 100,000 gallons per day), these smaller facilities may not present as large a

risk to groundwater quality. By adopting a General Order that allows the Executive Officer to establish nitrogen effluent limitations on a case-by-case basis, the Water Board can more efficiently regulate sites with smaller flows to protect our groundwater.

Table 2 Summary of Effluent and Groundwater Quality – North and South Lahontan Facilities with Flow Greater Than 100,000 Gallons per Day

	FLOW > 10 MGD		10 MGD > FLOW > 1 MGD		1 MGD > FLOW > 100 k GD		Total	
EFF > MCL	1	33%	9	45%	2	11%	12	29%
EFF < MCL	2	67%	5	25%	2	11%	9	21%
EFF UKWN	0	0%	6	30%	15	79%	21	50%
GW > MCL	1	33%	7	35%	5	26%	13	31%
GW < MCL	2	67%	8	40%	4	21%	14	33%
GW UKWN	0	0%	5	25%	10	53%	15	36%
EFF & GW U	3		20		19		42	

Abbreviations:
EFF > or < MCL - Effluent total nitrogen greater or less than drinking water maximum contaminant level of 10 mg/L nitrate as nitrogen
GW > or < MCL - Groundwater nitrate concentrations more, less, or unknown compared to the drinking water maximum contaminant level of 10 mg/L nitrate as nitrogen

To examine potential impacts from sewage treatment facilities, Table 2, above, summarizes effluent and groundwater quality data. Both Tables 1 and 2 summarize information from enclosed Tables A (North Lahontan) and B (South Lahontan) and categorizes the facilities based on flow, quality of effluent produced, and quality of groundwater with respect to the nitrate drinking water standard MCL of 10 mg/L. These criteria were chosen because they relate to the protection of the beneficial use "municipal and domestic water supply" (MUN) from the Basin Plan and are the best indicators to ensure safe drinking water for the public. These criteria were examined and the following conclusions were drawn concerning the facilities of greatest concern with respect to nitrogen treatment levels and associated groundwater pollution.

1. The first category of facilities has both known effluent and groundwater quality above the MCL. There are currently two facilities in this category. This includes the Mammoth Community Water District (Mammoth CWD) and Fort Irwin sewage treatment plants. The Fort Irwin facility has made treatment improvements and groundwater corrective actions in accordance with the current Board Order. The Mammoth CWD plant needs further examination.

2. The second category of facilities has groundwater levels above the MCL, but unknown effluent water quality data. Facilities in this category include Fort Irwin, Bishop, Eastern Sierra, Marine Corps Logistics Base Barstow and Yermo, Sierra Army Depot, Marine Corps Mountain Training Center, and Edwards Air Force Base. The Water Board needs to examine the operations of these facilities more closely

and determine appropriate effluent quality in order to better ascertain the cause of groundwater pollution. The Water Board may need to encourage or require improved treatment, recycling or other means to limit discharges of waste impacting groundwater.

3. The third category that needs further examination includes facilities lacking both effluent and groundwater quality data with respect to nitrogen. This currently makes up 33 percent (%) or 13 of the facilities between 100,000 gallons per day and 10 million gallons per day. This category includes the Baker Wastewater Treatment Plant, Echo Mars Ponds, Trona and Pioneer Point Wastewater Treatment Plant, Boron Treatment Plant, Barstow Daggett Airport, and Big Pine. Two facilities in this category are the Victor Valley Water Reclamation Authority's sub-regional wastewater treatment plants in Apple Valley and Hesperia that are under construction and have not discharged any wastes. As a category, these sites need Level A inspections, which includes sampling, to determine effluent quality and, if possible, assess groundwater quality. These sites likely need revised and improved monitoring and reporting program requirements, which may include requirements for groundwater monitoring well installation, sampling, and reporting.

4. The fourth category includes three facilities that have effluent above the MCL, but where groundwater shows no pollution. This includes Los Angeles County Sanitation Districts (LACSD) Lancaster, Helendale Silver Lakes Community Services District, and Crestline Community Services District. LACSD Lancaster is operated to achieve an average effluent total nitrogen concentration of less than 10mg/L, but occasionally exceeds this value. These facilities should attain enhanced treatment either by regulation or voluntary improvement or ensure that effluent management practices will not cause or contribute to groundwater pollution.

5. A fifth category of facilities have effluent nitrogen concentrations below the MCL, but nitrogen concentrations in groundwater exceed the MCL, which requires a determination of the cause(s) of these elevated nitrogen concentrations in groundwater. Facilities in this category include the Victorville Southern California Logistics Airport, City of Adelanto Wastewater Treatment Plant, City of Barstow Wastewater Treatment Plant, and LACSD Palmdale. The causes are established and all of these facilities are newly upgraded to produce high quality effluent.

Conclusions from Facility Inventory

Through our review and evaluation of all of the facilities in the Lahontan region, we have determined a need to accelerate and streamline the regulation of such facilities. Facility flow and effluent quality data are the two primary indicators of a facilities threat to receiving water. In the past, resources were apportioned to the larger facilities first as they represented the larger threat to water quality.

We also concluded that Water Board staff should also focus on mid-sized facilities based on their respective potential threat to water quality. Upon closer examination of the effluent monitoring requirements and groundwater monitoring data for these mid-

sized facilities, Water Board staff can determine which of these facilities need to be addressed next and allocate additional resources in the future.

Local Area Management Plans and Onsite Wastewater Treatment Systems Policy

Onsite wastewater treatment systems (OWTS) are used where centralized wastewater treatment systems do not exist or are financially infeasible or impractical. The OWTS Policy took effect on May 13, 2013, and the presentation and report to the Water Board was provided by Water Board staff in September 2016. Any OWTS with a flow greater than 10,000 gallons per day requires WDRs adopted by the Water Board. This is a new requirement. The first task is to identify these OWTS facilities that include schools, mobile home parks, recreational vehicle parks, camps, and campgrounds. Water Board staff recommends using existing Board Orders or a new General Order to regulate these facilities.

Nitrogen Limits for Small Facilities

The State Board adopted a General Order (permit) for domestic wastewater flows of less than 100,000 gallons per day. The permit includes a mechanism to impose nitrogen effluent limits for plants at flows of 20,000 to 100,000 gallons per day. This leaves a gap of effective protective measures (the ability to establish effluent limitations) for facilities with design flows of less than 20,000 gallons per day. Where nitrogen limits or other effluent management measures are needed to protect groundwater quality, the Water Board will work with these facility owners to bring them under the new State Board permit or a Lahontan-specific individual or general order.

Operator Certification

The State Board Office of Operator Certification maintains certification programs for both water and wastewater treatment plant operators. Wastewater operators are a critical component of an effective regulatory program because they conduct routine wastewater treatment plant maintenance and ensure day-to-day treatment plant compliance. Operators stand for examinations and pay annual certificate fees. State regulations categorize treatment plants based on their technical complexity and flow size.

Collection Systems

Sewer collection system infrastructure is a key component of domestic sewage delivery for treatment. The Water Board has imposed individual cease and desist orders or time schedule orders on dischargers (e.g. Lake Arrowhead Community Services District) to ensure collection system upgrades occur and increased inspection and maintenance occur. The State Board permit regulating operation and maintenance of publically owned wastewater collection systems greater than one mile in length has resulted in fewer spills. Water Board staff is evaluating local agencies' implementation and compliance procedures. The State Board permit requires dischargers to maintain a current Sewer System Management Plan and conduct inspections and repairs.

Concerns Regarding Funding and Disadvantaged Communities

Generally, throughout the Lahontan region, wastewater entities that serve larger communities have user fees and the capital needed to reinvest in infrastructure to treat wastewater to California's recycled water standards for beneficial reuse. In the high desert portion of our region, small- and low-density communities, paired with a large number of land developers seeking to reduce the costs of their development, contributes to an increased number of smaller sized systems without sufficient treatment or monitoring. This situation requires a disproportionate amount of the Water Board staff time to regulate. Further, these facilities provide an unknown contribution of salts and nutrients to the assimilative capacity of the region's groundwater. Water Board staff needs to identify and evaluate these smaller facilities to determine which systems may require effluent limitations to ensure groundwater quality protection and reduce any current groundwater contamination. Additionally, Water Board staff should identify communities with a high density of septic systems; the Water Board could then encourage the installation of sewage collection, community sewers, and sewage treatment.

Small community service districts (CSDs) often lack the funds or the population to support treatment or monitoring upgrades to their wastewater treatment facilities to meet new discharge requirements. Also, many of these financial/local government organizations provide both clean drinking water and wastewater treatment systems for their customers. An upgrade to a wastewater treatment system to prevent pollution in the groundwater is often a lower priority for these small CSDs than ensuring safe drinking water to their communities.

Grants may be available for small, disadvantaged communities; however most financial assistance is in the form of low- or no-interest loans that require the communities to pay back these loans. Costs to both pay back such loans and pay for ongoing operations and maintenance are often seen to be prohibitive for disadvantaged communities.

Nevertheless, throughout the Lahontan region improvements in wastewater treatment are needed to better understand how discharges from wastewater treatment plants may be affecting groundwater quality, to discern reuse opportunities, and where the installation of additional groundwater monitoring wells may benefit the protection of water quality. Many WDRs do not contain sufficient effluent quality monitoring requirements, especially with respect to nitrogen species. Groundwater near supply wells should also be assessed for constituents of emerging concern such as pharmaceuticals and personal care products.

Recommendations

After assessing the wastewater treatment facilities in the Lahontan region, Water Board staff make the following recommendations for the Water Board's consideration in the next few years.

1. **Moderate Sized Facilities -** Evaluate moderate sized facilities and identify which of these facilities require improved treatment (may require setting effluent limitations) by updating individual WDRs for facilities where groundwater pollution is occurring or imminent. Develop work plans and schedules to update priority WDRs.

    - **Inventory -** There needs to be a more detailed evaluation of mid-sized facilities in the region that updates effluent and groundwater quality. Water Board staff should evaluate problematic facilities that may be contributing to groundwater pollution and perform Level A compliance inspections (with sampling) to resolve the facilities that have no available effluent data.

    - **Expand Monitoring -** Improved monitoring and reporting programs are needed to better evaluate effluent quality and groundwater impacts. Evaluation of all nitrogen species should be considered for both effluent and receiving water monitoring. The Water Board needs to consider requiring additional monitoring wells in some instances to assess groundwater quality and potential impacts to downgradient water supplies. Dischargers will be required to upload groundwater information to the GEOTRACKER database.

2. **General Order -** Develop a new general order for smaller facilities that allows the Executive Officer to establish nitrogen effluent limitations on a case-by-case basis. A large number of facilities in the region are small facilities (please refer to Figure 1). These small facilities are the target demographic for such a general order because this tool would improve water quality by imposing effluent limitations or methods to encourage improved wastewater treatment and improved monitoring consistently throughout the region. There are a greater number of small plants that take up an equal amount of time to regulate as the large- to mid-sized plants. Water Board staff must become even more efficient to ensure that program targets are met and available resources are directed to gain maximum effectiveness. This new general order could apply to new and existing facilities.

3. **Increase collaborative partnerships -** Partnering with DDW and other agencies, such as the Mojave Water Agency, will improve our knowledge of problem areas with respect to groundwater pollution. By improving knowledge of potential threats to water supplies and human health, water supply wells can be better protected.

4. **Conduct Sewer Collection System Audits -** There is a need to conduct sewer collection system audits to ensure dischargers are maintaining their sewer collection systems. Dischargers must assess the risk of collection systems and pump stations with regard to flooding and extreme weather events.

5. **Provide Outreach to the Regulated Public -** The Water Board should assist our dischargers and stakeholders through increased collaboration and technical

assistance to replace individual OWTS with community sewage treatment systems, improve treatment plant performance (nitrogen reductions) and add/improve monitoring (effluent monitoring and groundwater monitoring wells). Water Board staff can assist or coordinate with dischargers listed under the Proposition 1 Intended Use Plan for Capitalization Grants to jointly improve water and wastewater treatment systems. Water Board staff can continue to identify such opportunities to assist communities in finding the best financial resources (grants, loans, or other opportunities) to provide safe drinking water supplies to their communities and protect public health.

Enclosures

The following are enclosures to this staff report.

Tables

A. North Lahontan Regulated Wastewater Treatment Facilities
B. South Lahontan Regulated Wastewater Treatment Facilities

Maps

A. North Lahontan Basin Wastewater Sewage Facilities
B. Susanville Area Sewage Facilities
C. Lake Tahoe Area Sewage Facilities
D. South Lahontan Basin Wastewater Sewage Facilities
E. Owens Valley Area Sewage Facilities
F. Death Valley Area Sewage Facilities
G. Antelope Valley Area Sewage Facilities
H. San Bernardino County Area Sewage Facilities

References and Resources

Lahontan Basin Plan, Water Quality Control Plan for the Lahontan Region (Basin Plan), http://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.shtml

State Water Resources Control Board, CIWQS database, https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

State Water Resources Control Board, GEOTRACKER database, http://geotracker.waterboards.ca.gov/

State Water Resources Control Board, Division of Financial Assistance, http://www.waterboards.ca.gov/water_issues/programs/grants_loans/

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TABLE A

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Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Facilities 10 MGD or Greater								
None in this part of the region								
Facilities between 1 MGD - 10 MGD								
Tahoe-Truckee Martis Valley WTP	Truckee	Secondary Subsurface percolation Advanced activated sludge - using pure oxygen aeration Biological nitrogen removal Disinfected	2002	9.600	N	9	N	• Effluent Total Nitrogen: 4.6 mg/L • Groundwater Nitrate as N: Below quantification - 3.5 mg/L • Discharger requested re-consideration of the discharge standards at the point of compliance.
South Tahoe PUD WRP	South Lake Tahoe	Secondary Recycled - Agriculture Activated sludge Disinfected to 23 MPN/100 mL	2004	7.700	Y	16	N	• Effluent Total Nitrogen: Unknown (TKN 28.5 mg/L) • Groundwater Nitrate as N: Below quantification to 7.68 mg/L on average WDR should be updated for the following reasons: • Stream line for the use of recycled water for protection of Luther Pass pump station. • Proposal for Douglas County Improvement District to connect with STPUD for DCID, revision of order not needed.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Susanville Sanitary District (NPDES Permit)	Susanville	Tertiary Recycled - fodder crops Extended aeration, activated sludge with filtration, Ultraviolet disinfection and wetland polishing	2008-NPDES	2.000	Y	3	N	• Effluent Total Nitrogen: 18-26 mg/L • Groundwater Nitrate as N: 1 mg/L (2010 data one time) • Permit overdue for update; part of NPDES backlog • Monitoring wells on site not required to monitor, conducted a one-time sampling event (2010) with no noted pollutants. • For permit update, a different discharge pattern to prevent discharges that could contribute to surface water exceedances of water quality objectives or change water quality objectives.
Department of Corrections	Susanville	Secondary Recycled - Agriculture Fermentation pond, two sets of aeration ponds, wetland for polishing, disinfected to 23 MPN/mL	2008	1.400	Y	14	N	• Effluent Total Nitrogen: TKN 15 mg/L • Groundwater Nitrate as N: 0.52 mg/L~05.82 mg/L • The Department of Corrections owns the land that receives the recycled water and grows fodder crops.
Facilities between 100k GPD - 1 MGD								

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Herlong PUD	Herlong	Secondary, nitrogen control Percolation Extended air/activated sludge	2016	0.375	Y	3	N	• Effluent Total Nitrogen: 2.4 mg/L • Groundwater Nitrate as N: Below quantification • HPUD is managing the wastewater collection system for the West Patton Village Community Services District (WPVCSD). • WPVCSD collection system needs to be replaced.
Bridgeport PUD	Bridgeport	Secondary Percolation pond Oxidation ponds	2001	0.200	N	3	N	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 0-4.6 mg/L • The Permit should be reviewed.
USA Sierra Depot WWTF	Herlong	Two wastewater systems - Secondary Percolation and evaporation oxidation ponds	2001	0.160	N	0	Y	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: greater then 10mg/L • Issue with going over the maximum flow at one of the two treatment systems. • The site has nitrates in the groundwater information pointing at the collections system as being either a cause or a contributor.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
USMC Mountain Warfare Training Center WTF	Bridgeport	Secondary Subsurface Percolation Sequential batch reactor	1993	0.140	N	3	Y	• Effluent Total Nitrogen: Nitrate 0.15-15 mg/L TKN 0.81-41 mg/L (2016 monthly average) • Groundwater Nitrate as N: 9-14 mg/L • The permit should be reviewed. • Request to change one monitoring well location in the monitoring and reporting program.
Facilities under 100k GPD								
Leavitt Lake CSD WTF	Susanville	Secondary Percolation in a created wetland Stabilization ponds, converting to oxidation ponds	1996	0.049	N	4	N	• Effluent Total Nitrogen: 34.9 mg/L • Groundwater Nitrate as N: 0-6.8 mg/L • The permit should be reviewed and revised to show all the changes at the facility.
Coleville Housing Wastewater Disposal Facility	Coleville	Secondary, nitrate control Percolation subsurface Modified Ludzak Ettinger process	2011	0.039	N	3	N	• Effluent Total Nitrogen: 6.8 mg/L • Groundwater Nitrate as N: 0-4.7 mg/L • New upgraded facility only a few years ago, no issues with meeting requirements.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Spalding CSD Ponds	Spalding	Primary Lined evaporation ponds Septic tank effluent gravity to evaporation	2006	0.038	N	3	N	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Discharger has requested some relief in maintaining the evaporation ponds.
Markleeville PUD	Markleeville	Secondary Percolation pond Oxidation pond	1995	0.030	N	N	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • The District is in negotiation with a Developer to expand the facility.
USFS Lassen National Forest (Eagle Lake District Office Sewage Ponds)	Susanville	Primary~secondary Stabilization/Evaporation pond Aerated to minimize orders	1992	0.030	N	N	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • The Permit should be reviewed.
Annetts Mono Village	Twin Lakes	Primary Percolation subsurface Community Septic System	1995	0.030	N	3	Y	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 11.6 mg/L • Monitoring wells actually Lahontan's, installed as part of a different study
Reimers, Iris & Walter (Susanville MHP)	Susanville	Primary Percolation mound Community Septic System	2015	0.012	N	4	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • New wells installed and a short summary report submitted.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Floriston, Community of	Floriston	Primary Percolation subsurface Community Septic System	1988	0.010	N	3	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Two monitoring wells dry, third well can be intermittently sampled, but not properly purged. • Old community septic systems, leach field is in a difficult location to determine if it is degrading groundwater.
USFS Lassen National Forest (Eagle Lake Wastewater Facility)	Susanville	Primary Lined evaporation ponds Oxidation pond	2010	0.008	N	N	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • The enforcement action should be reviewed for rescission. • Alter the monitoring reporting program requirements.
Camp Antelope Community	Walker	Primary Percolation subsurface Community Septic System	1988	0.008	N	3	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Old community septic system has not been reviewed or inspected for a number of years. • No known problems, minimal to no reporting.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Sorensen's Resort	Hope Valley	Secondary with Disinfection Percolation subsurface or to South Tahoe Public Utility District's C line Septic tank for solids, tricking filter for treatment with disinfection	2004	0.007	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Altered the treatment systems to meet requirement for discharging into South Tahoe Public Utility Districts C-line. • The discharge quality has not met the requirements to discharge into the C-line.
Woodfords Indian Colony WWTF	Woodfords	Primary Percolation pond Stabilization pond	1995	0.006	N	3	N	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 0.7 mg/L • Stabilizations ponds used to treat the Wastewater, no problems noted.
Honey Lake Safety Roadside Rest Area	Honey Lake	Modified secondary, Nitrogen control Percolation Septic tank for solid separation, recirculation to fixed film media, recirculating sand filter, anoxic wetland	2016	0.004	N	0	Y	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Above 10 mg/L • Monitoring wells to be installed • Shallow onsite well above nitrate drinking water standard. • Private well with nitrate above drinking water standard. • Two other nearby private wells below nitrate drinking water standard.
Stones-Bengard CSD Ponds	Susanville	Primary Lined evaporation ponds Septic tank effluent gravity C36	2014	0.004	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Depth to groundwater is considered to be in excess of 200 feet.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Alpine County PUD (Turtle Rock Park Campground)	Markleeville	Primary Percolation Septic tank effluent gravity to percolation/evaporation pond	1996	0.002	N	3	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Monitoring wells have been dry for several years. • The monitoring wells may have collapsed. • The pond is usually dry.
Days End RV (NOA)	Litchfield	Modified primary Subsurface percolation/leach field Recirculating sand filter	1998	0.003	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Enrolled in 97-10 -DWQ • Lack of any recent monitoring reports.
Collection Systems under Sanitary Sewer System Gerneral Order			Year Enrolled					
Alpine Springs County Wate	Alpine Meadows	Enrolled	2006					
Bridgeport PUD	Bridgeport	Enrolled	2006					
California Correctional/High Desert State Prison	Susanville	Enrolled	2007					
D.L. Bliss State Park	Tahoma	Enrolled	2008					
Dept of Corrections	Susanville	Enrolled	2006					
Emerald Bay State Park	Tahoma	Enrolled	2008					
Lassen National Forest	Susanville	Enrolled	2006					
Leavitt Lake CSD	Susanville	Enrolled	2006					
Markleeville PUD	Markleeville	Enrolled	2006					
North Tahoe PUD	Tahoe Vista	Enrolled	2007					
Northstar CSD	Truckee	Enrolled	2006					
Placer County Eastern Regional Landfill	Auburn	Enrolled	2008					
South Tahoe PUD	South Lake Tahoe	Enrolled	2006					
Spalding CSD	Susanville	Enrolled	2009					
Squaw Valley PSD	Olympic Valley	Enrolled	2006					
Stones-Bengard CSD	Susanville	Enrolled	2006					

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Sugar Pine Point State Park	Tahoma	Enrolled	2008					
Susanville CSD	Susanville	Enrolled	2006					
Tahoe City PUD	Tahoe City	Enrolled	2006					
Tahoe Truckee Sanitation Agency	Truckee	Enrolled	2006					
Truckee Sanitation District	Truckee	Enrolled	2006					
United States Army	Herlong	Enrolled	2006					
Master Water Reclamation Permits or Enrollees under State Board General Order								
None in this part of the region								
Individual Water Reclamation Requirements								
South Tahoe PUD Diamond Valley WTP	South Lake Tahoe		2011	7.700	Y		N	• WDR/WRR for use of recycled wastewater
Gansberg Ranch	Fredericksburg		1989					• WRR predate the Recycled water Policy in need of being reviewed for updating • Groundwater monitoring done by supplier of recycled water, South Tahoe Public Utility District
Neddenriep Ranch	Fredericksburg		1989					• WRR predate the Recycled water Policy in need of being reviewed for updating • Groundwater monitoring done by supplier of recycled water, South Tahoe Public Utility District
Bruns Ranch	Fredericksburg		1989					• WRR predate the Recycled water Policy in need of being reviewed for updating • Groundwater monitoring done by supplier of recycled water, South Tahoe Public Utility District

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Celio Ranch	Paynesville		1989					• WRR predate the Recycled water Policy in need of being reviewed for updating • Groundwater monitoring done by supplier of recycled water, South Tahoe Public Utility District
Ace Hereford Ranch	Paynesville		1989					• WRR predate the Recycled water Policy in need of being reviewed for updating • Groundwater monitoring done by supplier of recycled water, South Tahoe Public Utility District
Dressler on the Farm	Paynesville		1989					• WRR predate the Recycled water Policy in need of being reviewed for updating • Groundwater monitoring done by supplier of recycled water, South Tahoe Public Utility District

Notes and Definitions:
(*) - Federal NPDES permit noted, all other WDRs
CSD - Community Services District
DCID - Douglas County Improvement District
DWQ - Department of Water Quality
mg/L - milligrams per Litre
MGD - Millions of Gallons per Day
MHP - Mobile Home Park
MPN - Most Probable Number
NOA - Notice Of Applicability
NPDES - National Pollutant Discharge Elimination System
PUD - Public Utilities District
RV - Recreational Vehicle
STPUD - South Tahoe Public Utitlities District
TKN - Total Kjeldahl Nitrogen
USFS - United States Forest Service

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
USMC - United States Marine Corps								
WDR - Waste Discharge Requirements								
WRP - Water Recycling Plant								
WRR - Water Recycling Requirements								
WTP - Water Treatment Plant								
WWTF - Wastewater Treatment Facility								

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TABLE B

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Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Facilities 10 MGD or greater								
VVWRA WTP	Victorville	Tertiary Nitrogen Control Surface Water Percolation Recycled - Landscape & Industrial Activated sludge system	2013 - NPDES 2012	18.000	Y	16	N	• Effluent Total Nitrogen: 7.8 mg/L • Groundwater Nitrate as N: 0.2-9.8 mg/L • Upper Narrows tunnel sewer line replacement in progress. • Effluent limits in order.
Lancaster WTF	Lancaster	Tertiary Nitrogen Control Recycled- Agriculture & landscape Pond Storage Activated sludge system	2002 2006	16.000	Y	43	N	• Effluent Total Nitrogen: 10.59 mg/L • Groundwater Nitrate as N: 0.29-1.55 mg/L • Revise WDRs to consolidate requirements and amendments. • Include statistically relevant numerical representation of background Water Quality at East Agricultural Area. • Investigate cause of elevated TDS beneath Storage Reservoirs.
Palmdale WTF	Palmdale	Tertiary Nitrogen Control Recycled- Agriculture & landscape Pond Storage Activated sludge system	2011	10.000	Y	49	Y	• Effluent Total Nitrogen: 6.5 mg/L • Groundwater Nitrate as N: 0.8-17.1 mg/L • CAO requires groundwater NO3 plume containment and cleanup.
Facilities between 1 MGD - 10 MGD								

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Barstow WTF Mojave River Bed	Barstow	Secondary Nitrogen Control Percolation Activated sludge pond system	1994	4.500	N	32	Y	• Effluent Total Nitrogen: 8 mg/L • Groundwater Nitrate as N: 0.02-22 mg/L • CDO prohibits effluent and sludge disposal to north field. • CAO requires NO3 groundwater cleanup extraction to begin by November 2017. • CAO requires replacement water to affected residential well. • NO3 plume co-mingled with perchlorate. • Phase I treatment plant upgrades completed. • Recommended recised WDRs to establish total N effluent limits. • Effluent limits in order.
Adelanto WWTP	Adelanto	Secondary Nitrogen Control Percolation Activated sludge pond system Percolation Activated sludge pond system	2013	4.000	N	2	Y	• Effluent Total Nitrogen: 1.4 mg/L • Groundwater Nitrate as N: 0.2-28.0 mg/L • Implement NO3 pollution corrective plan. • Effluent limits in order.
Ridgecrest WTF	China Lake	Secondary Percolation Recycled - Agriculture Primary aerated pond system	2000	3.120	Y	3	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 7.8 mg/L • Facility located on China Lake Naval Air Weapons Station. • City plans upgraded treatment to supply recycled water. • Groundwater MUN use removed beneath percolation ponds.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Lake Arrowhead CSD WTFS	Lake Arrowhead	Secondary Recycled - Agriculture Trickling filter pond system	2009	3.000	Y	16	N	• Effluent Total Nitrogen: 5.0 mg/L • Groundwater Nitrate as N: ND-9.6 mg/L • CDO requires reducing I/I during high storm events to prevent spills from exceeding outfall capacity. • Recommend meeting with District to identify vulnerabilities inhibiting achieving CDO I/I reduction objectives.
Victorville/SCLA Central WWTP Water Dist	Victorville	Tertiary Percolation Recycled - Industrial & Landscape Membrane bioreactor system	2014	2.500	Y	7	Y	• Effluent Total Nitrogen: 5.72 mg/L • Groundwater Nitrate as N: 0.2-10.0 mg/L • WDRs include numerical TDS receiving water effluent. • Effluent limits in order.
Mammoth CWD STP	Mammoth Lakes	Secondary Tertiary Percolation Recycled - Landscape Activated sludge pond system, plus tertiary	1991	2.200	N	4	Y	• Effluent Total Nitrogen: 0.05-34 mg/L • Groundwater Nitrate as N: 0.05-24 mg/L • Need to evaluate whether nitogen loading from Laurel Ponds may affect Hot Creek Hatchery Springs. • Discharger is evaluating options to manage or remove historical onsite sludge disposal.
Fort Irwin	Fort Irwin	Secondary Tertiary Percolation Recycled - Landscape Oxidation ditch pond system, with tertiary	2004	2.000	Y	24	Y	• Effluent Total Nitrogen: Unknown (NO3 as N: 11 mg/L) • Groundwater Nitrate as N: 20-35 mg/L • Historical effluent chlorination caused THMs in groundwater. • Improved treatment with nitrogen reduction expected to allow reduce groundwater nitrate pollution.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Rosamond WTF (Ponds)	Rosamond	Secondary Tertiary Percolation Aerated pond system, plus activated sludge tertiary (inactive)	2015	2.000	N	4	Y	• Effluent Total Nitrogen: 3-57 mg/L • Groundwater Nitrate as N: 1.3-13 mg/L • NOA pending DDW Engineering Report approval to become recycled water Administrator. • WDRs include time schedule to line leaking ponds causing pollution or propose alternative treatement/disposal plan. • Time schedule for additional monitoring wells included in WDRs.
Helendale Silverlakes STP	Helendale	Secondary Percolation Recycled - Agriculture Trickling filter pond system	2001	1.800	Y	4	N	• Effluent Total Nitrogen: 9.9-14.5 mg/L • Groundwater Nitrate as N: 2.2-7.5 mg/L • Revised WDRs pending to expand agricultural reuse area.
Bishop Sewage Treatment Plant	Bishop	Secondary Percolation Recycled - Agricultural Primary plus aerated lagoon system	1994	1.600	Y	5	Y	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: ND-18.7 mg/L • Treatment and disposal areas co-located with Eastern Sierra CSD. • City and District implementing Joint Work Plan taking actions intended to address pollution. • Recommend MRP include effluent Nitrogen
Edwards AFB Main Base	Edwards AFB	Secondary Tertiary Percolation Recycled - Landscape Oxidation ditch system	2001	1.500	Y	5	Y	• Effluent Total Nitrogen: Unknown (TKN: 0.82 mg/L) • Groundwater Nitrate as N: 0.17-10 mg/L • Continue with THM investigations. • Revise MRP to require daily, not weekly, coliform sampling.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Crestline SD Three WTF's	Crestline	Secondary Recycled - Agricultural Trickling filter and activated sludge system	1994	1.400	Y	4	N	• Effluent Total Nitrogen: 32.5 mg/L • Groundwater Nitrate as N: 0.9-6.4 mg/L • Flow combined from Huston Creek (main), Seeley Creek, Cleghorn and Pilot Rock (CAL FIRE) plants. • Effluent chlorinated to protect Silverwood Reservoir (California Aqueduct). • Need to evaluate collection system I/I. • District has year-to-year lease on Las Flores Ranch for disposal and re-use.
California City WTF	California City	Secondary Tertiary Percolation Recycled - Landscape Activated sludge system	2000	1.000	Y	3	N	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 3.9 mg/L • Monitoring well network around golf course pond with decayed liner should be evaluated.
June Lake PUD STP	June Lake	Secondary Percolation Oxidation ditch system	1993	1.000	N	2	U	• Effluent Total Nitrogen: 7-17 mg/L • Groundwater Nitrate as N: 0.18-1.0 mg/L
VVWRA Sub-regional Apple Valley	Apple Valley	Package Tertiary NitrogenControl Percolation Recycled - Landscape Membrane bioreactor system	2013	1.000	Y	4	N	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • No discharge • Construction underway. • Establishing background water quality. • Effluent limits in order.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
VVWRA Sub-regional Hesperia	Hesperia	Package Tertiary NitrogenControl Percolation Recycled - Landscape Membrane bioreactor system	2013	1.000	Y	3	N	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • No discharge • Construction underway. • Establishing background water quality. • Effluent limits in order.
Facilities between 100k GPD - 1 MGD								
Eastern Sierra CSD WWTF	Bishop	Secondary Percolation Recycled - Agricultural Primary plus aerated lagoon system	1994	0.850	Y	5	Y	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: ND-18.7 mg/L • Treatment and disposal areas co-located with City of Bishop. • City and District implementing Joint Work Plan taking actions intended to address pollution. • Recommend MRP include effluent Nitrogen
Mojave STP	Mojave	Secondary Percolation Aerated lagoon system	2001	0.600	N	0	U	• Effluent Total Nitrogen: 16.4 mg/L • Groundwater Nitrate as N: Unknown • When installing a monitoring well, drilling stopped at 500 fbgs with no saturated zone detected. • Nearby drinking wells have NO3 concentrations over the MCL. • Recommend headworks to remove rags, comminute solids, and install pond aerators for improved treatment.
USMC Barstow NEBO	Barstow	Secondary Percolation Activated sludge system	2001	0.600	Y	3	N	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 1.15-3.25 mg/L • Due to low flow, MCLB discharges into lined ponds and evaporates effluent.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Lone Pine WWTF	Lone Pine	Secondary Percolation Aerated lagoon system	1995	0.500	N	2	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: ND-0.2 mg/L • Recommend additional monitoring wells. • Recommend MRP include effluent Nitrogen
Baker WTF	Baker	None Percolation Raw sewage	1997	0.400	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend requiring secondary treatment effluent limitations to address odor problems • Recommend MRP include effluent Nitrogen • Recommend groundwater monitoring wells. • Recommend WDR update to include additional aereation and a percolation pond constructed.
Echo Mars Ponds	Fort Irwin	Septic Percolation Septic lined pond system	1993	0.340	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • NASA elects to evaporate, not percolate, effluent.
Trona & Pioneer Point WTF	Trona	Septic Percolation Septic pond system	1994	0.247	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Effluent from Trona and Pioneer Point communities treated in septic system and comingled with Searles Valley Minerals industrial waste for discharge into Searles Dry Lake open pond. • County had planned collection system improvements.
Boron STP	Boron	Secondary Percolation Aerated lagoon system	2002	0.210	N	0	U	• Effluent Total Nitrogen: Unknown (TKN: 73 mg/L) • Groundwater Nitrate as N: Unknown • Facility operating well under capacity.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
USMC Barstow Yermo	Yermo	Secondary Percolation Aerated lagoon system	2001	0.200	N	6	Y	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 2.04-20 mg/L • Continue 13267 oversight for high nitrate and phenols in groundwater.
Calico Ghost Town Recreational Facility WTF	Yermo	Septic Percolation Septic pond system	1983	0.181	N	2	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 4.4 mg/L • Recommend additional monitoring wells.
Barstow/Daggett Airport WTF	Daggett	Secondary Percolation Aerated lagoon system	1999	0.150	N	3	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Low flow evaporates within facility • Groundwater wells dry
Big Pine STP	Big Pine	Secondary Percolation Aerated lagoon system	1995	0.150	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend MRP include effluent Nitrogen • Recommend groundwater monitoring wells • Recommend improved oxidation.
Inyokern CSD WTF	Inyokern	Secondary Percolation Aerated lagoon system	1993	0.150	N	3	U	• Effluent Total Nitrogen: 9.70 mg/L • Groundwater Nitrate as N: Unknown • Inyokern CSD has financial difficulty and inability to keep certified operators submitting late reports and incomplete reports. • SMRs have been delinquent in reporting.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Desert Lake CSD WTF	Boron	None Percolation Raw sewage	2001	0.140	N	0	U	• Effluent Total Nitrogen: Unknown (TKN: 51 mg/L) • Groundwater Nitrate as N: Unknown • Recommend requiring upgraded treatment to remove solids, install pond aerators and install monitoring wells.
Independence WWTF	Independence	Secondary Percolation Aerated lagoon system	1995	0.130	N	2	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 0.53-2.4 mg/L • Recommend MRP include effluent Nitrogen • Recommend discharger utilize existing aerators. • Recommend SSO audit.
Facilities under 100k GPD								
Los Ranchos MHP	Apple Valley	Secondary Percolation Package secondary system	1985	0.096	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend connection to sanitary sewer system. • Discharger submitted Engineering Report proposing upgrades to supply tertiary recycled water to its onsite public lake in summer with continued winter effluent disposal in percolation ponds. • Recommend monitoring wells. • Recommend MRP include effluent Nitrogen
Rolling Green Terrace WTF	Big Pine	Septic Percolation Lagoon system	1987	0.089	N	2	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend enforcement re: groundwater data non-submittal • Recommend MRP include effluent Nitrogen • Recommend replacing existing open septic tank with a new septic tank or primary treatment unit. • Recommend requiring a Sanitary Sewer Managment Plan. • Recommend monitoring wells.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Hilton Creek CSD Package STP	Crowley Lake	Secondary Percolation Package secondary system	2004	0.087	N	0	U	• Effluent Total Nitrogen: 2.2-4.0 mg/L • Groundwater Nitrate as N: 1.0-6.3 mg/L • Recommend SSO audit.
DVNM HDQ Furnace Creek WWTF	Death Valley	Septic Percolation Aerated lagoon system	1986	0.080	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown
Lee Vining WTF	Lee Vining	Septic Percolation Lagoon system	1984	0.076	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend monitoring wells.
Furnace Creek Inn & Ranch Package STP	Death Valley	Package Secondary Subsurface Leachline Package plant	2016	0.071	N	0	U	• Effluent Total Nitrogen: (NO3-N: 17.5 mg/L) • Groundwater Nitrate as N: 5.0 mg/L
Edwards AFB Research Lab	Edwards AFB	Secondary Percolation Aerated lagoon system	1999	0.060	N	0	N	• Effluent Total Nitrogen: (TKN: 4.1-11 mg/L) • Groundwater Nitrate as N: Unknown • All effluent evaporated due to low flow. • Chlorinated solvents present in groundwater from upgradient source.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Mammoth Mtn Ski Area WTF	Mammoth Lakes	None Percolation Raw sewage	2000	0.060	N	3	N	• Effluent Total Nitrogen: 2.3-34.3 mg/L • Groundwater Nitrate as N: 0.05-0.24 mg/L • Recommend requiring upgraded treatment. • Recommend requiring wells to be sampled for constituent concentrations. Currently depth only required.
Rovana Housing Package STP	Rovana	Secondary Percolation Package secondary system	2001	0.060	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 0.1-4.2 mg/L • Recommend requiring Sanitary Sewer Managment Plan. • Recommend additional monitoring wells. • Recommend MRP include effluent Nitrogen
Tecopa Hot Springs Resort LLC	Tecopa Hot Sprin	None Percolation Raw sewage	1996	0.057	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend monitoring wells.
C.V. Kane Safety Roadside Rest Area	Barstow	Secondary Percolation Aerated lagoon system	1994	0.056	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • New liners in 2016.
Convict Lake Campground WTF	Mammoth Lakes	Secondary Percolation Aerated lagoon system	1995	0.053	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend monitoring wells.
Desert Oasis Safety Roadside Rest Area	Newberry Sprs	Secondary Percolation Septic pond system	1997	0.048	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend monitoring wells. • Recommend MRP include effluent Nitrogen

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Willow Springs MHP	Tehachapi	Secondary Percolation Package secondary system	2017	0.048	N	3	U	• Effluent Total Nitrogen: 35-84 mg/L • Groundwater Nitrate as N: Unknown • Requires constant compliance oversight. • Recommend MRP include groundwater Nitrate-N monitoring.
Big Pine Indian Reservation WTF	Big Pine	Secondary Percolation Aerated lagoon system	2002	0.047	N	3	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: ND-0.89 mg/L • Due to low flow, no discharge to percolation ponds
Mountain View Villas	Apple Valley	Secondary Subsurface Leachline Package plant subsurface system	1986	0.045	Y	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend monitoring wells.
Rock Creek Area WTP	Rock Creek	Secondary Percolation Aerated lagoon system	1992	0.040	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend MRP change to collect better nitrogen series data.
Tecopa Hot Springs Park WWTF	Tecopa	None Percolation Raw sewage	1994	0.040	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend monitoring wells.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Bishop Creek Campground WTF	Bishop	Secondary Percolation Aerated lagoon system	2000	0.035	N	0	N	• Effluent Total Nitrogen: 20.1 mg/L • Groundwater Nitrate as N: Unknown • Recommend monitoring wells.
Stovepipe Wells Village	Death Valley	None Percolation Raw sewage	1996	0.030	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Problem with wind blown sand into ponds. • Reverse Osmosis brine discharges into ponds. Groundwater TDS > 3000 ppm. Natonal Park Service considering alternatives. • Recommend monitoring wells.
Park Knolls Subdivision	Boron	None Percolation Raw sewage	1999	0.028	N	0	U	• Effluent Total Nitrogen: 65 mg/L • Groundwater Nitrate as N: Unknown • Recommend upgrading treatment. • Recommend monitoring wells.
Mountain High West Package Plant	Wrightwood	Secondary Subsurface Leachline Package plant subsurface system	1985	0.027	N	2	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown
US Borax Incorporated	Boron	None Percolation Raw sewage	2015	0.027	N	3	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend requiring nitrate groundwater monitoring, currently not required.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Bear Valley MHP WTF	Apple Valley	Secondary Subsurface Leachline Package plant subsurface system	1984	0.025	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend monitoring wells.
Grand View Plaza	Oak Hills	Secondary Subsurface Leachline Package plant subsurface system	2011	0.020	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown
Owens Valley Conservation Camp WTF	Bishop	Septic Percolation Septic pond system	1996	0.019	N	0	U	• Effluent Total Nitrogen: 12.1 mg/L • Groundwater Nitrate as N: Unknown • Recommend monitoring wells.
MolyCorp Mountain Pass DOMESTIC WASTEWATER T&DFs	Mountain Pass	Septic Percolation Septic pond system	2012	0.018	N	2	Y	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Range 2.8 - 360 mg/L, mine activity pollution related • Upgradient industrial nitrate groundwater plume. Discharge dillutes nitrate plume. • Owner in bankruptcy. • Consider for rescission.
Phelan Shopping Center	Phelan	Secondary Subsurface Leachline Package plant subsurface system	1989	0.015	N	0	U	• Effluent Total Nitrogen: Unknown (TKN: 1.1 mg/L) • Groundwater Nitrate as N: Unknown • Depth to GW more than 500 ft. • Occasional odor complaints.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Division Creek Roadside Rest Area	Independence	Septic Subsurface Leachline Septic subsurface system	1986	0.011	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend monitoring wells. • Recommend MRP include effluent Nitrogen
Kern Community College District	Bishop	Secondary Subsurface Leachline Package plant subsurface system	2003	0.010	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend monitoring wells, shallow groundwater. • Recommend MRP include effluent Nitrogen
Phelan Towne Square	Phelan	Secondary Subsurface Leachline Package plant subsurface system	1992	0.010	N	0	U	• Effluent Total Nitrogen: Unknown (NO3: 13 mg/L) • Groundwater Nitrate as N: Unknown • Depth to groundwater more than 500 feet.
Pilot Rock Conservation Camp Package WTF	Crestline	Secondary	2000	0.010	Y	0	U	• Effluent Total Nitrogen: 6.5 mg/L • Groundwater Nitrate as N: Unknown • Discharge into Crestline CSD outfall for disposal at Los Flores Ranch. • Effluent disinfected to protect Silverwood Reservoir. • New drinking water Reverse Osmosis system discharges brine to outfall line.
Coso Junction Roadside Rest Area	Little Lake	Septic Subsurface Leachline Septic subsurface system	1985	0.009	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend MRP include effluent Nitrogen • Repeated leach line faiures. • Recommend monitoring wells. Suspect nitrate impact. • Recommend treatment upgrade.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Amargosa Opera House	Death Valley	None Percolation Raw sewage	1996	0.008	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend septic tank for solids removal. • Recommend monitoring wells.
Boron Rest Facility	Boron	Septic Subsurface Leachline Septic subsurface system	1984	0.007	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Repeated leach line failures. • Recommend monitoring wells.
Jack in The Box Restaurant #3588	Yermo	Secondary Subsurface seepage Pit Package plant subsurface system	1991	0.005	N	3	N	• Effluent Total Nitrogen: (NO3-N: ND) • Groundwater Nitrate as N: 1.6-4.2 mg/L • Increasing groundwater nitrate concentrations. • General Order has no effluent limits. • Continued flow violations.
Melina Square	Hesperia	Septic Subsurface Leachline Septic subsurface system	1988	0.005	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend sewer connection. • Recommend inspection. • Problems with SMR submittal.
Oak Tree Inn	Yermo	Secondary Subsurface seepage Pit Package plant subsurface system	2001	0.005	N	3	Y	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 0.7-16.0 mg/L • Historical flow violations because installed package plant was twice size proposed in RWD. • Historical periodic NO3 violation. Working with discharger to optimize treatment and justify higher flow without causing groundwater pollution. Pending RWD for coverage under General Order at higher flow.

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
June Mountain Ski Area Chalet	Mammoth Lakes	Septic Subsurface Leachline Septic subsurface system	1999	0.004	N	0	U	• Effluent Total Nitrogen: 0.6 mg/L • Groundwater Nitrate as N: Unknown
Mount Whitney Fish Hatchery Residential Area	Independence	Septic Percolation Septic pond system	1985	0.003	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend rescission because the DFW does not currently use residences, but still pays annual fees. • Recommend installation of conventional septic/leach if residences reoccupied.
Roadhouse Restaurant	Boron	Septic Percolation Septic pond system	2004	0.003	N	3	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 0.29-1.8 mg/L • Increasing NO3 as N. • Adjacent unregulated systems contributing. • Recommend MRP include effluent Nitrogen
Crowley Lake Recreational Area	Mammoth Lakes	Septic Subsurface Leachline Septic subsurface system	1985	0.002	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend groundwater monitoring wells between leach field and lake.
Mountain High East Septic System	Wrightwood	Septic Subsurface Leachline Septic subsurface system	1987	0.002	N	2	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 0.48 mg/L

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Jensen's Market	Wrightwood	Septic Subsurface Leachline Septic subsurface system	1984	0.002	N	1	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown • Recommend groundwater monitoring wells.
RND Enterprises	Lancaster	Secondary Subsurface Seepage Pit Package plant subsurface system	2008	0.001	N	2	N	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: 0.93-3.2 mg/L
Bear Valley Firestone	Hesperia	Septic Subsurface Seepage Pit Septic subsurface system	2003	0.001	N	0	U	• Effluent Total Nitrogen: Unknown • Groundwater Nitrate as N: Unknown Recommend connection to sewer.
Burger Basket	Phelan	Secondary Subsurface Seepage Pit Package plant subsurface system	1993	0.001	N	0	U	• Effluent Total Nitrogen: 48.7 mg/L • Groundwater Nitrate as N: Unknown • Poor plant O/M. • Depth to groundwater more than 500 feet.
Collection Systems Under State Board Order No. 2006-003-DWQ								
Adelanto CS	Adelanto	ENROL	2006					
Baker CS	Baker	ENROL	2006					
Barstow CS	Barstow	ENROL	2006					Audit completed FY15/16
CSA S-7 CS (Lenwood)	Lenwood	ENROL	2006					
Big Pine CS	Big Pine	ENROL	2006					

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Big Pine Indian Reservation CS	Big Pine	ENROL	2006					
Bishop Creek CS	Bishop	ENROL	2006					
Bishop STP CS	Bishop	ENROL	2006					
Boron CS	Boron	ENROL	2006					
Calico Ghost Town Regional Park CS	Yermo	ENROL	2006					
California City CS	California City	ENROL	2006					
Convict Lake CS	Bishop	ENROL	2006					
Crestline Sanitation District Three CS	Crestline	ENROL	2006					Audit completed FY15/16
Silverwood Lake SRA CS	Hesperia	ENROL	2006					
Desert Lake CSD CS	Boron	ENROL	2006					
DVNM Hdq Furnace Creek CS	Death Valley	ENROL	2006					
Eastern Sierra CSD CS	Bishop	ENROL	2006					
Helendale CS	Helendale	ENROL	2006					
Hilton Creek Csd Package CS	Crowley Lake	ENROL	2006					Audit planned FY16/17
Independence CS	Independence	ENROL	2006					
Inyokern Csd CS	Inyokern	ENROL	2006					
June Lake PUD CS	June Lake	ENROL	2006					
Lake Arrowhead Csd CS	Lake Arrowhead	ENROL	2006					
City Of Lancaster CS	Lancaster	ENROL	2006					Audit planned FY16/17
California State Prison, Los Angeles County CS	Lancaster	ENROL	2006					
County Sanitation District No. 14 CS	Lancaster	ENROL	2006					
County Sanitation District No. 20 CS	Lancaster	ENROL	2006					
Unincorporated County Area Lake Hughes Zone of the CSMD CS	Lake Hughes	ENROL	2006					
Lee Vining CS	Lee Vining	ENROL	2006					
Lone Pine CS	Lone Pine	ENROL	2006					
Mammoth Cwd CS	Mammoth Lakes	ENROL	2006					
Mojave CS	Mojave	ENROL	2006					
City Of Palmdale CS	Palmdale	ENROL	2006					
Ridgecrest WWTF CS	Ridgecrest	ENROL	2006					
Rock Creek Area CS	Mammoth Lakes	ENROL	2006					

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Rosamond (Ponds) CS	Rosamond	ENROL	2006					
CSA 82 CS (Trona & Pioneer Point)	Trona	ENROL	2006					
VVWRA CS	Victorville	ENROL	2006					
City of Hesperia CS	Hesperia	ENROL	2006					
CSA 42 CS (Oro Grande)	Oro Grande	ENROL	2006					
CSA 64 CS (Spring Valley Lake)	Spring Valley Lak	ENROL	2006					Audit planned FY16/17
CSA 70 SP2 CS (Oak Hills)	Oak Hills	ENROL	2006					
Town of Apple Valley Wastewater Dept. CS	Apple Valley	ENROL	2006					
Victorville SD CS	Victorville	ENROL	2006					Audit completed FY15/16
Mojave Narrows Regional Park CS	Victorville	ENROL	2006					
(Running Springs) Treatment Plant in Region 8								
Arrowbear Park CWD CS	Arrowbear Lake	ENROL	2006					
CSA 79 CS (Green Valley Lake)	Green Valley Lak	ENROL	2006					
Septic System								
Mojave Forks Park - CA DPR	Hesperia	ENROL	2006					
Master Water Reclamation Permits or Enrollees under State Board General Order								
Lake Arrowhead CSD WTFS	Lake Arrowhead	REC Master	2007		Y			Should be assessed annual fee
Lancaster Water Recycling Plant	Lancaster	REC Master	2009		Y			Should be assessed annual fee
Mammoth Lakes WTP Tertiary Unit	Mammoth Lakes	REC Master	2009		Y			Should be assessed annual fee
Palmdale WTF Reclam	Palmdale	REC Master	2012		Y			Should be assessed annual fee. Los Angeles World Airport (not adjacent, but a part) has submitted a Farm Management Plan due to the large number of farms that they are leasing for farming.
Rosamond CSD	Rosamond	Draft Enrollee						Pending DDW Engineering report approval
VVWRA	Victorville	Enrollee	2017		Y			NOA issued 01-11-17

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
Individual Water Reclamation Requirements								
Apollo Co Park Reclam	Lancaster	REC	1985		Y	0	U	
Nebeker Ranch Irrig Site	Lancaster	REC	1986		Y	5	Y	Legacy NO3 pollution persists. No longer using reclaimed wastewater.
LACSD 14 Reclamation	Lancaster	WDR	2011		Y	26	U	
Ridgecrest Reclamation Irrigation Site	Ridgecrest	REC	1993		Y	3	N	Monitoring suggests that use may actually improve groundwater quality
USNWC Golf Course Recreational Facility	China Lake	REC	1984		Y	0	U	
Westwinds Golf Course	Victorville	REC	2013		Y	0	U	
High Desert Power Project	Victorville	REC	2009		Y	0	N	
Snow Valley LLC	Running Springs	REC	1994		Y	0	N	Recycled water delivery line not constructed.
Rancho Las Flores Recycling Site	Hesperia	REC	1996		Y	0	U	
Tatum Reclamation Site	Bishop	REC	1985		Y	5	Y	From Bishop/Eastern Sierra CSD effluent disposal
Biosolids General Order								
Ridgecrest Biosolid Sites	Ridgecrest	ENROL	2017		Y	3	N	Monitoring suggests that use may actually improve groundwater quality
Basin Plan Prohibition Exemptions								
Crestline Area Exemptions	Crestline	WDR	1981	0.000	N	0		Consider rescission as no facility
Lake Arrowhead Exemptions	Lake Arrowhead	WDR	1984	0.000	N	0		Consider rescission as no facility
Notes and Definitions:								
(*) - Federal NPDES permit noted, all other WDRs. Date may not reflect more recent Amendments								
AFB - Air Force Base								
CAO - Cleanup and Abatement Order								
CDO - Cease and Desist Order								
CS - Collection System								
CSA - County Sanitation Area								
CSD - Community Services District								
CSMD - County Services Management District								
CWD - Community Water District								

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
DDW - Department of Drinking Water								
DFW - Department of Fish and Wildlife								
DVNM HDQ - Death Valley National Monument Headquarters								
fbgs - feel below ground surface								
FY15/16 - Fiscal Year 15/16								
FY16/17 - Fiscal Year 16/17								
I/I - Inflow and Infiltration								
LACSD - Los Angeles County Sanitation District								
LLC - Limited Liability Company								
MCL - Maximum Contaminant Level								
MCLB - Marine Corps Logistics Base								
mg/L - milligrams per Litre								
MHP - Mobile Home Park								
MRP - Monitoring and Reporting Program								
MUN - Municipal								
NASA - National Aeronautics and Space Administration								
ND - Non Detect								
Nitrate as N								
NO3 - Nitrate								
NO3 as N - Nitrate as Nitrogen								
NOA - Notice Of Applicability								
NPDES - National Pollutant Discharge Elimination System								
O/M - Operations and Maintenance								
PUD - Public Utilities District								
REC - Reclamation								
RWD - Report of Waste Discharge								
SCLA - Southern California Logistics Airport								
SD - Sanitation District								
SMR - Self Monitoring Report								
SRA - State Recreation Area								
SSO - Sanitary Sewer Overflow								
STP - Sewage Treatment Plant								
T&DF - Treatment and Disposal Facility								
TDS - Total Dissolved Solids								
THM - Trihalomethane								
USMC - United States Marine Corps								
USNWC - United States Naval Weapons Center								

Facility	City	Treatment Type Disposal Method System Summary	Order Date (*)	Design Flow (MGD)	Recycled	No. Wells	Nitrate Pollution	Effluent Total Nitrogen Groundwater Nitrate-Nitrogen (range) Status
VVWRA - Victor Valley Wastewater Reclamation Authority								
WDR - Waste Discharge Requirement								
WRR - Water Recycling Requirement								
WTF - Wastewater Treatment Facility in this context, sometimes Water Treatment Facility								
WTP - Wastewater Treatment Plant in this context, sometimes Water Treatment Plant								
WWTF - Wastewater Treatment Facility								
WWTP - Wastewater Treatment Plant								

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MAPS

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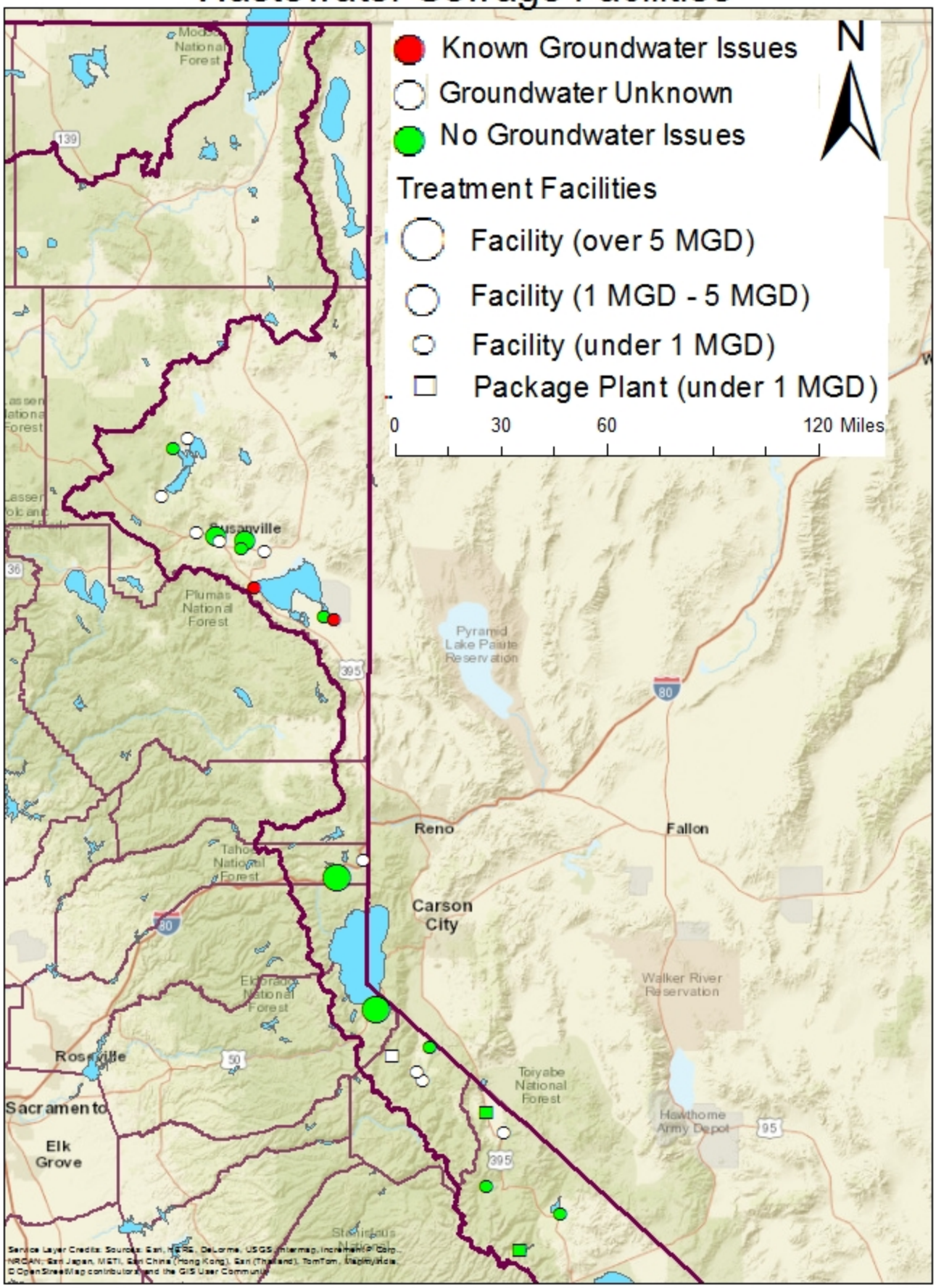
Map A: North Lahontan Basin
Wastewater Sewage Facilities



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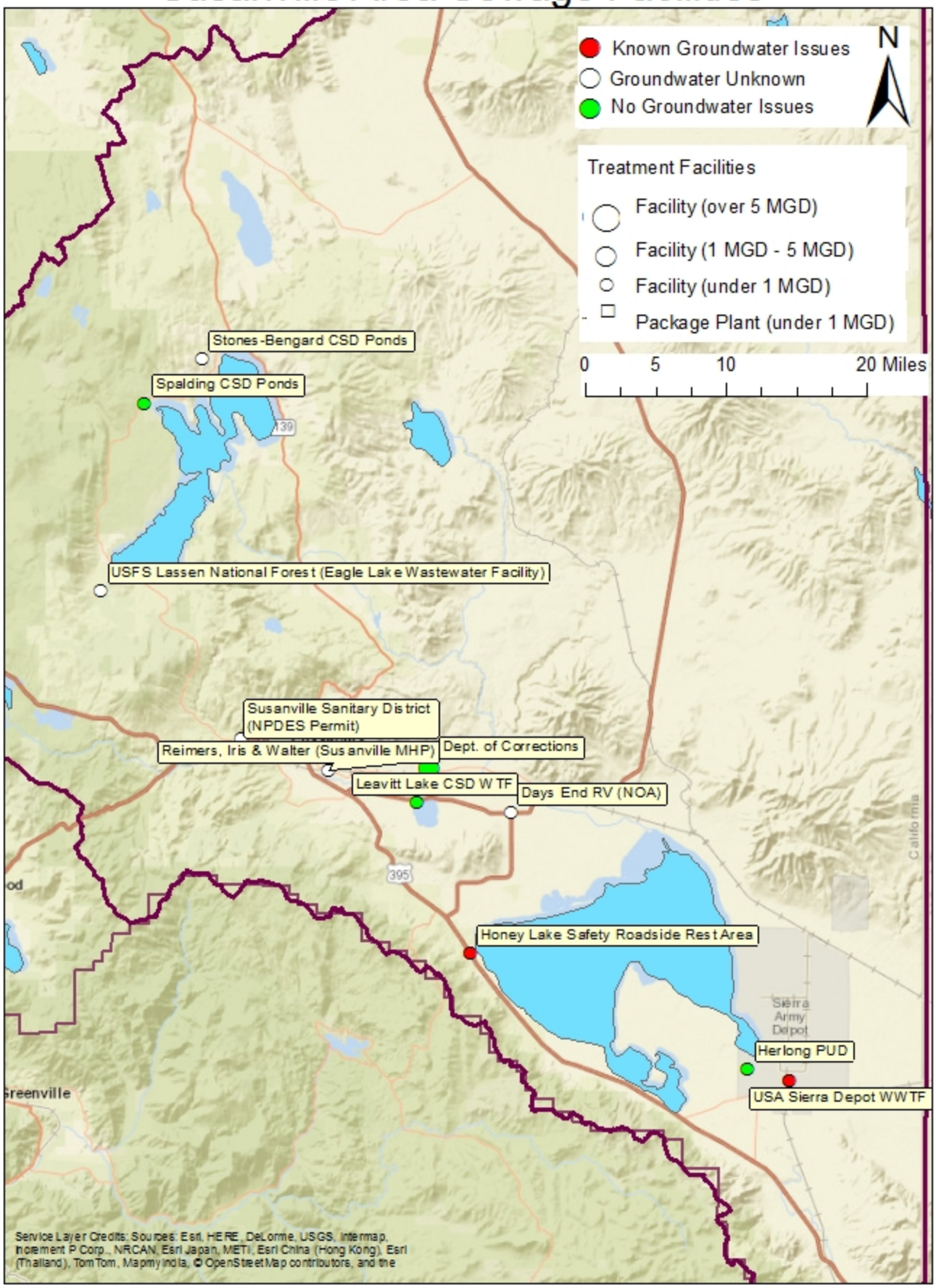
Map B: North Lahontan Basin
Susanville Area Sewage Facilities



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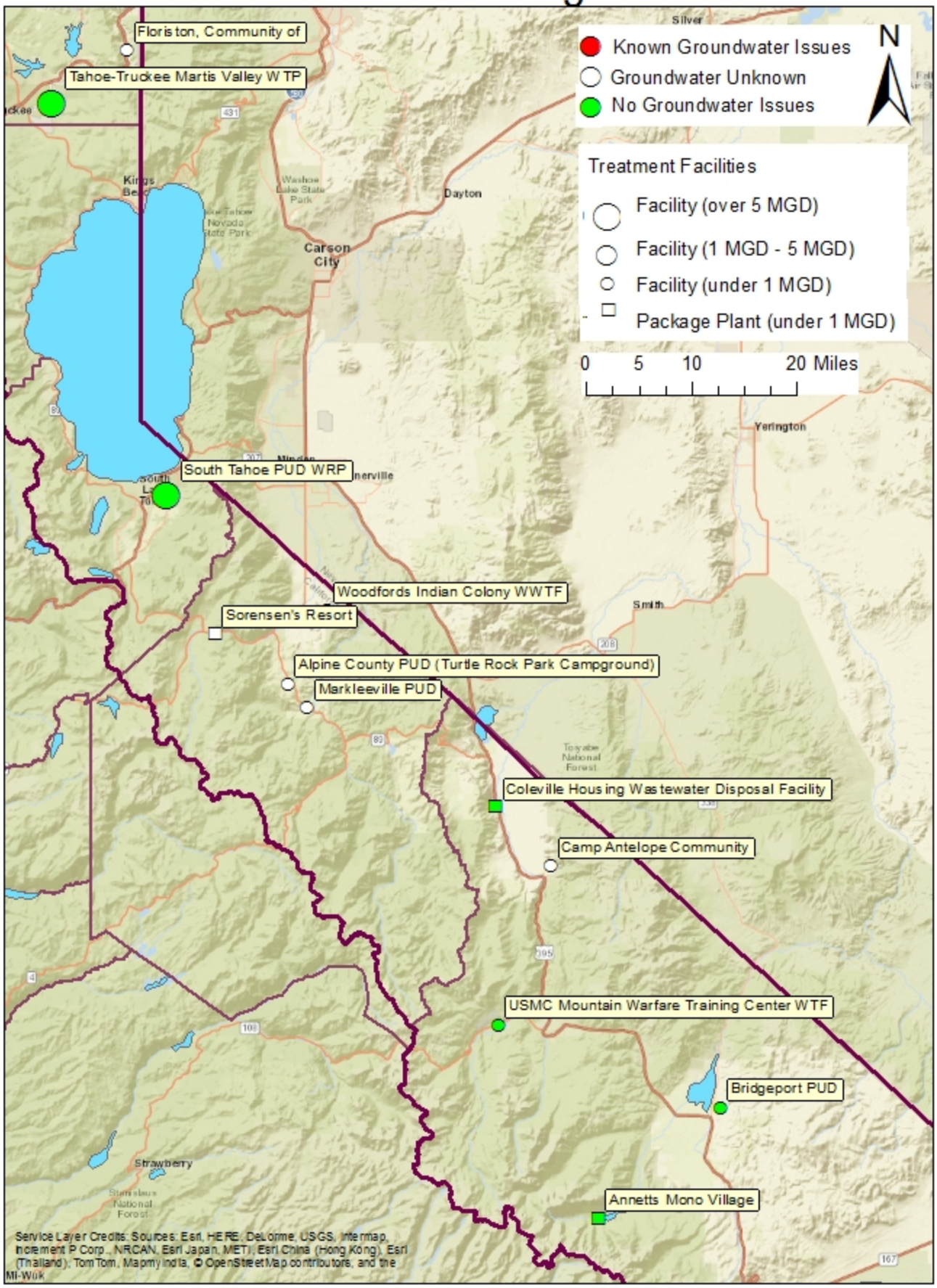
Map C: North Lahontan Basin
Lake Tahoe Area Sewage Facilities



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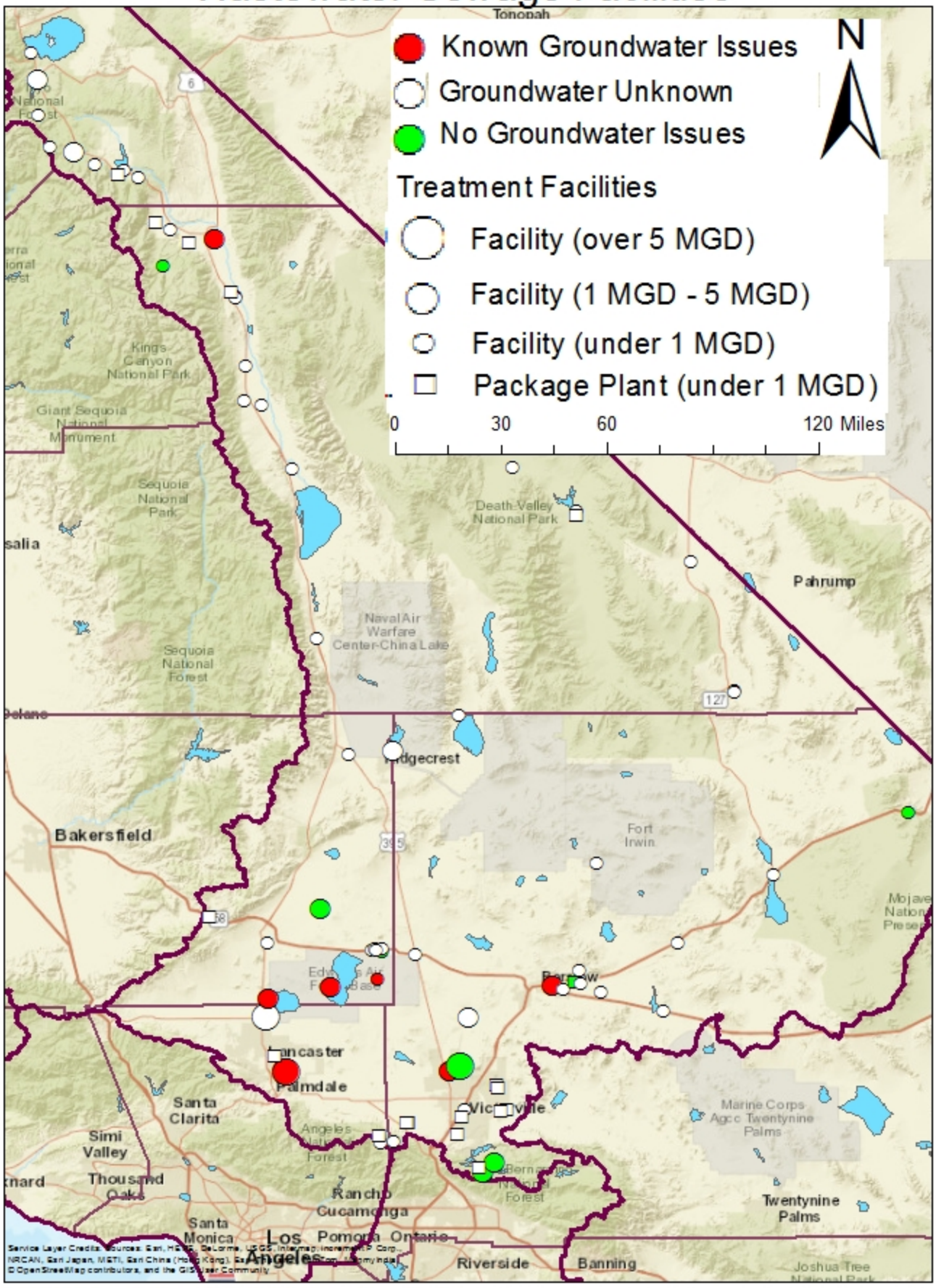
Map D: South Lahontan Basin
Wastewater Sewage Facilities



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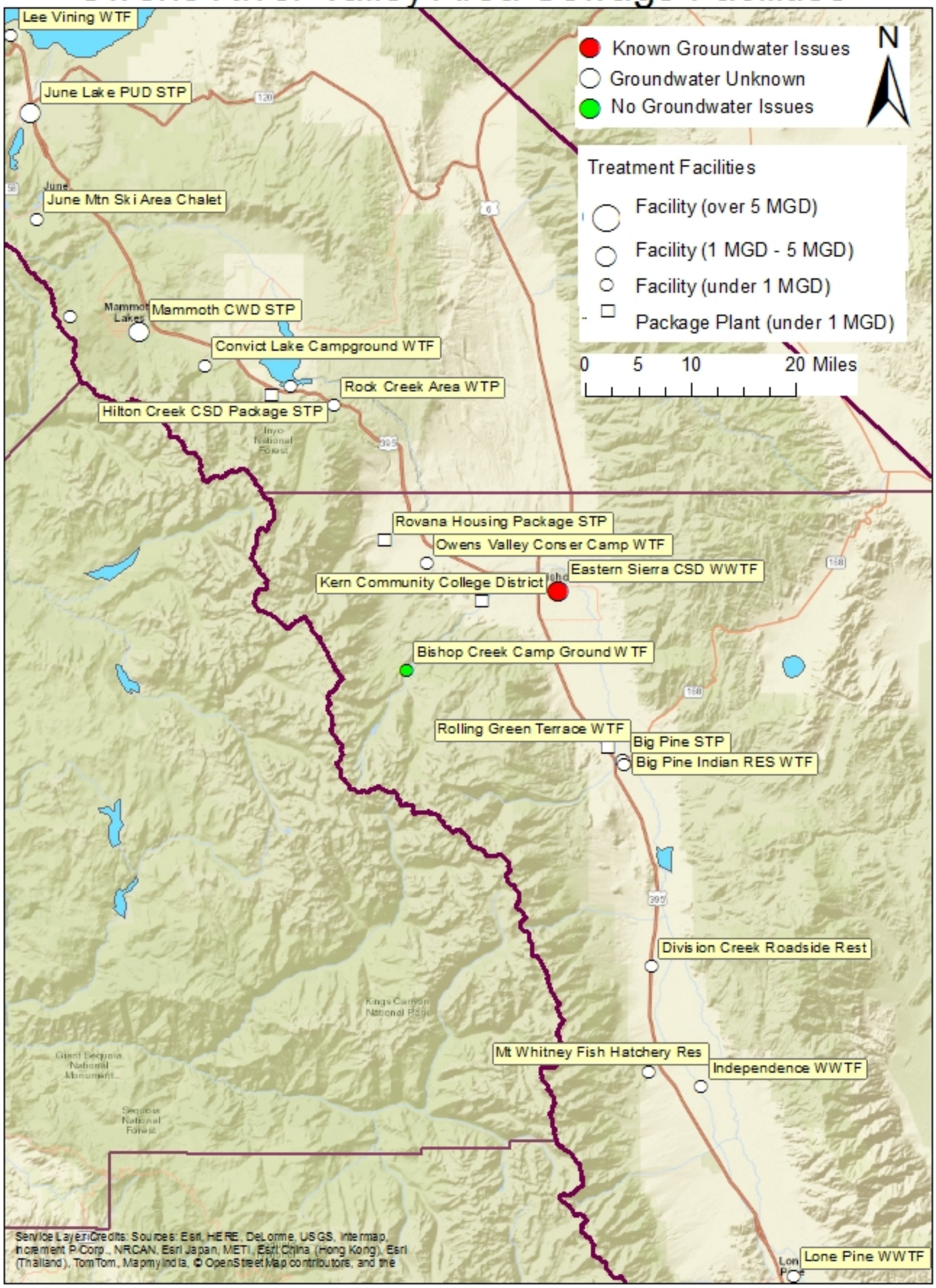
Map E: South Lahontan Basin
Owens River Valley Area Sewage Facilities



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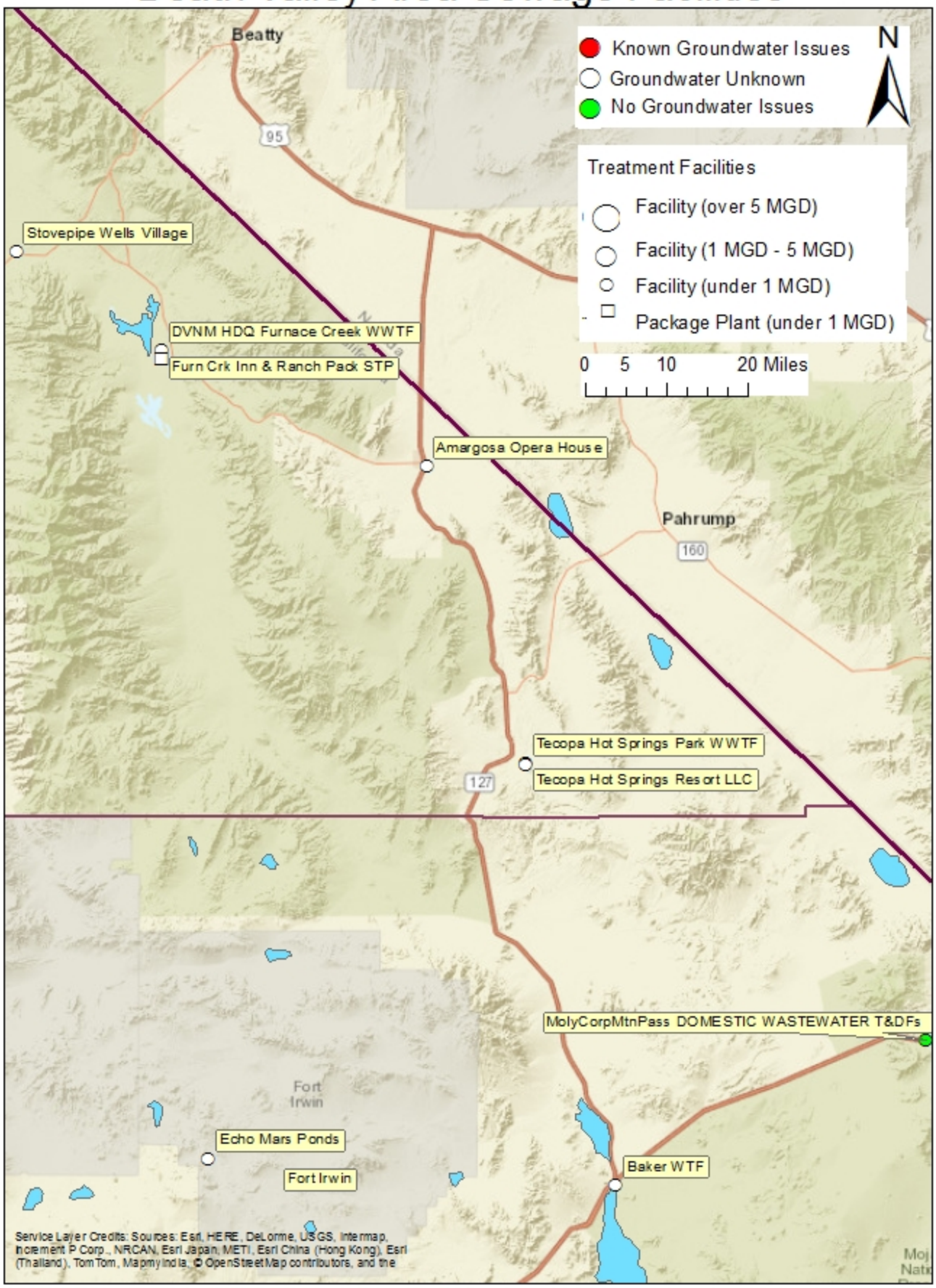
Map F: South Lahontan Basin
Death Valley Area Sewage Facilities



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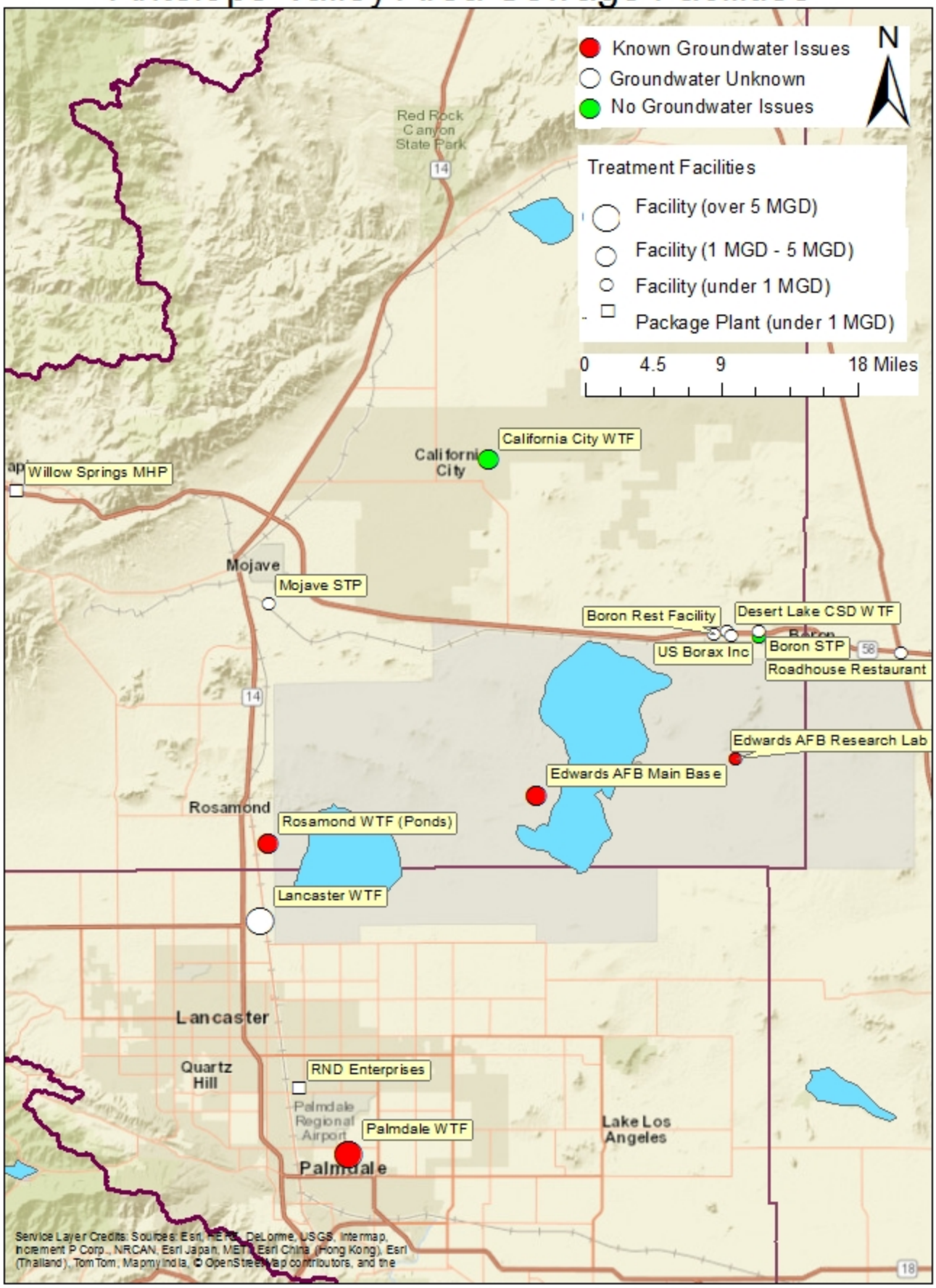
Map G: South Lahontan Basin
Antelope Valley Area Sewage Facilities



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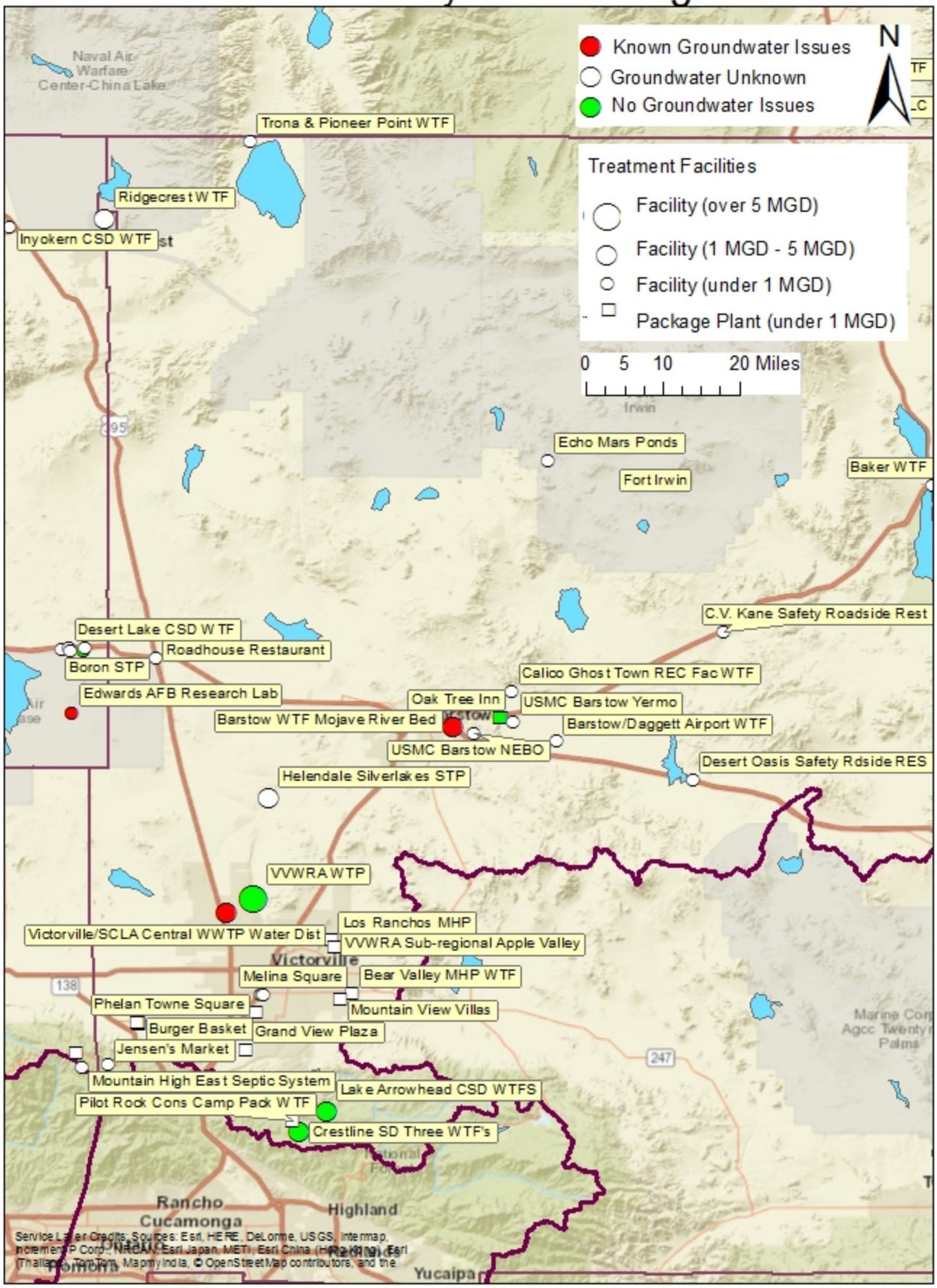
Map H: South Lahontan Basin
San Bernardino County Area Sewage Facilities



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ENCLOSURE 2

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ITEM 7 - WORKSHOP: DOMESTIC WASTEWATER SEWAGE TREATMENT PLANT STATUS IN LAHONTAN REGION

Lahontan Regional Water Quality Control Board

Board Meeting : April 19, 2017

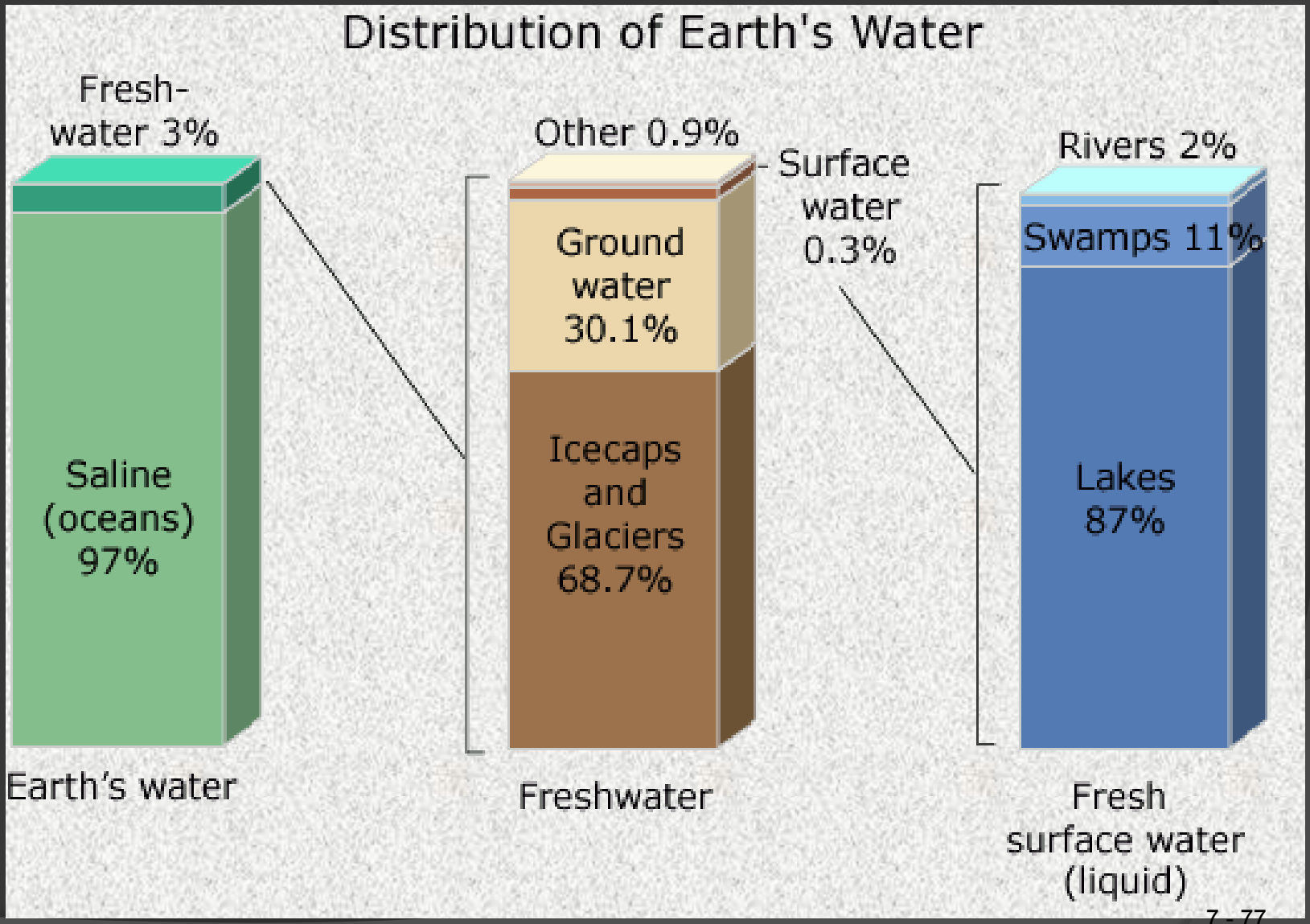
Cephas Hurr, WRCE

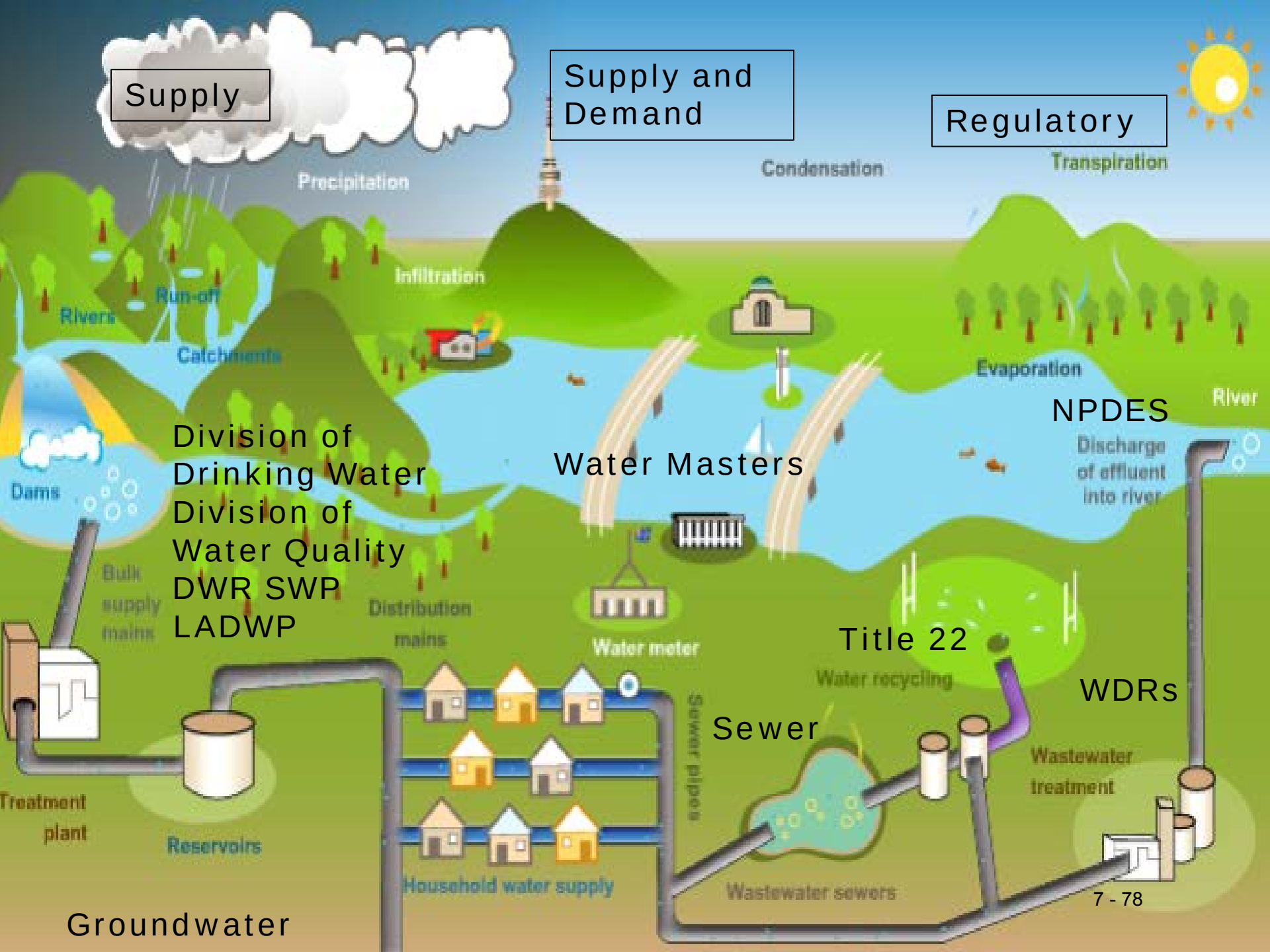
15095 Amargosa Road, Building 2 STE 210, Victorville, CA

Overview

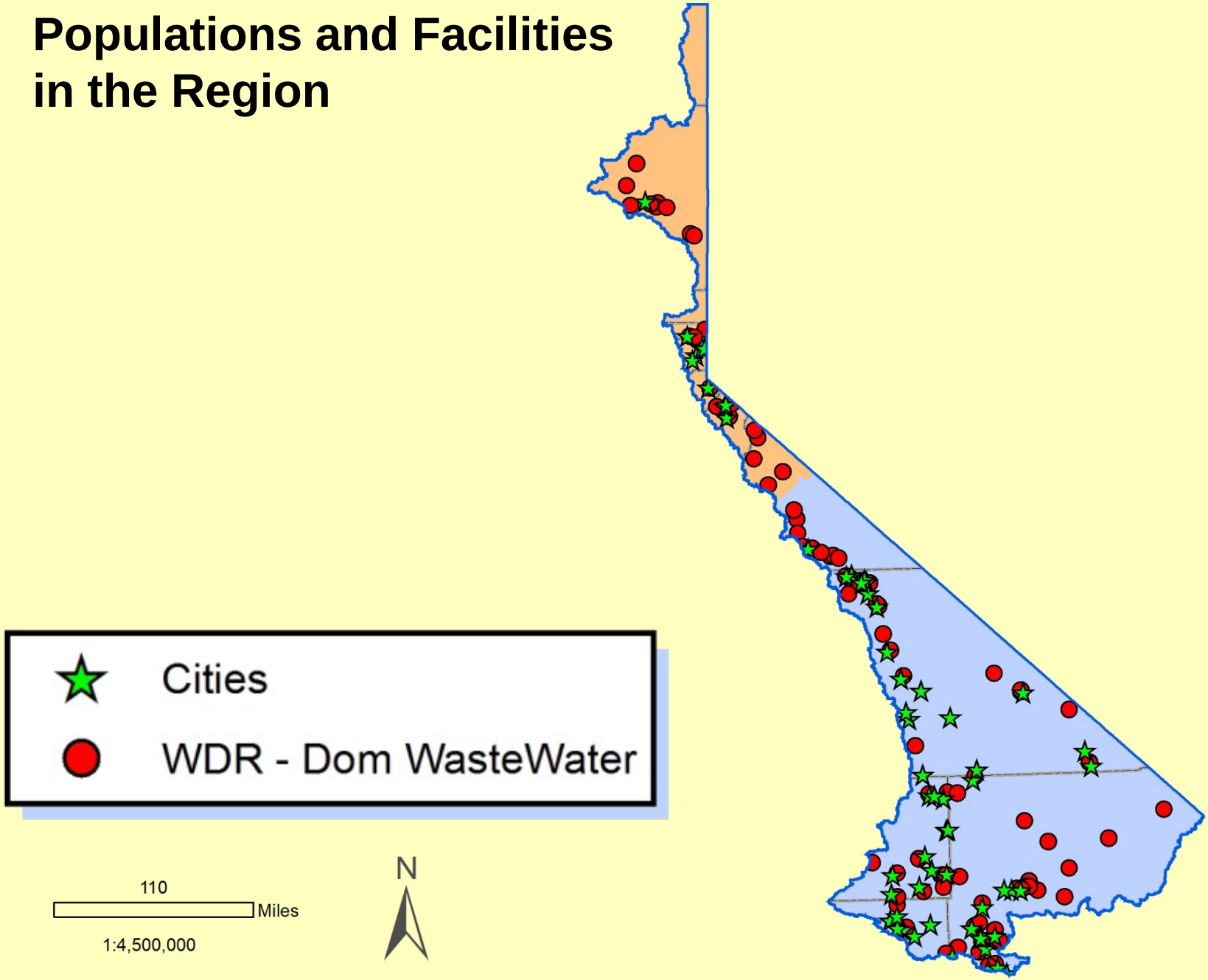
- Significance of what we do.
- Purpose behind what we do and how we fit in the big picture.
- Wastewater treatment Plant Overview, Maps, Nitrogen Cycle & Table
- Inventory & Future workload : Steps towards improving our regulatory approach
- Water Quality Standards & Monitoring
- Current Regulatory Tasks
- Recommendations

Significance



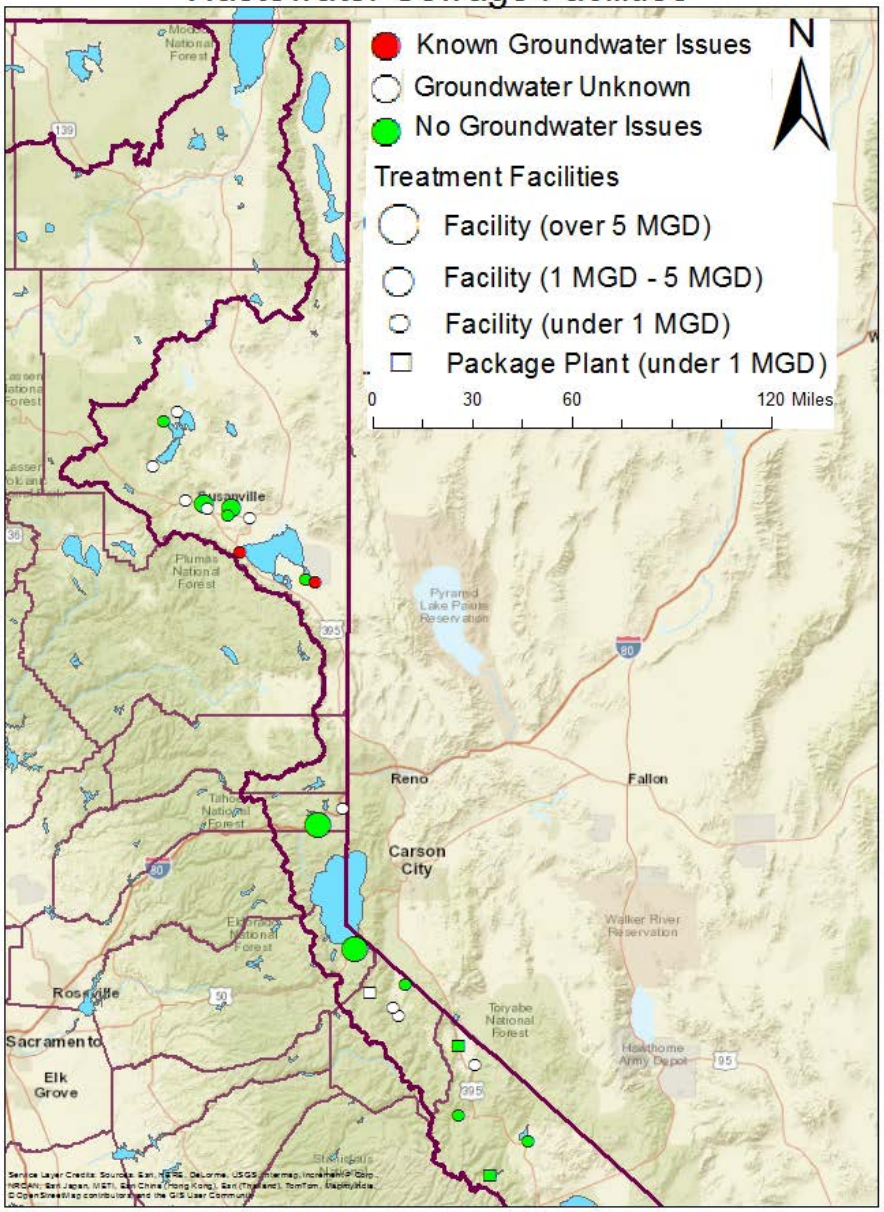

Supply
Supply and Demand
Regulatory
Precipitation
Condensation
Transpiration
Infiltration
Rivers
Run-off
Catchments
Evaporation
River
NPDES
Discharge of effluent into river
Dams
Division of Drinking Water
Division of Water Quality
DWR SWP
LADWP
Water Masters
Bulk supply mains
Distribution mains
Water meter
Title 22
Water recycling
WDRs
Sewer
Sewer pipes
Wastewater treatment
Treatment plant
Reservoirs
Household water supply
Wastewater sewers
Groundwater

Populations and Facilities in the Region



Date: 8/2/2016

Map A: North Lahontan Basin
Wastewater Sewage Facilities



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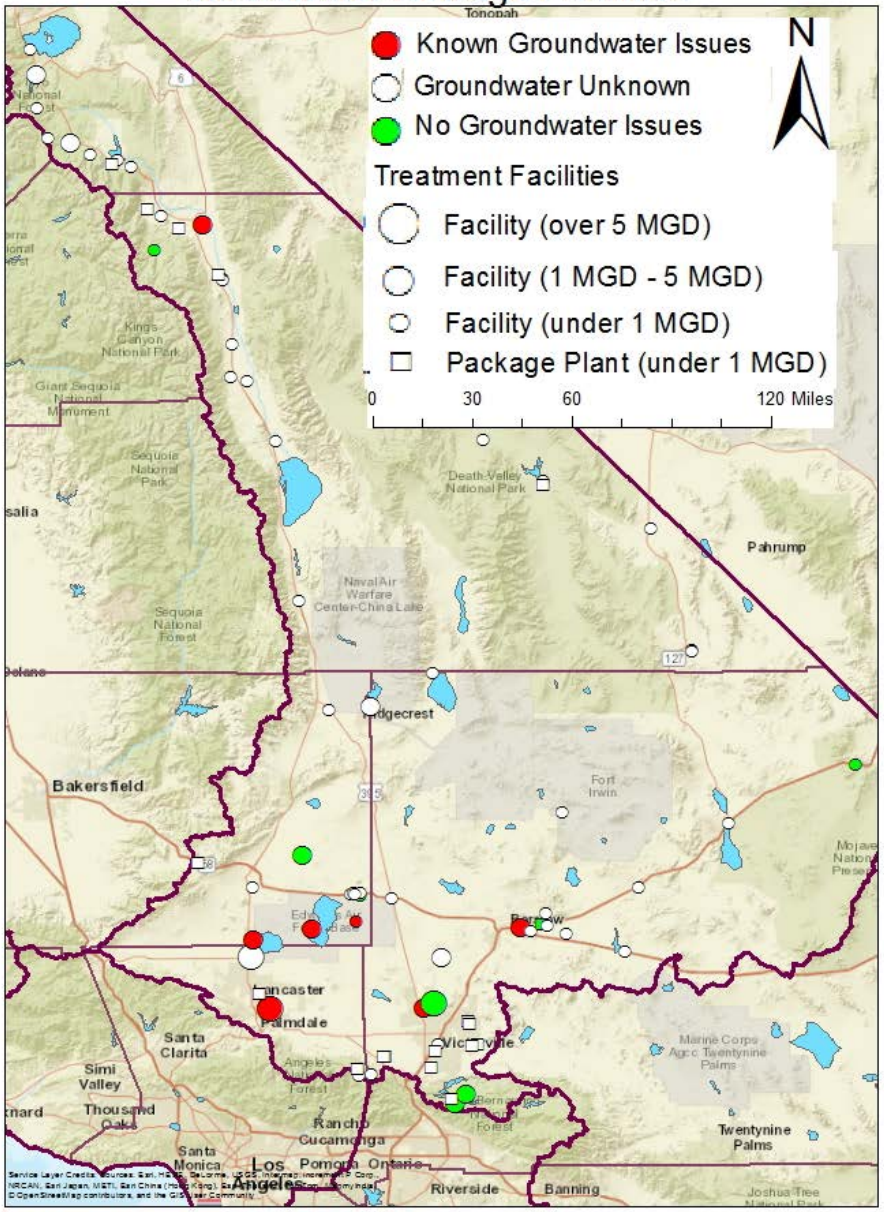
Map D: South Lahontan Basin
Wastewater Sewage Facilities



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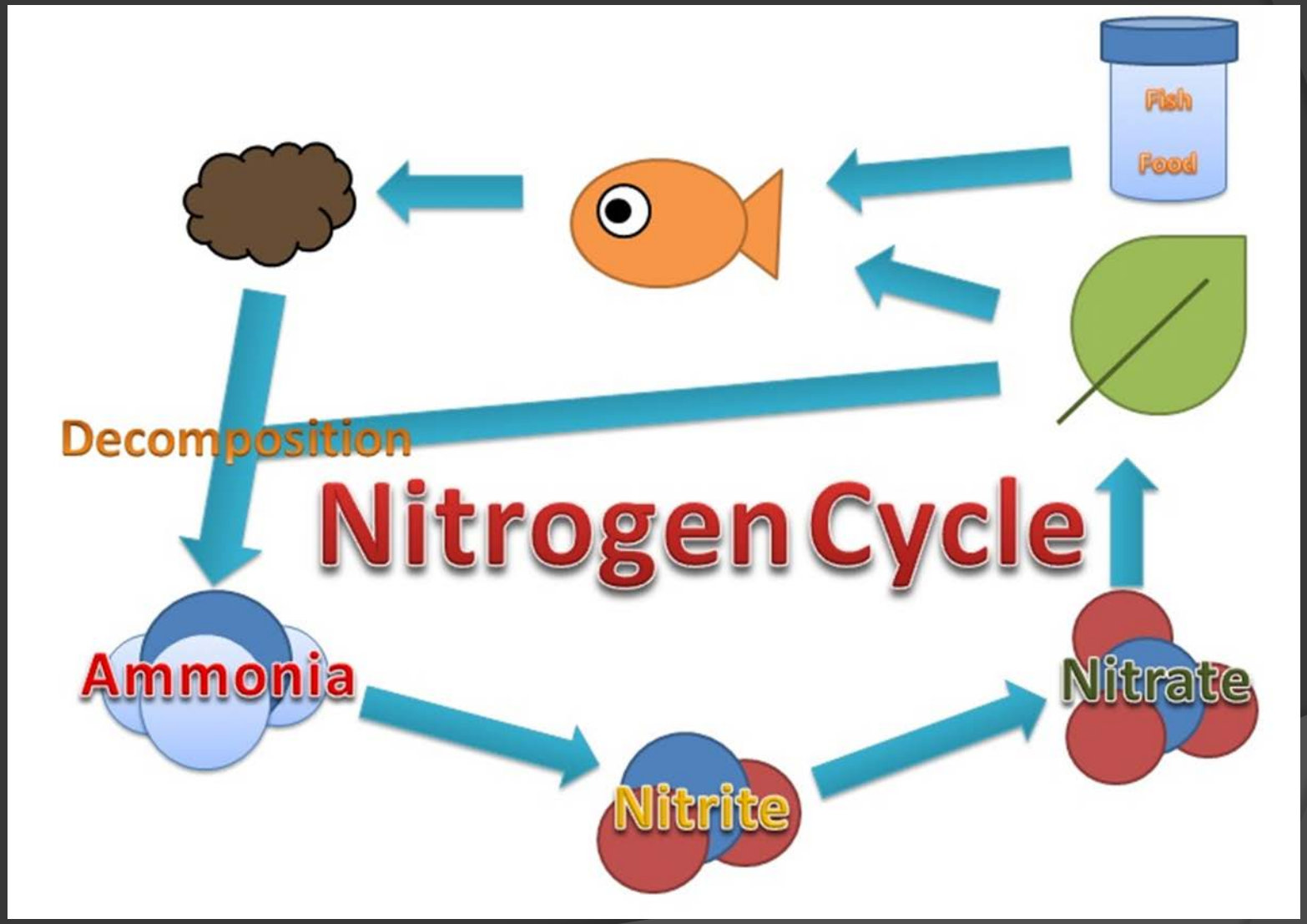
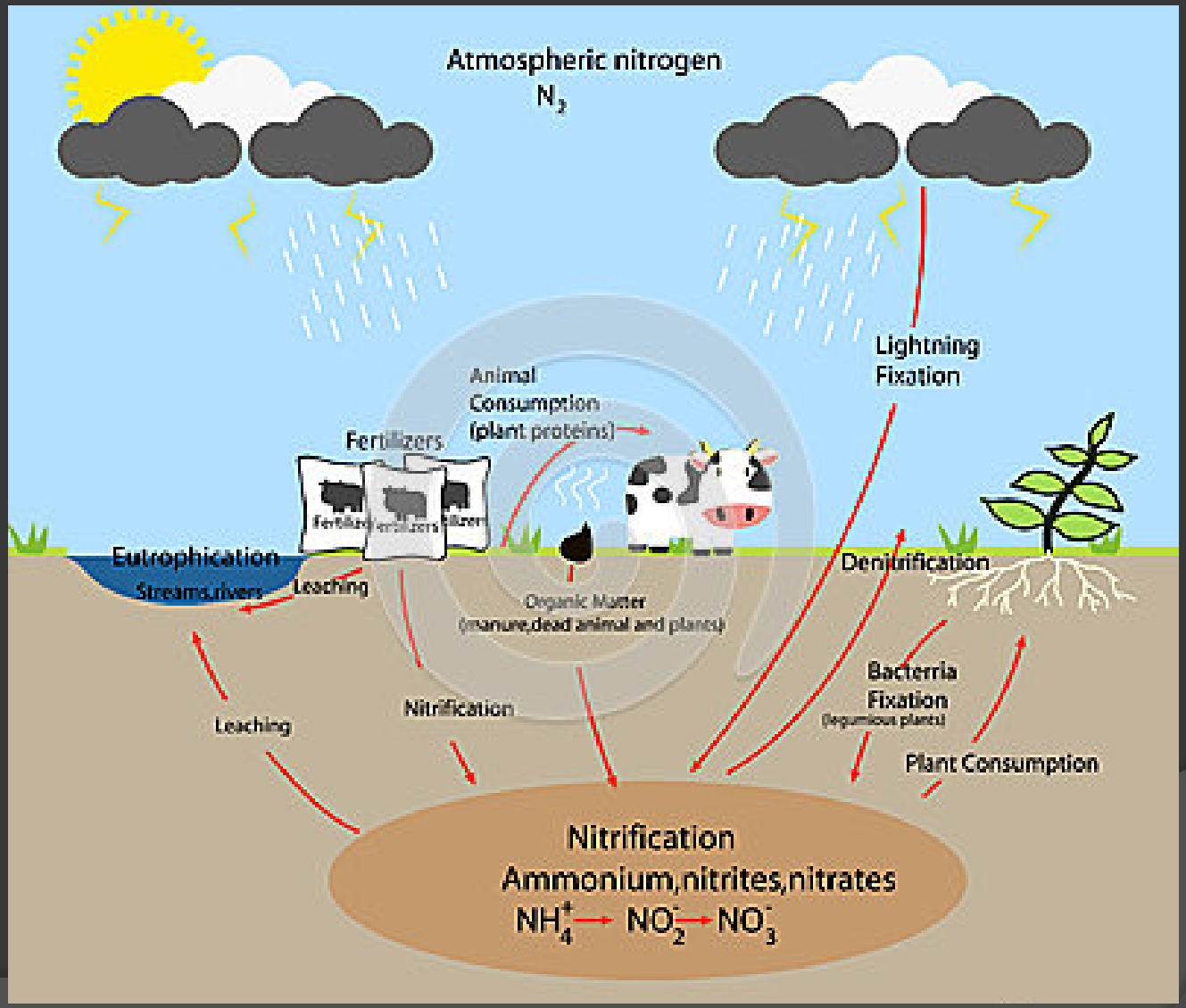
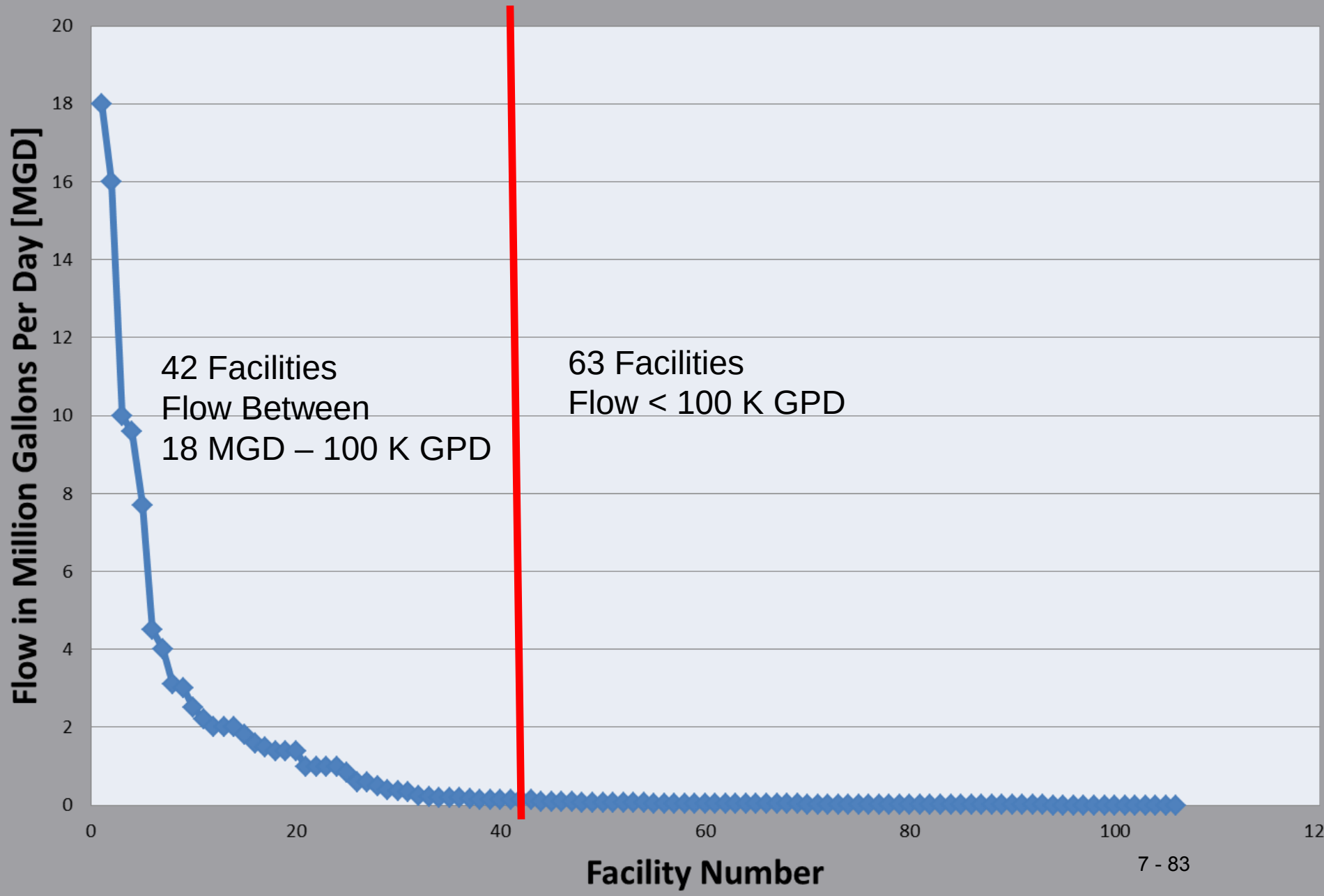
Chemicals in Nitrogen Cycle



Nitrogen Cycle Rural Use



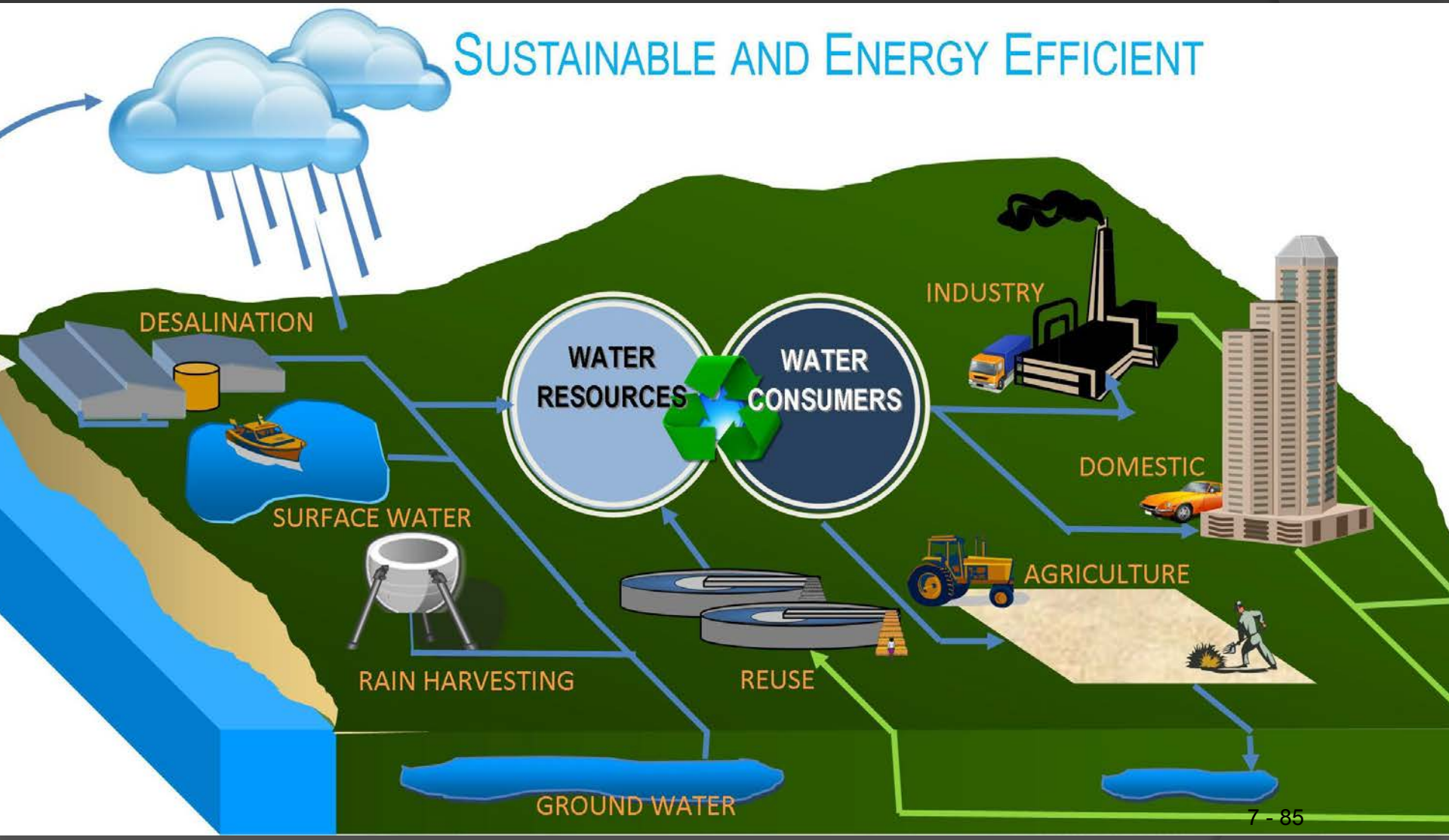
Distribution of Facilities in the Region



Summary of Facility Inventory

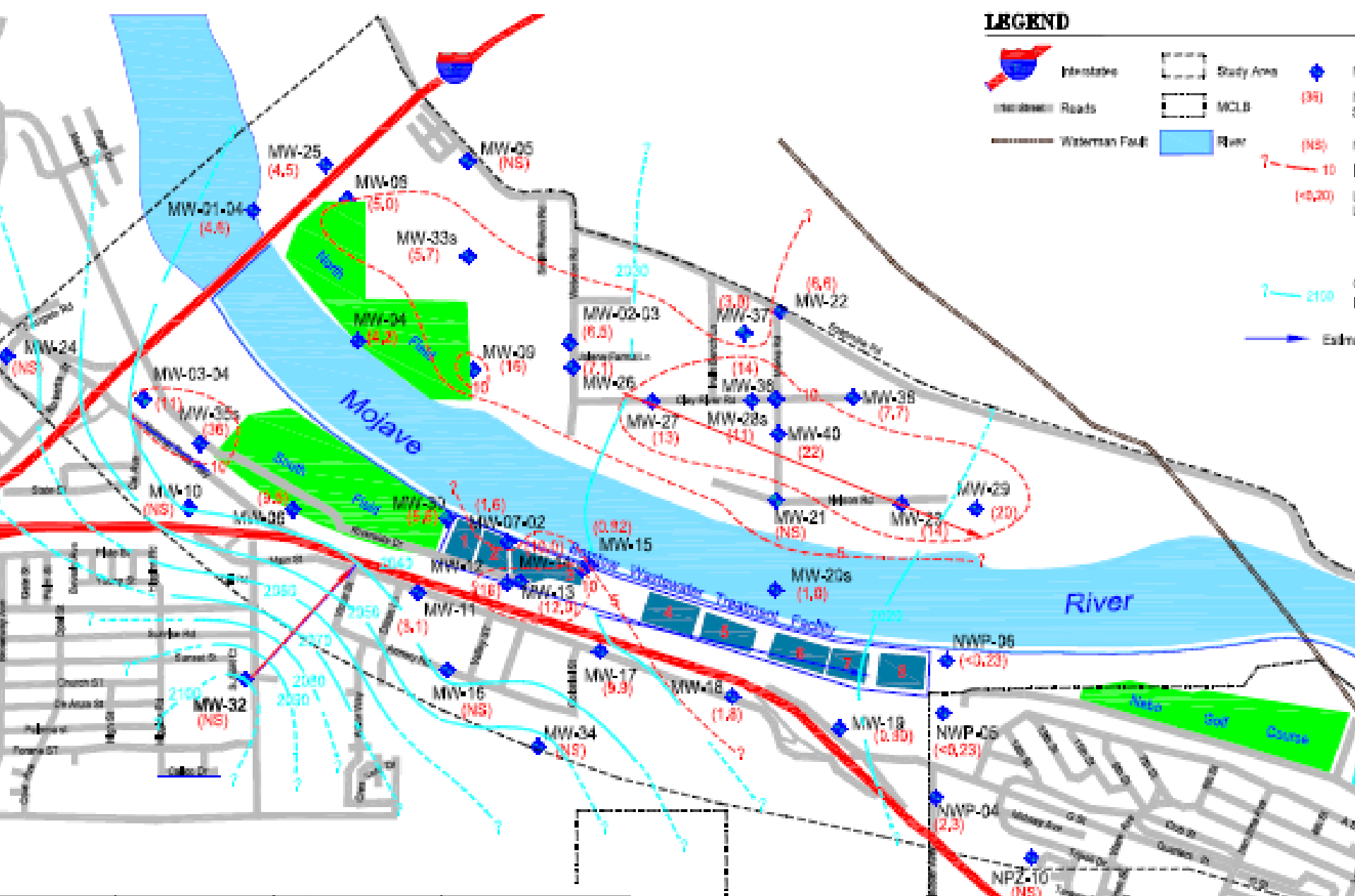
- Effluent Data Quality
- Effluent: Nitrogen Controls
- Groundwater Quality
- Receiving Water: Groundwater Monitoring Wells
- Regulate at the point of discharge
- Recycled Water
- Addressing Future Data Gaps

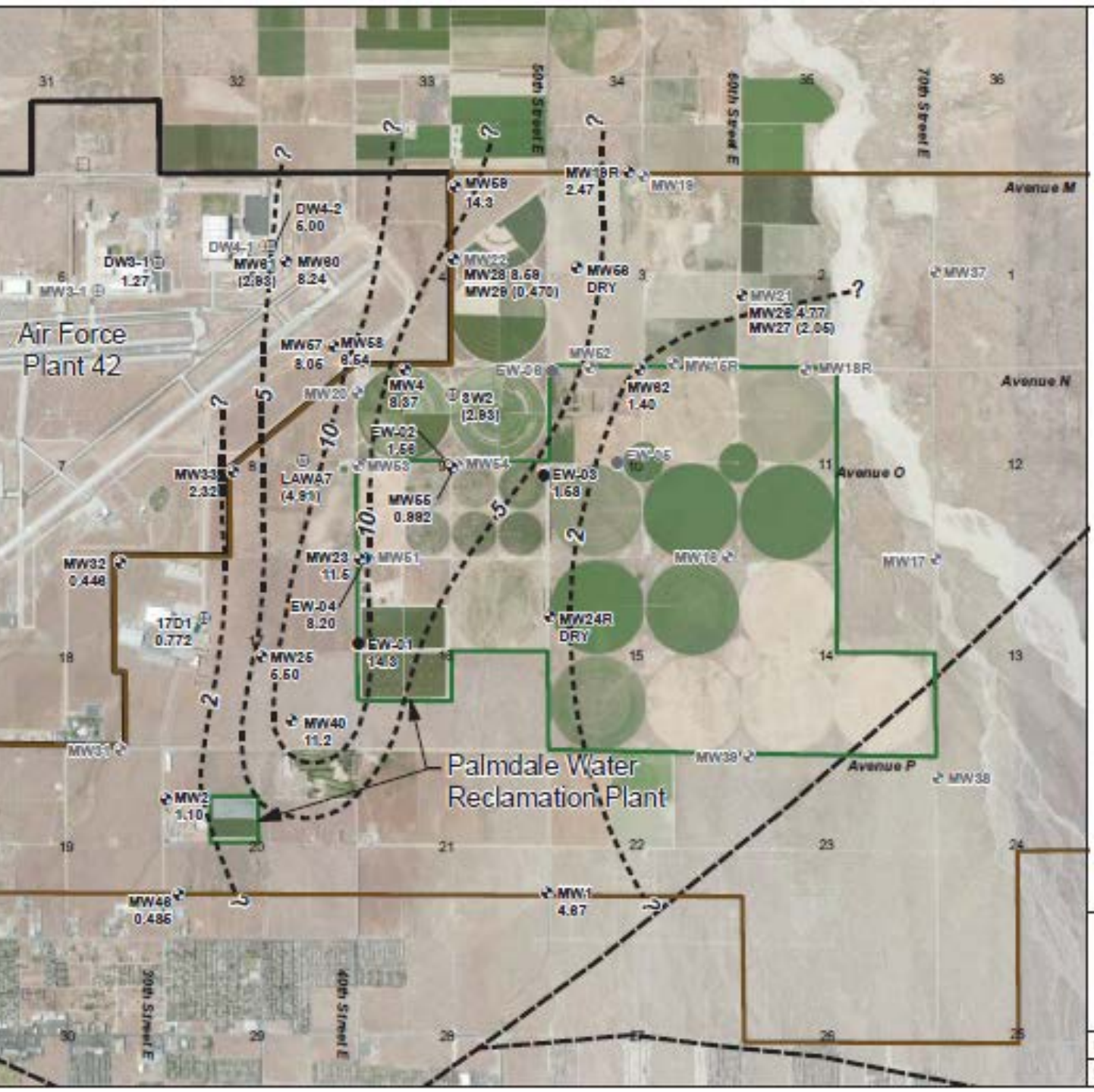
Recycled Water



Current Regulatory Tools

- Waste Discharge Requirements: Individual or General Order
- Salt and Nutrient Management Plans
- Investigative Orders
- Cleanup and Abatement Orders
- Inspections
- Self Monitoring Reports
- Interaction: phone calls & meetings


LEGEND
Interstate
Roads
Waterman Fault
Study Area
MCLB
River
MW-25 (4.5)
MW-05 (NS)
MW-08 (5.0)
MW-21-04 (4.8)
MW-33s (5.7)
MW-34 (4.2)
MW-24 (NS)
MW-03-04 (11)
MW-35s (36)
MW-39 (16)
MW-02-03 (6.5)
MW-26 (2.1)
MW-37 (3.0)
MW-22 (6.6)
MW-27 (13)
MW-28s (4.1)
MW-36 (14)
MW-38 (7.7)
MW-40 (22)
MW-10 (NS)
MW-06 (9.6)
MW-07-02 (10.0)
MW-15 (0.92)
MW-12 (1.6)
MW-13 (12.0)
MW-11 (3.1)
MW-21 (NS)
MW-23 (11)
MW-29 (20)
MW-20s (1.0)
Barstow Wastewater Treatment Facility
River
NWP-05 (<0.23)
NWP-03 (<0.23)
NWP-04 (2.3)
MW-18 (0.80)
MW-17 (5.9)
MW-16 (NS)
MW-18 (1.6)
MW-32 (NS)
MW-34 (NS)
NPZ-10 (NS)
Golf Course
Drawn By: EFD
Date: 11/20/2013
Rev: 12/4/2016
CITY OF BARSTOW
STUDY AREA
NITRATE AS N
ISOCONCENTRATION
SHALLOW WELLS
4th QUARTER 2016



Explanation

- Monitoring well location and designation
- AFP42 water supply well location and designation
- Extraction well location and designation
- Well was not monitored this quarter
- 14.3 Nitrate (as N) in groundwater in milligrams per liter; results listed are from Fourth Quarter 201
- DRY Insufficient water present in well casing for sampling
- Interpreted nitrate (as N) isoconcentration contour
- Agricultural Site
- Air Force Plant 42 boundary
- Los Angeles World Airports boundary
- Approximate location of fault and groundwater subbasin boundary (Bloyd, 1967)
- 24 Public land survey section

Notes:

1. Data in parentheses are from deeper well completions and were not used in developing isoconcentration contours.
2. Reported results are from groundwater samples collected during the Fourth Quarter 2016 sampling event coordinated by District Staff.
3. Isoconcentration contours were interpreted using data from monitoring wells.

0 1500 3000

Approximate Scale in Feet

N

Basemap modified from aerial photograph from Esri, DigitalGlobe, Geoeye, i-cubed, Earthstar Geographics, USDA, USGS, AEX, Getmapping, and the GIS User Community

INTERPRETED DISTRIBUTION OF NITRATE (AS N) IN GROUNDWATER OCTOBER TO DECEMBER 2016

Palmdale WRP
Palmdale, California

amec foster wheeler

Date: 02/09/2017	Project No.: 9620	Figure 4.1
Submitted By: tp	Drawn By: pah	

Recommendations

- Improve monitoring – effluent monitoring for nitrogen and groundwater monitoring wells
- Develop a region wide general order for facilities with less than 50,000 gallons per day so that Nitrogen effluent limits or effluent management can be imposed.
- Revise Waste Discharge Requirements to impose nitrogen effluent limits 10 mg/L or improve effluent management

Recommendations (continued)

- Increased collaboration with agencies like Mojave Water Agency to improve monitoring and incorporate data for water quality assessment and management.
- Increased outreach to dischargers regarding funding opportunities and evaluation of feasible alternatives
- Increased outreach / technical assistance to dischargers to improve effluent quality.

QUESTIONS?