City of Escalon
Water System Evaluation

Report

February 2016

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1 Introduction

The City of Escalon (City) domestic water system operates under State Water Resources Control Board (SWRCB) Division of Drinking Water, Domestic Water Supply Permit Public Water System No. 3910003 (Permit). A Citation for Violation of Health and Safety Code Section 116555(a)(1) and California Code of Regulations, Title 22, Section 64431 (Citation) for Violation of the Nitrate Maximum Contaminant Level (Citation No. 01-10-15S-006) was issued to the City on July 13, 2015. The City requested an amendment to the Permit on August 14, 2015 to reclassify Well No. 1 from an active status to an inactive status due to nitrate levels above the Maximum Contaminant Level (MCL). The amendment includes a requirement to submit a plan and schedule for rehabilitation to return to Well No. 1 to active service, or for the destruction of the well by February 12, 2016. This water system evaluation includes a review of the City's water system and operations to prioritize improvements in order to: 1) comply with SWRCB Permit requirements; 2) address the requirements of the Citation to provide a plan and schedule for Well No. 1; 3) improve operations and increase efficiency of the system; and 4) meet maximum day water system demands.

2 Background

Background information regarding the Permit and Citation requirements and the existing water system are provided in this section for reference.

2.1 Regulatory Requirements

The Permit, Permit Amendment, and Citation include public water supply requirements to comply with the requirements of the SWRCB, Division of Drinking Water, California Drinking Water Standards, California Safe Drinking Water Act, and California Health and Safety. Refer to the Permit, Permit Amendment, and Citation in the appendices of this document for of the specific details of the requirements and directives.

The Citation identified the following violations:

1. The City failed to comply with Section 116555(a)(1) of the California Health and Safety Code as well as Section 64431 of the California Code of Regulations due to the fact that the City's source water exceeded the primary MCL for nitrate at Well No. 1 with a detected level of 47.8 mg/L exceeding the nitrate MCL of 45.0 mg/L.

The Citation directed the following actions [1]:

1. Well No. 1 shall not be utilized "without the installation of an approved treatment process to remove nitrate from the water" or "provide the Division with sufficient nitrate monitoring data which shows the nitrate levels in Well No. 1 have dropped below the MCL".

2. If the City elects to not install nitrate removal equipment, and keep the well as an active source, the City must submit a detailed Corrective Action Plan (CAP) detailing routine nitrate sampling during winter and summer months, as well as daily samples for one week showing nitrate levels at or below 36 mg/L before requesting authorization from the Division to operate Well No. 1

and discharge to the distribution system. A nitrate analyzer shall also be installed with an alarm to alert the City of nitrate levels reaching 36 mg/L with an automatic shut down if nitrate levels reach 40 mg/L. The well shall be tested daily, for a week, for nitrate and samples shall be analyzed by a State certified laboratory when the well is brought online and starts pumping to the system. If the well nitrate results stay below 36 mg/L during the daily testing, for one week, then the testing frequency can be reduced to once per week.

2.2 Existing Conditions and Operation Strategy

The existing City water system serves a population of approximately 7,413 people through 2,495 service connections. The City water supply for domestic and fire flow is supplied from four active groundwater wells and one 500,000 gallon storage tank located at Well Site No. 1. There are 4 groundwater well sites: Well Site No. 1, Well Site No. 3A, Well Site No. 9, and Well Site No. 10. The combined well source capacity is approximately 3,800 gallons per minute (gpm). Table 2-1 summarizes each well pump capacity.

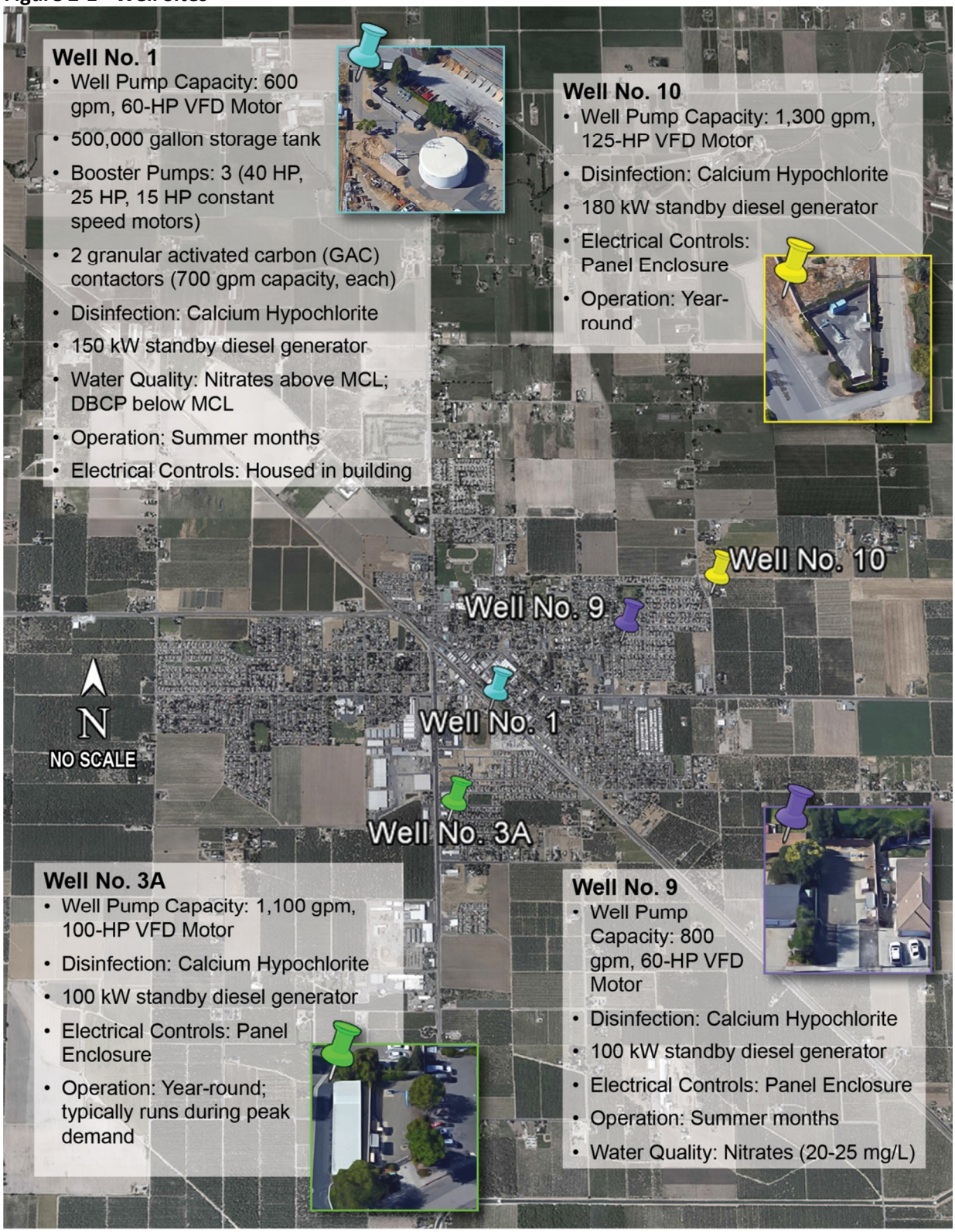
Table 2-1 Summary of Well Pump Capacities

Source	Capacity (gpm)
Well No. 01	600 gpm*
Well No. 3A	1,100 gpm
Well No. 09	800 gpm
Well No. 10	1,300 gpm

*Rated Capacity is 900 gpm.

Pressures in the distribution system are maintained based on operator set limits via supervisory control and data acquisition (SCADA) system. Well pumps operate in a lead/lag sequence to rotate pump operation. The pumping sequence to meet distribution system pressure is as follows: Well 3A, Well, 10, Well Site No. 1 booster pumps, Well 9, and Well 10. Well pumps No. 3A, No. 9, and No. 10 are equipped with variable frequency drives. Well Site No. 1 booster pumps are equipped with constant speed motors. The following sections describe the equipment and operations at each well site. Refer to Figure 2-1 for a summary of equipment and operation for each well site location.

Figure 2-1 - Well Sites



2.2.1 Well Site No .1

Well site No. 1 is located near the City center at the end of Roosevelt Avenue and is currently inactive. This well site is active only during summer months to meet peak demands.

Well No. 1

500,000 gallon storage Tank

Well No. 1 was drilled in 1965 and has a capacity of 600 gpm. It is equipped with a 900 gpm-rated vertical turbine pump and 60-horsepower (HP) variable frequency drive (VFD) motor [3]. The well pump discharges through one of the two granular activated carbon (GAC) filters to the 500,000 gallon storage tank on-site. The storage tank is over 30-years old and provides emergency, operation, and fire flow storage for the system. Site piping and valving allow the tank to be filled off of the distribution system when Well No. 1 is not in service. Three booster pumps with constant speed motors (15-HP, 25-HP, and 40-HP) pump water out of the storage tank to the distribution system via 12-inch diameter piping.

The booster pumps operate to meet peak demands or emergency fire flow. The pump station is served with Square-D Model 6 MCC within a CMU structure, and has available spare bucket space. Site controls/SCADA is accomplished via AutomationDirect PLC. This site has a 400A, 480V Pacific Gas and Electric (PG&E) service and a 150kW standby Caterpillar diesel generator.

Well Site No. 1 Booster Pump Station

Well Site No. 1 GAC Filters

The GAC filters were installed in 2003 to remove dibromochloropropane (DBCP) when detected levels exceed the MCL. However, the City did not violate the DBCP MCLs as water was not discharged to the system when exceedance levels were detected. Each GAC vessel is rated for 700 gpm capacity. The City utilizes only one of the two filters at a time. So, the actual reliable capacity of Well No. 1 is limited to 700 gpm; however, current operations utilize the pump at 600 gpm. Since the installation of the GAC filters, DBCP levels have not exceeded the MCLs prior to being treated, and DBCP concentrations in the ground water have been decreasing. In addition to DBCP treatment, continuous disinfection is provided on-site with calcium hypochlorite dry tablet erosion via a Hammonds chlorinator prior to discharge to the distribution system.

Nitrate levels exceeding the MCLs are detected prior to start-up during the summer months after the pump has been inactive all winter. As a result, the City must pump Well No. 1 to waste for approximately 2-3 weeks in order to reduce the nitrate concentration. During this period, the City takes numerous nitrate samples to monitor fluctuating nitrate levels. The City requests authorization from the SWRCB to make Well No. 1 active when the nitrate level drops to approximately 25-30 mg/L. Nitrate sampling is required for one to three hours after start-up of the well, and weekly thereafter. Due to nitrate levels exceeding the MCLs prior to the summer months in 2015, the City elected not to make Well No. 1 active. It was determined that Well No. 1 was not needed to meet reduced demands as a result of conservation efforts due to drought conditions during the 2015 summer,.

Flushing the system to lower nitrate levels from Well No. 1 wastes approximately 1 million gallons of water. The waste water is discharged to an adjacent drainage basin that ultimately discharges to the City's wastewater treatment plant.

2.2.2 Well Site No. 3A


Well Site No. 3A

Well site No. 3A is located in the southern portion of the City on Ullrey Avenue. Well No. 3A was drilled in 1988 and has a capacity of 1,100 gpm. It is equipped with a vertical turbine pump and 100-HP VFD motor. The well discharges directly to the distribution system via 10-inch diameter piping. Operations at this well site are year-round and the pump runs continuously to meet system demands. Continuous disinfection is provided on-site with calcium hypochlorite dry tablet erosion via a Hammonds chlorinator prior to discharge to the distribution system. This site has a 200A, 480V Modesto Irrigation (MID) service and a 150 kW standby Caterpillar diesel generator.

2.2.3 Well Site No. 9

Well site No. 9 is located in the north-eastern part of the City on California Avenue. Well No. 9 was drilled in 1985 and has a capacity of 800 gpm. The well is equipped with a vertical turbine pump and 60-HP VFD motor. The well discharges directly to the distribution system via 8-inch diameter piping. Operations at this well site are year-round, and the well typically only comes on-line to meet peak system demands. Continuous disinfection is provided on-site with calcium hypochlorite dry tablet erosion via a Hammonds chlorinator prior to discharge to the distribution system. This site has a 200A, 480V PG&E service and a 100 kW standby Caterpillar diesel generator.

Well Site No. 9

Nitrates have been detected at this well at levels below the MCLs at concentrations of 20-25 mg/L.

2.2.4 Well Site No. 10

Well site No. 10 is the City's newest well facility and is also located in the north-eastern part of the City, on Campbell Avenue. Well No. 10 was drilled in 1997 and is the highest producing well at 1,300 gpm. Well No. 10 is equipped with a vertical turbine pump and 125-HP VFD motor. The well discharges directly to the distribution system via 10-inch diameter piping. Operations at this well site are year-round to meet system demands. Continuous disinfection is provided on-site with calcium hypochlorite dry tablet erosion via a Hammonds chlorinator prior to discharge to the distribution system. This site has a 300A, 480V PG&E service and a 180 kW standby Caterpillar diesel generator.

Well Site No. 10

3 System Deficiencies

This evaluation of the existing system identified system deficiencies and needed improvements related to water quality, capacity, and operation.

3.1 Water Quality

The following deficiencies were identified, all of which may contribute to poor water quality:

- Well No. 1 is currently inactive due to nitrate levels exceeding the MCL. The nitrate MCL is exceeded during start-up of the well after being inactive during the winter months.

- The City tried to extend the well depth by 10 feet to improve water quality in the fall/winter of 2012/2013. The attempted repair resulted in damage to the well pumping equipment. It was determined that the well was not plumb and beyond repair. As a result, the well has been taken out of regular operation.

- Well No. 1 has the shallowest depth to suction of the four wells in the system.

3.2 System Capacity and Operation

The following system capacity and operational deficiencies were identified:

- With Well No. 1 out of service, the system is approaching non-compliance with Permit requirements. Community water systems are required to meet the system maximum day demand with the largest water source off-line [3] during a regular 'non-conservation year'. The largest water source in the system is Well No. 10. The combined capacity of Well No. 1, Well No. 3A, and Well No. 9 is 2,500 gpm; however, with Well No. 1 being inactive, the total system capacity is reduced to 1,900 gpm. Table 3-1 presents the maximum day demands for the previous 5 years.

Table 3-1 - Summary of Water Usage

Year	Max. Day Usage (gpm)
2008	2,089
2009	2,191
2010	1,822
2011	1,797
2012	2,796*
2013	2,389
2014	1,890
2015	1,591

*Calculated value (1.5 x ADD of Max Month)

The maximum day demand for the year 2015 was approximately 1,591 gpm [4]. The current system has sufficient capacity to meet the maximum day demand based on the 2015 usage data. The significant reduction in the maximum day demands for the year 2015 is a result of the State mandated water conservation efforts implemented by the City. Considering a 'normal' year, the system capacity would be insufficient to meet maximum day demands with Well No. 1 inactive. Normal years are considered years when the City mandated conservation program is not in place.

- Permit conditions require the City to flush and pump to waste when nitrate concentrations exceed 36 mg/L at Well No. 1. This flushing exercise is required every time Well No. 1 is inactive. Because Well No. 1 is active during summer months only, and does not run continuously, this flushing process must be completed several times annually. Each time this process is completed, approximately one million gallons of water is wasted and discharged to the existing wastewater treatment plant which impacts operations at the treatment plant. This is especially a problem if the system needs to be flushed during the industrial season (during summer months) when wastewater flows to the system are high and industrial ponds are in use.

- Per City staff, Well Pump No. 9 often shuts off when Well 10 is in operation. This operational deficiency is attributed to the significantly lower pump horsepower of Well No. 9 at 60-HP than Well Pump No. 10 at 125-HP. As a result, the reliability of Well No. 9 is marginal.

4 Recommended Improvement Analysis

Improvement alternatives were developed to determine strategies for future improvements to the existing water system that address system deficiencies. Each alternative is evaluated based on the proposed improvement's ability to meet system priorities of 1) compliance with regulatory requirements; 2) meeting system demands; and 3) improve system operations and increase efficiency. Phasing of proposed improvements and cost are also considered for each alternative.

4.1 Improvement 1 – Destroy Existing Well No. 1, Construct New Well, Remove GAC Filters

4.1.1 Destroy Existing Well No. 1

The existing Well No. 1 was drilled in 1965. The serial number on the pump indicates that the well pump was built in 1985, so the age of the well pump is 31 years old, which is well beyond the typical useful life of a well pump of 25 years. Recent attempts to deepen to well to improve water quality have been unsuccessful and further improvements to this well are not recommended. Additionally, the depth to suction of the well is shallow compared to the other existing wells in the system and the water quality produced is poor with high nitrates and a history of detectable levels of DBCP. Due to the age and condition of equipment, coupled with poor water quality, replacement of Well No. 1 is warranted.

A plan for destruction of this well will meet the system priority to comply with regulatory requirements by eliminating a well source with nitrate levels that exceed MCLs.

4.1.2 Construction of New Well and Remove GAC Filters

The existing Well Site No. 1 has available space to drill a replacement well. There is additional open space near the water storage tank on the southeast end of the property.

Well Site No. 1 Open Space Location for Proposed New Well

The rated capacity of the pumps that the electrical controls are sized to supply is 900 gpm, although the actual capacity is currently 600 gpm due to GAC filter capacity limitations. DBCP treatment is not needed, currently, as levels are below the MCL. Removal of the filters will allow the City to operate the existing or a new well pump and existing booster pumps at their rated capacities to meet system demands. Additionally, removal of the filters will increase operation and efficiency as there will be less maintenance required on the additional equipment and there is one less process to pump through to supply water to the distribution system.

The City's master plan recommends that new wells have a capacity of at least 1,250 gpm. Construction of a new well and installation of a new well pump with a capacity of 1,250 gpm, with an estimated 125-HP to 150-HP VFD motor will require upsizing the existing VFD and related feeder. The existing PG&E service and transfer switches are adequate to serve a maximum load of 225-HP for the number of pumps running simultaneously. Anything more than a combined power demand of 225-HP will require an electrical service upgrade and related onsite upgrades. The adequacy of the existing 150 kW standby generator will also need to be evaluated considering the HP of the new well.

The new well will require new site piping to connect to the existing site piping. It should also be considered that the new well discharge directly to the distribution system. The new well should be drilled to a depth where the well yield and water quality meet City and regulatory requirements. Well No. 3 is located less than a half-mile from Well No. 1 and has no water quality issues, so it is feasible that a new well, drilled to a depth greater than the existing well, will yield the same or an increased quantity of water of better quality. Construction of a new well can be completed by methods of drilling a pilot hole for sampling and testing with the option to develop the final well in one construction phase.

Construction of a new well will accomplish the system priorities to comply with federal regulations, meet system demands, and improve operations and increase efficiency. An active well at Well Site No. 1 is required to comply with Permit and Citation requirements to meet maximum day demands. A new well producing water with acceptable nitrate levels will require less sampling for seasonal start-up which will also improve operations and efficiency. Removal of the GAC filters will accomplish the system priorities to meet system demands, and improve operations and increase efficiency.

A request to the SWRCB for modification of the permit or for a new permit to include the new well and associated site modifications and to no longer require DBCP treatment will be required before the improvements can be made.

4.2 Improvement 2 – Increase Capacity of Existing Well(s)

Increasing the capacity of existing wells will accomplish the system priorities to meet system demands, and improve operations and increase efficiency. Currently, the reliable system capacity is 1,900 gpm with Well No. 1 inactive. The reliable system capacity, assuming all well pumps operate normally, is 2,500 gpm with the largest well off-line. Increased well capacity will provide more reliability in the system to meet maximum day demands with the largest well out of service. As stated previously, the City's master plan recommends that new wells have a capacity of at least 1,250 gpm. Each well site was evaluated for the feasibility of increasing capacity to a minimum of 1,250 gpm.

4.2.1 Improvement 2(a) – Increase Capacity of Well No. 3A

The existing capacity of Well No. 3A is 1,100 gpm. The well is drilled to a depth of 587 feet and has a well casing of 18-inches to a depth of 540 feet. This well has the largest well casing which allows for more room to accommodate a higher capacity pump. Increasing the capacity of the well pump to 1,250 gpm with an estimated 125-HP to 150-HP VFD motor will require upsizing the existing VFD and related feeder as well as a new utility feed and standby power system. At a minimum the MID feeder and metering will need to increase to 400A. The existing 100 kW standby diesel generator would be undersized for the application, and a 150-kW rated unit would be required along with a new automatic transfer switch.

Well No. 3A is the only well site with power service provided by MID. All other well sites are serviced by PG&E. City staff has indicated that MID service is approximately half the cost of PG&E service per kilowatt hour. This pump runs year-round to meet system demands. Improvements to increase capacity at this well site would be more economical based on the cost of power service compared to other sites.

4.2.2 Improvement 2(b) – Increase Capacity of Well No. 9

The existing capacity of Well No. 9 is 800 gpm. The well is drilled to a depth of 615 feet and has a well casing of 16-inches to a depth of 590 feet. Well No. 9 is rarely used and primarily supplies the system during peak demands. Additionally, this site area is small and the location is in a residential neighborhood. Improvements to install larger pump equipment, electrical controls, and a larger generator are less favorable when compared to other wells due to the limited available site area and proximity to residences.

4.2.3 Improvement 2(c) – Increase Capacity of Well No. 10

The existing capacity of Well No. 10 is 1,300 gpm. The well is drilled to a depth of 610 feet and has a well casing of 16-inches to a depth of 600 feet. The well site area is large and the location is at the far northeast end of town where there are fewer residences in close proximity. Well No. 10 is the newest well, and for that reason, improvements to this site are a low priority as equipment and operations are running efficiently.

4.3 Improvement 3 – Increase the Motor Horsepower of Well Pump No. 9

Increasing the motor horsepower at Well Pump No. 9 will accomplish the system priorities to meet system demands, and improve operations and increase efficiency. The reliability of Well No. 9 is marginal, as the nearby Well Pump No. 10 discharges to a common water main manifold and has a higher horsepower rating causing Well No. 9 to shut off as a result of being overpowered. Increasing the horsepower of Well Pump No. 9 is recommended for the pump to be able to operate reliably to meet peak system demands. This piping arrangement may also contribute to the operational deficiency, as the pump discharges via an 8-inch diameter piping to an 8-inch diameter and 10-inc h diameter tee in the distribution system. Increasing the 8-inch diameter discharge piping to 10-inch diameter piping should also be considered.

4.4 Improvement 4 - Replace Existing Booster Pump and Constant Speed Motors with New Booster Pumps and Variable Frequency Driven Motors

The existing booster pumps at Well Site No. 1 are equipped with constant speed motors. Replacement of the pumps and motors equipped with VFDs will improve the overall operational efficiency of the system. The booster pumps are utilized to meet operational, emergency, and fire flow. The booster pumps also allow for turnover of the water in the tank, which must be done regularly. Replacement of the constant speed motors will increase efficiency of the system by allowing the pumps to adjust to the system demands without interfering with the normal operations of the operating wells in the system

5 Improvement Phasing and Estimated Costs

Factors that are also considered in evaluating each recommendation, in addition to system priorities are phasing of improvements and cost. Prioritization of each recommendation is done to maximize the benefit to the City by addressing system deficiencies and budget constraints.

5.1 Recommended Phasing of Improvements and Budgetary Costs

The following summarizes the recommended phasing of improvements:

(1) Improvement 1 – Destroy Existing Well No. 1, Construct New Well, and Remove GAC Filters
(2) Improvement 2(a) - Increase Well Capacity of Existing Well No. 3A
(3) Improvement 3 - Increase the Motor Horsepower of Well Pump No. 9
(4) Improvement 4 – Replace Existing Well Site No. 1 Booster Pumps and Motors with New Booster Pumps and Motors with Variable Frequency Drives

It is recommended that Improvement 1 be is completed first, as immediate attention is needed to comply with requirements directed in the Citation which includes a plan and schedule for the destruction or re-activation of Well No. 1. Improvement which includes destroying the existing Well No. 1 and construction of a new well will immediately address the Citation and accomplish the system priority to comply with state and federal regulations. Removal of the existing GAC filters increases operation and efficiency.

Improvements 2-4 are recommended to improve overall operation and efficiency of the system. Improvement 2(a) which includes increasing the well pump capacity at Well Site No. 3 provides significant benefits to meet system priorities to meet system demands. Improvement 3 includes increasing the motor horsepower of Well Pump No. 9 will improve the reliability of the well source to meet system priorities to meet system demands and improve operational efficiency. Improvement 4, which includes replacement of existing booster pumps and constant speed motors with new pumps and variable frequency drive motors, provides improvement to operations and efficiency and is recommended as a second phase of improvements.

Table 5-1 summarizes the budgetary cost for the highest priority improvement, Improvement 1.

Table 5-1 - Budgetary Costs for Improvement 1

Improvement 1: Destroy Existing Well No. 1, Construct New Well, Remove GAC Filters	Budgetary Cost
Destroy Existing Well No. 1	$10,000
Install Test Well: Drill pilot hole, sampling and testing	$50,000
Develop Final Production Well	$150,000
Vertical Turbine Well Pump and Motor w/VFD	$93,800
Site piping and connection to existing distribution system	$50,000
Installation of new well pump feeder and VFD cabinet for a 125-150-HP well pump	$36,500
Installation of a new standby diesel generator set (sized for capacity to include improvement from Item 2, Improvement 2)	$150,000
Upgrade of PG&E service, new automatic transfer switch (ATS), and related feeders, PG&E fees	$125,000
Site improvements: grading/paving/lighting.	$50,000
Removal and disposal of GAC filters	$15,000
Subtotal	$730,000
Contingency 25%	$182,575
Improvement 1 Construction Total	**$912,875**
Engineering Design	**$165,000**
Environmental	**$25,000**
Bidding and Construction Support	**$25,000**
Construction Management	**$85,000**
TOTAL PROJECT COST	**$1,212,875**

Table 5-2 summarizes the improvement alternatives and system priorities addressed by each improvement.

Table 5-2 - Improvements Summary

Improvement	Description	Improvements Required	System Priority Addressed
1	Destroy Existing Well No. 1 and Construct New Well	• Destroy existing well, drill and install new test well and final well. • New well pump and motor • Site piping to connect to distribution system. • Site improvements. • Remove and dispose of GAC filters • Upgrades to existing electrical system, programming, and service • Installation of new generator set	✓ Comply with regulatory requirements ✓ Meet system demands ✓ Improve operations and efficiency

Improvement	Description	Improvements Required	System Priority Addressed
2(a)	Increase Well Capacity of Existing Well No. 3A	• Install new well pump and motor	✓ Meet system demands ✓ Improve operations and efficiency
3	Increase the Motor Horsepower of Well Pump No. 9	• Replace existing motor with larger HP motor • Increase discharge piping diameter and distribution system piping diameter	✓ Meet system demands ✓ Improve operations and efficiency
4	New Booster Pump and Motors with VFDs	• New pumps and motors • Add VFDs • Upgrades to existing electrical system, and programming	✓ Meet system demands ✓ Improve operations and efficiency

6 Recommendations

Based on the evaluation and improvement costs it is recommended that the first phase of improvements include Improvement 1 which includes destroying the existing Well No.1, drilling a new well and installing a new well equipped with a pump and motor of larger capacity than the existing well pump, and removal of the GAC filters. These improvements require electrical service, programming, and system upgrades, as well as the installation of a new generator set. It is recommended that the electrical upgrades and new generator set be sized for future improvements to the booster pump station, described as Improvement 2.The environmental document anticipated for Improvement 1 is anticipated to be a Mitigated Negative Declaration as the project includes system capacity increase to the system and the installation of a new, larger generator set. The total budget cost for Improvement 1 is $1,212,875, including engineering, environments, bidding and construction management services.

Improvements 2- 4 should be subsequently phased and budgeted for after the first phase improvements are completed.

7 Funding Sources

The Drinking Water State Revolving Fund (DWSRF) Program is a potential funding source for the recommended first phase improvements. The U.S. Environmental Protection Agency offers this program, offering primarily loans to drinking water systems. The program is administered through the State of California. This program is a grant or loan based funding source. The DWSRF provides funding to correct public water system deficiencies based upon a prioritized funding approach that addresses the systems' problems that pose public health risks, and systems with needs for funding to comply with the requirements of the Safe Drinking Water Act.

The City is not considered a disadvantaged community since the median household income (MHI) of $58,000 per the U.S. Census data. As such, the City does not qualify for grants funding under the SRF program. Non-disadvantaged systems are eligible for the standard DWSRF/Prop 1 financing terms – specifically, a 20 year loan with an interest rate of 1.60%. [The interest rate changes each January 1st; the 1.60% noted above is current as of this writing.]

Water system improvements eligible under this program include rehabilitation of wells or development of eligible sources to replace contaminated sources, and upgrades to finished water storage tanks to prevent contaminants from entering the distribution system.

The process to apply for this funding program is to complete a planning or construction application for submittal to the State for the proposed improvements. Engineering design services, environmental services, labor compliance, rate studies, and project planning are eligible for loan funding under the program.

8 Schedule

Table 8-1 presents the estimated timeline to complete the first phase of recommended improvements for Item 1, Improvement Alternative 1.

Table 8-1 - Improvement Alternative 1 Schedule

Item	Expected Time of Completion from the Date the Work is Authorized
Submit Funding Application	1 month
Executed Funding Agreement	7-9 months
Preliminary Design	9-12 months
Environmental Documents	12 months
Provide Final Plans and Specifications	12-15 months
Project Approval and Bidding	16-18 months
Construction	18-24 months
Project Inspection and Completion	24 months

It is expected that the City Council will need to authorize the submittal of a funding application to apply for funds/loan from the State. Assuming a Council authorization date of March 2016, the proposed first phase of improvements is estimated to be completed by March 2018. This schedule is subject to change if the City elects to use alternate funds to complete the project(s) or if the State application review is longer than the estimated time of completion.

9 Summary

This water system evaluation includes a review of the City's water system and operations to prioritize improvements in order to: 1) comply with SWRCB Permit requirements; 2) address the requirements of the Citation to provide a plan and schedule for Well No. 1; 3) improve operations and increase efficiency of the system; and 4) meet maximum day water system demands. Review of the existing system

identified system deficiencies and needs for improvements related to water quality, capacity and operation.

Water quality and operational deficiencies exist at Well No. 1. The City requested an amendment to the water system Permit to reclassify Well No. 1 from an active status to an inactive status due to nitrate levels above the Maximum Contaminant Level (MCL). Additionally, current Permit conditions require the City to flush and pump to waste when nitrate MCL exceed 36 mg/L at Well No. 1. This flushing exercise is required every time Well No. 1 is activated. Because Well No. 1 is active during summer months only, and does not run continuously, this flushing process must be completed several times. Each time this process is completed, 1.0 million gallons of water is wasted and discharged to the existing wastewater treatment plant which impacts operations at the treatment plant. This is especially a problem if the system needs to be flushed during the industrial season (during summer months) when wastewater flows to the system are high and industrial ponds are in use.

System capacity is a concern with Well No. 1 inactive. The system is approaching non-compliance with regulatory requirements. Community water systems are required to meet the system maximum day demands with the largest water source off-line. The total system capacity is reduced to 1,900 gpm with Well No. 1 inactive. The maximum day demand for the year 2015 is approximately 1,591 gpm with Well No. 1 offline. The current system has sufficient capacity to meet current maximum day demands; however, the system capacity may be insufficient to meet maximum day demands with Well No. 1 inactive for 'non-conservation' years. Capacity issues also exist in the system, as Well No. 1 is limited in capacity to the capacity of the GAC filter. DBCP treatment is not needed, currently, as levels are below the MCL.

Operational deficiencies exist in the system as Well Pump No. 9 often shuts off when Well 10 is in operation. This operational deficiency is attributed to the significantly lower pump horsepower of Well No. 9 at 60-HP than Well Pump No. 10 at 125-HP. As a result, the reliability of Well No. 9 is marginal.

The recommended first phase of improvements to address deficiencies include destroying the existing Well No.1, drilling a new well and installing a new well equipped with a pump and motor of larger capacity than the existing well pump, and removal of the GAC filters. Completion of these improvements, described as Improvement 1, will meet the system priorities to comply with regulatory requirements, meet system demands, and improve operation and efficiency. The total budget cost for Improvement 1 is $1,212,875.

Funding available through the DWSRF Program is available in the form of a low-interest loan to fund the recommended first phase improvement project. The application process through construction completion of the proposed improvements is estimated to be completed in two years.

Improvements 2- 4 should be subsequently phased and budgeted for after the first phase improvements are completed.

10 References

[1] *Citation for Violation of California Health and Safety Code Section 116555(a)(1) and California Code of Regulations, Title 22, Section 64431 Violation of the Nitrate Maximum Contaminant Level Water System No. 3910003 Citation No. 01-10-15S-006, Issues State water Resources Control Board Division of Drinking Water*, State Water Resources Control Board Division of Drinking Water, Issued on July 13, 2015.

[2] City of Escalon Water Master Plan, ECO:LOGIC Consulting Engineers, January 2007.

[3] Kidwell, Brian. State of California Department of Health. Letter to: Carl Carlucci. Inspection of the City of Escalon (3910003), 2013 July 22.

[4] City of Escalon Water Production Data, 1998-2015.

APPENDIX A

SWRCB Inspection of the City of Escalon (3910003), 2013 July 22

State of California
Memorandum

California Department of Public Health

TO: Carl Carlucci **DATE:** July 22, 2013

FROM: Brian Kidwell

Inspection of the City of Escalon (3910003)

The inspection of the City of Escalon (City) water system was performed on July 11, 2013, with the assistance of Mathew Morgan, Lead Operator.

The water system is well-maintained and operated. The system's four wells, disinfection equipment, granular activated carbon vessels, and distribution system appeared to be well-maintained at the time of the inspection. All chemical monitoring minus a few minor deficiencies, was determined to be current.

SECTION I of this memorandum describes deficiencies or items of note that require attention.

SECTION II includes a summary of the City's water quality monitoring.

SECTION I – Items Requiring Attention

1. Well No. 07

   Well No. 07, inactive, has not been used since 2007. If the City does not plan on rehabilitating Well No. 07 or using it as an irrigation well, it must be properly destroyed. The City needs to submit a formal decision regarding Well No. 07, in writing, to the Department by September 30, 2013.

2. Pump Screens

   It was noted during the inspection that the deep well turbine pumps at Well No. 03A, Well No. 09, and Well No. 10 are not screened. The shafts, which are spinning at a high rate of speed during pump operation, are not surrounded by a screen. For safety reasons, the Department recommends that the City encase the pump shafts with screen at Well No. 03A, Well No. 09, and Well No. 10.

3. Properly Screen Air Release Valve

   It was noted during the inspection that the second air release valve at Well No. 09 is not properly screened. The City needs to properly screen the second air release valve at Well No. 09 by August 31, 2013.

4. Source Capacity

Water Use Data (From 2012 Annual Report)

Total Number of service connections:	2,390
Approximate Population served:	7,209
Total Ground Water produced in 2012:	576.01 MG
Maximum month (July):	83.21 MG (1,864 avg. gpm)
Maximum day (1.5 x ADD during July):	4.03 MG (2,796 avg. gpm)

Summary of Water Usage

Year	Service Conn.	Total Annual (MG)	Max. Month (MG)	Max. Day Usage (gpm)	Ave. Day Usage (gpm)	Ratio of Max. Day to Average Day
2008	2,390	604.53	76.98	2,089	1,150	1.82
2009	2,390	571.71	78.96	2,191	1,088	2.01
2010	2,396	516.93	77.87	1,822	984	1.85
2011	2,401	529.97	73.55	1,797	1,008	1.78
2012	2,390	576.01	83.21	2,796*	1,096	2.55

*Calculated value (1.5 x ADD of Max Month)

The City's water system has four active wells with a combined source capacity of approximately 3,800 gpm. During the time of the inspection Well No. 01 was offline, reducing the source capacity to 3,200 gpm. Based on historical use data, the City's water system has adequate source capacity to meet maximum day demands. According to the operator the City has never had any water outages, or problems supplying the public with enough drinking water.

In 2012 the City did not collect daily water production data. Therefore the actual maximum day demand (MDD) in 2012 is unknown. The 2012 MDD had to be calculated by multiplying the average day demand during the maximum month by a factor of 1.5. The calculated 2012 MDD is 2,796 gpm. It should be noted that this MDD is higher than the MDD from recent years.

The City shall return to taking daily well production readings. These daily production readings are extremely important when it comes to calculating the MDD and source capacity, especially during the summer months.

It was noted by the system operator that the water system is able to run all of the active wells at the same time. However, community water systems must be able to meet the MDD, using only water sources, with the highest producing well offline. This will create a worst case scenario. The calculated MDD is 2,796 gpm, as noted above. In the worst case scenario, with Well No. 10 offline, the City's source capacity is reduced to 2,500 gpm. If Well No. 10 was down with a problem, the City would not be able to meet the MDD. As noted above, Well No. 01 is currently offline, and the operator isn't sure if it will be put back online this summer. With Well No. 01 and Well No. 10 offline, the source capacity is reduced to 1,900 gpm. This is well below the MDD. If the highest producing well and a second source are offline, the City would not be able to meet the MDD.

To calculate the peak hour demand (PHD), the MDD is multiplied by a factor of 1.5. Community water systems with 1,000 or more service connections must be able to meet the PHD for four

hours using water sources and water storage. The City's calculated PHD is 4,194 gpm or a four hour total of 1.006 MG. The City is able to meet the PHD using the 0.5 MG water storage tank and the three sources currently online, 3,200 gpm or a four hour total of 0.768 MG. Therefore, the City's water system does not have any PHD concerns.

The City needs to submit a plan and time schedule for developing a new water source. From the calculations above it is clear with the highest producing well offline the City is not able to meet the MDD.

5. Chlorination Plan

The Department does not have a chlorination operations plan for the City. If the City has a chlorination plan, a copy needs to be submitted to the Department by August 31, 2013. If the City does not have a chlorination operations plan, then one must be drafted and submitted to the Department for review and approval by September 30, 2013. Chlorination operations plan guidance can be provided upon request.

6. Disinfection Data Sheets

It was noted during the inspection that the Department does not have Disinfection Data Sheets for each of the disinfection stations. The City needs to complete Disinfection Data Sheets for each point of disinfection by August 31, 2013.

7. MSDS Sheets

During the inspection of the water system it was noted that there weren't any Material Safety Data Sheets (MSDS) located in any of the calcium hypochlorite storage buildings. In case of emergencies these MSDS sheets should be kept in all locations where calcium hypochlorite is stored. The City needs to place MSDS sheets in all of the locations where calcium hypochlorite is used or stored by August 31, 2013.

8. GAC Data Sheet

During the inspection it was noted that the Department does not have a GAC Data Sheet for the GAC treatment. The City needs to complete a GAC Data Sheet for the GAC treatment by August 31, 2013.

9. Booster Pump Data Sheet

It was noted during the inspection that the Department does not have a Booster Pump Data Sheet for the booster pump station. The City needs to complete a Booster Pump Data Sheet for the booster pump station by August 31, 2013.

10. Distribution Data Sheet

It was noted during the inspection that the Department does not have a Distribution Data Sheet for the water system. The City needs to complete a Distribution Data Sheet for the water system by August 31, 2013.

11. Cross-Connection Control

According to the Annual Report to the Department, there are a total of 257 backflow prevention devices in the system and 246 were tested in 2012, with the other 11 being tested in late 2011.

Backflow prevention devices must be tested every year. The City shall test all the backflow prevention devices annually.

According to the 2012 Annual Report to the Department, the last cross-connection control survey was completed in 2007. A cross-connection control survey should be completed every 5 years.

12. Valve Maintenance Program

If the City has a valve exercising plan, a copy needs to be submitted to the Department by August 31, 2013. If the City does not have a valve exercising plan, then one must be drafted and submitted to the Department for review and approval by September 30, 2013. The valve exercising plan should include what valves will be exercised and when. This will ensure that all of the valves get exercised on a routine basis.

SECTION II – Water Quality Monitoring

1. Monitoring of Treated Water (Effluent) from GAC Vessels

After the Department permitted the use of GAC treatment at Well No. 01, a problem, which was not identified prior to issuance of the permit, developed with both vessels having elevated HPC levels. The City had placed only Vessel No. 01 in service. Well No. 01 and Vessel No. 01 were used only during the warmer months and when in use, the operation was 24 hours a day, 7 days a week. The continuous operation prevented high HPC counts. Since Well No. 01 was going to be idle during the winter months, the Department stipulated that certain amount of monitoring be conducted prior to start-up and after start-up to ensure the treated water is safe for distribution to the consumers. The City continues to use only one vessel at a time. Therefore, start-up monitoring applies only to the vessel in use. Reference Permit Amendment No. 03-10-03PA-014 issued June 25, 2003, for details regarding monitoring.

DBCP

DBCP must be monitored once before start-up from the vessel and the effluent. The start-up results must be available to the Department for review and approval before treated water can enter the distribution system. Thereafter, monthly DBCP monitoring must be conducted from the vessel and the effluent.

25, 50, and 75 Percent Sampling Ports

Sampling the ports must be conducted monthly from the vessel in use. Sampling is currently conducted at the 75 percent port. This monitoring helps the City track the progress of the adsorption through the vessels. It should be noted that the raw water DBCP levels are well below the MCL, 0.4-0.6 ug/L.

Nitrate

Since nitrates can be retained in the GAC, nitrate monitoring must be conducted on the combined effluent when the raw water nitrate levels are at or greater than 50 percent of the nitrate MCL. Monitoring for nitrate, from the combined effluent, is required one to three hours after start-up and weekly thereafter. As noted above, Well No. 01 and the GAC treatment is not brought online until flushing of the well has reduced the nitrate level to below the MCL. According to past data, Well No. 01's nitrate level during operation is approximately 30 mg/L.

Bacteriological

Due to high HPC levels, an HPC sample must be collected prior to start-up from the vessel is use. The results must be available to the Department for review and approval before treated water can enter the distribution system. After start-up, the City must continue with monthly HPC monitoring from the vessel in use. In addition, after start-up, the effluent must be monitored for total coliform daily for one week, weekly for a month, and monthly thereafter.

2. Distribution System Monitoring:

Bacteriological

With a reported population of approximately 7,209 people served through 2,390 service connections, the City's water system is required to have a minimum of two routine samples from its distribution system examined for bacteriological quality every week. For the period of July 2008 through July 2013, there has been no detection of coliform bacteria in the distribution system.

The water is continuously disinfected to minimize the potential growth of microbiological contaminants in the distribution system. Chlorine residuals are checked routinely (weekly) in the distribution system to ensure that the level of disinfection is adequate to maintain the microbiological quality of the water. Chlorine residuals are recorded at the time the bacteriological samples are collected in the distribution system.

The City's Bacteriological Sample Siting Plan (BSSP) was revised July 8, 2013. The existing system map is still accurate and is on file. The City shall continue to use the approved BSSP, dated July 8, 2013, until otherwise notified.

The City tries to maintain a distribution system chlorine residual between 0.7-1.0 mg/L. The following table summarizes the monthly average chlorine residual level over the last year:

Month - Year	Monthly Avg. Chlorine Level (mg/L)
July – 2012	0.59
August – 2012	0.59
September – 2012	0.68
October – 2012	0.61
November – 2012	0.82
December – 2012	1.16
January – 2013	1.23
February – 2013	1.10
March – 2013	0.73
April – 2013	0.73
May – 2013	0.71
June – 2013	0.65
Running Annual Avg.	**0.80**

Total Trihalomethanes (TTHM) and Haloacetic Acids (HAA5) Monitoring

Stage 1 DBPR

The Stage 1 Disinfection Byproducts Rule (ST1DBPR) became effective on January 1, 2004, for systems that add a chemical disinfectant. Based on the City's latest population figures and

source water type, one sample per year per treatment plant from a location representing maximum residence time is required. The results of the samples collected on August 16, 2004, were non-detect for both TTHM and HAA5. Based on the results, the City applied for and was granted, reduced monitoring. For groundwater system serving less than 10,000 people, reduced monitoring is one sample every three years.

A ST1DBPR plan was prepared, dated December 2003, and is on file with the Department. The existing sample site was reviewed with the operator and it was determined that the sample site that would represent the maximum residence time was the routine sample site located at 376 Farinelli Parkway, Escalon, CA.

In accordance with the ST1DBPR plan, one sample every three years is taken from 376 Farinelli Parkway and analyzed for TTHM and HAA5.

The results of the ST1DBPR monitoring are shown in the table below.

Summary of TTHM & HAA5 Monitoring (ug/l)

Date	TTHM	HAA5
08/2004	ND	ND
08/2006	2.9	ND
08/2007	ND	ND
08/2010	1.7	ND

The next TTHM and HAA5 monitoring will be due in August 2013.

Stage 2 DBPR

The California Department of Public Health adopted the Stage 2 Disinfection Byproduct Rule (ST2DBPR), effective June 21, 2012. The ST2DBPR applies to all community and non-transient, non-community water systems that treat their water with a primary or residual disinfectant, other than UV, or deliver water that has been treated with a primary or residual disinfectant, other than UV, to conduct an Initial Distribution System Evaluation (IDSE). The purpose of the IDSE is to identify sample points in the water system that are more likely to have higher DBP levels than those selected for Stage 1 monitoring.

The ST2DBPR is being implemented on four separate schedules. Those water systems associated with a population of greater than or equal to 100,000 are the Schedule 1 systems. Those water systems associated with a population of 50,000 to 99,999 are the Schedule 2 systems. Those water systems associated with a population of 10,000 to 49,999 are the Schedule 3 systems, and those associated with a population of less than 10,000 are Schedule 4 systems. Based on population, the City's water system is a Schedule 4 system. Therefore, the City's water system must begin complying with the ST2DBPR by October 1, 2013.

Based on the City's DBP monitoring to date, the system qualifies for a 40/30 Certification. The City submitted a 40/30 Certification request on November 15, 2007, which was approved the same day. Water systems that do not have to complete an IDSE must still perform ST2DBPR monitoring. The main difference between ST1DBPR and ST2DBPR is that compliance will be based on locational running annual averages (LRAA) of the results of monitoring that will continue to be performed at the Stage 1 monitoring sites, once the effective date for Stage 2 monitoring requirements is reached.

Since the City was granted a 40/30 waiver and was not required to complete an IDSE, one dual ST2DBPR sample (for both TTHM and HAA5) shall be taken at 376 Farinelli Parkway **annually**. The City shall continue to use the same sample siting plan as it used for ST1DBPR. As noted above the City will be required to begin complying with ST2DBPR by October 1, 2013. **The TTHM and HAA5 monitoring results for the sampling site need to be submitted by the lab via EDT. The TTHM and HAA5 results from 376 Farinelli Parkway need to be associated with sampling point 3910003-900. The first ST2DBPR monitoring will be required in July 2014.**

Lead and Copper (tap monitoring)

The following is a summary of the lead and copper tap monitoring conducted to date:

Summary of Lead and Copper Tap Monitoring

Date Completed	No. of Samples Required	90% Lead (mg/l)	90% Copper (mg/l)
December 1992	40	0.0	0.14
May 1993	40	0.005	0.14
June 1994	20	0.0	0.10
January 1996	20	0.002	0.08
August 1999	20	0.0	0.08
September 2002	20	0.0	0.065
August 2005	20	0.0	0.103
August 2008	20	0.0036	0.141
August 2011	20	0.0013	0.090
Next Due 6/2014-9/2014	**20**		

Title 22 of the California Code of Regulations (22CCR), Division 4, Chapter 17.5, Section 64675 requires the City to collect 40 samples under standard tap sampling, and 20 samples under reduced tap monitoring. Currently the City's water system conducts reduced tap monitoring. Water systems that monitor annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August, or September.

The next lead and copper tap monitoring shall be conducted between June and September 2014 with a minimum of 20 samples required. Upon completion of the analyses, the results of all tests and the dates of completion of the testing shall be submitted to the Department's Stockton District Office. Form 141A shall also be completed and submitted along with the monitoring results.

Asbestos

The City's water system has approximately 17 percent asbestos-cement water mains. Systems that contain asbestos-cement pipes are considered vulnerable to asbestos contamination due to the potential release of asbestos fibers into the water under water quality conditions that are corrosive. Normally, water not saturated with calcium or water with an aggressive index less than 11.5 units is known to provide corrosive conditions for the leaching of asbestos fibers. Monitoring for such systems is required at least once every nine years from the distribution system that is serviced by an asbestos-cement pipe.

From the most recent monitoring data, the aggressive indices indicate the well water sources are slightly aggressive except for Well No. 01. The last asbestos monitoring was completed on May

8, 2005. The asbestos results were non-detectable. **The next asbestos monitoring from the distribution system from a site serviced by an asbestos-cement pipe will be due in May 2014.**

Aggressive Index Summary

	Well No. 01	Well No. 03A	Well No. 09	Well No. 10
pH	7.4	7.8	7.6	7.9
Total Alkalinity, mg as $CaCO_3$	180	70	110	70
Calcium Hardness, mg/l as $CaCO_3$	110	35	55	32.5
Aggressive Index (AI)	11.7	11.2	11.4	11.3

3. Source Water Monitoring:

Bacteriological

Raw wellhead bacteriological monitoring for the system's four active wells is being conducted on a monthly basis and the results are on file. A review of recent records shows that the City's water system source water has had no total coliform positives.

Chemical

The City conducts monitoring of the chemical quality of the four groundwater sources. The following table is a summary of the last chemical monitoring for the water system's four active wells:

Summary of Last Monitoring

	Inorg.	Nitrate	Nitrite	GM/GP	VOCs	SOCs	Radiological
Well No. 01	01/31/2013	04/17/2013	01/31/2013	01/31/2013	05/16/2012	Varies	06/20/2012
Well No. 03A	01/16/2013	01/16/2013	01/16/2013	01/16/2013	05/16/2012	Varies	03/15/2012
Well No. 09	03/13/2013	03/13/2013	03/13/2013	03/13/2013	05/16/2012	Varies	03/15/2012
Well No. 10	10/17/2012	10/17/2012	10/17/2012	10/17/2012	05/16/2012	Varies	09/18/2012

Inorg. – Inorganics, table 64431-A
Nitrate: Generally, annual nitrate monitoring is required.
GM/GP=General Mineral/General Physical and Secondary Standards, Table 64449-A & B
VOCs=Volatile Organic Chemicals - Table 64444-A SOCs=Synthetic Organic Chemicals - Table 64444-A
N. Rad=NATURAL RADIOACTIVITY - Sec 64442

The following table summarizes the monitoring that is due in the future. Dates indicate when monitoring should be conducted for that category.

Summary of Upcoming Required Well Monitoring

	Inorg.	Nitrate	Nitrite	GM/GP	VOCs	SOCs	Radiological
Well No. 01	01/2016	Due Now	01/2016	01/2016	05/2015	Varies	06/2021
Well No. 03A	01/2016	01/2014	01/2016	01/2016	05/2015	Varies	03/2021
Well No. 09	03/2016	03/2014	03/2016	03/2016	05/2015	Varies	03/2021
Well No. 10	10/2015	10/2013	10/2015	10/2015	05/2015	Varies	09/2021

Inorganics:

Routine monitoring is required every three years for active wells.

Well No. 01: Monitoring of inorganic chemicals for this well was last conducted in January 2013. The water produced by the well meets the primary drinking water standards for these parameters. **The next inorganic chemical monitoring for this well will be due in January 2016.**

Well No. 03A: Monitoring of inorganic chemicals for this well was last conducted in January 2013. Water produced by the well meets the primary drinking water standards for these parameters. **The next inorganic chemical monitoring for this well will be due in January 2016.**

Well No. 09: Monitoring of inorganic chemicals for this well was last conducted in March 2013. Water produced by the well meets the primary drinking water standards for these parameters. **The next inorganic chemical monitoring for this well will be due in March 2016.**

****Asbestos: Asbestos was last monitored in January 2001; asbestos monitoring is required once every nine years and is due now.**

Well No. 10: Monitoring of inorganic chemicals for this well was last conducted in October 2012. Water produced by the well meets the primary drinking water standards for these parameters. **The next inorganic chemical monitoring for this well will be due in October 2015.**

****Asbestos: Asbestos has never been monitored for this well; asbestos monitoring is required once every nine years and is due now.**

Nitrate: Routine nitrate monitoring is required annually for active wells where the results are below half the MCL, and quarterly for active wells where the results are above half the MCL. The following table summarizes the most recent nitrate concentrations in each well. The water produced by all of the wells, except Well No. 01, meets the primary drinking water standards for this parameter. Well No. 01 is only operated during the summer months. During the winter months, when the well is not operating, the nitrate levels climb above the MCL (45-50 mg/L). Before the City brings this well online, it is operated and pumped to waste for approximately 2-3 weeks. The City takes numerous nitrate samples during this process to monitor the fluctuating nitrate level. Once the nitrate level has dropped below the MCL, around 25-30 mg/L, the City places Well No. 01 online. It should be noted that Well No. 01 is currently on quarterly nitrate samples. However, during the time of the inspection, the pump was removed from Well No. 01. Therefore, the quarterly nitrate sample will most likely be missed.

Nitrate (as NO3)

	Most Recent Monitoring	Monitoring Interval	Next Monitoring Due
Well No. 01	47.9 mg/l	Quarterly	**Due Now**
Well No. 03A	16.7 mg/l	Annually	01/2014
Well No. 09	20.7 mg/l	Annually	03/2014
Well No. 10	17.2 mg/l	Annually	10/2013

Nitrite (as nitrogen): Routine nitrite monitoring is required every three years for active wells. The following table summarizes the most recent nitrite concentrations in each well. The water produced by the wells meets the primary drinking water standards for this parameter.

Nitrite (as N)

	Most Recent Monitoring	Monitoring Interval	Next Monitoring Due
Well No. 01	< 400.00 ug/l	Three Years	01/2016
Well No. 03A	< 400.00 ug/l	Three Years	01/2016
Well No. 09	< 400.00 ug/l	Three Years	03/2016
Well No. 10	< 400.00 ug/l	Three Years	10/2015

General Mineral and General Physical:

Monitoring for these constituents is required every three years for active wells.

Well No. 01: Monitoring of general mineral and general physical constituents for this well was last conducted in January 2013. The water produced by the well meets the primary drinking water standards for these parameters. **The next general mineral and general physical constituent monitoring for this well will be due in January 2016.**

Well No. 03A: Monitoring of general mineral and general physical constituents for this well was last conducted in January 2013. The water produced by the well meets the primary drinking water standards for these parameters. **The next general mineral and general physical constituent monitoring for this well will be due in January 2016.**

Well No. 09: Monitoring of general mineral and general physical constituents for this well was last conducted in March 2013. The water produced by the well meets the primary drinking water standards for these parameters. **The next general mineral and general physical constituent monitoring for this well will be due in March 2016.**

Well No. 10: Monitoring of general mineral and general physical constituents for this well was last conducted in October 2012. The water produced by the well meets the primary drinking water standards for these parameters. **The next general mineral and general physical constituent monitoring for this well will be due in October 2015.**

Volatile Organic Chemicals (VOCs):

Monitoring for these constituents is required every three years for active wells

Well No. 01: VOC monitoring for this well was last conducted in May 2012. The water produced by the well meets the primary drinking water standards for these parameters. **The next VOC monitoring for this well will be due in May 2015.**

Well No. 03A: VOC monitoring for this well was last conducted in May 2012. The water produced by the well meets the primary drinking water standards for these parameters. **The next VOC monitoring for this well will be due in May 2015.**

Well No. 09: VOC monitoring for this well was last conducted in May 2012. The water produced by the well meets the primary drinking water standards for these parameters. **The next VOC monitoring for this well will be due in May 2015.**

Well No. 10: VOC monitoring for this well was last conducted in May 2012. The water produced by the well meets the primary drinking water standards for these parameters. **The next VOC monitoring for this well will be due in May 2015.**

All SOC monitoring for the City water system is waived except for atrazine, simazine, dibromochloropropane (DBCP), and ethylene dibromide (EDB). Well No. 03A, Well No. 09, and Well No. 10 all monitoring atrazine and simazine every nine years and EDB and DBCP every three years. Well No. 01 monitors atrazine and simazine every nine years and EDB and DBCP every three months, or quarterly. The increased DBCP monitoring at Well No. 01 is due to the fact that the City has GAC treatment for DBCP.

Last SOC Monitoring

	Atrazine	Simazine	DBCP	EDB
Well No. 01	01/2007	01/2007	04/2013	04/2013
Well No. 03A	01/2007	01/2007	03/2012	03/2012
Well No. 09	03/2007	03/2007	01/2013	01/2013
Well No. 10	10/2006	10/2006	03/2012	03/2012

Next SOC Monitoring

	Atrazine	Simazine	DBCP	EDB
Well No. 01	01/2016	01/2016	**07/2013**	**07/2013**
Well No. 03A	01/2016	01/2016	03/2015	03/2015
Well No. 09	03/2016	03/2016	01/2016	01/2016
Well No. 10	10/2015	10/2015	03/2015	03/2015

Natural Radioactivity (Gross Alpha, Radium-226, Radium-228, Uranium):

Based on the most recent monitoring results submitted to CDPH, all of the City's wells are required to be monitored for gross alpha once every nine years. **The next radiological monitoring for the wells is shown in the table below.**

Radiological Monitoring

	Most Recent	Gross Alpha	Frequency	**Next Monitoring**
Well No. 01	06/2012	0.676	9 years	**06/2021**
Well No. 03A	03/2012	0.383	9 years	**03/2021**
Well No. 09	03/2012	1.60	9 years	**03/2021**
Well No. 10	09/2012	0.626	9 years	**09/2021**

The water produced by all of the wells meets the primary drinking water standards for this parameter. Department records show that the City completed the initial monitoring for Radium-228 in July 1998.

APPENDIX B

City Water Data 1998-2015

City of Escalon

Production Totals
1998-2014

In Gallons

1998			**2003**			**2008**		
JAN	18,435,200		JAN	20,700,000		JAN	22,414,600	
FEB	16,461,200		FEB	18,700,000		FEB	21,983,178	
MAR	15,598,600		MAR	31,200,000		MAR	39,113,411	
APR	22,492,200		APR	32,600,000		APR	56,244,099	
MAY	26,967,800		MAY	56,100,000		MAY	69,879,464	
JUN	46,003,600		JUN	73,100,000		JUN	76,977,708	
JUL	66,586,600		JUL	84,600,000		JUL	75,292,996	
AUG	64,097,000		AUG	74,300,000		AUG	74,057,411	
SEP	52,342,700		SEP	66,000,000		SEP	63,589,934	
OCT	38,131,500		OCT	53,318,000		OCT	50,439,908	
NOV	21,597,400		NOV	25,797,200		NOV	30,544,640	
DEC	20,384,000	Annual total	DEC	22,951,000	Annual total	DEC	23,893,181	Annual total
		409,097,800			559,366,200			604,430,530
1999			**2004**			**2009**		
JAN	19,743,100		JAN	21,830,000		JAN	23,608,146	
FEB	19,243,300		FEB	22,687,000		FEB	20,614,388	
MAR	24,408,400		MAR	33,805,000		MAR	29,750,100	
APR	36,430,100		APR	57,373,000		APR	48,278,217	
MAY	55,152,400		MAY	61,077,900		MAY	63,650,972	
JUN	65,576,200		JUN	72,423,700		JUN	69,635,924	
JUL	71,280,900		JUL	79,257,000		JUL	78,975,464	
AUG	63,486,400		AUG	71,115,000		AUG	73,377,373	
SEP	56,046,200		SEP	58,087,900		SEP	63,430,096	
OCT	45,750,500		OCT	40,279,000		OCT	43,335,218	
NOV	26,994,600		NOV	24,525,300		NOV	34,140,427	
DEC	22,486,700	Annual total	DEC	20,351,600	Annual total	DEC	22,915,384	Annual total
		506,598,800			562,812,400			571,711,709
2000			**2005**			**2010**		
JAN	22,435,600		JAN	22,087,000		JAN	20,480,000	
FEB	17,697,100		FEB	19,651,300		FEB	18,227,481	
MAR	27,594,300		MAR	23,372,200		MAR	26,616,568	
APR	42,466,200		APR	35,835,000		APR	30,259,735	
MAY	50,997,100		MAY	55,883,000		MAY	49,762,300	
JUN	68,972,500		JUN	66,776,900		JUN	67,493,131	
JUL	78,314,300		JUL	81,345,600		JUL	77,870,812	
AUG	70,252,100		AUG	77,738,000		AUG	72,294,320	
SEP	56,110,500		SEP	60,746,500		SEP	62,687,889	
OCT	38,281,800		OCT	51,763,400		OCT	44,989,877	
NOV	24,758,000		NOV	37,532,500		NOV	25,902,155	
DEC	20,147,000	Annual total	DEC	24,436,600	Annual total	DEC	20,341,152	Annual total
		518,026,500			557,168,000			516,925,420
2001			**2006**			**2011**		
JAN	23,745,500		JAN	22,084,300		JAN	20,659,096	
FEB	11,861,000		FEB	22,534,999		FEB	19,866,916	
MAR	26,837,200		MAR	22,250,000		MAR	21,923,128	
APR	37,614,100		APR	27,680,493		APR	37,927,677	
MAY	62,024,300		MAY	66,035,630		MAY	58,807,697	
JUN	67,066,400		JUN	74,505,216		JUN	60,900,118	
JUL	67,431,700		JUL	83,589,799		JUL	73,553,066	
AUG	64,523,300		AUG	79,031,658		AUG	72,513,219	
SEP	55,984,700		SEP	67,304,321		SEP	63,270,314	
OCT	45,808,700		OCT	49,714,047		OCT	44,507,507	
NOV	25,733,300		NOV	29,078,881		NOV	29,466,646	
DEC	19,915,800	Annual total	DEC	22,709,710	Annual total	DEC	26,573,693	Annual total
		508,546,000			566,519,054			529,969,077
2002			**2007**			**2012**		
JAN	20,560,000		JAN	24,148,876		JAN	26,944,000	
FEB	19,890,000		FEB	22,003,200		FEB	25,845,000	
MAR	25,505,200		MAR	34,590,865		MAR	28,669,000	
APR	39,889,600		APR	43,195,963		APR	33,197,996	
MAY	55,384,400		MAY	65,195,188		MAY	63,015,635	
JUN	68,978,200		JUN	81,304,349		JUN	71,513,424	
JUL	72,927,200		JUL	83,805,237		JUL	83,210,612	
AUG	69,622,500		AUG	78,941,037		AUG	78,870,000	
SEP	59,797,700		SEP	62,435,227		SEP	64,892,342	
OCT	47,973,000		OCT	43735375		OCT	50,192,565	
NOV	26,530,400		NOV	32307724		NOV	29,166,053	
DEC	22,009,000	Annual total	DEC	24558716	Annual total	DEC	20,490,000	Annual total
		529,067,200			596,221,757			576,006,627

2013			**2014**			**2015**		
JAN	22,362,000		JAN	28,425,230		JAN	23,575,390	
FEB	23,932,274		FEB	22,208,017		FEB	21,810,000	
MAR	40,165,523		MAR	28,931,271		MAR	35,376,209	
APR	48,556,372		APR	39,322,502		APR	38,220,791	
MAY	66,989,281		MAY	57,617,573		MAY	41,212,298	
JUN	72,939,783		JUN	66,423,105		JUN	45,374,622	
JUL	78,951,657		JUL	74,623,976		JUL	48,596,686	
AUG	74,623,976		AUG	62,987,015		AUG	49,534,499	
SEP	63,041,235		SEP	52,484,438		SEP	45,875,562	
OCT	53,275,083		OCT	45,681,778		OCT	39,262,045	
NOV	37,844,647		NOV	28,485,893		NOV	21,779,962	
DEC	27,572,355	Annual total	DEC	23,731,764	Annual total	DEC	19,429,861	Annual total
		610,254,186			530,922,562			430,047,925

APPENDIX C

City of Escalon – Domestic Water Supply Permit Amendment (No. 01-10-15PA-002)

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

August 19, 2015

System No. 3910003

Ms. Tammy Alcantor, Interim City Manager
City of Escalon
2060 McHenry Avenue
Escalon, CA 95320

CITY OF ESCALON –DOMESTIC WATER SUPPLY PERMIT AMENDMENT (NO. 01-10-15PA-002)

The State Water Resources Control Board, Division of Drinking Water (Division), is issuing a Permit Amendment (No. 01-10-15PA-002) to the City of Escalon (City) water system. This permit amendment includes an all-inclusive list of permit conditions that supersedes the existing permit (No. 82-034) and all permit amendments issued by the Division.

The purpose of this Permit Amendment, as stated in the Permit Amendment Application dated August 14, 2015, is to re-classify Well No. 01 from an active status to an inactive status due to nitrate levels above the Maximum Contaminant Level. It should be noted that a Permit Amendment will be required if the City wishes to return Well No. 01 to active status.

Please acknowledge in writing by September 30, 2015, receipt of this Permit Amendment and your willingness to comply with the Permit Amendment conditions.

If you have any questions regarding this letter, or the attached Permit Amendment, please feel free to contact Brian Kidwell by phone at (209) 948-3963 or by email at Brian.Kidwell@waterboards.ca.gov.

Sincerely,

Bhupinder S. Sahota, P.E.
District Engineer, Stockton District
NORTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS

Attachments: Permit Amendment No. 01-10-15PA-002

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State Water Resources Control Board
Division of Drinking Water

STATE OF CALIFORNIA

AMENDMENT TO THE

DOMESTIC WATER SUPPLY PERMIT ISSUED TO

City of Escalon

Public Water System No. 3910003

ORIGINAL PERMIT NO. ***82-034*** DATE OF ISSUE: ***07-16-82***

PERMIT AMENDMENT NO. ***01-10-15PA-002*** EFFECTIVE DATE: ***08-21-2015***

WHEREAS:

1. The City of Escalon (hereinafter "City") submitted an application to the State Water Resources Control Board, Division of Drinking Water (Division), dated August 14, 2015 for an amendment to the Domestic Water Supply Permit issued to the City on July 16, 1982.

2. The purpose of the permit amendment, as stated in the application, is to allow the City to make the following modifications to the public water system:

   - Re-classify Well No. 01 from an active status to an inactive status due to nitrate levels above the Maximum Contaminant Level

3. The City has submitted all of the supporting information required to evaluate the application.

4. The Division has evaluated the application and the supporting material and has determined that the proposed modification complies with all applicable State drinking water requirements.

THEREFORE:

The Division hereby approves the application submitted by the City for a permit amendment. The Domestic Water Supply Permit issued to the City-West Point on July 16, 1982, is hereby amended as follows:

- Well No. 01 is re-classified from an active status to an inactive status due to nitrate levels above the Maximum Contaminant Level

This permit amendment is subject to the following conditions:

1. All water supplied by the water system for domestic purposes shall meet all MCLs established by the State Water Resources Control Board, Division of Drinking Water. If the water quality does not comply with the California Drinking Water Standards, treatment shall be provided to meet standards.

   In addition, the City shall comply with all the requirements set forth in the California Safe Drinking Water Act, California Health and Safety Code and any regulations, standards or orders adopted thereunder.

2. The status and primary station codes of the sources permitted for this system are listed below:

Name	Status	Primary Station Code
Well 03A	AR	3910003-010
Well 09	AR	3910003-009
Well 10	AR	3910003-014

AR: Active Raw

No changes, additions, or modifications shall be made to the sources mentioned in Condition No. 2 unless an amended water permit has first been obtained from the Division.

3. Pursuant to State law, a well that is inactive or has not been used for one year is considered to be abandoned, unless the owner demonstrates intention to use the well again. Within 120 days of the issuance of this permit amendment (August 21, 2015), provide the Division with a plan and schedule for rehabilitating Well No. 01 and returning Well No. 01 to active service within one year or destroying Well No. 01 in conformance with the well ordinance of San Joaquin County. A permit must be obtained from the Environmental Health Department of San Joaquin County to assure that the well is properly destroyed.

   In accordance with Section 24400 of the California Health and Safety Code, the well owner shall properly maintain an inactive well as evidence of intention for future use in such a way that the following requirements are met:

a. The well shall not allow impairment of the quality of water within the well and ground water encountered by the well.

b. The top of the well or well casing shall be provided with a cover, that is secured by a lock or by other means to prevent its removal without the use of equipment or tools, to prevent unauthorized access, to prevent a safety hazard to humans and animals, and to prevent illegal disposal of wastes in the well. The cover shall be watertight where the top of the well casing or other surface openings to the well are below ground level, such as in a vault or below known levels of flooding. The cover shall be watertight if the well is inactive for more than five consecutive years. A pump motor, angle drive, or other surface feature of a well, when in compliance with the above provisions, shall suffice as a cover.

c. The well shall be marked so to be easily visible and located; and labeled so as to be easily identified as a well.

d. The area surrounding the well shall be kept clear of brush, debris, and waste materials.

4. The City shall provide disinfection treatment at all the active wells whenever water from these wells is discharged into the distribution system. At each well site the disinfectant shall be metered into the water at a point downstream of the check valve and upstream of the point of discharge into the distribution system.

5. The disinfectant feed rate at each well site shall be adequate to maintain at least a detectable free chlorine residual concentration but less than 4.0 mg/L throughout the distribution system. The free chlorine residual must be monitored at least weekly at the extremities of the distribution system and the records shall be maintained.

6. All wells shall be monitored monthly for coliform contamination to assure that contamination that may occur in the wells will not go undetected. The samples collected for bacteriological examination shall be collected from points at the well sites that represent raw water before the addition of any disinfectant. A monthly wellhead coliform monitoring summary shall continue to be submitted to the Division within 10 days of the end of each month. All positive coliform samples shall be analyzed for *E. coli* contamination and follow-up monitoring shall be performed in accordance with the most recent version of the Division's Groundwater Disinfection and Monitoring Policy.

7. Each year in April, the City must compare the data relevant to the number of connections served by the water system and the amount of water produced for domestic consumption, as reported to the Division in the water system's Annual

Report to the Drinking Water Program, for the past 5 years and observe trends in water demand on the water system. The City must project the trends into the future for the next 4 years and report the historical trend and future projection to the Division by April 30 of each year. In the analysis, include the current capacity of the water system to produce water for domestic consumption. When the analysis indicates that the capacity of the system may be exceeded by projected demand in four years, provide the Division with preliminary plans to respond to the projected capacity shortfall to assure that water shortages will not occur in the future.

8. The City shall conduct routine (quarterly as a minimum) regular external and internal inspections of the reservoir and implement corrective actions as necessary. External inspections shall evaluate effectiveness of any physical site and reservoir security measures and the physical integrity of the vent screens and reservoir appurtenances and the structure itself. Internal inspections shall include visual evaluation of the stored water quality including looking for any signs of debris or oil floating on the surface, and observation of any sediment buildup on the reservoir bottom. Corrective actions may include testing, cleaning, flushing, overflowing, or scheduling of repairs, or bypassing the reservoir completely, so it can be drained for a thorough physical inspection.

9. Based on the number of service connections, 2,468, and the population served, 7,323, the City is required to collect and analyze 2 bacteriological samples per week from within the distribution system.

   According to the signed "Acknowledgment of Type of Triggered Source Monitoring Under the Ground Water Rule", submitted to the Division on September 9, 2009, the City has elected to sample each well in the event of a total coliform positive routine distribution bacteriological sample. The well samples shall be analyzed by a density analytical method that provides enumeration.

   The City must submit its monthly distribution bacteriological summary to the Division for review and approval by the 10th of the following month.

10. All personnel who operate the distribution facilities shall be certified in accordance with Title 22, Section 63770, California Code of Regulations. The City's distribution system is classified as a D2 distribution system. As such, the minimum grade for the Chief Operator is D2 and the minimum grade of the Shift Operator is D1.

11. The City shall comply with Title 17 of the California Code of Regulations, to prevent the water from being contaminated from possible cross-connections. The City shall maintain a program for the protection of the domestic water system against backflow from premises having dual or unsafe water systems in accordance with Title 17.

This amendment shall be appended to and shall be considered to be an integral part of the Domestic Water Supply Permit issued to the City on July 16, 1982.

This permit amendment shall be effective as of the date shown below.

FOR THE STATE WATER RESOURCES CONTROL BOARD, DIVISION OF DRINKING WATER

Bhupinder S. Sahota, P.E.
District Engineer, Stockton District
NORTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS

8/19/2015
Date

Attachments:

Citation 01-10-15C-006
Permit Amendment Application / Citation Response

APPENDIX D

A Citation for Violation of Health and Safety Code Section 116555(a)(1) and California Code of Regulations, Title 22, Section 64431 for Violation of the Nitrate Maximum Contaminant Level

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

July 13, 2015

System No. 3910003

Ms. Tammy Alcantor, Interim City Manager
City of Escalon
2060 McHenry Avenue
Escalon, CA 95320

TRANSMITTAL OF CITATION NO. 01-10-15C-006

The City of Escalon (hereinafter "City") water system (No. 3910003) violated the nitrate maximum contaminant level, as specified in Title 22, Section 64431, of the California Code of Regulations, in June 2015. The State Water Resources Control Board, Division of Drinking Water has issued Citation No. 01-10-15C-006, in response to this violation. The Citation is being transmitted to the City under cover of this letter.

Please respond to the Directives of this Citation by the deadlines established with each item. If you have any questions regarding this Citation, please contact Brian Kidwell by email at Brian.Kidwell@waterboards.ca.gov or by phone at (209) 948-3963.

Sincerely,

Bhupinder S. Sahota, P.E.
District Engineer, Stockton District
NORTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS

Attachments:
Citation No. 01-10-15C-005

Certified Mail No. 7004 2890 0002 0057 9560

CC:
Matt Morgan, Lead Operator

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STATE OF CALIFORNIA

WATER RESOURCES CONTROL BOARD

DIVISION OF DRINKING WATER

TO: City of Escalon
2060 McHenry Avenue
Escalon, CA 95320

Attn: Ms. Tammy Alcantor, Interim City Manager
City of Escalon

CITATION FOR VIOLATION OF CALIFORNIA HEALTH AND SAFTEY CODE SECTION 116555(a)(1) AND CALIFORNIA CODE OF REGULATIONS, TITLE 22, SECTION 64431

VIOLATION OF THE NITRATE MAXIMUM CONTAMINANT LEVEL

WATER SYSTEM NO. 3910003

CITATION NO. 01-10-15C-006

Issued on July 13, 2015

The State Water Resources Control Board (hereinafter "Water Board"), acting by and through its Division of Drinking Water (hereinafter "Division") and the Deputy Director for the Division (hereinafter "Deputy Director"), hereby issues this Citation (hereinafter "Citation") pursuant to Section 116650 of the California Health and Safety Code (hereinafter "CHSC") to the City of Escalon (hereinafter, "City") for violation of California Code of Regulations (CCR), Title 22, Section 64431.

APPLICABLE AUTHORITIES

Section 116650 of California Health and Safety Code provides:

(a) If the Division determines that a public water system is in violation of this chapter or any regulation, permit, standard, citation, or order issued or adopted thereunder, the Division may issue a citation to the public water system. The citation shall be served upon the public water system personally or by certified mail. Service shall be deemed effective as of the date of personal service or the date of receipt of the certified mail. If a person to whom a citation is directed refuses to accept delivery of the certified mail, the date of service shall be deemed to be the date of mailing.

(b) Each citation shall be in writing and shall describe the nature of the violation or violations, including a reference to the statutory provision, standard, order, citation, permit, or regulation alleged to have been violated.

(c) A citation may specify a date for elimination or correction of the condition constituting the violation.

(d) A citation may include the assessment of a penalty as specified in subdivision (e).

(e) The Division may assess a penalty in an amount not to exceed one thousand dollars ($1,000) per day for each day that a violation occurred, and for each day that a violation continues to occur. A separate penalty may be assessed for each violation.

Section 116555(a)(1) of California Health and Safety Code provides, in relevant part:

(a) Any person who owns a public water system shall ensure that the system does all of the following:

(1) Complies with primary and secondary drinking water standards.

California Code of Regulations, Title 22, Section 64431 provides, in relevant part:

Public water systems shall comply with the primary MCLs in table 64431-A as specified in this article.

Table 64431-A
Maximum Contaminant Levels
Inorganic Chemicals

Chemical	*Maximum Contaminant Level, mg/L*
Aluminum	1.
Antimony	0.006
Arsenic	0.010
Asbestos	7 MFL*
Barium	1.
Beryllium	0.004
Cadmium	0.005
Chromium	0.05
Cyanide	0.15
Fluoride	2.0
Hexavalent chromium	0.010
Mercury	0.002
Nickel	0.1
Nitrate (as NO3)	45.
Nitrate+Nitrite (sum as nitrogen)	10.
Nitrite (as nitrogen)	1.
Perchlorate	0.006
Selenium	0.05
Thallium	0.002

* MFL=million fibers per liter; MCL for fibers exceeding 10 um in length.

STATEMENT OF FACTS

The City is operated under Water Supply Permit No. 82-034, which was issued on July 16, 1982.

The City water system is publically owned and operated. The water system is located in San Joaquin County, on California Highway 120, approximately 12 miles east of the City of Manteca. The City's service area is approximately 2.5 square miles in size. The water system is classified as a community water system that serves primarily residential customers living within the City's service area. The water system serves approximately 7,323 people through 2,468 service connections. The system is operated by City personnel.

The City's domestic water supply consists of four wells, Well No. 01, Well No. 03A, Well No. 09, and Well No. 10. Well No. 01 is equipped with a 60-hp deep well turbine pump with an approximate capacity of 600 gpm. Well No. 03A is equipped with a 100-hp deep well turbine pump with an approximate capacity of 1,100 gpm. Well No. 09 is equipped with a 60-hp deep well turbine pump with an approximate capacity of 800 gpm. Well No. 10 is equipped with a 125-hp deep well turbine pump with an approximate capacity of 1,300 gpm. The water from each well is continuously disinfected using calcium hypochlorite.

Well No. 01 has Dibromochloropropane (DBCP) levels which have previously exceeded the Maximum Contaminant Level (MCL). Although the City was never in violation of the DBCP MCL, the City installed DBCP treatment. The groundwater from Well No. 01 passes through two granular activated carbon (GAC) vessels before being disinfected and pumped into the City's 0.5 MG water storage tank. The GAC treatment reduces the DBCP levels to 0.00-0.04 ug/L, which is below the DBCP MCL

of 0.20 ug/L. Typically Well No. 01 is only utilized during the summer months and it is taken offline during the winter months.

During the winter months, when Well No. 01 is offline, the nitrate rises to levels near the MCL. Before the City brings this well online, it is operated and pumped to waste for approximately 2-3 weeks. The City takes numerous nitrate samples during this process to monitor the fluctuating nitrate level. Once the nitrate level has dropped to approximately 25-30 mg/L, the City requests the Division's approval to bring Well No. 01 online.

Since nitrates can be retained in the GAC, nitrate monitoring must be conducted on the combined effluent when the raw water nitrate levels are at or greater than 50 percent of the MCL. Monitoring for nitrate, from the combined effluent, is required one to three hours after start-up, and weekly thereafter.

As noted above, before the City requests the Division's approval to bring Well No. 01 online, the City pumps Well No. 01 to waste and collects numerous raw water nitrate samples. Once the nitrate level drops to approximately 25-30 mg/L the City supplies the Division with this data and requests approval to bring Well No. 01 online. In the past, the City would not submit all the nitrate results leading up to the sample that would be below the Nitrate MCL to the Division. Recently, the City was directed to report all nitrate sampling in accordance with Section 64469 of the CCR.

§64469. Reporting Requirements.

(a) Analytical results of all sample analyses completed in a calendar month shall be reported to the State Board no later than the tenth day of the following month.

(c) Analytical results shall be reported to the State Board electronically using the Electronic Deliverable Format as defined in The Electronic Deliverable Format [EDF] Version 1.2i Guidelines & Restrictions dated April 2001 and Data Dictionary dated April 2001.

Although the City does not anticipate having to use Well No. 01 this summer, the City has been collecting monthly nitrate samples from Well No. 01 and tracking the results. The latest Well No. 01 nitrate results, from June 2015, were 47.8 mg/L, which is above the MCL of 45.0 mg/L. The City elected not to collect a confirmation sample.

It should be noted, that when the samples are being collected from Well No. 01 the water is being pumped to waste and not to the distribution system.

DETERMINATION

The Division has determined, although Well No. 01 is offline, and not currently supplying water to the distribution system, the City failed to comply with Section 116555(a)(1) of the California Health and Safety Code as well as Section 64431 of the California Code of Regulations due to the fact that the City's source water exceeded a primary MCL noted in table 64431-A. Specifically, the latest nitrate results for Well No. 01, 47.8 mg/L, exceeded the nitrate MCL of 45.0 mg/L. Therefore the City is in violation of Section 116555(a)(1) of the California Health and Safety Code and Section 64431 of the California Code of Regulations.

It should be noted, that since the water from Well No. 01, which contains nitrate above the MCL, was not pumped to the distribution system. Therefore, the City was not required to conduct Tier 1 Public Notice.

DIRECTIVES

The City is hereby directed to take the following actions:

1. Nitrate poses an acute health hazard especially to infants and young children at high levels of exposure. Since Well No. 01 has exceeded the nitrate MCL, the Division will not allow the City utilize Well No. 01 without:

   a. The installation of an approved treatment process to remove nitrate from the water.

   Or

   b. Providing the Division with sufficient nitrate monitoring data which shows the nitrate levels in Well No. 01 have dropped well below the MCL.

2. If the City elects not to install nitrate removal treatment, and keep the well as an active source, then the City must take the following actions:

   a. Submit to the Division, for review and approval, a detailed Well No. 01 Corrective Action Plan (CAP) by August 15, 2015. The Well No. 01 CAP shall include at a minimum:

      - Routine nitrate sampling schedule during the winter months.
      - Routine nitrate sampling schedule during the summer months.
      - The plan shall require daily samples, for a week, which show the nitrate level at or below 36 mg/L, before requesting Division approval to utilize Well No. 01.

- The plan shall also note that all requests, to utilize Well No. 01, must be in writing on City letterhead. The three consecutive nitrate samples must also be attached to the request.
- The plan must also note that Well No. 01 may not be pumped to the distribution system without written Division approval.
- The Well No. 01 CAP must be initiated if Well No. 01 is offline for more than 24 hours.

b. Before the well can be brought back online, the City must install an online nitrate analyzer at Well No. 01, downstream of the GAC treatment.

c. The online nitrate analyzer must be in working condition during times the well is in operation.

d. The nitrate analyzer shall be programmed to sound an alarm, via the SCADA System, if the nitrate level reaches 36 mg/L. The SCADA System shall be programmed to shut the well down if the nitrate level reaches 40 mg/L.

e. The nitrate analyzer shall be calibrated/maintained per the manufacturer's recommendation.

f. The well shutdown feature shall be tested before putting the well online and then at least once per week. The records shall be maintained and provided to the Division on a monthly basis.

g. When the well first starts pumping to the system, the well shall be tested daily, for a week, for nitrate and samples shall be analyzed by a State certified laboratory. When a sample is collected for laboratory analysis, the reading on the nitrate analyzer shall also be noted and later compared to the laboratory result when available.

h. If the well nitrate results stay below 36 mg/L during the daily testing, for one week, then the frequency can be reduced to once per week.

i. Every time the well is offline for more than a 6-hour period, conditions g and h, listed above, will apply.

j. Every effort shall be made to keep the well online 24 hours per day.

The Division reserves the right to make such modifications to this Citation as it may deem necessary to protect public health and safety. Such modifications may be issued as amendments to this Citation, and shall be deemed effective upon issuance.

Nothing in this Citation relieves the City of its obligation to meet the requirements of the California Safe Drinking Water Act, or of any regulation, permit, standard, or order issued or adopted thereunder.

All submittals required by this Citation shall be submitted to the Division at the following address:

Brian Kidwell, P.E.
Associate Sanitary Engineer
State Water Resources Control Board, Division of Drinking Water
31 E. Channel Street, Room 270
Stockton, CA 9202

PARTIES BOUND

This Citation shall apply to and be binding upon the City, its officers, directors, shareholders, agents, employees, contractors, successors, and assignees.

SEVERABILITY

The Directives of this Citation are severable, and the City shall comply with each and every provision thereof, notwithstanding the effectiveness of any other provision.

FURTHER ENFORCEMENT ACTION

The California SDWA authorizes the Board to: issue citation with assessment of administrative penalties to a public water system for violation or continued violation of the requirements of the California SDWA or any permit, regulation, permit or order issued or adopted thereunder including, but not limited to, failure to correct a violation identified in a citation or compliance order. The California SDWA also authorizes the Board to take action to suspend or revoke a permit that has been issued to a public water system if the system has violated applicable law or regulations or has failed to comply with an order of the Board; and to petition the superior court to take various enforcement measures against a public water system that has failed to comply with violates an order of the Board. The Board does not waive any further enforcement action by issuance of this citation.

July 13, 2015
Date

Bhupinder S. Sahota, P.E.
District Engineer, Stockton District
Division of Drinking Water
State Water Resources Control Board

Certified Mail No. 7004 2890 0002 0057 9560

CC:

Matt Morgan, Lead Operator

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CITY OF ESCALON

August 13, 2015

Brian Kidwell, P.E.
Associate Sanitary Engineer
State Water Resources Control Board, Division of Drinking Water
31 E. Channel St. Room 270
Stockton, CA 95202

SUBJECT: PERMIT AMENDMENT TO CHANGE WELL #1 OPERATING STATUS IN RESPONSE TO CITATION No.01-10-15C-005

Dear Brian,

The City of Escalon in response to citation No.01-10-15C-005 has submitted a permit amendment to change the status of Well 1 3910003-001 to inactive. The status change will prevent any further violations and would allow the city time to design and fund the required changes at Well 1 as set forth in the citation.

Sincerely,

Tammy Alcantor

Tammy Alcantor
City Manager/Finance Director

Cc: MM

STATE OF CALIFORNIA

State Water Resources Control Board
Division of Drinking Water

APPLICATION FOR

DOMESTIC WATER SUPPLY PERMIT AMENDMENT

Applicant: City of Escalon

(Enter the name of legal owner, person(s) or organization)

Address: 2060 Mc Henry Ave. Escalon, CA. 95320

System Name: City of Escalon

System Number: 3910003

TO: State Water Resources Control Board
Division of Drinking Water
31 E. Channel Street, Room 270
Stockton, California, 95202

Pursuant and subject to the requirements of the California Health and Safety Code, Division 104, Part 12, Chapter 4 (California Safe Drinking Water Act), Article 7, Section 116550, relating to changes requiring an amended permit, application is hereby made to amend an existing water supply permit to Change the status of Well 1 (3910003-001) from Active to Inactive due to nitrate levels that exceed the MCL .

(Applicant must state specifically what is being applied for e.g. use a new well, storage tank, and change or modify treatment)

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AUG 14 2015
DRINKING WATER FIELD OPERATIONS
BRANCH - STOCKTON

I (We) declare under penalty of perjury that the statements on this application and on the accompanying attachments are correct to my (our) knowledge and that I (we) are acting under authority and direction of the responsible legal entity under whose name this application is made.

Signed By:

Name (Print or Type): Matthew Morgan

Title: Chief Water System Operator

Address: 2060 Mc Henry Ave Escalon, CA. 95320

Telephone: 209-691-7470

(Place official seal above)

Dated: 08/17/2015