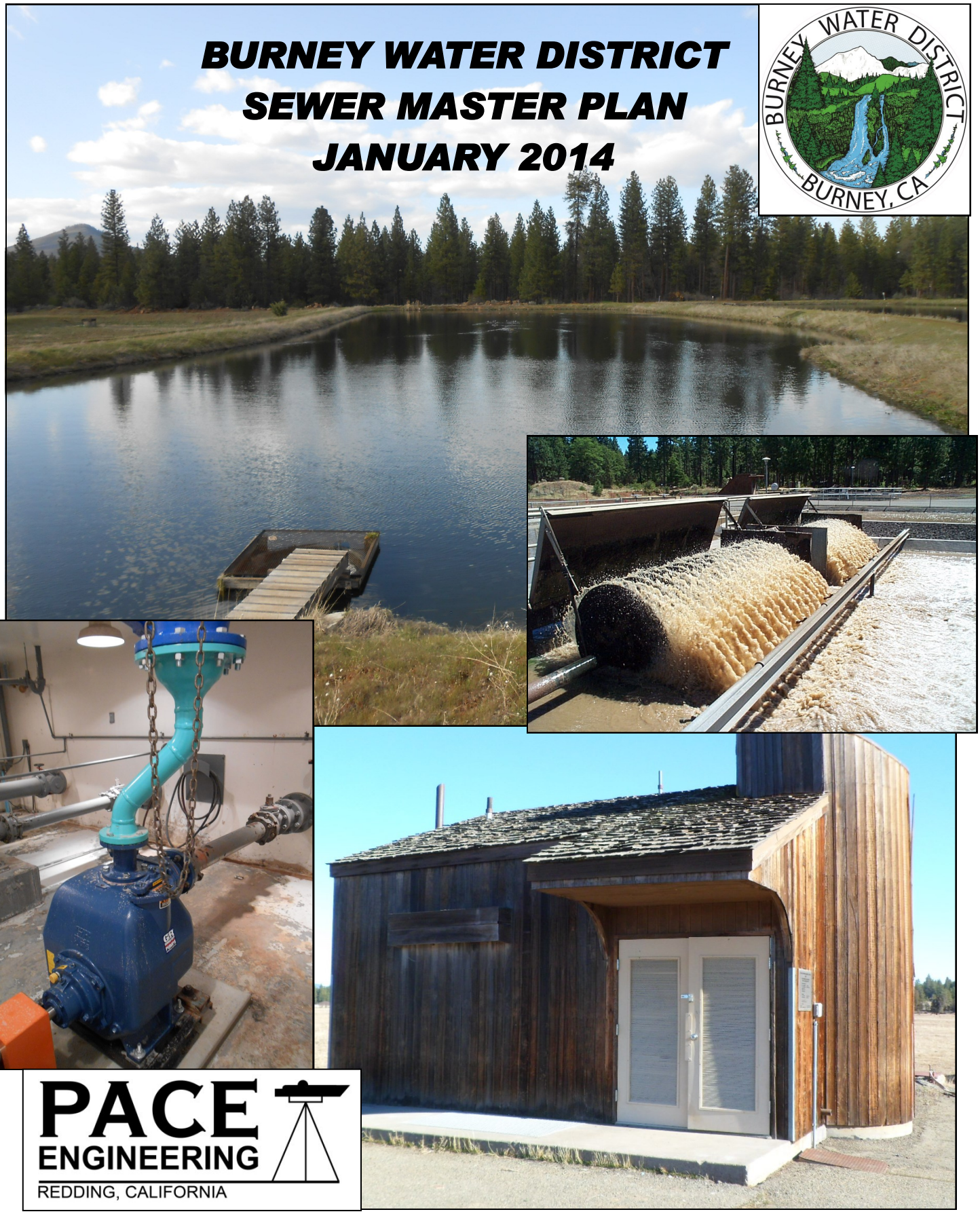
BURNEY WATER DISTRICT
SEWER MASTER PLAN
JANUARY 2014



PACE ENGINEERING
REDDING, CALIFORNIA

PACE ENGINEERING

January 30, 2014

306.24.100

Willie Rodriguez
Burney Water District
20222 Hudson Street
Burney, CA 96013

We are pleased to present our engineering report entitled:

BURNEY WATER DISTRICT
SEWER MASTER PLAN

This report contains the results of our investigation of the District's sewer system, including the collection system, lift stations, and wastewater treatment facilities. The report includes preliminary plans and cost estimates for major capital improvements recommended over the next 60 years. Emphasis has been placed on planning and staging of improvements necessary to correct existing deficiencies and be prepared for growth, should it occur. An executive summary of the report, including our recommendations, follows the Table of Contents.

PACE Engineering is very pleased to have participated in this project. We thank your staff for their able assistance in its preparation. We will be happy to meet with you at your convenience to discuss the Sewer Master Plan in detail.

Sincerely,

Laurie McCollum
Staff Engineer

REGISTERED PROFESSIONAL ENGINEER
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BURNEY WATER DISTRICT

SEWER MASTER PLAN

JOB NO. 306.24.100

BY:

PACE ENGINEERING
REDDING, CALIFORNIA

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ABBREVIATIONS

Certain terms and abbreviations have been used in this report for convenience. Definitions are as follows:

AD	As Developed
ADWF	Average Dry Weather Flow (The average rate of wastewater flow during summer months.)
AWWA	American Water Works Association
BWD	Burney Water District
CCTV	Closed Circuit Television
CF	Cubic Feet
CIP	Capital Improvement Plan
CRWQCB	California Regional Water Quality Control Board
CY	Cubic Yards
District	Burney Water District
EPA	Environmental Protection Agency
ENR CCI	Engineering News Record Construction Cost Index
GPAD	Gallons per Acre per Day
GPD	Gallons per Day
GPM	Gallons per Minute
HDPE	High Density Polyethylene
HE	Household Equivalent
HP	Horsepower
HVAC	Heating, Ventilation, and Air Conditioning
I&I	Infiltration and Inflow
kW	Kilowatt
LAFCO	Local Area Formation Commission Office
LS	Lift Station
MG	Million Gallons
MGD	Million Gallons per Day
MLSS	Mixed Liquor Suspended Solids

ABBREVIATIONS Cont.

O&M	Operations and Maintenance
PSI	Pounds per Square Inch
PWWF	Peak Wet Weather Flow
PVC	Polyvinyl Chloride
RAS	Return Activated Sludge
SCADA	Supervisory Control and Data Acquisition
SF	Square Feet
SMP	Sewer Master Plan
SOI	Sphere of Influence
TDH	Total Dynamic Head
TTLC	Total Threshold Limit Concentration
WAS	Waste Activated Sludge
WDRs	Waste Discharge Requirements
WWTP	Wastewater Treatment Plant
UV	Ultraviolet
VCP	Vitrified Clay Pipe

EXECUTIVE SUMMARY

SUMMARY

Development of this Master Plan consisted of an engineering analysis of the Burney Water District (District or BWD) wastewater trunk system, lift stations, and wastewater treatment plant (WWTP), and what effects current and future wastewater flow conditions have on each of these components. The wastewater collection system was analyzed using the Innovyze® H_2OMAP Sewer computer program for wastewater flow determination and pipeline sizing. Analysis of the sewer system and WWTP was accomplished with the assistance and review of District staff.

As shown on the Plates (located at the back of this report), the District service area boundary consists of approximately 2,420 acres (3.8 square miles). The District sphere of influence (SOI) includes areas outside the District boundary, such as Johnson Park, and is approximately 4,770 acres (7.4 square miles).

Wastewater Collection System: The existing District wastewater collection system is shown on Plate 1. In 2012, it consisted of about 100,000 feet of 6-inch to 10-inch collector sewer mains, and about 15,000 feet of 12-inch to 15-inch interceptor sewers.

Construction of the District wastewater system was completed in 1974; therefore, portions of the existing District sewers are nearly 40 years old and consist of clay pipe with cement mortar joints. The District has a low peak wet weather flow (PWWF) to average dry weather flow (ADWF) ratio of 2.4 compared to similar communities, reflecting either a fairly tight system or high soil percolation rates.

The collection system in general appears to have adequate capacity for existing conditions and projected flows, with a couple of exceptions. One sewer segment within the existing collection system currently shows some signs of surcharging during peak rain events and requires further consideration for corrective action in order to increase

sewer capacity (i.e., Park Avenue Sewer). Another sewer shows a potential for blockage and possible overflow due to apparent deficiencies in sewer grade and construction (i.e., Bartel Street Sewer).

Sewage Lift Stations: There are presently two sewage lift stations (LS) in the District: Bartel and Main. The Bartel LS is a wet well LS with an effective capacity of 250 gallons per minute (GPM) (0.36 MGD). The Main LS is a dry pit LS, which pumps all District wastewater to the WWTP. Effective capacity of this lift station is approximately 1,325 GPM (1.9 MGD).

Photo 1: Main Lift Station

Wastewater Treatment Plant: The Burney WWTP has an existing design ADWF capacity of approximately 0.44 million gallons per day (MGD), and a PWWF capacity of 1.02 MGD as indicated in the original Water Pollution Control Facilities Plans and Operations and Maintenance (O&M) Manual. The 2012 ADWF was estimated to be about 0.3 MGD, which is about 68% of the current plant capacity. PWWF at the WWTP was recorded at 0.72 MGD in November 2012, or 71% of the peak design capacity. However, accurate flow measurement is currently questionable; therefore, these flows should be confirmed when an accurate flow meter is verified. The WWTP has the capability to be increased to an ADWF of 0.63 MGD by modifying and expanding existing treatment processes in order to meet projected future flows.

FUTURE WASTEWATER FLOWS

A household equivalent (HE) is defined as the average dry weather wastewater flow generated from a single-family dwelling. Utilizing the average winter water consumption, along with an assumed 10% vacancy rate in the District, results in an HE of approximately 220 gallons of wastewater per day. The current number of District HEs is estimated to be approximately 1,538. Given the current trend in active water services over the last ten years, growth and population is likely to remain relatively static into the foreseeable future. As such, the District is more in an O&M mode rather than one of system expansion to accommodate new development. A Developer Fee Justification Study was completed by SchoolWorks for the Fall River Joint Unified School District in February 2012. This study projected five new residential units to be constructed per year, which would result in an approximate growth rate of only 0.2% per year. At an annual growth rate of 0.2%, the current 0.44 MGD ADWF capacity of the WWTP would not be met for more than 100 years into the future. Development of the Pit River Casino complex and/or commercial land, formerly Fruit Growers east of town along Highway 299, would certainly accelerate the need for sewer collection and treatment improvements prior to this time.

That having been said, there are a few proposed developments, i.e., Timber Ridge Subdivision, Phase 2, etc., which have tentative maps and/or preliminary plans already completed. These developments were utilized in this Master Plan as examples of where potential development might occur in the next 60 years. Full build-out of these developments would result in an approximate growth rate of 1% per year for the next 60 years, totaling a possible 1,317 HEs being added to the system. It should be emphasized this is simply an example of what could occur. Thus, if the actual rate of development is slower or faster, improvements shown herein should be proportionately shifted in time. It must be noted that although this anticipated growth rate could vary considerably in the future, if this growth were to occur, the WWTP would have an ADWF of 0.63 MGD, which would exceed the current ADWF capacity of 0.44 MGD.

Since the District intends to update this Master Plan within 10 years, and full build-out of proposed developments is not likely to occur in this time, making future flow predictions for ultimate development was beyond the scope of this Master Plan. Additionally, the following elements were not included in this Master Plan for reasons discussed herein:

- Initial Infiltration and Inflow (I&I) monitoring
- Costs for a comprehensive I&I reduction program
- Verification of how to serve future developments
- Ultimate PWWF hydraulic model

Existing and future I&I allowances were calculated from analysis of historical system ADWF and WWTP PWWF records. Although every effort has been made to assign reasonable I&I allowance values within the wastewater system, flow monitoring could not be completed due to an extremely dry winter prior to completion of this Master Plan (i.e., winters of 2012 and 2013). **It is imperative the District continue its flow-monitoring program in order to confirm the estimated I&I allowances assumed herein are valid.**

ANALYSIS AND RECOMMENDED IMPROVEMENTS

After reviewing existing wastewater system deficiencies under current conditions, the wastewater collection system was analyzed under future 2072 conditions assuming a 1% annual growth rate. The primary improvements defined by this analysis are as follows:

1. Complete I&I flow monitoring. Depending upon results, develop a comprehensive ongoing multi-stage I&I reduction program as needed. Upon completion of initial I&I flow monitoring, starting with identification of an initial I&I target area, the I&I reduction program should aggressively pursue reduction of high I&I if/when it is identified during monitoring. The first stage of the program would involve investigation and identification of I&I sources. The second stage would involve rehabilitation and repair. A flow-monitoring program should be continued in subsequent years in order to provide reliable data for verification of estimated flows, as well as provide flow information needed for evaluating the ongoing I&I reduction program.

2. Parallel or replace existing sewers in order to relieve current or impending surcharging and possible blockages; and to provide sufficient sewer capacity for projected future conditions. In some areas where sewers are in poor condition, it may be necessary to replace existing sections of sewer instead of adding a parallel relief sewer.

3. Rehabilitate elements of the existing lift stations that are inefficient and are considered to have operational deficiencies. Upsize pumps at the Main LS which have met their useful service life to meet anticipated future PWWF.

4. Rehabilitate processes at the WWTP that are inefficient and are considered to have operational deficiencies. Increase capacity of the WWTP in the next 60 years from an ADWF of 0.44 MGD to 0.63 MGD with addition of another secondary clarifier.

<u>Infiltration and Inflow Control</u>: This Master Plan assumes future I&I flow monitoring will be completed, and I&I reductions will be made as needed depending on flow monitoring results. I&I contribution projections developed for this Master Plan are based on questionable historical flow records. Therefore, in order to pursue accurate I&I reduction, a phased comprehensive I&I Reduction Program should be implemented.

Phase 1 of this reduction program should begin with accurate and reliable flow monitoring at the Main LS followed by identification of high I&I target areas. This would include an investigative stage that involves video inspection of sewer mains and laterals, manhole inspection and inventory, and analysis of collected data. The following repair and rehabilitation stage would attempt to correct collection system defects (identified in Phase 1) that are allowing I&I into the system. The repair and rehabilitation stage would involve such things as grout sealing, lining, and replacement of leaking sewers, laterals, and manhole repair or replacement. Upon completion of initial I&I monitoring, an estimated cost for addressing I&I in the target area should be determined, along with identification of the potential associated I&I reduction that is expected to occur.

Sewer System Improvements: Analysis of the existing sewer trunk system has indicated that, overall, the system has adequate capacity for the next 10 years given that verification of I&I flows is completed (see I&I Reduction Program above). However, analysis indicates that some existing 8-inch sewer segments along Bartel Street are at capacity during PWWF conditions, and these sewers may also have half the grade needed for proper solids transport. It is recommended the District perform further investigations of these sewers. If it can be determined a specific sewer reach is significantly flatter than current design criteria, it should be replaced as time permits in order to reduce the potential of blockage and overflow. Other immediately recommended improvements include a new portable generator and manual transfer switch at Bartel LS and a fall prevention system and new magnetic flow meter if accuracy of current metering cannot be verified at the Main LS.

Over the next 60 years, the District should consider constructing relief sewers at locations shown on Plate 2 as bold red lines between circled numbered points in order to eliminate potential bottlenecks to future development. In addition, it is estimated the capacity of the Main LS will need to be expanded as anticipated growth occurs, and bypass piping is recommended to be added. Two of the three existing pumps at the Main LS have met their useful service life and are recommended to be replaced at

sizes and times adequate to accommodate future development and ensure service reliability.

Potential "As Developed" (AD) trunk sewers are also shown on Plate 2 for currently undeveloped areas. These AD sewers are not included in the general sewer improvement category because they would normally be constructed as development occurs. It should be noted the size and location of these improvements are very nebulous at this point. In these cases, the full extent of future development and how it will be served is not well known. Additional studies needed to verify how to serve each of these developments are beyond the scope of this Master Plan. Therefore, improvements and details must be further looked at and re-evaluated when development is proposed.

Wastewater Treatment Plant: Wastewater Treatment Plant Design criteria shown in Table 2 outlines the process units and loading under the original 1975 design, 1985 design, existing 2012 flow conditions, and future 2072 flows. Future 2072 design criteria was determined to meet anticipated 60-year PWWF conditions assuming a 1% growth rate and a future development I&I rate of 1,000 GPAD. Major components of the improvements are shown on Figure 2.

In order to correct current WWTP deficiencies, several improvements are immediately recommended including the following:

- Dredge the sludge lagoon and inspecting the HDPE liner;
- Install an influent screening unit at the WWTP headworks;
- Install an additional 15 Hp floating aerator in the oxidation ditch;
- Replace the RAS/WAS pump;
- Install a fall prevention system and freeze protection in the RAS vault;
- Clean and plow oxidation ponds;

- Install handrails and walkways at oxidation pond flow control structures;
- Purchase a vacuum truck for cleaning of the Main LS; and
- Upgrade the SCADA system.

Photo 2: WWTP Sludge Lagoon

Additional improvements are recommended in subsequent years to improve efficiency of existing processes, as well as to expand capacity to keep pace with anticipated growth.

Master Plan Key Elements and Costs: The total cost for all sewer system general improvements (i.e., upgrading existing collection system and lift stations, and WWTP improvements) is approximately $12,348,000 of which about $3,133,000 is needed in the next 10 years. The Master Plan of Improvements needed to correct existing sewer system deficiencies and to provide anticipated future capacity for 60-year development is shown on Plate 2 at the end of this report. A summary of costs and recommended staging of sewer system and WWTP improvements is shown in Table 7.

Table 7 and Plate 2 are in essence the Sewer Master Plan. The sewer improvements shown in this Master Plan and their proposed construction periods are based on the computer model developed for the trunk sewer system and observed sewer deficiencies. As indicated hereinbefore, I&I rates used in this model are based on historical flow records, the accuracy of which is questionable, rather than flow-monitoring information. Consequently, it is recommended the District continue to pursue wet weather I&I monitoring before major expenditures are made on sewer capacity increases. The future improvement design process should include additional wet weather studies to confirm upstream I&I rates. In general, no sewer suspected of being inadequately sized

should be replaced or paralleled with a new relief sewer until it is either demonstrated that overflows or lateral flooding is imminent under wet weather conditions, or the sewer is shown to be poorly constructed and there is potential for sewer blockage. Since the computer model only flags trunk sewers that are inadequately sized by normal standards with moderate surcharge taken into account, it is quite possible that some of the proposed sewer construction can be postponed by allowing greater surcharges to occur. Such sewers require more constant monitoring during wet weather periods. Also, it is possible that confirming flow measurements during very wet weather periods will show some of the sewers flagged for construction to be unnecessary, i.e., if I&I rates are actually lower than assumed or can be reduced by rehabilitation or replacement of existing sewers. Potential postponement of some relief sewer construction and elimination of others will likely be offset by other unforeseen replacement projects; therefore, construction costs in the long-term will likely be similar to the expenditure forecast.

Estimates of Costs: A detailed cost breakdown of the immediate, near term, intermediate, and long-term improvement costs is shown in Table 7 at the end of this report. As the District grows, additional improvements involving sewage collection, treatment, and disposal will be required to meet future development system demands.

Projected improvement costs for the Master Plan are as follows:

Time Period	General Collection System Improvements	WWTP Improvements	Total
2012 - 2022 Immediate Term	$1,233,000	$1,900,000	$3,133,000
2022 - 2032 Near Term	$1,160,000	$2,233,000	$3,393,000
2032 - 2052 Intermediate Term	$2,516,000	$420,000	$2,936,000
2052 - 2072 Long-Term	$2,131,000	$754,000	$2,886,000
TOTAL	**$7,040,000**	**$5,307,000**	**$12,348,000**

Costs include a 45% adder for construction contingencies and indirect costs, and include budgeting $50,000 per year for the next 60 years for the District to replace the

worst of the aging sewer mains. Figures are based on January 2014 dollars and do not include any allowance for inflation or financing costs.

The conceptual location and size of new trunk sewers needed to serve future developments are also shown on Plate 2, although they are not listed in Table 7 as general improvements. The District may want to consider contributing to the cost of oversizing sewers in new developments where such sewers are necessary for service to an area larger than or located beyond the proposed development. This policy could lead to an orderly expansion of the sewer system in the future.

Financial Considerations**:** Currently, the District has a capacity charge of $6,130.60 per household equivalent (HE) – See Appendix F. The capacity charge for customers is based upon the size of service requested by the customer and approved by the District. As a part of this plan, a determination was made of an appropriate capacity charge based on actual and future costs for general improvements. The computed fee is $7,782. It is also recommended this fee be adjusted annually by the increase in the Engineering News Record Construction Cost Index (ENR CCI), which currently stands at 9,664 for January 2014.

The District evaluated the monthly service charge, including base and commodity components, as part of the 2009 fee increase – See Appendix F. PACE has prepared rate studies for a number of agencies including Yreka, Shasta Lake, and Rio Alto Water District. Each agency is unique in how the budget is categorized. PACE recommends that budgets should include an operation and maintenance reserve component ranging from 10 to 25% depending on numerous other financial considerations including savings, debt service, and condition of facilities. Taking those elements into consideration, PACE recommends the District include a reserve component of at least 10%. Funds collected should be set aside to accumulate in a separate account to be used on extraordinary operations and maintenance of the existing facilities.

It is recommended the District review this Master Plan report carefully, and, if in agreement, it be adopted as the Burney Water District Sewer Master Plan, with any corrections or supplements as may be applicable.

INTRODUCTION

HISTORY

The unincorporated town of Burney is located approximately 50 miles east of Redding in Shasta County, California. See Figure 1. The District provides water and sewer services, and owns the community pool and parks in the town of Burney. The District service area boundary encompasses approximately 2,420 acres (3.8 square miles). The District sphere of influence includes areas outside the District boundary such as Johnson Park, and is approximately 4,770 acres (7.4 square miles).

Burney is located in a rural setting and is surrounded by forest and agricultural land. The Shasta County General Plan indicates a broad range of land use designations in the District boundary. As such, there is diverse development within the permitted land uses. Principal economic activities in the area consist of forest products, the cogeneration of electric power, agriculture, and tourism. Highway 299 east bisects the town and is lined with typical retail and commercial uses. Lumber mills and light industrial development occur on the outskirts of town. Residential development at urban and suburban densities is spread throughout the service area.

The District was originally formed as Burney County Water District in 1944, to first provide water service and later wastewater collection and treatment. Construction of the wastewater collection and treatment system was completed in 1974. The Burney WWTP was originally designed for an initial population of 3,000. Original design criteria projected a population of 4,400 for the District by 1985, which equates to a 3.9% growth rate. However, the U.S. Census indicated a population of just 4,212 in 2010 for the Burney zip code, which includes nearby Johnson Park.

Photo 3: WWTP Oxidation Pond

Original 1985 design criteria estimated a WWTP ADWF of 0.44 MGD, which equates to 305 GPM and 100 GPD per person. The 1985 design PWWF was estimated at 1.02 MGD, which equates to 708 GPM, and an estimated PWWF:ADWF ratio of 1.02/0.44 = 2.3. Winter water consumption records for January 2012 resulted in an approximate ADWF of 0.3 MGD (208 GPM). The WWTP chart recorder reflected a PWWF greater than 0.72 MGD in November 2012. The recorded PWWF:ADWF ratio of 0.72/0.3 = 2.4 is low compared to similar communities where PWWF:ADWF ratios typically range from 3 to 6. Sewer systems constructed of vitrified clay pipe (VCP) with 4-foot joint intervals would be expected to have a substantially higher I&I rate. Possible reasons for the lower I&I rate could be that the sewer system is in great condition, or the soils have high percolation rates. Unfortunately, due to a historically inaccurate flow meter at the Main Lift Station and no effluent flow meter at the WWTP, there are limited WWTP flow records available, in particular during peak hour flows.

In December 2011, the District had 1,367 service customers. Assuming 2.3 capita per residential customer equates to 2,770 people served. This number served, together with a 100 GPD/capita, results in a textbook estimated ADWF of 0.28 MGD.

PREVIOUS STUDIES

Some key previous studies referenced in this Sewer Master Plan (SMP) include:

- Master Water Plan for the Burney County Water District, Camp Dresser & McKee, Inc., November 1978.
- Evaluation of Wastewater Treatment Plant Capacity for the Burney County Water District, Marvin R. Lindorf, Walnut Creek, California, September 1980.
- Sphere of Influence Report for the Burney Water District, Shasta LAFCO, October 1984.
- Groundwater Resource Evaluation of the Burney Basin for Burney County Water District, CH2M Hill, October 1988.
- Main Sewage Pump Station Upgrade Project Preliminary Engineering Report for Burney Water District, PACE Engineering, December 2011.

NEED AND SCOPE OF CURRENT STUDY

The District wastewater collection system has been expanded significantly since 1974, which has impacted capacity of sewer mains, lift stations, and the WWTP. Major portions of the treatment system were constructed circa 1974, and have been in service for nearly 40 years. Mechanical equipment such as pumps typically have a service life of 15 to 20 years, so much of the existing WWTP equipment is beyond its useful service life or has already been replaced. An original SMP is not known to exist for the District, and there is potential for increased future demand. Therefore, the District desired to develop a comprehensive SMP.

In 2012, the District authorized PACE Engineering to work jointly with District staff to prepare an SMP. The emphasis of this planning effort was to review and analyze the existing wastewater collection system, and develop a computer model that could be used to determine the need for future improvements. Projection of future peak wet weather wastewater flows was made, and a master plan of improvements was

developed to meet sewage collection, treatment, and disposal needs at current and future flows. Burney is experiencing its own economic downturn with proposed subdivisions put on hold or eliminated completely, and a static if not declining number of sewer connections. Improvements needed to accommodate growth are expected to be minimal in the upcoming years. As such, many improvements recommended herein are needed to correct existing system deficiencies.

This study, referred to as the *Burney Water District Sewer Master Plan*, relies in large part on previous studies completed and information provided by District staff. Much of the records search, sewer trunk lines inventory and review, and data gathering was provided by District staff so we are indebted to their service in making this a useful SMP. Data gathered and evaluated included the following:

- Determination of historical and future wastewater flows.
- Development of a collection system computer model.
- Evaluation of the existing collection, treatment, and disposal system.
- Development of a staged 10 to 60-year plan of improvements.
- Estimation of the current cost of proposed improvements.

SEWER SYSTEM REVIEW

A plan of the District's existing wastewater system is shown on Plate 1. For the purpose of this report, the potential sewer service area was divided into 13 subareas as shown on Plate 1. Tables, figures, and plates are located at the end of the text.

WASTEWATER COLLECTION SYSTEM

Construction of the District wastewater system was completed in 1974 after increasing concern over the contamination of groundwater by infiltration of effluent from septic tank leach fields. The initial collection system was constructed primarily of VCP, and those constructed since the 1980s have generally been of PVC pipe with rubber ring joints. Provided VCP and PVC sewers are properly installed and tested prior to final acceptance, they can result in relatively low infiltration values. As discussed in the previous chapter, the District has a low PWWF:ADWF ratio of 2.4 compared to similar communities, reflecting either a fairly tight system or high soil percolation rates.

In 2012, the District wastewater system consisted of about 100,000 feet of collection sewers and 15,000 feet of 12-inch to 15-inch main interceptor sewers. Collection sewers are generally 4 to 10 inches in diameter. Main branches of the collection system, typically called trunk or interceptor sewers, convey wastewater to the treatment facility and are generally 12 inches or larger.

Since development of the original 1974 system, there have been several expansions of the sewage collection system, primarily due to new development. For example, in 2000, the Bartel Lift Station (LS) was updated to serve existing and future developments east of Bartel Street along Sapphire Road. In addition, the area south of Cypress Avenue and east of Hudson Street was developed to add approximately 7,000 feet of collector sewers to the system.

SEWAGE LIFT STATIONS

The Town of Burney is located in the Burney Valley, surrounded by several mountains. District topography generally slopes from the southwest to the northeast, with the WWTP located in the northeasterly quadrant of the service area as shown on Plate 1. As a result, most of the raw sewage flows via gravity throughout the collection system. The Bartel LS diverts wastewater flow from one drainage area to another, on its way to the Main LS, prior to being pumped to the WWTP. Details of the District's lift stations are shown in Table 1, with their locations shown on Plate 1. The existing lift stations were evaluated by District staff and PACE in April 2013.

Photo 4: Bartel Lift Station

Bartel Lift Station was originally constructed in 1978, but was updated circa 2000. It consists of a 5-foot diameter wet well with a 5-foot diameter valve manhole. Two rail-mounted submersible 20 Hp, 1,750 RPM pumps with an effective capacity of 250 GPM (0.36 MGD) are located in the wet well. This lift station currently serves approximately 48 HEs in and around the Bartel Street area. Raw wastewater enters the station through an 8-inch collector pipe and is discharged via a 6-inch force main.

This lift station is provided with high and low wet well level alarms and pump failure alarms that send a radio signal to the operator on-call. However, there is no manual transfer switch or portable generator for this lift station in the event of a power failure. The District has had constant control issues after power outages when pumps stay on and pump the wet well dry. Otherwise, the lift station is reportedly in good operating condition.

Main Lift Station was constructed circa 1974, and is a dry pit pump station that pumps all District wastewater to the WWTP. This lift station contains the first three unit processes of the treatment system; wastewater metering, comminution, and influent pumping to the WWTP. Raw wastewater enters the station through a 15-inch interceptor pipe. Wastewater passes through a 9-inch Parshall flume in combination with an Echomax XPS transducer and HydroRanger 200 ultrasonic level controller, which replaced the original bubbler flow monitor for pump variable speed control. When operating correctly, this records influent flows via a totalizer-indicator-recorder signal.

After passing through the Parshall flume, wastewater enters a Worthington Model 15 C-5 submersible muffin monster. The muffin monster is original to the lift station, although the cutting blades have been replaced, and consists of a ¾ Hp electrical drive unit and a semi-circular 5/16-inch slotted screen with cutting blades.

From the muffin monster, wastewater flows to a wet well from which three pumps lift the raw wastewater through an 8-inch force main to the WWTP. The original station included two Allis-Chalmers Model 150 non-clog, horizontal, centrifugal pumps with 50 Hp variable speed motors. These pumps had a duty point of 1,000 GPM at 115 feet of total dynamic head (TDH), and 73% efficiency when operating at full speed. A third pump, Marlow horizontal, 300 GPM at 55 feet TDH, with variable speed 20 Hp motor and 46% efficiency was added circa 1983. This pump was added to operate at average to low flows, rather than using the large pumps at reduced speeds. Most recently a Gorman Rupp 20 Hp

Photo 5: New Gorman Rupp Pump

self-priming centrifugal pump replaced one of the original 50 Hp pumps. The current effective capacity (largest pump out of service) of the pumping facility is approximately 1,325 GPM (1.9 MGD).

The Main Lift Station is provided with high and low wet well level alarms and pump failure alarms connected via wire to WWTP SCADA. The alarm signal is sent by radio to the Master SCADA at the District office, which activates a RACO alarm dialer to signal the operator on-call. Furthermore, a Caterpillar Model 150 kW diesel engine generator is located on the ground floor of the pump station on standby to automatically provide full power to all electrical equipment should a power failure occur.

A field investigation of this facility noted the following:

- With the exception of the new Gorman Rupp pump, the existing pumps are more than 30 years old and have met their useful service lives.
- The existing muffin monster is as originally designed and does a poor job of cutting up long stringy waste, which eventually recombines downstream to clog pumps and hang up on treatment processes at the WWTP. Additionally, there is limited effective screening that occurs.
- There is no bypass pumping capability.
- Excessive oil and grease buildup is present in the wet well portion of the pump station, although it is being controlled by weekly spray and pump down maintenance.
- A modern fall prevention system is not in place at the hatch access at ground level.

WASTEWATER TREATMENT PLANT

Photo 6: Static Screen

The District's original extended aeration system was constructed in 1974. The system included an oxidation ditch, secondary clarifier, oxidation ponds, chlorine contact chamber, and sludge drying beds. California Regional Water Quality Control Board (CRWQCB) Waste Discharge Requirements (WDRs) Order No. 94-017 for the WWTP indicates a current maximum permitted ADWF of 0.44 MGD to unlined or partially lined stabilization ponds. Refer to Appendix A for the WDRs.

Headworks: Wastewater is currently pumped from the Main LS, which acts as the treatment headworks, through a 3,245-foot long, 8-inch cast iron force main to a static screen and distribution box. The hydrosive static screen is scraped and washed daily. Approximately 1 to 1.5 yards of screened material is collected per week and disposed of at the transfer facility immediately adjacent to the WWTP. Influent flows from the screen by gravity to the oxidation ditch.

Oxidation Ditch: The oxidation ditch consists of a racetrack-shaped channel with a 26-foot bottom width and 6-foot high sidewall on a one-to-one slope. Two 11-foot aerator brushes were located on each side and were supported by three piers; however, one brush aerator was removed due to a broken shaft in April 2012. The brush was replaced with two 10 Hp floating Aire-O_2 aerators from

Photo 7: Floating Aerator

Aeration Industries International for energy and oxygen transfer efficiency, improved industrial hygiene resulting from no wastewater spray, and simplification of periodic maintenance. Adjustable overflow weirs at the north end of the ditch control the water elevation. Significant oil, grease, and algal buildup was noted along the waterline edges of the oxidation ditch during a site visit by District staff and PACE on April 2013. This issue was also documented in a compliance inspection completed by the CRWQCB in December 2012. Refer to Appendix B for the Compliance Inspection Report.

Secondary Clarifier: Mixed liquor suspended solids (MLSS) gravity flows to the 35-foot diameter Envirex secondary clarifier. MLSS enters the center well through a 24-inch steel pipe. Return activated sludge (RAS) is pumped via two Wemco Model C torque-flow pumps driven by a Carter Type A hydraulic variable speed drive. Both pumps can provide 150 to 300 GPM; however, only one pump is currently operational, with a pump motor recently rebuilt by Redding Industrial Electric. RAS is pumped back to the oxidation ditch, while waste active sludge (WAS) can be pumped to a lined facultative sludge lagoon, or to sludge drying beds; however, the sludge drying beds are no longer utilized. Clarifier scum is pumped back to the hydrosive screen via a 3 Hp pump.

Photo 8: Secondary Clarifier

Sludge Drying Beds: Four sludge drying beds totaling approximately 4,700 square feet (SF) are no longer in service. Historically, the beds were ineffective for sludge drying due to the combination of sludge lifts being placed too thick and/or too short of drying seasons.

Sludge Lagoon: A facultative sludge lagoon with an HDPE liner was constructed in 1989 and stores WAS from the clarifier. According to the District WWTP operator in 2000, approximately 44,000 pounds of sludge are generated annually. Supernatant from the sludge lagoon is sent to an oxidation pond. The lagoon currently has significant sludge buildup and is scheduled to be dredged during spring 2014.

Oxidation Ponds: Clarifier effluent gravity flows to 8 oxidation ponds which provide effluent polishing, emergency treatment, and evaporation/percolation. The ponds can be operated in parallel or series, but are typically operated in series. Per the WDRs, subsurface testing indicated Ponds 1 through 7 have percolation rates less than 5 minutes per inch, and as such are suitable for percolation. Pond 8 was found to have seepage at the base of its berm, and therefore, currently utilizes a French drain to intercept any seepage that may occur. Supernatant collected in the French drain is carried to the unlined pond adjacent to the old chlorine contact basin which is no longer in service. Pond 8 is also used to dispose of supernatant from the sludge lagoon. A portion of Pond 5 is dedicated to discharges of cooling water blow down from Burney Mountain Power, and does not co-mingle with domestic wastewater.

An existing WWTP flow diagram is shown in Figure 2. A summary of the design criteria for original, existing, and future facilities is shown in Table 2.

CONTROL SYSTEMS

The current wastewater facility Supervisory Control and Data Acquisition (SCADA) system consists of the following: high and low wet well level and pump failure alarms, and an on/off signal at Bartel Lift Station; high and low wet well level and pump failure alarms, and standby generator and air compressor

Photo 9: Main Lift Station Pump Controls

failures at the Main Lift Station; and an RAS high level alarm at the WWTP. The District currently utilizes National Instruments Lookout for which software is outdated and no longer supported.

WASTEWATER FLOWS

SERVICE AREA

The future sewer service area for Burney Water District used in this Master Plan was limited to the current service area boundary, which is believed to be the same as the Local Agency Formation Commission Office (LAFCO) Sphere of Influence (SOI) Boundary outlined in the 1984 LAFCO SOI Report. As shown on Plate 2 located at the end of this report, the ultimate service area includes the areas of Johnson Park, Highway 299 east corridor, East, South, and North Burney, and the west side/lumber mill. LAFCO has scheduled a review and update of the SOI for 2014, at which time these boundaries will be verified.

This Master Plan outlines staged sewer improvements needed to service existing deficiencies and 60-year growth, as shown on Plate 2. To determine District collection system needs, the study area was divided into 13 subareas. HE wastewater loadings were then estimated for each subarea based on 60-year estimated growth. Subarea boundaries were established using existing sewer locations, topography, and other pertinent factors such as lot lines, and existing streets and drainages.

EXISTING WASTEWATER FLOWS

HE Determination

An HE is defined as the average dry weather wastewater flow generated from a single-family dwelling. Wintertime household water consumption is assumed to be a gauge of dry weather household wastewater flow, based on the assumption that the majority of winter water usage is discharged into the wastewater collection system. The 2012 average wintertime water usage for the entire District equaled approximately 0.31 MGD. However, the average 2011 summertime dry weather flow into the treatment plant was estimated at around 0.22 MGD. The 0.09 MGD difference between

summertime treatment plant wastewater flow and winter water consumption can be attributed to a number of factors including: increased winter demand for water to stop pipes from freezing; summertime groundwater exfiltration; illegal sump pump discharges; gravity sewer flushing and cleaning; inaccurate flow meters; and other factors. Utilizing the average winter water consumption, along with an assumed 10% vacancy rate in the District, results in an HE of approximately 220 gallons of wastewater per day. See Table 3. This compares reasonably well with similar communities in the region. For example, the City of Weed has a rate of 210 GPD per HE, and the Cities of Redding and Anderson both have rates of 300 GPD per HE. Therefore, for the purpose of this study, a flow factor of 220 GPD per HE was used for existing and future development throughout the District sewer service area when calculating ADWF per HE.

Inflow and Infiltration

Based on the 2012 average wintertime water usage, the ADWF is estimated at about 0.31 MGD. A review of historical wet weather flows at the WWTP indicated the instantaneous PWWF was about 0.72 MGD as recorded November 2012. It is important to note, this PWWF was recorded from WWTP circular charts due to the lack of operable and accurate influent and effluent flow meters. Peak flows in November 2012 actually measured off the circular chart; however, with no other information available this is assumed to be the peak seen by the WWTP. This must be confirmed when accuracy of the flow meter is verified. Comparing the historical PWWF to that of the ADWF, results in a difference of approximately 0.41 MGD. This difference is assumed to be the wintertime I&I component coming into the WWTP.

Photo 10: Main LS Flow Meter

Infiltration refers to groundwater that leaks into cracks and breaks in sewers and manholes. Inflow refers to stormwater that enters the sewer system directly from such sources as illicit roof drain connections, cross connections to storm drains, surface drainage that directly enters cleanouts without lids or leaky manhole covers, etc. Infiltration tends to be prolonged leakage until the groundwater table subsides, and inflow tends to be more noticeable during a storm event when surface water is present. Since the two are often very hard to separate, it is common practice to simply refer to the entire leakage problem as I&I.

I&I has significant impact on sizing of sewers in a collection system, and can increase costs significantly. The total I&I rate that occurs at the worst condition is referred to as peak I&I, and although this may last for only a short time, such as minutes in a small system or an hour or so in larger systems, wastewater facilities must be sized to handle peak I&I. Thus, the size of wastewater collection and interceptor facilities are governed mainly by the combination of peak I&I and peak wastewater flow components, with I&I often being the largest component. The second type of I&I that affects the cost of a wastewater system is simply the total amount of I&I, usually referred to as annual I&I. This affects the annual operating costs which include pumping, treating, and disposal of I&I.

A review of WWTP records (ADWF of 0.31 MGD and PWWF of 0.72 MGD) suggests that at PWWF a large portion (57%) of the wastewater flows are due to I&I, and it is believed most of this may be from infiltration. This is based on the observation that it takes a prolonged period of rain to significantly increase I&I flows at the WWTP. Furthermore, plant flows appear to drop off relatively slowly following a period of intense rainfall.

It should be noted that sewers that leak in can also leak out. Although leaks flowing out tend to become plugged, significant outflow leakage can occur in leaky sewer systems. This partially defeats the purpose of a sewer system, which is to collect and convey wastewater in a manner that is not harmful to humans or the environment.

I&I Field Investigations

An I&I study has not previously been performed in the District. Therefore, in an attempt to identify key areas that may be prone to I&I problems, PACE and District staff prepared to complete a systematic flow measurement program in the winter of 2012. 12 strategic manholes disbursed throughout the collection system (see Plate 1) were selected for flow monitoring on the basis of upstream service area, historical observed flows, flow isolation, and sewer size. Verification of each of these manholes was completed to ensure available access for flow monitoring equipment.

Photo 11: I&I Monitoring Equipment

Unfortunately, 2012 and 2013 were extremely dry winters, and no significant rainfall events occurred to allow for wet weather flow monitoring to take place. It is recommended the District complete I&I flow monitoring at designated monitoring station manholes during the next significant storm event to better identify and evaluate I&I prone areas in the system. The field flow monitoring effort should consist of going through the collection system at night and early morning, when the wastewater component of the flow is minimal, to measure flow at designated manholes. In some cases, the measured flow will include the flow(s) measured in upstream monitoring stations which will be deducted from measured flow to derive I&I contributions in the lone service area. Because measurements are taken at different times, and flows vary over time, this can compound errors; however, the data will be meaningful and provide a basis for additional future planning efforts.

Without I&I monitoring data, assumptions had to be made for completion of this Master Plan. Bartel LS pumping records were utilized to calculate and apply an I&I rate to subarea B7. See Plate 1. As previously discussed, since an accurate flow meter was

not functional, WWTP circular charts were utilized to determine the PWWF at the WWTP, which was 0.72 MGD. The historical PWWF I&I component observed at the WWTP (PWWF minus ADWF) was evenly distributed throughout the wastewater collection system. This equal distribution is likely not an accurate representation of what occurs in the system, but is currently the most appropriate estimate using available data. All assumptions herein must be confirmed when a accuracy of the flow meter is verified and I&I flow monitoring is completed.

A summary of the calculated I&I data is presented in Table 4. Columns 5 and 6 indicate the estimated existing and future sewered area, in acres, for each monitoring subarea. Columns 12 and 14 show the estimated existing and future AWDF and PWWF per subarea. The estimated I&I flow rates for each subarea, shown in 8 and 10, were calculated by taking the recorded I&I flow and dividing it by the sewered area in each monitored area.

Typically, sewered areas with I&I rates at or below 1,500 GPAD are considered to be within acceptable limits. As can be seen in Table 4, using the assumptions explained above, all of the monitoring stations had values significantly less than 1,500 GPAD, indicating sewers that appear to be very tight. I&I rates in excess of 2,500 GPAD are considered high and indicate sewers that have defects and are sources of I&I. Since assumed PWWF values utilized herein resulted in such suspiciously low I&I rates, the need for accurate I&I flow monitoring to be completed at the next available opportunity is emphasized even more so. This will provide verification that recommendations and needed improvements indicated herein are adequate and representative of those actually needed in the wastewater system.

GROWTH PROJECTIONS

In 2002, the estimated number of existing metered water services was 1,365 within the District service area. In 2012, the number of services was 1,364. Similarly, the population has remained relatively static, for a zero average annual growth rate over

the past 10 years. According to the Shasta County General Plan, the California Department of Finance indicated the population of Shasta County as a whole increased by 4% over the last 5 years (annual average growth rate of 0.8%). Current data shows a predicted growth rate of 17% between the years 2010 and 2020 (annual average growth rate of 1.7%) in a report previously completed by the Department of Finance is likely too high. Also noted in the General Plan, the Department of Finance now states that assumptions used to project future population may no longer be applicable, and these projections could change with their next estimate cycle which is every 5 years.

Given the relatively static trend in services over the last 10 years, District growth and population is likely to remain relatively static into the foreseeable future. As such, the District is more in a preventive repair and/or replace O&M mode rather than one of system expansion to accommodate new development. A Developer Fee Justification Study was completed by SchoolWorks for the Fall River Joint Unified School District in February 2012. This study projected five new residential units to be constructed per year, which would result in an approximate growth rate of only 0.2% per year.

In fact, it is possible the District may see a contraction in the near future, with many retirees moving due to harsh weather in the winter months. Rather than having issues associated with too much growth in the near future, it is more likely the District will struggle to meet increased O&M costs with an inadequate fixed revenue stream. That having been said, there are a few proposed developments which have tentative maps and/or preliminary plans already completed and approved. Therefore, this Master Plan utilizes these developments to forecast growth in the next 10 to 60 years. Full build-out of these developments would result in an approximate growth rate of 1% per year for the next 60 years. They are listed in Table 5 and shown on Plate 2. Tentative improvements to accommodate this growth are also shown on Plate 2. It is important to note these improvements are only preliminary as development details are yet to be determined. Additional studies needed to verify how to serve each of these developments are beyond the scope of this Master Plan. Therefore, improvements and

details must be further investigated and evaluated at such a time prior to development occurring.

This Master Plan has been developed assuming no additional annual fill-in growth, other than that from proposed tentative developments. If there is no development in the future, improvements designed to accommodate growth for the next 60 years will be satisfactory for a longer period of time than indicated herein. If there is growth and development greater than that anticipated herein from tentative developments, improvements will reach their design capacity sooner than projected.

10 to 60-Year Growth Projections

For this study, proposed developments which have tentative maps and/or preliminary plans already completed and approved were anticipated to be built within the next 10 to 60 years. An analysis of this growth suggests that by year 2072, an additional 1,317 ADWF HEs may be added (i.e., 2,855 total ADWF HEs) to the District wastewater system due to development. Table 5 lists and describes the submitted developments, and Plate 2 shows their location. The predicted 60-year increase in HEs results in a 1% annual growth rate. Table 4 indicates the number of existing and future HEs, as well as the anticipated I&I contribution from each of the 13 subareas.

Figure 3 represents estimated treatment plant dry weather flows over the next 60 years based on varying growth rates. As can be seen from this figure, projected treatment plant flows could exceed the current 0.44 MGD ADWF capacity of the plant within the next 35 years if the assumed 1% growth rate is realized.

Ultimate Growth Projections

Since the District intends to update this Master Plan within 10 years, and full build-out of the proposed developments is not likely to occur in the next 10 to 20 years, future flow predictions for ultimate development were beyond the scope of this Master Plan.

FUTURE WASTEWATER AND INFILTRATION AND INFLOW

To obtain meaningful flow projections to use in developing a plan to meet year 2072 sewer needs, it is important to predict how much growth is expected to occur in the next 60 years, and where growth will likely occur in the District.

After estimating the expected growth in specific subareas, and determining the number of HEs associated with that growth, existing 2012 and future 2072 wastewater and I&I flow contributions were estimated for each subarea. The estimated 2072 flows were used to determine the required sewer size needed to serve that subarea.

Subarea boundaries are shown on Plate 1 and are approximate limits of service. Boundaries can often be shifted slightly to change the subarea without significantly impacting sewer sizing. However, large changes in service areas should be reviewed to determine if downstream sewers are impacted.

All existing subareas had calculated I&I values of less than 500 GPAD which are extremely low. Therefore, it was assumed these I&I rates would gradually increase due to degradation of the collection system over time to 1,000 GPAD under future conditions. All future sewered areas were also assigned an I&I allowance of 1,000 GPAD. It is again emphasized these values and assumptions should be re-evaluated when meaningful I&I flow monitoring data can be obtained. As shown in Table 5, if future development area I&I rates are determined to be about 500 GPAD, the number of I&I equivalent HEs will be much less, and proposed improvements will be satisfactory for longer than indicated herein. However, if I&I rates are found to be closer to 1,500 GPAD, proposed improvements will reach their design capacity sooner than projected.

All of the above mentioned estimates of HEs, sewered area, and I&I rate data for each subarea are summarized in the service area tabulation sheets for all subservice areas as shown in Table 4.

DESIGN CRITERIA SUMMARY

Sewer sizing was based on handling PWWF, which equals the sum of the peak dry weather wastewater flow rate and peak I&I allowance.

The typical diurnal curve shown on Figure 4 was developed based on pump station records of several north state utilities. This diurnal curve was used in the hydraulic model to simulate affects of daily flows into the District collection system.

HYDRAULIC COMPUTER MODELING

H_2OMAP Sewer by Innovyze ® was used to model the District's collection system. Two computer models were created for this Master Plan: an existing 2012 PWWF model and a 60-year 2072 PWWF model. The existing PWWF model was created using existing District collection system mapping, surveying, and field measurements. District mapping of the existing collection system was used to confirm collection system pipe size, length, and material for input into the modeling software. Manhole lid elevations were surveyed, and invert depths were measured in the field by District staff. Wet weather sewage flow records from Bartel LS and the WWTP were then used to determine approximate I&I rates for the District system and were input into the hydraulic model. This rate was combined with estimated ADWF to create the 2012 PWWF model.

Photo 12: Innovyze® $H_2$0MAP Sewer Program

The 2012 PWWF model was then used as the basis for the 60-year model. The 2072 model includes estimated growth projections and locations based on proposed developments which have tentative maps and/or preliminary plans already completed.

Future sewers needed to serve these developments were approximated and input into the model.

An ultimate PWWF model was beyond the scope of this Master Plan.

As indicated, model I&I allowances were estimated by an analysis of the WWTP historical wet weather flows. It is possible that some of the District's sewer mains are impeded by roots, failing pipes, disconnected pipes, or other problems, while other pipes are in good condition. However, the model cannot determine the condition of pipes and assumes that all sewer pipes have free flow. As the District investigates areas known to have high I&I, it may discover that some of the sewer flows are impeded or have other problems not reflected by the model.

Once the hydraulic models were created, they were analyzed and collection system limitations were addressed. Where modeled sewer capacities were limited, parallel or larger replacement sewers were calculated in order to resolve these limitations in the model. Table 6 summarizes hydraulic model results and also shows sewer capacities needed to reduce the potential of existing or future sewer surcharge, given an assumed future I&I rate of 1,000 GPAD. These improvements are shown on Plate 2.

More or less parallel and/or replacement sewers may be needed if actual I&I is found to be greater than or less than 1,000 GPAD. As shown in the table and associated map located in Appendix C, if an I&I rate of closer to 500 GPAD is found, less improvements will be required. If an I&I rate of about 1,500 GPAD is recorded, more improvements will be required as shown in the table and map in Appendix D.

ANALYSIS AND RECOMMENDED IMPROVEMENTS

GENERAL

The first step in analysis of the wastewater system was to compare the capacity of existing gravity trunk sewer lines with calculated 2012 and year 2072 PWWF using the hydraulic models. Plate 1 shows the existing sewer collection system pipes 6-inch and larger. Trunk sewers shown in green on this plate were the focus of the modeling effort.

Projected future growth was limited to the current service area boundary; therefore, future sewers in areas not presently served by the District were not considered. New sewers needed to parallel or replace existing sewers anticipated to be inadequate in the future are shown on Plate 2. Once critical slopes and pipe diameters were determined, the computer program was used to verify size requirements. Build-out of known proposed developments was used for proposed future sewer sizing.

Future sewer lines marked "AD" (As Developed) on Plate 2 represent sewers that are not currently scheduled for construction. Most of these sewers would be constructed as the areas develop. These sewers will typically be funded by development projects or by assessment districts, as the areas are sewered. On the other hand, new sewers that have been designated as General Improvements are anticipated to be paid for by District capacity charges.

The lines shown "As Developed" are nebulous at this point. In these cases, the extent of future development is undetermined at the present time and, consequently, pipe sizes will likely need to be revised as conditions change. In order to effectively utilize this Master Plan, it is recommended service area tabulations shown in Table 4 of this report be reviewed prior to construction of major trunk sewers. If actual development is significantly more or less dense than anticipated, appropriate adjustments in proposed sewer sizes and downstream sewer sizes should be made. Locations and sizes of

pipes shown for new development are approximate and should be considered schematic based upon available topographic mapping. In flatter areas, final pipe locations will be dependent upon obtaining more definitive topographic information and the actual pattern of future development.

Where existing sewers are not large enough to convey existing or year 2072 flows, a new parallel or replacement sewer is indicated on the Sewer Master Plan. Parallel sewers were sized based on handling the differential flow between future demands and existing capacity. This assumes the existing sewer will remain in service and can be restored to acceptable standards utilizing currently available rehabilitation techniques, if necessary. Prior to paralleling or replacing any existing sewer, a detailed review, including video inspection, should be made of the existing sewer to determine whether it is desirable to keep it in service. The capital cost of a total sewer replacement, which would require a larger new sewer and lateral re-connections, is considerably greater than installing a parallel relief sewer.

INFILTRATION AND INFLOW REDUCTION PROGRAM

Sizing of parallel relief sewers and replacement sewers, and future expansion of the treatment plant are often dependent on estimated existing and future I&I rates. As previously mentioned, these estimates represent the largest contingency in the development of this Sewer Master Plan. In view of future large expenditures required to install parallel relief sewers and upgrade the WWTP, it is imperative the District invest in I&I monitoring and measurement, and an I&I reduction program if needed.

Accurately identifying and reducing I&I will result in long-term savings to the District by reducing the volume of wastewater treated at the WWTP and delay or possibly eliminate the need for parallel or replacement sewers. Industry experience has shown that installing relief sewers without correcting major sources of I&I relieves existing bottlenecks, but will eventually result in even higher PWWF downstream. Sewer

systems in poor condition continue to deteriorate, and, if not corrected, the volume of I&I will only increase with time.

The average peak I&I rate for all sewers within the District is about 400 GPAD, which is extremely low. However, this is only an estimate using minimal WWTP data currently available. Therefore, for this Master Plan, it is assumed the District will complete I&I flow monitoring in the future to obtain a more accurate representation of system I&I. Should flow monitoring indicate areas of significant I&I problems (i.e., areas with I&I much larger than 1,500 GPAD), the District will develop a plan to aggressively correct these I&I problems in the future. As with most I&I reduction programs, the initial I&I reduction tasks will be relatively easily identified (e.g., broken sewer mains and leaking manholes) and relatively cost effective to correct. However, successive I&I reduction efforts tend to be much more difficult and expensive in terms of dollars per gallon of I&I removed.

Laterals and House Connection I&I

For any I&I reduction program to be effective, improvements to leaky laterals and building sewers are necessary, in addition to improvements to collection sewer mains. There have been several studies that point to sewer laterals and building connections as contributors of up to half of all I&I entering a collection system.

In a study for the U.S. EPA, Conklin (1981) noted that many sewer rehabilitation programs that did not address sewer laterals had a maximum I&I removal rate of about 30%. Furthermore, the EPA study also concluded that building connections and private sewer laterals contribute 50% of total I&I into the system. Therefore, without a committed effort by the District to correct I&I from laterals and house connections, the best that can be hoped for in any I&I reduction program is about a 30% reduction.

The sewer connection from the house to the District sewer main is separated into two parts. Typically the sewer pipe from the house to the property line and/or cleanout is called the “house connection,” and the sewer pipe from the property line and/or

cleanout to the sewer main is called the sewer “lateral.” Currently, District ordinances stipulate the property owner is responsible for the sewer connecting the house to the cleanout. Generally, the lateral is located in the public right-of-way. Presently, in order for the property owner to repair the sewer lateral he/she would be required to obtain encroachment permits from the District and the County in order to work on the lateral within the public right-of-way.

In order for the District to address I&I originating from private laterals and house connections, the following is currently included in District Sewer Ordinance No. 90-01, as shown in Appendix E:

1) Currently, Section 3.04.G. of the District ordinance requires cleanouts be installed at the property line for all new laterals. Section 4.04.B. requires a cleanout be installed at the property line prior to an existing lateral being cleaned and tested. A critical part of any I&I reduction program is lateral cleanouts installed at the right-of-way or easement limit. A lateral cleanout serves as a point of access for servicing the sewer and as a “port” for visually inspecting, testing, or video inspecting the sewer lateral.

2) Section 4.02.C. of the District ordinance requires all service laterals be tested under any of the following conditions:
    - Installation of additional toilet facilities in the house, building, or property served, or;
    - Change of the use of the house, building, or property serviced from residential to business or commercial, or from non-restaurant commercial to restaurant commercial, or;
    - Upon repair or replacement of all or part of the building sewer, or;
    - Upon addition to structures of living quarters, such as guest cabins on the property served or plumbing of garages into living quarters, or;
    - Upon determination by the District Manager that cleaning and testing is required for the protection of public health, safety, and welfare.

Should I&I become a more significant problem in the system, it is recommended a more frequently scheduled event result in lateral testing and cleaning, such as the sale of property. Instituting Section 4.03 of the District ordinance that establishes a maximum rate of leakage from a house connection could be enforced at the time of property sale. If the sewer lateral does not meet the leakage rate standard, the sale of the house would be contingent upon repair of the lateral. As a minimum, the District should consider having the private lateral video-inspected in order to determine any gross defects in the pipe that need to be corrected prior to sale.

It is suggested the District implement a two-phased I&I reduction program. Accurate I&I flow monitoring should be completed, followed by a repair and rehabilitation phase if high I&I areas are identified. Initially, the first phase would consist of additional field evaluation of existing sewers. This field effort should include the following:

- Smoke and dye testing of sewers to determine open sewer cleanouts, illegal connections from downspouts, basement sump pumps, etc;
- Internal video inspection of both the main line sewers and laterals where access is possible to determine defects and sources of I&I;
- Manhole inspections and inventory to reveal I&I sources that are caused by poor manhole construction and degradation; and,
- Field data review, summarize where sources of I&I are evident, and formulate the best way to repair these defects.

The second phase of the I&I reduction program would involve implementing repair and replacement of leaking sewer infrastructure. This would include grouting of sewers and lateral joints, lining, pipe bursting, or replacing main line sewers and manholes, and addressing laterals by installing cleanouts as needed so specific laterals can be evaluated and repaired if necessary.

Costs for a comprehensive I&I reduction program within the District are not included herein. When I&I monitoring is complete, an I&I reduction program can be developed

based on review of the field data. Until such time, costs for performing I&I reduction work cannot be accurately forecasted.

The City of Dunsmuir offers one example of I&I investigation and repair costs. The City's 2007 Master Sewer Plan found an area of approximately 100 homes to have unusually high I&I rates from 8,200 to 28,000 GPAD. Upon completing CCTV inspection, sewers in these areas were found to be constructed of PVC and in good condition; therefore, it was concluded I&I must be coming from laterals. The City put out to bid in May 2013, a public works project for additional CCTV of laterals, followed by replacement of laterals from the sewer main to the property line with installation of a two-way cleanout for future I&I investigation. The average contractor price for 3,100 feet of lateral replacement, plus installation of 104 two-way cleanouts, was approximately $500,000. This equated to a unit price of $4,810 per cleanout with 30 feet of lateral replacement.

Dunsmuir certainly presents an argument that any I&I reduction program performed should be verified using flow monitoring and CCTV. Using flow monitoring data generated from successive Master Plans as a basis, subsequent flow monitoring data in those areas that have been rehabilitated will need to be gathered and compared in order to verify reductions in I&I. It is strongly recommended the District perform such flow monitoring of the existing system at least every 5 years during PWWF.

WASTEWATER COLLECTION SYSTEM IMPROVEMENTS

Recommended sewer improvements are shown on Plate 2. Trunk sewer design flows and required sewer sizes were determined for 2012 and 2072 flow conditions as described below. Specific improvements recommended below are primarily based on repairing existing system deficiencies and allowing for future growth.

PWWF for each reach of trunk sewer was determined using the Innovyze® H_2OMAP Sewer computer program. Summary of the H_2OMAP program outputs, assuming a

future I&I rate of 1,000 GPAD, is shown in Table 6. The table indicates analysis year, model pipe number, sewer length, diameter, slope, capacity, model PWWF, surcharge depth, and recommended replacement or parallel sewer. Using an input sewer slope and diameter of the existing trunk sewer, together with compiled PWWF, the program computes existing sewer capacity. Table 6 indicates a recommended size of a parallel sewer if the existing sewer is inadequate. A replacement sewer size is also shown on the table in case the existing sewer is to be abandoned. For example, Table 6 shows moderate to severe surcharging could occur in the 15-inch interceptor prior to the Main LS due to future PWWF. Analysis indicates 2072 PWWF conditions will require the existing interceptor be paralleled with a 15 to 18-inch interceptor, or replaced with an 18 to 21-inch interceptor, in order to handle anticipated 60-year flows. Slopes of all existing sewers noted as needing improvements should be verified prior to construction.

Bartel Street Sewer: Computer model analysis indicates that during present day conditions, approximately 700 feet of existing 8-inch sewer along Bartel Street, from Bartel LS to Park Avenue (see Points 1 to 2 on Plate 2), can encounter surcharging conditions during PWWF. This surcharging condition has not been observed in the field, but that may be due to deep sewers in this area. Exacerbating this surcharge condition is the flat slope on the existing 8-inch VCP sewer. Field measurements indicate this 8-inch sewer has about half the slope required for proper sewage flow and solids transport. In order to relieve this potential surcharge condition and to reduce the possibility of sewer blockage due to solids deposition, it is recommended the existing 8-inch sewer be replaced with a new 12-inch sewer. It is anticipated the new replacement sewer can be constructed at the same slope as the existing sewer, or approximately 0.2%.

Park Avenue Sewer: Currently, approximately 1,500 feet of existing 8-inch sewer on Park Avenue from Bartel Street to Missouri Way (see Points 2 to 3) appears to have minimal surcharging during current PWWF, but is anticipated to have about 2 feet of surcharge at 2072 PWWF conditions. This surcharge was reflected in the hydraulic model even though it has not been observed in the field. However, the sewer is deep in

this area as well. It is recommended the District monitor this pipeline during the next PWWF. If I&I monitoring shows existing surcharging, it is recommended this sewer be paralleled with 8-inch relief sewer.

Sewer Prior to Main LS: Anticipated commercial and residential development within the northeast region of the District will impact the existing 15-inch sewer from District Manhole No. 281 to the Main LS (see Points 4 to 6 on Plate 2). When 2072 PWWF flow conditions were modeled for this stretch of sewer, moderate surcharging resulted. In order to prevent this condition, approximately 2,500 feet of parallel 15-inch relief sewer and 900 feet of parallel 18-inch relief sewer will likely be needed when 2072 PWWF conditions are realized.

Missouri Way and Grogan Street Sewer: Analysis indicates at anticipated 2072 PWWF conditions; approximately 1,500 feet of existing 8-inch sewer along Missouri Way and Grogan Street (see Points 7 to 8 on Plate 2) can encounter surcharging conditions. As such, it is recommended this portion of sewer be paralleled with 8-inch relief sewer when these future flow conditions are realized.

Ontario Avenue Sewer: The 60-year hydraulic model indicates approximately 400 feet of existing 15-inch interceptor sewer near Ontario Avenue could see a PWWF of 1.3 MGD (see Point 9 on Plate 2). This is equivalent to the existing sewer capacity; therefore, it is recommended this sewer be paralleled with a 12-inch relief sewer prior to reaching anticipated future flows.

Orchard Way Sewer: Analysis indicates approximately 200 feet of existing 6-inch on Orchard Way from the easement to Sail Lane (Plate 2 Point 10) has adequate capacity to serve up to 2072 PWWF conditions. However, it appears this sewer will then be at maximum capacity and will need additional capacity in order to accommodate additional growth. As such, it is recommended paralleling this area with 8-inch relief sewer.

Recommended improvements include the eventual replacement of sewer mains as they continue to deteriorate. Given that sewer mains have an approximate lifespan of 100 years, and many of the District sewers were installed as much as 40 years ago, the District should anticipate having to replace much of the system mains within the next 60 years. Complete system replacement within this time would amount to more than $14 million, or about $245,000 per year in January 2014 dollars. It is not possible to evaluate the condition of each section of the sewer system at this time without performing extensive field testing. Therefore, sequencing of the replacement work will probably be determined by the frequency of repairs required in various areas. Considering the magnitude of potential replacement costs, the District should develop a financial plan that provides for replacing sewer mains in order to minimize I&I. As such, costs indicated in Table 7 only include about 20% of system wide sewer replacements in the next 60 years. It is recommended the District budget as much as possible for replacements needed in upcoming years.

LIFT STATION IMPROVEMENTS

Bartel LS: This LS was updated circa 2000 and has been operating well since that time. The effective capacity of 250 GPM (0.36 MGD) is adequate to meet anticipated 60-year PWWF. While the lift station is in good operating condition, the existing davit arm assembly and hand crank was built by the District and is not very sturdy or effective. It is recommended this be replaced to allow for more efficient and safe removal of the pumps from the wet well. Additionally, there is no manual transfer switch or backup portable generator available at this lift station. It is recommended a new portable generator be provided with a manual transfer switch, allowing for safe and reliable backup during a power failure. O&M procedures should be compiled into an O&M Manual for operators to follow, which does not currently exist for this lift station. Updated and additional controls are recommended as described in the CONTROL SYSTEM IMPROVEMENTS section herein.

Main LS: The Main LS was constructed in 1974 and has an effective capacity of about 1,325 GPM (1.9 MGD). It is estimated over the next 60 years, PWWF into this lift station will increase to approximately 2.8 MGD. Additionally, with the exception of the new Gorman Rupp pump, the existing pumps are more than 30 years old and have met their useful service lives. Therefore, within the next 5 years, it is recommended the remaining two pumps be replaced with similar Gorman Rupp pumps and starters, sized for an effective lift station pumping capacity of about 2.8 MGD.

Photo 13: Main LS Pumps Needing Replacement

Several additional improvements are needed at this lift station. It is recommended a fall prevention system with webbing be installed, similar to that located at the Bartel Lift Station. Additionally, the District is in the process of calibrating the existing transducer, Parshall flume, and new ultrasonic level controller to record influent flows via a totalizer-indicator-recorder signal. Cables have been replaced and transducers maintained, but signal calibration is recommended. Should this continue to be unreliable, it is recommended a new magnetic flow meter be installed to provide accurate flow measurement. A permanent 6-inch suction pipe is recommended to be installed in the wet well, along with a 6-inch bypass pump discharge pipe upstream of the metering vault, and Bauer pump connectors installed at the surface to allow for bypass pumping.

Analysis of the Hazen-Wiliiams friction factor (C-factor) should be done on the 8-inch force main. A sewage force main operating at reduced velocity will collect grease and/or experience corrosion. Verification of the C-factor will require installation of an accurate flow meter and pressure meter, as well as exact elevations being determined. If testing determines an adequate C-factor, no further improvements are required.

However, if a C-factor of less than 100 is determined, it is recommended piping be installed to allow for pigging to be completed.

Photo 14: Grease & Oil Buildup at Main LS

The District has integrated a standard operating procedure to minimize grease, grit, and oil buildup at the Main LS by spraying it down and pumping it through to the WWTP. However, it is recommended weekly maintenance practices be implemented to include sucking out the grease, grit, and oil with a vacuum truck. The debris could then be dried in the sludge drying beds and hauled to a landfill as needed. Costs for the purchase of an adequate vacuum truck have been included herein.

Photo 15: Helisieve Screening Unit
Photo Courtesy of Parkson

If the District chooses to screen for large debris at this pump station, rather than screen only at the WWTP as recommended below, a Hycor ® Helisieve ® In-Channel Fine Screen or similar screening unit is recommended to be installed to reduce rag collection and subsequent clogging of pumps. Currently, no effective screening occurs, and as a result the District has issues with rags and other large debris being present in the oxidation ditch. The unit should be self-cleaning to clean, convey, and dewater screenings for ease of disposal. The Helisieve 300 ® model would be capable of fitting into the existing headworks channel. While this would eliminate rags and large debris at the WWTP, it would

require substantially more improvements and maintenance at the Main LS compared to installation of a screening unit in the existing screening building at the WWTP headworks. As such, costs for a screening unit at the Main LS have not been included herein. Instead cost for a new influent screening unit at the WWTP was included as described below.

WASTEWATER TREATMENT PLANT IMPROVEMENTS

The existing WWTP was designed for an ADWF of 0.44 MGD, and a PWWF of 1.02 MGD. The year 2012 ADWF was estimated to be about 0.3 MGD, which is approximately 68% of the current plant capacity. The 2012 PWWF was estimated at 0.72 MGD, or 71% of the design capacity. Given a 1% yearly growth rate due to anticipated proposed development, capacity of the existing WWTP could be reached by year 2048. In order to meet future flows, several improvements are recommended, in addition to immediate improvements needed to correct existing deficiencies.

WWTP design criteria shown in Table 2 outlines the process units and loading under the original 1975 design, 1985 design, existing 2012 flow conditions, and future 2072 flows. Future 2072 design criteria were determined to meet anticipated 60-year PWWF conditions, assuming a 1% growth rate and future I&I rate of 1,000 GPAD. Major components of the improvements are shown on Figure 2.

Photo 16: Strainpress® Sludgecleaner Photo Courtesy of HUBER

Headworks: The hydrosive static screen is scraped and washed daily, but is a constant source of issues including clogging and freezing. During winter months a portable gas heater is placed in the screening building to prevent buildup and freezing of debris. A recent site visit showed signs of screened material overflowing outside of the screening building. As such, it is recommended the static

screen be replaced with an insulated, enclosed, self-cleaning screen such as the Strainpress® Sludgecleaner SP or the ROTAMAT® by HUBER Technology. Heat tracing and/or insulation for inclement weather conditions is available for these units. It is possible the same unit be utilized to screen RAS as well. Costs have been included herein for installation of such a unit at the WWTP headworks.

Oxidation Ditch: One of the brush aerators in the oxidation ditch was recently replaced with two 10 Hp submerged floating aerators due to a shaft that first sheared off in 2009, and again in early 2011. While the floating aerators provide some aeration (960 Lbs O_2/day) to the activated sludge process, they are not equivalent to the brush aerator (1,475 Lbs O_2/day). As such, it is recommended an additional 15 Hp floating aerator be installed immediately to provide the required aeration.

Photo 17: Inoperable Brush Aerator

The District prefers the ease of O&M and the lack of wastewater spray the floating aerators provide compared to that of the existing brush aerator. As such, costs have been included herein to replace the remaining brush aerator with two additional 15 Hp floating aeration units in the future. Another option the District may want to consider at that time is the Aire-O_2 Triton® from Aeration Industries, or a similar system. Increased oxygen is provided at lower Hp, thereby lowering energy consumption. However, a blower would be required so further cost savings analysis would need to be completed. Electrical upgrades would be needed for either of these improvements. As such, costs have been included herein to replace the brush aerator and the associated electrical in the future.

Significant oil and grease buildup was noted along the edges of the oxidation ditch during a site visit by District staff and PACE on April 2013. This issue was also documented in a compliance inspection completed by the CRWQCB in December 2012. Vacuuming grease and oil out of the Main LS as part of regular O&M practice as previously recommended should remedy this problem.

Secondary Clarifier: During a site visit on April 2013, the secondary clarifier had some solids present. The District indicated this was likely due to adjustment of their wasting taking place. However, it was noted this problem occurs often during process adjustments, likely due to the small size of the 35-foot diameter, 9-foot tall clarifier. The recent CRWQCB compliance inspection noted the presence of moss and weeds on the clarifier effluent weirs. Operators have indicated mechanical failures to be common in the winter due to ice buildup. Additionally, the sweep arm has been bent or broken and cannot be replaced until the clarifier can be drained. Textbook recommended solids loading and overflow rates are expected to be exceeded at anticipated 60-year flows. Therefore, it is recommended a new 50-foot diameter, 12-foot tall secondary clarifier be constructed prior to this growth occurring. Once the new clarifier is operational, it is recommended the existing clarifier be rehabilitated with all new internal mechanical equipment.

Photo 18: Secondary Clarifier

Sludge is pumped via two Wemco pumps, however only one pump is currently operational. The other pump motor was recently rebuilt by Redding Industrial Electric. It is recommended the inoperable motor be replaced. Additionally, the RAS vault does not currently have a fall prevention system at hatch access from the ground level. It is

recommended a fall prevention system with webbing be installed, similar to that located at the Bartel LS. A 4-inch effluent magnetic flow meter is not currently operational, and is anticipated to be replaced in the near future. Finally, the RAS vault has had freezing issues due to the forced air ventilation that occurs and a vent fan timer that is in place. It is recommended an intrinsically safe space heater be installed and the vault forced air ventilation system be made operational as was originally designed.

Sludge Drying Beds: It is recommended the sludge drying beds be utilized to dry sludge removed from the sludge lagoon and grease, grit, and oil buildup from the Main LS. If 6-inch lifts are evenly spread in the beds, a relatively short drying period should be adequate to produce sludge suitable for hauling to the landfill.

Sludge Lagoon: An HDPE lined facultative sludge lagoon stores WAS from the secondary clarifier. A recent site visit showed what appeared to be small cracks in the seams of the HDPE liner due to ultraviolet (UV) exposure. The existing liner was installed in 1989 and is 25 years old. HDPE liners typically have a 20-year life; therefore, it is recommended the liner be replaced.

Photo 19: Sludge Lagoon HDPE Liner

The lagoon was last dredged in 2001 by Wastewater Solids Management of Oregon. At that time, Burney Disposal, Inc. hauled approximately 1,385 cubic yards (CY) of processed sludge from the WWTP to the Anderson Landfill in Anderson, California after tests revealed it to be non-toxic. Reportedly, the District ran out of funds prior to complete sludge removal. Therefore, the lagoon is currently full of more than 12 years of sludge buildup.

PACE collected samples from the sludge lagoon October 21, 2013, which were analyzed at Basic Lab. Lab results indicated all constituents to be well within limits for

disposal to the Shasta County West Central Landfill, with the exception of bis (2-ethylhexyl) phthalate which measured 1.73 mg/kg. This is above the Total Threshold Limit Concentration (TTLC) limit for designated waste of 0.17 mg/kg. Additional analysis will need to be completed on the dried sludge prior to disposal at the landfill to ensure this will not be a problem.

During the site visit, exposed sludge was observed in some areas of the lagoon surface. Depth measurements with a sludge judge in numerous areas revealed an uneven distribution of sludge throughout the lagoon, as well as a varied sludge thickness ranging from about 5% to 12% solids. As such, calculations of sludge removal herein assume a full lagoon totaling approximately 292,300 cubic feet (CF) of wet sludge. Cost comparisons were made assuming both 5% and 12% solids, resulting in 460 and 1,100 dry tons of sludge, respectively. Lab results indicated the sludge sample to be 12.9% solids; therefore, actual costs will likely be on the higher side of those estimated herein.

Discussions with District and CRWQCB staff resulted in several alternatives considered to remove sludge from the lagoon and allow for liner inspection as requested by the CRWQCB. A Sludge Disposal Plan was submitted to the CRWQCB January 8, 2014. Refer to Appendix G for details of the alternatives considered.

The District intends to contract with Synagro at an approximate cost of $200 per dry ton to dredge the lagoon and move as much sludge as possible to Stabilization Ponds No. 7 and 8 in the spring of 2014, then come back at the end of the summer drying season and haul away the dried sludge. Applying dredged sludge in 1-foot thick lifts would allow approximately 112,000 CF of sludge be removed in one drying season. This would cost the District approximately $35,000 at 5% solids, and $84,000 at 12% solids. This will allow the District to see proper dredging techniques used, possibly allowing for completion of the process themselves in subsequent years.

To allow for liner inspection and replacement, Sludge Lagoon No. 1 must be taken out of service. Therefore, the District intends to dewater Percolation Pond No. 1 to Stabilization Pond No. 6, and convert it into Sludge Lagoon No. 2. Existing supernatant pump station piping from Sludge Lagoon No. 1 would be rerouted from Percolation Pond No. 8 to Sludge Lagoon No. 2. Future operation of the two sludge lagoons would be rotated to keep sludge depths manageable and allow one to be taken offline, emptied, and cleaned while the other is operational. Solar aerators could be installed in each sludge lagoon to keep odors down, costs of which have been included herein should they be needed in the future.

Oxidation Ponds: Secondary effluent from the clarifier discharges to 8 oxidation ponds which provide effluent polishing, emergency treatment, and evaporation/percolation. Pond No. 1 was recently taken offline and plowed in 2011. The CRWQCB compliance inspection report indicated significant vegetation present on the banks of all ponds. As such, the District plans to take each of the remaining ponds offline and clean and plow them as they are able. This effort will be coordinated with Cal Fire and/or nearby fire conservation camps.

There are currently no handrails or walkways at oxidation pond flow control structures, making it difficult for District staff to complete routine O&M and sampling. It is recommended handrails and walkways with toe guards be installed.

Finally, it is recommended the main WWTP building HVAC system be replaced, as District staff has indicated it is no longer operable.

CONTROL SYSTEM IMPROVEMENTS

The current wastewater facility SCADA system consists of the following: an on/off signal and high and low wet well level and pump failure alarms at Bartel Lift Station; high and low wet well level and pump failure alarms, and standby generator and air compressor failures at the Main Lift Station; and an RAS high level alarm at the WWTP.

National Instruments Lookout is utilized for which software is outdated and no longer supported. It is recommended new hardware and additional monitoring capabilities be provided for the entire wastewater system, including monitoring of flow rates and volumes, wet well levels, pump run times, etc., at the Bartel and Main Lift Stations, as well as the WWTP. New software is recommended to be installed and integrated with the new water SCADA software.

It is recommended the proposed control system include a twice daily full pump speed cycle at the Main LS to flush out the force main prior to the WWTP. The lead pump would cycle off to allow enough time for the wet well to fill to a predetermined set point. The lag pump would then pump at full speed until the wet well approached the low level shut-off/alarm. The control system would then stop the pump to allow sewage to refill the wet well and then begin pumping at variable speed once it reaches a predetermined set point.

ESTIMATES OF COST AND FINANCIAL CONSIDERATIONS

BASIS OF COST ESTIMATES

Gravity sewer, force main, and other facility costs have been prepared using information from comparable projects in the area where construction contracts were competitively bid. Gravity sewer construction costs from these previous projects, projected to January 2014 costs and an Engineering News Record Index (ENR) of 9664, are illustrated on the curves in Figure 5. The figure accounts for varying depths and types of backfill required. Values from these curves and recent projects were used as a guide in preparing the estimate of pipeline costs herein.

Note that these estimates are based, in many instances, on preliminary information. Even in developed areas, at the report stage it is often difficult to determine underground conditions relative to the amount of groundwater, rock excavation, and conflicts with existing utilities that would be encountered. These cost elements cannot be properly evaluated until final design. Consequently, estimates in this report should be considered as "order-of-magnitude" estimates which may vary considerably from actual construction costs for a particular project element. However, overall Master Plan costs should be reasonably close and satisfactory for the basis of planning a financial program.

To obtain total project costs, construction contingencies and indirect costs were added to construction costs. Construction contingencies at this stage are usually estimated to be 25% of construction costs. Indirect costs include engineering, administration, and legal costs, and typically amount to about 20% of construction cost plus contingency. The total of the above two categories was taken at 45% for total project costs indicated herein. This figure may vary considerably depending upon the complexity of the work and the uncertainties of construction costs and raw materials.

All costs indicated in this report are based upon January 2014 dollars. For future or delayed work, an allowance for construction cost increases must be considered. During the last 10 years, general construction costs have increased at an average rate of about 3.6% per year. Similarly, the average rate of increase for the last 3 years has been about 2.8% per year. In projecting future costs, one should consider both short-term and long-term inflationary trends.

Note that costs presented in this report are capital improvement costs only, which do not include any O&M costs of the wastewater system. Projected capital costs do not include the annual cost for an I&I correction program.

The need for sewer improvements has been determined using the best available information regarding existing design capacity and flow conditions. However, current flow conditions are based on minimal and possibly inaccurate flow measurements, and future flow estimates are based on assumed future I&I and growth rates. Because of the approximate nature of these estimates, improvements identified in this study are preliminary. Prior to expending any funds for improvements, a detailed analysis of each problem area should be undertaken by video inspecting and smoke testing those areas.

Time Periods

Immediate Term (2012 to 2022): Improvements where existing capacity is clearly less than the calculated theoretical and are thus needed as soon as possible, or are needed to improve safety or performance of existing facilities (preferably completed within 5 to 10 years).

Near Term (2022 to 2032): Other improvements that are marginal in capacity, or will be over the theoretical capacity in the next 10 to 20 years, or are needed to improve performance or efficiency.

Intermediate Term (2032 to 2052): Improvements that are marginal in capacity, or will be over the theoretical capacity in the next 20 to 40 years, or are needed to improve performance or efficiency.

Long-Term (2052 to 2072): Remaining improvements that are theoretically needed to have adequate capacity to meet proposed 60-year development. Scheduling of these sewer facilities will likely be more definite in future Master Plan updates.

A preliminary cost estimate for the staged WWTP and general sewer system improvements is shown in Table 7. Table 7, together with the recommended improvements shown on Plate 2, in essence, is the Master Plan of Sewer Improvements. As shown in Table 7, approximately $3,133,000 (January 2014 dollars) worth of general sewer collection improvements and treatment plant improvements are anticipated to be needed in the next 10 years. Costs include a 45% adder for construction contingencies and indirect costs. The cost estimate in Table 7 includes staged improvements needed to first correct existing system deficiencies, then to expand the WWTP from an ADWF capacity of 0.44 MGD, to a future ADWF of 0.63 MGD.

Additional improvements are scheduled for subsequent time periods. Project costs scheduled in these time periods are based upon the projected growth of 1% and estimated future I&I rate of 1,000 GPAD. Final timing of the individual projects will be dependent upon actual growth experienced in each subservice area, as well as confirmation of the estimated I&I rate via subsequent flow monitoring. It is recommended this Master Plan of sewer improvements be re-evaluated upon installation of an accurate flow meter and completion of I&I flow monitoring, and updated every 10 years.

FINANCIAL CONSIDERATIONS

As a part of this Master Plan, a recommendation for a Capacity Charge for the District sewer system has been prepared. As of 2009, the District had a $6,130.60 Capacity Charge for one HE. This charge is strictly a Capacity Charge, and the cost for the actual sewer lateral would include an additional Service Connection Fee if the District installs the connection. The Capacity Charge is updated annually based upon the Engineering News Record Construction Cost Index, which stands at 9664 as of January 2014.

Capacity Charges are often referred to as Connection Fees, but this is a misleading term applied to a charge that is intended to be a revenue producer for capital improvements. Such fees are also often called capital improvement fees. In the American Water Works Association (AWWA) Manual M26, “Water Rates and Related Charges”, these fees are referred to as System Development Costs.

Herein, such fees will be referred to as Capacity Charges which are intended as a fair share payment towards capital improvements, specifically referred to herein as General Improvements. Although the purpose of this engineering analysis is to develop an updated Capacity Charge, other common charges will first be discussed, termed herein as the Service Connection Costs, and Local Improvement Costs.

Service Connection Costs

The District should consider charging a Service Connection Cost unique to each installation based upon cost incurred including:

1. Lateral and cleanout
2. Sewer extensions

Refer to Appendix F for Sewer Service Charges as of 2009. It does not appear the District currently charges a Service Connection Cost. The Capacity Charge should be independent of the Service Connection Costs, even though they both are typically imposed at the time of building permit application or time of actual connection. For most sewer services currently being installed, the subdivision developer has already installed the lateral and cleanout (Item 1). However, if no lateral and cleanout exist, the new customer must pay for both. If the District does the work, it should charge on a time and expense basis because each service is unique.

In some cases, it is necessary to have a sewer main extension (Item 2) to serve a new property. In this case, the new customer must also pay for the main extension, including possible manholes and/or rod holes. Each sewer main extension will be different, so the District should charge on a time and expense basis. The portion of any sewer extension that is in front of a given parcel being served is called a local improvement as discussed below. The portion of a sewer extension that is off-site (necessary to get to the property being served) is referred to as off-site improvements. The costs for such off-site improvements are usually borne by the developer, although the District does share in these costs if it benefits. The District should issue the Sewer Service Charges to new customers so that a potential customer is not surprised by additional costs that they were not fully aware of.

Local Improvement Costs

When it is necessary to distribute costs of a sewer system to the ones it serves (or will serve), it is customary to require each property owner to pay for their fair share of the sewer collection system that is needed to serve their property. In the simple case of a property that is on one side of the street, the cost of the sewer in the street in front of that parcel should be shared 50/50 with the properties on the other side of the street. The sewer size needed to serve the property is usually a minimum size of 6 or 8-inch. In addition, each property owner pays for their share of the cost of manholes and rod holes that generally serve it and several other parcels.

These costs are commonly referred to as Local Improvements Costs. Local Improvement Costs for sewer facilities are typically paid for through the developer or the District if it is interested in completely serving an area. The main principle to establish in trying to have an equitable system of finance is that Local Improvement Costs should be paid for by property owners that benefit. Local Improvement Costs can also include sewage lift stations if such facilities are needed for specific properties over and above the typical General Improvement Costs.

General Improvement Costs (Used To Determine Capacity Charge)

General Improvement Costs are defined as those improvements needed for a total sewer collection, treatment, and disposal system that are not funded by Local Improvement Costs and Sewer Connection Fees. These costs include the following:

1. Wastewater treatment facilities.

2. Sewer collection systems.

3. Sewage lift stations benefiting large areas of a district.

4. Over-sizing of sewers, usually greater than 8-inch diameter, to provide benefit to properties other than the property being served.

5. Interconnections of piping that are not necessary for service to existing properties (e.g., pipelines across government land).

6. Other improvements which a district decides are of benefit to the entire district. For example, an office building, monitoring facilities, etc.

Capacity Charge

The purpose of the Sewer Capacity Charge is to generate capital from new customers to pay for their fair share of General Improvements. Following are three possible ways this charge can be determined.

Method 1: Determine all capital costs of general improvements that have been paid in the past and divide by the number of present users being served. This is a buy-in cost, or a proportionate cost share of the current system. AWWA Manual M26 refers to this approach as the "equity" method.

Method 2: Determine all capital costs of general improvements that have been paid in the past and those that are planned for the future, and divide this total cost by the total of both the present and future users. This is a combination of Methods 1 and 3.

Method 3: Determine all capital costs of general improvements needed to serve future users and divide that amount by the number of future users that will benefit. This method often uses a defined planning period, such as a 10 to 20-year period, or a specific growth amount (number of new connections). AWWA Manual M26 refers to this approach as the "incremental cost" method. However, under the incremental cost method, the capacity charge is determined by dividing a project cost by the number of users benefiting. In this case, the project may or may not have already been built, but it is reflective of the costs needed to serve future users.

Each method has its application. Each also has advantages and disadvantages. Capacity Charges have become the norm (especially since Proposition 13, Jarvis-Gann Initiative), and its purpose is to raise revenue for capital improvements and to bring about equity – so new customers pay for a fair share of the capital cost of general improvements.

For the Burney Water District, Method 3 (future improvement costs divided by future connections benefitting) is believed to be the most applicable for several reasons: Methods 1 and 2 would require a considerable effort to determine past costs and depreciation of the present system, and would involve discretionary decisions regarding how to treat previous grants, debt financing, depreciation, and replacement costs. Method 3 is likely more representative of the true cost incurred for future users and, thus, is more easily supported. AWWA Manual M26 states “this method is considered most appropriate when a significant portion of the capacity required to serve new customers must be provided by the construction of new facilities.”

Refer to Table 7, RECOMMENDED IMPROVEMENTS & CAPACITY CHARGE BASIS. The General Improvement Costs were developed based on the in-depth study of the sewer collection and treatment system discussed herein. Following the cost for each item in Table 7 is a percentage assigned for new development. A portion of some improvements benefit existing users and are needed to resolve existing deficiencies. For those improvements that benefit both future and existing customers, a proportional share in the cost burden is recommended.

Cost proportioning is based upon the number of future HEs that will occur over the next 60 years based upon the 1% growth rate assumed herein. Given these estimates, the District will add 1,317 HEs over the next 60 years, which represents 46% [1,317 / (1,317 + 1,538)] of the total number of HEs. Based upon the estimates presented here, the Wastewater Capacity Charge as calculated in Table 7 is $7,782 per HE. Customers that represent more than one HE, such as a commercial development, should pay a proportionately larger fee based upon the estimated number of HEs as determined by the District’s engineer.

The remaining portion of the Capital Improvement Plan (CIP) ($12,348,000 - $2,175,000 = $10,173,000) not paid by future customers is paid by existing customers through the monthly user fee. This cost spread over the existing 1,538 HEs for the next 60 years amounts to $9.19 per month per HE.

It is highly recommended the District adjust these fees annually, based on the Engineering News Record Construction Cost Index (ENR CCI = 9664, January 2014) to account for inflation. It is also appropriate to recalculate the fee every 5 to 10 years, especially at the time of preparation of an updated master plan. Before adopting a new Capacity Charge, an attorney should be consulted and shown this report to ensure the process is done correctly pursuant to government code.

In adopting a Capacity Charge, the District should be aware of similar charges by other districts or utilities. The State Water Resources Control Board publishes a biyearly report entitled *Wastewater User Charge Survey Report*. The fiscal year 2012-2013 report, surveyed 422 California service areas, three of which were in Shasta County. At that time, the Capacity Charge or connection fee ranged from $3,490 (City of Anderson) to $15,520 (City of Shasta Lake) with an average of $8,380. All of this and Table 7 suggests that a fee of $7,782 appears to be a reasonable Wastewater Capacity Charge for new customers to the Burney Water District.

TABLES

TABLE 1
Burney Water District
Sewer Master Plan
EXISTING LIFT STATIONS

Lift Station	Type	Number of Pumps & Horsepower	Accurate Flowmeter (Y/N)	Current Effective Capacity (MGD)[1]	Number of HEs Served		Estimated PWWF (MGD)[2]		10-Year Recommended Improvements
					2012	2072	2012	2072	
Main	Horizontal, non-clog, centrifugal, variable speed	2-20 Hp 1-50 Hp	N	1.91	1538	2855	1.19	2.84	Fall prevention system, flow meter, replace pumps 1 & 2 by year 2022, bypass pumping, slide gate, SCADA
Bartel	Horizontal, non-clog, centrifugal, variable speed	2-20 Hp	Y	0.36	48	48	0.05	0.10	Pump removal system, portable generator, manual transfer switch, O&M Manual, SCADA

[1] Effective capacity assumes largest pump is out of service.
[2] PWWF based on 1,000 GPAD I&I rate.

TABLE 2
Burney Water District
Sewer Master Plan
WWTP DESIGN CRITERIA

	Description	Original 1975 Design (1)	1985 Design (1)	Current 2012 Flows	Future 2072 Design
1	**Population**	3,000	4,400	4,250	6,300
2					
3	**Flows**				
4	Average Dry Weather Flow, ADWF (MGD)	0.30	0.44	0.31	0.63
5	Peak Wet Weather Flow, PWWF (MGD)	0.72	1.02	0.72	2.8
6	PWWF : ADWF	2.4	2.3	2.3	4.5
7	**Sewage Loadings**				
8	Biochemical Oxygen Demand (BOD_5)				
9	ADWF BOD_5 (mg/L)	240	240	300	300
10	ADWF BOD5 (Lbs/Day)	600	881	776	1576
11	Total Suspended Solids (TSS)				
12	ADWF TSS (mg/L)	295	295	295	295
13	ADWF TSS (Lbs/Day)	738	1083	763	1550
14	**Main Pump Station**				
15	Number of comminutors	1	1	1	1
16	Comminutor Capacity (MGD)	1.5	1.5	1.5	1.5
17	Parshall Flume, Width (In)	9	9	9	9
18	Parshall Flume Capacity (MGD)	2	2	2	2
19	Bar Screen				
20	Number of units	1	1	1	1
21	Bar spacing (In)	2	2	2	2
22	Method of cleaning	hand	hand	hand	hand
23	Hydrosive Capacity (MGD)	-	1	1	1
24	**Oxidation Ditch**				
25	Basin Volume (CF)	65,500	65,500	65,500	65,500
26	MLSS (mg/L)	2,000	2,000	2,000	2,000
27	Organic Loading Overall (Lbs BOD/1000 CF/Day)	9.2	13.4	11.8	24.1
28	F:M Overall (Lb BOD5/Lb MLSS/Day)	0.07	0.11	0.09	0.19
29	Hydraulic Retention Time @ ADWF (Hr)	39	27	38	19
30	MCRT (Days)	25	25	25	20
31	Brush Aerators (No.) (2/brush)	4	4	2	0
32	Brush Aerator Motor Horsepower (Hp)	25	25	25	-
33	Brush Aerator Oxygen Transfer Capacity (Lbs O^2/Hp/Hr)	1.25	1.25	1.25	-
34	Oxygen Supplied w/ One Brush Aerator in Service (Lbs/day)	1500	1500	1500	-
35	Floating Aerators (No.)	-	-	2	5
36	Floating Aerator Motor Horsepower (Hp)	-	-	10	2-10,3-15
37	Floating Aerator Oxygen Transfer Capacity (Lbs O^2/Hp/Hr)	-	-	2.0	2.0
38	Oxygen Supplied w/ One Floating Aerator in Service (Lbs/day)	-	-	480	720
39	**Secondary Clarifier**				
40	Diameter (Ft)	35	35	35	1 @ 35, 1 @ 50
41	Depth (Ft)	9	9	9	9, 12
42	Surface Area of Clarifier (SF)	962	962	962	2,924
43	Overflow Rate @ ADWF (GPD/SF)	312	458	322	215
44	Overflow Rate @ PWWF (GPD/SF)	749	1061	749	971
45	Solids Loading @ ADWF (Lbs/SF/Day) w/o Q_{RAS}	5	8	5	3.6
46	Solids Loading @ PWWF (Lbs/SF/Day) w/o Q_{RAS}	12	18	12	16
47	Solids Loading @ PWWF (Lbs/SF/Day) w/ 50% ADWF ML Recycle	49	52	48	31
48	Weir Overflow Rate @ PWWF (GPD/LF)	6551	9281	6551	10641

TABLE 2
Burney Water District
Sewer Master Plan
WWTP DESIGN CRITERIA

	Description	Original 1975 Design [1]	1985 Design [1]	Current 2012 Flows	Future 2072 Design
49	**Sludge Pumps**				
50	Number	2	2	1	2
51	Hp	15	15	15	15
52	Flow (GPM)	150	150	150	400
53	Head (Ft)	12	12	12	12
54	**Scum Pump**				
55	Number	1	1	1	1
56	Hp	3	3	3	3
57	Flow (GPM)	50	50	50	50
58	Head (Ft)	52	52	52	52
59	**Sludge Drying Beds**				
60	Number of Beds	4	4	-	4
61	Area, Total (SF)	4680	4680	-	4680
62	Waste Sludge (design) (Lbs/day)	270	390	-	200
63	Concentration (mg/L)	10000-20000	10000-20000	-	10000
64	Design Annual Sludge Loading Rate (Lbs/SF/Yr)	21.1	30.4	-	15.6
65	**Chlorine Contact Basin**				
66	Depth (Ft)	5	5	-	-
67	Volume (CF)	22,600	22,600	-	-
68	Detention Time @ ADWF (Min)	109	74	-	-
69	Detention Time @ PWWF (Min)	45	32	-	-
70	**Chlorinators**				
71	Number	2	2	-	-
72	Max Capacity (Lb Cl_2/day)	500	500	-	-
73	Typ Dosage (mg/L)	10	10	-	-
74	Dosage @ ADWF (Lbs/Day)	25	37	-	-
75	Dosage @ PWWF (Lbs/Day)	60	85	-	-
76	**Oxidation Ponds**				
77	Number	8	8	7	7
78	Total Surface Area (Ac)	11.3	11.3	9.7	9.7
79	Total Volume (Ac-Ft)	52.7	52.7	45.6	45.6
80	Design Percolation Rate (In/Hr)	1.0	1.0	1.0	1.0
81	ADWF at Capacity (MGD)	34.3	34.3	29.7	29.7
82	**Percolation Ponds**				
83	Number	2	2	1	-
84	Total Surface Area (Ac)	1.0	1.0	0.6	-
85	Total Volume (Ac-Ft)	7.3	7.3	4.1	-
86	Design Percolation Rate (In/Hr)	1.0	1.0	1.0	-
87	ADWF at Capacity (MGD)	4.8	4.8	2.7	-
88	**Sludge Lagoon**				
89	Number	-	-	1	2
90	Total Surface Area (Ac)	-	-	0.9	1.4
91	Total Volume (Ac-Ft)	-	-	6.5	9.7

[1] Design criteria as indicated in the original 1972 Water Pollution Control Facilities Plans by Yoder-Trotter-Orlob & Associates, and 1975 O&M Manual by CDM Inc.

TABLE 3
Burney Water District
Sewer Master Plan
HOUSEHOLD EQUIVALENT DETERMINATION

Top User	Average Winter Water Use (CF/Month)[2]	Average Winter Water Use [2] (GPD)	Estimated Equivalent HE's
Top User No. 1	44,600	10,762	49
Top User No. 2	20,129	4,857	22
Top User No. 3	17,888	4,316	20
Top User No. 4	12,140	2,929	13
Top User No. 5	10,390	2,507	11
Top User No. 6	9,600	2,316	11
Top User No. 7	9,516	2,296	10
Top User No. 8	7,210	1,740	8
Top User No. 9	6,850	1,653	8
Top User No. 10	6,820	1,646	7
Top User No. 11	5,500	1,327	6
Top User No. 12	5,455	1,316	6
Top User No. 13	5,439	1,312	6
Top User No. 14	4,644	1,121	5
Top User No. 15	4,510	1,088	5
Top User No. 16	4,340	1,047	5
Top User No. 17	4,310	1,040	5
Top User No. 18	4,229	1,020	5
Top User No. 19	4,086	986	4
Top User No. 20	3,936	950	4
Top User No. 21	3,718	897	4
Top User No. 22	3,535	853	4
Top User No. 23	3,283	792	4
Top User No. 24	3,275	790	4
TOTALS	**205,403**	**49,562**	**225**

Average Burney Winter Water Consumption [1]	0.310	MGD
Metered Winter Water Use Top 24 users [2]	0.050	MGD
Winter Water Use Distributed to Remaining Services	0.260	MGD
Total Connections[3]	1337	
Top 24 Service Connections	24	
Remaining active service connections = HE's	1313	
Estimated HE Dry Weather Flow	200	GPD
Adjusted HE Dry Weather Flow [4]	**220**	**GPD**
Total estimated HEs	1,538	HEs

[1] Average winter (Jan 2012) metered water use from Burney Water District.
[2] Average winter (Jan 2012) metered water use top users discharged to collection system.
[3] Number of active water connections billed for Jan 2012 water use.
[4] Adjusted ADWF/HE based on a 10 percent vacancy rate.

TABLE 4
Burney Water District
Sewer Master Plan
SERVICE AREA TABULATION TABLE

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Service Area No.	Year	No. of MHs	Total ADWF HEs	Existing Sewered Area (AC)	New Sewered Area (AC)	Existing I&I Rate (GPD)	Existing I&I Rate (GPM)	I&I Equiv HEs	Existing I&I Rate (GPAD)	Future I&I Rate (GPAD)	ADWF (MGD)	I&I Flow (MGD)	PWWF[1] (MGD)
B1	2012	6	56	78.4		31778	22	144	405		0.01	0.03	0.06
	2072		56	78.4		78382	54	356	1000		0.01	0.08	0.11
B2	2012	6	136	86.9		35232	24	160	405		0.03	0.04	0.10
	2072		229	86.9	39.0	125901	87	572	1000	1000	0.05	0.13	0.24
B3	2012	10	159	37.7		15278	11	69	405		0.03	0.02	0.10
	2072		159	37.7		37683	26	171	1000		0.03	0.04	0.12
B4	2012	6	227	111.5		45211	31	206	405		0.05	0.05	0.16
	2072		249	111.5	9	120896	84	550	1000	1000	0.05	0.12	0.25
B5	2012	7	117	44.1		17891	12	81	405		0.03	0.02	0.08
	2072		117	44.1		44129	31	201	1000		0.03	0.04	0.10
B6	2012	7	65	73.2		29685	21	135	405		0.01	0.03	0.06
	2072		65	73.2		73220	51	333	1000		0.01	0.07	0.11
B7	2012	1	48	70.9		21639	15	98	305		0.01	0.02	0.05
Bartel	2072		48	70.9		70913	49	322	1000		0.01	0.07	0.10
B8	2012	4	201	82.4		33404	23	152	405		0.04	0.03	0.14
	2072		235	82.4	16	98113	68	446	1000	1000	0.05	0.10	0.22
B9	2012	11	121	53.4		21649	15	98	405		0.03	0.02	0.08
	2072		123	53.4	1.0	54399	38	247	1000	1000	0.03	0.05	0.12
B10	2012	9	72	44.1		17882	12	81	405		0.02	0.02	0.05
	2072		72	44.1		44108	31	200	1000		0.02	0.04	0.08
B11	2012	6	181	121.9		49436	34	225	405		0.04	0.05	0.14
	2072		224	121.9	10	131468	91	598	1000	1000	0.05	0.13	0.24
B12	2012	1	36	20.9		8458	6	38	405		0.01	0.01	0.03
	2072		36	20.9		20861	14	95	1000		0.01	0.02	0.04
B13	2012	7	119	205.5		83333	58	379	405		0.03	0.08	0.14
	2072		1,242	205.5	294.0	499546	347	2271	1000	1000	0.27	0.50	1.13
2012 Totals			1,538	1,031	0	410,874	285	1,868	5,170	0	0.3	0.4	1.2
2072 Totals			2,855	1,031	369	1,399,620	972	6,362	13,000	6,000	0.6	1.4	2.8

[1] Includes a Dry Weather Flow peaking factor of 2.3 based on the diurnal curve data.

TABLE 5

Burney Water District
Sewer Master Plan
GROWTH AREAS

Development Number[1]	Land Use Designation	Acres	I&I (GPD) @1000 GPAD[4]	I&I Equiv HEs[5]	Estimated ADWF HEs[5]	I&I (MGD) @1000 GPAD[4]	ADWF (MGD)	PWWF (MGD)	Service Area
1A	Residential[2]	261	260,660	1,185	664	0.261	0.146	0.597	B13, B2
1B	Commercial[3]	66	66,270	301	530	0.066	0.117	0.335	B13
2	Residential[2]	6	5,750	26	20	0.006	0.004	0.016	B13
3	Residential[2]	10	9,530	43	43	0.010	0.009	0.031	B11
4	Residential[2]	9	9,380	43	22	0.009	0.005	0.021	B4
5	Residential[2]	16	15,720	71	34	0.016	0.007	0.033	B8
6	Residential[2]	2	1,880	9	4	0.002	0.001	0.004	B9, B13
	TOTALS	369	369,190	1,678	1,317	0.369	0.290	1.036	

Development Number[1]	Land Use Designation	Acres	I&I (GPD) @1500 GPAD[6]	I&I Equiv HEs[5]	Estimated ADWF HEs[5]	I&I (MGD) @1500 GPAD[6]	ADWF (MGD)	PWWF (MGD)	Service Area
1A	Residential[2]	261	390,990	1,777	664	0.391	0.146	0.727	B13, B2
1B	Commercial[3]	66	99,405	452	530	0.099	0.117	0.368	B13
2	Residential[2]	6	8,625	39	20	0.009	0.004	0.019	B13
3	Residential[2]	10	14,295	65	43	0.014	0.009	0.036	B11
4	Residential[2]	9	14,070	64	22	0.014	0.005	0.025	B4
5	Residential[2]	16	23,580	107	34	0.024	0.007	0.041	B8
6	Residential[2]	2	2,820	13	4	0.003	0.001	0.005	B9, B13
	TOTALS	369	553,785	2,517	1,317	0.554	0.290	1.220	

Development Number[1]	Land Use Designation	Acres	I&I (GPD) @500 GPAD[7]	I&I Equiv HEs[5]	Estimated ADWF HEs[5]	I&I (MGD) @500 GPAD[7]	ADWF (MGD)	PWWF (MGD)	Service Area
1A	Residential[2]	261	130,330	592	664	0.130	0.146	0.466	B13, B2
1B	Commercial[3]	66	33,135	151	530	0.033	0.117	0.301	B13
2	Residential[2]	6	2,875	13	20	0.003	0.004	0.013	B13
3	Residential[2]	10	4,765	22	43	0.005	0.009	0.027	B11
4	Residential[2]	9	4,690	21	22	0.005	0.005	0.016	B4
5	Residential[2]	16	7,860	36	34	0.008	0.007	0.025	B8
6	Residential[2]	2	940	4	4	0.001	0.001	0.003	B9, B13
	TOTALS	369	184,595	839	1,317	0.185	0.290	0.851	

(1) See Plate 2 for development locations.
(2) Assumes one HE per residence.
(3) Commercial property is assumed to be 8 HEs per acre.
(4) Assume an I&I rate of 1000 GPAD
(5) One HE equals 220 GPD
(6) Assume an I&I rate of 1500 GPAD
(7) Assume an I&I rate of 500 GPAD

TABLE 6

Burney Water District

Sewer Master Plan

HYDRAULIC MODEL SEWER CAPACITY AND FLOW SUMMARY W/ I&I @ 1000 GPAD

								2012			2072			RECOMMENDED IMPROVEMENTS				
														REPLACEMENT SEWER		PARALLEL SEWER		
Model Pipe ID No.	From Model Manhole	To Model Manhole	Sewer Diameter (in)	Existing Or Future	Length (ft)	Sewer Slope (ft/ft)	Pipe Capacity (MGD)	Pipe Flow (gpm)	Model PWWF (MGD)	PWWF Surcharge (ft)	Pipe Flow (gpm)	Model PWWF (MGD)	Estimated PWWF Surcharge (ft)	Size (in)	Capacity (MGD)	Size (in)	Capacity (MGD)	Comments
121	49	48	6	E	197	0.055	0.85	26.0	0.037		46.0	0.066						
123	88	87	6	E	167	0.008	0.324	70.0	0.101		145.0	0.209						
125	87	99A	6	E	184	0.004	0.229	74.8	0.108		157.0	0.226		8	0.49	8	0.72	Parallel w/ 8"
127	99A	99	8	E	156	0.002	0.349	85.7	0.123		173.9	0.250						
13	175	173	8	E	473	0.003	0.427	297.7	0.429		440.9	0.635	1.678	10	0.77	8	0.85	Parallel w/ 8"
15	400	10	8	E	375	0.002	0.349	46.9	0.068		117.1	0.169						
17	174	176	8	E	185	0.003	0.427	576.5	0.830	1.5	586.1	0.844	1.586	10	0.77	8	0.85	Replace w/ 12" due to slope
19	176	175	8	E	500	0.002	0.349	344.8	0.497	1.0	559.5	0.806	4.272	12	1.03	10	0.98	Replace w/ 12" due to slope
191	45A	45	8	E	500	0.004	0.493	27.7	0.040		50.4	0.073						
21	173	172	8	E	390	0.002	0.349	271.5	0.391	0.2	436.9	0.629	1.728	12	1.03	8	0.70	Parallel w/ 8"
211	81	42	8	E	356	0.011	0.818	89.4	0.129		180.1	0.259						
215	45	44	8	E	304	0.005	0.551	30.9	0.044		55.2	0.079						
217	44	43	10	E	188	0.005	1.000	33.2	0.048		58.6	0.084						
221	43	42	10	E	313	0.003	0.774	34.4	0.050		61.2	0.088						
235	41	40	10	E	299	0.001	0.447	126.8	0.183		244.3	0.352						
245	73	72	6	E	167	0.005	0.256	7.4	0.011		12.0	0.017						
247	72	71	6	E	245	0.005	0.256	11.9	0.017		18.6	0.027						
249	71	40	6	E	301	0.006	0.280	15.6	0.023		24.7	0.036						
259	70	60	8	E	218	0.004	0.493	14.3	0.021		22.6	0.033						
261	63A	70	8	E	115	0.006	0.604	12.6	0.018		18.7	0.027						
265	60	37	8	E	350	0.007	0.652	17.4	0.025		27.8	0.040						
267	40	38	10	E	558	0.003	0.774	136.3	0.196		259.1	0.373						
269	38	37	10	E	179	0.003	0.774	137.5	0.198		262.7	0.378						
27	10	9000	8	E	60	0.004	0.493	46.2	0.066		115.2	0.166						
275	37	36	12	E	367	0.002	1.028	155.4	0.224		291.2	0.419						
277	36	35	12	E	300	0.004	1.454	157.6	0.227		295.2	0.425						
305	35	34	12	E	265	0.001	0.727	162.7	0.234		300.2	0.432						
335	16	15	12	E	249	0.002	1.028	355.6	0.512		557.3	0.802						
337	15	14	12	E	136	0.003	1.259	348.5	0.502		547.4	0.788						
339	14	13	12	E	174	0.004	1.454	350.0	0.504		548.6	0.790						
341	13	12A	12	E	195	0.003	1.259	351.2	0.506		550.5	0.793						
347	151	21	12	E	320	0.002	1.028	304.6	0.439		511.4	0.736						
349	21	20	12	E	382	0.002	1.028	305.0	0.439		520.8	0.750						
351	20	19	12	E	395	0.002	1.028	301.5	0.434		518.6	0.747						
353	19	18	12	E	424	0.002	1.028	361.2	0.520		559.7	0.806						
365	24	23	8	E	360	0.011	0.818	81.0	0.117		149.5	0.215						
419	168	166	8	E	690	0.004	0.493	214.9	0.309		360.6	0.519	0.261	10	0.89	8	0.99	Parallel w/ 8"
421	166	23A	8	E	350	0.019	1.075	209.7	0.302		350.7	0.505						
423	23	23A	10	E	360	0.004	0.894	87.7	0.126		160.4	0.231						
425	23A	152B	8	E	247	0.013	0.889	294.5	0.424		474.3	0.683						
429	26	25	8	E	488	0.007	0.652	77.2	0.111		147.5	0.212						
431	25	24	8	E	305	0.009	0.740	78.3	0.113		149.4	0.215						
451	30	29	6	E	435	0.009	0.344	65.0	0.094		121.5	0.175						
455	29	28	6	E	308	0.006	0.280	62.0	0.089		118.6	0.171						

TABLE 6

Burney Water District

Sewer Master Plan

HYDRAULIC MODEL SEWER CAPACITY AND FLOW SUMMARY W/ I&I @ 1000 GPAD

								2012			2072			RECOMMENDED IMPROVEMENTS				
														REPLACEMENT SEWER		PARALLEL SEWER		
Model Pipe ID No.	From Model Manhole	To Model Manhole	Sewer Diameter (in)	Existing Or Future	Length (ft)	Sewer Slope (ft/ft)	Pipe Capacity (MGD)	Pipe Flow (gpm)	Model PWWF (MGD)	PWWF Surcharge (ft)	Pipe Flow (gpm)	Model PWWF (MGD)	Estimated PWWF Surcharge (ft)	Size (in)	Capacity (MGD)	Size (in)	Capacity (MGD)	Comments
483	172	171	8	E	500	0.002	0.349	235.1	0.339		383.2	0.552	1.473	10	0.63	8	0.70	Parallel w/ 8"
489	170	168	8	E	485	0.004	0.493	227.6	0.328		378.8	0.545	0.404	10	0.89	8	0.99	Parallel w/ 8"
505	152	151	12	E	120	0.003	1.259	297.6	0.429		491.0	0.707						
517	64	63A	8	E	340	0.004	0.493	12.3	0.018		16.9	0.024						
567	7	6	15	E	943	0.003	2.283	507.1	0.730		918.2	1.322						
577	190B	190A	8	E	264	0.003	0.427	39.5	0.057		141.6	0.204						
579	190A	190-1	8	E	77	0.002	0.349	45.0	0.065		148.5	0.214						
583	190-1	190	8	E	420	0.007	0.652	48.2	0.069		153.6	0.221						
587	190	198B	8	E	163	0.010	0.780	58.1	0.084		170.3	0.245						
589	198B	187B	8	E	264	0.011	0.818	63.5	0.091		182.4	0.263						
591	187B	187	8	E	412	0.007	0.652	70.8	0.102		194.8	0.280						
595	187	186	8	E	139	0.002	0.349	73.6	0.106		200.6	0.289						
599	186	185	10	E	430	0.004	0.894	75.6	0.109		198.8	0.286						
601	185	184	10	E	563	0.003	0.774	82.6	0.119		219.4	0.316						
615	184	6	10	E	610	0.003	0.774	86.9	0.125		223.5	0.322						
617	6	P4	15	E	1147	0.002	1.864	581.2	0.837		1092.7	1.574						
619	P4	467	15	E	179	0.002	1.864	593.4	0.854		1111.0	1.600						
621	P3	P2	15	E	1450	0.002	1.864	607.2	0.874		1794.8	2.584	2.582	18	3.03	15	3.73	Parallel w/ 15"
623	P2	P1	15	E	867	0.001	1.318	616.7	0.888		1791.8	2.580	2.400	21	3.23	18	3.46	Parallel w/ 18"
647	202A	190B	6	E	459	0.004	0.229	34.6	0.050		137.3	0.198						
649	203	202A	8	E	205	0.005	0.551	22.0	0.032		127.5	0.184						
665	467	P3	15	E	1028	0.002	1.864	602.6	0.868		1901.7	2.738	2.309	18	3.03	15	3.73	Parallel w/ 15"
675	P1	9002	15	E	10	0.103	13.379	613.7	0.884		1770.0	2.549						
679	473	471	8	E	1	2.000	11.028	2325.0	3.348		2325.0	3.348						
71	90	89A	6	E	100	0.069	0.951	57.8	0.083		107.3	0.155						
715	475	400	8	E	402	0.002	0.349	51.3	0.074		130.2	0.187						
73	89A	88A	6	E	283	0.010	0.362	66.5	0.096		131.4	0.189						
749	9	7	15	E	434	0.001	1.318	503.1	0.724		904.4	1.302		18	2.14	12	2.05	Parallel w/ 12"
75	88A	88	6	E	132	0.005	0.256	66.3	0.095		134.0	0.193						
751	18	16	12	E	404	0.010	2.299	349.0	0.503		554.3	0.798						
753	152B	152	12	E	558	0.003	1.259	300.8	0.433		474.1	0.683						
755	28	26	6	E	564	0.004	0.229	68.1	0.098		132.1	0.190						
757	171	170	8	E	233	0.018	1.046	239.1	0.344		395.3	0.569						
759	34	12	12	E	451.7	0.003	1.259	163.6	0.236		302.0	0.435						
761	42	41	10	E	339	0.003	0.774	119.4	0.172		232.8	0.335						
765	99	82A	8	E	446	0.008	0.697	86.9	0.125		176.0	0.253						
767	48	45A	6	E	761	0.021	0.525	25.0	0.036		45.5	0.066						
769	82A	81	8	E	695	0.002	0.349	90.1	0.130		181.5	0.261						
771	12A	9	15	E	820	0.004	2.636	485.0	0.698		863.5	1.243						
773	12	12A	15	E	108	0.001	1.318	166.2	0.239		305.9	0.440						

(1) Minimum sewer size to be 8-inch.

(2) District to observe problem sewers during future PWWF conditions to verify if significant surcharging is occurring prior to performing recommended improvements.

(3) Assumed I&I rate of 1000 GPAD

TABLE 7

Burney Water District

Sewer Master Plan

RECOMMENDED IMPROVEMENTS & CAPACITY CHARGE BASIS [1]

Item No.		ESTIMATED COST[2] Immediate Term (2012-2022)	Near Term (2022-2032)	Intermediate Term (2032-2052)	Long Term (2052-2072)	% Attributed to Growth	Cost Attributed to Growth
GENERAL COLLECTION SYSTEM IMPROVEMENTS							
1	Replace 700' of 8" Bartel St Sewer with 12" (Pts. 1 to 2)	$160,000				0%	$0
2	Parallel 1,500' of 8" Park Ave Sewer with 8" (Pts. 2 to 3)		$265,000			46%	$121,900
3	Parallel 2,500' of 15" Sewer Prior to Main LS with 15" (Pts. 4 to 5)			$450,000		46%	$207,000
4	Parallel 900' of 15" Sewer Prior to Main LS with 18" (Pts. 5 to 6)			$205,000		46%	$94,300
5	Parallel 1,500' of 8" Missouri Way & Grogan St Sewer with 8" (Pts. 7 to 8)				$190,000	46%	$87,400
6	Parallel 400' of 15" Ontario Ave Sewer with 12" (Pt. 9)				$65,000	46%	$29,900
7	Parallel 200' of 6" Orchard Way Sewer with 8" (Pt. 10)				$25,000	46%	$11,500
8	Aging Sewer Main Replacements [3]	$500,000	$500,000	$1,000,000	$1,000,000	0%	$0
BARTEL LIFT STATION IMPROVEMENTS							
9	Manual Transfer Switch	$10,000				0%	$0
10	Portable Generator	$40,000				0%	$0
11	Pump Removal System	$30,000				0%	$0
12	O&M Manual	$5,000				0%	$0
13	Replace 2 Centrifugal Pumps with Starters			$80,000		46%	$36,800
MAIN LIFT STATION IMPROVEMENTS							
14	8-inch Mag Meter	$16,000				0%	$0
15	Fall Prevention System	$10,000				0%	$0
16	2 Centrifugal Pumps with Starters	$80,000				46%	$36,800
17	Bypass Piping		$25,000			0%	$0
18	Force Main Pigging		$10,000			0%	$0
19	Replace 3 Centrifugal Pumps with Starters				$120,000	46%	$55,200
20	Replace Generator				$70,000	46%	$32,200
GENERAL COLLECTION SYSTEM IMPROVEMENTS SUBTOTAL:		**$851,000**	**$800,000**	**$1,735,000**	**$1,470,000**		**$713,000**
WWTP IMPROVEMENTS							
21	Replace HDPE Liner	$140,000				0%	$0
22	Influent Screening Unit	$200,000				0%	$0
23	15 Hp Floating Aerator	$25,000				0%	$0
24	Vacuum Truck	$250,000					
25	Replace brush aerator w/ floating aerators, complete w/ updated electrical		$100,000				
26	15 Hp RAS/WAS Pump	$30,000				0%	$0
27	SCADA System - Integrate with Lift Stations, Complete	$200,000				0%	$0
28	50-foot Clarifier		$800,000			46%	$368,000
29	Fall Prevention System & Freeze Protection for RAS Vault	$15,000				0%	$0
30	Rehab Existing Clarifier Mechanical, Complete		$250,000			46%	$115,000
31	Oxidation Pond Cleaning & Plowing	$10,000	$10,000	$20,000	$20,000	0%	$0
32	Handrails/Walkways at Oxidation Ponds	$50,000					
33	Yearly Sludge Dredging	$370,000	$100,000	$200,000	$200,000	0%	$0
34	Sludge Lagoon Aerators	$20,000	$20,000			46%	$18,400
35	New Sludge Lagoon		$250,000			46%	$115,000
36	WWTP HVAC System		$10,000			0%	$0
37	Replace MCC& Update Electrical, Complete				$300,000	46%	$138,000
38	Replace 2 RAS/WAS Pumps			$60,000		46%	$27,600
39	Replace Scum Pump			$10,000		46%	$4,600
WWTP IMPROVEMENTS SUBTOTAL:		**$1,310,000**	**$1,540,000**	**$290,000**	**$520,000**		**$787,000**
TOTAL ESTIMATED CONSTRUCTION COSTS:		$2,161,000	$2,340,000	$2,025,000	$1,990,000		$1,500,000
Contingency & Indirect Costs (45%):		$972,000	$1,053,000	$911,000	$896,000		$675,000
TOTAL ESTIMATED PROJECT COSTS:		**$3,133,000**	**$3,393,000**	**$2,936,000**	**$2,886,000**		**$2,175,000**
Cumulative Project Costs:		$3,133,000	$6,526,000	$9,462,000	$12,348,000		

Total Cumulative Project Costs w/o Growth Components:	$10,173,000
Average Yearly Cost for 60 Years:	$169,550
Number of Existing Hes:	1538
Average Yearly Cost per HE:	$110.24
Average Monthly Cost per HE:	**$9.19**

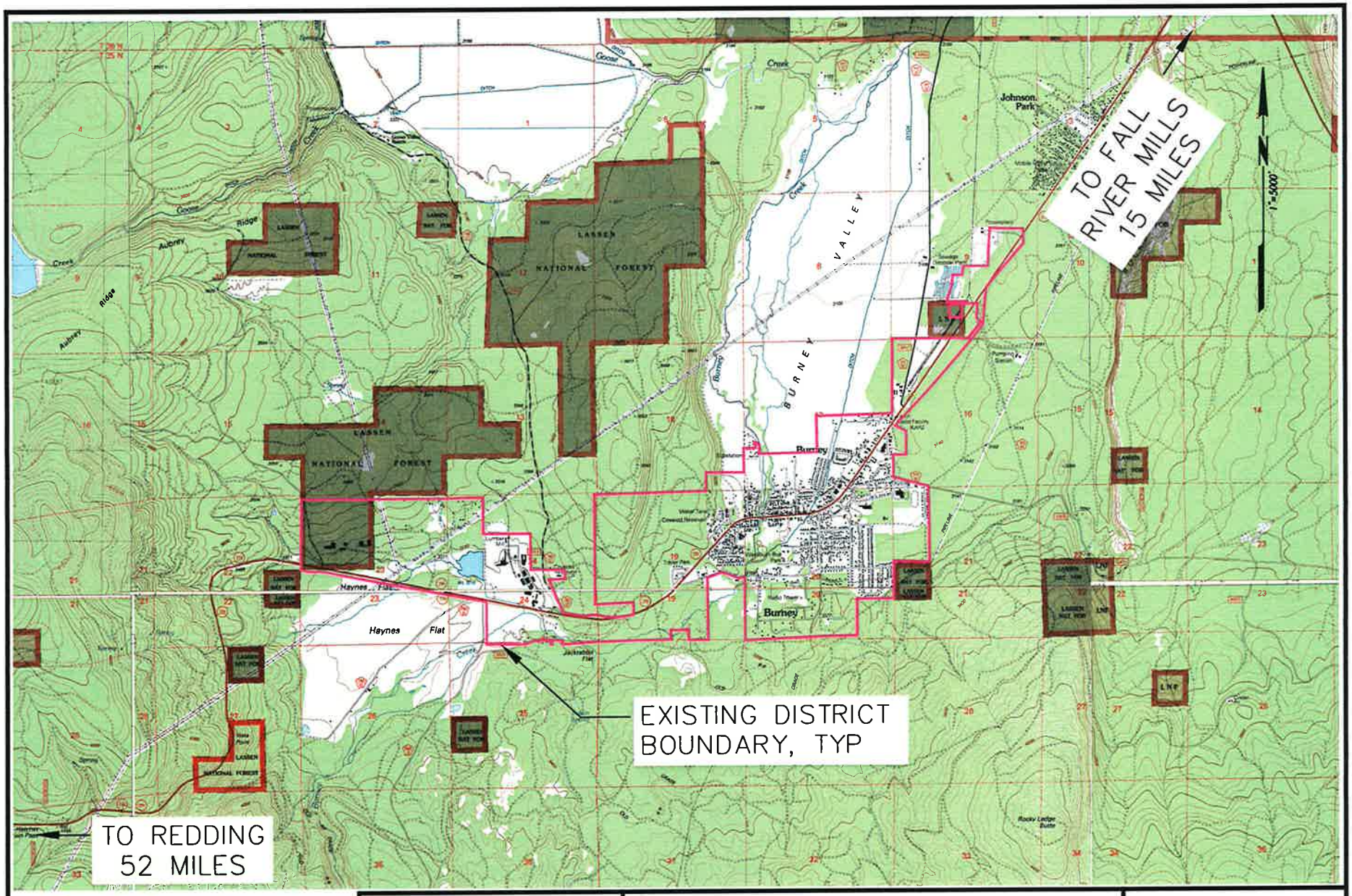
Additional HEs Over Next 60 Years:	1317
Additional Future Capacity Charge per HE:	$1,651.48
Existing Capacity Charge:	$6,130.60
Total Future Capacity Charge:	**$7,782**

[1] Based on a 1% annual growth rate.

[2] All costs in Jan 2014 dollars at an ENR index of 9664.

[3] Costs shown would result in ~20% of systemwide sewer main replacement after 60 years.

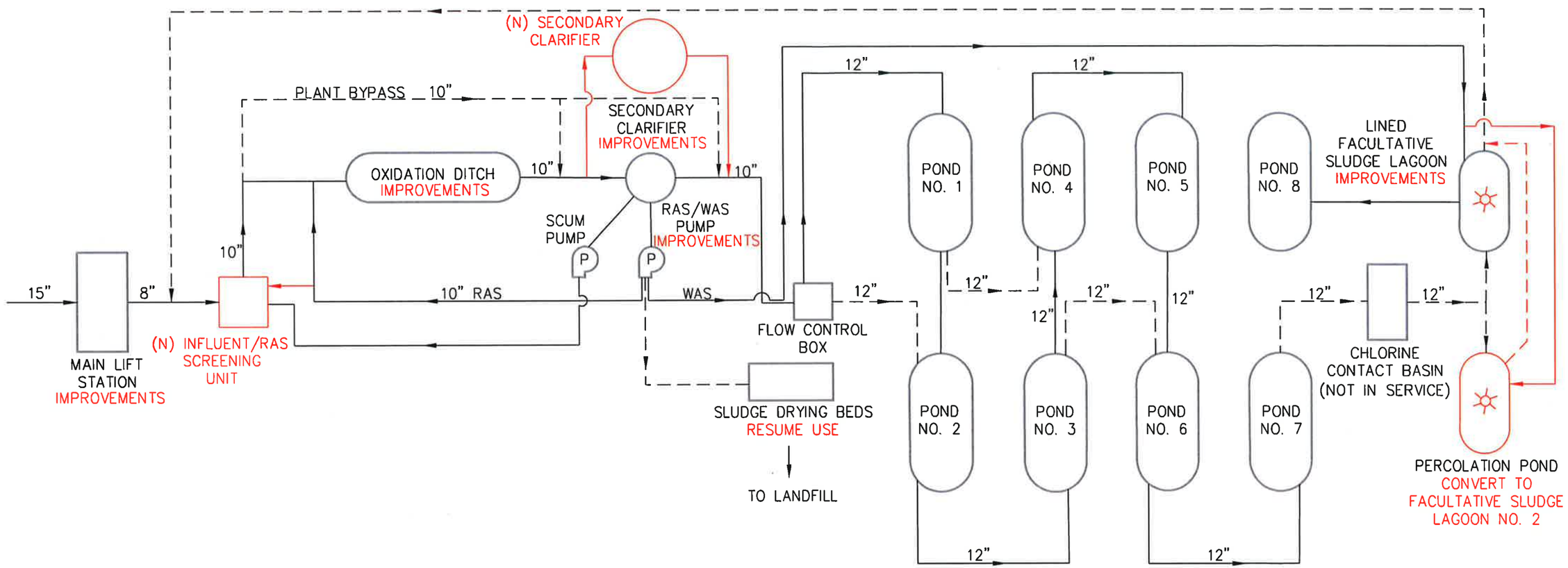
FIGURES



PACE ENGINEERING
REDDING, CALIFORNIA

BURNEY WATER DISTRICT BOUNDARY MAP

FIGURE 1
DATE: 6/13
JOB #306.24



NOT TO SCALE

PACE ENGINEERING
REDDING, CALIFORNIA

BURNEY WATER DISTRICT
SEWER MASTER PLAN
EXISTING WWTP FLOW DIAGRAM
WITH PROPOSED IMPROVEMENTS

FIGURE 2
DATE: 01/14
JOB # 306.24

Plot Date: January 29, 2014 - 8:05 am Login Name: lmccollum
File Name: M:\Land Projects\0306.24 Master Sewer and Water Plans\WWTP Flow Diagram.dwg, Layout: FIG 2

FIGURE 3
Burney Water District
SEWER MASTER PLAN

PROJECTED WASTEWATER TREATMENT PLANT ADWF FLOWS

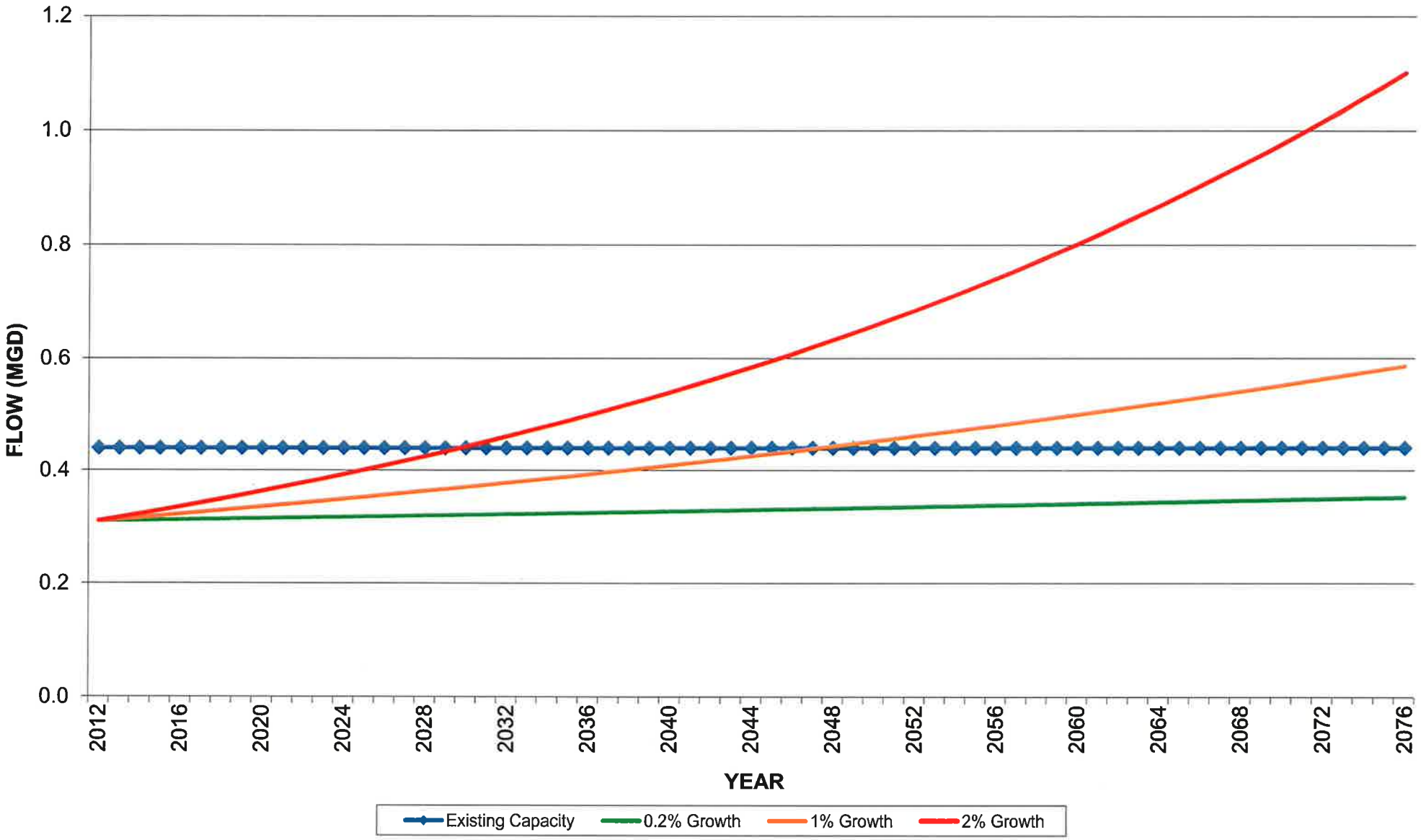
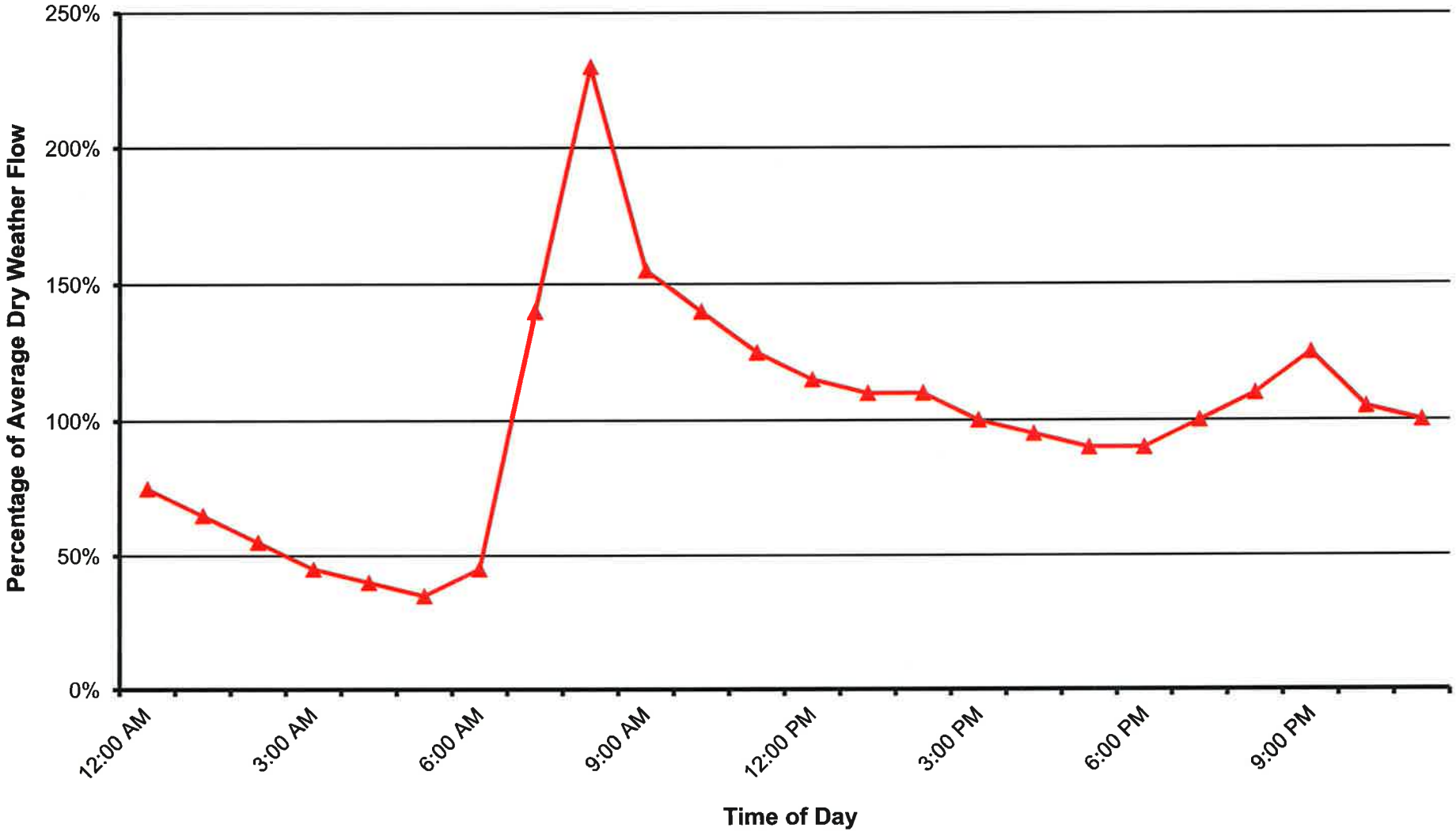


FIGURE 4
Burney Water District
SEWER MASTER PLAN
COLLECTION SYSTEM DIURNAL CURVE



M:\Jobs\0306\0306.24 Sewer and Water Master Plans and Rate Study\0306.24.100 Sewer Master Plan\Spreadsheets\Diurnal Curve.xls
1/29/2014

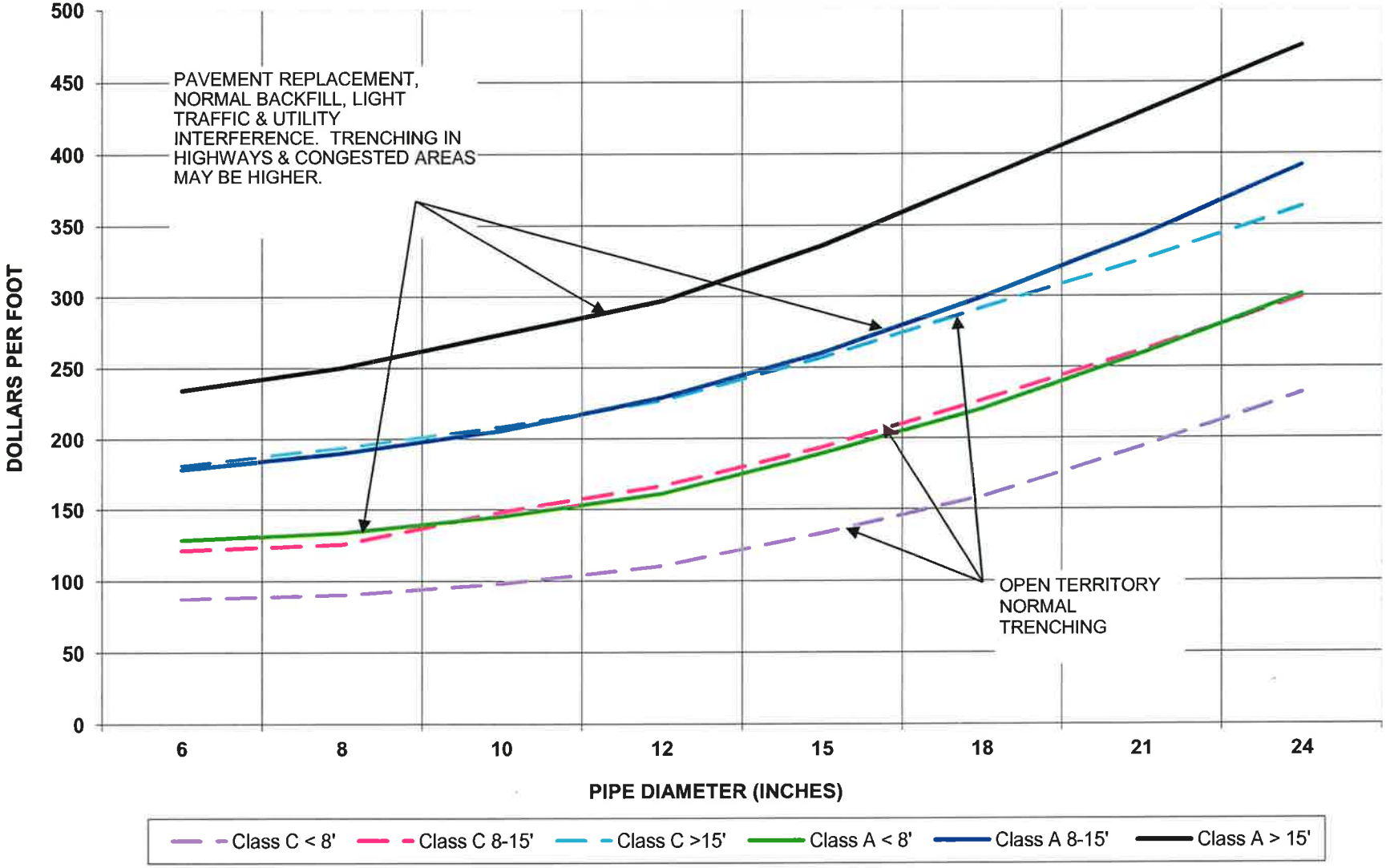
FIGURE 5

Burney Water District

SEWER MASTER PLAN

GRAVITY SEWER CONSTRUCTION COST

January 2014



NOTE: COSTS ARE FOR OPEN TRENCHING & INCLUDE ALLOWANCES FOR MANHOLES & OTHER NORMAL APPURTENANCES. THIS COST FIGURE DOES NOT INCLUDE ENGINEERING OR CONTINGENCIES, BORING AND JACKING, ROCK EXCAVATION, SEVERE GROUND WATER, EASEMENTS, OR OTHER SITE SPECIFIC FACTORS.

M:\Jobs\0306\0306.24 Sewer and Water Master Plans and Rate Study\0306.24.100 Sewer Master Plan\Spreadsheets\Gravity Sewer Construction Costs May 2013.xls

1/29/2014

APPENDIX A

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 94-017

WASTE DISCHARGE REQUIREMENTS FOR BURNEY WATER DISTRICT WASTEWATER TREATMENT FACILITY SHASTA COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

1. Waste Discharge Requirements Order No. 84-070, adopted by the Board on 22 June 1984, prescribed requirements for a discharge from Burney Water District (hereafter Discharger). The property (Assessor's Parcel No. 003-100-51) is currently owned by the Discharger.

2. Present waste discharge requirements established by Order No. 84-070 are neither adequate nor consistent with plans and policies of the Board.

3. The Burney Water District facility (hereafter Facility) is in Section 9, T35N, R2E, MDB&M, with surface drainage to Burney Creek, a tributary to Lake Britton, as shown in Attachment "A" which is attached hereto and part of the Order by reference. The site is within the Sacramento River Hydrologic Storage Area No. 526.32 as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986.

4. The Discharger discharges a maximum of 0.44 mgd (19.3 l/sec) of domestic wastewater from the treatment facility to unlined or partially lined stabilization ponds. The facility consists of a static screen, headworks, oxidation ditch, secondary clarifier, sludge lagoon, drying beds, and eight evaporation/percolation ponds. The process flow schematic is shown in Attachment "B" which is attached hereto and part of the Order by reference.

5. The Discharger also discharges cooling tower blowdown, boiler blowdown, and plant washdown water from Burney Mountain Power Cogeneration Facility. The cogeneration plant wastewater is discharged to a pond dedicated for this discharge and does not commingle with domestic wastewater.

6. The Discharger also accepts and discharges wastewater from log deck recycle ponds at Burney Forest Products (BFP), and wastewater from log deck recycle ponds at Sierra Pacific Industries (SPI, Burney). Log Deck recycle pond water is discharged directly to the percolation ponds.

7. The Discharger also accepts and discharges leachate from the Intermountain Landfill, Incorporated, Class III Solid Waste Landfill, and leachate from the Burney Transfer Station, a solid waste transfer station under permit to Shasta County Department of Public Works. Leachate from the Intermountain Landfill is analyzed in accordance with Waste Discharge Requirements Order No. 90-229 issued by the Board. Leachate from the Burney Transfer Station is analyzed in accordance with Facility Permit No. 45-11-0001 issued by Shasta County Department of Resource Management, Environmental Health Division. All leachate is processed through the oxidation ditch and clarifier before discharge to the percolation pond.

8. The Facility was constructed on a basaltic lava flow in varying stages of weathering. In 1985 and 1986, Geotechnical Consultants, Incorporated, conducted subsurface exploration and percolation testing (GCI study) of the eight existing ponds to determine if underlying soils met Board guidelines for percolation ponds. The study indicated Ponds 1 through 7 will perform as percolation ponds within the Board's guidelines based on the following:

   a. Ponds 1 through 7 have percolation rates slower than five minutes per inch.

   b. There was no evidence of lava tubes or other open fractures without benefit of soil filtration.

   c. Secondary pathways (jointing) were clearly present in the subsurface; however, these fractures were typically clay-filled and vertically discontinuous.

   d. The interlayering of fresh rock and highly weathered zones appears to fulfill the five feet of soil horizon on a cumulative basis.

9. The GCI study determined that Pond 8 maintained seepage at the base of its berm, and the consultant concluded that Pond 8 could not be utilized until this problem had been corrected. Pond 8 currently utilizes a French drain to intercept any seepage through the base of its berm. Pond 8 is used to dispose of supernatant from the lined facultative sludge lagoon. Any supernatant collected in the French drain is carried to the unlined pond adjacent to the old chlorine contact basin.

10. The Board adopted a Water Quality Control Plan, Second Edition, for the Sacramento River Basin (5A), hereafter Basin Plan, which contains water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

11. The beneficial uses of Burney Creek and Lake Britton are agricultural supply; hydroelectric power generation; recreation; esthetic enjoyment; ground water recharge; freshwater replenishment; and preservation and enhancement of fish, wildlife, and other aquatic resources.

12. The beneficial uses of the ground water are domestic, municipal, industrial, and agricultural supply.

13. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act, in accordance with Section 15301, Title 14, California Code of Regulations (CCR).

14. This discharge is exempt from the requirements of Section 2511(b), Chapter 15, Division 3, Title 23, CCR. The exemption is based on the following:

    a. The Board has issued waste discharge requirements,

    b. The discharge is in compliance with the applicable Water Quality Control Plan, and

    c. The wastewater does not need to be managed according to Chapter 30 of Division 4, Title 22, CCR, as a hazardous waste.

15. The Board has notified the Discharger and interested agencies and person of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

16. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that Order No. 84-070 is rescinded and Burney Water District, its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. Discharge Prohibitions (General)

1. The direct discharge of wastes to surface waters or surface water drainage courses is prohibited.

2. The by-pass or overflow of untreated or partially treated waste is prohibited.

3. Discharge to unlined stabilization ponds or percolation ponds where the underlying soils do not meet the following criteria is prohibited:

   a. Percolation rate of underlying soils is slower than 5 minutes per inch at any point.

   b. Minimum flow path through soil to open fractures of five feet.

4. The discharge of waste classified as 'hazardous' or 'designated,' as defined in Sections 2521(a) and 2522(a) of Chapter 15, is prohibited.

B. Discharge Prohibitions (Industrial Wastewater)

1. The discharge to the evaporation/percolation pond of industrial wastewater containing constituents with concentrations in excess of the limits contained in the State of California, Department of Health Services Drinking Water Standards, Title 22, is prohibited.

2. The discharge of waste containing any carcinogen or reproductive toxin listed by the Governor pursuant to Health and Safety Code Sections 25249.5 through 25249.13, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), where such chemical passes or probably will pass into any source of drinking water, is prohibited.

C. Discharge Specifications

1. Neither the treatment nor the discharge shall cause a pollution or nuisance as defined by the California Water Code, Section 13050.

2. The discharge shall not cause degradation of any water supply.

3. The 30-day average daily dry weather discharge flow shall not exceed 0.44 million gallon (19.3 l/sec).

4. Objectionable odors originating at this facility shall not be perceived beyond the limits of the wastewater treatment and disposal areas.

5. As a means of discerning compliance with Discharge Specification No. 4, the dissolved oxygen content in the upper zone (1 foot) of stabilization ponds shall not be less than 1.0 mg/l.

6. Public contact with wastewater shall be precluded through such means as fences, signs, or some other acceptable alternatives.

7. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

8. Ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration. Design seasonal precipitation shall be based on total annual precipitation using a return period of 25 years, distributed monthly in accordance with historical rainfall patterns. Freeboard shall never be less than two feet (measured vertically).

9. Ponds shall be managed to prevent breeding of mosquitoes. In particular,

    a. An erosion program should assure that small coves and irregularities are not created around the perimeter of the water surface.

    b. Weeds shall be minimized through control of water depth, harvesting, or herbicides.

    c. Dead algae, vegetation, and debris shall not accumulate on the water surface.

10. The discharge of an industrial wastewater effluent to the evaporation/ percolation pond shall not exceed the following:

Constituents	Unit	Maximum
Total Dissolved Solids	mg/l	1,000
Oil and Grease	mg/l	5

D. Sludge Disposal

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner that is consistent with Chapter 15 of Title 23, CCR, and approved by the Executive Officer.

2. Any proposed change in sludge use or disposal practice shall be reported to the Executive Officer at least **90 days** in advance of the change.

3. Use and disposal of sewage sludge shall comply with existing federal and state laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

   If the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.

4. The Discharger is encouraged to comply with the State Guidance Manual issued by the Department of Health Services titled *Manual of Good Practice for Landspreading of Sewage Sludge.*

5. By **1 June 1994**, the Discharger shall submit a sludge disposal plan describing the annual volume of sludge generated by the plant and specifying the disposal practices.

E. Ground Water Limitations

The discharge shall not cause underlying ground water to:

1. Be degraded.

2. Contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

3. Exceed a most probable number of coliform organisms of 2.2/100 ml over any seven-day period.

4. Contain concentrations of chemical constituents in amounts that adversely affect agricultural use.

F. Provisions

1. The Discharger shall comply with Monitoring and Reporting Program No. 94-017, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

2. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

3. The use of effluent for irrigation must comply with the provisions of Title 22, Division 4, CCR, Section 60309. The Discharger must obtain written approval from the Executive Officer prior to the use of effluent on adjacent lands.

4. The Discharger shall report promptly to the Board any material change or proposed change in the character, location, or volume of the discharge.

5. The Discharger shall provide certified wastewater treatment plant operators in accordance with regulations adopted by the SWRCB.

6. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall

notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to this office.

7. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

8. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.

9. The Board will review this Order periodically and may revise requirements when necessary.

I, WILLIAM H. CROOKS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 28 January 1994.

WILLIAM H. CROOKS, Executive Officer

CMB:djc 12/22/93

Attachments

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 94-017
FOR
BURNEY WATER DISTRICT
WASTEWATER TREATMENT FACILITY
SHASTA COUNTY

INFLUENT MONITORING - DOMESTIC WASTE

A sampling station shall be established and located where representative samples of the influent can be obtained. The following shall constitute the influent monitoring program:

Constituents	Unit	Type of Sample	Sampling Frequency
BOD_5, 20°C	mg/l	Grab	Monthly
Inflow	mgd	--	At Same Time as Influent Sampling

EFFLUENT MONITORING - DOMESTIC WASTE

The following shall constitute the evaporation/percolation pond monitoring program:

Constituents	Unit	Type of Sample	Sampling Frequency
Flow	mgd	--	Daily
Dissolved Oxygen	mg/l	Grab	Daily
Liquid Depth and Freeboard	Feet	Visual	Weekly
Precipitation	Inches	Visual	Weekly

INDUSTRIAL WASTEWATER MONITORING

A sampling station shall be established and located where representative samples of the industrial influent can be obtained. The following shall constitute the industrial influent monitoring program:

Constituents	Unit	Type of Sample	Sampling Frequency
Flow	Gallons	--	Daily
Specific Conductivity	μmhos @ 25°C/cm	Grab	Daily
Total Dissolved Solids	mg/l	Grab	Weekly
pH	pH Units	Grab	Weekly
Oil and Grease	mg/l	Grab	Monthly
Heavy Metals	mg/l	Grab	Annually

GROUND WATER MONITORING

The ground water monitoring program shall consist of laboratory analysis of samples collected from the private well located on the Hathaway property to the northwest of the treatment facility.

Constituent	Unit	Type of Sample	Sampling Frequency
Total Coliform Organisms	MPN	Grab	Quarterly

LOG DECK RECYCLE POND WATER MONITORING

Samples of log deck recycle pond water must be collected at the source prior to shipment. The following shall be the monitoring program for any shipments of log deck recycle pond water accepted at the Facility:

Constituent	Unit	Type of Sample	Sampling Frequency
Quantity	Gallons	--	Truckload
pH	Units	Grab	Truckload
Electrical Conductivity	µmhos/cm @ 25°C	Grab	Shipment[1]
Total Dissolved Solids	mg/l	Grab	Shipment[1]
Chloride	mg/l	Grab	Shipment[1]
Tannins and Lignins	mg/l	Grab	Shipment[1]
COD	mg/l	Grab	Shipment[1]

[1] One shipment is defined as up to 40 truckloads of 3,000 gallons each (1 shipment = 120,000 gallons). The sample analysis can be waived if already performed (for purposes of compliance with waste discharge requirements) within 2 weeks prior to shipment.

SOLID WASTE LEACHATE MONITORING

The following shall constitute the monitoring program for any leachate accepted from the Intermountain Landfill or the Burney Transfer Station:

Constituent	Unit	Type of Sample	Sampling Frequency
Source	--	--	Truckload
Flow	Gallons	--	Truckload

The Discharger shall also submit all sample analysis results required by the Burney Transfer Station - Facility Permit No. 45-AA-0001 (issued by Shasta County Department of Resource Management, Environmental Health Division).

OBSERVATIONS

The ponds shall be inspected on a regular basis to check the following:

a. Seepage through pond dikes
b. Excessive odors or other nuisances
c. Excessive weed growth, scum, or solids buildup in pond

REPORTING

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly the compliance with waste discharge requirements.

Monthly monitoring reports shall be submitted to the Regional Board by the **15th day** of the following month.

The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Board.

The Discharger shall implement the above monitoring program as of the date of this Order.

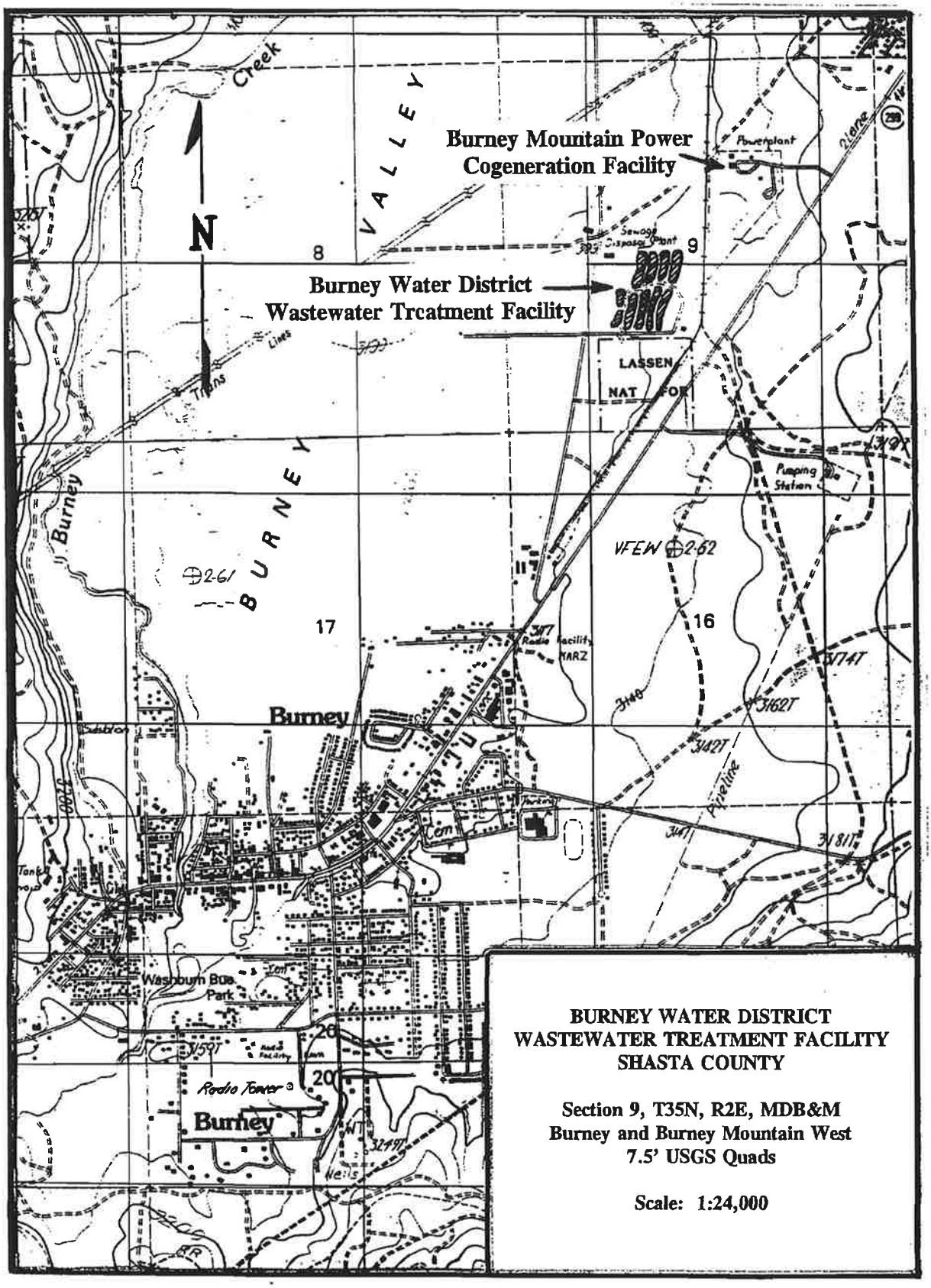
Ordered by

WILLIAM H. CROOKS, Executive Officer

28 January 1994
(Date)

CMB:djc 12/23/93

ATTACHMENT "A"

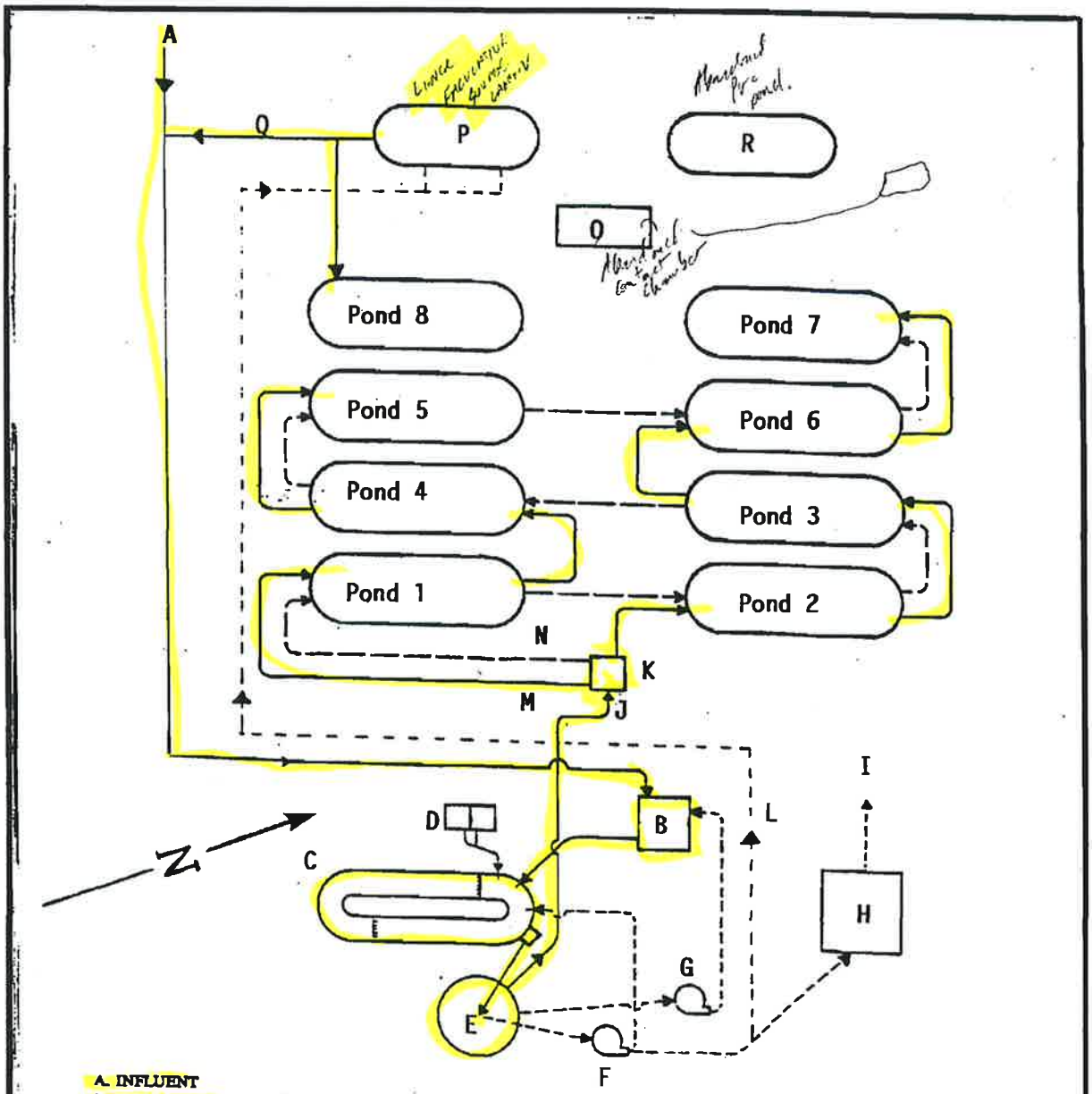


BURNEY WATER DISTRICT
WASTEWATER TREATMENT FACILITY
SHASTA COUNTY

Section 9, T35N, R2E, MDB&M
Burney and Burney Mountain West
7.5' USGS Quads

Scale: 1:24,000

ATTACHMENT "B"



A. INFLUENT
B. HYDROSIVE SCREEN
C. OXIDATION DITCH
D. RAW SLUDGE HOLDING BOX (NOT IN SERVICE)
E. CLARIFIER
F. SLUDGE PUMP
G. SCUM PUMP
H. SLUDGE DRYING BEDS
I. HAUL TO LAND DISPOSAL
J. EFFLUENT
K. FLOW CONTROL BOX
L. WASTE SLUDGE
M. PARALLEL OPERATION
N. SERIES OPERATION
O. CHLORINE CONTACT (NOT IN SERVICE)
P. FACULTATIVE SLUDGE LAGOON
Q. SUPERNATANT
R. FRENCH DRAIN SEEPAGE FROM POND 8

BURNEY WATER DISTRICT
WASTEWATER TREATMENT PLANT
PROCESS FLOW SCHEMATIC

Not to Scale

INFORMATION SHEET

BURNEY WATER DISTRICT
WASTEWATER TREATMENT FACILITY
SHASTA COUNTY

The Burney Water District operates and maintains a wastewater treatment facility for Burney, a community of approximately 4,000 people, 50 miles northeast of Redding on State Highway 299 in Shasta County. The wastewater treatment facility is in Section 9, T35N, R2E, MDB&M. Surface drainage is to Burney Creek, a tributary to Lake Britton.

The facility currently treats approximately 0.34 mgd of domestic sewage and was designed to treat a maximum of 0.44 mgd. The facility consists of static screen headworks, oxidation ditch, secondary clarifier, lined sludge lagoon, drying beds, and eight evaporation/percolation ponds. In addition to domestic sewage, the facility also receives industrial wastewater consisting of cooling tower, boiler blowdown, and plant washdown water from Burney Mountain Power, a wood-burning cogeneration facility. The industrial wastewater from the cogeneration facility is discharged directly to an evaporation/percolation pond, by-passing the oxidation ditch. The requirements have separate monitoring programs for the industrial and domestic wastewater.

The Discharger also discharges wastewater from log deck recycle ponds from Burney Forest Products (BFP), wastewater from log deck recycle ponds from Sierra Pacific Industries (SPI, Burney), leachate from the Intermountain Landfill, Incorporated, Class III Solid Waste Landfill, and leachate from the Burney Transfer Station, a solid waste transfer station under permit to Shasta County Department of Public Works.

The facility is underlain by basaltic lava flow in various stages of weathering. The near-surface materials under the ponds consists of six inches to four feet of Gravelly Clay. Below this zone are layers of highly weathered "soilized" rock.

The facility was placed in operation in 1974 and the original design was based on a clay lining in the ponds with the effluent passing through the eight ponds and disposed of by irrigation or percolation. The native clay material used in the percolation ponds did not provide adequate sealing, resulting in rapid percolation. The requirements prohibit discharge to the ponds where underlying soils do not meet a minimum flow path through soil to open fractures of five feet, and a percolation rate slower than five minutes per inch. In 1985 and 1986, the Discharger retained Geotechnical Consultants, Incorporated, to conduct subsurface exploration and percolation studies to determine if the underlying soils met the above guidelines for percolation ponds. The results indicated the following:

a. Ponds 1 through 7 have percolation rates slower than five minutes per inch.

b. There was no evidence of lava tubes or other open fractures without benefit of soil filtration.

c. Secondary pathways were typically clay filled and vertically discontinuous.

d. The interlayering of fresh rock and highly weathered zones appeared to fulfill the five feet of soil horizon on a cumulative basis.

Geotechnical Consultants, Incorporated, concluded that the existing holding Ponds 1 through 7 are suitable for long term use as percolation ponds. Because of seepage at the base of Pond 8, this pond could not be utilized until the problem was corrected. Pond 8 currently utilizes a French drain to intercept seepage and is used to dispose of supernatant from the lined facultative sludge lagoon.

CMB:djc 12/23/93

APPENDIX B

CALIFORNIA
Water Boards

RECEIVED
FEB 8 2013

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board
5 February 2013

Willie Rodriguez, District Manager
Burney Wastewater Treatment Plant
20222 Hudson St.
Burney, CA 96013

WDID No. 5A450107001

COMPLIANCE INSPECTION, BURNEY WASTEWATER TREATMENT PLANT, BURNEY, SHASTA COUNTY

On 18 December 2012, Regional Water Board staff conducted a compliance inspection of the Burney Wastewater Treatment Plant (Facility). During the inspection multiple inconsistencies were discovered with the construction, maintenance, operation, and effluent monitoring of the Facility. The section titled "Summary" of the attached inspection report provides additional information for our request. Please provide the following work plans and reports by 15 March 2013:

1. Submit a work plan to address the removal and proper disposal of oil & grease from the headworks.

2. Submit a report for the replacement of the 8-inch pump located in the dry well at the headworks.

3. Submit justification and documentation that the two floating aerators in the oxidation ditch are supplying the equivalent aeration and that treatment (specifically, nitrification/denitrification) as provided by the removed aeration brush.

4. Submit a work plan to remove the build-up of oil & grease within the oxidation ditch.

5. Submit report that details why the 4-inch magmeter on the effluent line is not in use to record effluent flows and place it back in service.

6. Submit a work plan to remove vegetation from the banks of the evaporation/percolation ponds.

7. Submit a work plan to determine the volume of the facultative lagoon, the volume of sludge, a time frame for cleaning the sludge lagoon, inspecting the liner, and proper disposal of the sludge.

Pursuant to the California Water Code (CWC) section 13350, failure to comply with your WDRs subjects you to formal enforcement actions, including but not limited to administrative civil liabilities (monetary penalties) by the State or Regional Board up to :1) $5,000 per day per violation or 2) $10 for each gallon of waste discharged.

If you have any questions regarding this information, please contact me at (530) 224-4848 or the footer address below.

Daniel Warner
Water Resource Control Engineer
North Regulatory Unit

DLW: mlr

cc: Burney Wastewater Treatment Plant Board of Directors

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CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

Name and Location of Facility Inspected Burney Wastewater Treatment Plant 21111 Black Ranch Road Burney, CA 96013	**Entry Date** 12/18/2012 **Entry Time** 09:00 AM	**Permit Effective Date** 1/28/1994
Mailing Address Burney Wastewater Treatment Plant 20222 Hudson St. Burney, CA 96013	☐ **Major** ☒ **Minor**	**Permit Expiration Date**
Order Number 94-017	**Contact Information** Phone: (530) 335-3582 Fax: (530) 335-2194	**Notified of Inspection?** ☒ Yes ☐ No
Name(s) & Title(s) of On-Site Representative(s) Willie Rodriguez, District Manager Don Sibert , Grade II Operator Mike Skelly, Grade I Operator Willie Lyons, OIT	**Contact Information** Phone: (530) 335-3582	**Official Contacted?** ☒ Yes ☐ No
Name, Title & Address of Responsible Official Willie Rodriguez, District Manager 20222 Hudson St. Burney, CA 96013	**Presented Credentials?** ☒ Yes ☐ No	
Inspector(s) Primary: Daniel Warner (CVRWQCB) Other(s):	**Facility Receiving Water Name:** No Discharge to surface Waters	
Weather Conditions at Time of the Inspection: Dry, Partially Cloudy	**CIWQS Inspection ID:** 10713410	

Facility Narrative.

On 18 December 2012, I inspected the Burney Wastewater Treatment Plant in Burney, CA. The Wastewater Treatment Plant is regulated by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) Order 94-017. The Facility representative is Willie Rodriguez (District Manager). Don Sibert (Grade II Operator), Mike Skelly (Grade I Operator), and Willie Lyons (OIT) are responsible for the day to day operations at the facility, compliance and monitoring. Present during the inspection were Burney Wastewater Treatment Plant representatives Willie Rodriguez, Don Sibert, Mike Skelly, and Willie Lyons.

Burney Wastewater Treatment Plant (hereafter Facility) is owned and operated by the Burney Water District (hereafter Discharger). The Discharger discharges a maximum of 0.44 million gallons per day of domestic wastewater from the treatment facility to unlined or partially lined stabilization ponds. The facility consists of a static screen, headworks, oxidation ditch, secondary clarifier, eight evaporation/percolation ponds, sludge lagoon, and drying beds.

The Discharger also accepts discharges of cooling tower blowdown, boiler blowdown, and plant washdown water from Burney Mountain Power Cogeneration Facility. In addition the Discharger accepts and discharges wastewater from log deck recycle ponds at Burney Forest Power and wastewater from log deck recycle ponds at Sierra Pacific Industries, Inc., Burney Division. Further, the Discharger accepts and discharges leachate from the Intermountain Landfill, Inc. and leachate from the Burney Transfer Station.

The Discharger is subject to effluent, groundwater, and storage basin monitoring requirements contained in the Central Valley Water Board Order 94-017, Monitoring and Reporting Program. During the 5 August 2008 Facility inspection, excessive weed growth was observed in several of the percolation/evaporation ponds, in addition to significant buildup in the facultative sludge lagoon.

Facility Site Review

A visual observation of the treatment process flow that includes the headworks (wet well and dry well), static screen, oxidation ditch, secondary clarifier, return activated sludge building, evaporation/percolation ponds, and facultative sludge lagoon was conducted:

Headworks – The headworks for the facility is located approximately one half mile north of the facility, and consists of a wet well and separate drywell with a generator backup system. The wet well consists of a 9-inch Parshall flume, a JWC International Muffin Monster, and oil and grease removal. Significant oil and grease buildup was noted (see photograph 1). The facility operators stated that oil and grease is removed by either pumping it to the facility or vacuuming it out and drying it in the sludge drying beds.

The dry well has three pumps (two 8" pumps and one 10" pump) to deliver domestic wastewater to the Facility to the south. Mr. Rodriguez stated that they are currently in the process of replacing one of the 8" pumps and it should arrive by mid-January.

Static Screen – According to Mr. Sibert, the static screen (see photograph #2) is scraped and washed every day. Approximately 1 to 1.5 yards of screened material is collected per week and disposed at the adjacent transfer facility.

Oxidation Ditch – The oxidation ditch was designed with two sets of aerator brushes (see photograph 3). One set of brushes has been removed due to a broken shaft in April 2012. Due to costs the brushes were replaced with two 10-hp floating Aire-O_2 from Aeration Industries International (see photograph 4) in July 2012. Significant oil & grease buildup was noted along the edges of the oxidation ditch (see photograph 5) along with vegetative material.

Secondary Clarifier – The secondary clarifier (see photograph 6) appeared to be working at the time of the inspection. No solids or debris were observed in the clarifier discharge. However, the effluent weirs appeared to have buildup of moss and weeds (see photograph 7). The operators stated that mechanical failures due to ice buildup during the winter were common problems. In previous years, the sweep arm has been bent or broken and could not be replaced until the secondary clarifier could be drained.

Return Activated Sludge Building – The RAS building is located east of the secondary clarifier with both the return pump and effluent pump located below grade. The effluent line has a 4-inch magmeter installed, but not in use at this time.

Evaporation/Percolation Ponds – The Facility uses a system of eight evaporation /percolation ponds. Pond 5 was dedicated to discharges of wastewater from Burney Mountain Power. The facility was in compliance with the freeboard requirements (greater than 2 ft. freeboard), no seepage was noted along the pond levees. However, significant vegetation was observed on the banks of all the ponds.

Per the WDRs, Discharge Specifications 9.b. Weeds shall be minimized through control of water depth, or herbicides.

Sludge Lagoon – Inspection of the lined facultative lagoon (see photograph 8) indicates significant buildup. When asked about the sludge management in the lagoon, Mr. Rodriguez stated that the use of the Bio Huma Netics Inc. probiotic was stopped between six months and one year ago, because it appeared to be ineffective. Mr. Rodriguez also stated that Synagro Technologies Inc. was contacted to determine the volume of sludge in the lagoon and provide a bid for cleaning, dewatering, and transporting the sludge to an approved landfill. The lagoon is expected to be cleaned during the summer of 2013.

Effluent & Receiving Waters

SMRs for the period of May 2012 through October 2012 were reviewed as a component of the inspection. The review included a comparison of reported monitoring results versus requirements and limitations contained in the permit, as well as a file review.

Effluent & Receiving Water Findings.

1. Central Valley Water Board Order 94-017, Monitoring and Reporting Program, Effluent Monitoring – Domestic Waste requires dissolved oxygen to be analyzed daily from the effluent and the ponds, as well as, liquid depth and freeboard are required to be measured weekly. Of the six monitoring reports, all six had omitted or missing data. For example, the September monitoring report had seventeen days that dissolved oxygen analysis was not conducted on either the effluent or ponds. In addition, depths of wastewater and freeboard were measured only once during the month.

2. Central Valley Water Board Order 94-017, Monitoring and Reporting Program, Groundwater Monitoring requires quarterly coliform analysis from the private well located on the Hathaway property. A review of the submitted monitoring reports for the past six months indicates that the required monitoring has not been conducted. Since no groundwater data was provided during the six month review period, a determination for groundwater compliance could not be made. Mr. Rodriguez was asked to review the facility records and provide the required groundwater monitoring data.

Flow Measurements
The influent effluent flow rate is measured with a 9-inch Parshall flume in combination with an Echomax XPS transducer and HydroRanger 200 ultrasonic level controller. A 4" magmeter is located on the effluent line, but currently not being used. The effluent is estimated to be the same as the influent rate for the facility.

Laboratory
The on-site laboratory is not ELAP certified. Analyses for pH and dissolved oxygen are conducted on-site using a bench top Beckman 40 pH meter and a YSI Model 57 for dissolved oxygen. Bench sheets do not show the time or operator conducting the analysis. In addition, buffer solutions for the calibrating the pH meter were found to be past their expiration date.

Biosolids/Solid Waste Handling & Disposal
Solids collected on the static screen are collected in a dumpster and disposed of weekly at the adjacent transfer facility. Biosolids accumulating in the lined facultative sludge lagoon have not been removed since 2001. As mentioned above the Discharger is in contact with Synagro Technologies Inc. regarding cleaning, dewatering, and transporting the biosolids to an approved landfill.

Permit
The Central Valley Water Board Order 94-017 was available at the Facility and was observed to accurately reflect Facility operations. However, several changes to Facility equipment has taken place over the past couple of years.

Records & Reports
Records and reports were maintained according to requirements in the Regional Water Board Order 94-017 per Central Valley Water Board Standard Provisions for Waste Discharge Requirements. The following reports were requested and reviewed (unless otherwise noted):

- Self-monitoring Reports (SMRs) (May 2012 through October 2012)
- Operations log books or daily plant operations records
- Monitoring bench sheets for on-site analysis
- Contract laboratories records and chain-of custodies

All records and reports required by the permit were available for review.

The following observations were made with respect to the Records and Reports:

1. Self-monitoring reports do not contain all required analysis or have the signature of the responsible person.
2. Monitoring bench sheets for on-site analysis do not contain the name or initial of the person who performed the analysis.

Compliance Schedules
Not applicable to the Facility

Pretreatment
Not applicable to the Facility

Storm Water
Not applicable to the Facility.

Summary

- Excessive oil & grease within the wet well at the headworks has been noted in previous inspection reports and remains a problem. The Mr. Rodriguez was asked to submit a work plan to address the removal and disposal of oil & grease from the headworks. In addition, Mr. Rodriguez was asked to submit a report detailing the replacement of the 8-inch pump at the headworks.

- In July 2012, one set of aerator brushes were removed from the oxidation ditch and replaced with two 10-hp floating Aire-O_2 from Aeration Industries International. Mr. Rodriguez was asked to submit documentation that the floating aerators are supplying equivalent aeration to the oxidation ditch as the removed aerator brush did. In addition, Mr. Rodriguez was asked to address the build-up of vegetative material and oil & grease lining the oxidation ditch.

- Effluent flow is reported as the same as the influent flow from the headworks. The return activated sludge building has a 4-inch magmeter installed on the effluent line to the ponds.

The magmeter is not currently being used. Mr. Rodriguez was asked to inspect the magmeter, recalibrate it, and place it back online.

- The evaporation/percolation ponds continue to have significant vegetation growing on the banks. Significant vegetation has been noted in previous inspection reports. Mr. Rodriguez was asked to submit a work plan for addressing vegetation at the facility.

- The lined facultative lagoon shows significant buildup of sludge. A sludge management plan was submitted to the Central Valley Water Board in September 2008. The sludge management plan consisted of adding Bio Huma Netics product, Probiotic, at a rate of 2-gallons every 4 days. This was stopped 6 to 12 months ago by Mr. Rodriguez after he determined it to be ineffective. Mr. Rodriguez has contacted Synagro Technologies Inc. to determine the volume of sludge, a bid for cleaning, dewatering, and transportation of sludge to an approved landfill. Mr. Rodriguez was asked to submit a copy of the report and bid to the Central Valley Water Board. Mr. Rodriguez anticipates the sludge pond being cleaned during the summer of 2013.

- The previous six months of self-monitoring reports were reviewed onsite. It was noted that analysis for dissolved oxygen, freeboard, and groundwater monitoring were not being conducted according to the monitoring and reporting program. Mr. Rodriguez was asked to correct this shortcoming immediately and begin having the self-monitoring reports signed by responsible person (Willy Rodriguez).

- Laboratory bench sheets do not contain the initials of the operator running the tests or the times the tests are being conducted. Mr. Rodriguez was asked to update the bench sheets to include the operator initials and time of testing.

DLW:mlr DLW

cc: Burney Wastewater Treatment Plant Board of Directors

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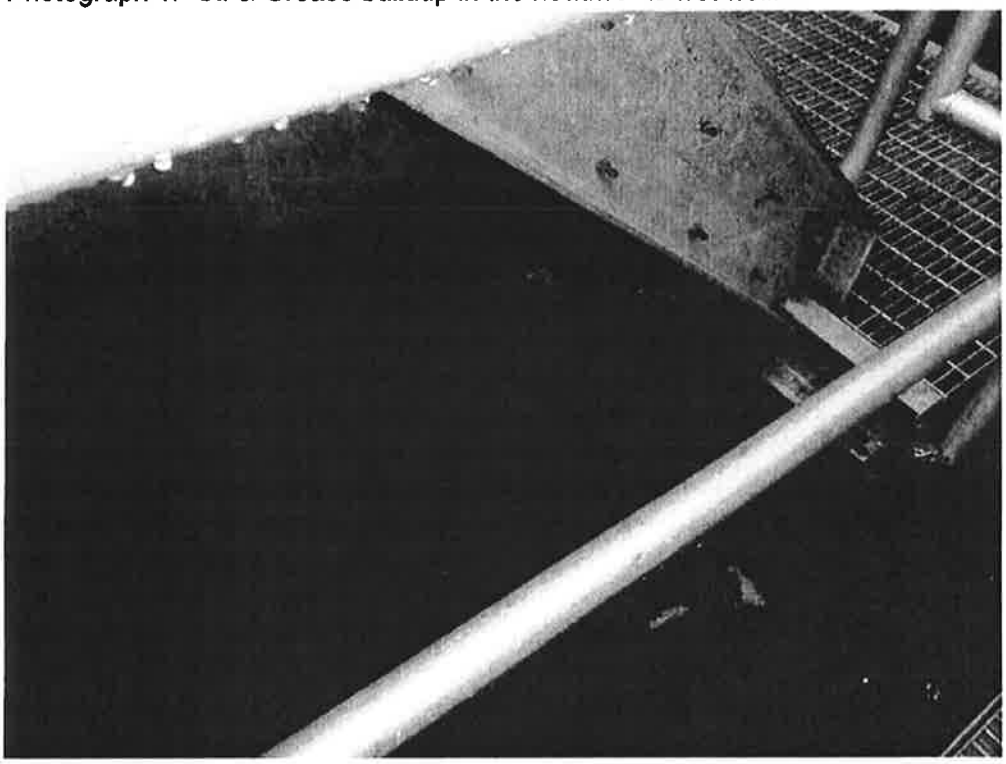
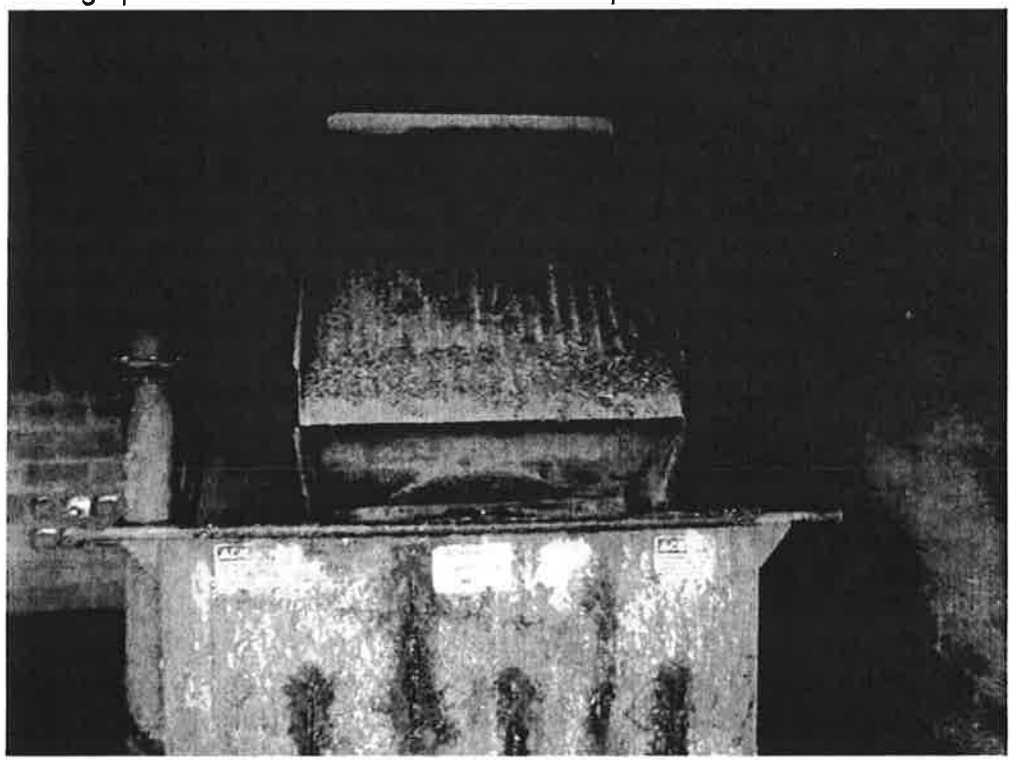
Photograph 1. Oil & Grease buildup in the headworks wet well.



Photograph 2 – Static Screen and collection dumpster.

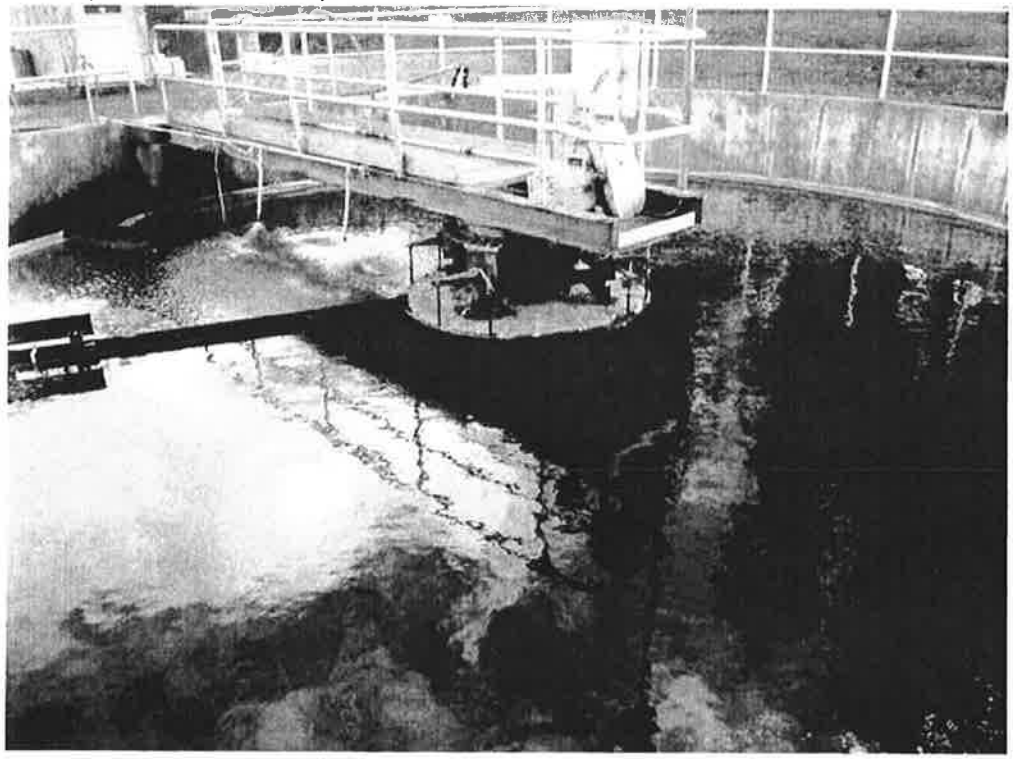


Photograph 3 – Oxidation ditch brush aerators.

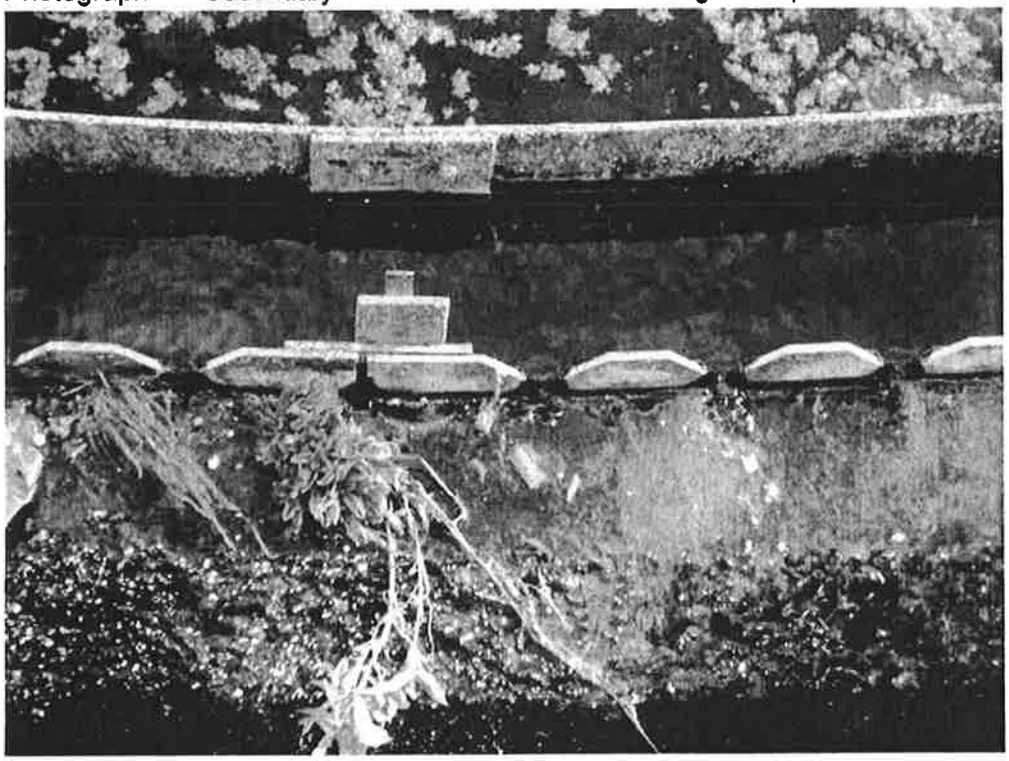
Photograph 4 – Oxidation ditch with two 10 hp Aire-O_2 aerators.

Photograph 5 – West end of oxidation ditch showing oil & grease build up.

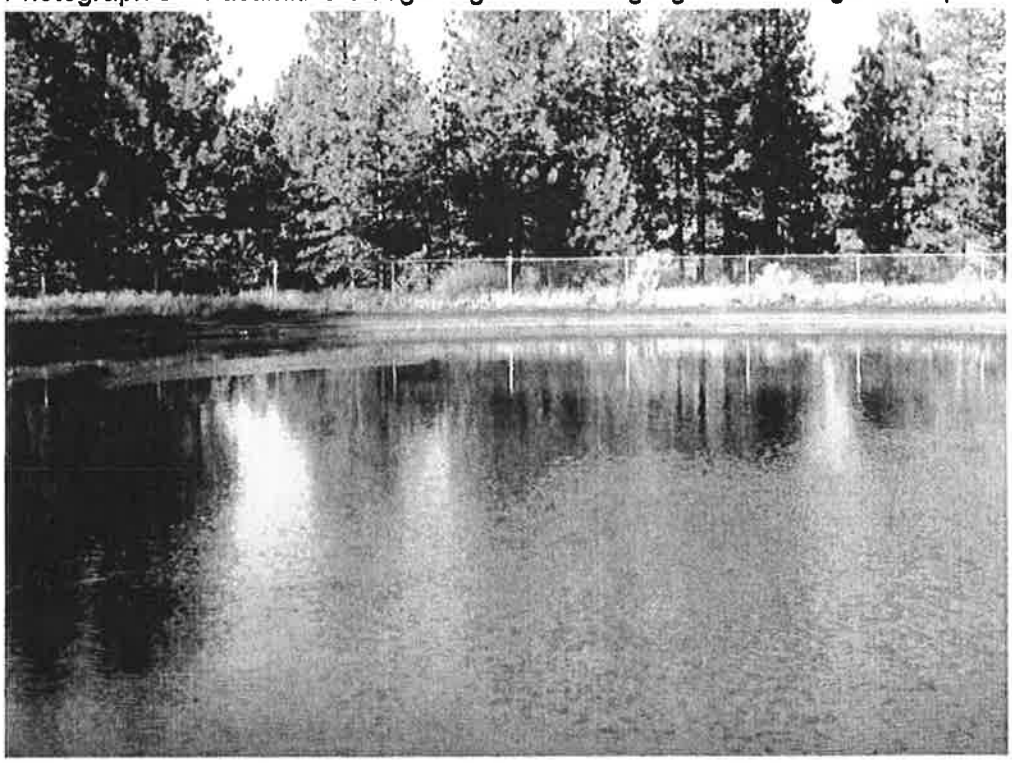
Photograph 6– Secondary Clarifier



Photograph 7 – Secondary clarifier effluent weirs showing buildup of moss and weeds.



Photograph 8 – Facaltative Sludge Lagoon showing significant sludge buildup.



APPENDIX C

APPENDIX C

Burney Water District

2013 Sewer Master Plan

HYDRAULIC MODEL SEWER CAPACITY AND FLOW SUMMARY W/ I&I @ 500 GPAD

Model Pipe ID No.	From Model Manhole	To Model Manhole	Sewer Diameter (in)	Existing Or Future	Length (ft)	Sewer Slope (ft/ft)	Pipe Capacity (MGD)	2012			2072			RECOMMENDED IMPROVEMENTS				Comments
														REPLACEMENT SEWER		PARALLEL SEWER		
								Pipe Flow (gpm)	Model PWWF (MGD)	PWWF Surcharge (ft)	Pipe Flow (gpm)	Model PWWF (MGD)	Estimated PWWF Surcharge (ft)	Size (in)	Capacity (MGD)	Size (in)	Capacity (MGD)	
121	49	48	6	E	197	0.055	0.85	26.0	0.037		29.3	0.042						
123	88	87	6	E	167	0.008	0.324	70.0	0.101		95.8	0.138						
125	87	99A	6	E	184	0.004	0.229	74.8	0.108		101.5	0.146						
127	99A	99	8	E	156	0.002	0.349	85.7	0.123		112.4	0.162						
13	175	173	8	E	473	0.003	0.427	297.7	0.429		305.2	0.439	0.065	10	0.77	8	0.85	
15	400	10	8	E	375	0.002	0.349	46.9	0.068		65.7	0.095						
17	174	176	8	E	185	0.006	0.604	576.5	0.830	1.0	578.9	0.834	0.978	10	1.10	8	1.21	
19	176	175	8	E	500	0.002	0.349	344.8	0.497	1.0	353.8	0.509	1.108	10	0.63	8	0.70	
191	45A	45	8	E	500	0.004	0.493	27.7	0.040		31.4	0.045						
21	173	172	8	E	390	0.002	0.349	271.5	0.391	0.2	279.7	0.403	0.248	10	0.63	8	0.70	
211	81	42	8	E	356	0.011	0.818	89.4	0.129		116.1	0.167						
215	45	44	8	E	304	0.005	0.551	30.9	0.044		34.9	0.050						
217	44	43	10	E	188	0.005	1.000	33.2	0.048		37.3	0.054						
221	43	42	10	E	313	0.003	0.774	34.4	0.050		38.8	0.056						
235	41	40	10	E	299	0.001	0.447	126.8	0.183		157.2	0.226						
245	73	72	6	E	167	0.005	0.256	7.4	0.011		8.1	0.012						
247	72	71	6	E	245	0.005	0.256	11.9	0.017		12.9	0.019						
249	71	40	6	E	301	0.006	0.280	15.6	0.023		17.1	0.025						
259	70	60	8	E	218	0.004	0.493	14.3	0.021		15.6	0.022						
261	63A	70	8	E	115	0.006	0.604	12.6	0.018		13.5	0.020						
265	60	37	8	E	350	0.007	0.652	17.4	0.025		19.0	0.027						
267	40	38	10	E	558	0.003	0.774	136.3	0.196		167.7	0.242						
269	38	37	10	E	179	0.003	0.774	137.5	0.198		169.1	0.244						
27	10	9000	8	E	60	0.004	0.493	46.2	0.066		64.6	0.093						
275	37	36	12	E	367	0.002	1.028	155.4	0.224		188.9	0.272						
277	36	35	12	E	300	0.004	1.454	157.6	0.227		190.9	0.275						
305	35	34	12	E	265	0.001	0.727	162.7	0.234		196.1	0.282						
335	16	15	12	E	249	0.002	1.028	355.6	0.512		385.8	0.556						
337	15	14	12	E	136	0.003	1.259	348.5	0.502		386.3	0.556						
339	14	13	12	E	174	0.004	1.454	350.0	0.504		388.2	0.559						
341	13	12A	12	E	195	0.003	1.259	351.2	0.506		389.8	0.561						
347	151	21	12	E	320	0.002	1.028	304.6	0.439		333.8	0.481						
349	21	20	12	E	382	0.002	1.028	305.0	0.439		334.3	0.481						
351	20	19	12	E	395	0.002	1.028	301.5	0.434		334.8	0.482						
353	19	18	12	E	424	0.002	1.028	361.2	0.520		383.5	0.552						

APPENDIX C

Burney Water District

2013 Sewer Master Plan

HYDRAULIC MODEL SEWER CAPACITY AND FLOW SUMMARY W/ I&I @ 500 GPAD

Model Pipe ID No.	From Model Manhole	To Model Manhole	Sewer Diameter (in)	Existing Or Future	Length (ft)	Sewer Slope (ft/ft)	Pipe Capacity (MGD)	2012			2072			RECOMMENDED IMPROVEMENTS				Comments
														REPLACEMENT SEWER		PARALLEL SEWER		
								Pipe Flow (gpm)	Model PWWF (MGD)	PWWF Surcharge (ft)	Pipe Flow (gpm)	Model PWWF (MGD)	Estimated PWWF Surcharge (ft)	Size (in)	Capacity (MGD)	Size (in)	Capacity (MGD)	
365	24	23	8	E	360	0.011	0.818	81.0	0.117		104.3	0.150						
419	168	166	8	E	690	0.004	0.493	214.9	0.309		226.9	0.327						
421	166	23A	8	E	350	0.019	1.075	209.7	0.302		220.9	0.318						
423	23	23A	10	E	360	0.004	0.894	87.7	0.126		111.9	0.161						
425	23A	152B	8	E	247	0.013	0.889	294.5	0.424		320.7	0.462						
429	26	25	8	E	488	0.007	0.652	77.2	0.111		102.9	0.148						
431	25	24	8	E	305	0.009	0.740	78.3	0.113		103.5	0.149						
451	30	29	6	E	435	0.009	0.344	65.0	0.094		92.7	0.133						
455	29	28	6	E	308	0.006	0.280	62.0	0.089		86.6	0.125						
483	172	171	8	E	500	0.002	0.349	235.1	0.339		244.0	0.351	0.002	10	0.63	8	0.70	
489	170	168	8	E	485	0.004	0.493	227.6	0.328		234.3	0.337						
505	152	151	12	E	120	0.003	1.259	297.6	0.429		327.7	0.472						
517	64	63A	8	E	340	0.004	0.493	12.3	0.018		13.0	0.019						
567	7	6	15	E	943	0.003	2.283	507.1	0.730		593.6	0.855						
577	190B	190A	8	E	264	0.003	0.427	39.5	0.057		94.8	0.137						
579	190A	190-1	8	E	77	0.002	0.349	45.0	0.065		98.6	0.142						
583	190-1	190	8	E	420	0.007	0.652	48.2	0.069		100.4	0.145						
587	190	198B	8	E	163	0.010	0.780	58.1	0.084		111.5	0.161						
589	198B	187B	8	E	264	0.011	0.818	63.5	0.091		117.9	0.170						
591	187B	187	8	E	412	0.007	0.652	70.8	0.102		126.1	0.182						
595	187	186	8	E	139	0.002	0.349	73.6	0.106		129.4	0.186						
599	186	185	10	E	430	0.004	0.894	75.6	0.109		127.5	0.184						
601	185	184	10	E	563	0.003	0.774	82.6	0.119		138.0	0.199						
615	184	6	10	E	610	0.003	0.774	86.9	0.125		140.2	0.202						
617	6	P4	15	E	1147	0.002	1.864	581.2	0.837		715.8	1.031						
619	P4	467	15	E	179	0.002	1.864	593.4	0.854		727.8	1.048						
621	P3	P2	15	E	1450	0.002	1.864	607.2	0.874		1252.6	1.804						
623	P2	P1	15	E	867	0.001	1.318	616.7	0.888		1248.1	1.797	0.718	18	2.14	12	2.05	
647	202A	190B	6	E	459	0.004	0.229	34.6	0.050		93.5	0.135						
649	203	202A	8	E	205	0.005	0.551	22.0	0.032		86.4	0.124						
665	467	P3	15	E	1028	0.002	1.864	602.6	0.868		1340.4	1.930	0.112	18	3.03	8	2.21	
675	P1	9002	15	E	10	0.103	13.379	613.7	0.884		1226.9	1.767						
679	473	471	8	E	1	2.000	11.028	2325.0	3.348		2325.0	3.348						
71	90	89A	6	E	100	0.069	0.951	57.8	0.083		83.7	0.121						
715	475	400	8	E	402	0.002	0.349	51.3	0.074		73.5	0.106						

APPENDIX C

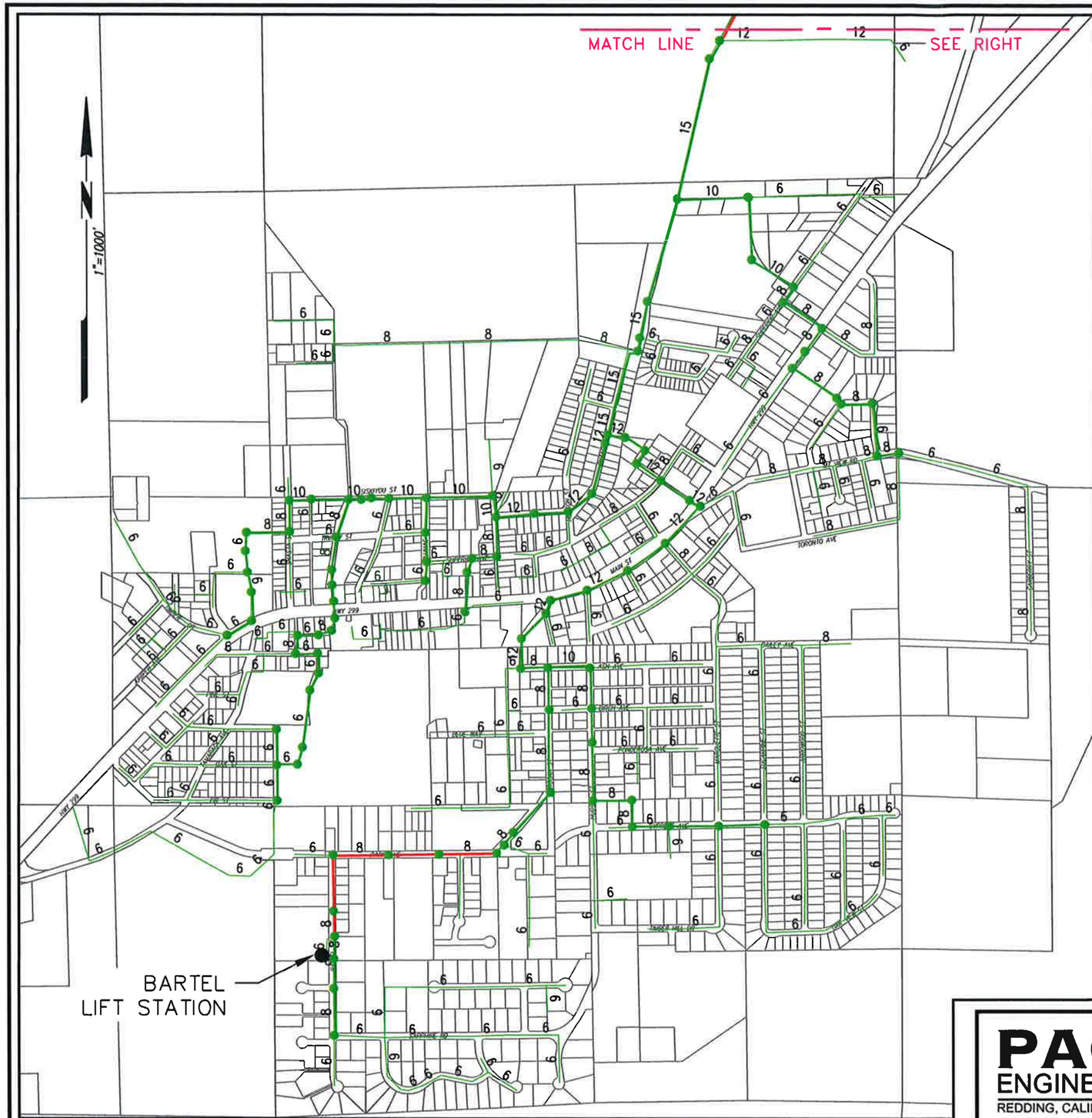
Burney Water District

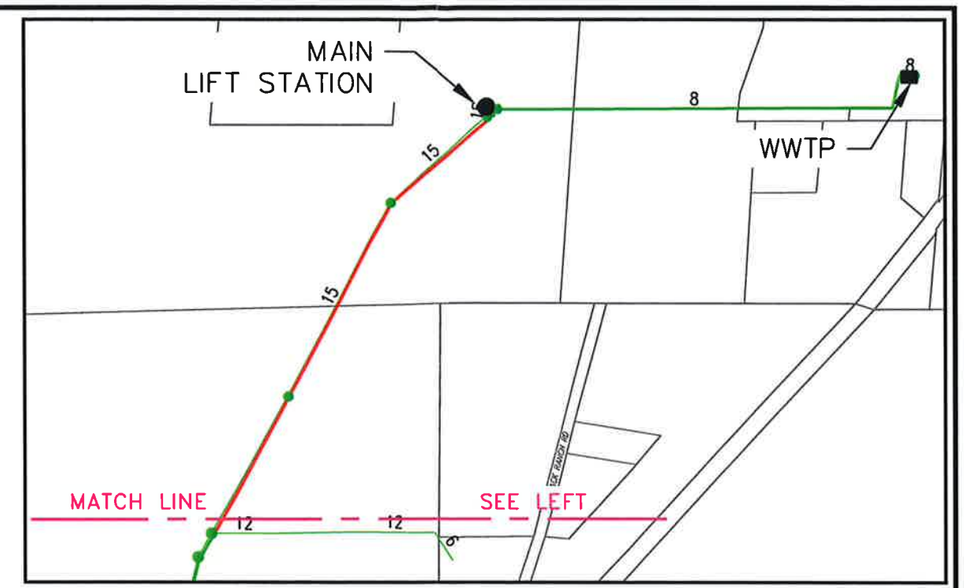
2013 Sewer Master Plan

HYDRAULIC MODEL SEWER CAPACITY AND FLOW SUMMARY W/ I&I @ 500 GPAD

Model Pipe ID No.	From Model Manhole	To Model Manhole	Sewer Diameter (in)	Existing Or Future	Length (ft)	Sewer Slope (ft/ft)	Pipe Capacity (MGD)	2012			2072			RECOMMENDED IMPROVEMENTS				Comments
														REPLACEMENT SEWER		PARALLEL SEWER		
								Pipe Flow (gpm)	Model PWWF (MGD)	PWWF Surcharge (ft)	Pipe Flow (gpm)	Model PWWF (MGD)	Estimated PWWF Surcharge (ft)	Size (in)	Capacity (MGD)	Size (in)	Capacity (MGD)	
73	89A	88A	6	E	283	0.010	0.362	66.5	0.096		93.4	0.134						
749	9	7	15	E	434	0.001	1.318	503.1	0.724		587.0	0.845						
75	88A	88	6	E	132	0.005	0.256	66.3	0.095		91.9	0.132						
751	18	16	12	E	404	0.010	2.299	349.0	0.503		384.3	0.553						
753	152B	152	12	E	558	0.003	1.259	300.8	0.433		326.3	0.470						
755	28	26	6	E	564	0.004	0.229	68.1	0.098		93.5	0.135						
757	171	170	8	E	233	0.018	1.046	239.1	0.344		246.2	0.355						
759	34	12	12	E	451.67	0.003	1.259	163.6	0.236		196.7	0.283						
761	42	41	10	E	339	0.003	0.774	119.4	0.172		148.9	0.214						
765	99	82A	8	E	446	0.008	0.697	86.9	0.125		113.9	0.164						
767	48	45A	6	E	761	0.021	0.525	25.0	0.036		28.4	0.041						
769	82A	81	8	E	695	0.002	0.349	90.1	0.130		117.5	0.169						
771	12A	9	15	E	820	0.004	2.636	485.0	0.698		556.4	0.801						
773	12	12A	15	E	108	0.001	1.318	166.2	0.239		199.8	0.288						

(1) Minimum sewer size to be 8-inch.
(2) District to observe problem sewers during future PWWF conditions to verify if significant surcharging is occurring prior to performing recommended improvements.
(3) Assumed I&I rate of 500 GPAD





LEGEND

- 6 — EXISTING SEWER PIPE AND DIAMETER
- EXISTING LIFT STATION
- EXISTING WWTP
- EXISTING MANHOLE ON TRUNK SEWER
- EXISTING TRUNK SEWER
- EXISTING TRUNK SEWER WITH $\frac{\text{LIQUID DEPTH}}{\text{PIPE DIAMETER}} > 0.8$

PACE ENGINEERING
REDDING, CALIFORNIA

BURNEY WATER DISTRICT
2013 SEWER MASTER PLAN

SEWER SYSTEM CAPACITY EVALUATION
I&I RATE ASSUMED @ 500 GPAD

FIGURE C1

DATE 5/13

JOB #306.24

APPENDIX D

APPENDIX D

Burney Water District

2013 Sewer Master Plan

HYDRAULIC MODEL SEWER CAPACITY AND FLOW SUMMARY W/ I&I @ 1500 GPAD

								2012			2072			RECOMMENDED IMPROVEMENTS				
														REPLACEMENT SEWER		PARALLEL SEWER		
Model Pipe ID No.	From Model Manhole	To Model Manhole	Sewer Diameter (in)	Existing Or Future	Length (ft)	Sewer Slope (ft/ft)	Pipe Capacity (MGD)	Pipe Flow (gpm)	Model PWWF (MGD)	PWWF Surcharge (ft)	Pipe Flow (gpm)	Model PWWF (MGD)	Estimated PWWF Surcharge (ft)	Size (in)	Capacity (MGD)	Size (in)	Capacity (MGD)	Comments
121	49	48	6	E	197	0.055	0.85	26.0	0.037		62.6	0.090						
123	88	87	6	E	167	0.008	0.324	70.0	0.101		194.4	0.280						
125	87	99A	6	E	184	0.004	0.229	74.8	0.108		212.6	0.306	0.566	8	0.49	8	0.72	
127	99A	99	8	E	156	0.002	0.349	85.7	0.123		235.4	0.339						
13	175	173	8	E	473	0.003	0.427	297.7	0.429		467.0	0.672	2.055	10	0.77	8	0.85	
15	400	10	8	E	375	0.002	0.349	46.9	0.068		168.5	0.243						
17	174	176	8	E	185	0.006	0.604	576.5	0.830	1.0	596.6	0.859	1.108	10	1.10	8	1.21	
19	176	175	8	E	500	0.002	0.349	344.8	0.497	1.0	580.7	0.836	4.679	12	1.03	10	0.98	
191	45A	45	8	E	500	0.004	0.493	27.7	0.040		69.4	0.100						
21	173	172	8	E	390	0.002	0.349	271.5	0.391	0.2	470.2	0.677	2.124	12	1.03	10	0.98	
211	81	42	8	E	356	0.011	0.818	89.4	0.129		244.5	0.352						
215	45	44	8	E	304	0.005	0.551	30.9	0.044		75.5	0.109						
217	44	43	10	E	188	0.005	1.000	33.2	0.048		79.8	0.115						
221	43	42	10	E	313	0.003	0.774	34.4	0.050		83.7	0.121						
235	41	40	10	E	299	0.001	0.447	126.8	0.183		331.5	0.477	0.037	12	0.73	8	0.69	
245	73	72	6	E	167	0.005	0.256	7.4	0.011		15.9	0.023						
247	72	71	6	E	245	0.005	0.256	11.9	0.017		24.4	0.035						
249	71	40	6	E	301	0.006	0.280	15.6	0.023		32.4	0.047						
259	70	60	8	E	218	0.004	0.493	14.3	0.021		29.8	0.043						
261	63A	70	8	E	115	0.006	0.604	12.6	0.018		23.9	0.034						
265	60	37	8	E	350	0.007	0.652	17.4	0.025		36.6	0.053						
267	40	38	10	E	558	0.003	0.774	136.3	0.196		350.5	0.505						
269	38	37	10	E	179	0.003	0.774	137.5	0.198		356.3	0.513						
27	10	9000	8	E	60	0.004	0.493	46.2	0.066		165.7	0.239						
275	37	36	12	E	367	0.002	1.028	155.4	0.224		393.5	0.567						
277	36	35	12	E	300	0.004	1.454	157.6	0.227		399.6	0.575						
305	35	34	12	E	265	0.001	0.727	162.7	0.234		405.3	0.584						
335	16	15	12	E	249	0.002	1.028	355.6	0.512		704.5	1.014						
337	15	14	12	E	136	0.003	1.259	348.5	0.502		707.0	1.018						
339	14	13	12	E	174	0.004	1.454	350.0	0.504		711.5	1.025						
341	13	12A	12	E	195	0.003	1.259	351.2	0.506		716.0	1.031						
347	151	21	12	E	320	0.002	1.028	304.6	0.439		608.9	0.877						
349	21	20	12	E	382	0.002	1.028	305.0	0.439		624.9	0.900						
351	20	19	12	E	395	0.002	1.028	301.5	0.434		628.4	0.905						
353	19	18	12	E	424	0.002	1.028	361.2	0.520		702.5	1.012						
365	24	23	8	E	360	0.011	0.818	81.0	0.117		194.8	0.281						

APPENDIX D

Burney Water District

2013 Sewer Master Plan

HYDRAULIC MODEL SEWER CAPACITY AND FLOW SUMMARY W/ I&I @ 1500 GPAD

								2012			2072			RECOMMENDED IMPROVEMENTS				
														REPLACEMENT SEWER		PARALLEL SEWER		Comments
Model Pipe ID No.	From Model Manhole	To Model Manhole	Sewer Diameter (in)	Existing Or Future	Length (ft)	Sewer Slope (ft/ft)	Pipe Capacity (MGD)	Pipe Flow (gpm)	Model PWWF (MGD)	PWWF Surcharge (ft)	Pipe Flow (gpm)	Model PWWF (MGD)	Estimated PWWF Surcharge (ft)	Size (in)	Capacity (MGD)	Size (in)	Capacity (MGD)	
419	168	166	8	E	690	0.004	0.493	214.9	0.309		398.0	0.573	0.921	10	0.89	8	0.99	
421	166	23A	8	E	350	0.019	1.075	209.7	0.302		390.2	0.562						
423	23	23A	10	E	360	0.004	0.894	87.7	0.126		208.9	0.301						
425	23A	152B	8	E	247	0.013	0.889	294.5	0.424		565.6	0.814						
429	26	25	8	E	488	0.007	0.652	77.2	0.111		192.3	0.277						
431	25	24	8	E	305	0.009	0.740	78.3	0.113		195.4	0.281						
451	30	29	6	E	435	0.009	0.344	65.0	0.094		150.6	0.217						
455	29	28	6	E	308	0.006	0.280	62.0	0.089		150.8	0.217						
483	172	171	8	E	500	0.002	0.349	235.1	0.339		419.0	0.603	1.957	12	1.03	8	0.70	
489	170	168	8	E	485	0.004	0.493	227.6	0.328		405.2	0.583	0.742	10	0.89	8	0.99	
505	152	151	12	E	120	0.003	1.259	297.6	0.429		586.5	0.845						
517	64	63A	8	E	340	0.004	0.493	12.3	0.018		20.8	0.030						
567	7	6	15	E	943	0.003	2.283	507.1	0.730		1173.4	1.690						
577	190B	190A	8	E	264	0.003	0.427	39.5	0.057		193.2	0.278						
579	190A	190-1	8	E	77	0.002	0.349	45.0	0.065		202.5	0.292						
583	190-1	190	8	E	420	0.007	0.652	48.2	0.069		209.6	0.302						
587	190	198B	8	E	163	0.010	0.780	58.1	0.084		231.3	0.333						
589	198B	187B	8	E	264	0.011	0.818	63.5	0.091		249.1	0.359						
591	187B	187	8	E	412	0.007	0.652	70.8	0.102		265.5	0.382						
595	187	186	8	E	139	0.002	0.349	73.6	0.106		273.9	0.394	0.073	10	0.63	8	0.70	
599	186	185	10	E	430	0.004	0.894	75.6	0.109		271.6	0.391						
601	185	184	10	E	563	0.003	0.774	82.6	0.119		302.7	0.436						
615	184	6	10	E	610	0.003	0.774	86.9	0.125		308.7	0.444						
617	6	P4	15	E	1147	0.002	1.864	581.2	0.837		1439.7	2.073	0.497	18	3.03	8	2.21	
619	P4	467	15	E	179	0.002	1.864	593.4	0.854		1461.1	2.104	0.091	18	3.03	10	2.50	
621	P3	P2	15	E	1450	0.002	1.864	607.2	0.874		2413.0	3.475	7.010	18	3.03	15	3.73	
623	P2	P1	15	E	867	0.001	1.318	616.7	0.888		2425.8	3.493	5.122	21	3.23	18	3.46	
647	202A	190B	6	E	459	0.004	0.229	34.6	0.050		187.5	0.270	0.689	8	0.49	8	0.72	
649	203	202A	8	E	205	0.005	0.551	22.0	0.032		176.7	0.255						
665	467	P3	15	E	1028	0.002	1.864	602.6	0.868		2555.7	3.680	5.827	21	4.57	18	4.90	
675	P1	9002	15	E	10	0.103	13.379	613.7	0.884		2387.3	3.438						
679	473	471	8	E	1	2.000	11.028	2325.0	3.348		2325.0	3.348						
71	90	89A	6	E	100	0.069	0.951	57.8	0.083		131.3	0.189						
715	475	400	8	E	402	0.002	0.349	51.3	0.074		186.8	0.269						
73	89A	88A	6	E	283	0.010	0.362	66.5	0.096		169.7	0.244						
749	9	7	15	E	434	0.001	1.318	503.1	0.724		1152.7	1.660	0.243	18	2.14	12	2.05	

APPENDIX D

Burney Water District

2013 Sewer Master Plan

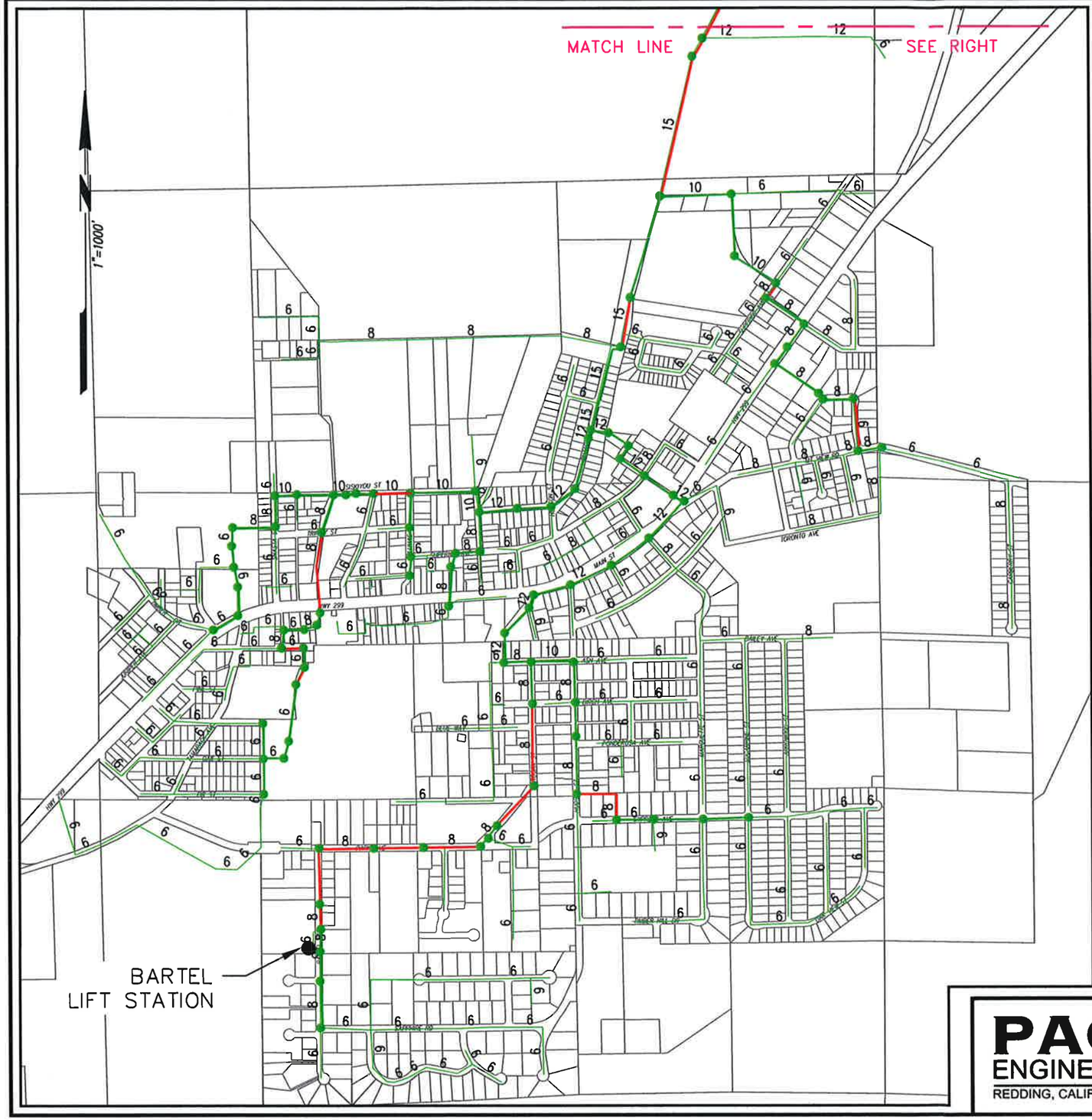
HYDRAULIC MODEL SEWER CAPACITY AND FLOW SUMMARY W/ I&I @ 1500 GPAD

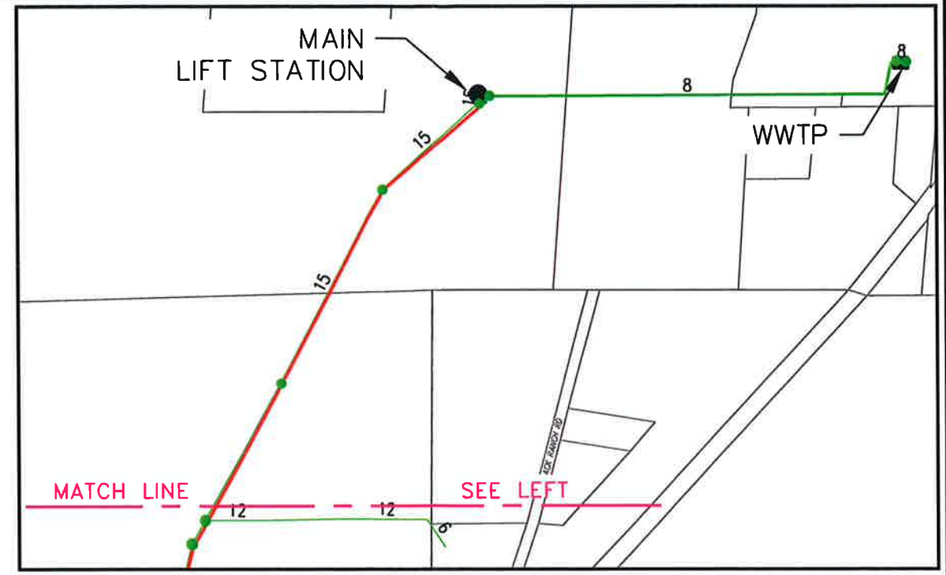
								2012			2072			RECOMMENDED IMPROVEMENTS				
														REPLACEMENT SEWER		PARALLEL SEWER		Comments
Model Pipe ID No.	From Model Manhole	To Model Manhole	Sewer Diameter (in)	Existing Or Future	Length (ft)	Sewer Slope (ft/ft)	Pipe Capacity (MGD)	Pipe Flow (gpm)	Model PWWF (MGD)	PWWF Surcharge (ft)	Pipe Flow (gpm)	Model PWWF (MGD)	Estimated PWWF Surcharge (ft)	Size (in)	Capacity (MGD)	Size (in)	Capacity (MGD)	
75	88A	88	6	E	132	0.005	0.256	66.3	0.095		176.2	0.254		8	0.55	8	0.81	
751	18	16	12	E	404	0.010	2.299	349.0	0.503		704.2	1.014						
753	152B	152	12	E	558	0.003	1.259	300.8	0.433		579.0	0.834						
755	28	26	6	E	564	0.004	0.229	68.1	0.098		170.8	0.246	0.319	8	0.49	8	0.72	
757	171	170	8	E	233	0.018	1.046	239.1	0.344		422.8	0.609						
759	34	12	12	E	451.67	0.003	1.259	163.6	0.236		407.4	0.587						
761	42	41	10	E	339	0.003	0.774	119.4	0.172		317.2	0.457						
765	99	82A	8	E	446	0.008	0.697	86.9	0.125		238.2	0.343						
767	48	45A	6	E	761	0.021	0.525	25.0	0.036		62.6	0.090						
769	82A	81	8	E	695	0.002	0.349	90.1	0.130		245.5	0.354	0.021	10	0.63	8	0.70	
771	12A	9	15	E	820	0.004	2.636	485.0	0.698		1095.8	1.578						
773	12	12A	15	E	108	0.001	1.318	166.2	0.239		412.0	0.593						

(1) Minimum sewer size to be 8-inch.

(2) District to observe problem sewers during future PWWF conditions to verify if significant surcharging is occurring prior to performing recommended improvements.

(3) Assumed I&I rate of 1500 GPAD





LEGEND

- 6 — EXISTING SEWER PIPE AND DIAMETER
- EXISTING LIFT STATION
- EXISTING WWTP
- EXISTING MANHOLE ON TRUNK SEWER
- EXISTING TRUNK SEWER
- EXISTING TRUNK SEWER WITH $\frac{\text{LIQUID DEPTH}}{\text{PIPE DIAMETER}} > 0.8$

PACE ENGINEERING
REDDING, CALIFORNIA

BURNEY WATER DISTRICT
2013 SEWER MASTER PLAN

SEWER SYSTEM CAPACITY EVALUATION
I&I RATE ASSUMED @ 1500 GPAD

FIGURE D1

DATE 5/13

JOB #306.24

APPENDIX E

SEWER ORDINANCE NO. 90-01

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THIS ORDINANCE REGULATES THE USE OF PUBLIC SEWERS, ESTABLISHES CHARGES RELATING TO SUCH USE, PRESCRIBES MATERIALS AND MANNER OF CONSTRUCTION FOR SERVICE LATERALS, DEFINES MAINTENANCE RESPONSIBILITIES, ESTABLISHES PERMIT PROCEDURES AND PROVIDES FOR ENFORCEMENT.

SECTION I

DEFINITIONS

For the Purpose of this Ordinance, the terms used in this Ordinance are defined as follows:

1. "ANSI" shall mean the American National Standards Institute

2. "ASTM" shall mean the American Society of Testing Materials

3. "Backfill" shall mean placement of earthen materials for the purpose of refilling any trench or excavation.

4. "BOD" an abbreviation for biochemical oxygen demand. The quantity of oxygen used in the biochemical oxidation of organic matter in a specified time, at a specified temperature, and under specified conditions. A standard test used in assessing wastewater strength.

5. "BUILDING SEWER" shall mean the pipes within the walls of a building and extending five (5 ft.) feet outside the wall which conveys sewer to the service lateral. The service lateral begins five (5 ft.) feet outside the exterior face of the building.

6. "CESSPOOL" a lined or partially lined underground pit into which raw household wastewater is discharged and from which the liquid seeps into the surrounding soil. Sometimes called a leaching cesspool.

7. "CLEANOUT" shall mean a "Y" connection on the service lateral, brought to grade, for the purpose of cleaning, testing and maintenance of the service lateral.

8. "COMBINED SEWER" shall mean a pipe or conduit receiving both precipitation run-off and wastewater.

9. "DISTRICT" shall mean the Burney Water District, County of Shasta, State of California.

10. "DISTRICT BOARD" or "BOARD" shall mean the Board of Directors of the Burney Water District.

11. "ENGINEER" shall mean the District's Engineer, it's consultants or person duly appointed by the Board to act in this capacity.

12. "GARBAGE" shall mean the animal and vegetable waste resulting from the handling, preparation, cooking, and serving of foods/or produce.

13. "GREASE" shall mean, in wastewater, a group of substances including fats, waxes, free fatty acids, calcium and magnesium soaps, mineral oils and certain other nonfatty materials.

14. "GREASE TRAP OR INTERCEPTOR" is a receptacle designed to collect and retain grease and fatty substances normally found in the kitchen or similar wastes. It is installed in the drainage system between the kitchen or other point of production of the waste and the building sewer and separates grease from wastewater by flotation so that it can be removed from the surface.

15. "HEALTH OFFICER" shall mean the Shasta County Public Health Officer, or his duly appointed representative.

16. "INDUSTRIAL WASTES" shall mean the liquid wasted from industrial processes as distinct from sanitary sewage.

17. "INFILTRATION" shall mean the quantity of ground water that enters the sanitary sewer from the ground surface through joints, cracks or breaks.

18. "INFLOW" shall mean the quantity of surface water that enters the sanitary sewer from the ground surface through cleanouts, manholes, roofs and floor drains.

19. "MANAGER" shall mean the District Manager of the Burney Water District, or his authorized agent or representative.

20. "MAY" is permissible.

21. "OWNER" shall include, but not be limited to individuals, corporations, partnerships, trusts, associations, joint tenants, tenants in common, and husband and wife. Ownership shall be shown on a recorded deed or recorded contract of sale which is in full force and effect on the day an application is filed with the District or at the time a provision of the Ordinance is subject to enforcement.

22. "pH" shall mean the reciprocal of the logarithm of the hydrogen ion concentration. The concentration is the weight of hydrogen-ions, in grams, per liter of solution.

23. "PAVED SURFACE" shall mean any form of pavement used on any street in the District, whether such pavement is composed of concrete, asphalt, oil, gravel, crushed rock, or any combination of said forms of pavement.

24. "PERSON" shall mean a natural person, his heirs, executors, administrators or assigns and shall also include a firm corporation, municipal or quasi-municipal corporation or governmental agency. Singular includes plural, male includes female.

25. "PRIVATE USE" in the classification of plumbing fixtures, shall mean fixtures in residences, apartments, private bathrooms in hotels, restricted use restrooms in commercial establishments, or installations where the fixtures are intended for the use of a family or an individual.

26. "PROPERLY SHREDDED GARBAGE" shall mean garbage that has been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than 1/2 inch in diameter.

27. "PUBLIC SEWER" shall mean a sewer designed to accommodate more than one service sewer, controlled by the District and located in a dedicated easement or public right of way.

28. "PUBLIC USE" in the classification of plumbing fixtures, shall mean fixtures in commercial and industrial establishments such as restaurants, bars, public buildings, comfort stations, schools, gymnasiums or places to which the public is invited or which are frequented by the public without special permission or invitation and other installations (whether pay or free) where fixtures are installed so that their use is similarly unrestricted.

29. "RESIDENTIAL STUDIO UNIT" shall mean a living unit containing no more than one bathroom, kitchen facility and a combination living-sleeping area. Any living unit containing one or more separate bedrooms shall not qualify as a Residential Studio use. Residential Studio uses shall include detached structures, apartments, stock cooperatives and time share projects, whether occupancy is continuous or intermittent. Motel uses shall not be included within Residential Studio categories.

30. "GUEST COTTAGE" shall mean a living unit containing no more than one bathroom and one bedroom. Any living unit containing a kitchen or additional rooms will not qualify as a Guest Cottage.

31. "SANITARY SEWAGE" shall mean any waste-water discharging from the sanitary conveniences of dwellings, offices, institutions and industrial establishments excluding storm and surface water.

32. "SANITARY SEWER" shall mean a sewer which carries sewage or industrial waste and to which storm, surface and ground waters are not intentionally admitted.

33. "SEPTIC TANK SYSTEM" shall mean a settling tank in which settled sludge is in immediate contact with the wastewater flowing through the tank; the organic solids are decomposed by anaerobic bacterial action and discharged into natural or prepared porous sub-surface beds.

34. "SERVICE LATERAL" shall mean that part of the sewer system commencing five (5 ft.) feet outside the foundation line of the structure and extending to the sewer main.

35. "SERVICE STUB" or "SEWER STUB" shall mean a capped sewer pipe extending from the sewer main to the property line. Upon connection of a structure, the service stub becomes a part of the service lateral.

36. "SERVICE YEAR" shall mean the fiscal year on the Burney Water District, being July 1 through June 30.

37. "SEWAGE" or "WASTEWATER" shall mean a combination of the water carrying wastes from residences, business buildings, institutions and industrial establishments, together with such ground, surface and storm waters as may be present.

38. "SEWAGE WORKS" or "SEWAGE SYSTEM" shall mean all facilities for collecting, pumping, treating and disposing of sewage.

39. "SEWER" shall mean a pipe or conduit for carrying sewage.

40. "SEWER TREATMENT PLANT" shall mean the regional treatment and disposal facilities operated by Burney Water District.

41. "SHALL" is mandatory.

42. "SLUG" shall mean any discharge of water, sewage, or industrial waste into a sewer in which the concentration of any given constituent or quantity of flow exceeds five (5) times the average twenty-four (24) hour concentration or flow rate during normal operation for a period of time exceeding fifteen (15) minutes.

43. "STORM SEWER" or "STORM DRAIN" shall mean a pipe or conduit which carries liquid resulting from precipitation run-off but excludes sewage and polluted industrial waste.

44. "STREET" is any public highway, road, street, avenue, alley, easement or right-of-way.

45. "SUSPENDED SOLIDS" shall mean solids that either float on the surface of, or are in suspension in water, sewage, or other liquids, and which are able to be removed by laboratory filtration.

46. "UPC" shall mean the Uniform Plumbing Code.

SECTION 2

GENERAL REGULATIONS

2.01 PURPOSE

This Ordinance has been adopted by the District Board to establish rules and regulations pertaining to the use, maintenance and charges for the sewage works within the boundaries of the Burney Water District in order to protect the health, safety and general welfare of the citizens of the District.

2.02 USE OF PUBLIC SEWERS REQUIRED

All persons with the Burney Water District shall connect to the public sewers. It shall be unlawful for any person to own, operate or maintain a septic tank, cesspool, or other means of private and/or on site waste disposal system within the boundaries of the District excepting those conditions as follows: as stated in UPC Chapter 11, Section 1101 where a structure is more that 200 feet from the nearest public sewer system and all requirements of the Shasta County Environmental Health Department are followed in regards to septic tank installation and percolation. All existing septic tanks shall be abandoned per UPC Section 1119.

2.03 APPLICABILITY

A. The following projects shall file an application and follow the rules and regulations stated herein:

   1. All new buildings or structures for which sewer connections are needed;

   2. All remodeling or changes of use of existing building or structures in which additional sewage may be generated.

B. New public sewers, extensions of existing public sewers or construction of sewer mains which will be dedicated to the District shall have plans and specifications submitted to the Manager. Plans are subject to compliance with the District's Standard Specifications for Sewer Construction and must be approved by the Manager.

2.04 CONNECTIONS TO THE SYSTEM

A. No unauthorized person shall uncover, make any connections with or openings into, use, alter, or disturb any public sewer, service sewer, or appurtenance thereof without first obtaining a permit from the District and paying all applicable fees to the District.

B. All persons, prior to connection, shall make application to the District for a permit to connect, construct and install or use

service laterals for sewage disposal from any building within the District. The Manager shall specify the form and content of the application.

C. The District, upon application, may issue a permit subject to the rules and regulations contained herein, however, these conditions may change in order to meet imposed legal restrictions or for the protection of the health, safety and general welfare of the public.

D. It shall be unlawful to connect roof or other drains to the public sewers which would allow precipitation or surface waters to enter the sewage works.

2.05 EXPANSION FEES

A. A sewer expansion fee shall be paid at the time of making application for issuance of sewer connection permits, according to the schedule set forth in Exhibit A, Table 1. If applicable, all other fees and charges due the District shall be paid prior to the issuance of the sewer expansion fees. Fixture units are determined in accordance with the following table from the Uniform Plumbing Code:

	No. of Plumbing Fixture Units	
	Private Use	Public Use
Bar Sink	1	2
Bathtub (with or without shower)	2	4
Dental Unit or Cuspidor	-	1
Drinking Fountain (each head)	-	1
Laundry Tub or Clothes Washer (each pair of faucets)	2	4
Lavatory	1	2
Shower (each head)	2	4
Sink or Dishwasher	2	4
Sink (flushing rim, clinic)	-	10
Sink (wash up, each set of faucets)	-	2
Sink (wash up, circular spray)	-	4
Urinal	3	5

Toilet	3	5
Garbage Disposal (with sink)	3	4
Floor Drains (each)	1	2
Hot Tubs/jacuzzi	2	4

B. Sewer expansion fees shall be refundable under the following circumstances:

1. Upon written application for cancellation of the sewer expansion permit by the person paying the fee and the owner of the property for which the permit was issued, provided that no substantial construction has commenced on the use for which the permit was issued.

2. Under circumstances that the Board determines are in the best interest of public health, safety and welfare.

Sewer expansion permits for which expansion fees have been refunded shall be invalid, and shall have no priority for re-issuance. Refunds shall be made less and administrative fee as shown in Exhibit A, Table 3.

C. Upon change in use of any structure connected to the District's sewage works, the sewer expansion fee applicable to the new use shall be paid the District. Fees previously paid shall be credited towards such expansion fees, however, no refunds shall be made where the sewer expansion fee applicable to the new use is lower than fees previously paid. It shall be the applicant's responsibility to verify fees previously paid. In the event the applicant cannot verify such payment, the Manager may credit fees applicable at the time of the original final building inspection if the Manager has reason to believe that such fees were paid and records substantiating such payment are not available.

D. The expansion fee established herein shall be in addition to special expansion or connection fees established for connection to sewer lines financed by special assessments.

2.06 SPECIAL EXPANSION FEES

In the event of a connection to a sewer line financed by special assessments, or by the District without direct participation of adjoining property owners, and the connection being by a property not originally specially assessed or otherwise directly charged for the line at the time of construction, an additional expansion fee will be charged. The amount will be based on the amount the property would have been specially assessed or directly charged to finance the construction of the line.

2.07 SEWER USER CHARGES

A. All persons using the District sewer works, shall pay to the District, as fees for the use of the facilities, monthly user sewer charges. The amounts of the user fees are set forth in Exhibit A, Table 2.

B. A service deposit is required at the time of filing an "application for service." The deposit will be held without interest until twelve consecutive months have passed of monthly payment and no delinquencies have occurred. The deposit will then be credited toward the account. The deposit amount is set forth in Appendix A, Table 2.

C. The Sewer User Charge shall be billed monthly after service has been rendered. The bill will be mailed during the first week of each month and is due and payable when rendered. The District reserves the right to charge a service charge of 1 1/2% for delinquent bills.

D. If payment has not been received by the 15th day of the billing month the account is considered to be delinquent. The customer will be notified of this delinquent status with the next billing cycle. On the bill notice will be given that payment must be received by the fifteenth (15th) day of the month or service will be discontinued. The first working day after the 15th a last and final notice will be sent giving five (5) days before termination of service. If payment has not been received by 5:00 P.M. on this deadline, the next working day service will be terminated. A service charge for restoring the service will be as set forth in Exhibit A, Table 2.

E. The District reserves the right to discontinue any and all services if delinquency on billing occurs for any service rendered. Once service has been discontinued, a reserve deposit amount in accordance with Exhibit A, Table 2 will be collected prior to restoring the service.

F. All sewer user charges shall be billed to and be the responsibility of the person signing the "application for service request", whether or not this is the occupant or the owner.

G. The Manager may adjust billings upon change of use or after a dispute as to the charge. Application requesting an adjustment of billing and stating grounds for an adjustment shall be made in accordance with Section 12, Appeals.

H. Enforcement of this Section shall be as set forth in Section 13.

I. A charge of $15.00 shall be paid for each check tendered as payment to the District that is returned unpaid after negotiation by the District. Only cash or a cashier's check shall be accepted by the District in payment for services once this has occurred. Future check privileges are at the discretion of the District personnel.

2.08 OTHER CHARGES

A. Other charges which may accrue to the property as a result of the property being connected to the sewer system shall be billed in the same manner as sewer service charges, as provided in paragraph F. of Section 2.07 SEWER USER CHARGES.

2.09 PERMIT INVALIDATION

If any structure with a valid sewer permit is destroyed (whether by design or accidental means) and not rebuilt for a period extending beyond one year the sewer permit becomes invalid. For new construction, if after the application for a sewer permit is issued and the permit has not been finalized within one year this permit becomes invalid. Further sewer work or inspection will require the applicant to apply for another permit and pay the appropriate fees.

2.10 INTEGRATED BILLING AND COLLECTION REGULATION FOR SEWER AND WATER

Charges for sewer collection, water service provided and swimming pool maintenance fees shall be collected together. All such charges shall be billed upon the same bill and collected as one item. All payments shall be due in the District's offices no later than the delinquent date stated on the bill. Postmarks shall not be accepted as time of payment. If all or part of any bill is not paid prior to becoming delinquent, the District may discontinue any and all service for which the bill is rendered. In particular, if the District provides sewer collection, water service and pool maintenance services and all or part of the component of any bill related to sewer collection or pool maintenance service is not paid prior to becoming delinquent, the water service shall also be discontinued. The District shall give notice of intent to discontinue service in accordance with law.

2.11 TRANSFER OF SERVICE

In the event the service for billing purposes is transferred to another, as in the case of a sale, a $10.00 fee shall be applied.

SECTION 3

MATERIAL AND MANNER OF CONSTRUCTION

3.01 GENERAL

A. The size, slope, alignment, materials of construction of a service lateral, and the methods to be used in excavating, placing the pipe, connection to the public sewer, jointing, testing, and backfilling the trench shall all conform to the requirements of this Section. The size and appurtenances of a service lateral for use other than by a single residential dwelling, shall be subject to review and approval by the Manager.

B. Where a service lateral has been provided to the property line, that lateral shall be used. If the owner, for his convenience desires service at a location other than that provided, upon approval the Manager, a new service may be installed. All costs shall be borne by the owner.

C. 1. A separate and independent sewer lateral shall be provided for every parcel. Where more than one structure or building exists on a parcel, and are under common ownership, they may share a common service lateral.

2. Where service to separate parcels by an independent sewer lateral is impossible or not practical, the Manager may allow service through a lateral constructed on an easement satisfactory to the District. Nothing herein shall allow structures in different ownership or different parcels to be served by the same service lateral.

3. No land division resulting in structures in different ownership being served by the same service lateral shall be allowed. Prior to the recording of any final map resulting in the creation of parcels, which if sold to different persons would result in structures in different ownerships beings served by the same service lateral, independent service to the structures shall be provided in conformance with the provisions of this Ordinance. In lieu of construction, submission and approval of plans and bonding for completion acceptable to the Manager shall be accepted.

D. All costs and expenses associated to the installation and connection of the service lateral shall be borne by the owner. The owner shall indemnify the District from any loss or damage that may directly or indirectly result from the installation of the building sewer and/or service lateral.

3.02 LOCATIONS

A. If requested by the owner, the District will provide information on the location of any service stub from the existing District records without warranty as to the accuracy or reliability of the information.

B. The owner shall be responsible for physically locating the stub, including any surveys or exploration, and shall bear the costs for locating the stub.

C. The District, it's officers, agents and employees shall not be deemed to make any warranties of any kind as to the accuracy of locations nor be liable for any losses or damages sustained resulting from any inaccuracies or inadequacy of location information.

3.03 MATERIALS

A. Pipe shall be a minimum of four inches (4") in (nominal) inside diameter except as provided in Section 7. Pipe material shall be one of the following:

1. Asbestos Cement Pipe (ACP) class 2400, maximum length length six feet, six inches (6'6") conforming to ASTM C-240.

2. Polyvinyl chloride pipe (PVC) SDR 35 or PS 46, maximum length twenty feet (20'), conforming to ASTM D-3034 and F-789 for PS 46 type.

3. Cast Iron Pipe (CI) maximum length ten (10') feet conforming to ANSI A 21.11 & 21.6 Class 22.

4. ABS schedule 40 plastic pipe, maximum length twenty (20) feet.
5. Vitrified Clay Pipe (VCP) maximum lenght of six and one half (6 1/2) feet.

B. All joints shall be solvent weld type with use of approved primer and glue as per manufacturers recommendation, bell and spigot construction or by formed fittings of the same class and type as the connecting pipe. Gaskets shall be rubber "O" ring type for sealing bell and spigot or formed fittings. Cast iron pipe "no hub" type joints shall be "caulder" or approved equal. Cleanouts shall be constructed of the same material as the service lateral whenever possible, and shall include a manufactured wye fitting. The cleanout box shall be concrete approximately 11 x 17 inches, with a lid marked sewer. The lid may be solid concrete if not in an area not exposed to vehicle loading. (Box and lid to be a Cook 1.5 or equivalent.) If subject to vehicle loading the lid shall be of cast iron construction marked sewer.

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C. Bedding and initial backfill shall be sand or native material provided that there shall be no particle greater the three-fourths (3/4") inches largest dimension.

3.04 MANNER OF CONSTRUCTION

A. Construction of sewer services in streets or public rights of way shall be by persons who furnish to the District satisfactory evidence of adequate liability insurance coverage. No excavation shall take place in a County Right of Way until a copy of the valid Encroachment Permit issued by the County has been deposited with the District. No excavation shall take place in a State Right of Way until the District has secured an Encroachment Permit from the Department of Transportation in the name of the District and the owner or his representative. If an excavation is to exceed five (5') feet in depth, the individual(s) performing the work shall make application and secure a separate Encroachment Permit from the Department of Transportation and furnish satisfactory evidence thereof to the District.

B. All excavations required for the installation of a building sewer shall be open trench work unless otherwise approved by the Manager. Compliance with safety orders of the Division of Industrial Safety of the California Department of Industrial Relations, (CAL OSHA), is mandatory. In addition, traffic safety measures as required by the Shasta County Department of Public Works or the California Department of Transportation shall be satisfied.

Where any existing pavement or surfacing of any street must be removed for the purpose of constructing any service sewer or other sewer, such pavement shall first be cut along the lines of excavation to prevent tearing or damaging the surfacing outside the excavation area.

C. The connection of the service stub to the public sewer shall be done by the District. Excavation and trench safety measures in accordance with the Division of Industrial Safety shall be provided by the owner. The fee for said connection shall be as shown in Exhibit A, Table 3.

D. Excavations shall be made at a uniform grade from the service stub. Over excavation shall be avoided. If the excavation extends below the invert of the service lateral to a depth greater than 6 inches, the over-excavated trench shall be filled with gravel, 3/4 inch minus, to an elevation 4 inches below the invert of the service lateral.

E. The sewer lateral shall be laid at a uniform grade of not less than one-fourth (1/4") inch vertical to one (1') foot horizontal (=2%) towards the structure and shall be laid in straight

alignment insofar as possible unless approved by the Manager. Changes in direction shall be made only with the proper pipe fittings. The pipe shall be laid up-grade continuously from the connection at the public sewer to the structure outlet connection with the bell end up-grade. Joints in the pipe shall be made as provided in the Ordinance. A bell or coupling hole shall be excavated to accommodate the bell or coupling of each pipe length or fitting, of a size and depth to facilitate a complete and satisfactory placing of the joint. All adjustments of pipe to line and grade shall be made by scraping away or filling in and compactly tamping earth or sand under the body of the pipe. Wedging or blocking up of the pipe shall not be permitted. The bell or coupling hole shall be kept free from water during the laying of the pipe and until the jointing has been completed to the point where water thereon will cause no damage. Both bell and spigot or other jointing surfaces be clean and care shall be taken that nothing but the manufacturers recommended joint compound enters the joint.

F. The pipe shall be bedded in material approved by the District and contain no particles larger than three=fourth (3/4") inch. Bedding shall be a minimum of four (4") inches deep below the bottom of the pipe, and shall extend six (6") inches each side of the pipe.

G. Cleanouts shall be provided at the property line, at all bends 45 degrees or greater in the service lateral, at or within five (5') feet of the structure foundation, and at intervals such that the distance between cleanouts does not exceed seventy-five (75') feet. The cleanout pipe shall be brought up to four (4") inches deep below finished grade by straight sections of pipe, and a watertight cap of the same material as the pipe installed. The cleanout shall have a box installed one half (1/2")inch below grade in paved driveways and undeveloped areas, and one (1") inch below grade with a two (2") inch thick, three (3') square asphalt or a four (4") inch thick, three (3') foot square concrete apron in unpaved driveways.

H. The depth of cover over a service lateral shall be a minimum of thirty (30") inches at the property line. If thirty inches (30") of cover is not maintained in any driveway or traffic area, cast iron pipe shall be used. At no point shall cover be less than twelve (12") inches.

I. All trenches shall be left open for inspection. No service lateral pipe may be covered until inspected and a test witnessed by the District. The owner shall notify the District 24 hours in advance to schedule an inspection. Initial backfill shall be placed to a depth of twelve (12") inches over the top of the pipe and compacted using suitable mechanical equipment. Subsequent backfill may be accomplished using native material provided no

rocks or particles greater than four (4") inches are present. No trench shall remain open longer than 24 hours. Above the initial backfill no material shall be allowed which contains rock greater than four (4") inches largest dimension.

J. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the District, the Shasta County Public Works Department, or the California Department of Transportation, as applicable. Backfill material and the method of placement in a road or highway right-of-way, shall conform to the requirements of the applicable agency mentioned above.

K. Connections to the public sewer six (6") inches and larger in diameter shall require special authorization of the Manager, who shall specify the method of construction.

L. No line shall be placed in service prior to completion of all encroachment permit conditions and the filing with the District of satisfactory evidence thereof.

M. Nothing contained herein shall be construed as making the District a party to any construction, nor shall this ordinance relieve any person from the necessity of compliance with the provisions of any other applicable ordinances or permits.

3.05 INSPECTION

A. No sewer line connected to the District's sewer system shall flow sewage until said line has passed a preliminary and final inspection. Two inspection (visits to the site constitute an inspection) shall be allowed. Additional inspections shall be at the rate as set forth in Exhibit A.

B. If a user's sewer line has not passed a final inspection within 90 days of the preliminary inspection, the District shall make a special inspection and report any deficiencies to the owner. If the user's sewer line is not finalized within a year of the permit date the permit will become invalid. Upon application for a new permit another permit fee will be charged. Additional inspections fees shall be billed and collected as are Sewer User Charges and shall be subject to the same delinquency charges.

3.06 PUMPED SEWER SERVICES

See Section 7.

SECTION 4

TESTING

4.01 PURPOSE

The purpose of this section is to reasonably insure the soundness of the sewer collection system in order to prevent infiltration and to insure compliance for both new and existing lines. Because of the nature and physical location of existing lines, the Manager has the authority to alter the testing methods if the methods stated herein are deemed impractical.

4.02 APPLICABILITY

A. All new connections to the public sewers shall be tested in accordance with the provisions of this section, to include gravity and pumped sewer services. No person shall use or introduce wastewater into the public sewer until the service lateral has passed a test as specified in Section 4.03.

B. No existing lateral shall be allowed to remain connected to the public sewer which is incapable of passing a test as specified in Section 4.04.

C. All service laterals, including those serving residential, multiple residential and commercial, connected to a District sanitary sewer shall be cleaned and tested in accordance with Section 4.04 under any of the following conditions:

1. Installation of additional toilet facilities in the house, building or property served, or

2. Change of the use of the house, building or property serviced from residential to business or commercial, or from non-restaurant commercial to restaurant commercial, or

3. Upon repair or replacement of all or part of the building sewer, or

4. Upon addition to structures of living quarters, such as guest cabins on the property served or plumbing of garages into living quarters, or

5. Upon determination by the Manager that the cleaning and testing is required for the protection of the public health, safety and welfare.

4.03 TESTING NEW SERVICE LATERALS

A. All new service laterals shall be tested by either an air or water method, at the discretion of the District. The test section shall be from the WYE at the main to the building cleanout or from the service stub at the property line to the building cleanout, corresponding to the line installed.

B. The air test shall consist of plugging each end of the service lateral and applying a pressure of three and one half pounds per square inch (3.5 psi) to the section under the test. The line shall be allowed a maximum loss in pressure of 1/2 psi in five (5) minutes. If the loss exceeds 1/2 psi, the test may be attempted one additional time. A second loss of pressure constitutes failure of the line.

C. The water test shall consist of plugging the downstream end of a service lateral, placing a section(s) of pipe in the vertical branch of the building cleanout and filling the test section with water such that the depth of water is 8 feet to the lowest point of the service lateral. Additional cleanouts may have to be installed in steep lines and the line tested in sections. In no case shall the total depth of water exceed fifteen (15') feet to any point in the line. The line shall be allowed a maximum loss of water level of one (1") inch in five (5) minutes for four (4") or six (6") inch diameter lateral per one hundred (100') feet in length. If the loss exceeds the allowable, the line may be retested one additional time. A second loss exceeding the allowable constitutes a failure of the line.

D. If a line fails, the owner shall be responsible for correction of the condition causing the failure, notifying the District when such work has been completed and for scheduling a new test.

4.04 TESTING OF EXISTING SEWER LATERALS

A. It shall be unlawful for any owner of a house, building, or property connected to a District sanitary sewer to maintain the building sewer in a condition where leakage is such that the tests contained herein cannot be successfully accomplished.

B. If a cleanout has not been installed at the property line, a cleanout shall be installed prior to cleaning and testing. The property owner shall be responsible for such installation.

C. The owner of any house, building, or property shall conduct all cleaning and testing required at his sole expense and shall notify the District in 24 hours prior to cleaning and testing. Operations conducted without such notice shall not satisfy the requirements of this Section.

D. Existing service laterals shall be tested by the air or water method, at the discretion of the District. Testing shall be in accordance with Section 4.03 B or 4.03 C as applicable. In the event that a service lateral fails, the owner shall initiate corrective work and retesting within thirty (30) days from the date of the original test.

E. If the sewer line fails the testing as specified herein, it shall be repaired or replaced in accordance with the manufacturers recommendations or specifications contained herein. Patch repairs shall not be made using cement grout, glues, epoxies, or other fillers. Damaged portions of the pipe shall be cut out and replaced. Replacement sections of pipe shall be of a material and classification as approved in Section 3.03, Materials.

F. In the event that sewer cleaning, testing, repair or replacement would be required, at a time when weather conditions or excavation restrictions (October 15 until May 1) prohibit such repairs, the Manager may defer completion of such requirement until June 15th or such earlier date as agreed upon with the property owner. If the test is deferred, the Owner may post a performance bond with the District in an amount equal to be hundred twenty-five (125%) percent of the District's estimate of the cost of replacing the service lateral. The bond shall be collectible on the date when the owner should have completed testing and the funds will be released to the District.

G. If repairs are not completed within the thirty day period the District may, upon written notice to the property owner discontinue water and/or sewer service to the property until such repairs are made. The cost of discontinuing service and restoring service will be the responsibility of the property owner. Services left unconnected for a period of one year or greater shall be subject to a new permit fee in effect at the time of the reconnection.

H. Nothing herein shall constitute a warranty by the District of the soundness, or ability of the service lateral to accomplish it's purpose or to remain in compliance with this Ordinance.

4.05 RESPONSIBILITY

A. The owner shall be responsible to have the test fully prepared and ready to be observed by the District.

B. The owner shall be responsible for any consequential damage to the public sewer as a result of cleaning and testing.

SECTION 5

GREASE TRAPS

5.01 REQUIRED USES

Grease traps or Interceptors shall be installed in all establishments which handle, prepare, cook or serve foods or produce, or when in the opinion of the Manager, an establishment may introduce grease into a sanitary sewer in quantities that can affect the proper functioning of the sewage works; except that such interceptors shall not be required for private living quarters or dwelling units.

5.02 GENERAL Dishwashers and all sinks without garbage disposal shall discharge to a grease trap. The trap shall be sized in accordance with manufacturers recommendations or that of a Registered Civil Engineer with the provision that no trap shall be sized for a flow of less than twenty (20) gallon per minute.

Each grease trap shall be so installed and connected that it shall be at all times easily accessible for inspection, cleaning and removal of the intercepted grease.

Grease and oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction, watertight, and equipped with easily removable covers which when bolted in place shall be gas tight and watertight.

Unless specifically required or permitted by the District, no food waste disposal unit shall be connected to or discharged into any grease trap.

Plans of the installation and sufficient documentation to substantiate the size proposed shall be submitted to and approval obtained from the District prior to the installation of any grease trap, and the flowing of the sewer. The District reserves the right to require sizing in excess of the Uniform Plumbing Code if, in the opinion of the Manager the use warrants the additional capacity.

Nothing in the approval process contained herein, shall constitute an endorsement of any brand, make or model of grease trap nor does the District warrant the effectiveness of any unit to comply with the provisions of Section 10, PROHIBITIONS.

Where installed, all grease traps shall be maintained by the owner, at their expense, in continuous, efficient operation at all times.

5.03 COMPLIANCE

A. All services requiring a grease trap shall meet the requirements stated herein according to the following:

1. New construction

2. Upon modification resulting in a 10% or greater change in the sewage capacity rating.

B. If a service requiring a grease trap is determined to have caused a blockage, or in the District's opinion may likely cause a blockage to any District sewage collection line, the owner shall abate the problem within sixty days upon notification by the District. The District may delay this time of correction if circumstances warrant extension.

C. The owner shall be responsible for all costs incurred as a result of this section including the actual cost for District's activities caused by a blockage (or threatened blockage), or any damages or fines resulting from an overflow.

5.04 AUTOMOTIVE REPAIR FACILITIES

All automotive service bays and repair shops must have floor drains connected to the sanitary sewer. All drains must go through an approved grease trap or approved oil separator prior to discharging into the District sanitary sewer system. Oil-component wastes may contain no more than 20 mg/l of oil.

SECTION 6

SWIMMING POOLS

6.01 APPLICABILITY

All swimming or wading pools containing 2,000 gallons of water or more shall discharge backwash and drain wastewater to the public sewer as set forth in this Section.

6.02 DRAINING

Prior to draining, written approval must be obtained from the Manager. The maximum size of pipe diameter discharging pool wastewater to a public sewer shall be 1 1/2 inches. An air gap of six inches (vertical), shall be maintained between the discharge line and the sewer. When not being used, the sewer shall remain tightly capped or valved. The Manager reserves the right to prohibit the draining of swimming when such activity may negatively impact the operation of the sewage works. Draining operations shall take place only between the hours of 9:00 PM and 7:00 AM.

6.03 FILTERS

Wastewater from backwash filters shall be discharged to the public sewer as set forth in Section 6.02 The Manager may require a sand interceptor be installed prior to discharge into the sewer.

SECTION 7

PUMPED SEWER SERVICE

7.01 REQUIRED USE

For all building sites in which the improvement plans designate a pumped service or for any owner wishing to construct a structure on a portion of a lot or parcel for which gravity service was not provided, the owner shall install a sewage pump as specified herein for the purpose of lifting sewage to the public sewer.

7.02 GENERAL

A pumped sewer service shall consist of a holding tank, pump, force main and alarm system. The pump and holding tank shall be installed in the basement, or below the floor level of the lowest area to be served and in such a location as to be reasonably accessible for inspection and maintenance. Where installed, such installations shall be maintained by the owner at his expense.

7.03 MATERIALS

A. DISCHARGE PIPING:

The materials for the discharge piping shall be cast iron, ductile iron, polyvinyl chloride (PVC), asbestos cement or polyethylene pipe. All pipe shall be Schedule 40 or rated for 150 psi pressure service. Fittings and valves shall be brass or other material rated for pressure service and compatible with raw sewage applications. Pipe shall be sized according to the pump discharge but in no circumstances shall it be less than two inches (2") in diameter.

B. ALARM SYSTEM

An alarm system shall be installed in a conspicuous place, to be audible and visual within the structure served by the system. The alarm system shall continuously signal when the sewage level in the pumping chamber exceeds a predetermined safe level.

C PUMPS

Pumps shall be grinder type or non-clog type passing a minimum of a two inch diameter sphere. The pump system shall be capable of meeting the required minimum flow rate at the total dynamic head characteristic of the system. The required flow rate shall maintain a minimum velocity of 2.5 ft/sec with a maximum velocity of ten feet (10') per second within the discharge line during pumping. Switches shall be watertight, explosion proof and designed for raw sewage applications.

D PUMPING CHAMBER

The pumping chamber shall be constructed of leak proof materials and shall be impervious to infiltration of surrounding waters and exfiltration of contained wastes. The pumping chamber reserve capacity shall be a minimum of 150 gallons beyond operating capacity.

7.04 MANNER OF CONSTRUCTION

A. Discharge lines shall be installed on a continuous slope from the discharge of the pump to the connection with the gravity sewer. Minimum depth shall be thirty inches (30") to top of pipe. Bedding and backfill shall be in accordance with Section 3.04. Thrust blocking at all fittings shall be provided when slip joint pipe is used.

B. A check valve and a gate valve shall be installed on the discharge of the pump system. Valves shall be protected from freezing and be readily accessible.

C. Cleanouts shall be provided at the connection to the service stub. Connection to the service stub shall be made using a suitable adapter or reducer.

D. The pumping chamber shall be vented through the building plumbing or shall be vented by an independent vent pipe a minimum of 6 feet above grade.

E. Pumped systems must be installed in accordance with existing County building codes, and safety and health requirements to include Underwriters' Laboratory label on all parts for use in Class I, Group D hazardous locations.

7.05 TESTING

The force main shall be pressure tested at 150% of the calculated working pressure using either water or air. When pressurized, there shall be no leakage for a period of ten minutes. The operation of the pump and alarms shall be tested by the owner and verified by the District prior to final approval.

SECTION 8

MOBILE HOME PARKS

8.01 APPLICABILITY

All new and existing mobile home parks shall be subject to the provisions of this section. Included are permanent and transient (overnight) mobile home parks.

8.02 MOBILE HOME LOT DRAIN INLET

A. Each lot shall be provided with a drain inlet not less than three inches in diameter.

B. Drain inlet sanitary sewer hookups shall be provided with a threaded or clamp-type fitting for drain connectors at proper grade. The drain inlet shall be accessible at ground level. The vertical riser of a drain inlet shall be three inches in height above the concrete supporting slab. Drain inlets shall be capped when not in use. All connections must be watertight to prevent the entrance of ground water or surface water at all times.

C. Each drain inlet shall be protected from movement by being encased in a concrete slab not less than three inches in thickness and surrounding the inlet not less than six inches on any side.

D. Mobile home lot drain inlets and extensions to grade shall be of material as outlined below.

8.03 MATERIALS

Materials shall conform to Section 3.03.

8.04 PIPE SIZE

A. Each mobile home lot drain inlet shall be assigned a waste loading value of six fixture units and each park drainage system shall be sized according to Table 8A, or as provided herein. Drainage laterals shall not be less than four (4") inches in diameter.

TABLE 8A

Drainage Pipe Diameter and No. of Fixture Units on Drainage System

Size of Drainage Pipe (inches)	Max. Number of Fixture Units (individually vented system)	Max. Number of Fixture Units (wet vented system)	Terminal and Relief Vent (wet vented system, inches)
4	180	35	3
5	356	180	4
6	600	356	4

B. A park drainage system in which the grade and slope of drainage pipe does not meet the minimum specified in Table 8B shall be designed for a minimum velocity flow of two feet per second by a registered engineer.

TABLE 8B

Pipe Size (inches)	Slope per 100 ft (inches)
4	15
6	8
8	4
10	3.5
12	3

C. Park drainage systems installed without P-traps or vents may be sized in accordance with Table 8A for individually vented systems.

D. A park drainage system which exceeds the fixture unit loading on Table 8A shall be designed by a registered engineer.

SECTION 9

RESPONSIBILITY

9.01 DISTRICT RESPONSIBILITY

A. The District shall own, operate and maintain all sewer mains. The District will exercise reasonable diligence and care to provide continuous operation of it's sewage disposal facilities and to avoid, so far as practicable, curtailments or interruptions in such service. The District or it's employees will not, however, be liable either for interruption, shortage, curtailment or stoppage of said service, or for any loss or damage occasioned thereby.

B. The District, for the purpose of making repairs to the system or it appurtenances, reserves the right to temporarily suspend service, and shall not be liable for any loss or damage resulting from such service interruption. Such repairs or improvements will be made as rapidly as practicable and, so far as possible, at such times as will cause the least inconvenience to it's customers and users.

C. The District will not be responsible for the maintenance and operation of any sanitary sewer which flows into a sewage pumping or lift station which is not under the operation of the District. Such lines flowing into private facilities will not be considered as part of the public sanitary sewer system. The District will not be responsible for sewer lines on private property except in an easement dedicated to the District.

D. The District will repair physically damaged sewer stubs from the property line cleanout to the sewer main in the county right-right-of way only. The District will not be responsible for any portion of the sewer lateral on private roads or easements not in the name of the District.

9.02 OWNER RESPONSIBILITY

A. The service lateral shall be the responsibility of the owner to operate and maintain in an open and free flowing condition and capable of passing a test as outlined in Section 3.04.

B. Cleanouts shall be maintained by the owner in a functional capacity and shall be kept free of obstructions. They shall be accessible to District personnel at all times.

C. The District shall not be responsible for blockages in any part of the service lateral beyond the county right-of-way. Sewer laterals on easements shall be the sole responsibility of the property owner.

D. Nothing herein shall be construed as waiving the responsibility to secure the permits and approvals for such work as is required in Section 3.04.

SECTION 10

PROHIBITIONS

10.01 GENERAL

In order to protect the sewage works, the sewage treatment plant and protect health, safety and general welfare, the District shall place restrictions on the quantity and quality of materials and waste discharged into the public sewers.

10.02 PROHIBITED DISCHARGES

No person shall discharge or cause to be discharged into the public sewer the following:

a: Any liquid or vapor having a temperature higher than one hundred forty (140) degrees Fahrenheit.

b. Any water or waste containing fats, wax, grease, or oils, whether emulsified or not, in excess of one hundred (100) mg/l or containing substances which may solidify or become viscous at temperatures below 60 degrees F.

c. Any garbage from a residential unit that has not been properly shredded. Garbage is prohibited from a commercial property.

d. Any water containing synthetic detergents in excessive quantity.

e. Any water or wastes containing excessive suspended solids or excessive dissolved solids.

f. Any noxious or malodorous gas or substance capable of creating a public nuisance.

g. Any water or wastes containing acid iron pickling wastes, or concentrated plating solutions whether neutralized or not.

h. Any water or wastes containing iron, chromium, copper, zinc, and similar objectionable or toxic substances; or wastes exerting an excessive chlorine requirement.

i. Any waste water containing cyanides in excess of two milligrams per liter (mg/l).

j. Any water or wastes containing phenols or other taste or odor producing substances in high concentrations.

k. Any radioactive wastes or isotopes.

l. Any water or wastes having pH in excess of 9.5.

m. Any wastewater flow or concentration of wastes constituting "slug" as defined herein.

n. Any wastewater with an excessive BOD or chemical oxygen demand.

o. Any substance prohibited by Proposition 65, California Constitutional Amendment.

p. Any water or wastes which contain substances or possesses characteristics which, in the judgement of the Manager, may have deleterious effect upon the sewage treatment works or collection system.

q. The use of diluting waters to meet the requirement standards for discharge of waste is prohibited.

10.03 APPLICATION

If any water or waste are proposed to be discharged to the public sewer, the District reserves the right to:

1. Reject the wastes, or

2. Require pretreatment to an acceptable condition for discharge to the public sewers, or

3. Require control over the quantities and rates of discharge, and/or

4. Require payment to cover the added cost of handling the wastes not covered by charges under the provisions of the Ordinance.

The owner shall make written application to the District. Such application shall name the substance, its concentration, the quantity of flow, the proposed discharge point, hours of discharge and other pertinent information as is necessary to determine the possible effects of such a discharge. No such discharge shall take place until and upon written authorization from the Manager is granted.

10.04 VIOLATIONS

When the District suspects the discharge of prohibited substances into the public sewers without written authorization, it shall cause samples to be analyzed by a certified laboratory. If substances are found in violation of the section, the owner shall immediately cease discharging and shall be subject to the penalties as outlined in this Ordinance and shall bear the cost of all laboratory charges.

SECTION 11

PENALTIES

11.01 GENERAL

All persons subject to the provisions of this Ordinance shall be subject to the penalties as set forth in this section for violations of this Ordinance.

11.02 NON-PAYMENT OF FEES OR CHARGES

Upon non-payment by the applicant of applicable fees and/or charges in accordance with the provisions of this Ordinance, past the delinquency date as specified in Section 2.07 is hereby subject to termination of service.

11.03 VIOLATIONS

All persons performing work under this Ordinance shall be responsible for any and all acts of their agents or employees in connection with said work. Any person found to be in violation of any provision of this Ordinance shall be served by the District with written notice stating the nature of the violation and provided a reasonable time limit for satisfactory correction. The offender shall, within the period of time stated in such notice, permanently cease all violation.

Any person who shall continue any violation beyond the limit specified in the written notice above, shall be subject to disconnection from the District's services, including but not limited to the sanitary sewers upon five (5) days written notice, or shall be guilty of a misdemeanor, and upon conviction thereof, shall be fined an amount not exceeding five hundred ($500.00) dollars or be imprisoned for not more than six months (6) in the County jail, or penalized by both fine and imprisonment for each violation. Each day in which any such violation shall continue shall be deemed a separate offense.

Any person violating any of the provisions of this Ordinance shall become liable to the District for any expense, loss, or damage suffered by the District for such violation.

11.04 ILLEGAL CONNECTIONS OR CHANGE OF USE

Any property found to have made a connection or change in use without making application to the District and paying all fees and/or service charges shall be subject to paying all fees and charges from the date of the issuance of the building permit or physical connection to the public sewer, whichever is earliest

SECTION 12

APPEALS

12.01 GENERAL

Any person may appeal actions, decisions or interpretations by the District of the Ordinance in accordance with provisions of this section.

12.02 PROCEDURE

A. A written Notice of Appeal shall be initiated and delivered to the Manager within ten (10) days of the subject action, decision or interpretation of this Ordinance.

The Notice of Appeal shall describe the action, decision or interpretation for which the appeal is being filed including times, dates and persons involved, and the contentions of the person filing the appeal.

B. The Manager shall review the circumstances and issue, in writing, a determination to approve or deny the appeal within ten (10) working days. If denied, the determination shall specify the reasons for denial.

C. The person filing the appeal may request, in writing, within ten (10) working days of the Manager's determination, a hearing with the Board if the Manager's determination is unsatisfactory to the appellant.

D. Upon receipt of such a request, a hearing shall be set at a regular meeting of the Board of Directors within 45 days of receipt of the request.

E. The Board shall conduct a hearing on the appeal. The appellant shall have the right to call witnesses and be represented by counsel.

F. The Board shall render a decision in writing at the next regular meeting following the hearing. The decision shall contain findings of fact and determination of the issues and shall provide notice to the appellant that the time within which judicial reviews must be sought is governed by Section 1094.6 of the code of Civil Procedure.

SECTION 13

SEVERABILITY

13.01 SEVERABILITY

If any section, subsection, subdivision, paragraph, sentence, clause, or phrase of this Ordinance, or any part is for any reason held to be invalid, the decision shall not affect the validity of the remaining portions of this Ordinance or any part thereof. The Board hereby declares that it would have passed each section, subsection, subdivision, paragraph, sentence, clause or phrase, irrespective of the fact that any one or more be declared invalid.

13.02 PRIOR ORDINANCES INCONSISTENT HEREWITH

To the extent of any of the existing and prior ordinances of the District applicable to its sewer systems, works and facilities are inconsistent herewith, all such prior ordinances shall be deemed revoked upon this Ordinance becoming effective.

13.03 EFFECTIVE DATE OF ORDINANCE

That this Ordinance shall become effective 30 days after its enactment, and shall be posted and published as required by law.

EXHIBIT A, TABLE 1

SEWER EXPANSION CHARGES

TYPE OF EXPANSION	EXPANSION CHARGE
RESIDENTIAL	$1,000.00 per unit
RESIDENTIAL STUDIO	$ 500.00 per unit
MOTEL WITHOUT KITCHEN	$ 700.00 plus $500.00 per rental unit
MOTEL WITH KITCHEN	$ 700.00 plus $600.00 per rental unit
CAMPGROUND OR TRAVEL TRAILER PARK WITH INDIVIDUAL SEWER HOOKUP	$ 700.00 plus $50.00 per site
CAMPGROUND OR TRAVEL TAILER PARK WITH GENERAL SEWER FACILITY	$ 700.00 plus $20.00 per site
MOBILE HOME PARK	$ 700.00 per space
RESTURANT AND BARS	$ 700.00 plus $50.00 per fixture unit
SNACK BARS	$ 700.00 plus $50.00 per fixture unit
LAUNDRIES	$ 700.00 plus $200.00 per washing machine
THEATER	$ 700.00 plus $50.00 per fixture unit
SERVICE STATIONS	$ 700.00 plus $200.00 per service bay plus $50.00 per fixture unit
BARBER SHOPS, BEAUTY SHOPS	$ 700.00 plus $50.00 per fixture unit
MARKETS	$ 700.00 plus $50.00 per fixture unit
CHURCHES	$ 700.00 plus $50.00 per fixture unit
OTHER BUSINESSES	$ 700.00 plus $50.00 per fixture unit
USES NOT STATED ABOVE	As determined by the District

EXHIBIT 1 TABLE B

RATES

1. The applicant shall be responsible for and shall be billed for all multiple connections through a single service, residential or non-residential.

2. The applicant shall be billed on the basis that the prime consumer shall constitute a full service charge.

3. Each unit which contains a sewer facility shall constitute a full service charge for sewer.

4. Business with more that ten (10) employees shall be billed a sewer rate according to schedule "H".

5. Motels and hotels shall be charged $11.00 for sewer for the first unit and $2.00 for each additional unit, and $1.95 for each washing machine. Units with kitchens will be charged $3.00 each per month.

6. Sewer rates for non-residential users are as specified in the attachments "A, B, C, D, E, F, G and H" as follows:

EXHIBIT A TABLE 3

SPECIAL CHARGES

Sewer Inspection Permit	$50.00
Service Charge	$15.00
Tapping Charge	$150.00
Sewer Deposit	$22.00

APPENDIX F

Burney Water District

20222 HUDSON STREET, BURNEY, CA 96013 (530) 335-3582

ORDINANCE 2009 S-1

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE BURNEY WATER DISTRICT, AMENDING EXHIBIT 1, TABLE B OF SEWER ORDINANCE NO. 90-01; SETTING SEWER BASE RATE CHARGES AND ESTABLISHING AN ANNUAL COST OF LIVING ADJUSTMENT; SETTING SEWER CAPACITY CHARGES AND ESTABLISHING AN ANNUAL CONSTRUCTION COST INDEX ADJUSTMENT; AND REPEALING ALL OTHER ORDINANCES OR PORTIONS THEREOF IN CONFLICT.

Whereas, the Board of Directors of the Burney Water District has determined that an increase is necessary in the sewer base rate charges and sewer capacity charges in order to cover rising operational costs and infrastructure replacement costs, and;

Whereas, the Board of Directors of the Burney Water District has determined that establishing an annual cost of living adjustment for the sewer base rate charges and an annual construction cost index adjustment for the sewer capacity charges will allow the District to make regular adjustments to these charges so as to keep pace with current economic conditions that affect the cost of providing sewer service.

Now Therefore, Be It Ordained by the Board of Directors of the Burney Water District, that the following amendments to Exhibit 1, Table B of Sewer Ordinance No. 90-01 shall be added as follows:

Section 1. Sewer Ordinance 90-01: Exhibit 1, Table B is hereby amended to read as follows:

"7. **Sewer Base Rate Charges** are determined by the Average Winter Flow (AWF), measured in Cubic Feet (CF).
The AWF is calculated by averaging December, January and February metered water usage. The Sewer Base Rates are adjusted annually, with rate changes reflected on the August billing cycle.
The Sewer Base Rate Charge Formula is approximately (0.011 x CF) + 11.15.

Average Winter Flow (in CF)	Sewer Base Rate Charge
0-4	$11.15
5-99	11.70
100-199	11.80
200-299	12.85
300-399	15.05
400-499	16.30
500-599	17.50
600-699	18.35
700-799	19.40
800-899	20.40
900-999	21.55
1000-1099	22.70
1100-1199	23.80
1200-1299	24.85
1300-1399	26.05
1400-1499	27.10
1500-1599	28.20
1600-1699	29.30
1700-1799	30.40
1800-1899	31.50
1900-1999	32.75

2000-2099	33.75
2100-2199	34.80
2200-2299	35.90
2300-2399	37.00
2400-2499	38.15
2500-2599	39.30
2600-2699	40.30
2700-2799	41.00
2800-2899	42.50
2900-2999	43.60
3000-3099	44.85
3100-3199	45.75
3200-3299	46.95
3300-3399	47.00
3400-3499	48.10
3500-3599	50.20
3600-3699	51.35
3700-3799	52.45
3800-3899	53.50
4300-4399	59.00
4400-4499	60.15
4600-4699	62.25
4800-4899	64.50
5100-5199	67.85
5300-5399	69.95
5600-5699	73.35
6600-6699	84.35
7600-7699	95.20
7700-7799	96.45
8300-8399	103.05
8800-8899	109.75
11100-11199	133.80
12600-12699	150.30
12700-12799	151.40
15700-15799	184.45
17600-17699	204.05

8. **Sewer Capacity Charges** generate funds from new sewer hook-ups to finance future capital improvements. Sewer Capacity Charges are charges for facilities in existence at the time the new sewer hook-up is made, or charges for new facilities to be constructed in the future, which are of benefit to the person or property being charged. These charges will be adjusted immediately upon adoption of this ordinance, and each July 1 thereafter, by an amount not to exceed the greater of: (1) the annual percentage increase, if any (comparing January of current year to January of prior year), in the Construction Cost Index published in the Engineering News-Record, or its successor ("CCI Increase"); or (2) 15% (the "Max Capacity Charge Increase").

Sewer Capacity Charge: $6,130.60 per household equivalent (5.7% CCI Increase)

Meter Size	Flow Per AWWA (GPM)	Household Equivalent	Sewer Capacity Charge
5/8"	**20**	**1**	**$6,130.60**
3/4"	**30**	**1.5**	**$9,195.90**
1"	**50**	**2.5**	**$15,326.50**
1-1/2"	**100**	**5**	**$30,653.00**
2"	**160**	**8**	**$49,044.80**
3"	**300**	**15**	**$91,959.00**
4"	**500**	**25**	**$153,265.00**
6"	**1000**	**50**	**$306,530.00**
8"	**1600**	**80**	**$490,448.00**

AWWA=American Water Works Association"

Section 2. All ordinances, parts of ordinances or agreements inconsistent or in conflict with this ordinance are hereby repealed.

Section 3. The provisions of this Ordinance shall take effect 30 days after adoption by the Board of Directors of the Burney Water District.

Section 4. If any section, sub-section, sentence, clause, or phrase of this ordinance, for any reason, held to be unconstitutional or invalid, such holding shall not affect the validity of the remaining portion of this ordinance. The Board of Directors of the Burney Water District hereby declares that it would have passed this ordinance and each section, sub-section, sentence, clause, or phrase if declared unconstitutional or invalid.

Duly adopted this 30th day of September 2009 by the following vote of the Board of Directors of the Burney Water District.

Ayes
Noes
Absent
Abstain

Attest

APPENDIX G

PACE ENGINEERING

January 8, 2014

306.08.200

SENT BY MAIL AND EMAIL
dwarner@waterboards.ca.gov

Daniel Warner
Water Resources Control Engineer
Central Valley Regional Water Quality Control Board
Redding Branch Office
364 Knollcrest Drive, Suite 205
Redding, CA 96002

Dear Dan,

Subject: Burney Water District Sludge Disposal Plan

The unincorporated town of Burney is located approximately 50 miles east of Redding in Shasta County, California. Burney Water District (District) provides water and sewer services, and owns the community pool and parks in the town of Burney. The District owns, operates, and maintains the wastewater collection system and wastewater treatment plant (WWTP).

In 2012, the District authorized PACE Engineering (PACE) to work jointly with District staff to prepare a Sewer Master Plan (SMP). The SMP will be finalized by the end of February 2014. The emphasis of this planning effort was to review and analyze the existing wastewater collection system, and develop a computer model that could be used to determine the need for future improvements. Projection of future peak wet weather wastewater flows was made, and a master plan of improvements was developed to meet sewage collection, treatment, and disposal needs at current and future flows. Burney is experiencing its own economic downturn with proposed subdivisions put on hold or eliminated completely, and a static if not declining number of sewer connections. Improvements needed to accommodate growth are expected to be minimal in the upcoming years. As such, many improvements recommended are needed to correct existing system deficiencies.

One such deficiency is that of the existing sludge handling process. The District's original extended aeration system was constructed in 1974. The system includes a static screen, headworks, oxidation ditch, secondary clarifier, sludge lagoon, sludge drying beds, and 8 stabilization ponds. California Regional Water Quality Control Board (CRWQCB) Waste Discharge Requirements (WDRs) Order No. 94-017 for the WWTP indicates a current maximum permitted ADWF of 0.44 MGD to unlined or partially lined stabilization ponds. Four sludge drying beds totaling approximately 4,700 square feet (SF) are no longer in service. Historically, the beds were ineffective for sludge drying

due to undersized beds requiring thick sludge lifts, together with too short of drying seasons and trees shading much of the beds. As such, a facultative sludge lagoon with an HDPE liner was constructed in 1989 which stores WAS from the clarifier. HDPE liners typically have a 20-year life. This liner is 25 years old and exhibiting signs it has met its useful service life; therefore, it needs to be replaced in the next 5 years. The lagoon is also currently full of more than 12 years of sludge buildup.

Sludge Sampling

PACE collected samples from the sludge lagoon October 21, 2013, which were analyzed at Basic Lab. Lab results indicated all constituents to be well within limits for disposal to the Shasta County West Central Landfill, with the exception of bis (2-ethylhexyl) phthalate which measured 1.73 mg/kg. This is above the Total Threshold Limit Concentration (TTLC) limit for designated waste of 0.17 mg/kg. Lab results are attached to this plan.

During the site visit, exposed sludge was observed in some areas of the lagoon surface. Depth measurements with a sludge judge in numerous areas revealed an uneven distribution of sludge throughout the lagoon, as well as a varied sludge thickness ranging from about 5% to 12% solids. As such, calculations of sludge removal herein assume a full lagoon totaling approximately 292,300 cubic feet (CF) of wet sludge. Cost comparisons were made assuming both 5% and 12% solids, resulting in 460 and 1,100 dry tons of sludge, respectively. Lab results indicated the sludge sample to be 12.9% solids; therefore, actual costs will likely be on the higher side of those estimated herein.

Discussions with District and CRWQCB staff resulted in a few alternatives considered to remove sludge from the lagoon and allow for liner inspection as requested by the CRWQCB.

Discussions between the District and Mr. Ron Hathaway, the farm owner of Hathaway Ranch, located immediately west of the WWTP across Black Ranch Road, resulted in the owner being interested in land applying WWTP biosolids to approximately 20 or 30 acres on his land. It is anticipated each drying season the District could haul treated and dried biosolids to this location once the sludge met requirements such that there would be no regulatory issues associated with land application at this location. However, land application of biosolids requires a complete environmental review process be done prior to site approval, and EPA Part 503 Rule regulations would also need to be adhered to. Additionally, the sludge would still have to be treated on-site and dewatered prior to land application. As such, this alternative will not be pursued at this time, but may be reconsidered in the future.

TenCate Geotubes®

Another considered alternative was to mechanically dewater the sludge using a centrifuge. The City of Lakeport is in the process of completing such a project for their oxidation ponds which require improvements and sludge removal. The City intends to issue a contract to dredge the lagoon, use a centrifuge to achieve adequate solids for land application, and haul the dried sludge away. Synagro has provided an approximate cost of $700 per dry ton to complete this same process for the District. Assuming 5% solids would result in approximately $322,000, while 12% solids would cost about $770,000.

Drying sludge in place and then hauling it to a nearby landfill is much less expensive than using centrifuges ($200 versus $700 per dry ton). As such, a considered alternative to contracting with Synagro is to utilize Geotubes® from TenCate to allow the sludge to further dry in place. Sludge would be pumped into a Geotube® container made of a high strength permeable geotextile. Polymer addition and effluent water draining through the small pores in the engineered textile results in dewatering and volume reduction. This volume reduction allows for repeated filling of the Geotube® container. However, discussion with Mr. Dave Burns at Hidden Valley Community Services District (CSD), who uses the Geotubes® as part of their everyday wasting process, indicated performance slows over time due to clogged pores. Clear filtrate can often be collected and recirculated through the WWTP if desired; however, this would require careful process control to ensure the recycle stream is not such that it causes WWTP upsets. Mr. Burns also indicated odors produced from the Geotubes® have been a problem at Hidden Valley CSD.

WaterSolve, LLC, is the distributor of TenCate Geotubes®; however, they are not licensed to install or operate the necessary equipment in California. As such, only the materials would be provided, including required hoses and mixing manifolds. Due to the lack of installation and operational support, together with undesirable odors that may be caused, this is not the preferred alternative. Considerable costs would be spent on materials and installation, and the sludge would then still have to be trucked to a landfill.

More recent discussions with the CRWQCB have resulted in the understanding the District can place dredged sludge in the existing unused stabilization ponds, as long as the sludge is then allowed to dry through only one drying season before being hauled away. This is a result of a subsurface study conducted in 1985 and 1986 by Geotechnical Consultants, Inc. which found the following to be true:

a. Ponds 1 through 7 have percolation rates slower than five minutes per inch.

b. There was no evidence of lava tubes or other open fractures without benefit of soil filtration.

c. Secondary pathways (jointing) were clearly present in the subsurface; however, these fractures were typically clay-filled and vertically discontinuous.

d. The interlaying of fresh rock and highly weathered zones appears to fulfill the five feet of soil horizon on a cumulative basis.

Percolation Pond No. 1

Pond 8 was found to have seepage at the base of its berm; therefore, a French drain was installed. This drain runs to unlined Percolation Pond No. 1, located to the north of the existing sludge lagoon. This pond also contains Sludge Lagoon No. 1 supernatant.

One alternative the District could pursue is to rent a dredge and move as much sludge as possible to Stabilization Ponds No. 7 and 8. A dredge can be rented from SRS Crissafulli or an equivalent company. A FLUMP (floating lagoon pumper) 4-inch severe duty dredge would be required at an initial month rental charge of $16,700, and $12,700 monthly thereafter, in addition to a damage deposit and round-trip freight. If, after the first month, the District decided to purchase the dredge, 100% of the initial month rental cost could be applied toward the purchase of the dredge, which is estimated to be approximately $150,000. Applying dredged sludge in 1-foot thick lifts would allow approximately 112,000 CF of sludge be removed in one drying season. It is estimated this would require approximately two months of dredge rental.

However, Synagro has indicated an approximately cost of $200 per dry ton to dredge the lagoon in the spring of 2014, then come back at the end of the summer drying season and haul away the dried sludge. This would cost the District approximately $35,000 at 5% solids, and $84,000 at 12% solids to remove 112,000 CF of sludge from the sludge lagoon in one drying season. Due to the complexities associated with dredging, and the relatively low cost provided by Synagro, it is recommended the District contract with Synagro for the first year of sludge dredging. This will allow the District to see proper dredging techniques, and possibly complete the process themselves in subsequent years. Odor control may be required via mechanical means or chemical addition as needed until the sludge cakes over.

To allow for liner inspection and replacement, Sludge Lagoon No. 1 must be taken out of service. Therefore, the District intends to dewater Percolation Pond No. 1 to Stabilization Pond No. 6, and convert it into Sludge Lagoon No. 2. Future operation of

the two sludge lagoons would be rotated to keep sludge depths manageable and allow one to be taken offline, emptied, and cleaned while the other is operational.

Sludge Lagoon No. 1 had to be lined in 1989 due to the presence of lava rock beneath it that would not hold water, even when lined with bentonite clay. The CRWQCB has indicated Sludge Lagoon No. 2 may not need to be lined, as it has been in operation unlined for numerous years and appears to hold supernatant for long periods of time. Quarterly total coliform groundwater tests taken downgradient of the WWTP at the Hathaway Ranch have all been absent with the exception of one test sampled March 25, 2013. However, this test was resampled with a result of less than 1.1 MPN/100 mL. These test results are attached. As such, the need for a liner is presently unknown and the cost to convert Percolation Pond No. 1 into Sludge Lagoon No. 2 cannot be estimated at this time. Further analysis must be completed to determine the soil characteristics at this location and subsequently what the CRWQCB will require in terms of a liner, monitoring wells, etc.

The District does not currently have the funds available to take on additional analyses and a significant sludge disposal project at this time. A sewer rate increase of $5 just went into effect October 1, 2013, and both sewer and water rate studies are being completed by PACE to ensure rates will be adequate to allow for improvements necessary to correct existing deficiencies. Operations and maintenance costs for additional staff time will likely be included in the rate studies, as this is needed for increased process control regardless of improvements completed. Due to lack of current funds, planned construction of Sludge Lagoon No. 2 has been included in the immediate term improvements in the SMP. The District intends to submit an application for funding from the State Water Resources Control Board (SWRCB) to complete a number of needed wastewater system improvements, including those for sludge disposal, as soon as the SMP is finalized and this sludge disposal plan and schedule is approved. The proposed project schedule is summarized in attached Table 1.

At this time, the District would appreciate the CRWQCB granting this plan and schedule request. In the meantime, the District will solicit bids for the sludge dredging project. Please call with any questions you might have regarding this letter.

Sincerely,

Laurie McCollum
Staff Engineer

REGISTERED PROFESSIONAL ENGINEER
LAURIE E. McCOLLUM
No. 77274
Exp. 6-30-15
CIVIL
STATE OF CALIFORNIA

LM
Enclosures
c w/enc: Willie Rodriguez, Burney Water District Manager, burneywd@yahoo.com
M:\Jobs\0306\0306.08 General Services\Sludge Storage Basin Planning\Sludge Diposal Plan.doc

TABLE 1 Burney Water District Sludge Disposal Plan Proposed Schedule			
Item No.	**Action**	**Target Date**	**Completion Date**
1	Submit proposed plan and schedule to CRWQCB	Jan-14	8-Jan-14
2	Receive approval of plan and schedule from CRWQCB	Mar-14	
3	Dredge project out to bid	Mar-14	
4	Sludge dredging & begin 1st round of sludge drying in Stabilization Ponds No. 7 & 8	May-14	
5	Submit application for funding to SWRCB	Jul-14	
6	Haul dried sludge to landfill	Oct-14*	
7	Begin sludge dredging/drying & repeat every subsequent year	May-15*	
8	Haul dried sludge to landfill & repeat every subsequent year	Oct-15*	
9	Receive funding commitment from SWRCB	Jul-16	
10	Complete project design	Apr-17	
11	Begin project construction	Aug-17	
12	Complete project construction and startup	Jan-20	

* Tentative dates depend on weather determining allowable sludge drying season lengths.

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Chico, California 95928 530.894.5143

November 14, 2013

Lab ID: 13J0945

TOM WARNOCK
PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
RE: GENERAL TESTING BURNEY SSB

Dear TOM WARNOCK ,

Enclosed are the analysis results for Work Order number 13J0945. All analysis were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

For

Ricky D. Jensen
Laboratory Director
California ELAP Certification Number 1677

basic laboratory

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

General Chemistry

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
SLUDGE STORAGE BASIN Sludge (13J0945-01) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 12.9									
Total Suspended Solids	mg/l	**41600**		2.0	6.0	SM 2540D	10/25/13	10/25/13	B3J1249
Total Volatile Solids	"	**24900**		3	9	EPA 160.4	10/25/13	10/25/13	B3J1259

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

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General Chemistry - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
% Moisture	%	**87.1**		0.02	0.06	SM 2540G	10/31/13	10/31/13	B3J1397
% Solids	"	**12.9**		0.02	0.06	"	"	"	"

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P.O. #

Metals - TTLC

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
Antimony	mg/kg	ND		2.0	8.0	EPA 6010B	10/30/13	10/23/13	B3J1193
Arsenic	"	ND		1.6	8.0	"	"	"	"
Barium	"	**45.2**		0.8	4.0	"	"	"	"
Beryllium	"	ND		0.8	4.0	"	"	"	"
Cadmium	"	ND		0.8	4.0	"	"	"	"
Chromium	"	**6.0**		0.8	4.0	"	"	"	"
Cobalt	"	ND		4.00	20.0	"	"	"	"
Copper	"	**49.8**		0.4	2.0	"	"	"	"
Lead	"	**7.1**		1.0	5.0	"	"	"	"
Mercury	"	**0.45**		0.07	0.33	EPA 7471A	10/24/13	10/24/13	B3J1258
Molybdenum	"	ND		2.0	10.0	EPA 6010B	10/30/13	10/23/13	B3J1193
Nickel	"	**3.6**	J	1.0	4.0	"	"	"	"
Selenium	"	ND		1.0	4.0	"	"	"	"
Silver	"	**2.4**	J	1.6	8.0	"	"	"	"
Thallium	"	ND		2.0	8.0	"	"	"	"
Vanadium	"	ND		8.0	40.0	"	"	"	"
Zinc	"	**104**		4.0	20.0	"	"	"	"

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Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
Acetone	ug/kg	ND	R-08	12.5	50.0	EPA 8260B	10/28/13	10/28/13	B3J1308
Acrylonitrile	"	ND	R-08	5.0	10.0	"	"	"	"
Benzene	"	ND	R-08	4.0	10.0	"	"	"	"
Bromobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Bromochloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
Bromodichloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
Bromoform	"	ND	R-08	3.0	10.0	"	"	"	"
Bromomethane	"	ND	R-08	5.0	10.0	"	"	"	"
2-Butanone (MEK)	"	ND	R-08	15.0	25.0	"	"	"	"
n-Butylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
sec-Butylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
tert-Butylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Carbon disulfide	"	ND	R-08	4.0	10.0	"	"	"	"
Carbon tetrachloride	"	ND	R-08	4.0	10.0	"	"	"	"
Chlorobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Chloroethane	"	ND	R-08	4.0	10.0	"	"	"	"
2-Chloroethylvinyl ether	"	ND	R-08	4.0	10.0	"	"	"	"
Chloroform	"	ND	R-08	4.0	10.0	"	"	"	"
Chloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
2-Chlorotoluene	"	ND	R-08	4.0	10.0	"	"	"	"
4-Chlorotoluene	"	ND	R-08	4.0	10.0	"	"	"	"
Dibromochloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dibromo-3-chloropropane (DBCP)	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dibromoethane (EDB)	"	ND	R-08	4.0	10.0	"	"	"	"
Dibromomethane	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	4.0	10.0	"	"	"	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	4.0	10.0	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	4.0	10.0	"	"	"	"
Dichlorodifluoromethane (CFC 12)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1-Dichloroethane (1,1-DCA)	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dichloroethane (1,2-DCA)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1-Dichloroethene (1,1-DCE)	"	ND	R-08	4.0	10.0	"	"	"	"
cis-1,2-Dichloroethene (c-1,2-DCE)	"	ND	R-08	4.0	10.0	"	"	"	"
trans-1,2-Dichloroethene (t-1,2-DCE)	"	ND	R-08	4.0	10.0	"	"	"	"
Dichloromethane (Methylene Chloride)	"	ND	R-08	10.0	50.0	"	"	"	"
1,2-Dichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
1,3-Dichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
2,2-Dichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
1,1-Dichloropropene	"	ND	R-08	4.0	10.0	"	"	"	"
cis-1,3-Dichloropropene	"	ND	R-08	4.0	10.0	"	"	"	"
trans-1,3-Dichloropropene	"	ND	R-08	4.0	10.0	"	"	"	"
1,4-Dioxane	"	ND	R-08	200	500	"	"	"	"
Ethylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Ethyl tert-Butyl Ether (ETBE)	"	ND	R-08	4.0	10.0	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	4.0	10.0	"	"	"	"
2-Hexanone	"	ND	R-08	20.0	50.0	"	"	"	"
Isopropylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Di-Isopropyl Ether (DIPE)	"	ND	R-08	4.0	10.0	"	"	"	"
p-Isopropyltoluene	"	ND	R-08	4.0	10.0	"	"	"	"
4-Methyl-2-pentanone (MIBK)	"	ND	R-08	10.0	50.0	"	"	"	"
Methyl tert-Butyl Ether (MTBE)	"	ND	R-08	4.0	10.0	"	"	"	"
Naphthalene	"	ND	R-08	4.0	10.0	"	"	"	"

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Report To: PACE ENGINEERING
1730 SOUTH STREET
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Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
n-Propylbenzene	"	ND	R-08	4.0	10.0	"	"	10/28/13	"
Styrene	"	ND	R-08	4.0	10.0	"	"	"	"
tert-Amyl Methyl Ether (TAME)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,1,2-Tetrachloroethane	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,2,2-Tetrachloroethane	"	ND	R-08	4.0	10.0	"	"	"	"
Tetrachloroethene (PCE)	"	ND	R-08	4.0	10.0	"	"	"	"
Tetrahydrofuran	"	ND	R-08	40.0	100	"	"	"	"
tert-Butyl Alcohol (TBA)	"	ND	R-08	30.0	100	"	"	"	"
Toluene	"	ND	R-08	4.0	10.0	"	"	"	"
1,2,3-Trichlorobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,1-Trichloroethane (1,1,1-TCA)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,2-Trichloroethane (1,1,2-TCA)	"	ND	R-08	4.0	10.0	"	"	"	"
Trichloroethene (TCE)	"	ND	R-08	4.0	10.0	"	"	"	"
Trichlorotrifluoroethane (Freon 113)	"	ND	R-08	4.0	10.0	"	"	"	"
Trichlorofluoromethane (Freon 11)	"	ND	R-08	4.0	10.0	"	"	"	"
1,2,3-Trichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
1,2,4-Trimethylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
1,3,5-Trimethylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Vinyl acetate	"	ND	R-08	4.0	10.0	"	"	"	"
Vinyl chloride	"	ND	R-08	4.0	10.0	"	"	"	"
m,p-Xylene	"	ND	R-08	6.0	20.0	"	"	"	"
o-Xylene	"	ND	R-08	4.0	5.0	"	"	"	"
Xylenes (total)	"	ND	R-08	10.0	50.0	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		*97.7 %*	*R-08*	*53.6-162*		"	"	"	"
Surrogate: Toluene-d8		*99.7 %*	*R-08*	*51.2-146*		"	"	"	"
Surrogate: 4-Bromofluorobenzene		*97.6 %*	*R-08*	*50.2-117*		"	"	"	"

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Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
Acenaphthene	mg/kg	ND	R-08	0.990	9.90	EPA 8270C	10/30/13	10/29/13	B3J1319
Acenaphthylene	"	ND	R-08	0.990	9.90	"	"	"	"
Aniline	"	ND	R-08	0.990	9.90	"	"	"	"
Anthracene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzidine	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (a) anthracene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (a) pyrene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (b) fluoranthene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (g,h,i) perylene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzo (k) fluoranthene	"	ND	R-08	0.990	9.90	"	"	"	"
Benzyl alcohol	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-chloroethoxy)methane	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-chloroethyl)ether	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-chloroisopropyl)ether	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-ethylhexyl)adipate	"	ND	R-08	0.990	9.90	"	"	"	"
Bis(2-ethylhexyl)phthalate (DEHP)	"	**1.73**	J, R-08	0.990	9.90	"	"	"	"
4-Bromophenyl phenyl ether	"	ND	R-08	0.990	9.90	"	"	"	"
Butyl benzyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
4-Chloro-3-methylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
4-Chloroaniline	"	ND	R-08	0.990	9.90	"	"	"	"
2-Chloronaphthalene	"	ND	R-08	0.990	9.90	"	"	"	"
2-Chlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
4-Chlorophenyl phenyl ether	"	ND	R-08	0.990	9.90	"	"	"	"
Chrysene	"	ND	R-08	0.990	9.90	"	"	"	"
Dibenz (a,h) anthracene	"	ND	R-08	0.990	9.90	"	"	"	"
Dibenzofuran	"	ND	R-08	0.990	9.90	"	"	"	"
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	0.990	9.90	"	"	"	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	0.990	9.90	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	0.990	9.90	"	"	"	"
3,3´-Dichlorobenzidine	"	ND	R-08	0.990	9.90	"	"	"	"
2,4-Dichlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
Diethyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
2,4-Dimethylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
Dimethyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
Di-n-butyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
Di-n-octyl phthalate	"	ND	R-08	0.990	9.90	"	"	"	"
4,6-Dinitro-2-methylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
2,4-Dinitrophenol	"	ND	R-08	0.990	9.90	"	"	"	"
2,4-Dinitrotoluene	"	ND	R-08	0.990	9.90	"	"	"	"
2,6-Dinitrotoluene	"	ND	R-08	0.990	9.90	"	"	"	"
Fluoranthene	"	ND	R-08	0.990	9.90	"	"	"	"
Fluorene	"	ND	R-08	0.990	9.90	"	"	"	"
Hexachlorobenzene	"	ND	R-08	0.990	9.90	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	0.990	9.90	"	"	"	"
Hexachlorocyclopentadiene	"	ND	R-08	0.990	9.90	"	"	"	"
Hexachloroethane	"	ND	R-08	0.990	9.90	"	"	"	"
Indeno (1,2,3-cd) pyrene	"	ND	R-08	0.990	9.90	"	"	"	"
Isophorone	"	ND	R-08	0.990	9.90	"	"	"	"
2-Methylnaphthalene	"	ND	R-08	0.990	9.90	"	"	"	"
2-Methylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
3 & 4-Methylphenol	"	ND	R-08	0.990	9.90	"	"	"	"
Naphthalene	"	ND	R-08	0.990	9.90	"	"	"	"

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
DEWATERED SLUDGE Sludge (13J0945-02) Sampled:10/21/13 12:00 Received:10/24/13 10:36 Temp (C): 14.5									
2-Nitroaniline	"	ND	R-08	0.990	9.90	"	"	10/29/13	"
3-Nitroaniline	"	ND	R-08	0.990	9.90	"	"	"	"
4-Nitroaniline	"	ND	R-08	0.990	9.90	"	"	"	"
Nitrobenzene	"	ND	R-08	0.990	9.90	"	"	"	"
2-Nitrophenol	"	ND	R-08	0.990	9.90	"	"	"	"
4-Nitrophenol	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodiethylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodimethylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosomethylethylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodi-n-butylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodi-n-propylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosodiphenylamine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosomorpholine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosopiperidine	"	ND	R-08	0.990	9.90	"	"	"	"
N-Nitrosopyrrolidine	"	ND	R-08	0.990	9.90	"	"	"	"
Pentachlorophenol (PCP)	"	ND	R-08	0.990	9.90	"	"	"	"
Phenanthrene	"	ND	R-08	0.990	9.90	"	"	"	"
Phenol	"	ND	R-08	0.990	9.90	"	"	"	"
Pyrene	"	ND	R-08	0.990	9.90	"	"	"	"
Pyridine	"	ND	R-08	0.990	9.90	"	"	"	"
2,3,4,6-Tetrachlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	0.990	9.90	"	"	"	"
2,4,5-Trichlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
2,4,6-Trichlorophenol	"	ND	R-08	0.990	9.90	"	"	"	"
Surrogate: 2-Fluorophenol		*55.0 %*	*R-08*	*18-97.9*		"	"	"	"
Surrogate: Phenol-d5		*52.0 %*	*R-08*	*30.8-106*		"	"	"	"
Surrogate: 2,4,6-Tribromophenol		*107 %*	*R-08*	*48.6-152*		"	"	"	"
Surrogate: Nitrobenzene-d5		*66.0 %*	*R-08*	*17.7-119*		"	"	"	"
Surrogate: 2-Fluorobiphenyl		*59.0 %*	*R-08*	*26.2-110*		"	"	"	"
Surrogate: Terphenyl-d14		*101 %*	*R-08*	*31.7-134*		"	"	"	"

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Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
General Chemistry										
Batch B3J1249 - General Prep - GC										
Blank										
Total Suspended Solids	ND	6.0	mg/l							
LCS										
Total Suspended Solids	174	6.0	mg/l	200		87.0	80-120			
Duplicate **Source: 13J0898-01**										
Total Suspended Solids	15.3	6.0	mg/l		15.8			3.22	5	
Duplicate **Source: 13J0912-02**										
Total Suspended Solids	5.0	6.0	mg/l		5.0			0.00	5	J
Batch B3J1259 - General Prep - GC										
Blank										
Total Volatile Solids	ND	9	mg/l							
Duplicate **Source: 13J0945-01**										
Total Volatile Solids	24200	9	mg/l		24900			2.85	5	
General Chemistry - Solid										
Batch B3J1397 - General Prep - GC										
Duplicate **Source: 13J0945-02**										
% Moisture	88.3	0.06	%		87.1			1.37	30	
% Solids	11.7	0.06	%		12.9			9.76	30	
Metals - TTLC										
Batch B3J1193 - EPA 3050A										
Blank										
Antimony	ND	8.0	mg/kg							
Arsenic	ND	8.0	mg/kg							
Barium	ND	4.0	mg/kg							
Beryllium	ND	4.0	mg/kg							
Cadmium	ND	4.0	mg/kg							
Chromium	ND	4.0	mg/kg							
Cobalt	ND	20.0	mg/kg							
Copper	ND	2.0	mg/kg							
Lead	ND	5.0	mg/kg							
Molybdenum	ND	10.0	mg/kg							
Nickel	ND	4.0	mg/kg							
Selenium	ND	4.0	mg/kg							
Silver	ND	8.0	mg/kg							
Thallium	ND	8.0	mg/kg							
Vanadium	ND	40.0	mg/kg							
Zinc	ND	20.0	mg/kg							
LCS										
Antimony	100	8.0	mg/kg	100		100	80-120			
Arsenic	95.2	8.0	mg/kg	100		95.2	80-120			

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Phone: 244-0202 x309
P.O. #

Quality Control Data

Metals - TTLC

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch B3J1193 - EPA 3050A										
Barium	93.8	4.0	mg/kg	100		93.8	80-120			
Beryllium	103	4.0	mg/kg	100		103	80-120			
Cadmium	95.0	4.0	mg/kg	100		95.0	80-120			
Chromium	97.4	4.0	mg/kg	100		97.4	80-120			
Cobalt	94.4	20.0	mg/kg	100		94.4	80-120			
Copper	89.2	2.0	mg/kg	100		89.2	80-120			
Lead	94.0	5.0	mg/kg	100		94.0	80-120			
Molybdenum	95.0	10.0	mg/kg	100		95.0	80-120			
Nickel	92.8	4.0	mg/kg	100		92.8	80-120			
Selenium	101	4.0	mg/kg	100		101	80-120			
Silver	93.6	8.0	mg/kg	100		93.6	80-120			
Thallium	95.8	8.0	mg/kg	100		95.8	80-120			
Vanadium	103	40.0	mg/kg	100		103	80-120			
Zinc	99.2	20.0	mg/kg	100		99.2	80-120			
Duplicate **Source: 13J0945-02**										
Antimony	ND	8.0	mg/kg		ND				20	
Arsenic	ND	8.0	mg/kg		ND				20	
Barium	43.8	4.0	mg/kg		45.2			3.15	20	
Beryllium	ND	4.0	mg/kg		ND				20	
Cadmium	ND	4.0	mg/kg		ND				20	
Chromium	5.54	4.0	mg/kg		5.96			7.30	20	
Cobalt	ND	20.0	mg/kg		ND				20	
Copper	49.8	2.0	mg/kg		49.8			0.00	20	
Lead	6.46	5.0	mg/kg		7.14			10.0	20	
Molybdenum	ND	10.0	mg/kg		ND				20	
Nickel	3.28	4.0	mg/kg		3.60			9.30	20	J
Selenium	ND	4.0	mg/kg		ND				20	
Silver	2.36	8.0	mg/kg		2.40			1.68	20	J
Thallium	ND	8.0	mg/kg		ND				20	
Vanadium	ND	40.0	mg/kg		ND				20	
Zinc	102	20.0	mg/kg		104			2.53	20	
Matrix Spike **Source: 13J0945-02**										
Antimony	98.2	8.0	mg/kg	100	ND	98.2	75-125			
Arsenic	95.4	8.0	mg/kg	100	ND	95.4	75-125			
Barium	137	4.0	mg/kg	100	45.2	91.8	75-125			
Beryllium	105	4.0	mg/kg	100	ND	105	75-125			
Cadmium	95.0	4.0	mg/kg	100	ND	95.0	75-125			
Chromium	104	4.0	mg/kg	100	5.96	97.6	75-125			
Cobalt	95.6	20.0	mg/kg	100	ND	95.6	75-125			
Copper	135	2.0	mg/kg	100	49.8	85.6	75-125			
Lead	102	5.0	mg/kg	100	7.14	94.7	75-125			
Molybdenum	95.2	10.0	mg/kg	100	ND	95.2	75-125			
Nickel	96.2	4.0	mg/kg	100	3.60	92.6	75-125			
Selenium	102	4.0	mg/kg	100	ND	102	75-125			
Silver	95.0	8.0	mg/kg	100	2.40	92.6	75-125			
Thallium	93.6	8.0	mg/kg	100	ND	93.6	75-125			
Vanadium	108	40.0	mg/kg	100	ND	108	75-125			

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Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
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P.O. #

Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Metals - TTLC										
Batch B3J1193 - EPA 3050A										
Zinc	202	20.0	mg/kg	100	104	97.8	75-125			
Batch B3J1258 - EPA 7471A										
Blank										
Mercury	ND	0.33	mg/kg							
LCS										
Mercury	5.46	0.33	mg/kg	5.00		109	80-120			
Duplicate **Source: 13J0526-01**										
Mercury	ND	0.33	mg/kg		ND				20	
Matrix Spike **Source: 13J0526-01**										
Mercury	4.76	0.33	mg/kg	5.00	ND	95	75-125			
Volatile Organic Compounds - Solid										
Batch B3J1308 - EPA 5030B Soil GCMS										
Blank										
Acetone	ND	10.0	ug/kg							
Acrylonitrile	ND	2.0	ug/kg							
Benzene	ND	2.0	ug/kg							
Bromobenzene	ND	2.0	ug/kg							
Bromochloromethane	ND	2.0	ug/kg							
Bromodichloromethane	ND	2.0	ug/kg							
Bromoform	ND	2.0	ug/kg							
Bromomethane	ND	2.0	ug/kg							
2-Butanone (MEK)	ND	5.0	ug/kg							
n-Butylbenzene	ND	2.0	ug/kg							
sec-Butylbenzene	ND	2.0	ug/kg							
tert-Butylbenzene	ND	2.0	ug/kg							
Carbon disulfide	ND	2.0	ug/kg							
Carbon tetrachloride	ND	2.0	ug/kg							
Chlorobenzene	ND	2.0	ug/kg							
Chloroethane	ND	2.0	ug/kg							
2-Chloroethylvinyl ether	ND	2.0	ug/kg							
Chloroform	ND	2.0	ug/kg							
Chloromethane	ND	2.0	ug/kg							
2-Chlorotoluene	ND	2.0	ug/kg							
4-Chlorotoluene	ND	2.0	ug/kg							
Dibromochloromethane	ND	2.0	ug/kg							
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	ug/kg							
1,2-Dibromoethane (EDB)	ND	2.0	ug/kg							
Dibromomethane	ND	2.0	ug/kg							
1,2-Dichlorobenzene (o-DCB)	ND	2.0	ug/kg							
1,3-Dichlorobenzene (m-DCB)	ND	2.0	ug/kg							
1,4-Dichlorobenzene (p-DCB)	ND	2.0	ug/kg							
Dichlorodifluoromethane (CFC 12)	ND	2.0	ug/kg							
1,1-Dichloroethane (1,1-DCA)	ND	2.0	ug/kg							

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Quality Control Data

Volatile Organic Compounds - Solid

Batch B3J1308 - EPA 5030B Soil GCMS

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
1,2-Dichloroethane (1,2-DCA)	ND	2.0	ug/kg							
1,1-Dichloroethene (1,1-DCE)	ND	2.0	ug/kg							
cis-1,2-Dichloroethene (c-1,2-DCE)	ND	2.0	ug/kg							
trans-1,2-Dichloroethene (t-1,2-DCE)	ND	2.0	ug/kg							
Dichloromethane (Methylene Chloride)	ND	10.0	ug/kg							
1,2-Dichloropropane	ND	2.0	ug/kg							
1,3-Dichloropropane	ND	2.0	ug/kg							
2,2-Dichloropropane	ND	2.0	ug/kg							
1,1-Dichloropropene	ND	2.0	ug/kg							
cis-1,3-Dichloropropene	ND	2.0	ug/kg							
trans-1,3-Dichloropropene	ND	2.0	ug/kg							
1,4-Dioxane	ND	100	ug/kg							
Ethylbenzene	ND	2.0	ug/kg							
Ethyl tert-Butyl Ether (ETBE)	ND	2.0	ug/kg							
Hexachlorobutadiene	ND	2.0	ug/kg							
2-Hexanone	ND	10.0	ug/kg							
Isopropylbenzene	ND	2.0	ug/kg							
Di-Isopropyl Ether (DIPE)	ND	2.0	ug/kg							
p-Isopropyltoluene	ND	2.0	ug/kg							
4-Methyl-2-pentanone (MIBK)	ND	10.0	ug/kg							
Methyl tert-Butyl Ether (MTBE)	ND	2.0	ug/kg							
Naphthalene	ND	2.0	ug/kg							
n-Propylbenzene	ND	2.0	ug/kg							
Styrene	ND	2.0	ug/kg							
tert-Amyl Methyl Ether (TAME)	ND	2.0	ug/kg							
1,1,1,2-Tetrachloroethane	ND	2.0	ug/kg							
1,1,2,2-Tetrachloroethane	ND	2.0	ug/kg							
Tetrachloroethene (PCE)	ND	2.0	ug/kg							
Tetrahydrofuran	ND	20.0	ug/kg							
tert-Butyl Alcohol (TBA)	ND	20.0	ug/kg							
Toluene	ND	2.0	ug/kg							
1,2,3-Trichlorobenzene	ND	2.0	ug/kg							
1,2,4-Trichlorobenzene	ND	2.0	ug/kg							
1,1,1-Trichloroethane (1,1,1-TCA)	ND	2.0	ug/kg							
1,1,2-Trichloroethane (1,1,2-TCA)	ND	2.0	ug/kg							
Trichloroethene (TCE)	ND	2.0	ug/kg							
Trichlorotrifluoroethane (Freon 113)	ND	2.0	ug/kg							
Trichlorofluoromethane (Freon 11)	ND	2.0	ug/kg							
1,2,3-Trichloropropane	ND	2.0	ug/kg							
1,2,4-Trimethylbenzene	ND	2.0	ug/kg							
1,3,5-Trimethylbenzene	ND	2.0	ug/kg							
Vinyl acetate	ND	2.0	ug/kg							
Vinyl chloride	ND	2.0	ug/kg							
m,p-Xylene	ND	4.0	ug/kg							
o-Xylene	ND	1.0	ug/kg							
Xylenes (total)	ND	10.0	ug/kg							
Surrogate: 1,2-Dichloroethane-d4	*20.1*		ug/kg	*20.0*		*101*	*53.6-162*			

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Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organic Compounds - Solid										
Batch B3J1308 - EPA 5030B Soil GCMS										
Surrogate: Toluene-d8	*19.6*		ug/kg	*20.0*		*97.8*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*19.1*		ug/kg	*20.0*		*95.5*	*50.2-117*			
LCS										
Benzene	20.0	2.0	ug/kg	20.0		100	77.7-121			
Chlorobenzene	20.7	2.0	ug/kg	20.0		103	81.1-118			
1,1-Dichloroethene (1,1-DCE)	22.2	2.0	ug/kg	20.0		111	61.3-127			
Toluene	20.5	2.0	ug/kg	20.0		103	76.3-124			
Trichloroethene (TCE)	21.1	2.0	ug/kg	20.0		106	78.9-120			
Surrogate: 1,2-Dichloroethane-d4	*17.5*		ug/kg	*20.0*		*87.3*	*53.6-162*			
Surrogate: Toluene-d8	*19.0*		ug/kg	*20.0*		*95.2*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*18.6*		ug/kg	*20.0*		*92.9*	*50.2-117*			
LCS Dup										
Benzene	20.3	2.0	ug/kg	20.0		101	77.7-121	1.19	20	
Chlorobenzene	20.6	2.0	ug/kg	20.0		103	81.1-118	0.485	20	
1,1-Dichloroethene (1,1-DCE)	21.9	2.0	ug/kg	20.0		109	61.3-127	1.36	20	
Toluene	20.2	2.0	ug/kg	20.0		101	76.3-124	1.57	20	
Trichloroethene (TCE)	21.2	2.0	ug/kg	20.0		106	78.9-120	0.378	20	
Surrogate: 1,2-Dichloroethane-d4	*18.7*		ug/kg	*20.0*		*93.5*	*53.6-162*			
Surrogate: Toluene-d8	*19.6*		ug/kg	*20.0*		*97.8*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*18.8*		ug/kg	*20.0*		*94.0*	*50.2-117*			
Matrix Spike Source: 13J0805-03										
Benzene	20.5	2.0	ug/kg	20.0	ND	102	77.7-121			
Chlorobenzene	20.6	2.0	ug/kg	20.0	ND	103	81.1-118			
1,1-Dichloroethene (1,1-DCE)	23.1	2.0	ug/kg	20.0	ND	116	61.3-127			
Toluene	22.1	2.0	ug/kg	20.0	5.10	85.0	76.3-124			
Trichloroethene (TCE)	20.3	2.0	ug/kg	20.0	ND	102	78.9-120			
Surrogate: 1,2-Dichloroethane-d4	*19.3*		ug/kg	*20.0*		*96.4*	*53.6-162*			
Surrogate: Toluene-d8	*20.0*		ug/kg	*20.0*		*100*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*18.9*		ug/kg	*20.0*		*94.6*	*50.2-117*			
Matrix Spike Dup Source: 13J0805-03										
Benzene	20.3	2.0	ug/kg	20.0	ND	101	77.7-121	1.08	20	
Chlorobenzene	20.5	2.0	ug/kg	20.0	ND	102	81.1-118	0.584	20	
1,1-Dichloroethene (1,1-DCE)	22.8	2.0	ug/kg	20.0	ND	114	61.3-127	1.22	20	
Toluene	22.0	2.0	ug/kg	20.0	5.10	84.7	76.3-124	0.272	20	
Trichloroethene (TCE)	20.1	2.0	ug/kg	20.0	ND	101	78.9-120	0.989	20	
Surrogate: 1,2-Dichloroethane-d4	*19.5*		ug/kg	*20.0*		*97.6*	*53.6-162*			
Surrogate: Toluene-d8	*20.3*		ug/kg	*20.0*		*102*	*51.2-146*			
Surrogate: 4-Bromofluorobenzene	*19.2*		ug/kg	*20.0*		*96.0*	*50.2-117*			
Semi Volatile Organic Compounds										
Batch B3J1319 - EPA 3550B										
Blank										

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

basic laboratory

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Quality Control Data

Semi Volatile Organic Compounds

Batch B3J1319 - EPA 3550B

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Acenaphthene	ND	0.330	mg/kg							
Acenaphthylene	ND	0.330	mg/kg							
Aniline	ND	0.330	mg/kg							
Anthracene	ND	0.330	mg/kg							
Benzidine	ND	0.330	mg/kg							
Benzo (a) anthracene	ND	0.330	mg/kg							
Benzo (a) pyrene	ND	0.330	mg/kg							
Benzo (b) fluoranthene	ND	0.330	mg/kg							
Benzo (g,h,i) perylene	ND	0.330	mg/kg							
Benzo (k) fluoranthene	ND	0.330	mg/kg							
Benzyl alcohol	ND	0.330	mg/kg							
Bis(2-chloroethoxy)methane	ND	0.330	mg/kg							
Bis(2-chloroethyl)ether	ND	0.330	mg/kg							
Bis(2-chloroisopropyl)ether	ND	0.330	mg/kg							
Bis(2-ethylhexyl)adipate	ND	0.330	mg/kg							
Bis(2-ethylhexyl)phthalate (DEHP)	ND	0.330	mg/kg							
4-Bromophenyl phenyl ether	ND	0.330	mg/kg							
Butyl benzyl phthalate	ND	0.330	mg/kg							
4-Chloro-3-methylphenol	ND	0.330	mg/kg							
4-Chloroaniline	ND	0.330	mg/kg							
2-Chloronaphthalene	ND	0.330	mg/kg							
2-Chlorophenol	ND	0.330	mg/kg							
4-Chlorophenyl phenyl ether	ND	0.330	mg/kg							
Chrysene	ND	0.330	mg/kg							
Dibenz (a,h) anthracene	ND	0.330	mg/kg							
Dibenzofuran	ND	0.330	mg/kg							
1,2-Dichlorobenzene (o-DCB)	ND	0.330	mg/kg							
1,3-Dichlorobenzene (m-DCB)	ND	0.330	mg/kg							
1,4-Dichlorobenzene (p-DCB)	ND	0.330	mg/kg							
3,3'-Dichlorobenzidine	ND	0.330	mg/kg							
2,4-Dichlorophenol	ND	0.330	mg/kg							
Diethyl phthalate	ND	0.330	mg/kg							
2,4-Dimethylphenol	ND	0.330	mg/kg							
Dimethyl phthalate	ND	0.330	mg/kg							
Di-n-butyl phthalate	ND	0.330	mg/kg							
Di-n-octyl phthalate	ND	0.330	mg/kg							
4,6-Dinitro-2-methylphenol	ND	0.330	mg/kg							
2,4-Dinitrophenol	ND	0.330	mg/kg							
2,4-Dinitrotoluene	ND	0.330	mg/kg							
2,6-Dinitrotoluene	ND	0.330	mg/kg							
Fluoranthene	ND	0.330	mg/kg							
Fluorene	ND	0.330	mg/kg							
Hexachlorobenzene	ND	0.330	mg/kg							
Hexachlorobutadiene	ND	0.330	mg/kg							
Hexachlorocyclopentadiene	ND	0.330	mg/kg							
Hexachloroethane	ND	0.330	mg/kg							
Indeno (1,2,3-cd) pyrene	ND	0.330	mg/kg							
Isophorone	ND	0.330	mg/kg							

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1730 SOUTH STREET
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Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Quality Control Data

Semi Volatile Organic Compounds

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch B3J1319 - EPA 3550B										
2-Methylnaphthalene	ND	0.330	mg/kg							
2-Methylphenol	ND	0.330	mg/kg							
3 & 4-Methylphenol	ND	0.330	mg/kg							
Naphthalene	ND	0.330	mg/kg							
2-Nitroaniline	ND	0.330	mg/kg							
3-Nitroaniline	ND	0.330	mg/kg							
4-Nitroaniline	ND	0.330	mg/kg							
Nitrobenzene	ND	0.330	mg/kg							
2-Nitrophenol	ND	0.330	mg/kg							
4-Nitrophenol	ND	0.330	mg/kg							
N-Nitrosodiethylamine	ND	0.330	mg/kg							
N-Nitrosodimethylamine	ND	0.330	mg/kg							
N-Nitrosomethylethylamine	ND	0.330	mg/kg							
N-Nitrosodi-n-butylamine	ND	0.330	mg/kg							
N-Nitrosodi-n-propylamine	ND	0.330	mg/kg							
N-Nitrosodiphenylamine	ND	0.330	mg/kg							
N-Nitrosomorpholine	ND	0.330	mg/kg							
N-Nitrosopiperidine	ND	0.330	mg/kg							
N-Nitrosopyrrolidine	ND	0.330	mg/kg							
Pentachlorophenol (PCP)	ND	0.330	mg/kg							
Phenanthrene	ND	0.330	mg/kg							
Phenol	ND	0.330	mg/kg							
Pyrene	ND	0.330	mg/kg							
Pyridine	ND	0.330	mg/kg							
2,3,4,6-Tetrachlorophenol	ND	0.330	mg/kg							
1,2,4-Trichlorobenzene	ND	0.330	mg/kg							
2,4,5-Trichlorophenol	ND	0.330	mg/kg							
2,4,6-Trichlorophenol	ND	0.330	mg/kg							
Surrogate: 2-Fluorophenol	*0.350*		mg/kg	*0.667*		*52.5*	*18-97.9*			
Surrogate: Phenol-d5	*0.356*		mg/kg	*0.667*		*53.4*	*30.8-106*			
Surrogate: 2,4,6-Tribromophenol	*0.345*		mg/kg	*0.667*		*51.8*	*48.6-152*			
Surrogate: Nitrobenzene-d5	*0.167*		mg/kg	*0.333*		*50.2*	*17.7-119*			
Surrogate: 2-Fluorobiphenyl	*0.166*		mg/kg	*0.333*		*49.7*	*26.2-110*			
Surrogate: Terphenyl-d14	*0.350*		mg/kg	*0.333*		*105*	*31.7-134*			
LCS										
Acenaphthene	0.219	0.330	mg/kg	0.333		65.7	24.9-129			J
4-Chloro-3-methylphenol	0.188	0.330	mg/kg	0.333		56.4	23.4-137			J
2-Chlorophenol	0.195	0.330	mg/kg	0.333		58.4	26.7-122			J
1,4-Dichlorobenzene (p-DCB)	0.194	0.330	mg/kg	0.333		58.2	22.1-110			J
2,4-Dinitrotoluene	0.242	0.330	mg/kg	0.333		72.6	49.7-109			J
4-Nitrophenol	0.138	0.330	mg/kg	0.333		41.3	33.5-119			J
N-Nitrosodi-n-propylamine	0.192	0.330	mg/kg	0.333		57.5	17.6-132			J
Pentachlorophenol (PCP)	0.206	0.330	mg/kg	0.333		61.9	32-132			J
Phenol	0.175	0.330	mg/kg	0.333		52.4	29.4-124			J
Pyrene	0.297	0.330	mg/kg	0.333		89.0	39.1-136			J
1,2,4-Trichlorobenzene	0.197	0.330	mg/kg	0.333		59.1	22.3-116			J

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Quality Control Data

Semi Volatile Organic Compounds

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch B3J1319 - EPA 3550B										
Surrogate: 2-Fluorophenol	*0.360*		mg/kg	*0.667*		*54.0*	*18-97.9*			
Surrogate: Phenol-d5	*0.401*		mg/kg	*0.667*		*60.2*	*30.8-106*			
Surrogate: 2,4,6-Tribromophenol	*0.517*		mg/kg	*0.667*		*77.5*	*48.6-152*			
Surrogate: Nitrobenzene-d5	*0.197*		mg/kg	*0.333*		*59.2*	*17.7-119*			
Surrogate: 2-Fluorobiphenyl	*0.208*		mg/kg	*0.333*		*62.5*	*26.2-110*			
Surrogate: Terphenyl-d14	*0.326*		mg/kg	*0.333*		*97.7*	*31.7-134*			
Matrix Spike Source: 13J0945-02										
Acenaphthene	1.39	9.90	mg/kg	2.00	ND	69.5	24.9-129			R-08, J
4-Chloro-3-methylphenol	1.73	9.90	mg/kg	2.00	ND	86.5	23.4-137			R-08, J
2-Chlorophenol	1.38	9.90	mg/kg	2.00	ND	69.0	26.7-122			R-08, J
1,4-Dichlorobenzene (p-DCB)	1.35	9.90	mg/kg	2.00	ND	67.5	22.1-110			R-08, J
2,4-Dinitrotoluene	1.44	9.90	mg/kg	2.00	ND	72.0	49.7-109			R-08, J
4-Nitrophenol	1.36	9.90	mg/kg	2.00	ND	68.0	33.5-119			R-08, J
N-Nitrosodi-n-propylamine	1.57	9.90	mg/kg	2.00	ND	78.5	17.6-132			R-08, J
Pentachlorophenol (PCP)	1.95	9.90	mg/kg	2.00	ND	97.5	32-132			R-08, J
Phenol	0.940	9.90	mg/kg	2.00	ND	47.0	29.4-124			R-08, Z-01, J
Pyrene	1.99	9.90	mg/kg	2.00	ND	99.5	39.1-136			R-08, J
1,2,4-Trichlorobenzene	1.37	9.90	mg/kg	2.00	ND	68.5	22.3-116			R-08, J
Surrogate: 2-Fluorophenol	*1.36*		mg/kg	*2.00*		*68.0*	*18-97.9*			*R-08*
Surrogate: Phenol-d5	*1.49*		mg/kg	*2.00*		*74.5*	*30.8-106*			*R-08*
Surrogate: 2,4,6-Tribromophenol	*2.37*		mg/kg	*2.00*		*118*	*48.6-152*			*R-08*
Surrogate: Nitrobenzene-d5	*0.730*		mg/kg	*1.00*		*73.0*	*17.7-119*			*R-08*
Surrogate: 2-Fluorobiphenyl	*0.660*		mg/kg	*1.00*		*66.0*	*26.2-110*			*R-08*
Surrogate: Terphenyl-d14	*1.09*		mg/kg	*1.00*		*109*	*31.7-134*			*R-08*
Matrix Spike Dup Source: 13J0945-02										
Acenaphthene	1.49	9.90	mg/kg	2.00	ND	74.5	24.9-129	6.94	30	R-08, J
4-Chloro-3-methylphenol	1.97	9.90	mg/kg	2.00	ND	98.5	23.4-137	13.0	30	R-08, J
2-Chlorophenol	1.48	9.90	mg/kg	2.00	ND	74.0	26.7-122	6.99	30	R-08, J
1,4-Dichlorobenzene (p-DCB)	1.40	9.90	mg/kg	2.00	ND	70.0	22.1-110	3.64	30	R-08, J
2,4-Dinitrotoluene	1.57	9.90	mg/kg	2.00	ND	78.5	49.7-109	8.64	30	R-08, J
4-Nitrophenol	1.40	9.90	mg/kg	2.00	ND	70.0	33.5-119	2.90	30	R-08, J
N-Nitrosodi-n-propylamine	1.59	9.90	mg/kg	2.00	ND	79.5	17.6-132	1.27	30	R-08, J
Pentachlorophenol (PCP)	2.03	9.90	mg/kg	2.00	ND	102	32-132	4.02	30	R-08, J
Phenol	0.940	9.90	mg/kg	2.00	ND	47.0	29.4-124	200	30	R-08, Z-01, J
Pyrene	2.05	9.90	mg/kg	2.00	ND	102	39.1-136	2.97	30	R-08, J
1,2,4-Trichlorobenzene	1.44	9.90	mg/kg	2.00	ND	72.0	22.3-116	4.98	30	R-08, J
Surrogate: 2-Fluorophenol	*1.43*		mg/kg	*2.00*		*71.5*	*18-97.9*			*R-08*
Surrogate: Phenol-d5	*1.49*		mg/kg	*2.00*		*74.5*	*30.8-106*			*R-08*
Surrogate: 2,4,6-Tribromophenol	*2.41*		mg/kg	*2.00*		*120*	*48.6-152*			*R-08*
Surrogate: Nitrobenzene-d5	*0.740*		mg/kg	*1.00*		*74.0*	*17.7-119*			*R-08*
Surrogate: 2-Fluorobiphenyl	*0.690*		mg/kg	*1.00*		*69.0*	*26.2-110*			*R-08*
Surrogate: Terphenyl-d14	*1.04*		mg/kg	*1.00*		*104*	*31.7-134*			*R-08*

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Report To: PACE ENGINEERING
1730 SOUTH STREET
REDDING, CA 96001
Attention: TOM WARNOCK
Project: GENERAL TESTING BURNEY SSB

Lab No: 13J0945
Reported: 11/14/13
Phone: 244-0202 x309
P.O. #

Notes and Definitions

Z-01	Due to a calculation error in the reporting softeware the RPD reported is 200. The correct RPD is 0.
R-08	The sample was diluted due to sample matrix resulting in elevated reporting limits.
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). The J flag is equivalent to the DNQ Estimated Concentration flag.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
<	Less than reporting limit
≤	Less than or equal to reporting limit
>	Greater than reporting limit
≥	Greater than or equal to reporting limit
MDL	Method Detection Limit
RL/ML	Minimum Level of Quantitation
MCL/AL	Maxium Contaminant Level/Action Level
mg/kg	Results reported as wet weight
TTLC	Total Threshold Limit Concentration
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leachate Procedure
Note 1	Received Temperature - according to EPA guidelines, samples for most chemistry methods should be held at ≤6 degrees C after collection, including during transportation, unless the time from sampling to delivery is <2 hours. Regulating agencies may invalidate results if temperature requirements are not met.
Note 2	According to 40 CFR Part 136 Table II, the following tests should be analyzed in the field within 15 minutes of sampling: pH, chlorine, dissolved oxygen, and sulfite.

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BASIC LABORATORY CHAIN OF CUSTODY RECORD

2218 Railroad Avenue, Redding, CA 96001 (530) 243-7234 FAX (530) 243-7494

LAB #: 1310945

PAGE 1 OF 1

CLIENT NAME: PACE Engr / Burney Water Dist

PROJECT NAME: Burney SSB

PROJECT #:

MAILING ADDRESS: 1730 South St Redding CA

REPORT DUE DATE:

TURN AROUND TIME: Standard Rush

OF SAMPLES: 2

MATRIX / TYPE: S/W

PROJECT MANAGER: Tom Warnock

CUSTODY SEAL INTACT? Yes No N/A

PHONE: 244-0202

EMAIL: twarnock@pace-----

SYSTEM #:

FAX:

RESULTS SENT: Email Fax EDD Mail

EDD TYPE:

INVOICE TO: Burney Water District

PO#:

QC: Standard Level II

ANALYSIS REQUESTED

SAMPLE DATE	SAMPLE TIME	WATER	COMP	SOLID	SAMPLE LOCATION / IDENTIFICATION	NUMBER OF BOTTLES	TSS	% Volatile (TVS)	CAM 17 Metals	VOCs	SOCs	Moisture Content					LAB ID	CHLORINE RESIDUAL OR COMMENTS
10/21/13	1200	X			Sludge Storage Basin	1	X	X									01	12.9
10/21/13	1300			X	Dewatered Sludge	4	X		X	X	X	X					02	14.5

PRESERVED WITH: HNO_3 H_2SO_4 NaOH ZnAce/NaOH HCL NaThio OTHER _____

SAMPLED BY (PRINT): THOMAS W. WARNOCK	SAMPLE DATE/TIME: 10/21/13/1200	RELINQUISHED BY: [signature]	DATE/TIME: 10/24/13/1040
RECEIVED BY:	DATE/TIME:	RELINQUISHED BY:	DATE/TIME:
RECEIVED BY (LAB): [signature]	DATE/TIME: 10/24/13@10:36	PROCESSED AND VERIFIED BY:	DATE/TIME: 10/24/13@10:36
LOGGED IN BY: [signature]	DATE/TIME: 10/24/13@10:36	CARRIER: _____	COOLER TEMPERATURE: _____ °c

INSTRUCTIONS, TERMS AND CONDITIONS ON BACK.

SAMPLE TYPE: 1 = ROUTINE, 2 = REPEAT, 3 = REPLACEMENT, 4 = SPECIAL 5 = RAW

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

MPN TESTING

Sampled By: DON SIBERT
Client Contact: WILLIE RODRIGUEZ
Phone: 921-3475
Fax: 335-2189

Lab No: 3031064
Reported: 04/08/13
System Number: 4510003
Regulator: ODW
P.O. #

Analysis Report

Total & Fecal Coliform MPN 10

Method: SM 9221B/E

Analysis	Result	Units	Set Up	Read Out	Chlorine (mg/l)	Received Temp (C)*
HATHAWAY (3031064-01) Special	**Sampled: 03/29/13 10:05**	**Received: 03/29/13 13:01**				
Total Coliforms	<1.1	MPN/100 ml	03/29/13 13:15	03/31/13 13:00		9.5
Fecal Coliforms	<1.1	MPN/100 ml				9.5

Notes and Definitions

A-01 <1.1

* Received Temp: Samples received in the laboratory (unless received within 2 hours of sampling) with temperatures exceeding 10 degrees C do not meet the transportation temperature requirements as required by CA-DHS ELAP and EPA approved methods.

< Less than reporting limit

≤ Less than or equal to reporting limit

> Greater than reporting limit

≥ Greater than or equal to reporting limit

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

BACTERIA TESTING

Sampled By: MIKE SKELLY
Client Contact: WILLIE RODRIGUEZ
Phone: 921-3475
Fax: 335-2189

Lab No: 3030895
Reported: 03/26/13
System Number: 4510003
Regulator: ODW
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
BARTEL STREET (3030895-01) Routine	**Sampled: 03/25/13 09:40**		**Received: 03/25/13 12:53**			
Total Coliforms	Absent		7.6	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		7.6			
SERPENTINE LANE (3030895-02) Routine	**Sampled: 03/25/13 09:50**		**Received: 03/25/13 12:53**			
Total Coliforms	Absent		9.4	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		9.4			
HUDSON STREET (3030895-03) Routine	**Sampled: 03/25/13 09:56**		**Received: 03/25/13 12:53**			
Total Coliforms	Absent		8.3	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		8.3			
JUNIPER STREET (3030895-04) Routine	**Sampled: 03/25/13 09:28**		**Received: 03/25/13 12:53**			
Total Coliforms	Absent		8.0	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		8.0			
HATHAWAY (3030895-05) Routine	**Sampled: 03/25/13 09:17**		**Received: 03/25/13 12:53**			
Total Coliforms	Present		8.1	03/25/13 15:20	03/26/13 09:20	Colilert 24
E. Coli	Absent		8.1			

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MAR 26 2013
BY BH + OW

Date/Time 3/26/13 11:30
Basic Representative BH
Client Contact Willie

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

BACTERIA TESTING

Sampled By: MIKE SKELLY
Client Contact: WILLIE RODRIGUEZ
Phone: 921-3475
Fax: 335-2189

Lab No: 3030681
Reported: 03/19/13
System Number: 4510003
Regulator: ODW
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
HATHAWAY (3030681-01) Routine		**Sampled: 03/18/13 08:45**		**Received: 03/18/13 12:51**		
Total Coliforms	Absent		14.3	03/18/13 15:10	03/19/13 09:10	Colilert 24
E. Coli	Absent		14.3			

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of **Fecal coliforms** and/or ***E. coli*** indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

*** Sample Receipt Temp:** Samples received in the laboratory (unless received within 2 hours of sampling) with temperatures exceeding 10 degrees C do not meet the transportation temperature requirements as required by CA-DHS ELAP and EPA approved methods.

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

MONTHLY TESTING

Sampled By: DON SIBERT
Client Contact: DON SIBERT
Phone: 335-3149
Fax: 335-2189

Lab No: 2110293
Reported: 11/08/12
System Number:
Regulator:
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
HATHAWAY (2110293-03) Routine	**Sampled: 11/07/12 08:41**		**Received: 11/07/12 11:39**			
Total Coliforms	Absent		16.1	11/07/12 16:00	11/08/12 10:00	Colilert 24
E. Coli	Absent		16.1			

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of **Fecal coliforms** and/or ***E. coli*** indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

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Report To:	BURNEY WATER DISTRICT 20222 HUDSON STREET BURNEY, CA 96013-4260	**Lab No:**	13I0290
		Reported:	09/16/13
		Phone:	335-3582
Attention:	WILLIE RODRIGUEZ	**P.O. #**	1327
Project:	BACTERIA TESTING		
Description:	HATHAWAY	**Lab ID:** 13I0290-01	**Sampled:** 09/09/13 09:05
Matrix:	Water		**Received:** 09/09/13 10:37

Microbiology

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Total Coliforms	MPN/100 ml	<1			1	SM 9223B	09/10/13	09/09/13	B3I0776

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
<	Less than reporting limit
≤	Less than or equal to reporting limit
>	Greater than reporting limit
≥	Greater than or equal to reporting limit
MDL	Method Detection Limit
RL/ML	Minimum Level of Quantitation
MCL/AL	Maxium Contaminant Level/Action Level
mg/kg	Results reported as wet weight
TTLC	Total Threshold Limit Concentration
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leachate Procedure
Note 1	Received Temperature - according to EPA guidelines, samples for most chemistry methods should be held at ≤6 degrees C after collection, including during transportation, unless the time from sampling to delivery is <2 hours. Regulating agencies may invalidate results if temperature requirements are not met.
Note 2	According to 40 CFR Part 136 Table II, the following tests should be analyzed in the field within 15 minutes of sampling: pH, chlorine, dissolved oxygen, and sulfite.

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BURNEY WATER DISTRICT
20222 HUDSON STREET
BURNEY, CA 96013-4260

MONTHLY TESTING

Sampled By: DON SIBERT
Client Contact: DON SIBERT
Phone: 335-3149
Fax: 335-2189

Lab No: 2030175
Reported: 03/07/12
System Number:
Regulator:
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
HATHAWAY (2030175-04) Routine		**Sampled: 03/06/12 09:40**		**Received: 03/06/12 11:47**		
Total Coliforms	Absent		15.2	03/06/12 15:30	03/07/12 09:30	Colilert 24
E. Coli	Absent		15.2			

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of **Fecal coliforms** and/or ***E. coli*** indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

*** Sample Receipt Temp:** Samples received in the laboratory (unless received within 2 hours of sampling) with temperatures exceeding 10 degrees C do not meet the transportation temperature requirements as required by CA-DHS ELAP and EPA approved methods.

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BURNEY WATER DISTRICT
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BURNEY, CA 96013-4260

MONTHLY TESTING

Sampled By: DON SIBERT
Client Contact: DON SIBERT
Phone: 335-3149
Fax: 335-2189

Lab No: 1110293
Reported: 11/08/11
System Number:
Regulator:
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine (mg/l)	Sample Receipt Temp (C)*	Set Up	Read Out	Method
HATHAWAY (1110293-04) Routine		**Sampled: 11/07/11 09:10**		**Received: 11/07/11 11:05**		
Total Coliforms	Absent		13.5	11/07/11 16:15	11/08/11 10:15	Colilert 24
E. Coli	Absent		13.5			

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of Fecal coliforms and/or *E. coli* indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

*** Sample Receipt Temp:** Samples received in the laboratory (unless received within 2 hours of sampling) with temperatures exceeding 10 degrees C do not meet the transportation temperature requirements as required by CA-DHS ELAP and EPA approved methods.

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BURNEY WATER DISTRICT
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MONTHLY TESTING

Sampled By: DON SIBERT
Client Contact: DON SIBERT
Phone: 335-3149
Fax: 335-2189

Lab No: 1090273
Reported: 09/09/11
System Number:
Regulator:
P.O. #

Coliform Analysis Report

Standard Total Coliform & E.coli

Analysis	Result	Chlorine mg/l	Set Up	Read Out	Method
HATHAWAY (1090273-04) Routine	**Sampled: 09/08/11 09:25**		**Received: 09/08/11 10:59**		
Total Coliforms	Absent		09/08/11 14:45	09/09/11 08:45	Colilert 24
E. Coli	Absent				

Notes and Definitions

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.

The presence of Fecal coliforms and/or *E. coli* indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

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Report To:	BURNEY WATER DISTRICT 20222 HUDSON STREET BURNEY, CA 96013-4260	**Lab No:**	13F0766
		Reported:	06/21/13
		Phone:	921-3475
Attention:	WILLIE RODRIGUEZ	**P.O. #**	3728
Project:	BACTERIA TESTING		
Description:	HATHAWAY	**Lab ID:** 13F0766-01	**Sampled:** 06/19/13 11:15
Matrix:	Wastewater		**Received:** 06/19/13 13:31

Microbiology

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Total Coliforms	MPN/100 ml	<1			1	SM 9223B	06/20/13	06/19/13	B3F0899

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
<	Less than reporting limit
≤	Less than or equal to reporting limit
>	Greater than reporting limit
≥	Greater than or equal to reporting limit
MDL	Method Detection Limit
RL/ML	Minimum Level of Quantitation
MCL/AL	Maxium Contaminant Level/Action Level
mg/kg	Results reported as wet weight
TTLC	Total Threshold Limit Concentration
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leachate Procedure
Note 1	Received Temperature - according to EPA guidelines, samples for most chemistry methods should be held at ≤6 degrees C after collection, including during transportation, unless the time from sampling to delivery is <2 hours. Regulating agencies may invalidate results if temperature requirements are not met.
Note 2	According to 40 CFR Part 136 Table II, the following tests should be analyzed in the field within 15 minutes of sampling: pH, chlorine, dissolved oxygen, and sulfite.

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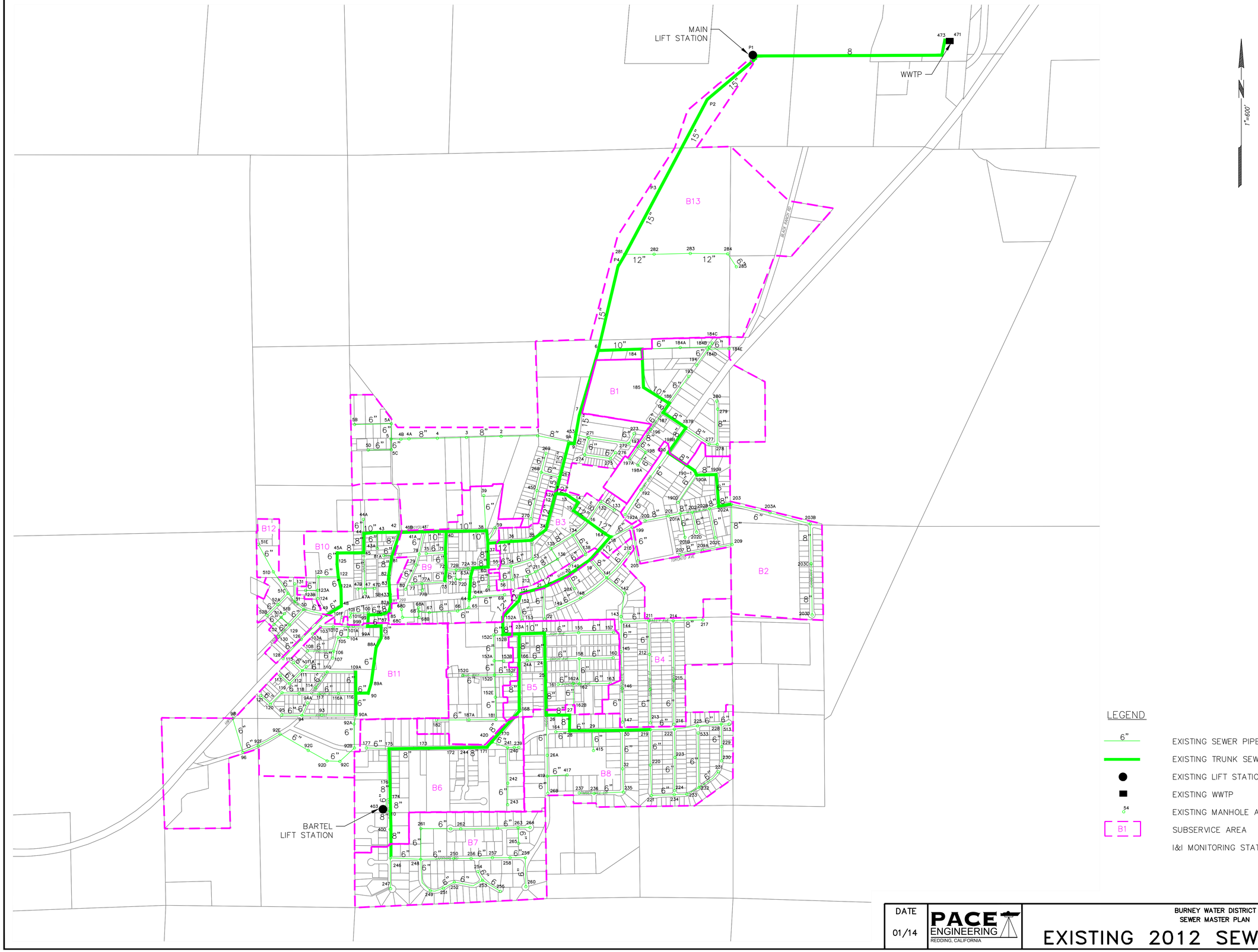
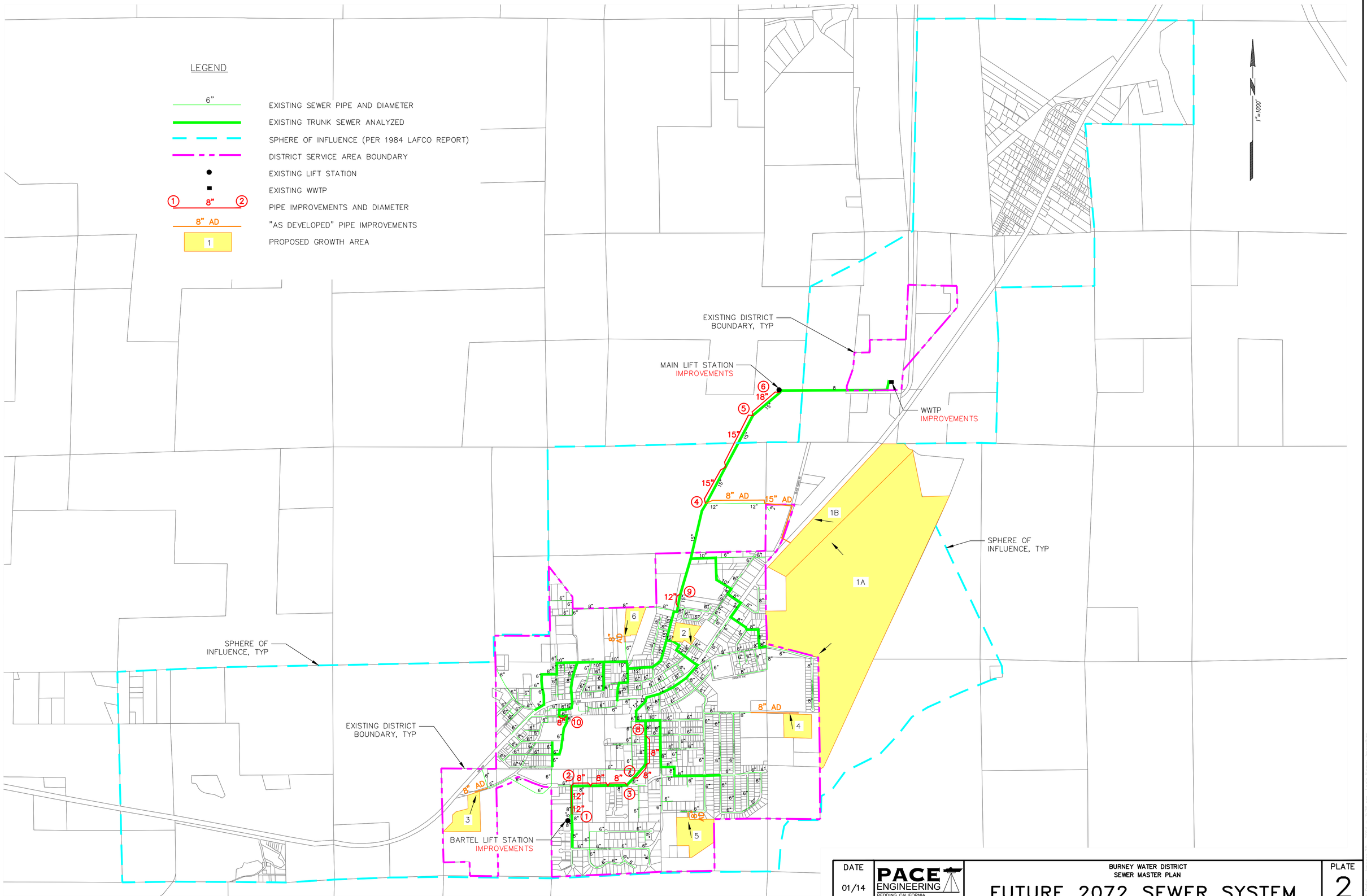


LEGEND

- 6" — EXISTING SEWER PIPE AND DIAMETER
- EXISTING TRUNK SEWER ANALYZED
- EXISTING LIFT STATION
- EXISTING WWTP
- 54 — EXISTING MANHOLE AND NUMBER
- B1 — SUBSERVICE AREA
- I&I MONITORING STATION

DATE			PLATE
01/14	PACE ENGINEERING REDDING, CALIFORNIA	BURNEY WATER DISTRICT SEWER MASTER PLAN EXISTING 2012 SEWER SYSTEM	1

Plot Date: January 23, 2014 - 2:27 pm Login Name: hincollum
File Name: M:\Land Projects\2008.24 Master Sewer and Water Plans\Plots\dwg Layout: EXIST



DATE			PLATE
01/14	PACE ENGINEERING REDDING, CALIFORNIA	BURNEY WATER DISTRICT SEWER MASTER PLAN FUTURE 2072 SEWER SYSTEM	2