Technical Memorandum Well Rehabilitation Prioritization Program



PREPARED FOR: Palmdale Water District December 31, 2020

FINAL



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Final Report

Prepared For:

Palmdale Water District

Rike

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APPENDICES

Appendix A. Well Driller's Reports

Appendix B. Inventory of Available Downhole Video Surveys

Appendix C. Video Survey Reports (Active Wells)

Appendix D. Video Survey Review Notes

Appendix E. Video Survey Review Snapshots (Digital)

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Appendix G. May 29, 2020 CITM Survey – Well No. 7A



LIST OF ACRONYMS AND ABBREVIATIONS

AFY	Acre-Feet per Year
APN	Assessor's Parcel Number
ASTM	American Society for Testing and Materials
bgs	Below Ground Surface
bRP	Below Reference Point
DWR	California Department of Water Resources
DR	Direct Circulation Rotary Drilling
CITM	Casing Inspection Thickness Measurement
gpm	Gallons per Minute
HP	Horsepower
HSLA	High Strength Low Alloy
ID	Inside Diameter
MS	Mild Steel
OD	Outside Diameter
PWD	Palmdale Water District
RC	Reverse Circulation Rotary Drilling
SS	Stainless Steel
SWP	State Water Project



1.0 INTRODUCTION

1.1 BACKGROUND

Palmdale Water District (PWD) meets the water demand of its almost 28,000 service connections through a combination of treated surface water from the State Water Project (SWP), and groundwater pumped from water supply wells. PWD's 22 active groundwater production wells account for approximately 40 percent of water supplied to its customers, the majority of which is pumped directly into the distribution system following disinfection. The remainder is disinfected, pumped into storage tanks, and boosted to four (4) nearby pressure zones. In addition to the wells, PWD's water storage and distribution system consists of 21 reservoirs, 17 booster stations, 14 pressure-reducing stations, and several hundred miles of pipeline.

Under the December 2015 adjudication of the Antelope Valley Groundwater Basin, PWD is assigned a native groundwater production right of approximately 2,770 acre-feet per year (AFY). Additionally, PWD benefits from a share of unused water rights from the Federal Government's 7,600 AFY of native groundwater rights of approximately 1,370 AFY. PWD is also entitled to a return flow credit equal to all imported water utilized by PWD, estimated to range from between 4,900 and 6,000 AFY.

1.2 PROJECT LOCATION

PWD is located within the southern central part of the Antelope Valley Groundwater Basin, Los Angeles County, California (see Figure 1). Well locations are shown on Figure 2.

1.3 PURPOSE & SCOPE

It is our understanding that PWD's primary goal for this project is to prepare a roadmap to maximize local water supply sources and reduce reliance on costly imported water. This planning document will guide PWD in decision making for future well maintenance and well replacement projects designed to optimize and maintain production capacity. It will identify those wells that are in most need of rehabilitation and that offer the best chance for success at the lowest cost. It will also identify wells that should be operated to failure while planning for replacement. The scope of work for achieving this objective include:

- Acquisition and review of well data and reports.
- Preparation of well histories and condition assessments for each well.
- Ranking of each well based on condition.
- Identification of wells in need of replacement.
- Ranking of wells by highest likelihood of successful rehabilitation at least cost.
- Ranking of wells by system needs.
- Preparation of this well rehabilitation prioritization report.

1.4 DATA SOURCES

Data obtained from PWD for purposes of this study included the following:



- Well locations.
- Downhole video survey logs and reports.
- Well driller's logs.
- Well construction details.
- Well modification details.
- Historical water levels.
- Historical instantaneous pumping rates.
- Sand production records.
- Prior well rehabilitation records.
- Pumping plant equipment details.
- Pump efficiency test results.



2.0 WELL HISTORIES

Well records and performance data were collected from PWD, and compiled, processed, and reviewed to assemble a detailed well history for each of the 22 active wells, and to assist with identification of factors that may be affecting useful service life, well performance, and possible rehabilitation and/or repair methodologies that may be required.

Detailed well construction and testing information extracted from available Well Driller's Reports (included in Appendix A) and downhole video surveys are summarized in Table 1. In most cases, only the most recent downhole video surveys were reviewed for each active well, supplemented with review of prior surveys as necessary to clarify well condition, construction details, and well modification details. An inventory of all 142 available downhole video surveys in DVD and VHS format is included in Appendix B and available video survey reports for active wells are included in Appendix C. Detailed notes taken during video survey review are included in Appendix D and snapshots are included in digital format in Appendix E. As-built construction diagrams for each active well were prepared using well construction and modification information gathered during data review and are included in Appendix F. The Casing Inspection Thickness Measurement (CITM) survey log conducted at Well No. 7A is included in Appendix G.

Well performance details, including static and pumping water levels, instantaneous pumping rate, specific capacity, and prior well rehabilitation events were used to prepare historical groundwater level and performance charts for each active well (see Figures 3 to 24).



2.1 WELL 2A

Well 2A was drilled and constructed to a depth of approximately 900 feet below ground surface (bgs) in 1968 using the direct circulation rotary drilling method. The blank well casing consists of 16-inch diameter by ¼-inch wall thickness mild steel extending from ground surface to 450 feet bgs, and from 462 to 480 feet bgs. The well screen consists of mild steel casing with 0.125-inch louvered openings extending from 450 to 462 feet bgs and from 480 to 900 feet bgs, differing considerably from as-built construction details observed during the downhole video survey conducted on June 22, 2010. That video survey indicated the well screen to begin at 450 feet below reference point (bRP) and extending all the way to 852.6 feet bRP, terminating in fill. The water level in the well was reported to occur at a depth of 370 feet bgs at time of construction (i.e., 1968). The instantaneous production rate recorded at the time of construction was approximately 2,100 gallons per minute (gpm). The DWR Well Driller's Report is included in Appendix A.

The steel casing patch extending from 581 to 586 feet bRP was presumably installed to repair hole(s) within the blank well casing, possibly in 2010.

June 22, 2010 Video Survey

On June 22, 2010, a downhole video survey was performed as part of a rehabilitation event to evaluate the physical condition of the well. At the time that survey was conducted, the static water level was observed at a depth of approximately 568 feet bRP. Small bubbles were observed entering the well screen below the static water level, evidence of aquifer dewatering followed by recovery. The blank well casing and louvered well screen above the static water level were observed to be in relatively good condition, exhibiting only mild spalling and corrosion. The existing well patch appeared to be in fair condition. The louvered well screen was observed to be clogged with light-colored mineral encrustation and bacterial growth, becoming increasingly severe and almost completely obscured below approximately 580 feet bRP (see photograph on following page).

Fill was encountered at a depth of approximately 852.6 feet bRP indicating approximately 47 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey, including the locations of well modifications, are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

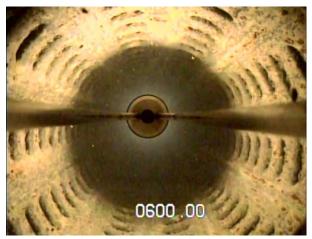
Historical static and pumping water elevations and well performance data are shown on Figure 3 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 511 feet bgs in April 1992 and December 1993 to a maximum of 581 feet bgs in December 2001 while pumping water levels range from approximately 531 feet bgs in December 2019 to 614 feet bgs in February 2016. Static and pumping water levels exhibit seasonal fluctuations, likely due to cyclical pumping, and show generally decreasing trends over the period of record from 1992 to 2015. Since that time, static water levels have shown an increasing trend.



Instantaneous pumping rates exhibit a decrease from a high of approximately 2,100 gpm in 1968 (i.e., immediately following construction) to a low of 591 gpm in May 2014 with an average of approximately 1,365 gpm. Specific capacity ranges from a low of approximately 23 gpm/foot in May 2014 to a high of 94 gpm/foot in December 2012, averaging approximately 60 gpm/foot. The overall trend in specific capacity has fluctuated considerably over the period of record, primarily mirroring increases and decreases in instantaneous pumping rate.

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), both static and pumping water levels have exhibited a generally increasing trend of approximately 12 feet per year (see Figure 3). Instantaneous pumping rates have fluctuated considerably while specific capacity has increased by approximately 6 gpm/foot per year (see Figure 3).



Mineral encrustation upon louvered well screen.



Louvers completely obscured by mineral encrustation.



2.2 WELL 3A

Well 3A was drilled and constructed to a depth of approximately 848 feet bgs in 1960 using the direct circulation rotary drilling method. The blank well casing consists of 16-inch diameter by ¼-inch wall thickness mild steel extending from ground surface to 396 feet bgs. The well screen consists of mild steel louvered casing with estimated 0.125-inch openings extending from 396 to 848 feet bgs, differing somewhat from as-built construction details observed during the downhole video survey conducted on August 25, 2004. That video survey indicated that the well screen extends from 399 to 540 feet bRP, and from 581 to 807 feet bRP, terminating in fill. The DWR Well Driller's Report is included in Appendix A.

The steel casing patches extending from 705 to 715 feet bRP were presumably installed to repair hole(s) within the blank well casing.

August 25, 2004 Video Survey

On August 25, 2004, a downhole video survey was performed following installation of the casing patches and to evaluate the physical condition of the well. At the time that survey was conducted, the static water level was observed at a depth of approximately 587 feet bRP. Small bubbles were observed entering the well screen below the static water level, evidence of aquifer dewatering followed by recovery. The blank well casing and louvered well screen above the static water level were observed to be in relatively good condition, exhibiting only mild spalling and corrosion. The existing well patch appeared to be in fair condition. The louvered well screen was observed to be open and possibly enlarged, becoming partially clogged with encrusting materials and biological growth below approximately 735 feet bRP (see photograph on following page).

Fill was encountered at a depth of approximately 807 feet bRP indicating approximately 41 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey, including the locations of well modifications, are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water elevations and well performance data are shown on Figure 4 for the period of record from July 1992 to March 2020. Static water levels range from a minimum of approximately 519 feet bgs in December 1993 to a maximum of 610 feet bgs in October 2015 while pumping water levels range from approximately 520 feet bgs in May 2003 to 603 feet bgs in August 2007. Static and pumping water levels exhibit seasonal fluctuations, likely due to cyclical pumping, and show generally decreasing trends over the period of record from 1992 to 2015. Since that time, static water levels have shown an increasing trend.

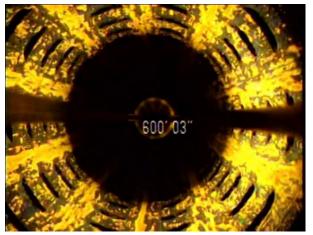
Instantaneous pumping rates exhibit a decrease from a high of approximately 1,617 gpm in February 2003 to a low of 983 gpm in April 2017 with an average of approximately 1,300 gpm.



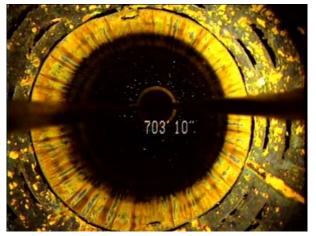
Specific capacity ranges from a low of approximately 20 gpm/foot in August 2007 to a high of 67 gpm/foot in April 2013, averaging approximately 47 gpm/foot. The very high specific capacity value reported in December 2008 is assumed to be anomalous. Despite fluctuations due to seasonal and operational changes, the overall trend in specific capacity has been relatively stable over the period of record.

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), both static and pumping water levels have exhibited a generally increasing trend of approximately 12 feet per year (see Figure 4). Instantaneous pumping rates have remained stable while specific capacity has increased by approximately 3 gpm/foot per year (see Figure 4).



Open and possibly enlarged louvered openings.



Top of well casing patch.



2.3 WELL 6A

Well 6A was drilled and constructed to a depth of approximately 1,010 feet bgs in 1983 using the direct circulation rotary drilling method. The blank well casing consists of 16-inch diameter by ¹/₄-inch wall thickness mild steel extending from ground surface to 480 feet bgs. The well screen consists of mild steel casing with 0.080-inch louvered¹ openings extending from 480 to 1,010 feet bgs. The water level in the well was reported to occur at a depth of 600 feet bgs at time of construction (i.e., 1983). The instantaneous production rate recorded at the time of construction was approximately 800 gpm. The DWR Well Driller's Report is included in Appendix A.

<u>May 15, 2018 Video Survey</u>

On May 15, 2018, a downhole video survey was performed to evaluate the physical condition of the well. At the time that survey was conducted, the static water level was observed at a depth of approximately 535 feet bRP. The blank well casing and louvered well screen above the static water level were observed to exhibit mild to severe spalling and corrosion, increasing with depth. The louvered well screen below the static water level to approximately 600 feet bRP was observed be coated with mild mineral encrustation, nodules, and bacteriological growth. Biological growth increased considerably below 600 feet bRP with the well screen openings becoming obscured with heavy bacterial growth and slime buildup (see photograph on following page).

Fill was encountered at a depth of approximately 995 feet bRP indicating approximately 15 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water elevations and well performance data are shown on Figure 5 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 495 feet bgs in September 2008 to a maximum of 607 feet bgs in July 2005 while pumping water levels range from approximately 521 feet bgs in January 1999 to 575 feet bgs in June 2014. Static and pumping water levels exhibit seasonal fluctuations, likely due to cyclical pumping, and show generally decreasing trends over the entire period of record.

Instantaneous pumping rates exhibit a decrease from a high of approximately 343 gpm in February 2017 to a low of 176 gpm in February 2019, with an average of approximately 265 gpm. Specific capacity ranges from a low of approximately 2 gpm/foot in June 2014 to a high of 8 gpm/foot in April 2008, averaging approximately 3 gpm/foot. Despite fluctuations due to seasonal and operational changes, the overall trend in specific capacity has been relatively stable over the period



¹ It should be noted that the DWR Well Driller's Log for Well 6A indicates the well screen to be mill-slotted although the video survey clearly indicates louvered well screen.

of record. In early-2017 the instantaneous pumping rate decreased sharply with no corresponding change in static water levels or specific capacity.

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static water levels have exhibited a generally stable trend (see Figure 5). Pumping water levels exhibit a slight increasing trend of approximately 7 feet per year (see Figure 5), likely due to the sharp decline in pumping rate in early-2017. Instantaneous pumping rates sharply decreased by approximately 75 gpm in 2017, presumably due to a change in pumping equipment and/or operations at that time. Specific capacity remained generally stable over that same period of time (see Figure 4).



Mild encrustation and bacterial growth above 600 feet bRP.



Heavy bacterial growth below 600 feet bRP.



2.4 WELL 7A

Well 7A was drilled and constructed to a depth of approximately 920 feet bgs in 1985 using the reverse circulation rotary drilling method. The blank well casing reportedly consists of 16-inch diameter by 1/4-inch wall thickness mild steel extending from ground surface to 570 feet bgs, and from 900 to 920 feet bgs. The well screen reportedly consists of mild steel wire-wrap with 0.050-inch openings extending from 570 to 900 feet bgs, differing slightly from as-built construction details observed during the downhole video survey conducted on May 4, 2020. The water level in the well was reported to occur at a depth of 485 feet bgs at time of construction (i.e., mid- to late-1985). The instantaneous production rate recorded at the time of construction was approximately 2,000 gpm with an associated specific capacity of approximately 37 gpm per foot. The DWR Well Driller's Report is included in Appendix A.

Holes within the blank well casing were repaired in 2018 with the installation of two stainless steel patches extending from 542.2 to 546.3 feet bRP, and from 547.4 to 552.4 feet bRP. At this time, a concrete plug was also installed at the bottom of the well from 832.5 to 860 feet bRP to seal a breach in the well screen at a depth of approximately 860 feet bRP. An inflatable packer was also installed on the pump column at a depth of approximately 627 to 632 feet bRP in an effort to mitigate entrained air from cascading water.

May 4, 2020 Video Survey

On May 4, 2020, a downhole video survey was performed to evaluate the physical condition of the well following a reported pump failure after installation of a new motor. At the time that survey was conducted, the static water level was observed at a depth of approximately 528 feet bRP with only a slight sheen of turbine oil present floating on the water surface. The blank well casing above the static water level was observed to be in relatively good condition, exhibiting only general corrosion and pitting, and isolated areas of spalling. The blank well casing below static water level exhibited a greater degree of corrosion and evidence of nodule growth. The existing well patches appear to be in good condition. The wire-wrap well screen was observed to be in relatively poor condition, exhibiting some heavily corroded rods, and appearing moderately to heavily clogged with corrosion byproducts and bacterial growth (see photograph on following page).

A large vertical rupture was evident within the well screen between the depths of 629 and 630.9 feet bRP, the same depth as the aforementioned inflatable packer assembly (see photograph on following page). Some grains of gravel were visible settled within certain sections of well screen above the rupture and no gravel was observed behind the rupture, suggesting gravel envelope material was evacuated from this section by the pump. Damaged and corroded screen wire was observed at depths of approximately 652.1 and 652.5 feet bRP, further evidence of possible structural deficiencies in the well screen.



The well screen appears intermittently clogged below the depth of the large rupture at 630.9 feet bRP to approximately 700 feet bRP, with minor to moderate amounts of corrosion and bacterial growth present. The degree of clogging becomes heavier below approximately 705 feet bRP to approximately 800 feet bRP, with the well screen becoming almost completely obscured below that depth. Fill was encountered at a depth of approximately 823.7 feet bRP indicating approximately 9 feet of fill above the reported top of the cement plug at 832.5 feet bRP. The as-built details verified by the downhole video survey, including the locations of well modifications and damage, are included in Appendix F.

May 29, 2020 Casing Inspection Thickness Measurement (CITM) Survey

On May 29, 2020, a CITM survey (see Appendix G) was conducted by Pacific Surveys, LLC to assess the structural condition of the well in response to evaluation of the May 4, 2020 video survey and subsequent condition assessment. It should be noted that results of the survey suggest that the blank well casing consists of High-Strength Low-Alloy (HSLA) steel rather than the mild steel assumed from the DWR Well Driller's Report.

The CITM survey suggests that moderate metal loss of up to 20% has occurred within the blank well casing above the well screen, with the majority of the loss occurring below approximately 200 feet bRP. There are three areas within the well screen that suggest some degree of damage: 1) at the depth of the reported rupture at approximately 630 feet bRP, 2) at approximately 682 feet bRP, and 3) at approximately 765 feet bRP. At the time that survey was conducted, the static water level was observed at a depth of approximately 530 feet bRP.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 6 for the period of record from March 1992 to November 2019. Static water levels range from a minimum of approximately 478 feet bgs in April 1992 to a maximum of 568 feet bgs in September 2009 and March 2016 while pumping water levels range from approximately 538 feet bgs in March 1996 to 633 feet bgs in February, September, and October 2019. Static and pumping water levels exhibit seasonal fluctuations, likely due to cyclical pumping, and show generally decreasing trends over the period of record from 1992 to 2015. Since that time, static water levels have shown a slight increasing trend. Decreasing pumping water levels observed since 2018 are likely due to increased pumping rates.

Instantaneous pumping rates exhibit a decrease from a high of approximately 2,000 gpm in September 1985 (i.e., immediately following construction) to a low of 870 gpm in March 2017 with an average of approximately 1,180 gpm. Specific capacity ranges from a low of approximately 14 gpm/foot in September 2017 to a high of 38 gpm/foot in February 2017, averaging approximately 28 gpm/foot. The overall trend in specific capacity has remained relatively stable over the period of



record. In late-2018 the instantaneous pumping rate increased considerably with a corresponding decrease in specific capacity, likely due to rehabilitation of the pumping equipment in 2018.

Performance Characteristics (Prior 5 Years)

Pumping water levels and specific capacity exhibited a sharp decrease beginning in 2018, corresponding to a sharp increase in instantaneous pumping rate, despite relatively stable static water levels (see Figure 6). This is likely the result of increased pumping following a well rehabilitation event completed that same year.





Large rupture from 629-630.9 feet bRP.

Heavily clogged well screen.

Well Repair and Rehabilitation

The well condition assessment conducted in May 2020 resulted in the observation that the well casing and screen is in generally poor condition, beyond its estimated useful life of 20 to 30 years, and likely to experience additional structural failure within the near future. Installation of well patches to stabilize the current structural issues were deemed unlikely to result in a significant extension in the life of the well and highly likely to cause further structural problems, including catastrophic casing collapse. As such, it was recommended that the well replaced as soon as possible. Installation of a partial well liner with gravel envelope was recommended to extend the useful service life of the well until such time that the well can be replaced. As of the date of this report, the well liner had been installed and the well is undergoing rehabilitation and redevelopment.



2.5 WELL 8A

Well 8A was drilled and constructed to a depth of approximately 960 feet bgs in 1988 using the reverse circulation rotary drilling method. The blank well casing consists of 16-inch diameter by ¼-inch wall thickness mild steel extending from ground surface to 560 feet bgs. The blank well casing from 740 to 820 feet bgs, 880 to 920 feet bgs, and 940 to 960 feet bgs reportedly consists of 16-inch by 3/8-inch wall thickness steel (presumably mild steel). The 16-inch diameter wire-wrap well screen reportedly extends from 560 to 740 feet bgs, 820 to 880 feet bgs, and 920 to 940 feet bgs with 0.050-inch openings. The well screen steel material type is not reported on the DWR log but appears to be stainless steel. The water level in the well was reported to occur at a depth of 461 feet bgs at time of construction (i.e., 1988). The instantaneous production rate recorded at the time of construction was approximately 2,500 gpm. The Well Driller's Report is included in Appendix A.

February 22, 2017 Video Survey

On February 22, 2017, a downhole video survey was performed to evaluate the physical condition of the well following a well rehabilitation event. At the time that survey was conducted, the static water level was observed at a depth of approximately 546 feet bRP. The blank well casing above the static water level was observed to be in relatively good condition, exhibiting only mild spalling and corrosion. The wire-wrap well screen was observed to be open and in excellent condition (see photograph on following page) although the intermediate blank sections appeared corroded with some occurrence of nodule growth and bleeding of corrosion byproducts into adjacent well screen sections (see photograph on following page).

Fill was encountered at a depth of approximately 892 feet bRP, obscuring the lowermost well screen section and indicating approximately 68 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 7 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 473 feet bgs in October 2008 to a maximum of 588 feet bgs in August 2004 while pumping water levels range from approximately 515 feet bgs in October 2008 to 651 feet bgs in July 2005. Static and pumping water levels exhibit seasonal fluctuations, likely due to cyclical pumping, and have shown several periods of increasing and decreasing trends over the period of record from 1992 to 2020. Water levels have exhibited a generally increasing trend since 2015.

Instantaneous pumping rates have averaged approximately 1,570 gpm over the period of record from September 2009 through November 2016. However, these data appear suspect and the flowmeter equipped on the well was reported questionable. Following a rehabilitation event in 2017, the pumping rate averaged 1,911 gpm and exhibited a generally stable trend. Specific capacity ranges



from a low of approximately 34 gpm/foot in September 2014 to a high of 72 gpm/foot in October 2017, averaging approximately 50 gpm/foot. Despite fluctuations due to seasonal and operational changes, the overall trend in specific capacity has been relatively stable over the period of record. In mid-2017, following a rehabilitation event, there was a marked increase in specific capacity coincident with an increase in water levels and instantaneous pumping rate.

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have exhibited generally increasing trends of approximately 10 feet per year (see Figure 7). Instantaneous pumping rates increased sharply by approximately 300 gpm following a rehabilitation event in 2017, possibly in part due to erroneous readings from a questionable flowmeter in use prior to 2017. Specific capacity increased by approximately 15 gpm/foot following the 2017 rehabilitation event and has remained generally stable since that time (see Figure 7).



Clean and open well screen with visible gravel material.



Corrosion byproducts bleeding from blank into well screen.



2.6 WELL 10

Well 10 was drilled and constructed to a depth of approximately 282 feet bgs in 1928, likely using the cable tool drilling method. The well was deepened in 1946 to a reported depth of 600 feet bgs, although subsequent information suggests that the well was extended to a greater depth at that time². The original 1928 well casing consisted of 16-inch diameter steel. The well casing installed in 1946 reportedly consisted of 12-inch diameter steel although subsequent information suggests that the well casing was 14-inch diameter with perforations of unknown type extending from 280 to 527 feet bgs³. A 12-inch diameter liner was reportedly installed in 1987 extending to an unknown total depth and perforated with vertical mills knife openings from 500 to 610 feet bgs and louvered openings extending from 624 feet bgs and terminating in fill material at a depth of 658 feet bgs. A second 8-inch diameter well liner was installed in 2017 to a depth of 640 feet bgs with machine cut openings extending from 340 to 640 feet bgs. The DWR Well Driller's Report is included in Appendix A.

September 8, 2017 Video Survey

On September 8, 2017, a downhole video survey was performed to evaluate the physical condition of the well prior to installation of the second well liner. Subsequent video surveys following installation of the well liner, if in existence, were not available for review. At the time the September 8, 2017 survey was conducted, the static water level was observed at a depth of approximately 439 feet bRP. The 1987 liner above the static water level was observed to be in poor condition, exhibiting several areas of structurally compromised casing, the most severe section occurring between the depths of 334 and 346 feet bRP (see photograph on following page). The liner had been previously repaired with steel casing patches extending from 309 to 329 feet bRP, presumably to repair hole(s) within the liner. The mill-slotted well screen was observed to be generally open with minor buildup (see photograph on following page) while the louvered section of well liner below 624 feet bRP exhibited heavier buildup of material.

Fill was encountered at a depth of approximately 628 feet bRP within the louvered section of the well liner indicating at least 30 feet of fill above the estimated bottom of the well liner. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 8 for the period of record from March 1992 to March 2020. Static water levels range from a minimum of



² A subsequent well liner installed in 1987 extended to a depth of at least 658 feet bgs, terminating in fill at that depth and suggesting that the 600-foot depth reported in 1946 was erroneous.

³ The well liner installed in 1987 was 12 inches in diameter, suggesting that the casing installed in 1946 could not have been 12 inches in diameter. The 1946 well casing could be seen behind the 1987 well casing and is presumed to be one nominal pipe diameter larger than the 1987 liner.

approximately 403 feet bgs in March 2013 to a maximum of 499 feet bgs in February 1996 while pumping water levels range from approximately 431 feet bgs in late-2012/early-2013 to 608 feet bgs in July 1993. Static and pumping water levels have exhibited an increasing trend during the period between the early 1990s to early-2013 and then a decreasing trend through late-2016 at which time the well was rehabilitated. Since early-2018, water levels have been generally stable.

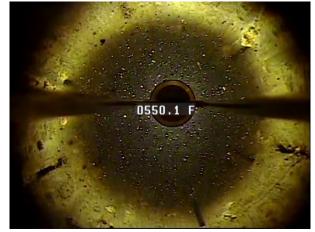
Instantaneous pumping rates and specific capacity exhibit a generally stable trend over the period of record from January 2008 through March 2020 and have averaged approximately 189 gpm and 7 gpm/foot, respectively. Static and pumping water levels, and instantaneous pumping rates exhibited a sharp decrease in early-2018 along with a corresponding decrease in specific capacity. This is likely due to additional head losses imparted by installation of the well liner in 2017.

Performance Characteristics (Prior 5 Years)

Instantaneous pumping rates and specific capacity have been generally stable over the past five (5) years (i.e., 2015 through 2020) but exhibited a sharp decrease in early-2018 due to increased head losses from installation of the second well liner in 2017 (see Figure 8). Static and pumping water levels exhibited a similar decrease in early-2018 but have remained generally stable since that time (see Figure 8).



Numerous holes within the 1987 well liner.



Minor mineral encrustation upon the mill-slotted liner.



2.7 WELL 11A

Well 11A was drilled and constructed to a depth of approximately 900 feet bgs in 1963 using the direct circulation rotary drilling method. The blank well casing reportedly consists of 16-inch diameter by 1/4-inch wall thickness mild steel extending from ground surface to 504 feet bgs. The well screen reportedly consists of mild steel casing with 0.125-inch louvered openings extending from 504 to 900 feet bgs. The DWR Well Driller's Report is included in Appendix A.

A 12-inch diameter liner was installed in 2012 extending to a depth of 875 feet bgs and perforated with 0.060-inch louvered openings from 665 to 865 feet bgs.

March 14, 2012 Video Survey

On March 14, 2012, a downhole video survey was performed to evaluate the physical condition of the well following a well rehabilitation event that included installation of a 12-inch liner. At the time that survey was conducted, the static water level was observed at a depth of approximately 552 feet bRP. The blank well liner above the static water level was observed to be clean and in relatively good condition. The blank casing and screen below static water level exhibited minor to moderate biological growth throughout, and evidence of filamentous bacterial growth below approximately 775 feet bRP (see photographs on following page). Fill was encountered at a depth of approximately 861 feet bRP indicating approximately 14 feet of fill above the reported bottom of the 12-inch well liner. The as-built details verified by the downhole video survey, including the locations of well modifications and damage, are included in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

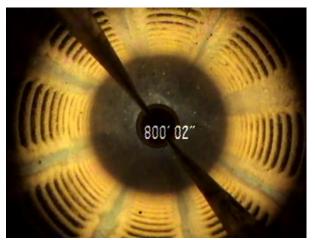
Historical static and pumping water levels and well performance data are shown on Figure 9 for the period of record from January 1999 to March 2020 although there are no water levels reported beyond September 2015. Static water levels range from a minimum of approximately 476 feet bgs in November 2004 to a maximum of 616 feet bgs in September 2001 and March 2016 while pumping water levels range from approximately 512 feet bgs in August 2007 to 653 feet bgs in September 2001 and October 2003. Static and pumping water levels exhibit seasonal fluctuations, likely due to cyclical pumping, and show several periods of increasing and decreasing trends.

Instantaneous pumping rates exhibit a generally decreasing trend from a high of approximately 1,175 gpm in March 2000 to a low of 456 gpm in February 2002, with an average of approximately 832 gpm. Specific capacity ranges from a low of approximately 13 gpm/foot in September 2004 to a high of 30 gpm/foot in April 2001, averaging approximately 24 gpm/foot. The overall trend in specific capacity has remained relatively stable over the period of record.

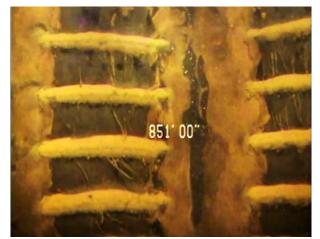


Performance Characteristics (Prior 5 Years)

Instantaneous pumping rates exhibited a sharp increase in early-2016 followed by a sharp decrease in early-2017 due to unknown reasons, and has since exhibited a stable trend (see Figure 9). There are insufficient data for other performance parameters to enable meaningful analyses of this event.



Moderate bacterial growth upon well screen.



Filamentous bacteria growth below ~775 feet bRP.



2.8 WELL 14A

Well 14A was drilled and constructed to a depth of approximately 900 feet bgs in 1965 using the direct circulation rotary drilling method. The blank well casing consists of 16-inch diameter by ¹/₄-inch wall thickness mild steel extending from ground surface to 450 feet bgs. The 16-inch diameter louvered well screen reportedly extends from 450 to 900 feet bgs with unknown opening size. The DWR Well Driller's Report is included in Appendix A.

May 20, 2014 Video Survey

On May 20, 2014, a downhole video survey was performed to evaluate the physical condition of the well. At the time that survey was conducted, the static water level was observed at a depth of approximately 576 feet bRP. The blank well casing above the static water level was observed to be in poor condition, exhibiting moderate to severe spalling, sheeting, and corrosion, and possible holes within the casing at 449 feet bRP (see photograph on following page). The louvered well screen appeared partially clogged with moderate to severe mineral encrustation, bacterial growth, and nodule formation (see photograph on following page). The camera appeared not centered within the well toward the end of the survey, a possible indication that the well has alignment issues.

Fill was encountered at a depth of approximately 809 feet bRP, obscuring the lowermost well screen section and indicating approximately 91 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

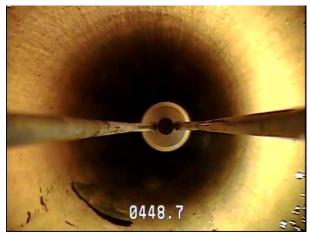
Historical static and pumping water levels and well performance data are shown on Figure 10 for the period of record from May 2002 to March 2020. Static water levels range from a minimum of approximately 515 feet bgs in May 2003 to a maximum of 623 feet bgs in August and September 2010 while pumping water levels range from approximately 543 feet bgs in December 2019 to 654 feet bgs in September 2008. Static and pumping water levels exhibit seasonal fluctuations, likely due to cyclical pumping, and have shown a decreasing trend from 2002 to 2010 followed by an increasing trend from 2010 to 2020.

Instantaneous pumping rates have averaged approximately 938 gpm over the period of record from January 2008 through March 2020. Pumping rates were generally stable at approximately 1,000 gpm during the period from early-2008 to late-2017. They have since been on a declining trend and are at a historic low of approximately 750 gpm. Specific capacity ranges from a low of approximately 21 gpm/foot in March 2015 to a high of 77 gpm/foot in January 2011, averaging approximately 41 gpm/foot. The overall trend in specific capacity has been decreasing.



Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have exhibited generally increasing trends of approximately 13 feet per year (see Figure 10). Instantaneous pumping rates decreased sharply by approximately 230 gpm beginning in early-2017, coincident with a decrease in specific capacity of 4 gpm/foot over that same period of time (see Figure 10). Based upon information obtained from PWD, this change in performance is related to unsuccessful efforts made to reduce excessive sand production.



Possible hole in blank well casing.



Heavily buildup of bacterial growth on louvered well screen.



2.9 WELL 15

Well 15 was drilled and constructed to a depth of approximately 800 feet bgs in 1960 using the direct circulation rotary drilling method. The blank well casing consists of 16-inch diameter by ¼-inch wall thickness mild steel extending from ground surface to 420 feet bgs. The well screen consists of mild steel with 0.125-inch machine-cut openings extending from 420 to 800 feet bgs, differing considerably from as-built construction details observed during the downhole video survey conducted on December 12, 2016. That video survey indicated the well screen to begin at approximately 320 feet bRP and extending all the way to 764 feet bRP, terminating in fill. The water level in the well was reported to occur at a depth of 325 feet bgs at time of construction (i.e., 1960). The instantaneous production rate recorded at the time of construction was approximately 1,750 gpm. The DWR Well Driller's Report is included in Appendix A.

December 12, 2016 Video Survey

On December 12, 2016, a downhole video survey was performed to evaluate the physical condition of the well during a well rehabilitation event, presumably following mechanical cleaning. At the time that survey was conducted, the static water level was observed at a depth of approximately 559 feet bRP. The blank well casing above the static water level was observed to be in fair condition, exhibiting minor to moderate spalling, sheeting, and corrosion. The mill-slotted well screen openings above and below the static water level appeared moderately to heavily clogged with unknown materials (see photograph on following page) and displayed evidence of severe bacterial growth and encrusting materials that had been removed during mechanical cleaning. Cascading water was observed below 552 feet bRP. Light-colored starburst deposits observed around portions of the slots suggest high velocity flow due to reduced open area (see photograph on following page).

Fill was encountered at a depth of approximately 764 feet bRP, obscuring the lowermost well screen section and indicating approximately 36 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 11 for the period of record from January 1999 to March 2020. Static water levels range from a minimum of approximately 512 feet bgs in April 2013 to a maximum of 630 feet bgs in August 2013 while pumping water levels range from approximately 582 feet bgs in May 2011 to 694 feet bgs in October 2005. Static and pumping water levels exhibit seasonal fluctuations, likely due to cyclical pumping, display several periods of increasing and decreasing trends, and have shown a slight increasing trend from 2016 to 2020.

Instantaneous pumping rates have averaged approximately 982 gpm over the period of record from February 1999 through March 2020. Pumping rates were generally stable at approximately 660 gpm



during the period from early-1999 to late-2003. Since that time there was a sharp increase in pumping rate that did not correspond to significant changes to specific capacity or water levels (see Figure 11). Pumping rates began to decline beginning early-2013 are currently somewhat stable at an average of approximately 690 gpm. Specific capacity ranges from a low of approximately 7 gpm/foot in July 2000 to a high of 40 gpm/foot in September 2012, averaging approximately 16 gpm/foot. The overall trend in specific capacity has been relatively stable.

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have exhibited generally stable trends (see Figure 11). Despite the sharp decrease in 2015/2016, instantaneous pumping rates have been relatively stable. Likewise, specific capacity has been relatively stable over the past 5 years (see Figure 11). Based upon information obtained from PWD, this well was severely impacted by biofouling during routine well rehabilitation and has since not operated at full capacity.



Severely clogged mill slots.



Evidence of past bacterial growth and high velocity flow.



2.10 WELL 16

Well 16 was drilled and constructed to a depth of approximately 550 feet bgs in 1960 using the direct circulation rotary drilling method. The blank well casing consists of 14-inch diameter by ¼-inch wall thickness mild steel extending from ground surface to 220 feet bgs. The well screen consists of mild steel with 0.125-inch mill-slotted openings extending from 220 to 550 feet bgs, differing slightly from as-built construction details observed during the downhole video survey conducted on March 31, 2008. That video survey indicated the well screen to begin at approximately 236 feet bRP and extending all the way to 537 feet bRP, terminating in fill. The water level in the well was reported to occur at a depth of 260 feet bgs at time of construction (i.e., 1960). The instantaneous production rate recorded at the time of construction was approximately 575 gpm. The DWR Well Driller's Report is included in Appendix A.

March 31, 2008 Video Survey

On March 31, 2008, a downhole video survey was performed to evaluate the physical condition of the well shortly after a rehabilitation event in late-2007. At the time that survey was conducted, the static water level was observed at a depth of approximately 179 feet bRP. The blank well casing above the static water level was observed to be in fair condition, exhibiting minor to moderate spalling, sheeting, and corrosion. The blank well casing below the water level exhibited moderate corrosion with a possible hole observed at 201 feet bRP. The mill-slotted well screen openings appeared heavily clogged with corrosion byproducts and bacterial growth, becoming almost completely obscured and 100% clogged below approximately 300 feet bRP (see photograph on following page).

Fill was encountered at a depth of approximately 537 feet bRP, obscuring the lowermost well screen section and indicating approximately 13 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

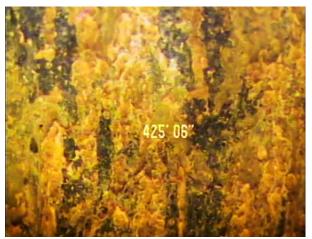
Historical static and pumping water levels and well performance data are shown on Figure 12 for the period of record from January 1999 to March 2020. Static water levels range from a minimum of approximately 164 feet bgs in August and September 2010 to a maximum of 261 feet bgs in March 1995, while pumping water levels range from approximately 198 feet bgs in December 2012 and January 2013 to 363 feet bgs in December 2007. Static and pumping water levels exhibited generally increasing trend from 1998 through 2010, with the exception of a severe decline in pumping water levels in late-2007/early-2008, presumably due to drastically increased instantaneous pumping rates. Water levels have remained relatively stable from 2011 to 2020.



Instantaneous pumping rates have averaged approximately 141 gpm over the period of record from January 2002 through March 2020. Pumping rates have exhibited a generally stable trend over much of the period of record (aside from the aforementioned sharp increase in rates in 2007/2008) and began a slight declining trend beginning in 2017 (see Figure 12). Specific capacity ranges from a low of approximately 3 gpm/foot in March 2008 to a high of 7 gpm/foot in January 2005, averaging approximately 5 gpm/foot. As with pumping rate, the overall trend in specific capacity has been relatively stable over much of the period of record, aside from a slight decline beginning in 2017.

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have exhibited generally stable trends (see Figure 12). Instantaneous pumping rates and specific capacity were relatively stable through 2015 and 2016 and began a slight decline beginning in 2017 (see Figure 12).



Completely obscured and clogged mill-slotted well screen.



Possible separation of spiral casing weld due to corrosion.



2.11 WELL 18

Well 18 was drilled and constructed to a depth of approximately 108 feet bgs in 1954 using the direct circulation rotary drilling method. The blank well casing consists of 8-inch diameter 8-gauge mild steel extending from ground surface to 20 feet bgs. The well screen consists of mild steel with mill slotted openings of unknown size extending from 20 to 108 feet bgs. The water level in the well was reported to occur at a depth of 37 feet bgs at time of construction (i.e., 1954). The instantaneous production rate recorded at the time of construction was approximately 171 gpm. The DWR Well Driller's Report is included in Appendix A.

December 8, 2016 Video Survey

On December 8, 2016, a downhole video survey was performed to evaluate the physical condition of the well following a rehabilitation event in 2016. At the time that survey was conducted, the static water level was observed at a depth of approximately 48 feet bRP. The blank well casing above the static water level was observed to be in poor condition, exhibiting heavy corrosion. The mill-slotted well screen was heavily corroded with numerous casing breaches, including large holes, ruptures, and massive degradation of the casing below 86 feet bRP (see photograph on following page). The mill-slotted openings were largely obscured by mineral encrustation and corrosion byproducts below approximately 60 feet bRP (see photograph on following page).

Fill was encountered at a depth of approximately 93 feet bRP, covering the lower section of well screen and indicating approximately 15 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 13 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 12.5 feet bgs in August 1994 to a maximum of 55 feet bgs in July 2018, while pumping water levels range from approximately 21 feet bgs in late-1994 and September 2006 to a maximum of 68 feet bgs in April 2004. Static and pumping water levels have exhibited several periods of broad-scale increasing and decreasing trends over the period of record, and have been observed to be generally stable, albeit fluctuating considerably since 2017 (see Figure 13).

Instantaneous pumping rates have averaged approximately 73 gpm over the period of record from January 2007 through March 2020. Pumping rates have exhibited several periods of increasing and decreasing trends, seemingly coincident with changes in water levels (see Figure 13). Specific capacity ranges from a low of approximately 4 gpm/foot in August 2018 to a high of 27 gpm/foot in June 2008, averaging approximately 11 gpm/foot. As with pumping rate, trends in specific capacity seem to be coincident with changes to water levels (see Figure 13).



Performance Characteristics (Prior 5 Years)

During the period from 2017 to 2020, static and pumping water levels, and specific capacity, have exhibited generally stable, and perhaps slightly increasing trends (see Figure 13). Data were not available for these parameters during the period from 2011 through 2016. Instantaneous pumping rates were generally stable over the past five (5) years with the exception of a period of decline in 2016 (see Figure 13). This well was downsized from a 5 HP motor to a 3 HP motor in 2016 due to operational impacts with Well 19.



Massive rupture in well screen showing formation cobbles.



Obscured well screen and evidence of casing degradation.

Well Repair and Rehabilitation

Based upon information provided by PWD, the well casing disintegrated during a rehabilitation event conducted in 2016. The well was then lined with blank well casing and screen consisting of 6-inch diameter SDR-21 Certa-Lok[™] PVC. The screened section of the well liner is reportedly 60 feet in length and presumably extends to the total depth of the well at 108 feet bgs. A new gravel envelope of unknown gradation was added to the annular space between the well liner and original well casing.



2.12 WELL 19

Well 19 was drilled and constructed to a depth of approximately 350 feet bgs in 1961 using the direct circulation rotary drilling method. The blank well casing consists of 14-inch diameter by ¼-inch wall thickness mild steel extending from ground surface to 80 feet bgs. The well screen consists of mild steel with mill-slotted openings of unknown size extending from 80 to 350 feet bgs. The water level in the well was reported to occur at a depth of 54 feet bgs at time of construction (i.e., 1961). The instantaneous production rate recorded at the time of construction was approximately 115 gpm. The DWR Well Driller's Report is included in Appendix A.

December 10, 2009 Video Survey

On December 10, 2009, a downhole video survey was performed to evaluate the physical condition of the well. At the time that survey was conducted, the static water level was observed at a depth of approximately 41 feet bRP. The blank well casing above the static water level was observed to be in fair condition, exhibiting general corrosion. The blank well casing below the water level exhibited some bacterial growth, nodule formation, and formation of iron oxide deposits. The mill-slotted well screen appeared heavily clogged with corrosion byproducts and bacterial growth, becoming almost completely obscured from approximately 100 to 200 feet bRP (see photograph on following page). There is an apparent transition in the water quality environment at approximately 200 feet bRP with the amount of reddish iron oxide material diminishing and the bare metal of the well casing becoming visible (see photograph on following page). The degree of mineral encrustation increases below approximately 250 feet bRP, becoming heavy and obscuring slot openings below 300 feet bRP.

Fill was encountered at a depth of approximately 316 feet bRP, obscuring the lower portion of the well screen section and indicating approximately 34 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 14 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 14 feet bgs in August 1994 to a maximum of 89 feet bgs in August 2014, while pumping water levels range from approximately 44 feet bgs in May 1995 to 112 feet bgs in February 2018. Static and pumping water levels exhibit an overall decreasing trend over the period of record, with the exception of a period of increasing water levels from 2004 to 2006 (see Figure 14).

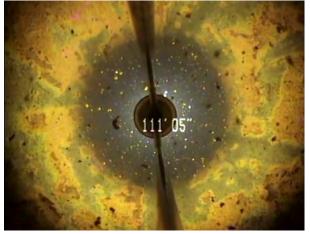
Instantaneous pumping rates have averaged approximately 127 gpm over the period of record from January 2007 through March 2020. Pumping rates have exhibited a generally stable trend over the period of record, with the exception of a slight increase following a rehabilitation event in 2010/2011 (see Figure 14). Specific capacity ranges from a low of approximately 1.8 gpm/foot in February 2018 to a high of 6.8 gpm/foot in July 2012, averaging approximately 4 gpm/foot. As with pumping rate,



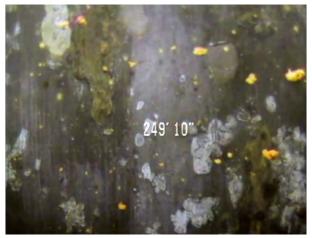
the overall trend in specific capacity has been relatively stable over much of the period of record, with the exception of a slight decline in 2011, coincident with the aforementioned increase in pumping rates following rehabilitation.

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static water levels have been generally stable, and pumping water levels have exhibited a slightly increasing trend of approximately 3 feet per year beginning in 2017 (see Figure 14). Instantaneous pumping rates and specific capacity were relatively stable throughout the past five (5) years (see Figure 14). The pump motor was upsized from 5 HP to 7 HP in 2011 without PWD oversight which resulted in impacts to the overall operation of the well.



Completely obscured and clogged mill-slotted well screen.



Bare metal of well casing visible below 200 feet bRP.



2.13 WELL 21

Well 21 was drilled and constructed to a depth of approximately 170 feet bgs in 1960 using the direct circulation rotary drilling method. The blank well casing reportedly consists of open-bottom 16-inch diameter mild steel casing of unknown wall thickness extending from ground surface to 170 feet bgs, and open borehole from 170 feet bgs to 350 feet bgs. The well casing was perforated with mills knife openings of unknown size and at unknown depths.

A 10-inch diameter by ¼-inch wall thickness mild steel liner was installed in 1979⁴ extending to a depth of 346 feet bgs and perforated with 0.140-inch mill slotted openings from 216.4 to 346 feet bgs. The DWR Well Driller's Report is included in Appendix A.

April 4, 2013 Video Survey

On April 4, 2013, a downhole video survey was performed to evaluate the physical condition of the well liner. At the time that survey was conducted, the static water level was observed at a depth of approximately 161 feet bRP. The blank well casing above the static water level was observed to be in poor condition, exhibiting moderate to severe spalling, sheeting, and corrosion, and possible structural issues at 98 feet bRP (see photograph on following page). The blank well casing below the water level exhibited possible bacterial growth and nodule formation. The mill-slotted well screen appeared heavily clogged and obscured with nodule growth, exhibiting heavy to massive growth below 288 feet bRP (see photograph on following page). A possible small hole was observed within the well screen at 320.5 feet bRP.

Fill was encountered at a depth of approximately 325 feet bRP, obscuring the lower portion of the well screen section and indicating approximately 21 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 15 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 160 feet bgs in March 2013 to a maximum of 207 feet bgs in June 2007, while pumping water levels range from approximately 181 feet bgs in March 2013 to 240 feet bgs in June 2007. Static and pumping water levels are observed to be general stable and exhibit an overall slight increasing trend over the period of record (see Figure 15).

Instantaneous pumping rates have averaged approximately 245 gpm over the period of record from January 2007 through March 2020 and show a declining trend (see Figure 15). Specific capacity



⁴ Based on a cost proposal for the well liner from Rottman Drilling Company and dated January 9, 1979. The exact date of liner installation is not known.

ranges from a low of approximately 5 gpm/foot in March 2017 to a high of 20 gpm/foot in October 2011, averaging approximately 10 gpm/foot. As with pumping rate, the overall trend in specific capacity has been relatively stable over much of the period of record, with the exception of an abrupt increase from mid-2011 through early-2013, coincident with an increase in water levels during that period of time (see Figure 15).

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have been generally stable and show no discernable trend (see Figure 15). Instantaneous pumping rates and specific capacity show a slight decreasing trend over the past five (5) years (see Figure 15).



Severe corrosion of blank well liner above water level.



Massive nodule structures present below 288 feet bRP.



2.14 WELL 22

Well 22 was drilled and constructed to a depth of approximately 400 feet bgs in 1974 using the direct circulation rotary drilling method. The blank well casing consists of 16-inch diameter by ¼-inch wall thickness mild steel extending from ground surface to 190 feet bgs. The well screen consists of mild steel with 0.125-inch louvered openings extending from 190 to 400 feet bgs. The water level in the well was reported to occur at a depth of 130 feet bgs at time of construction (i.e., 1974). The instantaneous production rate recorded at the time of construction was approximately 460 gpm. The DWR Well Driller's Report is included in Appendix A.

March 15, 2016 Video Survey

On March 15, 2016, a downhole video survey was performed to evaluate the physical condition of the well following a rehabilitation event. At the time that survey was conducted, the static water level was observed at a depth of approximately 114 feet bRP. The blank well casing above the static water level was observed to be in fair condition, exhibiting minor to moderate spalling, sheeting, and corrosion, and severe corrosion immediately above the water line (see photograph on following page). The louvered well screen appeared mostly open with some evidence of bacterial growth, nodule formation, corrosion, and sediment resting on the louver shelves (see photograph on following page). Bacterial growth was observed to be increasing below approximately 300 feet bRP until visibility was reduced to zero at 330 feet bRP.

Fill was encountered at a depth of approximately 395 feet bRP, obscuring the lower portion of the well screen section and indicating approximately 5 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 16 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 104 feet bgs in March 2009 and December 2013 to a maximum of 204 feet bgs in March 2013, while pumping water levels range from approximately 149 feet bgs in February 2003 and March 2009 to 255 feet bgs in November 1992 (see Figure 16). Static and pumping water levels exhibit a generally increasing trend from 1992 to 2004 followed by two periods of decreasing water levels from 2005 to 2012 and 2013 to 2020 (see Figure 16). The cause of the sharp increase in water levels in early-2013 is unknown.

Instantaneous pumping rates have averaged approximately 355 gpm over the period of record from January 2008 through March 2020. Pumping rates have exhibited a generally decreasing trend over the period of record, with the exception of a slight increase following a rehabilitation event in 2015/2016 (see Figure 16). Specific capacity has ranged from a low of approximately 6 gpm/foot in September 2008 to a high of 15 gpm/foot in March 2013, averaging approximately 8 gpm/foot.



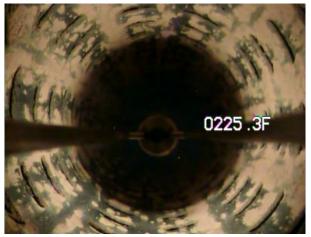
Specific capacity has been relatively stable over much of the period of record and shows a slight decline beginning in 2013, coincident with the aforementioned unexplained increase in water levels.

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have exhibited a declining trend of approximately 6 feet per year (see Figure 16). Instantaneous pumping rates and specific capacity were relatively stable and exhibited only slight decreasing trends (see Figure 16).



Heavy corrosion of casing immediately above water level.



Louvered well screen appears mostly open.



2.15 WELL 23A

Well 23A was drilled and constructed to a depth of approximately 840 feet bgs in 1991 using the reverse circulation rotary drilling method. The blank well casing consists of 16-inch diameter by 5/16-inch wall thickness mild steel extending from ground surface to 600 feet bgs. The well screen consists of mild steel with 0.030-inch louvered openings extending from 600 to 840 feet bgs. The DWR Well Driller's Report is included in Appendix A.

April 25, 2012 Video Survey

On April 25, 2012, a downhole video survey was performed to evaluate the physical condition of the well. At the time that survey was conducted, the static water level was observed at a depth of approximately 552 feet bRP. The blank well casing above the static water level was observed to be in generally good condition, exhibiting general corrosion and pitting from ground surface to approximately 215 feet bRP and minor to moderate spalling and corrosion increasing below this depth. The louvered well screen appeared mostly open with minor to moderate nodule formation and buildup of mineral encrustation, increasing somewhat below approximately 700 feet bRP (see photograph on following page).

Debris (i.e., cable and tape) was encountered at a depth of approximately 740 feet bRP (see photograph on following page), obscuring the lower portion of the well screen section and indicating approximately 100 feet of debris and/or fill may be present above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

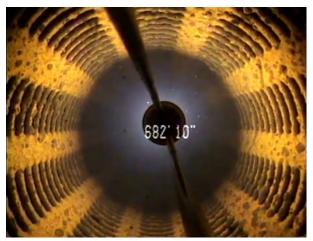
Historical static and pumping water levels and well performance data are shown on Figure 17 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 517 feet bgs in December 1993 to a maximum of 604 feet bgs in September 2007 and September 2015, while pumping water levels range from approximately 572 feet bgs in May 2003 to 602 feet bgs in July 2014 (see Figure 17). Static and pumping water levels show several periods of increasing and decreasing trends and have most recently exhibited an increasing trend beginning in 2015 (see Figure 17).

Instantaneous pumping rates have averaged approximately 647 gpm over the period of record from January 2002 through March 2020. Pumping rates have exhibited a generally stable trend over the period of record from 2008 through 2017 followed by a sharp increasing in early-2017 (see Figure 17). Specific capacity has ranged from a low of approximately 7 gpm/foot in July 2014 to a high of 21 gpm/foot in March 2018, averaging approximately 14 gpm/foot. As with pumping rate, specific capacity has been relatively stable over much of the period of record followed by a sharp increase in early-2017 (see Figure 17).

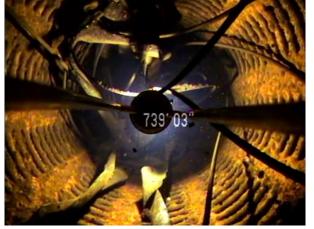


Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have exhibited increasing trends of approximately 10 and 15 feet per year, respectively (see Figure 17). Aside from the aforementioned sharp increase in early-2017, instantaneous pumping rates and specific capacity were relatively stable (see Figure 17).



Nodule formation and mineral encrustation on well screen.



Debris in well at approximately 740 feet bRP.



2.16 WELL 25

Well 25 was drilled and constructed to a depth of approximately 605 feet bgs in 1989 using the direct circulation rotary drilling method. The blank well casing consists of 16-inch diameter by 5/16-inch wall thickness mild steel extending from ground surface to 255 feet bgs. The well screen consists of mild steel wire-wrap with 0.060-inch openings extending from 255 to 335 feet bgs, 385 to 405 feet bgs, 435 to 595 feet bgs, differing considerably from as-built construction details observed during the downhole video survey conducted on November 13, 2005. That video survey indicated the well screen to begin at approximately 166 feet bRP. A 10.75-inch outside diameter (OD) by ¼-inch wall thickness mild steel well liner was installed in 2019 extending to an estimated depth of 580 feet bgs. The liner screen consisted of 0.040-inch vertical slotted openings extending across an unknown interval⁵. The water level in the well was reported to occur at a depth of 108 feet bgs at time of construction (i.e., 1989). The instantaneous production rate recorded at the time of construction was approximately 750 gpm. The DWR Well Driller's Report is included in Appendix A.

April 23, 2019 Video Survey

On April 23, 2019, a downhole video survey was performed to evaluate the physical condition of the well. At the time that survey was conducted, the static water level was observed at a depth of approximately 118.6 feet bRP. The blank well casing above the static water level was observed to exhibit general corrosion and pitting, increasing below approximately 100 feet bRP. The blank casing below the water surface exhibited severe spalling and corrosion with minor nodule formation. The wire-wrap well screen openings appeared to be mostly open but in generally poor condition with bacterial growth, corrosion, and clogging increasing in severity with increasing depth. Numerous vertical ruptures and holes were observed throughout the well screen indicating severe structural issues (see photograph on following page). The second well screen interval (i.e., 386 to 405 feet bRP) exhibited clogging from sediment and heavy bacterial growth (see photograph on following page). The third well screen interval beginning at 436 feet bRP was observed to be heavily clogged with sediment and bacterial growth and suffering from severe structural issues, including large vertical ruptures (see photograph on following page). Fill was encountered at a depth of approximately 525 feet bRP, obscuring the lower portion of the well screen section and indicating approximately 80 feet of debris and/or fill above the reported total depth of the well. As-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 18 for the period of record from April 1992 to March 2020. Static water levels range from a minimum of approximately 77 feet bgs in September 2007 to a maximum of 189 feet bgs in February 2011, while



⁵ Video surveys conducted immediately prior to and following the 2019 liner installation were not available for review as part of this evaluation. The latest available video survey is dated April 23, 2019.

pumping water levels range from approximately 159 feet bgs in January 1994 to 319 feet bgs in February 2020 (see Figure 18). Static and pumping water levels show several periods of increasing and decreasing trends and have most recently exhibited a significant decrease following installation of the aforementioned well liner in 2019 (see Figure 18).

Instantaneous pumping rates have averaged approximately 502 gpm over the period of record from January 2006 through March 2020. Pumping rates have exhibited a generally decreasing trend over the period of record from 2006 through early-2018 followed by a sharp decrease following installation of the well liner in 2019 (see Figure 18). Specific capacity was relatively stable over the period of record from 2006 through 2011 and averaged approximately 7 gpm/foot (see Figure 18). There are no specific capacity data during the period from early-2011 through late-2016 due to the lack of water levels⁶ but data reported for late-2016 through early-2018 indicate an apparent decline in specific capacity during the period without data to an average of 5 gpm/foot (see Figure 18). As with pumping rate, specific capacity declined again to an average of approximately 2 gpm/foot following installation of the well liner in 2019 (see Figure 18).

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), there have been significant declines in water levels, instantaneous pumping rate, and specific capacity due to clogging of the original well casing and installation of a well liner in 2019 (see Figure 18). The instantaneous pumping rate has declined by approximately 50% from early-2015 through early-2020. Specific capacity has declined by approximately 60% from late-2017 through early-2020 (see Figure 18). There are operational constraints when running this well with Wells 29, 30, and 33 due to water level interference.



Heavy bacterial growth and severe vertical rupture.



Heavy bacterial growth and severe vertical rupture.



⁶ The lack of water level data collected during this period was reportedly due to malfunctioning pressure transducer(s) deployed within the well.

2.17 WELL 26

Well 26 was drilled and constructed to a depth of approximately 480 feet bgs in 1989 using the direct circulation rotary drilling method. The blank well casing consists of 16-inch diameter by 5/16-inch wall thickness mild steel extending from ground surface to 150 feet bgs. The well screen consists of mild steel wire-wrap with 0.060-inch openings extending from 150 to 270 feet bgs and 310 to 470 feet bgs. The water level in the well was reported to occur at a depth of 180 feet bgs at time of construction (i.e., 1989). The instantaneous production rate recorded at the time of construction was approximately 750 gpm. The DWR Well Driller's Report is included in Appendix A.

August 11, 2005 Video Survey

On August 11, 2005, a downhole video survey was performed to evaluate the physical condition of the well⁷. At the time that survey was conducted, the static water level was observed at a depth of approximately 106 feet bRP. The blank well casing above the static water level was observed to be in generally poor condition, exhibiting moderate to severe corrosion, pitting, and spalling. The blank casing below the water level was observed to be severely corroded with evidence of nodules that had been knocked off, presumably during a mechanical cleaning event. The uppermost wire-wrap well screen section (i.e., 151 to 271 feet bRP) appeared partially clogged and exhibited moderate to severe corrosion and deposition of iron oxide deposits, increasing with depth (see photograph on following page). The lowermost well screen interval exhibited moderate corrosion and clogging beginning at 311 feet bRP, transitioning into clean and open well screen below approximately 360 feet bRP. There is an apparent transition in the water quality environment at approximately this depth with the amount of reddish iron oxide material diminishing drastically and the bare metal of the well screen becoming visible and giving the appearance of stainless steel (see photograph on following page). Drilling mud was observed upon the well screen at 459 feet bRP.

Fill was encountered at a depth of approximately 460 feet bRP, obscuring the lower portion of the well screen section and indicating approximately 20 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 19 for the period of record from June 1992 to March 2020. Static water levels range from a minimum of approximately 109 feet bgs in April 2006 to a maximum of 220 feet bgs in August 1994, while pumping water levels range from approximately 215 feet bgs in February 2006 to 391 feet bgs in September 2014 (see Figure 19). Static and pumping water levels show several periods of increasing and decreasing trends and have most recently exhibited an increasing trend beginning in 2015 (see



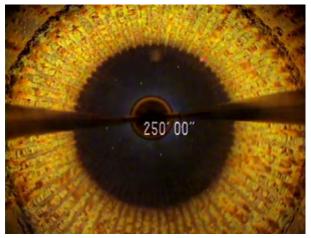
⁷ There is record of a more recent video survey conducted on June 14, 2016 but that video survey was not available for review as part of this evaluation.

Figure 19). The divergence of static and pumping water levels observed during the early history of the well is evidence that the well intake structure began to clog and become inefficient shortly after construction (see Figure 19).

Instantaneous pumping rates have averaged approximately 282 gpm over the period of record from February 2009 through March 2020. Pumping rates have exhibited a generally stable trend over the period of record with the exception of a slight increase in early-2017, coincident with an increase in water levels (see Figure 19). Likewise, specific capacity has averaged approximately 2.6 gpm/foot over the period of record and has exhibited similar trending (see Figure 19).

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have exhibited increasing trends of approximately 17 feet per year (see Figure 19). Aside from the aforementioned increases in early-2017, instantaneous pumping rates and specific capacity for Well 26 have been relatively stable (see Figure 19).



Severe corrosion and deposition of iron oxide on well screen.



Well screen clean and giving appearance of stainless steel.



2.18 WELL 29

Well 29 was drilled and constructed to a depth of approximately 370 feet bgs in 1989 using the reverse circulation rotary drilling method. The blank well casing consists of 16-inch diameter by 5/16-inch wall thickness mild steel extending from ground surface to 190 feet bgs. The well screen consists of mild steel with 0.070-inch louvered openings extending from 190 to 370 feet bgs. The water level in the well was reported to occur at a depth of 104 feet bgs at time of construction (i.e., 1989). The instantaneous production rate recorded at the time of construction was approximately 350 gpm. The DWR Well Driller's Report is included in Appendix A.

The steel casing patch extending from 254.4 to 259.4 feet bRP was presumably installed to repair hole(s) within the blank well casing.

October 10, 2018 Video Survey

On October 10, 2018, a downhole video survey was performed to evaluate the physical condition of the well following a rehabilitation event. At the time that survey was conducted, the static water level was observed at a depth of approximately 126 feet bRP. The blank well casing was observed to be in generally fair condition, exhibiting symptoms of general corrosion and pitting. The louvered well screen appeared severely clogged and obscured with bacterial growth and scale, becoming increasing severe with increasing depth (see photograph on following page). Some isolated louvered openings appear enlarged and have gravel envelope material visible within them, an indication of erosion from high velocity flow due to reduced open area (see photograph on following page).

Fill was encountered at a depth of approximately 367 feet bRP, obscuring the lower portion of the well screen section and indicating approximately 3 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 20 for the period of record from May 2007 to March 2020. Static water levels were generally stable from early-2007 to late-2012, and then entered into a declining trend from 2013 to late-2019 (see Figure 20). The divergence of static and pumping water levels beginning in 2013 is evidence that the well intake structure is clogging over time (see Figure 20).

Instantaneous pumping rates have averaged approximately 229 gpm over the period of record from May 2007 through March 2020. Pumping rates have exhibited a generally stable trend over the period of record from 2007 to 2012, and have since begun to decline, coincident with a decrease in water levels at that time (see Figure 20). Likewise, specific capacity has averaged approximately 2.2 gpm/foot over the period of record and has exhibited similar trending (see Figure 20).



Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have exhibited decreasing trends of approximately 1 to 2 per year (see Figure 20). Instantaneous pumping rates have declined by approximately 39% (see Figure 20). Specific capacity is also declining somewhat but recent data for 2019 to present was not available for review. There are operational constraints when running this well with Wells 25, 30, and 33 due to water level interference.



Severe clogging of well screen from bacterial growth.



Enlarged louvered openings showing gravel envelope.



2.19 WELL 30

Well 30 was drilled and constructed to a depth of approximately 410 feet bgs in 1989 using the reverse circulation rotary drilling method. The blank well casing consists of 16-inch diameter by 5/16-inch wall thickness mild steel extending from ground surface to 200 feet bgs. The well screen consists of mild steel with 0.070-inch louvered openings extending from 200 to 410 feet bgs. The water level in the well was reported to occur at a depth of 126 feet bgs at time of construction (i.e., 1989). The instantaneous production rate recorded at the time of construction was approximately 1,400 gpm. The DWR Well Driller's Report is included in Appendix A.

January 14, 2016 Video Survey

On January 14, 2016, a downhole video survey was performed to evaluate the physical condition of the well following a rehabilitation event. At the time that survey was conducted, the static water level was observed at a depth of approximately 147 feet bRP. The blank well casing above the water level was observed to be in generally good condition. The blank casing below the water level was observed to be clean and in relatively good condition, exhibiting moderate pitting, bacterial growth, and nodule formation. The louvered well screen appeared relatively clean and open, with evidence of prior bacterial growth and nodule formation (see photograph on following page). Sediment was observed settled upon the louver shelves below 366 feet bRP (see photograph on following page).

Fill was encountered at a depth of approximately 408 feet bRP, obscuring the lower portion of the well screen section and indicating approximately 2 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 21 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 104 feet bgs in February 1994 to a maximum of 238 feet bgs in July 2014 and December 2016 while pumping water levels range from approximately 170 feet bgs in May 1995 to 323 feet bgs in July 2014. The water levels show a series of increasing and decreasing trends over the period of record but show an overall decreasing trend. Since early-2014, water levels have been generally stable and have exhibited a slight increasing trend (see Figure 21).

Instantaneous pumping rates have averaged approximately 512 gpm over the period of record from January 2008 through March 2020. Pumping rates have exhibited a generally stable trend over much of the period of record and have begun to decline in early-2017 (see Figure 21). Likewise, specific capacity has averaged approximately 7 gpm/foot over the period of record and has exhibited similar trending (see Figure 21).



Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), static and pumping water levels have exhibited generally stable trends (see Figure 21). Instantaneous pumping rates and specific capacity have both declined by approximately 20% since early-2016 (see Figure 21). There are operational constraints when running this well with Wells 25, 29, and 33 due to water level interference.



Evidence of prior bacterial growth upon the well screen.



Sediment resting upon the louver shelves.



2.20 WELL 32

Well 32 was drilled and constructed to a depth of approximately 570 feet bgs in 1989 using the direct circulation rotary drilling method. The blank well casing consists of 16-inch diameter by 5/16-inch wall thickness mild steel extending from ground surface to 280 feet bgs. The well screen consists of mild steel with 0.094-inch louvered openings extending from 280 to 570 feet bgs, differing somewhat from the screened intervals observed on the August 12, 2013 video survey. That video survey indicated two (2) well screens sections located from 333 to 483 feet bRP and from 505 to 574 feet bgs, terminating in fill. The water level in the well was reported to occur at a depth of 238 feet bgs at time of construction (i.e., 1989). The instantaneous production rate recorded at the time of construction was approximately 450 gpm. The DWR Well Driller's Report is included in Appendix A.

August 12, 2013 Video Survey

On August 12, 2013, a downhole video survey was performed to evaluate the physical condition of the well following a rehabilitation event. At the time that survey was conducted, the static water level was observed at a depth of approximately 202 feet bRP. The blank well casing above the water level was observed to be in fair condition with general corrosion, spalling, and pitting, increasing with depth. The blank casing below the water level was observed to be in relatively good condition, exhibiting mild to moderate corrosion and evidence of nodule formation. The majority of the uppermost louvered well screen appeared relatively clean and open, with evidence of prior bacterial growth and nodule formation (see photograph on following page), with moderate buildup occurring below approximately 460 feet bRP. The lower screen interval appeared moderately to heavily clogged with sediment and growth (see photograph on following page).

Fill was encountered at a depth of approximately 574 feet bRP, below the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

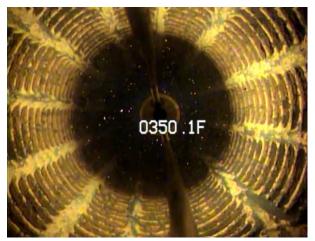
Historical static and pumping water levels and well performance data are shown on Figure 22 for the period of record from May 1992 to March 2020. Static water levels range from a minimum of approximately 201 feet bgs in March 2020 to a maximum of 327 feet bgs in July and August 1997, while pumping water levels range from approximately 295 feet bgs in March 2020 to 421 feet bgs in November 1993. Water levels exhibit seasonal fluctuations due to pumping cycles and a general overall increasing trend over the period of record (see Figure 22).

Instantaneous pumping rates have averaged approximately 238 gpm over the period of record from January 2008 through March 2020. Pumping rates have exhibited a generally stable trend over much of the period of record despite a slight decrease during the period from late-2013 through early-2017 (see Figure 22). Specific capacity has averaged approximately 2 gpm/foot over the period of record and has exhibited a generally stable trend (see Figure 22).

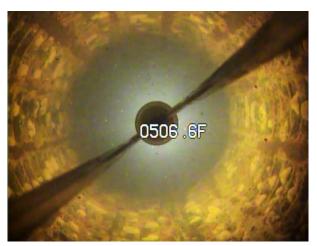


Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), both static and pumping water levels have exhibited a generally increasing trend of approximately 10 feet per year (see Figure 22). Instantaneous pumping rates and specific capacity have both exhibited generally stable trends over the same period of time (see Figure 22).



Evidence of prior bacterial growth and nodule formation.



Moderate to heavy growth upon lower well screen interval.



2.21 WELL 33

Well 33 was drilled and constructed to a depth of approximately 465 feet bgs in 1991 using the reverse circulation rotary drilling method. The blank well casing consists of 16-inch diameter by ¼-inch wall thickness mild steel extending from ground surface to 220 feet bgs, 240 to 280 feet bgs, and 460 to 465 feet bgs. The well screen consists of stainless steel wire-wrap with 0.040-inch openings extending from 220 to 240 feet bgs and 0.070-inch openings from 280 to 460 feet bgs. The water level in the well was reported to occur at a depth of 130 feet bgs at time of construction (i.e., 1991). The instantaneous production rate recorded at the time of construction was approximately 1,000 gpm. The DWR Well Driller's Report is included in Appendix A.

August 7, 2008 Video Survey

On August 7, 2008, a downhole video survey was performed to evaluate the physical condition of the well. At the time that survey was conducted, the static water level was observed at a depth of approximately 152 feet bRP. The blank well casing above the water level was observed to exhibit general corrosion, spalling, and pitting, increasing with depth. The blank well casing below the water level was observed to exhibit heavy corrosion, spalling, sheeting, and pitting. The section of mild steel blank well casing between the two screen sections exhibited moderate corrosion and buildup. The uppermost well screen section appeared to be in open, clean, generally excellent condition, with gravel envelope material visible through the well screen openings (see photograph on following page). The lowermost screen appears to be partially clogged with sediment resting within the wire openings, becoming completely clogged with what appears to be drilling mud below approximately 450 feet bRP (see photograph on following page).

Fill was encountered at a depth of approximately 454 feet bRP, obscuring the lower portion of the well screen section and indicating approximately 11 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 23 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 64 feet bgs in December 2008 to a maximum of 270 feet bgs in October 2003, while pumping water levels range from approximately 180 feet bgs in January 1996 to 269 feet bgs in September 2003. Water levels exhibit seasonal fluctuations due to pumping cycles and several broad-scale increasing and decreasing trends. However, the overall trend over the period of record has been decreasing, with water levels becoming relatively stable since 2015 (see Figure 23).

Instantaneous pumping rates have averaged approximately 431 gpm over the period of record from January 2002 through March 2020. Pumping rates have exhibited an increasing trend over the period of record from late-2003 through early-2011 and have since been on a declining trend (see



Figure 23). Specific capacity has averaged approximately 6 gpm/foot over the period of record and has exhibited a generally stable trend (see Figure 23).

Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), both static and pumping water levels have exhibited a generally stable trend, despite significant seasonal fluctuation (see Figure 23). Instantaneous pumping rate has declined by approximately 18% from early-2015 through early-2020. Specific capacity has been relatively stable (see Figure 23). There are operational constraints when running this well with Wells 25, 29, and 30 due to water level interference



Upper well screen open and in excellent condition.



Lower well screen partially clogged with sediment.



2.22 WELL 35

Well 35 was drilled and constructed to a depth of approximately 500 feet bgs in 1991 using the reverse circulation rotary drilling method. The blank well casing consists of 16-inch diameter by 5/16-inch wall thickness mild steel extending from ground surface to 200 feet bgs. The well screen consists of stainless steel wire-wrap with 0.060-inch openings extending from 200 to 500 feet bgs. The water level in the well was reported to occur at a depth of 174 feet bgs at time of construction (i.e., 1991). The instantaneous production rate recorded at the time of construction was approximately 800 gpm. The DWR Well Driller's Report is included in Appendix A.

April 30, 2018 Video Survey

On April 30, 2018, a downhole video survey was performed to evaluate the physical condition of the well. At the time that survey was conducted, the static water level was observed at a depth of approximately 173 feet bRP. The blank well casing above and below the water level was observed to exhibit moderate to severe corrosion, spalling, and pitting, increasing with depth. The well screen appeared to be in open, very clean, and in generally excellent condition to approximately 435 feet bRP, with gravel envelope material visible through the well screen openings (see photograph on following page). Sediment buildup within the well screen was observed below 435 feet bRP, increasing with increasing depth and completely clogging the well screen openings below 472 feet bRP. Although unclear, the bottom of the wire-wrap screen appears torn and separated below 476 feet bRP (see photograph on following page).

Fill was encountered at a depth of approximately 476 feet bRP, obscuring the lower portion of the well screen and indicating approximately 24 feet of fill above the reported total depth of the well. The as-built details verified by the downhole video survey are shown graphically in Appendix F.

Historical Groundwater Levels and Pumping Dynamics

Historical static and pumping water levels and well performance data are shown on Figure 24 for the period of record from January 1992 to March 2020. Static water levels range from a minimum of approximately 154 feet bgs in April 1992 to a maximum of 265 feet bgs in June 2014, while pumping water levels range from approximately 251 feet bgs in February 1996 to 390 feet bgs in May 2007. Water levels exhibit seasonal fluctuations due to pumping cycles and a period of increased decline and recovery during the period of record from early-2002 through late-2010 (see Figure 24). The overall trend over the period of record has been decreasing, with water levels becoming relatively stable since 2015 (see Figure 24).

Instantaneous pumping rates have averaged approximately 369 gpm over the period of record from January 2008 through March 2020 and have exhibited an overall decreasing trend (see Figure 24). Specific capacity has averaged approximately 2.5 gpm/foot over the period of record and has exhibited a generally declining trend since late-2015 (see Figure 24).

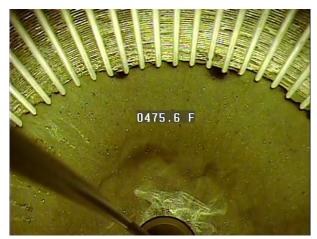


Performance Characteristics (Prior 5 Years)

Over the past five (5) years (i.e., 2015 through 2020), both static and pumping water levels have exhibited a generally stable trend, despite significant seasonal fluctuation (see Figure 24). Instantaneous pumping rate has declined by approximately 5% and specific capacity has declined approximately 18% from early-2015 through early-2020 (see Figure 24).



Well screen open and in excellent condition.



Bottom of well screen appears torn and clogged.



3.0 RANKING METHODOLOGY

3.1 Well Condition and Performance Ranking

The well condition assessments performed in Section 2.0 were used to develop an overall appraisal of the current condition of each well based on physical attributes and performance characteristics. These appraisals were used to rank the wells in order of overall condition, with the highest ranked wells having the worst overall condition, and the lowest ranked wells being in the best condition. The ranking of each well was based on the criteria discussed below and reflects each site's overall condition. The condition ranking criteria were given a weighting factor of 1 to 3 (3 being most important). For example, the age of a well is considered a critical factor related to evaluating the useful service life of a well and, thus, was given a weighting factor of 3. Each well was assessed individually as to respective well-specific criteria by being assigned a raw criteria scores and their respective weighting factors resulted in a total weighted score for well condition and performance.

Each of the wells were evaluated as to condition and performance in terms of several factors. Specifically, this evaluation included an assessment of the following criteria within three categories, each of which is summarized in Table 2 and discussed in greater detail below.

Category	Criteria	Weighting Factor
	Well Age	3
	Steel Type	3
Design and Construction	Screen Type	2
Design and Construction	Screen Opening Size	2
	Remaining Service Life	3
	Drilling Method	1
	Structural Concerns / Risk of Collapse	3
Physical Condition	Fill and/or Debris	1
	Encrustation and/or Biofouling	2
	Water Level Trends	2
Performance Characteristics	Flow Rate and/or Specific Capacity Trend	1
	Sand and/or Gravel Production	3
	Water Levels Below Screen / Air Entrainment	2

Well Condition and Ranking Criteria

3.1.1 DESIGN AND CONSTRUCTION CRITERIA

3.1.1.1 Well Age

The age of a well directly affects useful service life. Older wells will increasingly experience clogging of the well screen structure from mineral encrustation, buildup of corrosion byproducts, and biological growth. Continued metal loss from corrosion and rehabilitation activities may ultimately



lead to structural concerns (e.g., holes, ruptures, deformation, and enlarged screen openings) which may lead to operational issues, and ultimately complete failure of the well structure. As of the date of this report, the PWD well field ranges in age from 29 to 74 years with an average age of 45 years and with all but three (3) wells exceeding the theoretical useful service life. Although other criteria within this category may be affected as a direct result of well age, this criterion is considered to be an overall metric from which to assess the general condition of a well. The weighting factor assigned to this criterion is 3 and criteria scores were assigned based on the following.

Description	Score
< 10 Years	0
10 – 29 Years	1
30 – 44 Years	2
> 45 Years	3

Well Age
(Weighting Factor 3)

3.1.1.2 Steel Type

The type of steel used to construct a well has a direct impact on clogging of the well screen structure and useful service life. A stainless steel well will suffer far less rates of corrosion than a mild steel well, will clog less readily, and will respond more positively to rehabilitation and redevelopment efforts. As such, a well constructed of higher grade steels will require less down time for maintenance and will need replacement at much greater intervals, allowing for longer periods of uninterrupted service. The range of steels between mild steel and stainless steel offer varying degrees of corrosion resistance. It should be noted that hard red and Kai-Well steels have a high copper content and were developed to withstand the rigors of the cable-tool drilling process. As such, these types of wells have been known to exhibit unusually long, albeit unpredictable, service lives. The weighting factor assigned to this criterion is 3 and criteria scores were assigned based on the following.

Steel Type (Weighting Factor 3)

Description	Score
Stainless Steel	0
Hard Red / Kai-Well	1
Copper-Bearing / HSLA	2
Mild Steel / Unknown	3



3.1.1.2.1 SCREEN **T**YPE

The type of steel used to construct a well has a direct impact on structural integrity, rate of clogging, and useful service life. Pipe-based well screens such as louvers and mill slots offer structural strength while wire-wrap screens, especially those constructed of low-grade steels, are considered highly susceptible to degradation and structural decline. Opening geometry is also a factor, with louvers and wire-wrap geometries opening outward and being considered most favorable, and mill slots being susceptible to clogging and being least favorable. Knife-cut and hydraulically-perforated openings (e.g., Moss perforations) can be susceptible to high velocity flow, resulting in erosion and widening of the opening over time, ultimately leading to sand and gravel influx. The weighting factor assigned to this criterion is 2 and criteria scores were assigned based on the following.

Description	Score
Louvered	0
Stainless Steel Wire-Wrap	1
Knife-Cut / Mill Slot / Moss Perforations	2
Mild Steel Wire-Wrap	3

Screen Type (Weighting Factor 2)

3.1.1.2.2 SCREEN OPENING SIZE

Larger screen openings are considered generally more resistant to clogging from mechanisms such as mineral encrustation, biological activity, and formation sands. Over the life of a well, smaller openings will generally result in lower well efficiency, resulting in non-recoverable decline in production, and the need for more frequent well rehabilitations. Additionally, wells with liners exhibit even greater well inefficiency and considered least favorable. The weighting factor assigned to this criterion is 2 and criteria scores were assigned based on the following.

Screen Opening Size (Weighting Factor 2)

Description	Score
> 0.080-inch	0
0.060 – 0.080-inch	1
0.050 – 0.060-inch	2
< 0.050-inch / Well Liner Installed	3



3.1.1.2.3 REMAINING SERVICE LIFE

The useful service life of a well is heavily affected by many factors, including design, construction materials, construction methodology, screen type, water quality, operational practices, and maintenance activities. However, the two primary factors in estimation of remaining useful service life include the steel type from which the well is constructed and the amount of useful life that has already been expended (i.e., age). Generally speaking, mild steel construction within a slightly corrosive environment may have a 30-year service life. Use of copper-bearing steel materials will result in a service life expectancy of 30 to 45 years. High-Strength Low-Alloy (HSLA) steel will result in a service life of 45 to 60 years, while wells constructed of 304L and 316L stainless steels will have service lives in excess of 75 and 90 years, respectively. The PWD well field, with few exceptions, is constructed primarily from lower grade materials such as mild steel and, consequently, do not have extended theoretical service lives. Additionally, the majority of the wells are advanced in age, with all but four (4) wells exceeding remaining service life based on age and steel type. The weighting factor assigned to this criterion is 3 and criteria scores were assigned based on the following.

Description	Score
> 30 Years	0
15 – 29 Years	1
5 – 14 Years	2
< 5 Years	3

Remaining Service Life (Weighting Factor 3)

3.1.1.2.4 DRILLING METHOD

Although not a particularly critical factor, the method by which a well is drilled can affect operational dynamics over the life of a well, primarily due to the degree with which drilling fluid additives are utilized. Drilling additives are used to maintain borehole integrity by controlling the flow of drilling fluids into the formation through formation of a cake of mud upon the borehole surface. This can invade and damage aquifer materials, resulting in lower well efficiencies, and must be removed quickly following well construction. Cable-tool drilling is typically accomplished without the use of additives and will most likely result in a well that is not affected by drilling additives or the drilling process itself. Reverse-circulation rotary drilling typically relies on hydrostatic pressure to maintain borehole integrity, employs little or no additives, and has a low probability of causing damage to aquifer materials. Direct-circulation rotary drilling uses a wall cake generated by a full program of drilling additives to maintain borehole integrity and has a high probability of resulting in a well that is not properly developed following construction. The weighting factor assigned to this criterion is 1 and criteria scores were assigned based on the following.



Drilling Method
(Weighting Factor 1)

Description	Score
-	0
Cable Tool	1
Reverse-Circulation Rotary	2
Direct-Circulation Rotary	3

3.1.1.3 PHYSICAL CONDITION CRITERIA

This category of criteria concerns an assessment of the current condition and health of each well by direct observation through review of downhole video surveys. PWD provided 142 video surveys, of which, the most recent video survey was reviewed, with older surveys reviewed in an effort to ascertain older conditions and to clarify well construction details prior to well modification. Where recent surveys were not available, assumptions were made based on other data.

3.1.1.3.1 STRUCTURAL CONCERNS / RISK OF COLLAPSE

The video survey review revealed several wells that are exhibiting structural issues, including severe corrosion, spalling and exfoliation, holes, ruptures, and deterioration. Some wells have experienced past structural issues as is evidenced by well modifications such as casing liners, patches, and bottom plugs. Holes and ruptures are problematic as groundwater flow can result in an evacuation of material from behind the feature, ultimately leading to voids behind the casing wall which can dramatically increase the risk of casing collapse. Seven (7) wells (Well Nos. 7A, 10, 14A, 16, 18, 21, and 25) show evidence of severe corrosion and structural issues, and are at risk of structural collapse or will experience severely shortened service lives from prior well modifications. One of these wells, Well No. 7A, has a large vertical rupture within the well screen as a result of over-inflation of a pneumatic inflatable packer installed on the pump column to mitigate cascading water. Plans are currently being developed to install a partial liner within this well. The weighting factor assigned to this criterion is 3 and criteria scores were assigned based on the following.

Structural Concerns / Risk of Collapse (Weighting Factor 3)

Description	Score
None / Unknown	0
Minimal (Few Holes, Existing Patches, Minor Spalling, Enlarged Perforations)	1
Moderate (Many Holes, Existing Lined Sections, Moderate Spalling, Minor Screen Deterioration)	2
Sever (Large Ruptures, Heavy Spalling, Casing Deformation, Severe Screen Deterioration)	3

3.1.1.4 FILL AND/OR DEBRIS

Fill material will commonly accumulate at the bottom of a well during the course of normal operation. However, the nature and degree of fill can be symptomatic of other problems. For example, the presence of large volumes of fill and/or the presence of gravel envelope material within that fill can be an indication that there are holes or ruptures within the well casing and/or screen, or that the well screen openings are enlarged and/or improperly designed. Additionally, large volumes of fill can cover well screen openings and reduce groundwater flow to the well. In this case, the number of feet of fill was used as a metric from which to evaluate the severity of fill accumulation. The weighting factor assigned to this criterion is 1 and criteria scores were assigned based on the following.

Description	Score
< 9 feet	0
10 – 19 feet	1
20 – 49 feet	2
> 50 feet	3

Fill and/or Debris (Weighting Factor 1)

3.1.1.5 ENCRUSTATION AND/OR BIOFOULING

Unchecked bacterial growth and mineral encrustation can result in clogged well screen openings and accelerated corrosion. Long periods of untreated bacterial activity and mineral buildup can result in unrecoverable loss in well production. As such, the degree of biofouling and mineral encrustation, as observed on the video surveys, was used as a metric for how severely the wells have been impacted and the probability that the wells can be successfully rehabilitated. The weighting factor assigned to this criterion is 1 and criteria scores were assigned based on the following.

Fill and/or Debris (Weighting Factor 2)

Description	Score
No Significant Encrustation and/or Biofouling Present	0
Minimal (Superficial Buildup, Minimal Nodules, Little to No Bacterial Activity)	1
Moderate (Significant Encrustation, Nodules, and Bacterial Activity)	2
Severe (Major Obstruction of Well Screen, Abundant Nodules, Widespread Biological Activity)	3



3.1.2 PERFORMANCE CHARACTERISTICS

3.1.2.1 WATER LEVEL TRENDS

There are many factors affecting groundwater level trends (both static and pumping), including but not limited to regional water level changes, changes in wellfield and/or individual well operation, clogging of the well screen, worn pumping equipment, and liner installation. Wells that exhibit diverging static and pumping water level trends are likely impacted by clogging of the well intake structure rather than by regional groundwater level decline or pump-related issues. As such, criteria scores were primarily based on the magnitude of divergence between static and pumping water levels within the past 5 years (i.e., 2015-2020). The weighting factor assigned to this criterion is 2 and criteria scores were generally assigned based on the following parameters.

Description	Score
No Divergence of Static and Pumping Water Levels	0
Slight Divergence of Static and Pumping Water Levels	1
Moderate Divergence Static and Pumping Water Levels	2
Major Divergence Static and Pumping Water Levels	3

Water Level Trends (Weighting Factor 2)

3.1.2.2 FLOW RATE AND/OR SPECIFIC CAPACITY TRENDS

As with water levels, there are many factors affecting instantaneous pumping rate and specific capacity trends, including but not limited to regional water level changes, changes in wellfield management and/or individual well operations, clogging of the well screen, modified pumping equipment, and well modifications. Wells that exhibit declining instantaneous pumping rates and/or specific capacity were considered more problematic for the purposes of this evaluation, while wells that exhibit no declines were considered less problematic. As such, criteria scores were primarily based on the magnitude of declining trends over the past 5 years (i.e., 2015-2020). The weighting factor assigned to this criterion is 1 and criteria scores were assigned based on the following.

Flow Rate and/or Specific Capacity Trends (Weighting Factor 1)

Description	Score
No Decline in Instantaneous Pumping Rate and/or Specific Capacity	0
Slight Decline in Instantaneous Pumping Rate and/or Specific Capacity	1
Moderate Decline in Instantaneous Pumping Rate and/or Specific Capacity	2
Major Decline in Instantaneous Pumping Rate and/or Specific Capacity	3



3.1.2.3 SAND AND/OR GRAVEL PRODUCTION

Sustained production of formation sand from a well is an undesirable condition as it can lead to enlargement of perforations, creation of voids behind the well casing and increased risk of structural collapse, accelerated wear and damage to pumping equipment, service complaints, and in rare cases, land subsidence in the vicinity of the well head. Production of material from the gravel envelope (if present) can be a symptom of more serious structural issues and can cause severe damage to pumping equipment when entrained. This criterion was evaluated by assessing the number of available PWD sand reports per well over the past five (5) years (i.e., 2015-2020), weighted by the severity of each report (i.e., none/unknown, trace, small trace, and large trace). The weighting factor assigned to this criterion is 3 and criteria scores were assigned based on the following.

Description	Score
None / Unknown	0
Minimal (Minor or Isolated Sand Production)	1
Moderate (Significant and/or Sustained Sand Production)	2
Severe (Heavy Production of Sand and/or Gravel Envelope)	3

Sand and/or Gravel Production (Weighting Factor 3)

3.1.2.4 WATER LEVELS BELOW SCREEN / AIR ENTRAINMENT

Water levels that have declined to the extent that they are below the top of the well screen can create undesirable conditions within a well, including 1) water quality degradation from turbulent flow of water entering the well above the water column, and 2) the effective reduction of aquifer thickness (i.e., aquifer dewatering). Turbulent flow and cascading water can cause entrainment of air within the water column which can lead to accelerated corrosion of the well and pumping components, damage to the pump from cavitation, and service complaints due to aerated water. The weighting factor assigned to this criterion is 2 and criteria scores were assigned based on the following.

Sand and/or Gravel Production (Weighting Factor 2)

Description	Score
None / Unknown	0
Minimal (Water Levels Below Top of Screen)	1
Moderate (Evidence of Cascading Water Conditions)	2
Severe (Cascading Water Conditions when Idle, Reported Air Entrainment)	3



3.2 SUPPLEMENTAL RANKING CONSIDERATIONS

The well condition and performance assessment performed in Section 3.1 resulted in a ranked list of wells with the most problematic condition and performance being ranked toward the top of the list. The wells were then further evaluated using the supplemental ranking criteria included in Table 3 described in greater detail below. The incorporation of these supplemental criteria enable an assessment of 1) the probability of successful well rehabilitation and/or repair, 2) the general cost of well rehabilitation and/or repair, and 3) the relevance of the individual well to the system. The supplemental ranking criteria were given a weighting factor of 1 to 3 (3 being most important) and each well was assessed individually by being assigned a raw criteria score between 0 and 3 (3 being best). The product of individual supplemental criteria scores and their respective weighting factors resulted in a total supplemental weighted score. A well with a high probability of a successful rehabilitation at low cost would score relatively high, while a well with a low probability of success at high cost would score relatively low.

3.2.1 PROBABILITY OF SUCCESSFUL WELL REHABILITATION AND/OR REPAIR

The extent of well rehabilitation and/or repair work needed for each of the wells was estimated based on the well condition and performance assessment. An assessment was then made as to the magnitude of risk posed by the required work, and the likelihood that the rehabilitation event would result in a positive outcome. Wells at high risk of structural collapse and little to no possibility of success were scored low, while those well posing little risk and high probability of improvement were scored high. For example, a well experiencing widespread biofouling, reduced performance, and observable structural issues such as holes and/or ruptures within the well casing would be scored low. Wells that appear structural sound with minor levels of biofouling and mineral encrustation may score relatively high. The weighting factor assigned to this criterion is 2 and criteria scores were generally assigned based on the following parameters.

Description	Score
Very Low (High Risk / Not Feasible)	0
Low (Improvement Unlikely)	1
Moderate (Some Improvement Possible)	2
High (Significant Improvement Likely)	3

Probability of Successful Rehabilitation and/or Repair (Weighting Factor 3)

3.2.2 COST OF REHABILITATION AND/OR REPAIR

The cost to complete the estimated well rehabilitation and/or repair work needed for each of the wells was estimated based on planning-level cost estimates for each component of work and roughly scaled based on the depth of the well. A deep well requiring repair, chemical and mechanical cleaning, and redevelopment would be considered relatively expensive and assigned a low score. A



shallow well only requiring mechanical cleaning and disinfection would be considered relatively inexpensive and would be scored high. The weighting factor assigned to this criterion is 3 and criteria scores were generally assigned based on the following parameters.

Cost of Rehabilitation and/or Repair (Weighting Factor 3)

Description	Score
Very High (Repairs, Mechanical and Chemical Cleaning, Redevelopment)	0
High (Mechanical and Chemical Cleaning, Redevelopment)	1
Moderate (Mechanical Cleaning and Redevelopment)	2
Low (Mechanical Cleaning and Disinfection)	3

3.2.3 Relevance to the System

Regardless of how each well ranks with regard to prior assessments, some wells may be deemed more critical for operation of the system and should potentially be ranked at a higher level regardless of prior ranking scores. As such, PWD personnel were requested to provide input as to which wells are considered more critical to the system. Generally, wells within the north wellfield are considered a higher priority to system operation and were assigned a score of 2. A subset of wells within the north wellfield (Well Nos. 3A, 7A, 14A, and 23A) are equipped with natural gas generators and operate at greater efficiency, and were assigned a score of 3. Similarly, Well No. 2A is equipped with an engine-driven pump and was also assigned a score of 3 due to increased operational efficiency. All other wells were assigned a score of 1 for this criterion as they are beyond the north wellfield and exhibit very low production capacity. The weighting factor assigned to this criterion is 3 and criteria scores were assigned based on the following.

Relevance to the System (Weighting Factor 3)

Description	Score
-	0
Low (Not Critical to System Operation)	1
Moderate	2
High (Critical to System Operation)	3

3.3 RANKING RESULTS

3.3.1 Well Condition and Performance Ranking

The results of the well condition and performance ranking, including weighting factors, criteria scores, total weighted scores, and rank are provided in Table 4, ordered by well designation. The



highest ranked wells represent the most problematic wells in terms of condition and performance characteristics, with the lowest ranked wells being considered in the best condition.

3.3.2 SUPPLEMENTAL RANKING

Supplemental ranking modifies the well condition and performance ranking to include the supplemental effects of 1) probability of successful well rehabilitation efforts, 2) the cost of well rehabilitation and repair, and 3) relevance to the system. The results of the supplemental ranking, including weighting factors, criteria scores, total weighted scores, and rank are provided in Table 5, ordered by well designation.

3.3.3 FINAL PRIORITIZATION RANKING

The final prioritization ranking is provided in Table 6, including weighting factors, criteria scores, total weighted scores, modified weighted scores, and rank. Seven (7) wells were identified as structurally unsound and have been assigned a modified criteria score of 0, resulting in those wells being relegated to the bottom of the ranking (shaded red in Tables 4 through 6). These wells should either 1) not undergo significant rehabilitation efforts for fear of casing collapse, or 2) should not be rehabilitated as the probability of improving performance is considered unlikely. It should be noted that these wells may be deemed suitable for routine maintenance and/or well repair should they be considered critical to the system, or should time be needed to raise capital funding for new construction projects (e.g., recent liner installations at Well Nos. 7A and 25). However, these wells are nearing the end of their useful service lives and should be replaced within the next 10 years.



4.0 **RECOMMENDATIONS**

4.1 WELL REPLACEMENT

The PWD well field is in generally poor condition, primarily due to the use of inferior construction materials and poor design elements (i.e., mild steel casing and screen, wire-wrap well screen, and relatively thin walled casing). At the very least, PWD should plan for replacement of those wells identified as structurally unsound and deemed unsuitable candidates for well rehabilitation efforts. Those wells include Well 7A, 10, 14A, 16, 18, 21, and 25. The order of the replacements should be based on the relevance of each well to the system as will be determined by PWD. Well 7A is currently undergoing repair and redevelopment to extend its useful service life and should be ranked lower in terms of the schedule for replacement. The following table summarizes current production capacity versus the earliest known capacity for each well identified in need of replacement.

Well Designation	Pressure Zone	Earliest Recorded Capacity (year) (gpm)	Current Capacity (gpm)
7A	2800	2,000 (1985)	600*
10	2800	208 (2008)	164
14A	2800	972 (2008)	753
16	2950	575 (1960)	136
18	3250	171 (1954)	78
21	2950	270 (2007)	227
25	2950	750 (1989)	217
Total	-	4,946	2,175

Well Replacements - Production Capacity

* Estimated capacity projection following installation of casing liner in 2020.

It should be noted that wells situated within the north wellfield generally exhibit much higher production capacities than wells situated within other areas of PWD's service area. As such, it is recommended that the north wellfield area be considered the most favorable area for replacement wells, particularly during the earliest phases of a well replacement program. A well site assessment and preliminary design was recently completed as one of the first steps toward construction of one or more production wells, designated Well Nos. 36 and 37, within the north wellfield area.

4.2 WELL REHABILITATION

The remaining 15 wells were ranked in order of which wells are most problematic, have the highest chance of successful well rehabilitation at the least cost, and considered most critical to system operation (see table below). Those wells that have been rehabilitated within the past five (5) years are considered to be a lower priority for imminent well rehabilitation and are shaded green.



Well Designation	Pressure Zone	Final Prioritization Rank	Last Well Rehabilitation Event	Recommended Rehabilitation Effort
26	2850	1	2016	CH-I, R
3A	2800	1	2012	M, CH-I
15	2800	3	2016	M, CH-I, CH-II, R
2A	2800	4	2010	M, CH-I, CH-II, R
11A	2800	5	2012	M, CH-I, R
29	2950	6	2018	M, CH-I, CH-II, R
6A	2800	7	2018	M, CH-I, CH-II, R
19	3250	8	2011	M, CH-I, CH-II, R
35	2950	9	2018	CH-I, R, CP
23A	2800	9	2013	M, CH-I, CH-II, R
30	2850	11	2016	M, CH-I, R
8A	2800	11	2017	CH-I, R
22	2850	13	2016	M, CH-I, R, CP
32	2800	14	2013	M, CH-I, CH-II, R
33	2850	15	2008	CH-I, R

Final Rehabilitation Ranking

M: Mechanical cleaning.

CH-I: Phase I chemical treatment with polymer dispersant and/or surfactant.

CH-II: Phase II chemical treatment with acid.

R: Redevelopment.

CP: Casing patch installation.

4.3 ESTIMATED COST OF WELL REHABILITATION

The cost to complete the estimated well rehabilitation and/or repair work efforts outlined in the table above are based on general estimates for each component of work and roughly adjusted based on the depth of the well (i.e., the total rehabilitation cost for a well of less than 500 feet total depth was adjusted to 80% of the total estimated cost). It should be noted that cost estimates presented herein are to be utilized only as a general metric from which to compare costs between wells and should in no way be used for planning purposes. The estimated cost for each component of rehabilitation or repair work is summarized as follows.

Work Effort	Estimated Cost
Mechanical Cleaning	\$10,000
Phase I Chemical Treatment	\$5,000
Phase II Chemical Treatment	\$50,000
Redevelopment	\$60,000
Casing Patch Installation	\$15,000



The estimated total costs for rehabilitation, redevelopment, and repair for each of the 15 top-ranked wells are presented below along with recommended rehabilitation timing. Those wells that have been rehabilitated within the past five (5) years are considered to be a lower priority for imminent well rehabilitation and are shaded green.

Well Designation	Pressure Zone	Final Prioritization Rank	Last Well Rehabilitation Event	Estimated Rehabilitation Cost	Recommended Rehabilitation Year
26	2850	1	2016	\$52,000	2023
3A	2800	1	2012	\$75,000	2021
15	2800	3	2016	\$125,000	2023
2A	2800	4	2010	\$125,000	2021
11A	2800	5	2012	\$75,000	2021
29	2950	6	2018	\$100,000	2028
6A	2800	7	2018	\$125,000	2025
19	3250	8	2011	\$100,000	2023
35	2950	9	2018	\$64,000	2028
23A	2800	9	2013	\$125,000	2021
30	2850	11	2016	\$60,000	2023
8A	2800	11	2017	\$65,000	2024
22	2850	13	2016	\$72,000	2026
32	2800	14	2013	\$125,000	2023
33	2850	15	2008	\$52,000	2021

Estimated Rehabilitation Costs and Schedule

4.4 EQUIPPING OF INACTIVE WELLS

Well No. 28 was constructed in 1989 and had a reported instantaneous production rate of 800 gpm at the time of construction. Well No. 34A was constructed in 1992 and had a reported instantaneous production rate of 450 gpm at the time of construction. Neither of these wells were equipped following construction due to funding issues and have since remained inactive. It is possible that these wells could be rehabilitated, redeveloped, equipped, and brought to service. However, both wells are nearing the end of their estimated useful service life based on steel type alone and may not be viable for long-term utilization. Furthermore, the thorough evaluation, testing, and infrastructure requirements necessary to bring these wells to service may ultimately be cost-prohibitive.

4.5 **PROGRAM UPDATES**

It is recommended that this well rehabilitation prioritization program be updated as new information and system needs are developed, as existing facilities are modified, and/or new facilities constructed. Additionally, criteria scores and weighting factors can be modified as the need arises.



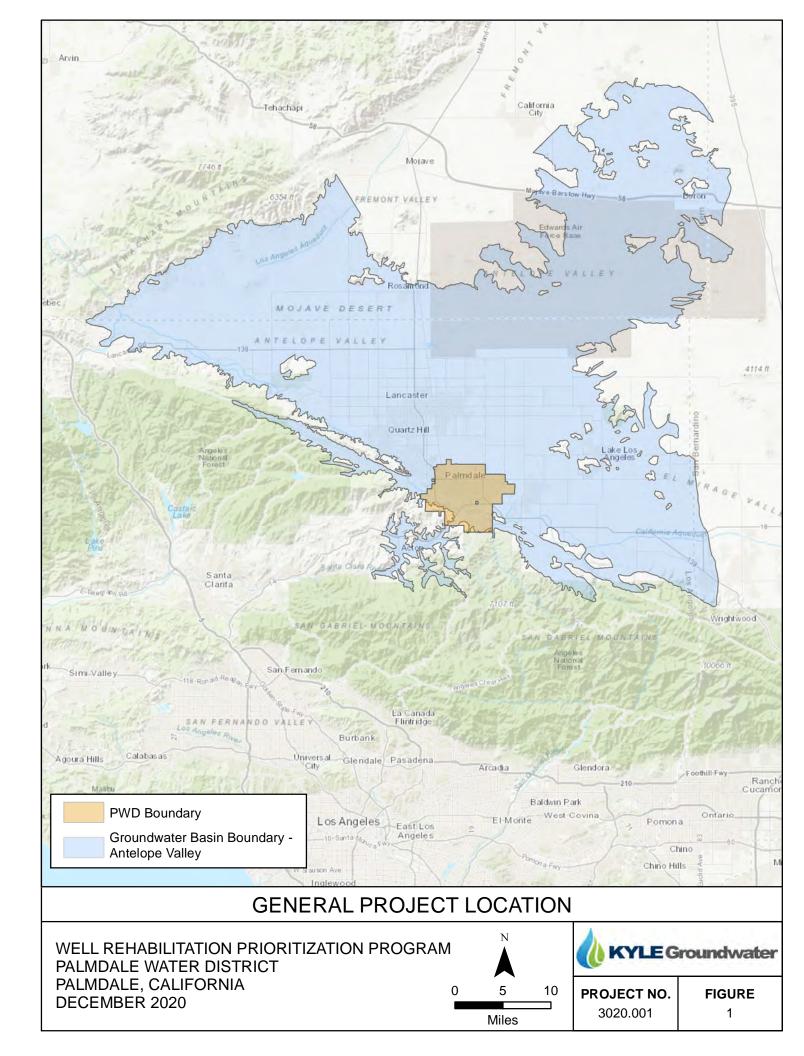
5.0 REFERENCES

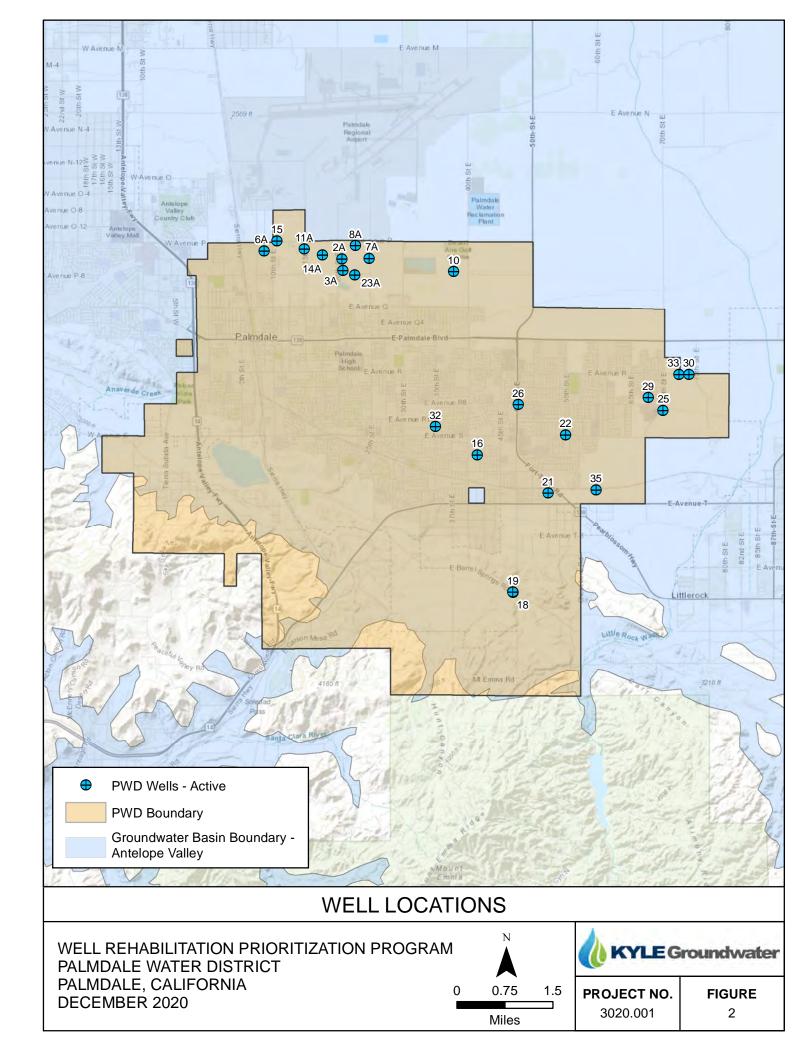
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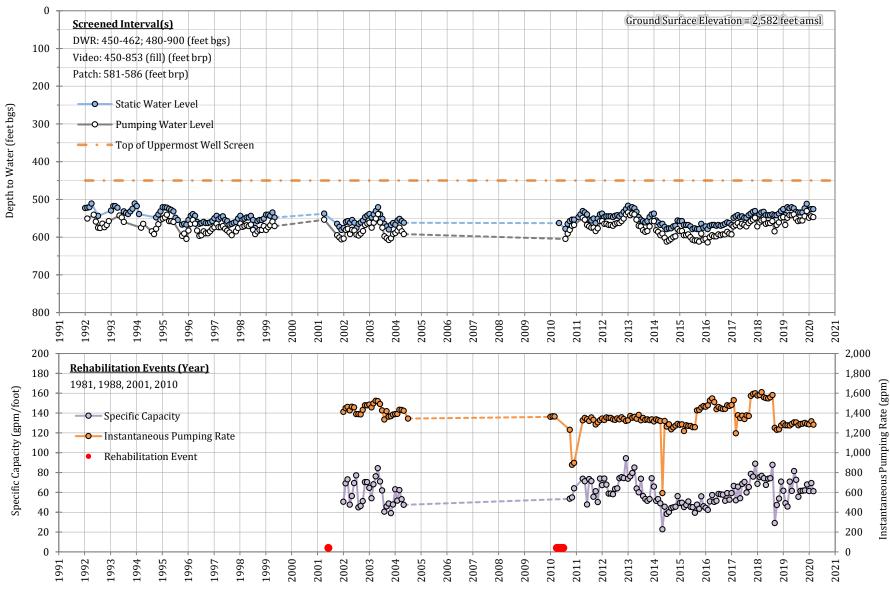


FIGURES



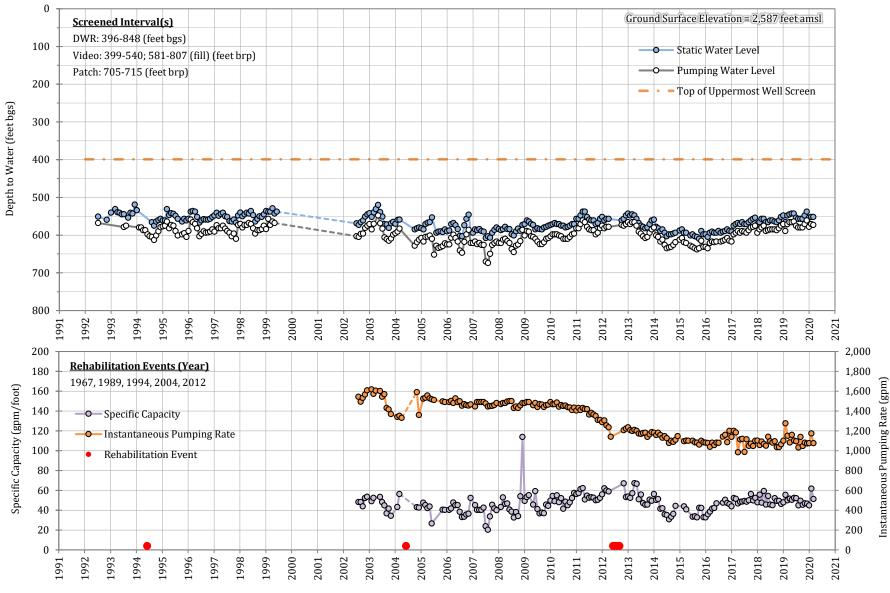










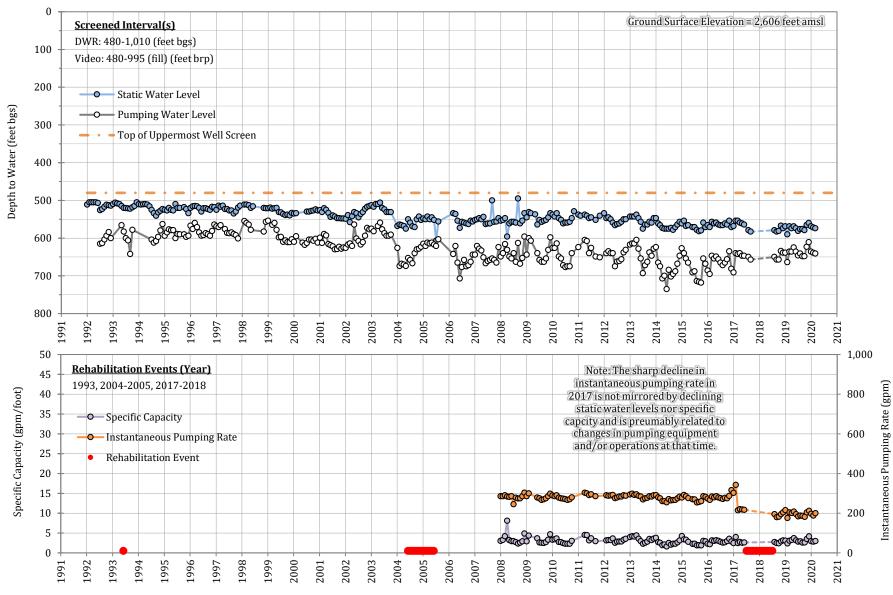


Source: Palmdale Water District (2020).

December 2020





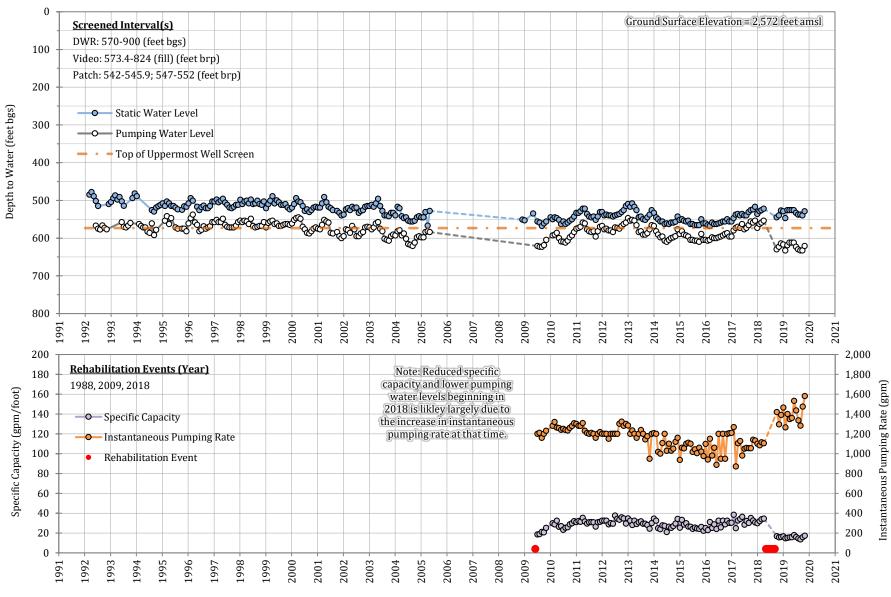


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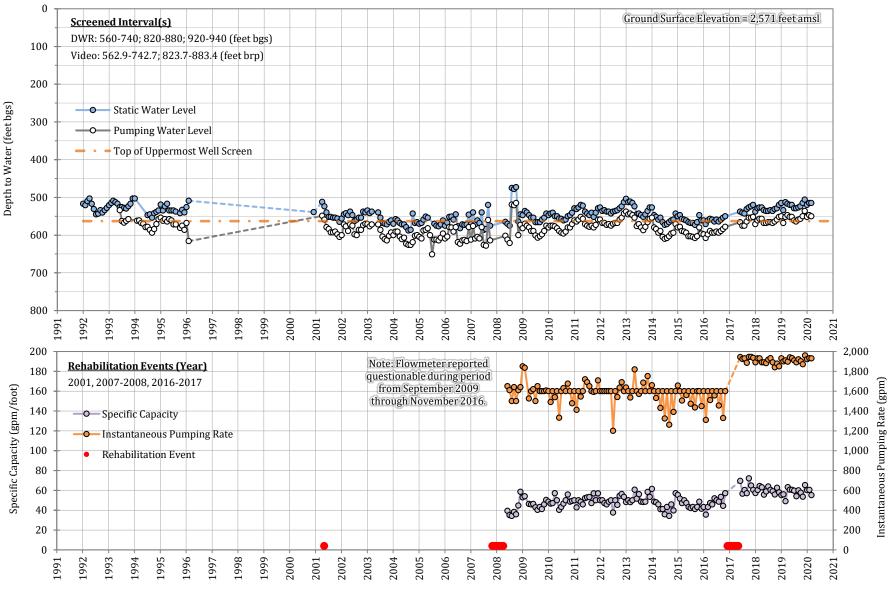
Figure 5



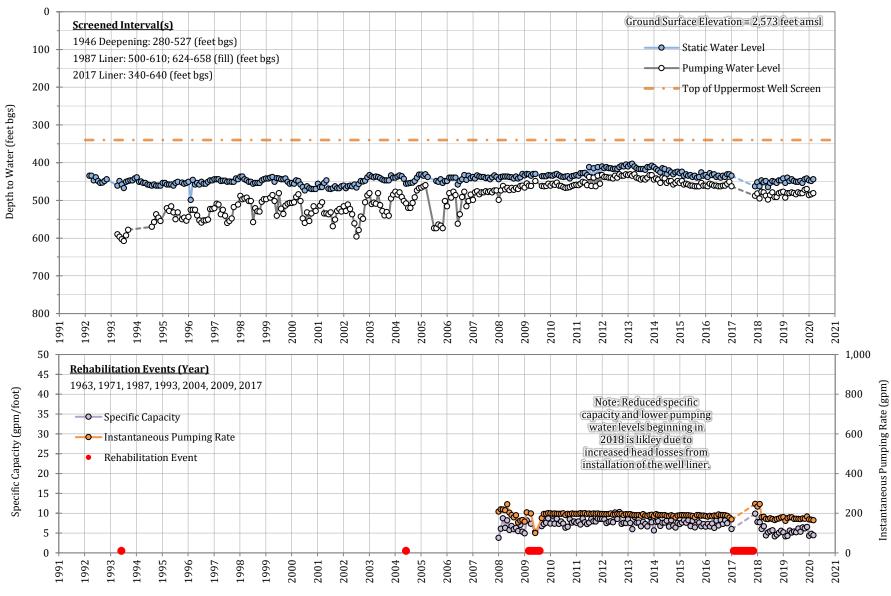




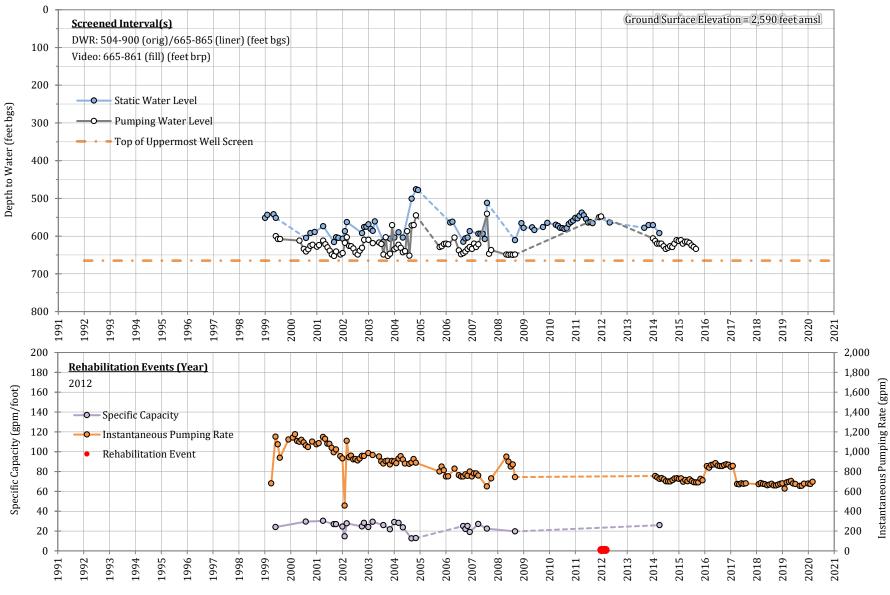










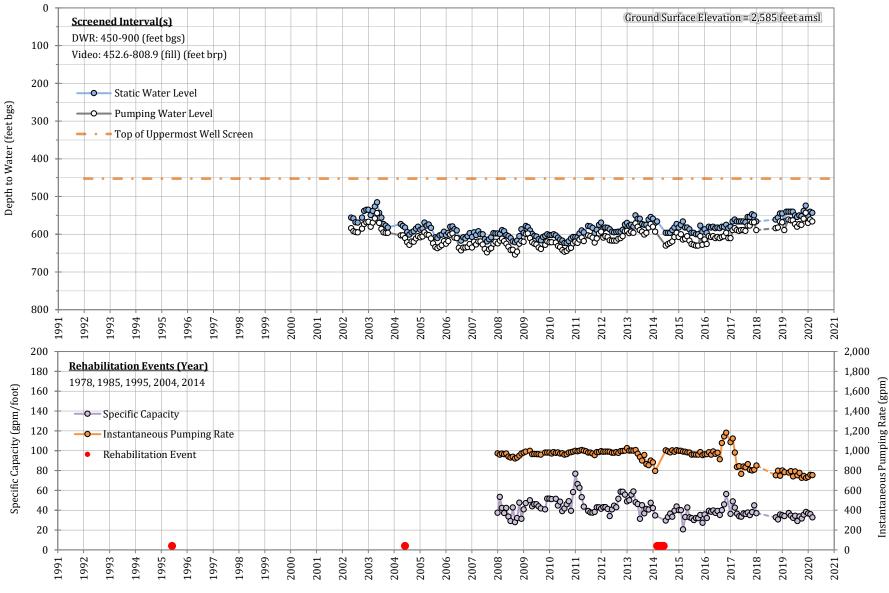


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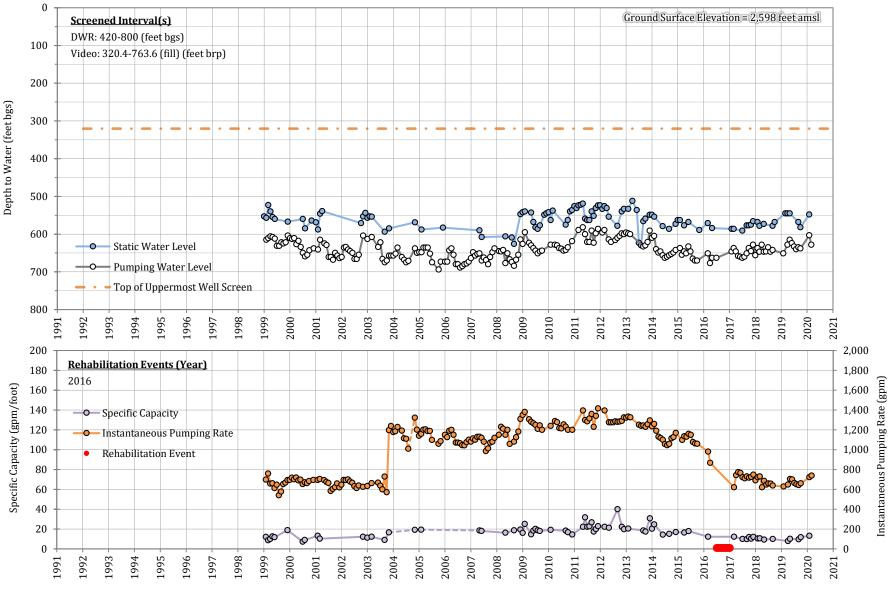
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KYLE Groundwater





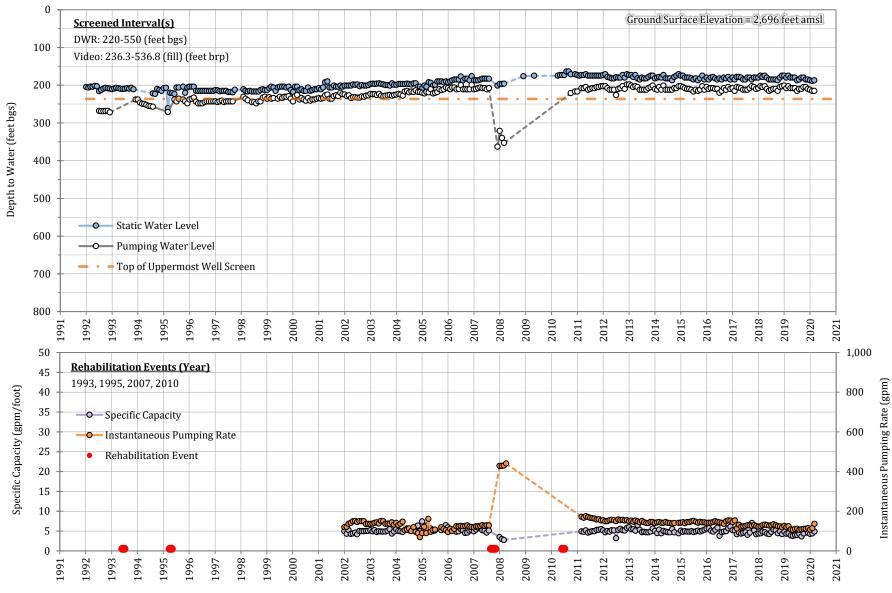


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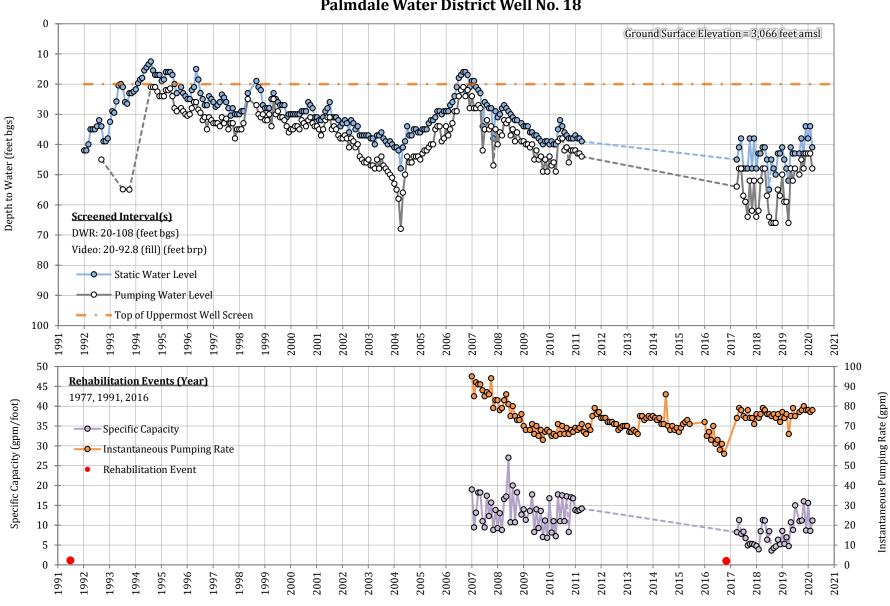
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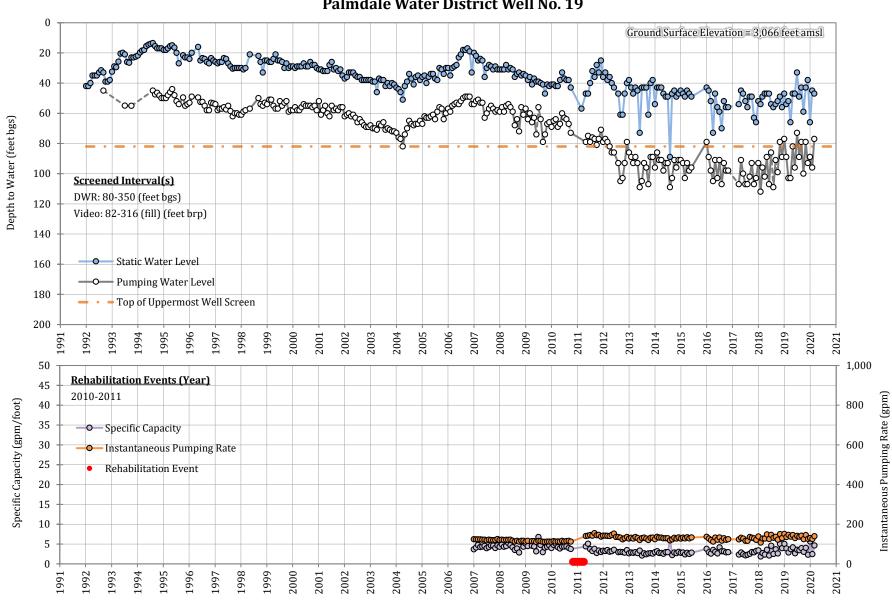




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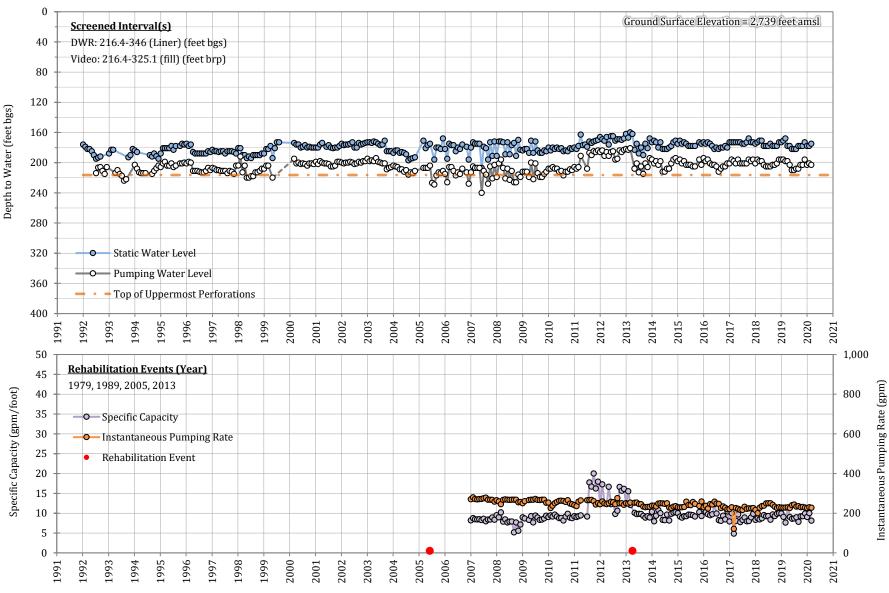
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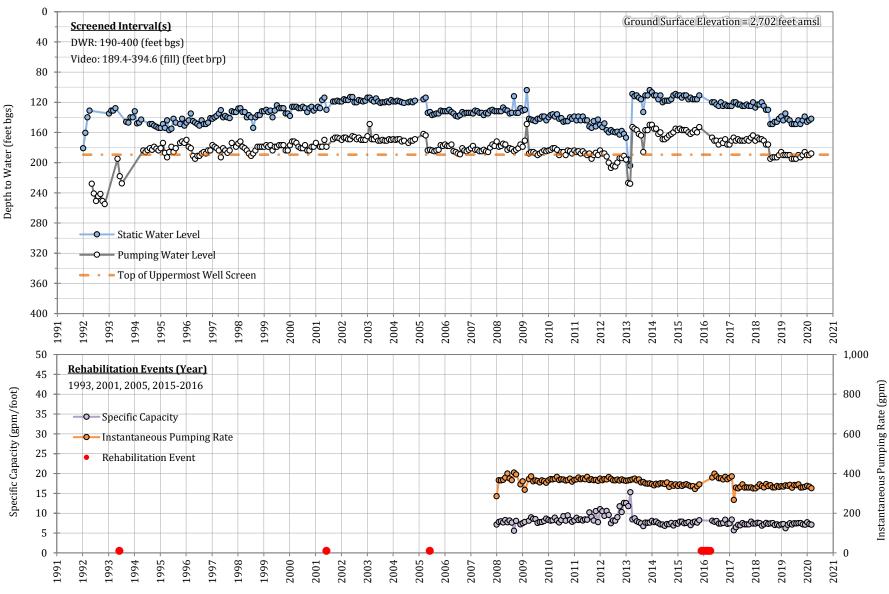






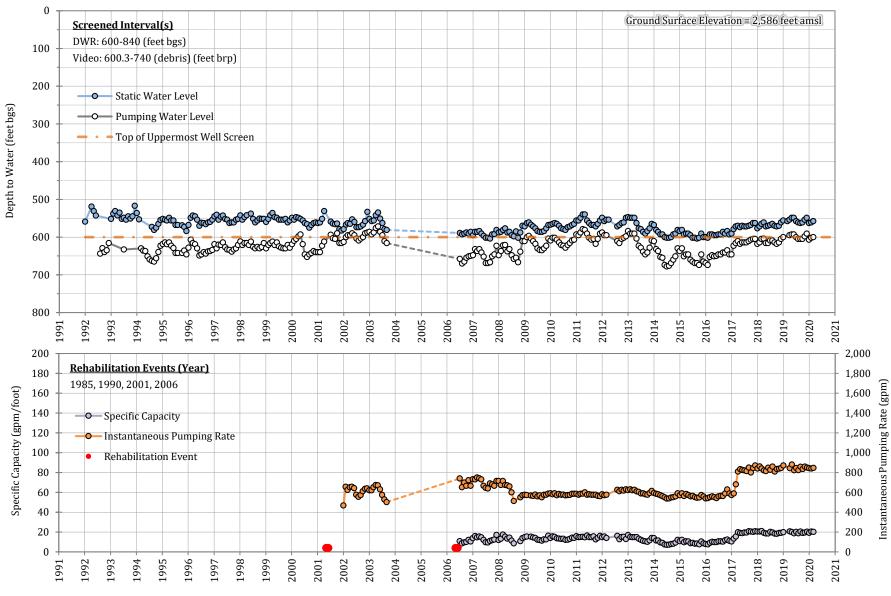




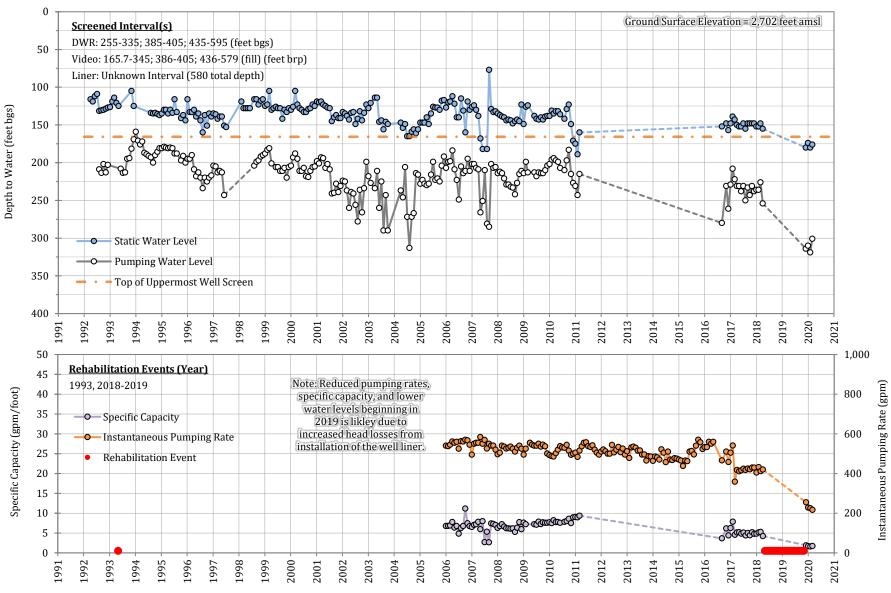






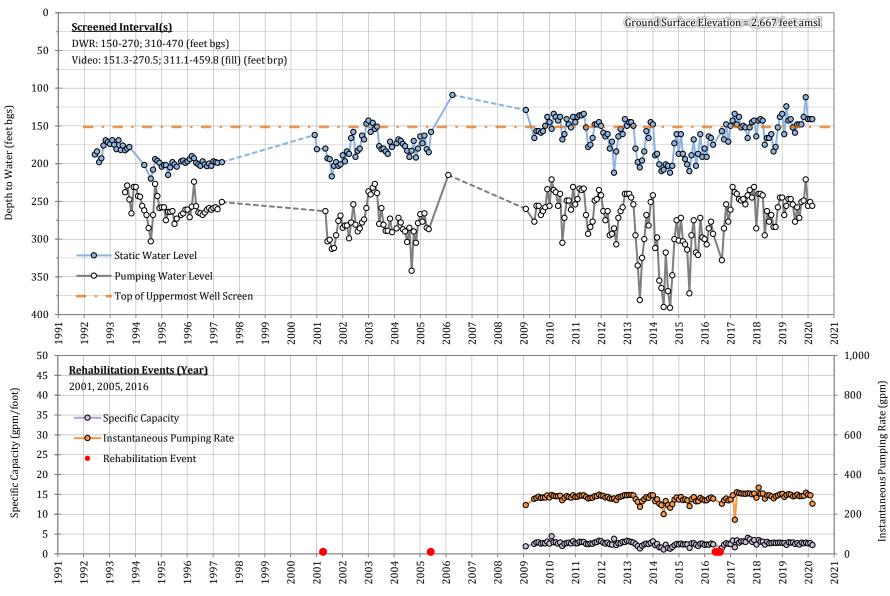




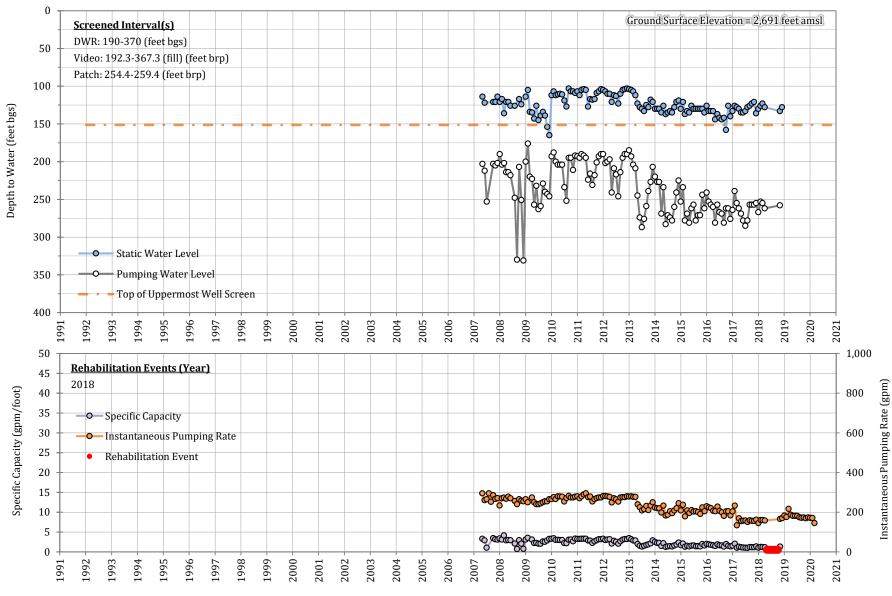




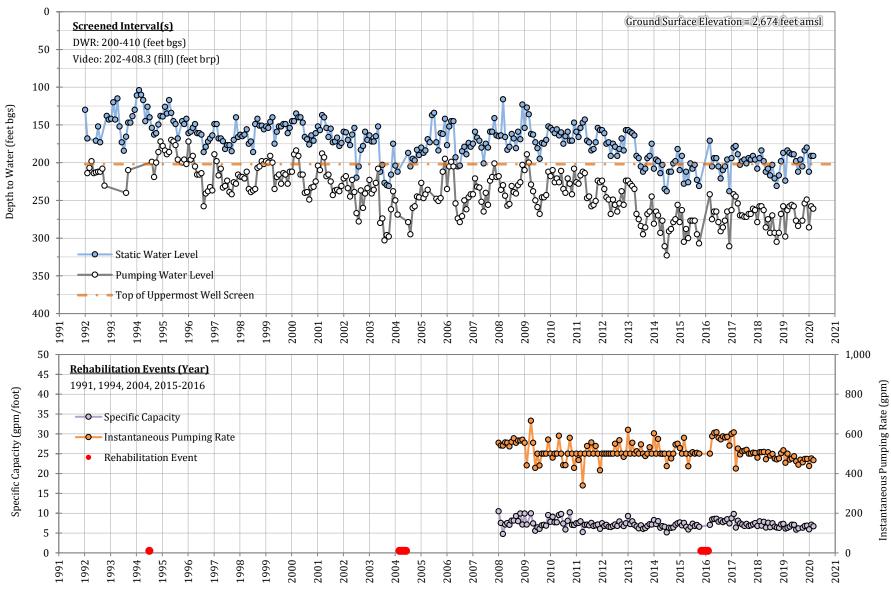












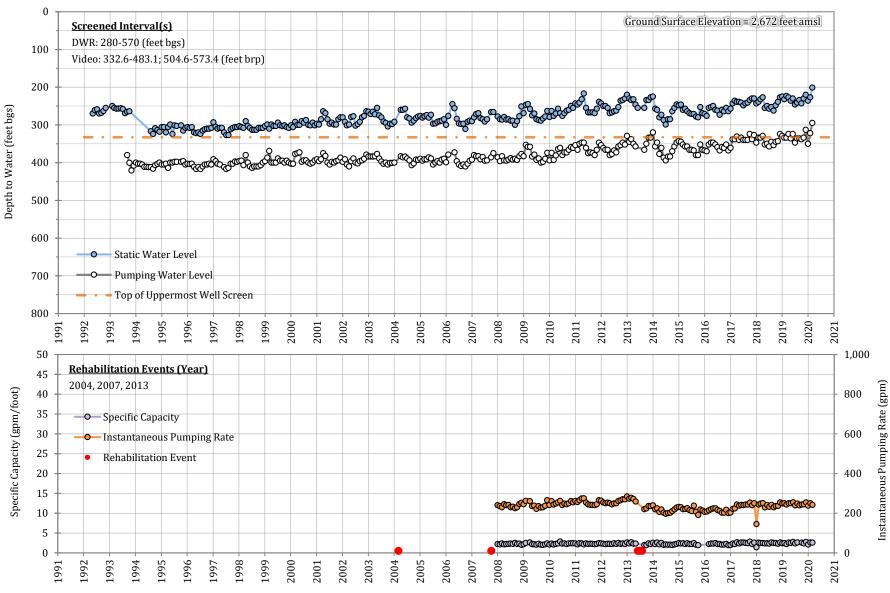
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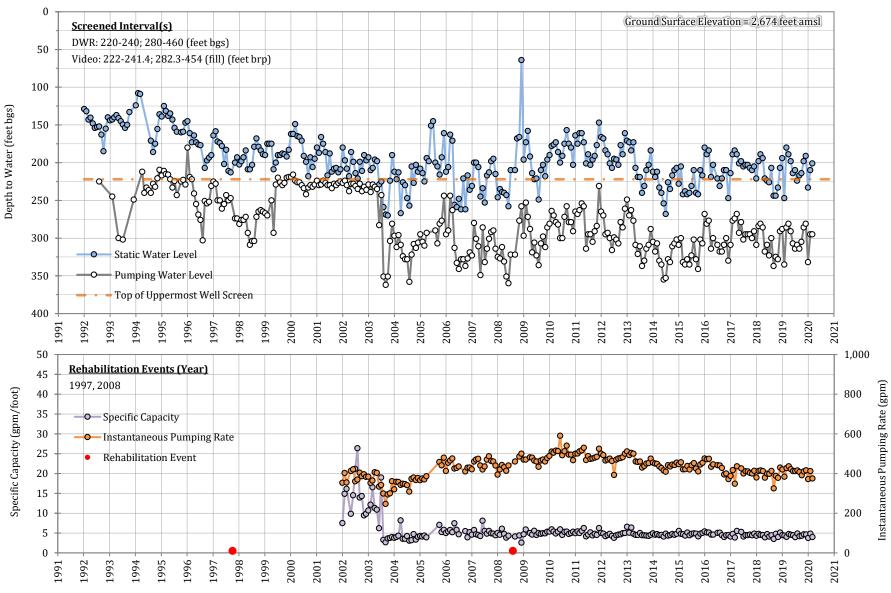


Figure 21



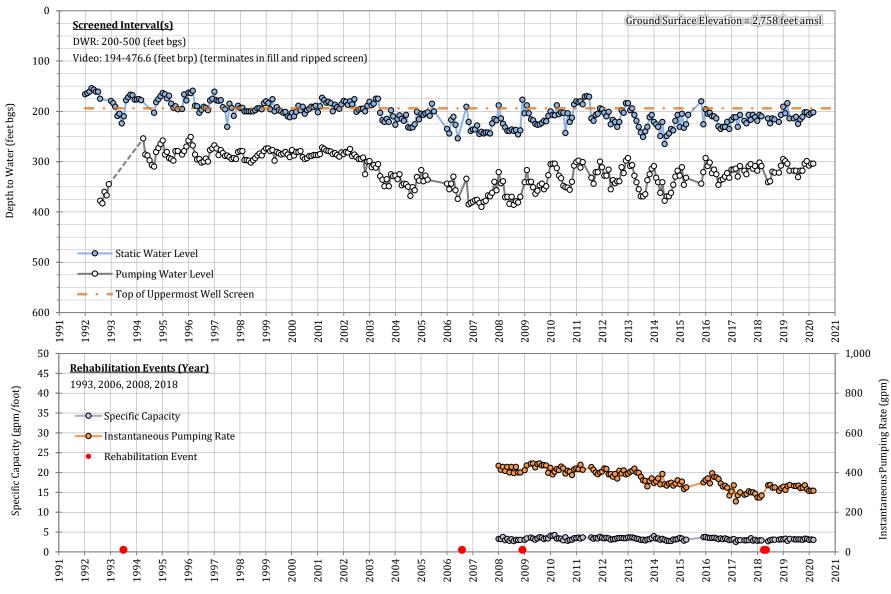












Source: Palmdale Water District (2020).



KYLE Groundwater

TABLES



Summary of Well Construction and Operational Details

Well Designation	State Well Number	Pressure Zone	Well Status	Street Address	Construction Year	Construction Method	Borehole Depth	Steel Type ¹	Well Depth		ginal Casing heter / Depth		iginal Wall mess / Depth		sing Liner / Patch Diameter / Depth	Screen Interval(s)	Screen Interval(s) Video Survey	Screen Type	Screen Opening Size	Gravel Type	Annular Seal Depth	Original Pumping Rate	Original Static Water Level	Original Drawdown
							[feet bgs]		[feet bgs]		es / feet bgs]		es / feet bgs]	[ii	nches / feet bRP]	[feet bgs]	[feet bgs]		[inches]		[feet bgs]	[gpm]	[feet bgs]	[feet]
1	06N11W19	-	Inactive	-	-	RC	1,080	MS	1,080	16	0-1,080	5/16	0-1,080	-	-	540-1,060	-	Wire-Wrap	0.090	-	80	350	491	197
1A	06N11W19	-	Destroyed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2A	06N11W19E	2800	Active	39400 20th Street	1968	DR	915	MS	900	16	0-900	1/4	0-900	-	581-586	450-462; 480-900	450-853(fill)	Louvered	0.125	No. 5	50	2,100	370	-
3A	06N11W19E06	2800	Active	2163 E. Avenue P-8	1960	DR	868	MS	848	16	0-848	1/4	0-848	-	705-715	396-848	399-540; 581-807(fill)	Louvered	0.125 (estimated based on gravel size)	Pea	-	-	-	-
4	06N12W23M01	-	Destroyed	450 South of Ave. P-8 East of Division St.	1954	DR	651	MS	624	14	0-624	1/4	S	-	-	300-624	-	Chisel	0.188	Pea	50	360	305	175
4Λ	06N11W19F	2800	Inactive / Standby (High CrVI)	2475 E. Avenue P-8	1970	DR	838	MS	830	18 16	0-330 330-830	5/16	0-830	-	-	Ful-Flo: 480-510; 540-630; 690-720; 780-810 Std Flo: 510-540; 630-690; 720-780; 810-830	480-791(fill)	Louvered	0.125	5/16 x 4	50	-	-	-
5	05N12W04	2950	Inactive / Out of Service (2003)	1036 Barrel Springs Road	Acq. 1963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6A	06N12W23A	2800	Active	39455 10th Street	1983	DR	1,030	MS	1,010	16	0-1,010	1/4	0-1,010	-	-	480-1,010	480-995(fill)	Louver (Mill on DWR)	0.080	No. 5	100	800	600	-
7A	06N11W19F	2800	Active	39395 25th Street	1985	RC	1,020	MS	920	16	0-920	1/4	0-920	-	542-545.9 547-552	570-900 (orig.) 570-832.5 (plugged below)	573.4-824(fill)	Wire-Wrap	0.050	6 x 12	80	2,000	485	53.5
8A	06N11W19C	2800	Active	2200 E. Avenue P	1988	RC	1,030	MS (blank) SS (screen)	960	16	0-960	1/4 3/8	0-560 560-960	-	-	560-740; 820-880; 920-940	562.9-742.7; 823.7-883.4	Wire-Wrap	0.050	No. 8	80	2,500	461	-
9	06N11W32P	2800	Destroyed	3347 E. Avenue S.	1961	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	06N11W20G01	2800	Active	3701 E. Avenue P-8	orig. 1928 deep. 1946 lined 1987 lined 2017	-	696	-	600?	16 14	0-282 (orig.) 275-600? (deep.)	-	-	12 8.765	0-658 (fill) (1987 liner) 0-640 (2017 liner)	280-527 (14" 1946 deep.) 500-610 (12" 1987 liner) 624-658? (12" 1987 liner) 340-640 (8" 2017 liner)	No survey following 2017 liner install.	Unknown (1946) Vert. Mills Knife & Louvered (1987) Machine Cut (2017)	-	-	-	-	-	-
11A	06N12W24C	2800	Active	39501 E. 15th Street	1963	DR	1,275	MS	900	16	0-900	1/4	0-900	12	0-875 (liner)	504-900 (orig.) 665-865 (liner)	665-861(fill)	Louvered	0.125 (orig.) 0.060 (liner)	Pea	50	-	-	-
12	06N11W05F	2850	Destroyed	36824 N. 40th Street East	Acq. 1957 Drilled 1920s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14A	06N12W24A	2800	Active	39401 20th Street	1965	DR	900	MS	900	16	0-900	1/4	0-900	-	-	450-900	452.6-808.9(fill)	Louvered	-	-	50	-	-	-
15	06N12W13N01	2800	Active	1003 East Avenue P	1960	DR	880	MS	800	16	0-800	1/4	0-800	-	-	420-800 (DWR) 320-800 (Actual)	320.4-763.6(fill)	Machine Cut	0.125	Special	50	1,750	325	44
16	05N11W05C	2950	Active	4125 E. Avenue S-4	1960	DR	585	MS	550	14	0-550	1/4	0-550	-	-	220-550	236.3-536.8(fill)	Machine Cut	0.125	Special	50	575	260	115
17	06N12W34N	3200	Inactive / Off Line (1997)	718 Denise Avenue	1956	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	05N11W17H	3250	Active	4640 Barrel Springs Road	1954	DR	137	MS	108	8	0-108	8 ga	0-108	6 SDR-21	0-108 (assumed)	20-108 (orig.) 48-108 (liner)	20-92.8(fill)	Machine Cut	-	-	-	171	37	48
19	05N11W17H	3250	Active	4640 Barrel Springs Road	1961	DR	393	MS	350	14	0-350	1/4	0-350	-	-	80-350	82-316(fill)	Machine Cut	-	Nos. 3 and 4	None	115	54	62
20	05N11W09A	3000	Inactive / Out of Service	5680 Pearblossom Highway	Acq. 1977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	05N11W04P	2950	Active	36525 52nd Street East	1960	DR	-	MS	350	16	0-170 (casing) 170-350 (open)	-	0-350	10 x 1/4	0-350	216.4-346 (Liner)	216.4-325.1(fill)	Machine Cut	0.140 (liner)	#4 Pea (Liner)	-	-	-	-
22	06N11W34P	2850	Active	5401 E. Avenue S	1974	DR	400	MS	400	16	0-400	1/4	0-400	-	-	190-400	189.4-394.6(fill)	Louvered	0.125	No. 5	50	460	130	70
23	06N11W19L01	-	-	-	1977	RC	-	MS	857	16	0-857	1/4	0-857	-	-	496-856	-	Louvered	0.125	Minus 3/8	50	2,300(?)	480	-
23A	06N11W19L	2800	Active	2202 E. Avenue P-8	1991	RC	900	MS	840	16	0-840	5/16	0-840	-	-	600-840	600.3-740(debris)	Louvered	0.030	1/4" Birdseye	50	-	-	-
24	06N11W19L	2800	Inactive / Out of Service	2701 E. Avenue P-8	1985	RC	-	MS	920	16	0-900	1/4	0-920	-	-	570-900	-	-	0.050	6 x 12	80	600	481	124
25	06N11W35J01	2950	Active (Not run with 33)	37520 70th Street E	1989	DR	607	MS	605	16	0-605	5/16	0-605	10.75 x 1/4	0-580 (liner)	255-335; 385-405; 435-595	165.7-345; 386-405; 436-525(fill)	Wire-Wrap (orig.) Vet. Slots (liner)	0.060 (orig.) 0.040 (liner)	No. 5 (liner)	80	750	108	-
26	06N11W33J02	2850	Active	4701 Katrina Place	1989	DR	484	MS	480	16	0-480	5/16	0-480	-	-	150-270; 310-470	151.3-270.5; 311.1- 459.8(fill)	Wire-Wrap	0.060	6 x 12	50	750	180	-
27	06N11W35	2850	Destroyed	575' West of 70th Street on R12	1989	RC	-	MS	605	16	0-605	5/16	0-605	-	-	145-235; 255-345; 385-405; 435-595		-	0.060	6 x 12	80	750	108	30
28	05N11W03A01	2850	Unequipped	1,534' South of Ave S 650' West of 70th	1989	RC	-	MS	625	16	0-625	5/16	0-625	-	-	325-625	-	Louvered	0.094	5/16" Special	50	800	195	-
29	06N11W35G01	2950	Active (Run 3 hrs/day)	37700 E. 67th Street	1989	RC	394	MS	370	16	0-370	5/16	0-370	-	254.4-259.4 (patch)	190-370	192.3-367.3(fill)	Louvered	0.070	5/16" Special	50	350	104	-
30	06N11E36C	2850	Active	7392 E. Avenue R	1989	RC	425	MS	410	16	0-410	5/16	0-410	-	-	200-410	202-408.3(fill)	Louvered	0.070	5/16" Special	50	1,400	126	-
31	06N11W26J	-	Destroyed	600' South of Palmdale 50' West of 70th	1990	RC	-	MS	300	16	0-300	5/16	0-300	-	-	175-295	-	Louvered	0.094	5/16" Special	50	150	119	-
32	06N11W32P	2800	Active	37301 E. 35th Street	1989	DR	580	MS	570	16	0-570	5/16	0-570	-	-	280-570	332.6-483.1; 504.6- 573.4(fill)	Louvered	0.094	5/16" Special	50	450	238	-
33	06N11E36D	2850	Active (Not run with 25)	7160 E. Avenue R	1991	RC	469	MS (blank) SS (screen)	465	16	0-465	1/4	0-465	-	-	220-240; 280-460	222-241.4; 282.3- 454(fill)	Wire-Wrap	0.040 0.070	4 x 8 / 6 x 12 Blend	80	1,000	130	110
34	06N11W26M	2850	Borehole Only	Avenue R and 60th Street	1992	RC	344	-	-	-	-	-	-	-	-	-	4.54(III) -	-	-		50	-	-	-
34A	06N11W26M	2850	Inactive / Unequipped	3,000' South of Ave. S 101' West of Cannon Ct.	1991	RC	-	MS (Blank) SS (Screen)	570	16	0-570	5/16	0-570	-	-	250-570	-	Wire-Wrap	0.060	6 x 12	50	450	164	175
35	05N11W03N01	2950	Active	36549 E. 60th Street	1991	RC	820	MS (blank) SS (screen)	500	16	0-500	5/16	0-500	-	-	200-500	194-476.6 (terminates in fill and ripped screen)	Wire-Wrap	0.060	6 x 12	100	800	174	207

Shaded cells represent wells evaluated and ranked as part of this study.

Sources: California Department of Water Resources, 2018. Palmdale Water District, 2020. State Water Resources Control Board Division of Drinking Water, 2018.

Notes: ¹ Steel type assumed to be low-carbon mild steel when not indicated in records. ² Machine cut slots assumed to be 0.125-inch when not indicated in records. ³ Construction details for Well No. 25 liner (2018-2019) are unknown as of the date if this report.

Table 1



Well Condition and Performance	Ranking Criteria
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	Criteria	Weighting Factor	0	1	2	3
	Well Age	3	< 10 Years	10 - 29 Years	30 - 44 Years	> 45 Years
ction	Steel Type	3	Stainless Steel	Hard Red / Kai-Well	Copper-Bearing / HSLA	Mild Steel / Unknown
Design and Construction	Screen Type	2	Louvered	Stainless Steel Wire-Wrap	Knife-Cut / Mill Slot / Moss Perforations	Mild Steel Wire-Wrap
gn and (Screen Opening Size	2	> 0.080-inch	0.060 - 0.080-inch	0.050 - 0.060-inch	< 0.050 inch
Desi	Remaining Service Life	3	> 30 Years	15 - 29 Years	5 - 14 Years	< 5 Years
	Drilling Method	1	-	Cable Tool	Reverse-Circulation Rotary	Direct-Circulation Mud Rotary
lition	Structural Concerns / Risk of Collapse	3	None / Unknown	Minimal (Few Holes, Existing Patches, Minor Spalling, Enlarged Perforations)	Moderate (Many Holes, Existing Lined Sections, Moderate Spalling, Minor Screen Deterioration)	Severe (Large Ruptures, Heavy Spalling, Casing Deformation, Severe Screen Deterioration)
Physical Condition	Fill and/or Debris	1	< 9 feet	10 - 19 feet	20 - 49 feet	> 50 feet
Physi	Encrustation and/or Biofouling	2	No Significant Encrustation and/or Biofouling Present	Minimal (Superficial Buildup, Minimal Nodules, Little to No Bacterial Activity)	Moderate (Significant Encrustation, Nodules, and Bacterial Activity)	Severe (Major Obstruction of Well Screen, Abundant Nodules, Widespread Biological Activity)
ristics	Water Level Trends	2	No Divergence of Static and Pumping Water Levels	Slight Divergence of Static and Pumping Water Levels	Moderate Divergence Static and Pumping Water Levels	Major Divergence Static and Pumping Water Levels
Characteristics	Flow Rate and/or Specific Capacity Trend (Prior 5-year Period)	1	No Decline in Instantaneous Pumping Rate and/or Specific Capacity	Slight Decline in Instantaneous Pumping Rate and/or Specific Capacity	Moderate Decline in Instantaneous Pumping Rate and/or Specific Capacity	Major Decline in Instantaneous Pumping Rate and/or Specific Capacity
Performance C	Sand and/or Gravel Production	3	None / Unknown	Minimal (Minor or Isolated Sand Production)	Moderate (Significant and/or Sustained Sand Production)	Severe (Heavy Production of Sand and/or Gravel Envelope)
Perfor	Water Levels Below Screen / Air Entrainment	2	None / Unknown	Minimal (Water Levels Below Top of Screen)	Moderate (Evidence of Cascading Water Conditions)	Severe (Cascading Water Conditions when Idle, Reported Air Entrainment)



Supplemental Ranking Criteria

Criteria	Weighting Factor	0	1	2	3
Probability of Successful Rehabilitation and/or Repair	3	Very Low (High Risk / Not Feasible)	Low (Improvement Unlikely)	Moderate (Some Improvement Possible)	High (Significant Improvement Likely)
Cost of Rehabilitation and/or Repair	3	Very High (Repairs, Mechanical and Chemical Cleaning, Redevelopment)	High (Mechanical and Chemical Cleaning, Redevelopment)	Moderate (Mechanical Cleaning and Redevelopment)	Low (Mechanical Cleaning and Disinfection)
Relevance to the System	3	-	Low (Not Critical to System Operation)	Moderate	High (Critical to System Operation)



		Desi	ign and (Construe	ction		Physi	cal Con	dition	Perfor	mance (Characte	eristics		ank
Well Designation	Well Age	Steel Type	Screen Type	Screen Opening Size	Remaining Service Life	Drilling Method	Structural Concerns/ Risk of Collapse	Fill and/or Debris	Encrustation and/or Biofouling	Water Level Trends	Specific Capacity / Production Trend	Sand and/or Gravel Production	Water Levels Below Screen/ Air Entrainment	Total Weighted Score	Well Condition and Performance Rank
	3	3	2	2	3	1	3	1	2	2	1	3	2		
2A	3	3	0	0	3	3	1	2	3	0	0	1	2	48	15
3A	3	3	0	0	3	3	1	2	1	0	1	2	3	50	10
6A	2	3	2	0	3	3	1	1	2	0	0	2	2	49	12
7A	2	3	3	2	3	2	3	1	2	0	0	2	3	62	2
8A	2	3	1	2	3	2	0	3	0	0	1	1	1	41	20
10	3	3	2	3	3	1	3	2	1	0	0	2	2	61	3
11A	3	3	0	3	3	3	0	1	3	0	1	2	0	50	10
14A	3	3	0	0	3	3	3	3	2	0	1	3	1	58	6
15	3	3	2	0	3	3	1	2	3	0	1	1	3	55	8
16	3	3	2	0	3	3	3	1	3	0	1	2	0	57	7
18	3	3	2	0	3	3	3	1	2	0	0	3	1	59	4
19	3	3	2	0	3	3	0	2	2	0	0	3	1	51	9
21	3	3	2	0	3	3	2	2	3	0	1	0	0	49	12
22	3	3	0	0	3	3	2	0	2	0	1	0	1	43	18
23A	1	3	0	3	3	2	1	3	2	0	0	1	1	44	16
25	2	3	3	3	3	3	3	3	3	2	3	2	2	74	1
26	2	3	3	2	3	3	1	2	1	1	0	3	2	59	4
29	2	3	0	0	3	2	1	0	3	2	3	1	2	49	12
30	2	3	0	1	3	2	0	0	1	0	1	2	2	41	20
32	2	3	0	0	3	3	0	0	2	0	0	3	1	42	19
33	1	0	1	2	0	2	1	1	1	0	3	1	2	27	22
35	1	3	1	1	3	2	1	2	0	0	2	2	2	44	16

Well Condition and Performance Ranking (by order of well designation)

Notes:

Weighting factors range from 1 to 3 (3 being considered most important).

Criteria scores range from 0 to 3 (3 being considered the most problematic).

Total weighted criteria scores calculated as product of weighting factor and criteria scores.

Higher rank equates to poorer well condition and/or performance.

Red shaded cells indicate wells that are considered structural unsound or beyond useful service life.





		Desi	gn and (Construc	ction		Physi	cal Con	dition	Perfor	mance (Characte	ristics	Supple	mental (Criteria		
Well Designation	Well Age	Steel Type	Screen Type	Screen Opening Size	Remaining Service Life	Drilling Method	Structural Concerns/ Risk of Collapse	Fill and/or Debris	Encrustation and/or Biofouling	Water Level Trends	Specific Capacity / Production Trend	Sand and/or Gravel Production	Water Levels Below Screen/ Air Entrainment	Probability of Successful Well Rehabilitation and/or Repair	Cost of Well Rehabilitation and/or Repair	Relevance to the System	Total Weighted Score	Final Prioritization Rank
	3	3	2	2	3	1	3	1	2	2	1	3	2	3	3	3		
2A	3	3	0	0	3	3	1	2	3	0	0	1	2	2	2	3	69	7
3A	3	3	0	0	3	3	1	2	1	0	1	2	3	1	3	3	71	3
6A	2	3	2	0	3	3	1	1	2	0	0	2	2	1	2	2	64	12
7A	2	3	3	2	3	2	3	1	2	0	0	2	3	0	0	3	71	3
8A	2	3	1	2	3	2	0	3	0	0	1	1	1	1	3	2	59	18
10	3	3	2	3	3	1	3	2	1	0	0	2	2	0	3	2	76	2
11A	3	3	0	3	3	3	0	1	3	0	1	2	0	1	3	2	68	8
14A	3	3	0	0	3	3	3	3	2	0	1	3	1	0	0	3	67	9
15	3	3	2	0	3	3	1	2	3	0	1	1	3	1	2	2	70	6
16	3	3	2	0	3	3	3	1	3	0	1	2	0	0	0	1	60	17
18	3	3	2	0	3	3	3	1	2	0	0	3	1	0	1	1	65	11
19	3	3	2	0	3	3	0	2	2	0	0	3	1	1	2	1	63	14
21	3	3	2	0	3	3	2	2	3	0	1	0	0	1	3	1	64	12
22	3	3	0	0	3	3	2	0	2	0	1	0	1	1	3	1	58	20
23A	1	3	0	3	3	2	1	3	2	0	0	1	1	1	2	3	62	15
25	2	3	3	3	3	3	3	3	3	2	3	2	2	0	3	1	86	1
26	2	3	3	2	3	3	1	2	1	1	0	3	2	0	3	1	71	3
29	2	3	0	0	3	2	1	0	3	2	3	1	2	3	2	1	67	9
30	2	3	0	1	3	2	0	0	1	0	1	2	2	2	3	1	59	18
32	2	3	0	0	3	3	0	0	2	0	0	3	1	1	2	1	54	21
33	1	0	1	2	0	2	1	1	1	0	3	1	2	1	3	1	42	22
35	1	3	1	1	3	2	1	2	0	0	2	2	2	2	3	1	62	15

Supplemental Ranking (by order of well designation)

Notes:

Weighting factors range from 1 to 3 (3 being considered most important).

Well condition and performance criteria scores range from 0 to 3 (3 being considered the most problematic).

Supplemental criteria scores range from 0 to 3 (3 being considered the most likely for successful rehabilitation at least cost).

Total weighted criteria scores calculated as product of weighting factor and criteria scores.

Higher rank equates to poorer well condition and/or performance.

Red shaded cells indicate wells that are considered structural unsound or beyond useful service life.





$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Modified Weighted Score	Final Prioritization Rank
A A	71 71 70 69	1 1 3
26 2 3 3 2 3 3 1 2 1 1 0 3 2 0 3 1 71 3A 3 3 0 0 3 3 1 2 1 0 1 2 3 1 71 3A 3 3 0 0 3 3 1 2 1 0 1 2 3 1 3 3 71 15 3 3 2 0 3 3 1 2 3 0 1 1 3 1 2 2 70 2A 3 3 0 0 3 3 1 2 3 0 1 1 3 1 2 2 70 2A 3 3 0 0 3 3 1 2 3 0 1 3 2 2 3 69 11A 3 0 0 3 2	71 70 69	1 3
3A 3 3 0 0 3 3 1 2 1 0 1 2 3 1 3 3 71 15 3 3 2 0 3 3 1 2 3 0 1 2 3 1 3 3 71 15 3 3 2 0 3 3 1 2 3 0 1 1 3 1 2 2 70 2A 3 3 0 0 3 3 1 2 3 0 1 1 3 1 2 2 70 2A 3 3 0 0 3 3 1 2 3 0 1 2 2 2 2 3 69 1A 3 3 0 3 3 0 1 3 0 1 2 0 1 3 2 68 29 2 3 2 0	71 70 69	1 3
15 3 3 2 0 3 3 1 2 3 0 1 1 3 1 2 2 70 2A 3 3 0 0 3 3 1 2 3 0 1 1 3 1 2 2 70 2A 3 3 0 0 3 3 1 2 3 0 1 1 2 2 2 3 69 11A 3 3 0 3 3 0 1 3 0 1 3 2 68 29 2 3 0 0 3 2 1 0 3 2 3 1 2 3 2 1 67 6A 2 3 2 0 3 3 1 1 2 0 0 2 2 1 2 64	70 69	3
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11A 3 3 0 3 3 0 1 3 0 1 2 0 1 3 2 68 29 2 3 0 0 3 2 1 0 3 2 3 1 2 0 1 3 2 68 29 2 3 0 0 3 2 1 0 3 2 3 1 2 3 1 2 1 67 6A 2 3 2 0 3 3 1 1 2 0 0 2 2 1 2 64	-	
29 2 3 0 0 3 2 1 0 3 2 3 1 2 3 2 1 67 6A 2 3 2 0 3 3 1 1 2 0 0 2 2 1 2 64		4
6A 2 3 2 0 3 3 1 1 2 0 0 2 2 1 2 2 64	68	5
	67	6
	64	7
19 3 3 2 0 3 3 0 2 2 0 0 3 1 1 2 1 63	63	8
35 1 3 1 1 3 2 1 2 0 0 2 2 2 2 3 1 62	62	9
23A 1 3 0 3 3 2 1 3 2 0 0 1 1 1 2 3 62	62	9
30 2 3 0 1 3 2 0 0 1 0 1 2 2 2 3 1 59	59	11
8A 2 3 1 2 3 2 0 3 0 0 1 1 1 1 3 2 59	59	11
22 3 3 0 0 3 3 2 0 2 0 1 0 1 1 3 1 58	58	13
32 2 3 0 0 3 3 0 0 2 0 3 1 1 2 1 54	54	14
33 1 0 1 2 0 2 1 1 1 0 3 1 2 1 3 1 42	42	15
7A 2 3 3 2 3 2 3 1 2 0 0 2 3 0 0 3 71	0	16
10 3 3 2 3 3 1 3 2 1 0 0 2 2 0 3 2 76	0	16
14A 3 3 0 0 3 3 3 3 2 0 1 3 1 0 0 3 67	0	16
16 3 3 2 0 3 3 <u>1 3 0 1 2 0 0 1 60</u>	0	16
18 3 3 2 0 3 3 3 1 2 0 0 3 1 0 1 1 65	0	16
21 3 3 2 0 3 3 2 2 3 0 1 0 0 1 3 1 64	0	16
25 2 3 3 3 3 3 3 3 3 <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u> <u>3</u>	0	16

Final Prioritization Ranking (by order of rank)

Notes:

Weighting factors range from 1 to 3 (3 being considered most important).

Well condition and performance criteria scores range from 0 to 3 (3 being considered the most problematic).

Supplemental criteria scores range from 0 to 3 (3 being considered the most likely for successful rehabilitation at least cost).

Total weighted criteria scores calculated as product of weighting factor and criteria scores.

Higher rank equates to poorer well condition and/or performance.

Red shaded cells indicate wells that are considered structural unsound or beyond useful service life.





APPENDIX A

Well Driller's Reports



	WELLERA N
DUPLICATE	DRILLERS REPORT Do Not Fill In
	CENCY OF CALLEODNIA
	WATER RESOURCES
(1) OWNER:	Other Well No.
Name Palazale Irrigation District	(11) WELL LOG:
Address 2005 Fast Avenue 0	Formation: Describe by color, character, size of material, and structure
Palmiala, Coltr. 93550	ICE IN COMPANY
(2) LOCATION OF WELL:	<u>0 - 5 Surface soil</u>
Township, Range, and Section Tak-N R-11-7 Sec 19	17 - 23 Rocks, sand, gravel
Distance from civies, roads, railroads, encl /1 md S of Ave P; Abt. 1001 2 of 20th St. Fast	23 - 35 Fledium to coarse sand
(3) TYPE OF WORK (check):	10 - 18 Fine to medium sand
New Well Deepening Deconditioning Destroying	18 - 110 Rocks, med to coarse sand, pravel
If destruction, describe material and procedure in Item 11. (4) PROPOSED USE (check): (5) EQUIPMENT	130 - 130 Fedium to coarse hand the
Domestic 🗌 Industrial 🗍 Municipal 😰 Rotary. :.	140 - 180 - Hed to coarse sand & rocks
Irrigation [] Test Well [] Other [] Cable [] Other []	100 - 200 Fine sand with clay streaks 200 - 270 Fine sand
(6) CASING INSTALLED:	200 - 270 Fine sand with clay/
STEEL: OTHER: If gravel packed	345 - 566 Clay - Stranger Stranger Stranger
SINGLE 2 DOUBLE .	365 -4 400 Band, clay streaks the streak
From To Gage Diameter or of From To	100 - 175 Hard to medicand with clay streak 175 - 530 Medico coerse and Fravel, prol
ft. ft. Diam. Wall , Bore ft. ft.	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	530 - 545 Coarse mand, small gravel, clay/ 545 - 560 Brown clay? Streaks of sand
	560 - 590 Med and Small clay streaks of sand
Size of shoe or well ring: Size of ersvel: 50 - 5	590 - 620 - Hed to coarse sand small clay str
Describe joint 1783Cerd (7) PERFORATIONS OR SCREEN:	620 - 645 Coarse Sind Travel 61av coarse
Type of perforation or mome of acreen LOUVER	615 - 685 Hed sand amail blay attents
Perf. Rowe	685 - 692 mall alay streaks, Pocks, med sur
From To per per Size ft. ft. row ft. in. x in.	692 - 720 Med sand, shall clay streaks 720 - 800 Med to coarse sand clay streaks
450 462 Abt 50 5 1/An x 2"	doo - 900 Mad gravel sand clay streaks & 1.
<u>180 900 a 5 a a</u>	The start of the same way to and the
	900 - 915 Blue clay Watches and all
	The 600 GPN @ 388 Leetrangel 2
(8) CONSTRUCTION: Was a surface samitary seal provided? Yes ID No D To what depth 50 fc.	100 10 10 10 10 10 10 10 10 10 10 10 10
Was a surface senitary scal provided? Yes ID No To what depth 50 ft. Were any strate scaled against pollution? Yes II No II If yes, note depth of strates	1500 - 395 348 - 194
From 0 fr. to 50 fr.	(Continued on attached sheet)
From fr. to fr. Method of scaling Control	Well DRILLER'S STATEMENT: WAS STATEMENT:
(9) WATER LEVELS:	This well was drilled under my jurisdiction and this report is true to the best
Depth at which water was first found, if known 378 ft.	of my knowledge and belief.
Standing level before perforating and developing 370 fe.	NAME ROLLINGT De 1111ng Company 1 2.
(10) WELL TESTS:	Address
Was pump test under Yes I No I If yes, by whom? Peerless Pump	Lancastar, Celly, 19353
"Md: 2100 tal./min. with ft. drawdown sfter bra.	[SIGNED] CALL DILLO
Wes electric log made of well? Yes D No DE If yer, attack copy	License No 117561 Dired 30 Apr 1968
SKETCH LOCATION OF V	VELL ON REVERSE SIDE
DW0 100	

S. C.D.Vetters

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WHITEHALL 2-5514 P. O. BOX 1163 LICENSED WELL DRILLING CONTRACTORS ROTARY WELL DRILLING . GRAVEL PACKING 42907 NORTH SIERRA HIGHWAY LANCASTER, CALIFORNIA December 30, 1960 Palmdale Irrigation District 816 East Ave 4-7 Well No. 3A Palmdale, California Well log and casing detail. Drilled 868' of 12 1/4" hole, reamed hole to 28" to 848'. Cased with 848' of 16" I. D. x 1/4" Boscoe Moss Co. casing. 0 to 396' blank, 396' to 848' perforated. Gravel packed with 135 tons of pea gravel. 0 to 10' surface sand & hardpan 40' sand & gravel-streaks of clay 10' 11 401 H 102' clay-streaks of sand 11 165' clay-thin streaks of sand 102' 212' packed sand-streaks of clay II 165' 230' sandy clay & sand Ħ 212' 11 261' hard sand-streaks of clay 230' 267' sand & gravel clay streaks 261' 11 11 : 291' hard sand-streaks of clay 267' 312' sand & gravel clay streaks 291' st 11 312' 335' firm sand clay streaks 335! 400' hard sand-thin streaks of soft clay 11 465' clay & sand 400 1 11 497' sand-streaks of clay 4651 11 546' sand-thin streaks of clay 4971 ri 5461 552' sand, clay streaks & rocks 11 565' sand-thin streaks of clay 11 552' 565' 14 572' firm sand-thin streaks of clay 572' 11 580' sand-some clay 580' 586' 600' 15 586' firm sand н 600' clay-small amount of sand 685' clay-streaks of sand 11 740' clay, streaks of sand, thin streaks of sandy shale 11 6851 835' clay-thin streaks of sand & brown shale 11 7401 848' sand & brown shale 11 8351 8481 11 851' hard sand 851' 11 868' clay-thin streaks of sand

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VI LIEV Page 1 of 2 pages Do Not Fill In STATE OF CALIFORNIA THE RESOURCES AGENCY - 1 - 127 66313 0 TRIPLICATE DEPARTMENT OF WATER RESOURCES Retain this copy State Well No WATER WELL DRILLERS REPORT Other Well No (11) WELL LOG: (1) OWNER: Same. Paladale Irrigation Mstrict fr. Depth of completed well 830 Total depth 838 Name 2005 Saut Ave. Q. Address Formation: Describe by color, character, size of material, and structure Faluciale, Calif. 93550 Sendy top soil 0 2 (2) LOCATION OF WELL: 2 Sand and gravel 6 6 Sandy brown clay 10 Owner's number, if any 10 23 Brown sand Township, Range, and Section Dimance france that entry and been on Dimance france that entry and the content of 2001 and a content of 2001 and a content of No. of C of Ave P.8 26 Sandy clay 23 26 Sand Company 31 (3) TYPE OF WORK (check): 31 33 Sandy brown clay 33 1.7 Sand and graval New Well Deepening C Reconditioning C Destroying If destruction, describe material and procedure in Item 11. 11 Sand and Large gravel 43 Sandy brown clay 52 (4) PROPOSED USE (check): 43 (5) EQUIPMENT: Brown sand 52 56 Rotary Domestic 🗍 Industrial 🗍 Municipal 🏝 1 56 Sandy brown olay Irrigation 🗌 Test Well 🗌 Other 1 Cable 57 3. 57 Other 65 Coarse sand and gravel 65 74 · Light brown medium sand (6) CASING INSTALLED: If gravel packed 74 68 Course sand and gravel OTHER: STEEL: 38 Sandy brown clay 99 SINGLE DOUBLE . 114 - Coa rea brown sand-14 99 Gage Diameter 11 127 Soft candy brom alay when To From From 1'u or 01 Diam Wall Bore ft. fr. 27 136 Medium to coarse brows sand Vo 'jun 30" 16 3331 T 36 153 Lavers of coarse brown sand and sandy Section - and the second of brown clay ···· 53 165 Coarse brown send Size of gravels Canle 3dd Sire of shor or well rises 121200 Jeldeb .65 Sandy broom clay ! inter 185 .85 191 Hard minanted sand Dentite with (7) PERFORATIONS OR SCREEN. 1.97 Sandy brown eley 91 97 213 Hard and Type of perforation of name of screen 221 213 Sandy bross clay Perf. Rows 231 227 Hard course brown send and small grave? Size From To per per 510^{480.} 0510 2/3/8 -1/8 12 row 121. 231 240 Sandy brown clay Levers of sandy brown clay and hard 5 2h0 271 600 540 12 lame size 690 a and a set to state for gand 220 600 12 12 slots in 284 Herd coares brown sand 271 720 ii of 810 780 900 310 12 280 289 Brown clay 12 perij. 289 308 Layers of sand and brown olay 308 360 (8) CONSTRUCTION: Sandy brown alay and suall layers of To what depth · . · · · · · gand Was a surface sanitary seal provided? Yes [] No C 360 375 Sandy brown alay The C Were any strata scaled acainst pollution ? Yes [] If yes, note depth of strata 75 38h Coarse Light brown sand (continued) ft. 10 Work scarted 6/1/70 1 Completed 10 From Conont grout WELL DRILLER'S STATEMENT: . Method of sealing This well was drilled under my jurisdiction and this report is true to the best This well was around the of my knowledge and belief. (9) WATER LEVELS: Depth at which water was first found, if known 221 Bill Bellman NAME Standing level before perforating, if known fe. (Person, firm, or corporation) · i(Typed or printed) Standing level after perforaging and developing It. 18 P. O. Bar 816 (10) WELL TESTS: Address Readley, California 9365h Was samp lest made? Tes C No C IL YOL BY ROSCOS MODE CO. -00 to it is a market [SIGNED] eal./min. with fr. deswdawn after Yield: Drifer) diast. alette Was a chemical analysis made? Yes [] No M

Contact States

SKETCH LOCATION OF WELL ON REVERSE SIDE

License No

If yes, attach copy

106833

Temperature of water

Was electric lue made of well? Tes [] No []

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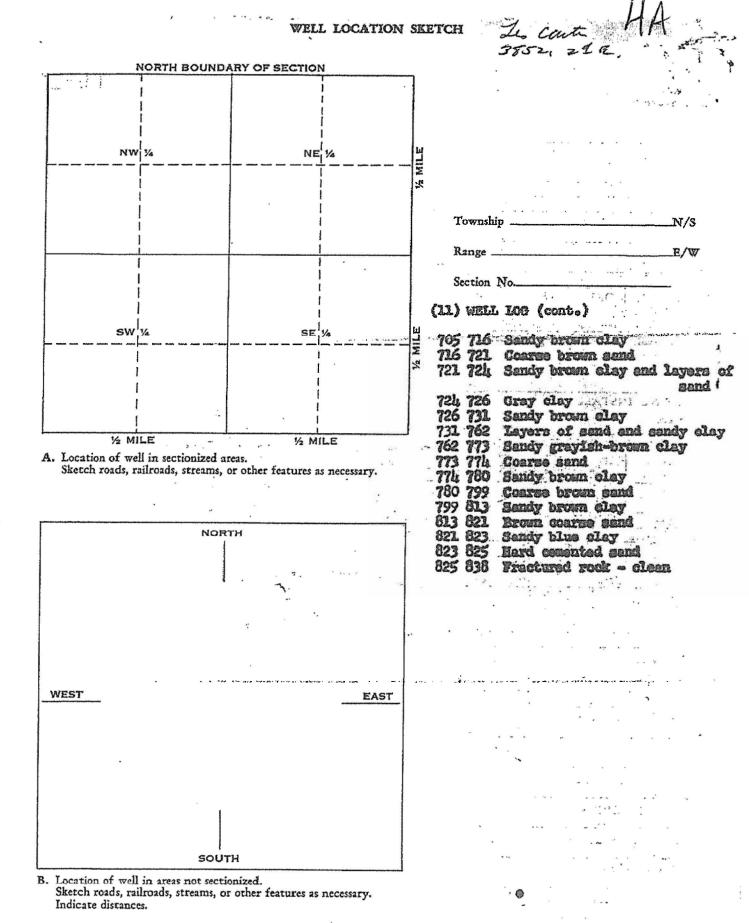
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WATER WELL DRILLERS REPORT	State Well No Other Well No

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"A'E "'s Copy		CALIFORNIA RCES AGENCY	Do not ;
		WATER RESOURCES	No. 067865
series of Intent No	14 million - 1980 - 1990 - 1990 - 1990	DRILLERS REPORT	State Well No.
Local Permit No. or Date	PAGE # 3 # 067867		Other Well No
(1) OWNER: Name		(12) WELL LOG: To	tal depthft. Depth of completed welt
Address			(Describe by color, character, size or material
Sity	Zip	810 - 820	Med. to Occurses and w/ #
2) LOCATION OF WELL (See in	structions);		gravel & 10% Gray Clay
CountyOw	mer's Well Number	820 - 830	Made to Charge sand uf f
Vell address if different from above	· · · · · · · · · · · · · · · · · · ·		gravel & 10% Grey Clay
'nynshipRange	Section	830 - 840	Med. to Coarse sand w/307
Distance from cities, nueds, railnards, lences, etc.			Brn. Clay
		840 - 850	Wed. to Coarse sand W/ 20
ана и на селото и полити и Полов В. Полов и Полов Полов и полови и Полов и полови и Полови и Полови и Полови и К		850 - 860	Brn. Clay Med. to Coarse sand w/ 10
*****	(3) TYPE OF WORK:	000 000	Ern. & White Clay
	New Well D Deepening	860 3 880	Fine to Mad. sand w/ 10%
	Reconstruction	- 1000	Bra. Clay
	Reconditioning	.889 - 900 (C	Cuarse sand w/ # 3 to 5
	Horizontal Well	110 - 1411	Ngravel
	Destruction () (Describe	900 - 910 111	Course (saud w/ # 3 to 4
	destruction materials and procedures in Item [2]	- 15:	gravel & Mans Clay streak
	(4) PROPOSED USE	910 - 920	Med, to)Coarpe sand v/ Cr
	Domestic	-110	Elej streaks
	Irrigatûm	920 1 940 D	Mind, to Coarse saud
	Industrial ()	9402 - 970	Fine to Coarse send
	Rei Men 🗸 🖸	.970 - 2000	Fine to Med. send
	Stock 1	1000 - 1010/0~	Fine to Coarse sand
		1010 - 1020	Fine to Med. sand
WELL LOCATION SKETCH		1020 - 1030	Fine canti, Granite (Chips
	AFT BYCK: U.D.		<u> </u>
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are strute, scaled : against ' pollution? Tes []	No [] IntervalfL	1	a second states and second second
thed of scaling) to gran with a second		Completed10
0), WATER LEVELS:		WELL DRILLER'S STATE	MENT
willing level after well completion	1,	This well was cirlied today my is	urindiction and this report is true to the best of
1) WELL TESTS:		SIGNED SAME IN	MENIS and this seport is true to the best of
us well test made? Yes I No I I yes	, by whom?	1.11	(Well Driffer)
pe of test - Pump G Builer		NAME (Person firm o	r canonat(un) (Termet or named)
rpth to water at start of testit.	Al end of testft	Address	r conjunation) (sypen or popular)
schargeRul/min afterhours	Water temperature	City	
			. Date of this report
	attach copy to this report	Liconse No.	Dute of the reput

TRIPLICATE Owner's Copy

Well 7A

STATE OF CALIFORNIA THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

Do not fill in No. 219188

.eo of Intent No. 213282

State Well No.____

(1) OWNER: Name (12) WELL LOG: Total depth 1020 Depth of completed well Palmdale Water District 920 Address 2005 E. Ave. Q. ft. Formation (Describe by color, character, size or material) from ft. to Paludale, CA City Zip 93550 -(2) LOCATION OF WELL (See instructions): -SEE ATTACHED County Los Angeles -_Owner's Well Number. 74 Well address if different from above, Township____6N____ Range 114 19 Section Distance from cities, roads, callroads, fences, etc. 1 mile South 100' west from intersection of Ave. P and 25th St. east. --(3) TYPE OF WORK: -New Well Dy Deepening Aus -Reconstruction -Reconditioning 1, mile -20.00 1.20 Hurizuntal Well -. . . 1 Destruction [] (Describe destruction muterials and procedures in Item 12) ナキシリ . -_ 11 - -(4) PROPOSED USE: -14 •1 Domestic Ó -Trrigation . -Industrial -Well. Test Well sita Stock . - \tilde{s}_{i} Municipal . Ò -WELL LOCATION SKETCH Other ri -(5) EQUIPMENT: (6) GRAVEL-PACK -Reverse XX Rotary D Yes DIX No D Size 6 X 12 Cable D 24" ú Air Dismeter of bore_ -T.D. to_Surf.n. Other D Bucket Packed from_ -(8) PERFORATIONS: Wire Wrap (7) CASING INSTALLED: Steel Q Y Plastic A Concrete D Type of perforation or size of serven _ From Dia. Cage or From . 2 To To Slot ft. ft. in. Wall ft. size 28 80 r) 250 570 -900 050 0 570 -16 250 900 16 9201 250 -9) WELL SEAL: -Was surface sanitary seul provided? Yes O X No O If yes, to depth____ 8011--Were strata scaled against pollution? Yes No D Interval Jt. sfethod of sealing Cement Work started_ 4/4 19_85 Completed 9/20 19_ 85 10) WATER LEVELS: WELL DRILLER'S STATEMENT: Depth of first water, if known, This well was drilled under my jurisdiction and this report is true to the best of my itanding level after well completion_ 485 It. 11) WELL TESTS: C- K- 00 SIGNED. Vas well test mude? Yes Dy No D II yes, by whom? Contractor Pump DA Bailer D Air Ilit D (Well Driller) Tist of test LAYNE-WESTERN COMPANY NAME. INC Jepth to water at start of test_ 485 AL At end of test 538. 51 (Person, firm, or corporation) (Typed or printed) P. O. Box 3216 Discharge_2000col/min after_23hthours Water temporature. Address_ hemical analysis made? Yes D No DXIf yes, by whom? City____ Bakersfield, CA 93385 Zip. trie low made? Yes DX No D If yes, attach copy to this report 45 License No. 452609 Date of this report 9/23/85

JWR 188 (NEV. 7-78) IF ADDITIONAL SPACE IS NEEDED. USE NEXT CONSECUTIVELY NUMBERED FORM

: .

7A

Layne-Western Company, Inc.

WELL LOG

Description

BA 3667

Palmdale Water Dist.

			Description
) to		Sand, Clay & Top Soil
80		90	Medium Sand
- 90		100	Medium Sand
100		110	Clay & Sand
110		120	Clay & Sand
120		130	Clay & Sand
130		140	Clay & Sand
140		150	Sand
150		160 .	Course Sand
160		170	Course Sand
_ 170		180	Course Sand
		190	Course Sand
190	to	200	Course Sand
200	to	203	
208	to	216	Sand & Gravel
216	to	220	Sand & Clay 50% EA
220	to	240	Sand & Gravel
	to		Clay & Sand 50% EA
240		289	
289	to	305	Sand & Gravel
305	to	330	Clay
330	- to -	365	Clay
		375	Clay
375	to	380	Sand & 10% Clay
		400	Clay_Little_Sand
415	to	415	Sand & Clay 50% EA
415	to	420	Sand & Little Clay
			Gravel & Clay
440	to	451	Sand Gravel & Clay
		471	<u>Clay</u>
471	_ to _	515	Sand & Gravel
51.5	_ 10 _	530	Sand Gravel & Clay
530	_ to _	545	Clay
545	- 10 -	550	Sand Gravel & Clay
550	_ to _	580	Clay
580	_ 01 _	590	Sand & Gravel
590	_ to _	600	Clay
600	_ 10 _	630	Sand & Clay
630	_ to	640	Clay & Little Sand
640	_ to	650	Sand & Gravel 50% EA
650	- 0	660	
660	_ to	670	Clay & Gravel
670_	_ to	680	Clay & Little San
680	10	690	Clay & 10% Sand
690	to	700	Clay
700	to	710: -	Clay & Little Sand
710	to	720	Clay & Sand 50%
720	to	730 -	Sand
730	to	740	Sand
740	to	750	Medium Sand & Small Gravel
750	to	760	Medium Sand & some Clav
760	to	770	Hard Brown Clay
770	to	780	Medium Course Sand
780	to	790	Brown Clay Traces of sand
790	to "	800	Fine Sand Traces of Clay

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LW-233

4 4.425 pt

Feet

Feet

FA

Page 2 BA 3667

Layne-Western Company, Inc. Palmdale Water Dist.

WELL LOG

Fee	et	Feet	Description
80	0 το	810	Brown Clay & Fine to Course Sand
81			Brown Clay & Fine to Medium Sand
82		the second se	Soft to Hard Brown Clay
830	0 to	840	Fine to Course Sand Layers of Clay
840		the second se	Fine to Medium Sand """
850) to	860	n n n n n n
860) to		Fine to Medium Sand Traces of Clay Some Hard Quartz
			Brown Clay Layers of Fine Sand
880			
890			Brown Clay Layers of Course Sand
900		910	Fine to Medium Sand Traces of Clay
910		920	Brown Clay Layers of Medium Sand
920		930	Medium Sand Traces of Clay
930		940	Fine to Medium Sand Traces of Clay
940		950	Fine Sand Traces of Clay
960		<u>960</u> 970	Fine to Medium Sand Traces of Clay
970		980	Brown Clay Layers of Sand Fine Sand & Gravel
980		990	Gravel & Sand
990			Gravel & Little Rock
_1000		1020	Broken Granite
	to		
-	to		· · · · · · · · · · · · · · · · · · ·
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ORIGINAL File with DWR

Note: This is page One of 2 pages STATE OF CALIFORNIA See Also No. 281952 THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

No.	281952	Do	not	fill	in	
No	. 28	19	51			

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Notice of Intent No		State Well No.
	ton Distuist	Other Well No
(1) OWNER: Name Palmdale Wat Address 2005 East Avenue	ICT DISTRICT	(12) WELL LOG: Total depth 1030 ft. Completed depth 960 ft.
City Palmdale. Calif.		from ft. to ft. Formation (Describe by color, character, size or material)
		0 - 15 ft. clay, some sand
(2) LOCATION OF WELL (See instruction County Los Angeles Owner	ctions):	<u>15 - 20 ft. sand, gravel & some clay</u> 20 - 30 ft. gravel and sand
County LOS Angeles Owner Well address if different from above	's Well Number	
Township Range	Casting	30 - 40 ft, sand, clay and gravel 40 - 80 ft, gravel and sand
Distance from cities, roads, railroads, fences, etc.	approximately	80 - 110 ft, sand, clay and gravel
1/2 mile West of 25th St	. East and	110 - 120 ft. sand
200 yards South of	Ave. "P"	120 - 130 ft. gravel
Palmdale, Calif.		120 - 160 ft. sand and clay
	(3) TYPE OF WORK:	<u>160 - 170 ft. clay</u>
	New Well 🗳 Deepening 🗆	170 - 180 ft. clay, gravel and sand
long to a 15	Reconstruction	180 - 190 ft., sand and gravel
	Reconditioning	190 - 210 ft. fine sand, gravel and some clay 210 - 240 ft. fine sand and clay
	Horizontal Well	210 - 240 ft. fine sand and clay 240 - 250 ft. fine sand and clay
	Destruction [] (Describe destruction materials and pro-	250 260 ft fine sand
18	cedures in Item 12)	260 270 ft. gravel / 1/
	(4) PROPOSED USE	1270 V- 290 ft. gravel and day
	Domestic	290 - 300ft. gravěl
	Irrigation	300 A 330 ft. clay 50
	Industrial Test Well	330
	Municipal D	344. ()-) 360 ft. clay
	Other S	360 380 ft, Glay and gravel
	(Pesacibe)	380 - 390 ft. clay. sand and gravel
		390 - 410 ft. clay and sand 410 - 430 ft. clay
(5) EQUIPMENT:	BL PACK:	420 450 ft. clay and fine sand
Cable Air D Riametere		750 11 460 ft. fine sand
Other D Bucket_D Packed iro	m 1030 to surface	
()	// × //	(500 - 520 ft. sand and clay, gravel
(7) CASING INSTALLED: Steel St Plastic Concrete Type of pe	PRATIONS:	-520 - 560 ft. sand and gravel
		<u>560 - 590 ft. gravel</u>
From To Dia Cage or From	To Slót	<u>590 - 610 ft. gravel and sand</u> 610 - 630 ft. clay and sand
8 58 30 . 228 560		610 - 630 ft. clay and sand 630 - 640 ft. gravel and sand
	320.880 .050	640 - 650 ft. clay, sand and gravel
8 940 960 +81 · 375 920	940 .050	650 - 660 ft. gravel and sand
(9) WELL SEAL:		660 - 680 ft. clay
	f yes, to depth 80 ft.	680 - 700 ft. clay and sand
Were strata sealed against pollution? Yes I No I		continued on No. 281952 Page 2)
Method of sealing Cement/sand slurr	<u>у</u>	Work started Oct. 21, 19-87 Completed Nov. 30 19-87
(10) WATER LEVELS: 461		WELL DRILLER'S STATEMENT:
The second s	168 [t	This well was drilled under my jurisdiction and this report is true to the best of my knowledge grid belief.
(11) WELL TESTS:		La Page 18. Propile
Was well test made? Yes XX No I If yes, by	whom? Beylik Drillin	Signed(Well Driller)
Type of test Pump & Bailer	Air lift	NAME BEYLIK DRILLING, INC.
Depth to water at start of test IC Discharge 2500gal/min after24 hours	At and of test ft. Water temperature	Address 591 S. Walnut Street
		City La Habra, Calif. ZIP 90631
Was electric log made Yes 🐯 No 🗌 II yes, atta	ach copy to this report	License No. 306291 C57&C-61 Date of this report Feb. 10, 1988
DWR 168 (REV. 12-86) IF ADDITIONAL	SPACE IS NEEDED. USE N	EXT CONSECUTIVELY NUMBERED FORM 84 94333

See Also Page 2, No. 281952

ORIGINAL File with DWR

· ; ·

STATE OF CALIFORNIA THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

......

Do not fill in

No. 281952

Notice of Intent No.		State Well No.
Local Permit No. or Date		Other Well No
(1) OWNER: Name Palmdale Wa Address 2005 East Avenue		(12) WELL LOG: Total depth 1030 ft. Completed depth 960 ft.
City Palmdale, Calif.	ZIP 93550	from ft. to ft. Formation (Describe by color, character, size or material)
		700 - 720 ft. clay, sand and gravel
(2) LOCATION OF WELL (See instru	actions):	720 - 730 ft. gravel, sand and red clay
County Los Angeles Owne	er's Well Number <u>8A</u>	730 - 740 ft. clay and gravel
Well address if different from above		740 - 790 ft. clay
Township 6N Range 11W	Section9	790 - 800 ft. clay and gravel
Distance from cities, roads, railroads, lences, etc.	Approximately	800 - 810 ft. clay
1/2 mile West of 25th Street 200 yards South of Avenue		810 - 850 ft. clay and gravel
Palmdale, Calif.	"P"	850 - 870 ft. clay
Alter VD 4		870 - 880 ft. 80% gravel and 20% clay
V Ave "P"	(3) TYPE OF WORK:	880 - 910 ft. gray clay 910 - 925 ft. gravel, sand and clay
200 ys+ 4 1/2 Miles	New Well 22 Deepening	
5 ja-	Reconstruction	and a second sec
	Reconditioning	
	Horizontal Well	1010 - 1020 ft. gravel and small amt. clay 1020 - 1035 ft. clay and gravel
	Destruction (Describe destruction materials and pro-	1035 1045 ftc. clay and graves
S	cedures in Item 12)	1045 1050 ft. day and gravel
N G	(4) PROPOSED USE	1050 - 1054 ft. hard rock and clay
A L	Domestic 🛛	(rend - end) end
1 5	Irrigation	A D AVED
2	Industrial	A-1/2 Ale
	Test Well	
ri i	Municipal 2	alline alling
	Other D	or - and
WELL LOCATION SKETCH	(peseçibe)	11 - (2)(2)
(5) EQUIPMENT: (G) GRA	VEL PACK:	Nr. O
Rotary C Reverse KK Yes	No 2 Size #8	allo
Cable Air Diameter	of bore2611.	CITTA
	om 1030 to surface	- /())/ -
	// V 10	~ -
(7) CASING INSTALLED: Steel EFK Plastic D Concrete Type of b	ORATIONS:	<u> </u>
Steel EK Plastic D Ouncrete Type of h	erforation or size of serioca	
From To Dia Cage or Toron ft. ft. ip. Wall	To	
		**
8 80 30 -328 560	KY40 - 050	
740 820 167 .375 820	Chi880> .050	
<u>948 868 183 875 920</u>	940 .050	
(9) WELL SEAL:		
	If yes, to depth ft.	
Were strata scaled against pollution? Yes No 3 Method of scaling Cement/sand		- (lot 0)
(10) WATER LEVELS:		Work started Oct. 21 19.87 Completed Nov. 30 19.87
Depth of first water, if known 461		WELL DRILLER'S STATEMENT:
Standing level after well completion 46	8 = "	This well was defiled under my jurisdiction and this report is true to the
(11) WELL TESTS		best of my knowlidge on belief. Republic
Was well test made? Yes 24 No 1 If yes be	whom? Beylik Drillin	Signed
Type of test Pump 2 Bailer [NAME BEYLIK DRILLING / INC.
Depth to water at start of test <u>401</u> ft. Discharge <u>461</u> gal/min after <u>468</u> hours		Fot C (Perron, firm, or corporation) (Typed or printed)
	C) SUI ATTOTO	Address 291 S. Walnut Street
		License No. 306291 C57 & C-61 Date of this reportFeb. 10, 1988
and the second	L SPACE IS NEEDED. USE N	EXECUTIVELY NUMBERED FORM

66N/11W-20G01, 5 SHEET 1 FORM 115 INVESTIGATION DIVISION OF WATER RESOURCES DEPARTMENT OF PUBLIC WORKS NUMPER 6N 11W 2001 STATE OF CALIFORNIA WELL LOG LECCAL FIGHERITON #8730 19-0116 -20G15 1330" W. of 40th St. E. 75" N. of Ave. P8" LOCATION_ S.W. +. N.E. +. Sec. 20, T. 6N., R. 11W. SKATCH OWNER Mata Hara Ranch' - P.M'. Gregory May 23, 1946 Originally drilled in 1928, DATE COMPLETED_ 16" I.D. = 0 - 282" at which time depth 297' DIAMETER OF CASING 12" I.D. = 275" - 600" = 325" sanded 6' and boulders dumped into well . . . from 291 - 285. Clugage' 3. L. DRILLED BY. SOURCE OF INFORMATION J. L. CLUBBRE 1 ncrof GRE FILE NO. INSPECTED WHILE DRILLING_ Gable Tools Method . 6 SURFACE ELEVATION 2568 U.S.G.S. TOPO. ELEVATION OF YOTAL VOIDS ABSOLUTE THICKNESS MATERIAL % DEPTH VOIDS BOTTON OF STRATUN FETT 285-291 Boulders (Dumped into well) Sand (not of original strate) -297 *********************************** 297 302 3/2 đ Hard clay -308 Coarse gravel & sand TO 6 ·й 348 GC 40 Clay & gravel Z J Gravel & sand TO 9 357 RNATE . . :369 Clav & Gravel GO 12 LTE -375 Sand & gravel TG 6 ∢ USE -441 :1. Clay & gravel 25/41 GQ. ŝ -478 Brown clay COPI 37 C -498 Mud & sand ELD SC. 20 E -501 Sand & gravel 2/1 TO R ō -527 Clay & gravel CC. 26 -696 Hard decomposed gravel & clay composi-73/96 tion of conglomerate shale Parf. 2801 -- 5271 11-1 2-28-47 LOG OBTAINED BY. 5 DATE an first S7588 S-32 ISN CALIFORNIA STATE PRINTING OFFICE

OGRI/1141-20 GC 6N/11W -20 GI 19-0116 SHEET 1 LOS ANGELES COUNTY 13 H.'11 HOOD CONTROL DISTRICT 6 ž MAIN_ MARA_ PANCIL-P.M. EGARY. 1. die and Devington 1330' 10. 0E 40" ST.E. 15-11. OF AVE P-8. in strigation 1-2568 likes, of average and, at wells, L'. S. G. S. Datum 5 L'. S. G. S. Datum Fles, of grd. siljacut to well:___ : 9 Water sulface reference points: "" (+) Faryn .____ To. How det. Fler. . Danig that: - -How det. (b) From, Tu .. Densigsion (1) .Trom ----- To How det. Elev. In sugar (.1) fasu Eler. How det Tu ... Druiptint 116" OD Type of acti 3TAND ._ Size. e - 282 Dispinal depthi _____ 696 Soundings: 1-215-600 Peroping equipments Paris vinta Diesel Consigned Detil (. 4. + 1) Drawbown: 15 (228 - 243' ante fall -"J.C. CLUEACE Dar dath di MAY 1946 (Franch Antoina danaciaistice _____ Quality of waters. 0 _OF ... DEILLE D_291 DEEP IN 1228; 30 SANDED 6 AND BOULDERS DUM PED WELLEREM 260 2.11 INTO PWR CHECKED LOCATION MAR 1947

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	CLASSIFICATION OF HATTRIA			SBIFICATION O	P HATCHIALS
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211 217	SAND (AST. OF OKIS	7446			i-
111 302	HIKD CLAY	*******	•.		,
102 308	CONKSE GEAVEL			· · ·	
L'ani aro	\$ SAND			·	
318 348	GRAVEL & SAND				
357 369	CLAY & OERYEL	<u>.</u>		· · · · · · · · · · · · · · · · · · ·	· 1
, 369 373	CLAY & OERYEL	i			
375 .141	CLAYE .			······	<u> </u>
1118 413	BLOWN CLAY =	- <u></u>		•	······
103 201	MUD & SAND SANDS GEAVEL			·	•
501 527	CLAY & GEAVEL		<u>.</u>		
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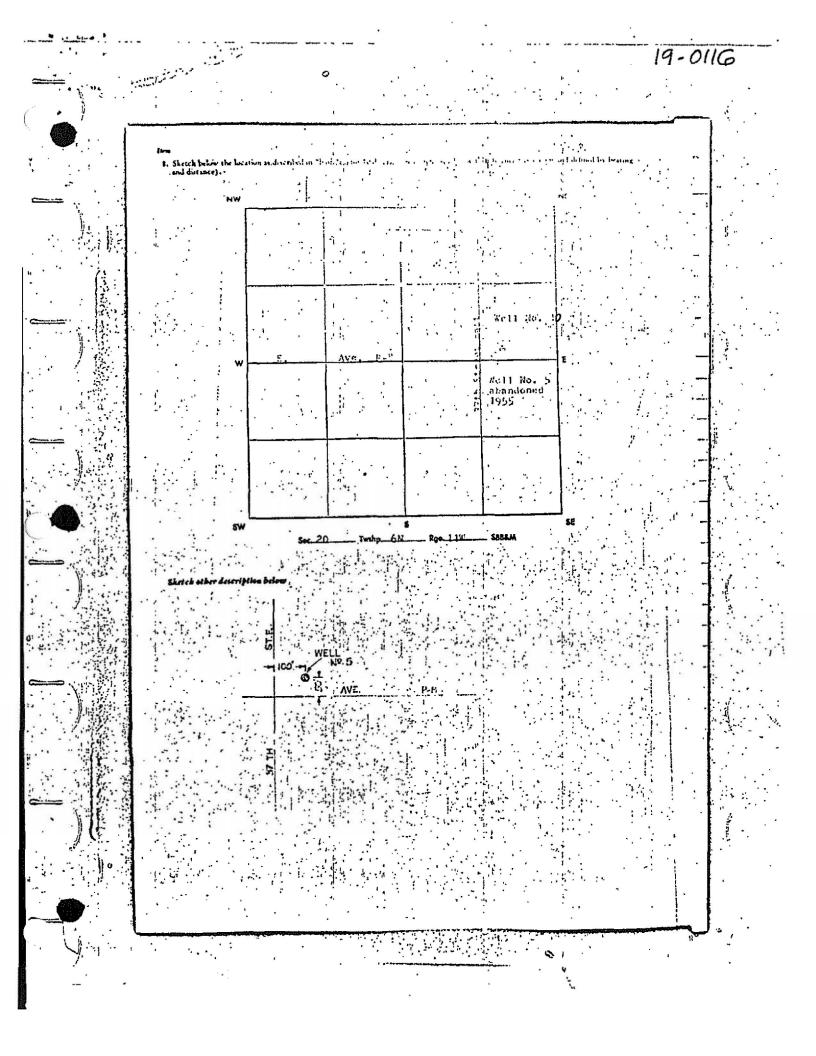
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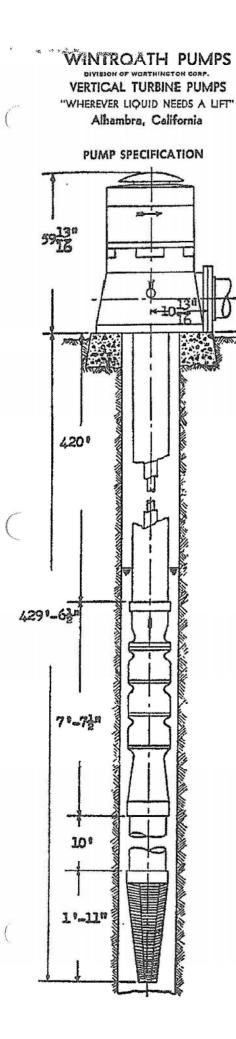
ON 1100 20G1

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19-0116

6/11-20 G'P Complete a separate STATE OF DAME AND form for each well STATE WATER RIGHTS LOAND さくちゃっと Sas Santa -15^{10} FIRST NOTICE GROUND WATER EXTRACTIONS President to Part 5, they're a 2 art. 1 1. s. Name of person filing this nutices . I ALATALE. Plan block apple at all the fi 2. a. Name of person extracting ground water if different than 1. above: b. Address ... Setur addition of P. O. ber aum State 1. Name of owner or owners of property on which well is located: 12 Same Address of person or persons listed in 3. aboves -. City t sidres or P. O. ber sumb Laste dires ar P. O. bes a set City See . 1.1 n ar P. O. has sumber Ca I. a. Other persons owning ac claiming interest in well or use of waters · . . • 4110 East Avenue P., Paladale. Callfor (1) P. M. Grecory_ Server address of P. C. ben hunter (1) Charles F. Harper . . . Serect aldr (3) Marjorie H. Swanson 6 n = Serert addren or P. O. bas State b. Previous awaers of well during past 10 yearst Seres add ani ce Gen (2) Cr; Owner's designation of wells a derignation must be 7: Description of well locations - 1 (*** & County Los Angeles b. Where United States Public land survey has been mule describe bration to or steet 40 acra sub-fision SE_M. NE_M. Section 20 . T. C.L. . R. 112. Statem. c. Description related to local landmarks and/or survey conners, of due for their met traibilities Well_located_approx. 1099 Wast co. contine linge will i their farm and bhailt north of center line hest Avenue 1.- ! Notes Additional sheets may be appended of more tare. I 3300 Fee Kellowich



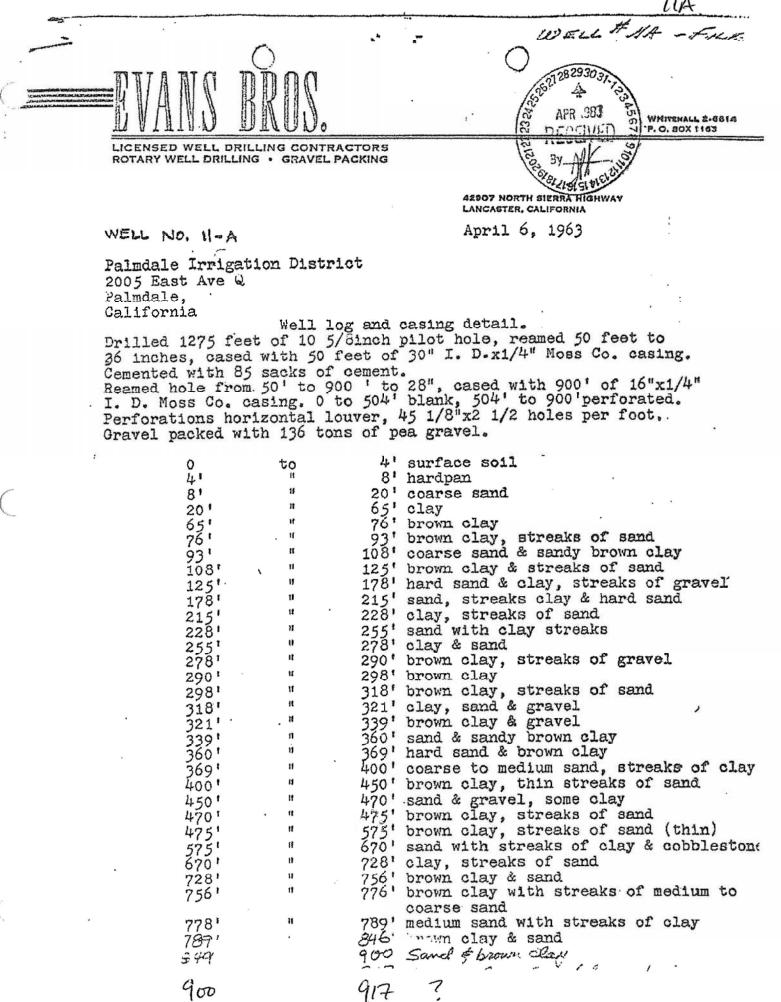


Proposal pro- 124
Specification 10 6005
Well No NOW # 10
Date July 7, 1960
For Palmdale Irrigation District
For Paindale
Californie
MOTOR DRIVEN PUMP HEAD
Type SKY-10
Size Discharge 8" Base Size 163"
Motor Mfr. U.S., C.B. ar equal
Type Motor VHS
H.P. 100 Volts 220/440 Cycles 60
R.P.M. 1760 Phase 3
COLUMN
Type Threaded & Coupled
Section Length20*
Eduction Pipe:
3128
Weight per foot24.70#
Thickness 2777
inreads per inch
Tubing:
512e
Treight per loo
(Inckitess
Bearing Spacing 5* Bearing Material Bronze
Shafting:
Size
Material 1045 G.S.
BOWLS
Туре 121-54 No. of Stages 8
External Diameter 1124
Type Impeller Closed
Bowl Material Cast iron
booming matching
Bearing Material Bronze
SUCTION
Type Threaded & Coupled
SizeSia
Weight per foot24.70#
Thickness277
Threads per inch8
Section Length10*
Type Strainer Cone

	WELL ANL	PERFORMANCE	DAL	A	
Well Diameter1	6" & 14"	Well Depth	610	9	
Static Water Level	3201		*****		
Pumping Water Lev	el 3751				
Surface Lift	231 1				
Total Lift	6061				
Capacity	550	GPM Speed	1	1760	RPM
Required H.P.	108				

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BEBEGBL



ILA

Page two

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Well log Palmdale Irrigation District, Well No. 11A

917' 920' 1007'	to "	10071	very hard sand blue clay, streaks of shale soft shale with streaks of medium to
1030'	11	10351	coarse sand
1035'	n	1096'	shale & blue clay, streaks of medium to woarse sand
1096'	18	1101'	sand & shale
1101'	н		blue clay, medium to coarse sand, some white clay
1106'	It	1115'	hard shale with streaks of sand
	11	1210	blue shale, streaks of sand
1115 ¹ 1210 ¹	. 11	1236'	blue shale, streaks of sand & brn. clay
1236'	u		blue shale & sand with large flakes of mica
1249'	tł .	1275'	blue shale, sand & cobblestones

Ower + 14A File

WHITEHALL 2-6614 P. O. BOX 1163

LICENSED WELL DRILLING CONTRACTORS ROTARY WELL DRILLING . GRAVEL PACKING

42907 NORTH BIERRA HIGHWAY LANCASTER, CALIFORNIA

March 31, 1965

Palmdale Irrigation District 2005 East Ave Q Palmdale, California

1.

Well log and casing detail Well No. 14-A Reamed hole to 36" to 50 ', cased with 50' of 30"x1/4" Moss Co. casing & cemented with 85 sacks of cement. Reamed hole to 272"from 50' to 900'.Cased with 900' of 16"I. D.x1/4" Moss Co. casing. 0 to 450' blank, 450' to 900' perforated.

0	to	3' surface soil
3'	Ħ	
20'	n	20' coarse sand & gravel
		50' fine to medium gravel, some brown clay
50'	71	70' " " " with red & brown olay
701	58	100' fine to medium sand, streaks of brown clay
1001	F1	1601 fine cond and and and a set of brown dray
160 '	n	160' fine sand, small amount of brown clay
200 '	u	200' fine to medium sand, 50/50 streaks of brown clay
		209' " " " streaks of brown clay
289'	n	373' hard medium to fine sand streaks of brown clay
373'	et	382' brown clay, some sand
3821	11	410' hard fine to medium sand, some brown clay
410 1	Ħ	had find the odden sand, some brown dray
4301	н.	430' fine to medium sand & brown olay
	11	450' brown clay & fine sand
450		500' hard brown clay & cemented sand
500 '	. "	550' fine sand & brown clay
550'	19	600' sand & brown clay
600 1	11	677 Plana and the bard have a
6571	19	657' fine sand & hard brown clay
668	18	668' brown clay, some sand streaks
		750' coarse to medium sand, streaks of brown clay
750	tt	810' fine to medium sand, streaks of brown clay
810'	11	830' " " " very little clay
830 1	11	104 7 740 010 0103
860 1	Ħ	
		900° sandy gray clay & streaks of sand

ORIGINAL (File Original, Duplicate and Triplicate with the REGIONAL WATER POLLUTION CONTROL BOARD No		CALIFORNIA	Do Not Fill In Nº 26950 State Well No.
(Inseri appropriate wambet)			Other Well No.
(1) OWNER:		(11) WELL LOG:	
Name Palmdale Irrigation	1 District	Total denth 880 fe. D	epik of completed wall 800
Address 816 Ave. Q-7		Formation: Describe by color, aberacter, a	iss of material, and structure.
Palmdale		$\frac{0 \text{ ft. to}}{20 \text{ "}} \frac{20 \text{ ft. 51}}{40 \text{ "}} \text{ g}$	urface soil
(2) LOCATION OF WELL:			lay and gravel
County L. A. Owner's number, if	my- 15		1 11
R. F. D. or Street No.		90 " 88	and and clay streaks
10th St. Eest	PUT AVA P	<u>90 " 150" sr</u>	and cley and coarse
Pelmdal		160 St	and and clay streaks
		100 880 11	ne send no ano grevel
			nd and clay streaks
(3) TYPE OF WORK (cbeck):		315 " 345" gr	Level
	tioning 🗌 Abandon 🗌		rd packed sand
If ebendonment, describe meterial and procedure in I		<u>375 " 430 " co</u>	arse sand
(4) PROPOSED USE (check):	(5) EQUIPMENT:		rd packed sand nd and clay
Domestic 🔲 Industrial 🗍 Municipal 🛧	Cable C		nd and clay streats
Irrigation [] Test Well [] Other []	Dug Well	535 " 565 " ha	rd sand
(6) CASING INSTALLED:	If gravel packed	_565 " 645 " cl	ay and sand
SINGLE DOUBLE . GIN		645 "675 " ha	rd packed sand
From it, to it. Diam. Well	Dismeter from to of Bore it. fr.	010 100 88	nd and clay streaks
	pipe "	735 " 765" ha	
800 ft. 16"TDx 17/4" wai1	vell casing "		rd fine send
II		* 824 " ft	ne sand and clay
<u></u>			11 11
Type and size of shos or well ring	Six of grand Special	850 B70 fi	m. sand and clay
Describe joint Tritt wolded	Option At	870 " 880" her	cemented formation
		<u> </u>	a saarp sand
(7) PERFORATIONS:		Performance:	
	Ti rth, by .2 ¹¹ in.	1750 gpm fr	om 369 ft.
From AD perforations ma			
	n 11. 11. 11. 12. 44		
" 0 " to 420 ft. solid			
420 " " 800 " perfo	rated """		
(B) CONSTRUCTION:			
Was a surface majory and provided? I Yes D No To wh	et depth 50 ft.		
Vers any strate seeled spainer pollution? Q Yes [] No If y	er, note depth of strata	5 11	
From fr. to fr.		H 14	
n n n		N (B	
Method of Scaling cement under	ressure-	Vork named Jan. 27 160). Completed Feb. 12 "E
(9) WATER LEVELS:		WELL DRILLER'S STATEMENT:	
Orgit at which water was first found 525	ft.	This well was deilled under my juri my knowledge and belief.	idiction and this report is true to the best
canding level before perforences	fr.	NAME Rottman Dri	lling Co.
tanding level after perforating	ft.	7 Serion Stm. of corpera	tion1 (ITy)ed or printed)
(10) WELL TESTS:			
IV WILL LADED.	a		
The sums out made) The T No Man by alant	דרק ו רידה		
1 MP 70	driller doggegggg	(SIGNED) TOTA	Vell Driller

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Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable. * Indicates items required for Source Water Assessment

** Indicates additional items required for assessments and Ground Water Rule

	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
DATA SHEET GENERAL INFORMATION		
System Name	Palmdale Water District	from DHS database
System Number	1910102	from DHS database
Source of Information (well log, DHS/County files, system, etc)	Well Log, Files & Field Review	
Organization Collecting Information (DHS, County, System, other)	CDPH, R. Roda	
Date Information Collected/Updated	5/28/2010	
WELL IDENTIFICATION		
* Well Number or Name	15	from DHS database
* DHS Source Identification Number (FRDS ID No.)	06N/12W-13N01 S	
DWR Well Log on File? ("YES" or "NO")	Yes	
State Well Number (from DWR)	15	
Well Status (Active, Standby, Inactive)	Active	from DHS database
WELL LOCATION	, iouro	nom price datas dec
Latitude	(Leave Blank)	from DHS database
Longitude	(Leave Blank)	from DHS database
Ground Surface Elevation (ft above Mean Sea Level)	2591'	nom Brie databaco
Street Address	1003 East Avenue P	
Nearest Cross Street	10th Street East	
City	Palmdale	
County	Los Angeles	
* Neighborhood/Surrounding Area (see Note 1)	Co/ Ru	
Site plan on file? ("YES" or "NO")	Yes	
DWR Ground Water Basin	Antelope Valley	to come from DWR
DWR Ground Water Sub-basin	Lancaster Sub-Unit	to come from DWR
SANITARY CONDITIONS	Editodotor oub onit	to come nom print
** Distance to closest Sewer Line, Sewage Disposal, Septic Tank (ft)	Sewer Line 95 ft.	Estimated
Distance to Active Wells (ft)	1,500 ft. (Well 6)	Estimated
Distance to Abandoned Wells (ft)	N/A	Unknown
Distance to Surface Water (ft)	16,750 ft.	Estimated
** Size of controlled area around well (square feet)	10,000 sqft.	
* Type of access control to well site (fencing, building, etc)	fencing & Building	Actual
* Surface Seal? (Concrete slab)("YES", "NO" or "UNKNOWN")	Yes	Actual
* Dimensions of concrete slab: Length(ft)/ Width(ft)/ Thick(in)	40 in. x 39 in. x 12 in.	Actual
* Within 100 year flood plain? ("YES", "NO" or "UNKNOWN")	No	Actual
* Drainage away from well? ("YES" or "NO")	Yes	Actual
ENCLOSURE/HOUSING		
Enclosure Type (building, vault, none, etc.)	Building (Block)	
Floor material	Concrete	
Located in Pit? ("YES" or "NO")	No	
Pit depth (feet) (if applicable)	N/A	
WELL CONSTRUCTION		
Date drilled	1960	Estimated
Drilling Method	Rotary	Actual
Depth of Bore Hole (feet below ground surface)	880 ft.	Actual
Casing Beginning Depth/Ending Depth(ft below surface);		
2nd Casing Beginning Depth/Ending Depth; 3rd Casing, etc.	0 to 800 ft. / 0 to 50 ft.	Actual
Casing Diameter (inches); 2nd Casing Diameter; 3rd Casing, etc.	16 in.	Actual
Casing Material; 2nd Casing Material; 3rd Casing, etc.	Steel	Actual

	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
WELL CONSTRUCTION (continued)		
Conductor casing used? ("YES", "NO" or "UNKNOWN") (See Note 2)	Yes	
Conductor casing removed? ("YES", "NO" or "UNKNOWN")	Unknown	
* Depth to highest perforations/screens (ft below surface) (or "UNKNOWN")	420 ft.	
Screened Interval Beginning Depth/Ending Depth (ft below surface); 2nd Screened Interval Beg. Depth/Ending Depth; 3rd Screened Interval, etc.	420 ft. to 800 ft.	
* Total length of screened interval (ft) (default = 10% pump capacity in gpm) (or "UNKNOWN")	380 ft.	
* Annular Seal?("YES", "NO" or "UNKNOWN") (See Note 3)	Yes	Actual
* Depth of Annular Seal (ft)	50 ft.	
Material of Annular Seal (cement grout, bentonite, etc.)	Cement	
Gravel pack, Depth to top (ft below ground surface)	0 to 800 ft.	Actual
Total length of gravel pack (ft)	800 ft.	Actual
AQUIFER		
* Aquifer Materials (list all that apply: sand, silt, clay, gravel, rock, fractured rock)	Clay, Gravel & Sand	
* Effective porosity (decimal percent) (default = 0.2) (or "UNKNOWN")	Unknown	
* Confining layer (Impervious Strata) above aquifer? ("YES", "NO" or "UNKNOWN")	N/A	
Thickness of confining layer, if known (ft)	N/A	
Depth to confining layer, if known (ft below ground)	N/A	1
* Static water level (ft below ground surface)	626 ft.	
Static water level measurement: Date/Method	Sep-09	Transducer
Pumping water level (ft below ground surface)	684 ft.	
Pumping water level measurement: Date/Method	Sep-09	Transducer
WELL PRODUCTION	1	
Well Yield (gpm)	1080 gpm	
Well Yield Based On (i.e., pump test, etc.)	18.62 (Specific capacity)	y
Date measured	Sep-09	PWD Well Sounding
Is the well metered? ("YES" or "NO")	Yes	and the strength of the
Production (gallons per year)	443 M.G. (Est.)	PWD Production Reports
Frequency of Use (hours/year)	Daily	
Typical pumping duration (hours/day)	Summer 12 to 16 Hrs/day	Winter 4 to 6 hrs/day
PUMP	1	35712
Make	Ingersoll Rand	12M75
Туре	Turbine	
Size (hp)	600 Hp (Gear Drive)	
Capacity (gpm)	1,100 gpm	Estimated
Depth to suction intake (ft below ground surface)	740 ft.	
Lubrication Type	Oil	
Type of Power: (i.e., electric, diesel, etc.)	Gas	15 million - 1
Auxiliary power available? ("YES" or "NO")	No	
Operation controlled by: (i.e., level in tank, pressure, etc.)	SCADA	
Pump to Waste capability? ("YES" or "NO")	Yes	

	Desert Floor	
Discharges to: (i.e., distribution system, storage, etc.)	(through air gap)	i.
DEMARKS AND DEEECTS (use additional chests as passage	4	

REMARKS AND DEFECTS (use additional sheets as necessary)

NOTES

I = Industrial, Mu = Municipal, P = Pristine, O = Other 2. Conductor Casing - Oversized Casing used to stabilize bore note during wen construction. Should be removed during installation of annular seal 3. Annular Seal - Seal of grout in the space between the well casing and the wall of the drilled hole. Sometimes called "sanitary seal".

			16		
DUPLICATE	WATER WELL D	RILLERS R	• •	. Do I	Not Fill In
File Original, Suplicate and Triplicate with the GIONAL WATER POLLUTION		7, 7078, Water Code)		Nº	47,154
NTROL BOARD No.	STATE OF	CALIFORNIA	· . ·	State Well No	N/12W
rt appropriste number)	- 460	CALIF ONNIA		Other Well No	
		(100		and the second
) OWNER:	and The share & shifest	(11) WELL			
ne Palmdale Irrigati	on District			Depth of completed well	550 ft
Palmdale		O ft. to	20 ft.	size of material, and structure SULTACE 80	ï 1
ratmuate		20	40 -	sand	
(2) LOCATION OF WELL:		40 "	75 .	coarse san	1000
County L.A. Owner's number,	, if 117	<u></u>	<u>85 "</u> 105 "	sand and b	oulders
R. F. D. or Street No. 40th St. Es	st & Ave. S-4	105	135	609786 507	d and boulde
Palmdale		135 "	165	hard packe	
		165 "	180 "	sand	
		180 "	217 "	coarse san	d
			235 "	sandy clay	The second se
(3) TYPE OF WORK (cbeck):		235 **	252 "	sand and b	
	nditioning 🗋 Abandon 🗌	252 "	270	coarse san	
If ebandonment, describe material and procedure i			<u>335 "</u> 360 "	sandy clay	A REAL PROPERTY AND ADDRESS OF TAXABLE PARTY.
(4) PROPOSED USE (check):	(5) EQUIPMENT:		405	COBrse San	d and clay
Domestic 🖸 Industrial 🗌 Municipal	Cable []	405	460	II II	<u> </u>
Irrigation 🔲 Test Well 🗌 Other	Dug Well	460 "	475 "	11 . 11	& boulders
(A) CASING DISTALLED.	If gravel packed	475	505."	n H.	
(6) CASING INSTALLED: SINGLE DOUBLE G		505	515 "	11 11	
	age Diameter from to	515	525	and and b	oulders
OM ft. to ft. Diam. V		<u> </u>	535	boulders	
50 ft. 26" conductor	• hine ""	535	540 550		d and bould
550 " 14" TDx 1/4"		<u>540</u>	585 "	bad rock	
				-rock	
<u> </u>	_				
Type and size of shoe or well ring Describe joint b12222 Walded	Size of grandi apecial				
Describe joint butt wolded					-
(7) PERFORATIONS:			M	CROFILME	.0
Type of perforence wed ' machin					
Size of perforations 1/8" in	e cut	4. 		DENITIAL	NOT
A	a. length, by 2 ia.		CONF	IDENTIAL -	NOT
From ft. to ft. P	a., length, by 2 in. Perf. per row Rows per ft.		CONF	DENTIAL -	
From ft. to ft. ft.	L., length, by 2 in. Perf. per row Rows per ft.		CONF		
From ft. to ft	a., length, by 2 ia. Perf. per row Rows per ft.		CONF FOR 1	PUBLIC REL	EASE
From ft. to 220" ft. sol1 " 220" # 550" # perfo	L, length, by 2 in. Perf. per row Rows per ft.		CONF FOR 1	PUBLIC REL	EASE
From ft. to 220" ft. sol1 "220" # 550" # perfo	Le, length, by 2 ia. Perf. per row Rows per ft.		CONF FOR F	DENTIA	EASE
From ft. to 220° ft. sold 0° to 220° ft. sold 220° ff 550° ft perfo 	Le length, by 2 ia. Perf. per row Rows per ft. iii i i i i i i i preted i i i i i i i i i i i i i i i i i i i	""""""""""""""""""""""""""""""""""""""		DENTIA	L
From ft. to ft. F 0 to 220 ft. sol1 220 # 550 # perfo 	Le length, by 2 ia. Perf. per row Rows per fe. 	""""""""""""""""""""""""""""""""""""""	CONF FOR 1 ONF	DENTIA	L
From ft. to ft. F 0 " to 220" ft. sol1 220 " # 550" # perfo 	Le length, by 2 ia. Perf. per row Rows per fe. 	""""""""""""""""""""""""""""""""""""""	CONF FOR 1 ONF	DENTIA	L
From ft. to ft. F 0 to 220 ft. sol1 220 # 550 # perfo 	Le length, by 2 ia. Perf. per row Rows per fe. 		CONF FOR 1 ONF	DENTIA	L
From ft. to ft. F 0 " to 220" ft. sol1 " 220 " ft 550" H perfo " " " " (8) CONSTRUCTION: Ver a surface sanicary seel provided? Yes 0 No 7 Were any starts sealed against pollution? Yes No 7 Prom ft. to "	L., length, by 2 ia. Perf. per row Rows per ft. 		CONF FOR 1 ONF In Acc cton 7078. Shots	DENTIA DENTIA ordance With 1 of the Water C of California	EASE
From ft. tn ft. perform 0 to 220 ft. solt 220 ft 550 ft perform 3 1 550 ft perform 3 1 550 ft perform 4 1 1 1 1 3 1 550 ft perform 4 1 1 1 1 4 1 1 1 1 4 1 1 1 1 5 0 0 1 1 1 4 1 1 1 1 1 1 4 1 </td <td>Le length, by 2 ia. Perf. per row Rows per ft. To what depth 50 ft. ft.</td> <td></td> <td>CONF FOR 1 ONF</td> <td>DENTIA DENTIA ordance With 1 of the Water C of California</td> <td>L</td>	Le length, by 2 ia. Perf. per row Rows per ft. To what depth 50 ft. ft.		CONF FOR 1 ONF	DENTIA DENTIA ordance With 1 of the Water C of California	L
From ft. tn ft. perform 0 to 220 ft. solt 220 ft 550 ft perform 3 1 550 ft perform 3 1 550 ft perform 4 1 1 1 1 3 1 550 ft perform 4 1 1 1 1 4 1 1 1 1 4 1 1 1 1 5 0 0 1 1 1 4 1 1 1 1 1 1 4 1 </td <td>L., length, by 2 ia. Perf. per row Rows per ft. </td> <td>······································</td> <td>CONF FOR 1 ONF In Acc CTON 7076. Skots 2/16/60</td> <td>DENTIA DENTIA DENTIA Distance With 1 of the Woter (of California</td> <td>EASE</td>	L., length, by 2 ia. Perf. per row Rows per ft. 	······································	CONF FOR 1 ONF In Acc CTON 7076. Skots 2/16/60	DENTIA DENTIA DENTIA Distance With 1 of the Woter (of California	EASE
From ft. to ft. P 0 "to 220" ft. sol1 "220 "ft 550" H perfo " (8) CONSTRUCTION: Ver a surface sanicary seal provided? Area No 7 Vers any strate sealed appiase pollation? Yes No 7 Vers any strate sealed appiase pollation? Yes No 7 Wers on the to " " Method of Sealing Consent	L., length, by 2 ia. Perf. per row Rows per ft. 	······································	CONF FOR 1 ONF In Acco Conton 7076, Shorts 2/16/60 'S STATEMEN villed under m	DENTIA DENTIA DENTIA Distance With 1 of the Woter (of California	EASE
From ft. to ft. F O to 220 ft. sold 220 ft 550 H perfo (8) CONSTRUCTION: Was a surface unitary sell provided? Ware any strate scaled against pollution? Ym No From ft. to Method of Scaling Coment WATER LEVELS: A at which water was first found diag level before performing	Le, length, by 2 ia. Perf. per row Rows per ft. I I I I I I I I I I I I I I I I I I I	This well was d	CONF FOR 1 ONF In Acc Conton 7076, Story 2/16/60 Vis STATEMEN Villed under my belief.	DENTIA DENTIA DENTIA DENTIA DENTIA DENTIA DENTIA	EASE
From ft. to ft. F 0 to 220 ft. sold 220 ft 550 H perfo (8) CONSTRUCTION: Was a surface unitary sel provided? Ware any strate sealed against pollution? Yes No T Ware any strate sealed against pollution? Yes No T Method of Sealing Compart WATER LEVELS: A at which water was first found	Le, length, by 2 ia. Perf. per row Rows per ft. I I I I I I I I I I I I I I I I I I I	This well was a my knowledge and NAME	CONF FOR 1 ONF In Acce Con 7076. Skory 2/16/60 's STATEMEN villed under mo belief. Rottmi (Person, Sim, or	DENTIA DENTIA DENTIA Distance With 1 of the Water Co of California	EASE
From fr. to ft. F O to 220 ft. sold 220 ft 550 H perfo (8) CONSTRUCTION: Wat a surface anitary sel provided? Wat a sub a s	Le, length, by 2 ia. Perf. per row Rows per ft. I I I I I I I I I I I I I I I I I I I	" " " " " " " " " " " " " " " " " " "	CONF FOR 1 ONF In Acce Con 7076. Skan Skan 2/16/60 'S STATEMEN Willed under mi belief. Rottmi	DENTIA DENTIA DENTIA Distance With 1 of the Water Co of California	EASE
From fr. to ft. F 0 to 220 ft. sold 220 ft 550 H perfo (8) CONSTRUCTION: Ver a surface unitary sel provided? Ye O No T Vers any strate scaled against polision? Ye O No T Vers any strate scaled against polision? Ye O No T Perom fr. to WATER LEVELS: A at which water was first found diag level before perforating tag kyel after p	Le length, by 2 in. Perf. per row Rows per ft. I I I I I I I I I I I I I I I I I I I	This well was a my knowledge and NAME	CONF FOR 1 ONF In Acce Con 7076. Skory 2/16/60 's STATEMEN villed under mo belief. Rottmi (Person, Sim, or	DENTIA DENTIA DENTIA Distance With 1 of the Water Co of California	EASE
From ft. to ft. F 0 to 220 ft. sold 220 ft 550 H perfo (8) CONSTRUCTION: Ver a surface sanicary sell provided? Ver O No 1 Ver any strate scaled against pollation? Yes O No 1 Ver any strate scaled against pollation? Yes O No 1 Ver any strate scaled against pollation? Yes O No 1 Ver any strate scaled against pollation? Yes O No 1 Ver any strate scaled against pollation? Yes O No 1 Ver any strate scaled against pollation? Yes O No 1 Ver any strate scaled against pollation? Yes O No 1 Ver any strate scaled against pollation? Yes O No 1 Ver any strate scaled against pollation? Yes O No 1 Ver a pump test made? Yes O No 16 yes, by when	Le length, by 2 ia. Perf. per row Rows per ft. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	This well was a my knowledge and NAME	CONF FOR 1 ONF In Acce Con 7076. Skory 2/16/60 's STATEMEN villed under mo belief. Rottmi (Person, Sim, or	DENTIA DENTIA ordance With 1 of the Woter (of California)? Completed (T: y jurisdiction and this m an Drilling corporation) Ave. I	EASE
From fr. to ft. F 0 to 220 ft. sold 220 ft 550 M perfo (8) CONSTRUCTION: Ver a surface unitary sel provided? Ver O No 1 Vere any strate sealed apiane pollation? Yes O No 1 Vere any strate sealed apiane pollation? Yes O No 1 Vere any strate sealed apiane pollation? Yes O No 1 Vere any strate sealed apiane pollation? Yes O No 1 WATER LEVELS: A at which water was first found diag level before perforating ing kyel after perforating No 16 yes, by when Yield: 575 gel./mif Fricht 375	Le length, by 2 in. Perf. per row Rows per ft. I I I I I I I I I I I I I I I I I I I		CONF FOR 1 ONF In Acce Con 7076. Skory 2/16/60 's STATEMEN villed under mo belief. Rottmi (Person, Sim, or	DENTIA DENTIA DENTIA Distance With 1 of the Water Co of California	EASE

WELL No. 16 TRIPLICATE File Original, Duplicate and Triplicate with the	WATER WELL I	DRILLERS		Nº 47158H
REGIONAL WATER POLLUTION	STATE OF	CALIFORN	1A	State Well No.
(lauers appropriate number)	N		RECORDBITION	Other Well No. 192716
(1) OWNER:		(11) WEI	L LOG:	n
Name Talmcale Irrigatio	n District	Total depth	000	th of completed well 550 t
Address E16 Avenue C-7	Meree	- O fe.	· 그는 사람이 제외에 많은 승규는 것이 같은 것이 가지 않는 것이 같이 많이 했다.	of meterial, and structure.
Palmdale, Calif.	ann an			
(2) LOCATION OF WELL:			75 000	urse sand
County Los Aricolos Owner's number, if	»57—			and bouldors
R. P. D. or Street No. 40th St. Fas	t & Avo, 5-4		105 801	nd and boulders
Palsielo		185		d packed sand
		165	180 ser	
		180 "		pree sand
	····	_217 -		rly clay
(3) TYPE OF WORK (check):	· · · · · · -			nd and boulders
A La Contraction Landger	tioning 🗌 Abandon 🗖			iran sand
If obondonment, describe material and procedure in I	(5) EQUIPMENT:	270		dy clay
(4) PROPOSED USE (check):		 		rse sand and clay
Domestic 🔲 Industrial 🗌 Municipal	Rotary Cable		AEC "	
Irrigation 🗌 Test Well 🗌 Other	Dug Well	460 "	475 1	" & boulders
(6) CASING INSTALLED:	If gravel packed	475	505 n	۲۶
SINGLE DOUBLE Gage	a Burn harri	-505-	<u> </u>	11
From fr. to fr. Diam. Wall	Diameter from 10 of Bare ft. ft.	-515		nd und boulders
		-525		ulders
- 50 11. 25"CD conducto	r pipe " "	-535-		eked sand and bpulder
- 550 ft. 14"IDx 1/4" c	And and a state of the second state of the sec	<u>-540</u> 		d-rock
	•1 • •		000 10	UR.
	Size of gravels		•	
Type and size of shoe or well ring Describe joint	Special			· · · · · · · · · · · · · · · · · · ·
bet.ts.t.t.				***
(7) PERFORATIONS:	14 C			
Type of perforsion used			•	
Size of perforations maching	nrih, by in.		••	
From ft. to H. B. Perf.	per com Rome per ft.		•	
. Oft. 220 ft. solid	14 14 11 11 11	•1	44	
- 220. 550. perton	vated " " "			
1				
		•	•	канданынын налага талар аларына дараан талар талар жана талар жана жана жана жана талар талар жана талар талар
(B) CONSTRUCTION:			•	· · · · · · · · · · · · · · · · · · ·
Wer a sourface semistary seel provided? I Yes I No To w	The second se	*	*	
Were any strate scaled spainer pollution? BYes D No If	a second s	•		
From ft. to ft				
Method of Sealing	an a suite and	Work marted	2/16/60.	. Completed 2/24/50 10
ccaent unde	r preseure	**************************************		
(9) WATER LEVELS:			R'S STATEMENT:	diction and this report is some to the best of
Depth at which water was first found	ft.	my knowledge an	d belief.	
Standing level before perforating	<u>ft.</u>	NAME RO	tthan Dril	
	ft.	Address	Person, firm, or corperat	
Standing level after performing				
			and the second	
(10) WELL TESTS:			Lancaster	<u>کار ان </u>
(10) WELL TESTS: Was a pamp test model [] Yes [] No If yes, by whom?	t. drawdowdater 2' - 5rs.	[SIGNED]	and the second	

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and the second second

		J UEFA	RIMENI OF FUE	tion of NEY	KI
- second	~		Palmdale H	ills. S17. 75NF	117 SBBK WELL # I
	WI	ELL DATA (1) Place and	Owner_Albert Ge	10 fr. 1	
((2)	Source of Information Dol R	Combs, Peorles	n Inc Bakersfiel S Pumps, Lancas	d, Valif. ter, Valif" - -
/		Collected by		Date1955	
	(3)	Number or Name	l #L	1 001-1964	1
	(*)	Date drilled	October 1954		
	(4)	Location: Neighborhood	-Peludalo, Soon	bl oprings tord	Recidentia
		Size of lot	Port of they	Burtin	27 at in but in the
		Distance to: Sewer		אורוה פרן	
		Sewage disposal	<u>inlividuel</u> none	POL- LT C- CLIPPE	
		Nearest property line	50'+ to ro	ad , , , ,	l sal
	(5)	Housing: Type		Ha Richard purify.	hand inthe
		Condition		new	
		Pit depth (if any)	concretey-		
		Floor (material)			
	10	Drainage	<u></u>		
	(6)	Well Depth	wo.		
	(7)	Casing: Depth	108'		
	(7)	Diameter	8"		
		Kind	8 69		
	ę.	Height above floor	19817		
		Distance to highest perforations	20'		
		Surface sealed (yes or no)	whas sleb		
		Gravel pack (yes or no)	yes		······································
C		Second casing depth			4
		Second casing diameter Annular seal (deptb)			· · · · · · · · · · · · · · · · · · ·
	(8)	Impervious Strata: (Thickness	10 to 74'	aley and houlde	rg
		Penetrated Depth to	*****		an a
	(9)	Water Levels: Surface	37 bolow	n n m h	
		Depth to Static	37		na n
		When pumping.	85' with		PM
			Pacific told in	istilled	2
	(10)	Pump: Make	not installed	-to-14to	-Teerless ,
		Type	turhine		In the Provide LUN
1.2	ہے۔ اس	Capacity, g.p.m Lubrication	- 150 mt open	ting-ierd65	170 6.PM 1:- 1d
	~	Power	Ploatriast	1	
. ~		Auxiliary power	· · · · · · · · · · · · · · · · · · ·		
	- >	Control	1. Chazassuze-	Constant Ste	
		Discharge location		rage tank	
-يەرەبىرىمى يەر يە	>	Discharge to	11 11		
···· ·	(11)	Frequency of Use	-disterritte	nt - Carlon	
×	(12)	Flood Hazard	none		
	(13)	Remarks and Defects (Use other side if necessary)			
	(14)	Show well log on other side.		,	
	STATE	OF CALIFORNIA RTMENT OF PUBLIC HEALTH	27626 12-80 XH 🖲 870		(REY, 1-1-81) Form SE-1402

STAR STAR The second second 10 11 **1**1 from to 0 10 10 send 20 <u>send silt olay</u> - Lendy with day 3037 Clay 37 Clay , sand 10 - 1° 1. 20 -30 37-5674 clay a boulders 50 60 clay and boulders 74 clay and boulders ٤., 60-74 90 50 gravel and water . 130 gravel and water . 5 - - -90 130 137 Boulders ----icle caued to 100 feet, gravel packed 13 inch hole with 8 inch casing water level stood at 37 feet from below curbing when cased. came for quiril between 7 4 and 130 ft :1 per PAR TAIN EXPLOR.FION INC WELL LOG (0, -1). . . . 2 2.50 1 . . 1 . 1 14 : 11. 1 × 1 × 1 × 1 × 1 × 1 : • - - - -ر اور الا الم الم الم الم **المحمد ا**لمار الم ې د خو و ه د خو او د او د او د اې د ځو او ه د ځا د او د او - is symple :

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QUINTUPLICATE	WATER SWELT	DRILLERS REPORT	Do Not Fill In
RETAIN THIS COPY	WALLER WELL	DALLERS KEPORT	
, 11		(water (400)	Nº 40890
Well # 19	STATE OF	CALIFORNIA	State Well No.
00011			Other Well Na
(1) OWNER:		1 (11)	and the second
Name Albert Gole		(11) WELL LOG:	-
Address 4630 Palmonie H	1- 5 -		of completed well 350 fr
Address 4630 Palmdale H Palmdale, Calif	15. Drive	D formations Describe by color, choracter, she o	f material, and structure.
	6	A LAS	
(2) LOCATION OF WELL:	•	and the second s	d and rocks d and gravel
Guary LuAs Owner's samber,	if any-	25 ··· 48 · 500	
R. F. D. or Siter No.	and the second		and clay streaks
approx. 46 th st. 1	Fost &		
Barrell Springs			se sand gravel
· · · · · ·		" and	clay streaks
		205 " 215 " hore	packed sand
(3) TYPE OF WORK (check):	·	215 * 220 * tigh	t hard packed sand
		220 " 245 " CONV	se sand and avayet
If abandonment, describe material and procedure in	ditioning 🗋 Abandon 🗍	245 * 267 * COAY	se sand and clay
(4) PROPOSED USE (check):	(5) EQUIPMENT	262 " 316 " Son	and clay streaks
a server second contraction of the second			sa sand
Domestic 🔲 Industrial 🗌 Municipal	1 12.11. 19		packed sond
Irrigation X Test Well 🗌 Other	Dug Well	<u></u>	packed sand
		47 T4	
(6) CASING INSTALLED:	If gravel packed		- and the second se
SINGLE DOUBLE GI	Dienseter from to	11 11	a a second a second a second de la seconda de la second
From fr. to fr. Diam. Wall	of Bore ft. ft.		
-24" hole " "	l		
-14" OD x 1/4" casing "		4 <i>.,</i>	
BO FT. Solid .		·	
270 - perforated "		49 • •	······································
Type and size of shoe or well ting	Sine of scends Nor9 . 3. 5 d		
Describe joise DU. TO WELDED		- Copy of	leg send to
(7) PERFORATIONS:		- AUSIVICI DC	- Fortwan
Type of performed Mach 1 Mi	e out	Bailling Cr	0. 4/1/20
Size of perforations [10-1]	nrth. by in.		
	per tow Rows per it.		
······································	··· · ··· ··· ··· ··· ··· ··· ··· ···	"TUDING DE	Mailed over by
-		- p - 7	M
		- Ken ta	unaw, 4/1/70
(8) CONSTRUCTION:	• • /-	· · · ·	
Was a surface anitery seal georided? [] To B No To vi	ut depth . It	•• •• ••	
Were any strata scaled against pollution? I You A No If		•• ••	
From fc. to ft		4 p 	
· · · ·	, –		-
Method of Sealing		Tork second of fame 1 - 12	
		6/23/61	Completed G/30/61 12
(9) WATER LEVELS:	541	TELL DRILLER'S STATEMENT	
Depth at which water was fest found BEAFLC	water level in m	This well was drilled under my jurisdiction whowledge and britef.	on and this report is true to the best of
Standing level before performing	, 1	AMPottman Drilling C	0
Standing level after performing	· · · · ·	(Person, Arm, or curmingions	(Typed or priores)
	<u> </u>	ddress 121 W. AVE. I	
(10) WELL TESTS:		tancastor	
Ver a purs y ter medel Z'res D No 11 yes, by wham?		میں نے بی در	
Yield 115 polymin wid 16 ft in		ICNED]	Driller. L -
	eis made? [] Yes 🛱 No Li	cenie No Date	
Will electric log mode of will D Yes 2 No		STATE B-34 BOU GUIN B BPO	DWR FORN NO. 246 (884, 3-54)
	,	. – .	

10-01

WELLT IJ

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PWD # 22

BINAL APR JUIJ14

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THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

Nº 78359 0 State Well No 6 M/11 W-34 /

Do Not Fill In

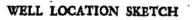
Other Well No.____

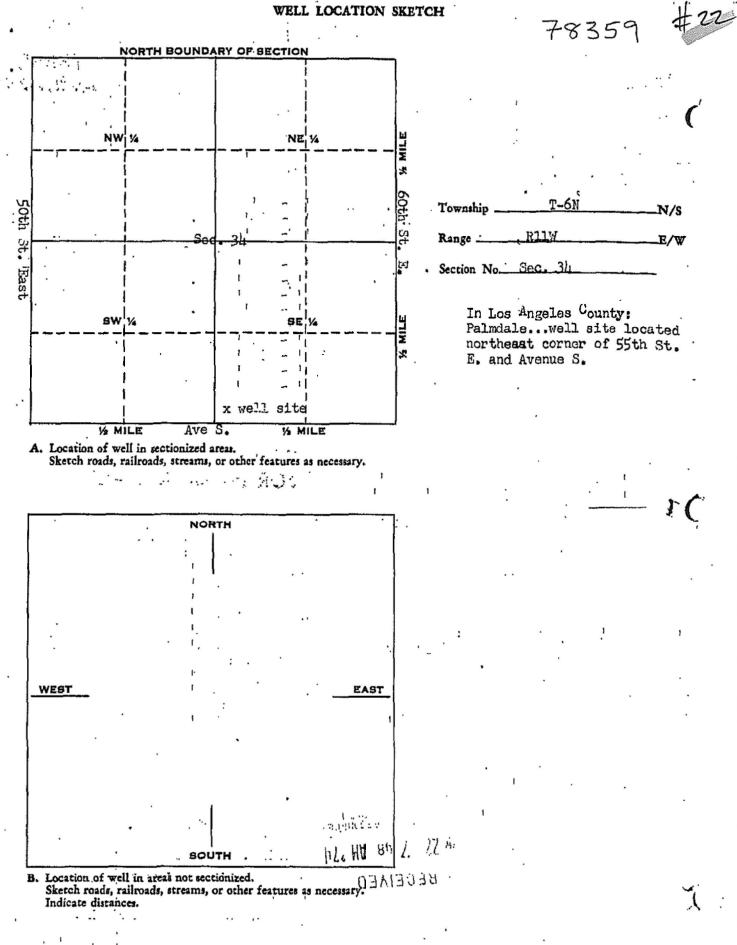
								Other well No)
ow	NER:	1			· ·		(11) WELL LOG:		
wame Palmdale Water District						Total depth 100	fr. Depth of completed well	1001	
Address 2005 E. Ave. Q							aracter, size of material, and structure	(001(
Palmdale. Calif. 93550								ft, to	f
(2) LO					amland '	Lita Mal	. 01 - 61	Ton Soil	
(2) LOCATION OF WELL: Pearland Wtr. Wel							61 - 301	Med: to coarse s	and & marro
	ange, and Sect					سلولياني پسيميد	301 - 651	Coarse sand and	
Tawnship, Range, and Section Sec. 31, T6N; R11W Distance from citles, roads, railroads, etc. northeast corner of							'small to medium		
Sth St	t. 17 o	nd Ave		Palmdal			651 - 1301	Coarse sand & sm	
	PE OF						1301 - 2001	Med. sand with c	-
New Well		pening		ditioning 🗍	Destroyi	ng 🗆	2001 - 2501	Coarse sand	
f destructi	on, describe	material an		re in Item 1			2501 - 3401	Med. to coarse s	and with cl
(4) PR(OPOSED	USE (cbeck):		(5) EQU	IPMENT:		streaks	
Domestic	Indu	astrial	Munici	ipal 🕅	Rotary	K	3/101 - 3701	Clay with Med. se	and
Irrigation	n 🗍 Test	Well		ther	Cable j .		3701 - 3901	Firm packed sand	
					Other ¹		3901 - 1001	Hard packed sand	
(6) CAS	SING IN	STALL	ED:				1001 - 1221	_Granite	
X STE		OTHE	5	I	f gravel pac	cked			
BINGLE		ĻΕ 🔲							
	1 1 1	1	Gage	Diameter	1	1 .	<u> </u>	<u>i i i i i i i i i i i i i i i i i i i </u>	
From	То		or	of	From	To			·
ft	fr.	Diam.	Wall	Bore	ft.	ft.	LONFIL	JENHAL - NJ	
	1001	16"	711	40"	0	501	FOR PI	JBLIC RELEASE	<u>.</u>
	501	. 3211	20	30"	50'	400'			
) in	Huctor				'	1			
hoe a	r well ring:	161		Size of grav	d: #5 Ca	astaic r		<u> </u>	
joint		ded wi					Water	Performance:	12 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
· · · · · · · · · · · · · · · · · · ·	RFORAT						April 17,	1.971	
Type of peefo	ration of nam	e of screen	I0	wre	<u> </u>		185 OPM @	<u>1981</u> Clea	ir
			Perf.	Rows			LIBO GPM @	<u>1991 "</u>	
From ft.	T ft		per row	per ft.		Size . x in.	185 GPM @	<u> </u>	
							475 GPM @		
901	400			re siz		11 - S.S.M 2	160 GPM @		
····					pennings.	per	150 GPM @		
			ineal	foot.			Increased RPM:		
							175 GP @		
	NSTRUC	TION					Decreased RPN		• ···· •••••••••••••••••••••••••••••••
	sanitary seal			ю П	To what depth	501 1.	h60 GPM :	2001	
	its scaled again		and the second	No D	1	depth of strata	End test.	<u> </u>	
rom	ft. 1		fs.		77 900, 1000	action of months	mine ueste	ter for the second s	
frum .	ft. 1		ft.				Work started 3- 5 19	74. Completed 17 APR 1	274
Method of sealing Cement top 501							WELL DRILLER'S STAT		
	TER LI	allow Revenue		1.541.1447	1			der my jurisdiction and this rep	ort is true to the b
	ich water was		if known	1301	d.		of my knowledge and belief.	• • •	
	el before perf				ſt.		NAME Rottmar	Drilling Co.	
	el after perfo				ſı		(Per	ion, firm, or corporation) (Typed or	printed)
	ELL' TE		2.244				Address 121 W. A	lvenue I	
· · · ·	at made? Yes		D 1	f yes, by whom	Rottma	in Drill.	7		
intti:		./min. with		It. drawdo	and the second s	hrs.	[SIGNED] Tam		
emperature	And the second second	and the second states of	Vas a chemic	cal analysis mas		No 🗋	01	(Well Driller)	
Was electric	lag made of w				attach copy		License No. 11756]	Dated April :	18. 1971
						· · · · · ·	THE ADDRESS OF THE ADDRES		

SKETCH LOCATION OF WELL ON REVERSE SIDE

SEITS-SED S-48 SOM THEP AD OFF

1.5





File with DWR Page 1 of 1 Owner's Well No. 23A Date Work Began 5-6-91, Ended 5-22-91 Local Permit Agency L.A. County Dept. of Health Ser	
Owner's Well No. 23A No. 48910 Date Work Began 5-6-91, Ended 5-22-91	
Date Work Began 5-6-91 , Ended 5-22-91 40510	
a nit of an a second se	LATITUDE LONGITUDE
Permit No. N/A Mr. Hopper Permit Date 4-15-91	APN/TRS/OTHER
GEOLOGIC LOG	WELL OWNER
	Palmdale Water District
DEPTH TO FIRST WATER (FL) BELOW SUBFACE Mailing	Address 2005 East Avenue "Q"
DEPTH FROM SURFACE DESCRIPTION P	
Ft. to Ft. Describe material, grain size, color, etc.	WELL LOCATION ZIP
	P-8 and 22nd St. Pump Station 23
	Palmdale
	Los Angeles
	ok Page Parcel 3022-12-919
	p 6N Range 11W Section 19 Lot 11
260 290 Gravel - clay	
290 : 300 : Clay- gravel	DEG. MIN. SEC. DEG. MIN. SEC.
300 320 Gravel - clay	- LOCATION SKETCH ACTIVITY (∠) - X NEW WELL
320 350 Clay - Gravel	MODIFICATION/REPAIR
350 360 Gravel - clay	Deepen
360 410 Clay- Gravel	Ave P-8
410 460 Gravel - clay	87
460 470 Gravel	350-> 041
470 500 Gravel - clay	41251-+ DESTROT (describe Procedures and Materiale Under "GEOLOGICLOG")
520 530 Gravel	La PLANNED CSE(S) - ∠ La MONTORING
530 550 Clay - gravel	A WATER SUPPLY
550 600 Gravel - clay	UT X Domestic
600 : 610 : Gravel - rock	(-2)
<u>610:620: Clay - gravel</u>	District Office 4 - Irrigation
620 630 Gravel - clay	Industrial
630 650 Gravel	Ave Q "TEST WELL"
650; 660; Clay	
660 680 Gravel - clay	or Describe Distance of Well from Landmarks OTHER (Specify)
PLEASE	BE ACCURATE & COMPLETEMunicipal
700 740 Gravel - clay	
140 150 CLAYMETHOD	
	ATER LEVEL & YIELD OF COMPLETED WELL
WATER LE	
000	D YIELD * (GPM) & TEST TYPE
0.10.1	GTH (Hrs.) TOTAL DRAWDOWN (Ft.)
TOTAL DEPTH OF COMPLETED WELLOTO_ (Feet)	be representative of a well's long-term yield.
DEPTH CASING(S)	DEPTH ANNULAR MATERIAL
FROM SURFACE HOLE TYPE (Z)	FROM SURFACE TYPE
(aches) T B 20 - DIAMETER OR WALL IF	ANY CE- BEN- ANY FILTER PACK
Fi. to Ft. (inclusion) 굶 뚫 8월 글 (inclusion) THICKNESS (inc	ches) Ft. to Ft. MENT TONITE FILL (TYPE/SIZE) (エン) (エン) (エン) (エン)
0 80 38 X Steel 30" 5/16"	0 50' X 9sk slurr
0 600 28" X Rosco Ms 16" 5/16"	50' 900' Birdsey
)30
0 85 28 X	
	IFICATION STATEMENT
Geologic Log	is complete and accurate to the best of my knowledge and belief.
Well Construction Diagram NAME Bakersfield W (PERSON, FIRM, OR CORPORATION) (TYPED OR P	Vell & Pump Co., Inc.
(PERSON, FIRM, OR CORPORATION) (TYPED OR P	
Geophysical Log(a)	is Ano Delemential as occord
Soll/Water Chemical Analyses 1600 E. Californ	La Ave. Bakersileid, CA 93307
	Dia Ave. Bakersfield, CA 93307
Soll/Water Chemical Analyses Other Other ADDRESS	CITY STATE ZIP LI-19-91 551820
	CITY STATE ZIP LI-19-91 551820 DATE SIGNED C57 LICENSE NUMBER

ORIGINAL Eile with DWR THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

Do not fill in

No. 277322

6 N/11W-35 JO State Well No. ice of Intent No. Local Permit No. or Date . Other Well No. (1) OWNER: Name Palmdale Water District (12) WELL LOC: Total depth _602_ ft. Completed depth _600_ ft. Address 2005 E. Aveneu "Q" ft. Formation (Describe by color, character, size or material) from ft. to Palmdale, CA ZIP 93550 City . 0 80 Conductor Fine Sand, 8" - 10" Rocks 80 96 -(2) LOCATION OF WELL (See instructions): Owner's Well Number 25 96 -104 County Los Angeles Fine Sand, Clay Spots Well address if different from above _ 70th St. 104 _ 109 Sandy Clay 109 118 Sand, Gravel w/Sm. Rocks __ Range _____11W__ Section . Township 6N. Distance from cities, roads, railroads, fences, etc. 118 128 Tan Clay 🗸 Sravel & Traces of Clay 128 ---171 Fine Sand, ż 171 214 -Clay~ .. 1 238 Coarse Sand, Streaks of Clay-214 -Brown Sand & Clay 1.1 238 239 (3) TYPE OF WORK: 239 240 Gravel & Clay New Well El Deepening 240 254 Brown Sticky Clay w/Fine Sand Reconstruction 354 Clay, Fine Sand, Spots of Gravel Reconditioning 396 40 Sand -Gravel w/Clay Spots. Horizontal Well 408 448 Sandy Clay, Sand, Sm. Gravel Destruction Describe destruction materials and pro-cedures in Item 12) 457 44 Sandy Clay, Sand, Sm. Gravel, Tight Sand, Sm. Opavel Sand, Sm. Ofavel w/Spots of Clay 45 463 (4) PROPOSED USE 463 49 Domestic Sand, Sm. Gravel w/Gray Clay - Firm 496 Irrigation D.C. Cranit w/Clay Layers 505 Industrial 4 n 5490 Granfte, White Quartz, Firm Test Well \$58 Granite, D.C. Granite, Fine Sand 607 Municipal Other (Desoribe) ß WELL LOCATION SKETCH (5) EQUIPMENT: (GHA ACK: Rotary. Dt Boverso Cable : Air 4 Other Bucke (7) CASING INSTALLED: (B) PERFORATIONS 0 Steel Dx . Plastic rfor Type of Gage or Wall Side Die _ From ft ft. ių. size 0 600 5/16 255 060 -385 060 -435 060 (9) WELL SEAL: Was surface sanitary seal provided? Yes 🖾 No 🗆 If yes, to depth <u>80</u> ft. -Were strata sealed against pollution? Yes D No Dx Interval. ft. Method of sealing 30" Conductor Cemented in Place Work started 12-9 19_88_ Completed_ 1 - 2619_ (10) WATER LEVELS: WELL DRILLER'S STATEMENT: 108 Depth of first water, if known _ This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. 108 Standing level after well completion (11) WELL TESTS: Signed If yes, by whom? ... McCalla Bros Bailer D Air lift D as well test made? · Yes 🕱 (Well Driffer) Div. of Layne-Western Co. No 🛛 Air lift McCalla Bros e of test Pump 5 NAME _ oth to water at start of test _ At end of test ____ (Person, firm, or corporation) (Typed or printed) Address 3132 Discharge ______ gol/min after . 5212 hours 17th St. Water temperature Santa Ana, CA Chemical analysis made? Yes No If yes, by whom? _____ City ____ _ zip __ 92703. 11. If yes, attach copy to this report 'N.A. Was electric log made Yes X No 🗆 License No. 510011 1-30-89 Date of this report . IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM, DWR 188 (REV. 12-86) 86 96355 t ...

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277322

WELL NO. 25

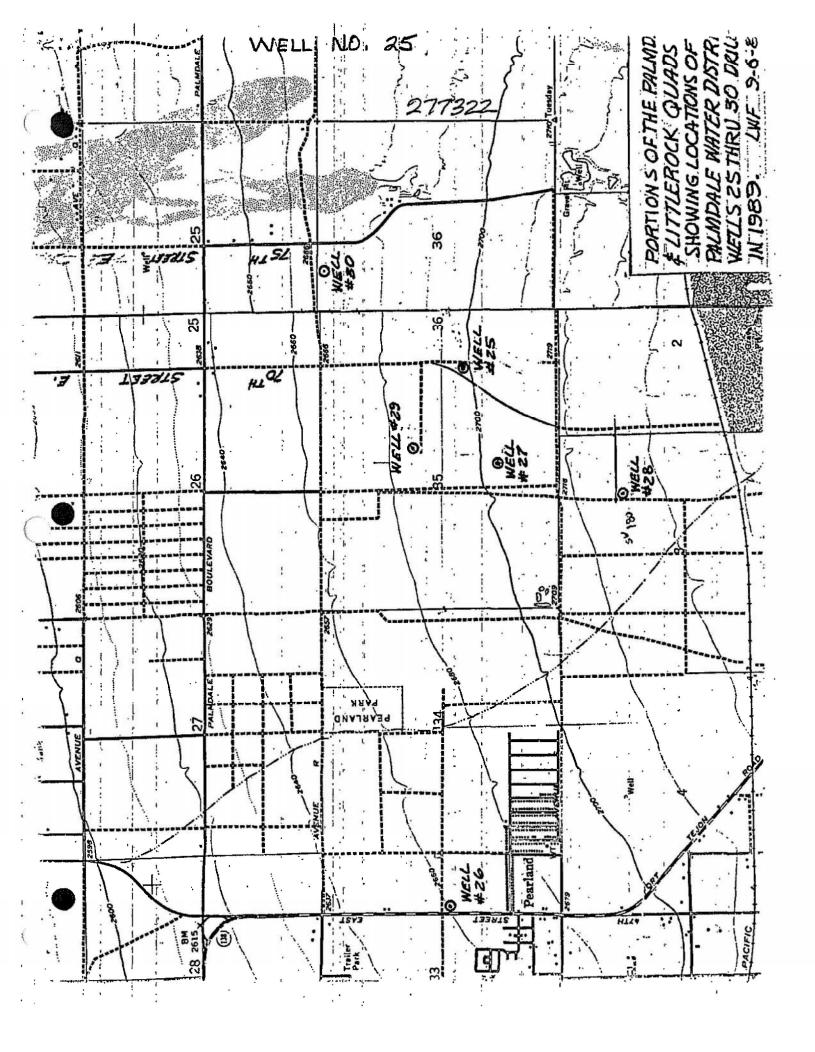
LEGAL DESCRIPTION

That portion of the Southeast quarter of Section 35, T6N, R11W, SBM described as follows:

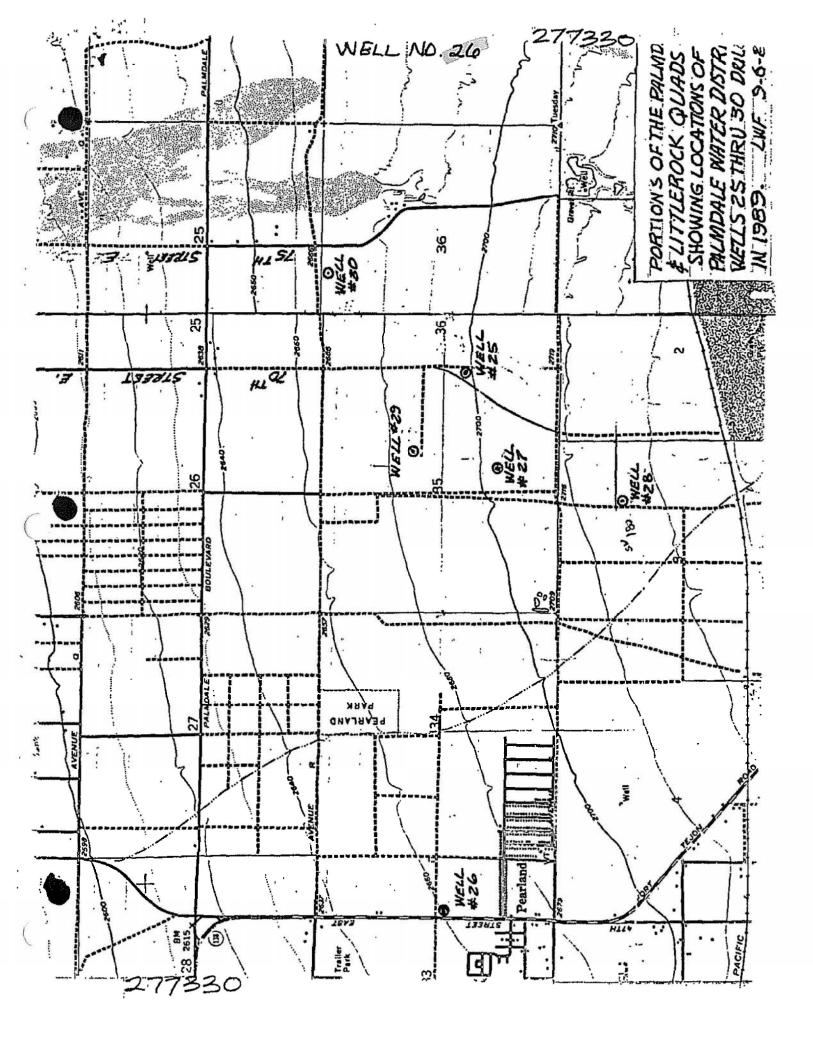
Beginning at the East quarter corner of said Section 35; thence North 89° 48' 35" West 30.00'; thence South 0° 02' 20" West 236.62' to the true point of beginning; thence South 0° 02' 20" West 440.65'; thence North 89° 16' 57" West 230.44' to an intersection with a 1550' radius curve which bears concave to the Northeast. The radial bearing from the center of said 1550' radius curve to said point of intersection bears South 63° 55' 47" East; thence Northeasterly along said 1550' radius curve through a central angle of 18° 22' 14" an arc distance of 496.97' to the true point of beginning.

The area of said site is equal to 1.015 acres.

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· · ·	STATE OF	CALIFORNIA
ORIGINAL		CES AGENCY Do not fill in
with DWR		VATER RESOURCES
27 0 .	WATER WELL D	RILLERS REPORT No. 277330
Notice of Intent No		- State Well No. 5N/11W - 33 Joz
Local Permit No. or Date		• Other Well No
(1) OWNER: Name Palmdale Wa	ter District	(12) WELL LOG: Total depth 484 ft. Completed depth 480 ft.
Address 2005 East Avenue "Q"		from ft. to ft. Formation (Describe by color, character, size or material)
City Palmdale, CA		0 - 50 Conductor
(2) LOCATION OF WELL (See instr	unting h	
County Los Angeeles Own		50 - 92 Fine Sand, Sm. gravel. Some Clay 92 - 137 Gravel, Fine Sand
Well address if different from above Lot #		137 - 149 Gravel & Rocks
Township Range		149 - 177 Clay
Distance from cities, roads, railroads, fences, etc.		177 - 179 Gravel, Rocks & Sand
50' E. of 47th St.	annini i	179 - 193 Clay
50* N. of R-8	• •	193 - 196 Sandy Clay, Sp. Gravel
		196 - 211 Gravelly Spots of Clay
	(3) TYPE OF WORK:	211 - 216 Gandy Clay & Sm. Gravel
	New Well Ck Deepening	216 - 230 Cley & Gravel Streaks
• •	Reconstruction	230 - 248 Gravel. Sm. Rocks & Sand
	Reconditioning.	248 288 Gravel WClay
· ·	Horizontal Well	268 - 290 Clay
	Destruction [] (Describe	290 - 293 Gravel Sandy Clay
	destruction materials and pro-	293 - 325 CERT
	cedures in Item 12)	325 368 Sm. Med. Oravel. Some Clay
	(4) PROPOSED USE	368 - 390 Granite AGrapery & Gray Clay
	Domestic	1397 - 406 Gray Clay Very Little Gravel
	Irrigation	406 423 Grandce Gravely, Some Clay
	Industrial	423-433 Decomposed Granite (firm)
	Test Well	(4530-) 468 Granite, Gravel & Clay
	Municipal D	468 - 470 Grafite (hard)
,	Other I	C) 470 - 4N3 Granite & Spots of Clay
WELL LOCATION SKETCH	(Desecibe)	473 - 484 Granite (hard)
(5) EQUIPMENT:	AVELACK MONDERED	<u> </u>
Rotary 2 Revenue	No 2 Size 6 12	
. Cable . Air . Air	en pi bore	aller .
Other Bucket Q Rached	Trom 480/p	
(\bigcirc)		<u></u>
(1) CASING INSTALLED:	REPRATIONS TO WEAD SCTERIO	· · · · · · · · · · · · · · · · · · ·
		-
From To Dia. Cage or		-
ft ft if Wall	dt. Vsize	······································
_0_480 16 5/16 15		
	0. 000 050 060	
	<u></u>	- · · · · · · · · · · · · · · · · · · ·
(9) WELL SEAL:	If yes, to depth ft.	······································
Was surface sanitary seal provided? Yes 2 No 2 Were strate sealed against pollution? Yes 2 No		
more scrate scaled against pollution 1 cs L1 No	mented In Place	
Methodolesiling 30" Conductor Cer		Work started <u>12-28</u> 19-88 Completed <u>2-28</u> 19-89 WELL DRILLER'S STATEMENT:
Method of sealing Conductor Cer		WELL DRILLERS STATEMENT:
(10) WATER LEVELS:		
(10) WATER LEVELS: Depth of first wäter, if known		This well was drilled under my jurisdiction and this report is true to the
(10) WATER LEVELS: Depth of first wäter, if known		This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
(10) WATER LEVELS: Depth of first wäter, if known		best of my knowledge and beltef.
(10) WATER LEVELS: Depth of first wäter, if known	by whom?McCalla_Bros.	best of my knowledge and beltef. Signed
(10) WATER LEVELS: Depth of first water, if known	by whom?McCalla_Bros.	best of my knowledge and beltef. Signed
(10) WATER LEVELS: Depth of first wäter, if known	by whom?McCalla_Bros. r	best of my knowledge and beltef. Signed
(10) WATER LEVELS: Depth of first wäter, if known Standing level after well completion WELL TESTS: was well test made? Yes k No I if yes Type of tost Pump Baile Depth to water at start of test h. Discharge 750. gal/min after 575 hours Chemical analysis made? Yes No 1 if yes	by whom?McCalla_Bros.	best of my knowledge and beltef. Signed



WELL NO. 26

LEGAL DESCRIPTION

Lot 1 of Tract No. 43865 in the County of Los Angeles, State of California as per map recorded in Book 1043, Pages 79 to 84, inclusive, of Maps in the office of the County Recorder of said County. ORIGINAL File with DWR

STATE OF CALIFORNIA THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES

Ι.

Do not fill in

New Wel Reconstru- Reconditi Horizonta Destructio destructio cedures in	ZIP93550	0 30 Sand, Gravel & Sm. Rocks 50 - 86 Sand, Gravel & Sm. Rocks 86 - 104 Fine Sand, Spots of Clay, Little G 104 - 119 Sand, Gravel, Some Clay 119 - 142 Sand, Gravel, Some Clay 142 - 147 Sand, Gravel 142 - 219 Sand Gravel 189 - 219 Sand Gravel 231 - 273 Band, Gravel, Sandy Clay 290 - 212 Sand & Gravel, Sandy Clay 312 328 Sand & Gravel, Sandy Clay 328 - 349 Sand & Gravel, Sandy Clay 328 - 394 Gravel, Gravel, Sandy Clay - - - - - - - - - - - <
1) OWNER: NamePalmdale_Water_Dist. Address2005_East_Avenue "O" SityPalmdaleCA 2) LOCATION OF WELL (See instructions): CountyLOS_AngelesOwner's Well Not Vell address if.different from above	ZIP93550	i Other Well No
Address 2005 East Avenue "O" Sity PalmdaleCA 2) LOCATION OF WELL (See instructions): Sounty Los Angeles Owner's Well No Yell address if different from above	ZIP93550	from fit to fit Formation (Describe by color, character, size or material) 0 0 - 50 Sand, Gravel & Sm. Rocka 50 - 86 Sand, Gravel & Sm. Rocka 86 - 104 Fine Sand, Spots of Clay, Little G 104 - 149 Sand, Gravel, Some Clay 119 - 142 Sand & Gravel 142 - 147 Sand, Gravel & Rock 147 - 189 Sandy Clay 189 - 219 Sand Sravel & Rock 219 - 231 Sand Shay 231 - 273 Band, Gravel, Spots of Sandy Clay 290 - 312 Sand Gravel, Sandy Clay 312 - 368 Sand & Gravel, Sandy Clay 312 - 368 Sand & Gravel, Sandy Clay 328 - 369 Sand & Gravel, Sandy Clay 329 - 356 Graphte 329 - 369 Sand & Gravel, Sandy Clay 329 - 369 Sand & Gravel, Sandy Clay 320 - 360 Graphte 320 - 360 Graphte 321 - 222 Sand & Gravel, Sandy Clay 322 - 369 Sand & Gravel, Sandy Clay 323 - 369 Sand & Gravel, Sandy Clay 324 - 369 Sand & Gravel, Sandy Clay 325 - 394 Graphte 326
Address 2005 East Avenue "O" Sity PalmdaleCA 2) LOCATION OF WELL (See instructions): Sounty Los Angeles Owner's Well No Yell address if different from above	ZIP93550	from fit to fit Formation (Describe by color, character, size or material) 0 0 - 50 Sand, Gravel & Sm. Rocka 50 - 86 Sand, Gravel & Sm. Rocka 86 - 104 Fine Sand, Spots of Clay, Little G 104 - 149 Sand, Gravel, Some Clay 119 - 142 Sand & Gravel 142 - 147 Sand, Gravel & Rock 147 - 189 Sandy Clay 189 - 219 Sand Sravel & Rock 219 - 231 Sand Shay 231 - 273 Band, Gravel, Spots of Sandy Clay 290 - 312 Sand Gravel, Sandy Clay 312 - 368 Sand & Gravel, Sandy Clay 312 - 368 Sand & Gravel, Sandy Clay 328 - 369 Sand & Gravel, Sandy Clay 329 - 356 Graphte 329 - 369 Sand & Gravel, Sandy Clay 329 - 369 Sand & Gravel, Sandy Clay 320 - 360 Graphte 320 - 360 Graphte 321 - 222 Sand & Gravel, Sandy Clay 322 - 369 Sand & Gravel, Sandy Clay 323 - 369 Sand & Gravel, Sandy Clay 324 - 369 Sand & Gravel, Sandy Clay 325 - 394 Graphte 326
Sity Palmdale. CA 2) LOCATION OF WELL (See instructions): County Los Angeles Owner's Well No Yell address if.different from above	umber 29 etion 35 S OF WORK: I 12 Deepening 1 toning 0 toning 0 on 1 (Describe on materials and pro- no Item 12) OPOSED USE: Street 16 Street 16	0 0 - 50 Sand, Gravel & Sm. Rocka 50 - 86 Sand, Gravel & Sm. Rocka 86 - 104 Fine Sand, Spots of Clay, Little G 104 - 119 Sand, Gravel Some Clay 119 - 142 Sand & Gravel 142 - 147 Sand, Gravel & Rock 147 - 189 Sandy Clay 189 - 219 Sand Sravel & Rock 219 - 231 Sand Sclay 231 - 273 & and Sclay 231 - 273 & and Sclay 290 - 30 Sandy Clay 312 - 349 Sand & Gravel, Sandy Clay 312 - 349 Sand & Gravel, Sandy Clay 328 - 349 Sand & Gravel, Sandy Clay 329 - 356 Grapher 336 - 394 Grapher
County LOS. Angeles Owner's Well No Vell address if different from above	ction 35 S OF WORK: I S Deepening controls of Well controls on materials and pro- n materials and pro- n Item 12) OPOSED USE: State V6 F	5086. Sand, Gravel & Sm. Rocks 86 - 104 Fine Sand, Spots of Clay, Little G 10419 Sand, Gravel, Some Clay 119 - 142 Sand, Gravel 142 - 147 Sand, Gravel 142 - 147 Sand, Gravel 189 - 219 Sand Cravel 219 - 231 Sand Clay 231 - 273 Band, Gravel, Spots of Sandy Clay 290 - 242 Sand & Clay 312 200 Sandy Clay 312 202 Sand & Cravel, Sandy Clay 328 - 349 Sand & Cravel, Sandy Clay 329 - 356 Graptte 320 - 394 Grantte d/Grap Clay, Some Gravel -
County LOS. Angeles Owner's Well No Vell address if different from above	ction 35 S OF WORK: I S Deepening controls of Well controls on materials and pro- n materials and pro- n Item 12) OPOSED USE: State V6 F	86 - 104 Fine Sand, Spots of Clay, Little G 104 - 119 Sand, Gravel, Some Clay 119 - 142 Sand, Gravel 142 - 147 Sand, Gravel 142 - 147 Sand, Gravel 142 - 147 Sand, Gravel 147 - 189 Sandy Clay 189 - 219 Sand Gravel 219 - 231 Sand Gravel 231 - 273 Sand, Gravel, Spots of Sandy Clay 290 - 242 Sand Gravel, Sandy Clay 312 A28 328 - 349 Sand & Gravel, Sandy Clay 328 - 349 Gravel, Sandy Clay, Some Gravel - - - - - - - - - - - - - - - - - - - - - - -
Vell address if different from above	ction 35 S OF WORK: I S Deepening controls of Well controls on materials and pro- n materials and pro- n Item 12) OPOSED USE: State V6 F	104 - 119 Sand, Gravel, Some Clay 119 - 142 Sand & Gravel 142 - 147 Sand, Gravel & Rock 147 - 189 Sandy Clay 189 - 219 Sand Sravel & Rock 219 - 231 Sand Sravel & Rock 211 - 273 Band, Gravel & Rock 213 - 273 Band, Gravel & Snots of Sandy Clay 231 - 273 Band, Gravel, Spots of Sandy Clay 231 - 273 Band & Gravel, Sandy Clay 290 - 212 Sand & Gravel, Sandy Clay 312 A28 312 A28 328 - 349 Sand & Gravel, Sandy Clay 328 - 349 Sand & Gravel, Sandy Clay 328 - 349 Sand & Gravel, Sandy Clay 349 - 356 Gravel, Sandy Clay, Some Gravel 349 - 356 Gravel Clay, Some Gravel - - - - - - - - - - - - - - - - - - - - - -
Distance from cities, roads, railroads, fences, etc. (3) TYPE New Wel Reconstru- Reconditi Horizonta Destruction Cedures in (4) PRO Domestic Irrigation Industrial Test Well Municipe Other WELL LOCATION SKETCH S) EQUIPMENT: Rotary E Reverse E Cable Air Other Backet Cable Air Other Backet Cable Air Cable Air Cable Air Cable Cable Cabl	S OF WOILK: I [2] Deepening [tetion [tening] on [] (Describe on materials and pro- n Item 12) OPOSED USE: Streep 16	142 - 147 Sand, Gravel & Rock 147 - 189 Sandy Clay 189 - 219 Sandy Gravel & Rock 219 - 231 Sand & Gravel & Rock 231 - 273 Band, Gravel & Spots of Sandy Clay 231 - 273 Band, Gravel, Spots of Sandy Clay 231 - 273 Band, Gravel, Sandy Clay 231 - 273 Band, Gravel, Sandy Clay 231 - 273 Band, Gravel, Sandy Clay 290 - 242 Sand & Gravel, Sandy Clay 312 328 328 - 349 Sand & Gravel, Sandy Clay 349 - 356 Grantre 346 394 394 Grantre 395 Grantre 396 Grantre 397 394 398 Grantre 398 Grantre 399 Grantre 390 Grantre 391 Grantre 392
(3) TYPE New Wel Reconstru- Reconditi Horizonta Destruction Cedures in (4) PRO Domestic Irrigation Industrial Test Wel Municipe Other WELL LOCATION SKETCH SequiPMENT: Rolary E Cable Air Other Cable Air Cable Air Cable Air Cable Air Cable Cable Cable Cable Cable Cable Cable Cable Cable Cable Cable From To Dia Cage or ft. fp. Dia Cage or the Cable Cabl	I [2] Deepening intion ioning ol Well on materials and pro- n Item 12) OPOSED USE:	147 - 189 Sandy Clay 189 - 219 Sand Sravel & Rock 219 - 231 Sand Eravel & Rock 219 - 231 Sand Eravel & Spots of Sandy Clay 231 - 273 Band, Eravel & Spots of Sandy Clay 273 - 290 Sand Eravel & Sandy Clay 290 - 312 Sand Gravel & Sandy Clay 312 328 328 - 349 Sand & Cravel & Sandy Clay 349 - 356 Grantte d/Grav Clay, Some Gravel 349 - 356 Grantte d/Grav Clay, Some Gravel - -
New Well Reconstru Reconstru Reconstru Reconstru Reconstruction Destruction destruction </td <td>I [2] Deepening intion ioning ol Well on materials and pro- n Item 12) OPOSED USE:</td> <td>189 - 219 Sand Sravel & Rock 219 - 231 Sand Slav 231 - 273 Band Spots of Sandy Clay 273 - 290 Sand Gravel, Sandy Clay 290 - 312 Sand Gravel, Sandy Clay 312 328 Sand & Cravel, Sandy Clay 312 328 Sand & Cravel, Sandy Clay 328 - 349 Sand & Cravel, Sandy Clay 349 - 356 Grantte 356 394 Grantte Gravel, Some Gravel - - -</td>	I [2] Deepening intion ioning ol Well on materials and pro- n Item 12) OPOSED USE:	189 - 219 Sand Sravel & Rock 219 - 231 Sand Slav 231 - 273 Band Spots of Sandy Clay 273 - 290 Sand Gravel, Sandy Clay 290 - 312 Sand Gravel, Sandy Clay 312 328 Sand & Cravel, Sandy Clay 312 328 Sand & Cravel, Sandy Clay 328 - 349 Sand & Cravel, Sandy Clay 349 - 356 Grantte 356 394 Grantte Gravel, Some Gravel - - -
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as surface sanitary seal provided? Yes 🙀 No 🖾 If yes, to d	.]	
	epth ft	ft
ere strate sealed against pollution? Yes 🔲 No 🗔 · Interv		ft
thod of scaling _30" conductor Cemented	in Place	Work started 5-30 19.89 Completed 6-30 19.89
0) WATER LEVELS:		WELL DRILLER'S STATEMENT:
pih of first water, if known		It. This well was drilled under my jurisdiction and this report is true to the
anding lavel after well completion104	ft	it. best of my knowledge and belief.
1) WELL (TESTS:	McCalla Bro	Signed
us well test made? Yes 🛣 No 🗌 If yes, by whom? -		NAME_McCalla Boos., Div. of Layne-Western Co.
sili to water at start of test ft. At end	of test ft	ft. (Person, firm, or corporation) (Typed or printed)
		Address .: 3132 W. 17th_St.
hemical analysis made? Yes 🗋 No 🕅 If yes, by whom?	temperature	10% Canta Ana 01 00300
As electric log made Yes No 🔀 If yes, attach copy IF ADDITIONAL SPACE		City Santa Ana, CA ZIP 92703
WR 168 (REV. 12-86)	to this report	License NoDate of this report8-31-89
	to this report	

WELL NO. 29

1

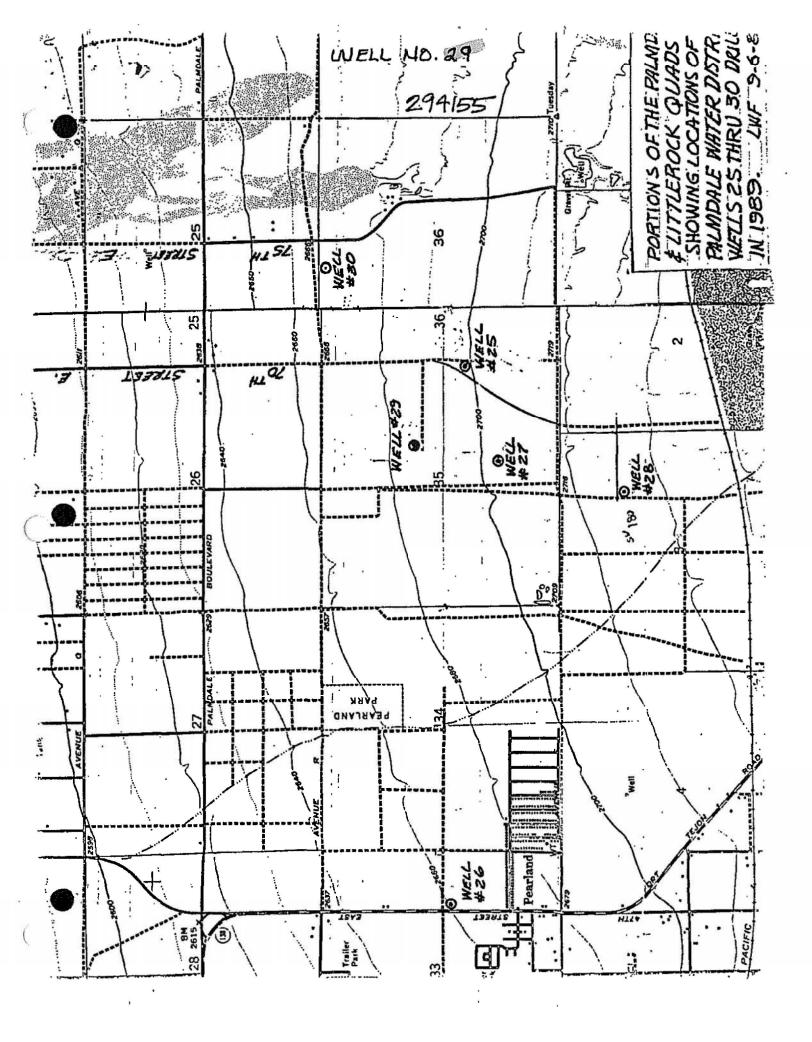
294155

LEGAL DESCRIPTION

A portion of the Southeast 1/4 of the Northeast 1/4 of Section 35, Township 6 North, Range 11 West, San Bernardino Meridian, County of Los Angeles, State of California.

Said land also described as Lot 215 of Tentative Tract No. 46768.

NOTE: Legal description will be forwarded when the tract is recorded.



TRIPLICATE Owner's Copy

STATE OF CALIFORNIA THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

Do not fill in

No. 294156

Reconditioning 411 - 424 Granite Betraction Betraction Hortzontal Well	Notice of Intent No.	State Well No.
Addres 2005 RattAvenue "Q" from f. to f. formation (Dearthe yeak, character, size or maturia)) (21) ToTLandala, CA ziP 23550 (21) LOCATION OF WELL (See instructions): 0 - 50 Conductor (21) LOCATION OF WELL (See instructions): 87 - 103 Fine Sand, Sand (Caravel, Sand Caravel, Sand Carav	Local Permit No, or Date	Other Well No.
City Palmdala, CA zip 93550 00 0 </td <td></td> <td></td>		
(2) LOCATION OF WELL (See instructions): 0		
Constr. Los. Angeães Ovner's Well Number 40 87 - 103 Fine Sand. Some Clay & Rock Well address if different from above 103 118 Fine Sand. Some Clay & Gravel Detarce from effects road, inflorads fences etc. 1124 - 155 Sand & Gravel 172 Well address if different from above 197 - 254 Sand & Gravel 172 Well address if different from above 197 - 254 Sand & Gravel 172 Well & Dependent 335 - 105 Clay Sond & Gravel 172 Well & Dependent 338 - 305 Sand & Gravel Sond & Gravel New Well & Dependent 338 - 401 Fine Sand & Gravel Sond & Gravel New Well & Dependent 338 - 401 Fine Sand & Gravel Sond & Gravel Well Address if different from store Industrial - 424 Grainite* - 411 Herrowith Industrial - 424 Grainite* - 411 - 424 Well Address if different from store Industrial - 424 - 424 - 424 </td <td></td> <td></td>		
Well address if different from above 118 Fine Sand, Sandry Clay Township_5R Barge_111W Section 36 118 - 124 Fine Sand, Some Clay & Gravel 1/2 Welles Cost, offF75th East 124 - 156 Sandry Clay, Some Sand & Gravel 1/2 Welle Social from the well of the sandry Clay is sand & Gravel 156 - 197 Clay is Sandry Clay, Some Sand & Gravel 1/2 Welle Social from the well of the sandry Clay is Sandry Clay, Some Sandry Sandry Clay, Some Sandry Sandry Clay, Some Sandry Sandry Clay, Some Sandry Sandry Clay is Sandry Sandry Clay is Sandry Sandry Clay, Some Sandry Sandry Sandry Clay, Some Sandry		
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Distance from citics roads rainwals froms site 124 -156 Sandy Clary, Sand & Gravel -1/2 !!!le So. offF75th East 197 -254 Sandy Clary, Sond & Gravel 256 -256 Clary, Sond & Gravel 256 (b) TYPE OF WORK. New Well & Despening 336 -339 Sand & Gravel New Well & Despening 336 -339 Sand & Gravel, Spots of Clary, Sond & Gravel Bernditoning Hernoutil Well -411 Fride Sand, Gravel, Decomp. Gran 1t Horrsontal Well		
1/2 !!!! So. off75th East 156 - 197 Clay (3) TYE OF WORK: 254 - 266 Clay/ (3) TYE OF WORK: 256 - 316 - Clay (3) TYE OF WORK: 256 - 316 - Clay/ (4) PROPOSED 258 - 431 Store Stand & Cravel. (4) PROPOSED USE - 431 France - 431 (4) PROPOSED USE - 431 - 431 - 431 (4) PROPOSED USE - 431 - 431 - 431 (4) PROPOSED USE - 431 - 431 - 431 (4) PROPOSED USE - 431 - 431 - 431 (4) PROPOSED USE - 431 - 431 - 431 (4) PROPOSED USE - 431 - 431 - 431 (5) EQUIPMENT 160 GRAVE RCK - 430 - 431 (6) EQUIPMENT 162 N/O - 434 - 430 - 431 (7) CASINO INSTALLED 160 GRAVE RCK - 434 - 430 - 434 (7) CASINO INSTALLED 160 GRAVE RCK - 440 - 440 -	Township Range Section 36	
197 - 254 Sand? Sand1 & Gravel (3) TYPE OF WORK: (3) TYPE OF WORK: 256 - 316 - Clay \ Some Sand & Gravel New Well & Deceming 336 - 398 Sand & Oravel , Spots of Clay Reconstruction 338 - 4311 Trias Sand, Gravel , Spots of Clay Beconditioning 411 - 424 Grainite? Hortzonal Well	Distance from cities, roads, railroads, fences, etc.	124 - 156 Sandy Clay, Sand & Gravel
254 - 266 Clary, Spine Sand & Gravel (3) TYPE OF WORK: 266 - 316 -Clary, Spine Sand, & Gravel New Well & Despening 316 - 328 Sand, & Cravel, Decomp. Grant: Reconstruction - 338 - 411 Fine Sand, & Cravel, Decomp. Grant: Reconstruction Observed. - 411 Fine Sand, & Cravel, Decomp. Grant: Hortzonal Well	_1/2 Mile So. off75th East	
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Reconstruction 398 411 Fries Sand, Gravel, Decomp. Grantic Horizonal Well	New Well 🕱 Deepening	316 - 398 Sand & Gravel, Spots of Clay
Reconditioning 411 - 424 Granite Betraction Betraction Hortzontal Well		200 Old Eline Canal Courses Desame Courses
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destruction materials and pro- cedures in film 12 image: construction materials and pro- cedures in film 12 (4) PROPOSED USE: - Domestic Irrigation Irrigation Industrial Municipal 0 (5) EQUIPMENT: (6) CRAVE FACK Board 20 Beverse CK (6) EQUIPMENT: (6) CRAVE FACK Board 20 Beverse CK VEL.L LOCATION SKETCH (CRAVE FACK (7) CASING INSTALLED (CRAVE FACK State 1 Despring for 28th Trice 1 Proposition A ALD TA - (7) CASING INSTALLED (S) PERPORTINGS: FULL PLO State 2 Plant: O 410 145-970-5715 (9) WELL SEAL: No Hyes to depth West stated dapins pultism? Yes No Hyes to depth (10) WATER LEVELS: Interval Depth of usater, flawore 10 (11) WELL TESTS: No Hyes to depth State Att in No in No Myes to depth State Att in No in No Myes to depth Typed for and act, flawore (11) WELL TESTS: Wavel tot tanke? Wavel tot tanke? Name Xee in water No in No in the reservater (11) WELL TESTS: <		
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Rotary Z Bovense IX In IX No I State 116 Space Cable I Air II Dapartics of bore 28tf Other Bucket Packed from A to 410 ft - (7) CASING INSTALLED. (8) PERPORATIONS. FULL Flo - From To Dig. Cage or From To Store 1 10 410 36-9705. Full / Flo - 6 410 36-9705. Full / Flo - 6 10 12. Cage or From To Store 70 Dig. Cage or From To Store 9 WELL SEAL: - - Was surface sanitary scale provided? Yes I No Interval - - (9) WELL SEAL: No Interval - - Was surface sanitary scale provided? Yes I No Interval - - (10) WATER LEVELS: Wet started 6-12 19.89 Completed 7-18 19.89 - Depth of (atware, if known 126 It This well was drilled under my jurisdiction and this report is true to the last of my knowledge and hellef. (11) WELL TESTS: No Interval This well was drilled under my jurisdiction and this report is true to the last of my knowledge or musted Yes I No We by whom? McCalle Bros <td< td=""><td>(5) EQUIPMENT</td><td>$\Omega_{\Lambda^{-}}$</td></td<>	(5) EQUIPMENT	$\Omega_{\Lambda^{-}}$
Cable Air Diametered bore 28th Other Bucket Backet from A 410 - (7) CASING INSTALLED: (8) PERPORATIONS: Full Plo - - (7) CASING INSTALLED: (8) PERPORATIONS: Full Plo - - Steel & Plaute cancerte Frid Waterford With Active Wither - From To Dia. Cage or Broin To Silet - 0 410 JGUTIDES/16 200 (410) 070x2/s - - (9) WELL SEAL: - - - - - - (9) WELL SEAL: - - - - - - (9) WELL SEAL: - - - - - - (9) WELL SEAL: - - - - - - - (10) WATER LEVELS: No Interval th - - - - - - - - - - - - - - - - - - -		
Other Bucket Packed from 0 410 - (7) CASING INSTALLED: (8) PERPORATIONS. Full Plo - Sceel 52 Plautic Concrete Principl Other Mon 21 & 8 & 1 & 900 Principle From The Dia. Cage or From The State 0 410 JG. The Wall - - 9) WELL SEAL: - - - - (9) WELL SEAL: - - - - Was surface sanitary aral provided? Yes 52 No If yes to depth 50 It - (9) WELL SEAL: - - - - - Ware strata scaled against pollution? Yes 10 Interval It - Were strata scaled against pollution? Yes 10 Interval It - Were strata scaled against pollution? Yes 10 No Interval It - (10) WATER LEVELS: Well Drilled under my jurisdiction and this report is true to the lest of my knowledge and belief. - - (11) WELL TESTS: Was well text made? Yes 5 No Hyes, by whom? MCCalls Bros		
(7) CASING INSTALLED: (8) PERPORATIONS: Full Flo Sted S2 Plastic Concrete From To Dig. Cage or From To Dig. Cage or From To To Stot - - From To Dig. Cage or From To Wall From To Stot - 0 410 16" Tox5/16 200 (410) O70x2/5 - - - (9) WELL SEAL: - - - - - - - Was surface sanitary scal provided? Yes ID No ID Interval It - - - - (9) WELL SEAL: -		<u> </u>
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From [l. To [h] Dia (h) Cage or Wall Direm To Size	(7) CASING INSTALLED: (1) (8), PERFORATIONS FULL FLO	- Juh)
From [l. To [h] Dia (h) Cage or Wall Direm To Size	Steel & Plastic D Concrete D Prise at 12 to 150 51 512 bi second ver	
Il In Wall Value Size 0 410 16 VIT x5/16 200 (410) 070 x2 ½ 0 410 16 VIT x5/16 200 (410) 070 x2 ½ 0 410 16 VIT x5/16 200 (410) 070 x2 ½ 0 410 16 VIT x5/16 200 (410) 070 x2 ½ 0 0 10 Void 2 10 Void 2 - (9) WELL SEAL: - - - Was surface sanitary seal provided? Yes (2) No (1) If yes to depth 50 ft. - - Were strata sealed against pollution? Yes (1) No (1) If yes to depth 50 ft. - - Were strata sealed against pollution? Yes (1) No (1) Interval (1) it. - - Were strata sealed against pollution? Yes (1) No (1) Interval (1) it. - - Were strata sealed against pollution? Yes (1) No (1) Interval (1) it. - - Work started fear well completion (126) It. - (10) WATER LEVELS: Well best of my knowledge and belief. - (11) WELL TESTS: No (1) If yes by whom? McCalla Bross Signed (10 Bross, 0) Uv. of Layne-Hestern Co. Name (14400 gal/min after (1400 gal/min after (1400 ga		
0 410 410 6"TI x5/16 200 (410) 670x2/3 (9) WELL SEAL: - - (9) WELL SEAL: - - Was surface sanitary scal provided? Yes (2) No (1) It yes, to depth 50 It. Were strata scaled against pollution? Yes (2) No (1) Interval it. - Were strata scaled against pollution? Yes (2) No (1) Interval it. - Work started 6=12 19 89 Completed 7-18 19 89 (10) WATER LEVELS: Work started 6=12 19 89 Completed 7-18 19 89 (10) WATER LEVELS: Werl Driller's water, if known ft. This well was drilled under my jurisdiction and this report is true to the best of my knowledge and beller. Signed - NAME McCalla Bross Signed - NAME		
(9) WELL SEAL:		
(9) WELL SEAL:	0 410 300 10X3/10 200 1(410) 070423	
(9) WELL SEAL:		
Was surface sanitary seal provided? Yes X No If yes, to depth 50		
Were strata scaled against pollution? Yes No Intervalit. Method of scaling		
Method of sealing 30" Completed 7-18 19 89 (10) WATER LEVELS: Work started 6-12 19 89 Completed 7-18 19 89 (10) WATER LEVELS: Well DRILLER'S STATEMENT: Well DRILLER'S STATEMENT: Depth of first water, if known 126 ft. This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. (11) WELL TESTS: Signed (Well Deiller) Was well text made? Yes No If yes, by whom? McCalla Bros Signed (Well Deiller) NAME McCalla Bros. 0 0 Water temperature NAME McCalla Bros. 0 10 Well Deiller) NAME McCalla Bros. 0 10 NAME McCalla Bros. 0 10		
(10) WATER LEVELS: Depth of first water, if known		
Depth of first water, if known		
Standing level after well completion 126 ft Standing level after well completion 126 ft (11) WELL TESTS: If yes, by whom? McCalla Bros Signed Was well test made? Yes No If yes, by whom? McCalla Bros Bailer Air lift NAME McCalla Bros Of Layne-Western Co. Opeth to water at start of test ft. At end of test ft. NAME McCalla Bros Discharge 1400gal/min after hours Water temperature Address 3132 U. 17th Str. ZIP 92703	(10) WATER LEVELS:	WELL DRILLER'S STATEMENT:
Standing level after well completion 120 11 (11) WELL TESTS: If yes, by whom? McCalla Bros Signed Yas well test made? Yes No If yes, by whom? McCalla Bros Type of test Pump Bailer Air lift Depth to water at start of test ft. At end of test ft. Discharge 1400gal/min after hours Water temperature City Santa Ana, CA ZIP 92703		This well was drilled under my jurisdiction and this report is true to the
Was well text made? Yes Yes No If yes, by whom? McCalla Bros Signed (Well Deiller) Type of test Pump Bailer Air lift NAME McCalla Bros Div. of Layne-Western Co. Depth to water at start of test ft. At end of test ft. McCalla Bros Div. of Layne-Western Co. Discharge 1400gal/min after hours Water temperature Address 3132 U. 17th St. Chemical analysis made? Yes No fit yes, by whom? City Santa Ana, CA ZIP 92703	Standing level after well completion 126 ft.	best of my knowledge and belief.
Was well text made? Yes Yes No If yes, by whom? McCalla Bros Signed (Well Deiller) Type of test Pump Bailer Air lift NAME McCalla Bros Div. of Layne-Western Co. Depth to water at start of test ft. At end of test ft. NAME McCalla Bros Div. of Layne-Western Co. Discharge 1400gal/min after hours Water temperature Address 3132 U. 17th St. Chemical analysis made? Yes No fit yes, by whom? City Santa Ana, CA ZIP 92703	(11) WELL TESTS:	
Type of test Pump [X] Bailer [] Air lift [] NAME McCalla Brose Div. of Layne-Western Co. Depth to water at start of test ft. At end of test ft. At end of test ft. NAME McCalla Brose Div. of Layne-Western Co. Discharge H400gal/min after hours Water temperature Address 3132 W. 17th St. Chemical analysis made? Yes [] No fit yes, by whom? City Santa Ana, CA ZIP ZIP		(Well Driller)
Discharge hours Water temperature Address3132 W. 17th St Chemical analysis made? Yes D No D If yes, by whom? City Santa Ana, CA ZIP92703	이 방법 정말 방법 및 및	NAME McCalla Bros., Div. of Layne-Western Co.
Chemical analysis made? Yes 🗌 No 🙀 If yes, by whom? City Santa Ana, CA ZIP2703		ATAM IT TOLL OF
Was pipetric for made for i No bill II was allach encount his second i I franza Mar A HISTI Data al this marrier U. 71	Was electric for made Yes No 😼 If yes, by whom?	License No. 510011 Date of this report 8-31-89

DWR 188 (8FV. 12-86)

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

- wee # 32

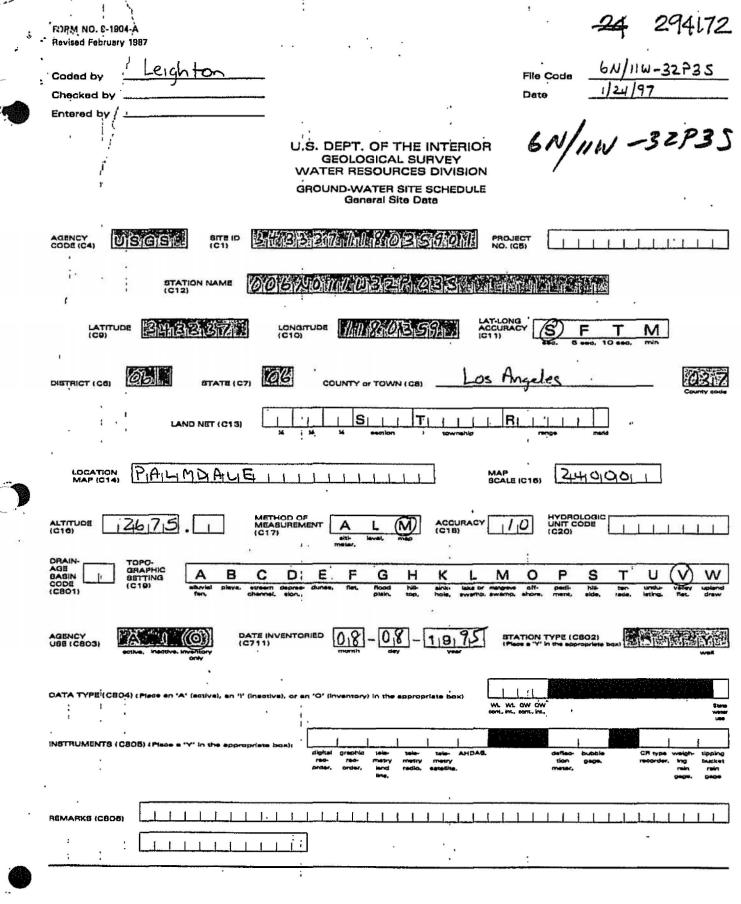
		CALIFORNIA	
TRIPLICATE		RCES AGENCY	Do not fill in
Owner's Copy	WATED WETT T	WATER RESOURCES	No. 294172
Notice of Intent No	e)	States REPORT	110. 204112
Notice of intent int.	6	Sta	te Well No
Local Permit No. or pate	42	Ot	er Well No.
(1) OWNER: Name Palmdale, Wat	er Mistrict	(12) WELL LOG: Total depth	80 ft Completed death 570 ()
Address 2005 E. Avenve "0" 111	<u></u>		be by color, character, size or material)
City Palmdale, CA 1-10,17			Sand, Gravel w/Clay
(2) LOCATION OF WELL (See instra	retions): 32		avel, Some Rocks
County Los Angeles	r's Well Number 37	60 - 70 Fine Grav	
Well address if different from above	er a men minnerea.	70 - 80 Sand & Gr	and a state of a state
Township Range	Section	80 - 90 Fine Sand	
Distance from cities, roads, railroads, fences, etc.		90 - 100 Sand	~
50' N. R8		100 - 110 Sandy Cla	$\sim 1/2$
50' W. of 35th St. East		110 - 120 Fine/Sand	
	T	120 - 130 Med. (A)	Barse Sand, Some Clay
	(3) TYPE OF WORK:	130 - 180 (Rine to(C	Marse Sand, Some Clay
	New Well I Deepening	180 - 200 Kine cd C	parse Sand
	Reconstruction	200 - 220 Find to C	parse Sandy Clay
	Reconditioning	220 (230 Fine Sand	& Little Clay
	Horizontal Well		& Mostly Clay
	Destruction D (Describe destruction materials and pro-	240 - 250 Fine & Co. 250 270 Fine Sand	fse Sand
1	cedures in Item 12)		-
	(4) PROPOSED USE:	280 - 290 Fine Sand	Sand & Mostly Clay
	Domestic		a firtle Clay
1	Irrigation	310 A Alto Piner Sand	A LIFFIE LIAY
	Industrial	4100-450 Sand	R CIAY
	Test Well	650 9 460 (Sand & Mor	atty Clay
	Municipal R	\$60) - 470 Sand & 1.11	
L	Other (Describe)	2) 470 - (180) Sand & Mor	tly Clay
WELL LOCATION SKETCH	(V480 - 490 firrle Cla	y & Mostly Sand
(5) EQUIPMENT:	VEL PACK 5/16-Special	490/- 500 Sand & Mos	tly Clay
Rotary K Heverse T Virs 12			y Clay
Cable D Air Diamete		(Sig) - 530 Sandy Clay	
Other D Bucket Racked I	0m - 0 - 6 - 580 (10		& Some Gravel
(7) CASING INSTALLED: (()) (8) PER	FORATIONS Hort Tour	1 550 - 560 Sand & Son	e Gravel
Steel De Plastic D Concrete D The M	ORATIONS HOTIZ ROUVE	E 560 - 580 Hard Grant	te
From To Dia Gage or Ager			
ft. fd fn Wall	S Att. Size		······································
0 570 16 5/16 280	(170 3/32×23	· ·····	
	CHILL PLOCE		
	No	_	** ************************************
(9) WELL SEAL:		-	
	If yes, in depth ft.		
Were strata sealed against pollution? Yes D No 50		-	
Method of scaling 30" conductor Come	nted in Place	Work started_10-19_19_89	Completed1 1989
(10) WATER LEVELS: Depth of first water, if known		WELL DRILLER'S STATEMEN	T:
a. h. h. e. e. e.	{t.	This well was drilled under my jurisdict	ion and this report is true to the
(11) WELL TESTS:	<u>n.</u>	best of my knowledge and beltef.	
	whom? McCalla Brog	Signed	TC ag
Type of test Pump X Bailer [J Airlift 🗌	NAME McCalla Bros. Div.	Of Lavne-Vestern Co.
Depth to water at start of test [1] Discharge gal/min after 30 hours	At end of test ft.	(Ferson, firm, or corpor	ation) (Typed or printed)
Discharge <u>450</u> gal/min after <u>30</u> hours Chemical analysis made? Yes No 🕞 If yes, by	Water temperature	Address 3132 W. 17th St.	
	ach copy to this report N.A.	City <u>Sent a Ana, CA</u> License No. <u>510011</u>	ZIP92703
	B.A.		Date of this report 1-9-90

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					WELL	··· · · · · · · · · · · · · · · · · ·
1.0	, , , , , , , , , , , , , , , , , , ,	÷ `				and and
•.	· _ /	STATE OF C				
101 I I I	RIPLICATE	THE RESOURC	÷	DOFE		Do not fill in
	IWners LODY	ARTMENT OF W			No	294172
	A CONTRACTOR	ER WELL DE	urrens w	ron	140.	
1	Nutice of Intent Na. 13 01				State Well No	
1	acal Permit No. or pine OPAT Har				Other Well N	lo/
	1) OWNER: Name Paliticia, Water Dia	trict	(10) WELL 1	OC. Total day	580 0	Completed depth 570_1.
(1) OWNER: Neine Pelfillete Water Dial	LEVEL F				
	Thy Palmdale, CA JUJI 11	ZIP 92550		the second se	And in case of the local division of the loc	r, character, size or material) Gravel w/Clay
		32	50 - 1		A second s	Some Rocks
(2) LOCATION OF WELL (See instructions):	200000	the subscription of the second division of th	O Fine G	a subscript strands and strands and strands	JOINE ROLKS
	hunty Los Angeles TISISOwner's Well No	unber	The second s	0 Sand &		
	Well address if different from above			O Fine Sa		
	Founship Nange Se		90 - 10			
	Distance from cities, roads, railroads, fences, etc.		100 - 11		1/101	~
	50' W. of 35th St. East		110 - 13			/
•			120 - 1	, martine the		Sand, Some Clay
I	(2) TVPI	OF WORK:	130 - 18			Sand, Some Clay
		I IN Deepening	180 - 20		Coarse	
ļ	Recorder		200 - 2			Sandy Clay
	Recorditi	-	220 (1)			ttle Clay
	Horizont		230 - 2	D Eine S	and (& Mos	atly_Clay
		on 🗋 (Describe	240 2		Coarse	
	destruction	in materials and pro-	250 7 22	O FINAS	and C	<u>}</u>
			270 21			Mostly Clap
		OPOSED USE	<u>> 280 - 2</u>	Fine S		<u> </u>
	Domestic		<u>/290 - 3</u>			ttle Clay
	Irrigation Industria		1310 84	In Fings	and & CL	ау
	Test We	111-	4102-14	Sand	20-	
	Municip		6350 24		Montly	
₽	1 Other		<u>-460) - 4</u>	1715 11	Little	
	WELL LOCATION SKETCH (Pargilin				Mostly	Mostly Sand
		5/16-Speed			Mostly_	•
		a SI TO-Shees?		10 Green		
		(abii)	CHOIL :	30 Sendy	clay	oy
		0 580 (7)			care j	ma Gravel
		- O		60 Sand 5		
)	(7) CASING INSTALLED: (8) PERFORATIO	10 diaman	E 560 - 5	80 Hard G	것 - 김 수영에는 동안하는 것 가지?	4441-14-14-1-1-1-14-14-1-1-1-1-1-1-1-1-
1	Sirel 50 Plaule D Sonerrie D TStol Withholden	C hears in Bit &		<u> </u>	4. 14. 14. 14. 19 ⁰ (1997)	
5	From To Dia. Gage or Right	Vol Slot	<u> </u>			
	1. A fr. Wall	size	-			
	0 570 16 5/16 280	10 3/32×21	-			
		10				
	(9) WELL SEAL:					······································
	Was surface sanitary seal provided? Yes 🕞 No 🗍 If yes, in a Were strain sealed against pollution? Yes 🗍 No 🛱 Inter-	· · · · · · · · · · · · · · · · · · ·	<u> </u>			
	Method of scaling _30 ¹¹ _conductor_Comented_			0.10	00 0	1. 1 11 27 10 0
	(10) WATER LEVELS:	in riace	Work started_1 WELL DRIL			leted11=27198
	Depth of first water, if known	р	000000000000000000000000000000000000000			•
	Standing level after well completion238	í.	This well was dr locat of my knowl	illed under my j	urisdiction an	d this report is true to the
	(1) WELL TESTS:			State and ocher.	~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
		McCalla Bros	Signed		Well Diller	- X X
	Type of test Pump 🕱 Bailer 🗍	Air life	NAME McCal	In Bros		Lavne-Western Co.
		it of test ft.				(prod or printed)
	Hischarge 450 gal/min after 30 lours Wate Chemical analysis made? Yes 🖸 No 🗮 If yes, by whom?	r lemperalute	Address 3132		• • • • • • • • • • • • • • • • • • • •	
	Was electric log made Yes W No L If yes, attach copy		Lingues No.	10011	Data	this report <u>1-9-90</u>
	DWR 186 (REV. 12-86) IF ADDITIONAL SPAC	H IS NEEDED. USE	NEXT CONSECUT	IVELY NUMBER	ED FORM	and the second
						E6 9635

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GIOUND-WATER SITE DATA	•
DATA RELIABILITY (C3) I checked, bostion, dees, orecked DATE OF CONSTRUCTION (C21)	
UGE OF WATER A B C D E F H I J K M N P Q R S T U Y Z	
sir bos commen des power, fins domes interinded, media indus public aque noores stoot, insti- unused, deselfor other cond., tiling, clei, wetter, tio, gation, tooglingt, sinal, trial, supply, outrure, tion, turiones, etcon	
BECONDARY USE OF WATER IC26) (Sta use of water) (Sta use of water)	
HOLE DEPTH (C27) ISBO. I WELL (C28) IS70. I BOUNCE OF DEPTH A D G L M O R S Z Other grout, other reporting other population of the reporting other reporting other sported, egenoy.	
WATER LEVEL (C30)	
METHOD OF WATER-LEVEL MEASUREMENT (C34) I string, segion, osibbred estimated, pressure calibrated geophysic manameter non-red, reported, steel status dalibrated calibrated estimated, pressure calibrated geophysic manameter non-red, reported, steel status dalibrated calibrated estimated, pressure calibrated	
SITE STATUS FOR WATER LEVEL (C37) WATER LEVEL (C37) WATER LEVEL (C37) WATER LEVEL (C37) WATER LEVEL (C37)	
BOURCE OF WATER-LEVEL DATA (C33) A D G L M O R S Z	
CONSTRUCTION DATA BECORD TYPE (C784) SIGINS RECORD SEQUENCE NO. (C723) DATE OF CONSTRUCTION (C80) [1] - 217 - 1191817	
NAME OF CONTRACTOR LAT NIE -WESTIRN BOURCE OF DATA A D G L M O R S Z (CO4) Other Office, geology State, State Memory State, State Memory State, State Memory State, State Memory State	
METHOD OF CONSTRUCTION (C65) A B C D H J P R T V W Z stronger, bored or seble tool, dug, hydrifelike jetted, eit per revenue transhing, driver, drive which, other	
TYPE OF FINISH (CBS) C F G H O P S T W X Z porces officer gravel horts, open per, or somen, sand welled, open other porces officer, sovern, gallery, end, storest, and welled, open other porces officer, sovern, gallery, end, storest, and welled, open other porces officer, sovern, gallery, end, storest, sovern, poly, welled, open other	
BOTTOM OF SEAL (C66) 150 METHOD OF DEVELOPMENT (C69) A B C J N P S Z	
HOURE OF DEVELOPMENT (C70)	

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fr. • •	
	CONSTRUCTION LIFT DATA 294172
	HECORD TYPE (C782) RECORD BEQUENCE NO. (C264) RECORD BEQUENCE NO. (C264) RECORD BEQUENCE NO. (C264) RECORD SEQUENCE (C43) RECORD SEQUENCE (C43) RECORD SEQUENCE RECORD SEQUENC
•	DATE RECORDED
	HORBE- POWER RATING MANUFACTURER SERIAL NO (C48) (C48)
,	POWER METER NUMBER (CS2)
	PERSON OR COMPANY MAINTAINING PUMP (C64)
	MISCELLANEOUS OWNER DATA
	RECORD TYPE (C768)
Ő	EXAMPLES: JONES, RALPH A. JONES CONSTRUCTION COMPANY
•	MISCELLANEOUS OTHER ID DATA RECORD TYPE (C770) OTTAILED RECORD BEQUENCE OOTHER ID (C190) 2014 MARCHINE STATES
•	ABBIGNER (C101) D. ILOGI LILIII
	MISCELLANEOUS OTHER DATA
	RECORD TYPE (C772) OITPIDIT
	TYPE (CIBI) R. R. F. T.
	OTHER DATA LOCATION (C182) C D R Z Cooperetor's District Reporting other Comperetor's Office Agency other
	MISCELLANEOUS VISIT DATA RECORD TYPE (C774) MUSIT RECORD BEQUENCE NO.(C737) DATE OF VISIT (C187) - 08 - 99245
	NAME OF PERBON (C188) MEITIZIGIEIRA, 1 121.1 F.
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TRIPLICATE Owner's Copy

STATE OF CALIFORNIA THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES WATER WELL DRILLERS REPORT

Do not fill in

No. 322406

Notice of Intent No.	
Local Permit No. or	Date

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State Well N	Na	
Other Well	No	

(1) OWNER: Name Palmdale Water District Address 2005 East Ave. Q	(12) WELL LOG: Total depth 365 ft. Completed depth 465 ft.
City_Palmdale93350	Irom ft. to ft. Formation (Describe by color, character, size or material) 0 _ 80 Conductor (Sand)
(2) LOCATION OF WELL (See instructions):	80 - 100 Sand
County Los Angeles Owner's Well Number 33	100 - 150 Sand, Gravel
Well address if different from above	150 - 210 SnadelCaey
Township 6N Range 11W Section 36	210 - 245 Gravel and Sand
Distance from cities, roads, railroads, fences, etc.	245 - 280 Clay, Sabd
1/4 mile west of 75th st. on R	280-2560 Gravel and Sand
	360 - 400 Sandy Gravel
	400 - 410 Sand/Clay
(3) TYPE OF WORK:	410 - 455 Gravel and Sand
New Well Deepening	455 - 469 Decomposed granite, Bedrock
Reconstruction	- / //
Reconditioning	
	11- 2 (6)
Destruction (Describe destruction materials and pro-	
cedures in Item 12)	
(4) PROPOSED USE	
Domestic	
Irrigation	A W ARE
Industrial	
Test Well	
Municipal	
Other	(1)) - <u>((</u> ))
(5) EQUIPMENT: (6) GRAVEL PACK. 428/6212 BJ C	nd (/~- )
Rotary D Reverse K Yes D No D Size	
Cable Air Diameter of bore 202	O(N)
Other Bucket-D Packed from _0 10 465/ ft-	<u> </u>
	<u> </u>
(7) CASING INSTALLED. (8) PERPORATIONS S.S. WIRe	2
Steel Plastic D Controle Type of perforation or size of attend P SCI	
From To Dia Cage or Riom To Slot	
ft. ft. in.) Wall ft size	
0 220-16" .250 220 .240 .040	· · · · · · · · · · · · · · · · · · ·
240 280 16" .250 280 460 .0702	
460 465 16" .250	······································
(9) WELL SEAL:	ـــــــــــــــــــــــــــــــــــــ
Was surface sanitary seal provided? Yes C No I If yes, to depth 80 ft.	an a
Were strata sealed against pollution? Yes D No DX Interval ft.	- 4
Method of scaling 30" conductor cemented in place	700 10 -
(10) WATER LEVELS:	Work started 3/8/91 19 Completed 4/2//91 19 WELL DRILLER'S STATEMENT:
Depth of first water, if known130 (t	
Standing level after well completion130 ft.	This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
(11) WELL TESTS:	May ). Marhael
Was well test made? Yes No I If yes, by whom? HestCoast Da	Well Driller) NAME West Coast Dwilling
Type of test Pump Dog Bailer Air lift D	
1000	Address 11060 Calabash AVe.
Discharge gal/min after hours Water température Chemical analysis made? Yes NoX If yes, by whom?	City Fontana CA 92335
Was electric log made Yes X No I If yes, attach copy to this report	License No. 600680 Date of this report 5/1/91
יישרא דווא אין אוואטיי דו איז בו גע וו אינה אוווינה געווינה געו	Date of this report

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ORIGINAL File with DWR	:			WEL	L COM	PLETI	ON 1		rÉ	DIS N	E ON	W	0.0 N	WOIS
Page of					Refer to In		Pamph	iei ;			STATE	WELL N	IO./STA	TION NO.
Owner's Well No	35					• 4(	)26	41						
Date Work Began .		27-9			7-30-91	' '			<u>ات</u>	LATITUDE			10	DNGITUDE
Local Permit Age	ency	مطي	AC	ounty_Heal			~		_  ∟		<u></u>	11		
Permit No	61385		inor		t Date	<u>    7-3-</u>	91		<u> </u>				S/OTHE	н
	r X		LOGIC		10000	PROLATE REAL		- 117-1V		WELL C		R —		
ORIENTATION (2)	VERI	TICAL		174	NGLE		Name			AV		<u>.</u> N#		·····.
DEPTH FROM	i depth	TO F	TRST W	· · · · · · · · · · · · · · · · · · ·	) BELOW, SUI	AFACE (	Mainr	Palm		CLAN		¥	9355	0
BURFACE Ft. to Ft.	1	D		ESCRIPTION naterial, grain size, c		a 110	CITY	- Chil	VIC	~		où messur	9355 8T/	TE ZIP
0 60	Sand,	and the second second	avel	, Cobbles	× 115	12	Addre	11	1	WELLICO	CATI	ON _		
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310 : 450	Sand,	Gr	avel	(& Light C	lav \v	11	1 ~	Book 30			Parce	1	3	
450 460	Clay,	, Sa	nd28	Gravel C	111	5/2	1	hip 5N	Range		Sectio		3	Circle Contractor
460. 520	Clay.	-8-2G	irave	1.2111	1111		Latitu		Trange		Longi			
520 630	Clav	11		1/2/11		(3)	15	"DEG.	MIN. SEC	ç.	Eving.		DEG.	MIN, SEC.
630 800	-Cl'ay	w/S	land\	& Gravel )	No Ke				NORT	SKETCH			XX	CTIVITY,(∠ ÆW WELL
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i		******					illusin such a	ate or Descri u Roeds, Buil SE BE ACC	dings, Fenc	of Well from	n Landı c.	markt	•	OTHER (Specify
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; ;		÷						WATER	LEVEL	A YIELD				D WELL -
							DEPTH	OF STATIC	174	_ (Ft.) & D/	ATE ME	ASURE	0 7	-91
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	DIA.			MATERIAL/	INTERNAL	GAUGE		LOT SIZE			CE-	BEN-		
Ft. to Fl.	(Inches)	SILAN	CON- DUCTOR	GRADE	(inches)	THICKNE		(Inches)	FI.	to FI.	MENT	TONITE		FILTER PAG
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# **APPENDIX B**

# Inventory of Available Downhole Video Surveys



Well_Name	Date	Format	Notes	Company
15th Street	22-Feb-90	VHS		McCalla Water Well Services Company
Well 2A	07-May-01	VHS		Welenco
Well 2A	21-May-01	VHS		Welenco
Well 2A	27-Apr-10	DVD		Pacific Surveys, LLC
Well 2A	09-May-10	VHS		Welenco
Well 2A	<b>22-Jun-1</b> 0	DVD		Pacific Surveys, LLC
Well 3	25-Apr-12	DVD	Pre Video	Layne Christensen Company
Well 3	24-May-12	DVD	After Brushing	Layne Christensen Company
Well 3A	16-Nov-92	VHS		Layne Christensen Company
Well 3A	23-Dec-92	VHS		McCalla Water Well Services Company
Well 3A	29-Jan-93	VHS		McCalla Water Well Services Company
Well 3A	20-Jul-04	DVD		Layne Christensen Company
Well 3A	04-Aug-04	DVD	After Brushing	Layne Christensen Company
Well 3A	25-Aug-04	DVD	After Patching	Layne Christensen Company
Well 4	10-Nov-97	VHS		Barbour Well Surveying Corporation
Well 4	08-Dec-97	VHS		Barbour Well Surveying Corporation
Well 4	22-Dec-97	VHS		Barbour Well Surveying Corporation
Well 4	15-May-01	VHS		Welenco
Well 4	24-May-01	VHS		Welenco
Well 5	16-Jul-02	VHS		Layne Christensen Company
Well 6	10-Jul-98	VHS		Layne Christensen Company
Well 6	21-Aug-98	VHS		Layne Christensen Company
Well 6	29-Oct-03	DVD		Layne Christensen Company
Well 6	24-Nov-03	DVD	After Brushing	Layne Christensen Company
Well 6	28-Sep-05	DVD		Layne Christensen Company
Well 6	19-Jan-06	DVD		Layne Christensen Company
Well 6	30-Mar-18	DVD		Well Rehabilitation Services, Inc.
Well 6	15-May-18	DVD		Well Rehabilitation Services, Inc.
Well 6 (Dupe)	24-Nov-03	VHS	After Brushing	Layne Christensen Company
Well 6A	12-Jan-93	VHS		McCalla Water Well Services Company
Well 7	24-Nov-08	DVD		Layne Christensen Company
Well 7	13-Feb-09	DVD	After Rehabilitation	Layne Christensen Company
Well 7	16-Mar-09	DVD	After Rehabilitation	Layne Christensen Company
Well 7	28-Apr-09	DVD	After Patch	Layne Christensen Company
Well 7	07-May-18	DVD		Pacific Surveys, LLC
Well 7	25-Jun-18	DVD		Pacific Surveys, LLC
Well 7	09-Jul-18	DVD		Pacific Surveys, LLC
Well 7A	04-May-20	DVD	Screen Rupture	Unknown
Well 8	07-Nov-07	DVD	-	Layne Christensen Company
Well 8	27-Nov-07	DVD		Layne Christensen Company
Well 8A	20-Nov-00	VHS		Welenco
XX7. 11. 0. A	40.1.44	DUD		

Well 8A

18-Jan-16

DVD



Pacific Surveys, LLC

Well_Name	Date	Format	Notes	Company
Well 8A	22-Feb-17	DVD		Pacific Surveys, LLC
Well 9	23-Dec-92	VHS		McCalla Water Well Services Company
Well 9	29-Apr-97	VHS		Welenco
Well 9	12-May-97	VHS		Welenco
Well 10	23-Dec-92	VHS		McCalla Water Well Services Company
Well 10	05-Feb-93	VHS		McCalla Water Well Services Company
Well 10	07-Apr-05	DVD		Layne Christensen Company
Well 10	25-Apr-05	DVD		Layne Christensen Company
Well 10	16-Jul-09	DVD		Layne Christensen Company
Well 10	12-Apr-17	DVD		Water Well Redevelopers
Well 10	31-Aug-17	DVD		Well Rehabilitation Services, Inc.
Well 10	08-Sep-17	DVD		Well Rehabilitation Services, Inc.
Well 11	23-Oct-07	DVD		Layne Christensen Company
Well 11A	01-Mar-99	VHS		Welenco
Well 11A	09-Apr-99	VHS		Groundwater Data, Inc.
Well 11A	23-Aug-99	VHS		Welenco
Well 11A	20-Sep-99	VHS		Welenco
Well 11A	07-Apr-05	DVD		Layne Christensen Company
Well 11A	29-Apr-05	DVD		Layne Christensen Company
Well 11A	23-Oct-07	DVD		Layne Christensen Company
Well 11A	07-Jan-08	DVD		Layne Christensen Company
Well 11A	25-Jan-08	DVD		Layne Christensen Company
Well 11A	19-Mar-08	DVD		Layne Christensen Company
Well 11A	06-Oct-08	DVD		Layne Christensen Company
Well 11A	13-Oct-11	DVD	General Inspection	Layne Christensen Company
Well 11A	14-Mar-12	DVD	After Liner	Layne Christensen Company
Well 14	16-Dec-03	DVD		Layne Christensen Company
Well 14	30-Jan-04	DVD	After Brushing	Layne Christensen Company
Well 14	10-Mar-14	DVD		Pacific Surveys, LLC
Well 14	20-May-14	DVD		Pacific Surveys, LLC
Well 15	28-Sep-94	VHS		McCalla Water Well Services Company
Well 15	16-Nov-94	VHS		McCalla Water Well Services Company
Well 15	09-Sep-04	DVD	After Patching	Layne Christensen Company
Well 15	22-Sep-04	DVD	After Brushing	Layne Christensen Company
Well 15	24-Nov-15	DVD	General Inspection	Layne Christensen Company
Well 15	14-Jan-16	DVD	After Brushing	Layne Christensen Company
Well 15	08-Nov-16	DVD	General Inspection	Layne Christensen Company
Well 15	12-Dec-16	DVD	Mid Rehabilitation	Layne Christensen Company
Well 16	03-May-91	VHS		Layne Christensen Company
Well 16	21-May-91	VHS		Layne Christensen Company
Well 16	13-Sep-94	VHS		McCalla Water Well Services Company
Well 16	16-Nov-94	VHS		McCalla Water Well Services Company



Well_Name	Date	Format	Notes	Company
Well 16	28-Aug-07	DVD		Layne Christensen Company
Well 16	19-Sep-07	DVD		Layne Christensen Company
Well 16	31-Mar-08	DVD		Layne Christensen Company
Well 17	16-Apr-97	VHS		Welenco
Well 17	19-May-97	VHS		Welenco
Well 18	15-Nov-16	DVD		Water Well Redevelopers
Well 18	08-Dec-16	DVD		Water Well Redevelopers
Well 19	02-Nov-10	DVD	General Inspection	Layne Christensen Company
Well 19	09-Dec-10	DVD	General Inspection	Layne Christensen Company
Well 20	06-Mar-89	VHS		McCalla Water Well Services Company
Well 21	24-Nov-04	DVD		Layne Christensen Company
Well 21	17-Jan-05	DVD		Layne Christensen Company
Well 21	04-Apr-13	DVD		Water Well Solutions
Well 22	16-Jul-01	VHS		Layne Christensen Company
Well 22	27-Jul-01	VHS	After Brushing	Layne Christensen Company
Well 22	24-Nov-04	DVD		Layne Christensen Company
Well 22	29-Feb-16	DVD	General Inspection	Layne Christensen Company
Well 22	15-Mar-16	DVD	Post Rehabilitation	Layne Christensen Company
Well 23	07-May-01	VHS		Layne Christensen Company
Well 23	24-May-01	VHS	After Brushing	Layne Christensen Company
Well 23	09-Dec-05	DVD		Layne Christensen Company
Well 23	22-Feb-06	DVD		Layne Christensen Company
Well 23	25-Apr-12	DVD	Pre Video	Layne Christensen Company
Well 23	24-May-12	DVD	After Brushing	Layne Christensen Company
Well 23A	27-Mar-93	VHS		McCalla Water Well Services Company
Well 25	13-Nov-03	DVD		Layne Christensen Company
Well 25	27-May-16	DVD		Water Well Redevelopers
Well 25	17-Jun-16	DVD		Water Well Redevelopers
Well 25	05-Nov-18	DVD		Well Rehabilitation Services, Inc.
Well 25	23-Apr-19	DVD		Well Rehabilitation Services, Inc.
Well 26	17-Nov-00	VHS		Welenco
Well 26	29-Nov-00	VHS		Welenco
Well 26	04-Dec-00	VHS		Welenco
Well 26	17-Jun-05	DVD		Layne Christensen Company
Well 26	25-Jul-05	DVD		Layne Christensen Company
Well 26	11-Aug-05	DVD		Layne Christensen Company
Well 26	14-Jun-16	Report Only		Water Well Redevelopers
Well 27	23-Oct-07	DVD		Layne Christensen Company
Well 29	19-May-18	DVD		Well Rehabilitation Services, Inc.
Well 29	25-Jun-18	DVD		Well Rehabilitation Services, Inc.
Well 29	19-Jul-18	DVD		Well Rehabilitation Services, Inc.
Well 29	10-Aug-18	DVD		Well Rehabilitation Services, Inc.



Well_Name	Date	Format	Notes	Company
Well 29	10-Oct-18	DVD		Well Rehabilitation Services, Inc.
Well 30	19-Mar-03	DVD		Layne Christensen Company
Well 30	05-Apr-04	DVD		Layne Christensen Company
Well 30	05-May-04	DVD		Layne Christensen Company
Well 30	21-May-04	DVD	Re-Video After Brushing	Layne Christensen Company
Well 30	24-Nov-15	DVD	General Inspection	Layne Christensen Company
Well 30	14-Jan-16	DVD	After Brushing	Layne Christensen Company
Well 32	30-Jan-04	DVD		Layne Christensen Company
Well 32	23-Feb-04	DVD	After Brushing	Layne Christensen Company
Well 32	26-Feb-04	DVD	After Brushing	Layne Christensen Company
Well 32	18-Sep-07	DVD		Welenco
Well 32	15-Jul-13	DVD	General Inspection	Layne Christensen Company
Well 32	12-Aug-13	DVD	After Brushing	Layne Christensen Company
Well 33	13-Oct-97	VHS		Welenco
Well 33	22-Jul-08	DVD		Layne Christensen Company
Well 33	07-Aug-08	DVD	After Brushing	Layne Christensen Company
Well 35	14-Jul-06	DVD		Layne Christensen Company
Well 35	15-Aug-06	DVD	Post Rehabilitation	Layne Christensen Company
Well 35	16-Apr-18	DVD		Well Rehabilitation Services, Inc.
Well 35	30-Apr-18	DVD		Well Rehabilitation Services, Inc.

Source of Video Surveys: Palmdale Water District (2020).



# **APPENDIX C**

Video Survey Reports (Active Wells)



#### Video Log

McCalla Water Well Services Co. Div. of Layne Inc. 13855 Central Ave. Chino Ca. 91710, (909) 627-1521

CLIENT : PALMDALE WATER DISTRICT ADDRESS : ---PHONE # : ---

LOCATION : WEST OFF 10TH SOUTH OF P NORTH SIDE OF TRACKS

WELL # : 6A

INSPECTED BY : CHRIS BONADURER

STATIC WATER LEVEL : 507 FEET

WATER CONDITION : GOOD

CASING DIAMETER : 16 INCH

TYPE OF PERFORATIONS : HORIZONTAL LOUVER 'FACT.'

LOCATION OF PERFORATIONS : 481 FEET TO BELOW T.D. AT 998 FEET

NOTES : SOME BUILD-UP ON CASING. PERFS SEMI-OPEN FROM 600 TO 700

FEET. MOST ALL PERFS ARE BLOCKED PAST 700 FEET BY SCALE AND

BUILD-UP. NO VISIBLE DAMAGE

JOB # :56-5638

DATE :1-12-93

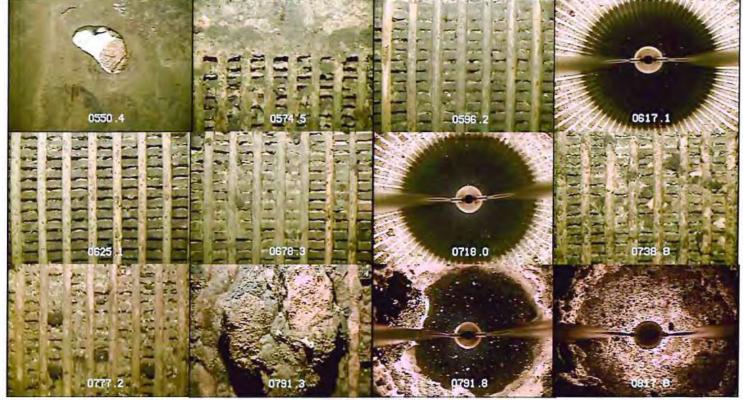
TOTAL DEPTH :998 FEET

# Pacific Surveys

a full service geophysical well logging company

Video Survey Report

Company:	Best Drilling and Pump			Date:	07-May-18		
Well:	Palmdale Water District We	ell #7		Run No.	One	Truck	PS-3
Field:	Palmdale			Job Ticket:	24028	_	
State:	California			Total Depth:	820.9 ft		
Location:	39395 25th St. E			Water Level:	536.0 ft	SWL	
				Oil on Water:		Amount:	N/A
GPS:	34.5983271 -118.0856966			Operator:	Villalobos		
Zero Datum		Tool Zero:	Side-Scan			Dead Space	2.50 ft
Reason for S		General Inspection		Guides Set @	14.5 in		210010
Depth		Observations			v	Vell Details	
0.0 ft	Begin survey from top of casing.				Perforation:	From Survey	
15.0 ft	Minor scaling observed on well cas	sing.			Wire-Wrap	574.50 ft to	820.50 ft
436.0 ft	Increase in scaling from minor to a	moderate.					
536.0 ft	SWL: water is clear. Visibility is go	od.					
550.4 ft	Observed a hole in the casing.						
574.5 ft	Top of SST wire-wrap screen: app		owth on screen.				
577.0 ft	Small bio-growth nodules appears	sporadically on screen.				1	
611.0 ft	Screen appears fairly open.						
625.0 ft	Screen appears mostly open.					1	
678.0 ft	Screen appears fairly open.						
708.0 ft	One side of the screen appears plu		ner side appears o	pen.			
712.0 ft	Decrease in bio-growth. Screen ap				Casing Size:	From Survey	
777.0 ft	Screen appears mostly plugged. M				15.5 in ID	0.00 ft to 1	820.90 ft
791.0 ft	Large bio-growth nodules appear of		iged.				
820.5 ft	Top of fill. Still in screen: appears	plugged.					
820.9 ft	Top of hard bottom.						
					Casing Material	Mild Steel	
					Screen Material	ISST	



800.919.7555 909.625.6262 1785 W. Arrow Route Bldg. D, Suite 3 and 4 Upland, CA 91786 www.pacificsurveys.com

# Pacific Surveys a full service geophysical well logging company

Video Survey Report

Company:	Best Drilling and	Pump Inc.			Date:	25-Jun-18		
Well:	Palmdale Water I				Run No.	Two	Truck	DS-7
Field:	Paimdale	District treat,			Job Ticket:	24251		157
State:	California				Total Depth:			
Location:	39395 25th St E				Water Level:		SWL	
Location:	39395 2501 SLE							N1/A
					Oil on Water:	100775	Amount:	N/A
GPS:	34.5983 -118.085				Operator:	Medrano		
Zero Datum		Cement Pad	Tool Zero:	Side-Scan		in a second of the	Dead Space	2.50 ft
Reason for	Survey:	Conc	crete Plug Inspection		Guides Set @	14.5 in		
Depth			Observations	-		V	Nell Details	
10.0 ft	Begin survey 10 feet t		ent pad.			Perforation:	As-Built	
50.0 ft	Casing appears in goo	od condition on dow	ownview.			Wire-Wrap	574 ft to	820 ft
532.5 ft	Static Water Level - M	Moderate visibility.						
547.5 ft	Top of casing patch. A	Appears to be in go						
552.5 ft	Bottom of casing patc	ch.						
570.0 ft	Visibility of the water i	improves.						
573.9 ft	Top of screened interv	rval. Screen appear	rs mostly open consistent w	with previous vide	o survey.			
771.8 ft	Camera enters area w	with zero visibility.						
773.1 ft	Side scan camera entr	ers area of zero vir	isibility. Camera completely	/ black.	The second second			
832.5 ft	Camera stops at top c	of concrete plug. W	With zero visibility survey ha	as ended. Pickup	from bottom @ 832.5"			
						Casing Size:	From Survey	
						15.5 in ID	0 ft to	833 ft
								_
						Casing Material	Mild Steel SST	
	0532.4	周日 7	RILLING AND PUMP N ID PALMOLE AVM 2 B DOMO 0 (19:334M		0547.5		0593.5	
	05781.8		07771 B		0773.1		0829.9	

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# **Pacific Surveys**

a full service geophysical well logging company Video Survey Report

Best Drilling and Pump 09-Jul-18 Company: Date: Palmdale Water District Well #7 Well: Run No. Three Truck PS-6 Field: Palmdale Job Ticket: 24608 State: Total Depth: 831.7 ft California Water Level: 534.9 ft SWL Oil on Water: Location: 39595 25th St. E. No Amount: N/A GPS: 34.5983271, -118.0856966 **Operator:** Conner Zero Datum: Top of CSG Tool Zero: Side-Scan **Dead Space** 1.75 ft General Inspection Guides Set @ 14.5 in Reason for Survey:

Depth	Observations		
0.0 ft	Began survey at top of well casing.	Perforation:	From Survey
534.9 ft	SWL; water is cloudy; visibility is fair.	Wire-Wrap	573.40 ft to 825.00 ft
542.0 ft	Patch in casing; appears to be in good condition; ends at 545.9 ft.		
547.0 ft	Patch in casing; appears to be in good condition; ends at 552 ft.		
570.0 ft	Water in column clears.		
573.4 ft	Top of wire wraps screen; appears to be mostly open.		
635.0 ft	Water in column becomes cloudy to 664 ft then clears.		1
665.0 ft	Screen appears to be open.		
700.0 ft	Screen appears to be mostly open.	1	
776.0 ft	Some nodule growth on screen.		
794.0 ft	Screen appears to be mostly plugged.		
825.0 ft	Last visible screen noticed; water becomes turbid; visibility poor.	Casing Size	From Survey
329.4 ft	Camera enters soft fill material.	15.5 in	0.00 ft to 831.70 ft
331.7 ft	Camera tags bottom.		
	Survey ends.	-	
		Casing Material	
		<b>Screen Material</b>	Mild Steel

	THERE		
0545.9	0573.4	8577.9	0594.7
0616.1	0659.1	0657.8	0680.8
0694.8	8735.5	0776.5	0794.6

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# Pacific Surveys

a full service geophysical well logging company Video Survey Report

Company:	Best Drilling and Pump		Date:	18-Jan-17		
Well:	Palmdale Water District Well #	BA	Run No.	One	Truck	PS-3
Field:	Palmdale		Job Ticket:	22368		
State:	CA		Total Depth:	870.1 ft		
			Water Level:	565.7 ft	SWL	
Location:	2200 E. Ave P		Oil on Water:	No	Amount:	N/A
	GPS 34.6013°-118.0894°		Operator:	Villalobos		
Zero Datum	Top of CSG	Tool Zero:	Side-Scan		Dead Space	2.50 ft
Reason for	Survey:	General Inspection	Guides Set @	15 in		

Depth	Observations		
.0 ft	Begin survey from top of well casing.	Perforation:	From Survey
0.0 ft	Minor scaling observed on casing. At 98 ft. scaling increases to moderate. At 377 ft. increases to heavy.	Wire-Wrap	563.40 ft to 743.20ft
63.4 ft	Top of screen: appears open.		824.40 ft to 869.80ft
65.7 ft	SWL: water is clear. Visibility is good.		
76.0 ft	Gravel pack is visible through screen.		
51.9 ft	Observed a small section where the size of the gravel behind the screen appears very large.		
35.7 ft	Increase in bio-growth on screen; appears mostly open.		
10.0 ft	Increase in bio-growth on screen; appears mostly plugged.		
3.2 ft	Bottom of screen: appears mostly plugged.		
4.4 ft	Top of screen: one side appears mostly plugged; the other side appears moderately plugged.		
59.8 ft	Top of fill. Still in screen; appears mostly plugged.		
70.1 ft	Camera light-bar touches top of hard bottom. End survey.	Casing Size	From Survey
		16.25 in ID	0.00 ft to 870.10ft
		Casing Material	Mild Steel
		Screen Material	SST
			0:52.2
	0706.4 0717.9 0742.5		- 0824.5
	0832.6		DRST 4

Pump Data Sheet - Flowserve

Company: Flowserve Name: Ian Sellers Date: 1/20/2017



Pump:							Search	Criteria:						
Size: 14M160 (9	stage)						Flow:	2000 U	S gpm		Head:	805 ft		
Type: Groundwatt	er 00 rom	S	peed: 17 Dia: 11.25	75 rpm			Fluid:							
Synch speed: 180 Impeller Type: En				actor: 8.41	lh/ft		Water	r i i i			Tempe	erature: 61	B°F	
Specific Speeds:	ioioacu		ls: 2450	autor. 0.41	IU/IC		Densi	ty: 62.32 sity: 0.99	b/ft ³		Vapor	pressure:	0.3391 p 14.7 psi a	osi a
opecale opecale.			lss: -					la:			Pun p	coourc.	i - i por a	
Dimensions:			uction: -											
Vertical Turbine:			lischarge:				Motor:	ard						
venical Turbine:		M	owl size: lax lateral	: —				ard: sure:			Speed	:		
		Т	hrust K fa	ictor: 8.41 l	b/ft		Sizino	criteria.	Max Powe	r on Deei	Frame			
Pump Limits:											griculve			
Temperature: 140 Pressure: 392 psi Sphere size: 0.5 i	ig		ower: — ye area: 3						Warnings: IP exceeds		he pump.			
Data P	oint	1		and a l										
and the second se	2000 US gpm		1	1:35n										
	822 ft		1200		-									
C. S.	85.2%	11												
Power:	487 hp						70	75						
NPSHr:	20.9 ft		1000				17	~	10 82 8 ⁴					
Design C	Curve							ſ	T	85				
have been a second s	1244 ft							1	11	85	.9			
Shutoff dP:	538 psi	4								1	8	5		
			800					1			AL			
Min flow:		ad	800	Fin			11	1	11	L	ZX	84		
Min flow: BEP: 85.9% @ 18	 840 US gpm	Head - ft		.5 in			11				T	84	2 80	
BEP: 85.9% @ 18 NOL power:		Head	9	.5 in							T	84	2 80	
BEP: 85.9% @ 18 NOL power:	 840 US gpm 175 US gpm	Head		.5 in			70 75	80			T	84	2 80 75	5
BEP: 85.9% @ 18 NOL power:	175 US gpm	Head	9	.5 in			70 75	80 83			T	84	80	70
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power:	175 US gpm <b>Irve</b>	Head	9	.5 in			70 75	80 83	82		T	84	80	
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power:	175 US gpm	Head	9	.5 in			70 75	80 83	V	80	T///	84	80	
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power:	175 US gpm <b>Irve</b>	Head	9.	.5 in			70 75	80 87	V	80 75	F / / / /20	84	80	
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power:	175 US gpm <b>Irve</b>	Head	9. 600 400 200	.5 in 250	500	750	1000	80 87	V	Y	-	84	80	
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power:	175 US gpm <b>Irve</b>		9. 600 400 200 600		500		10	8	82	75	70	84	80	70
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power:	175 US gpm <b>Irve</b>		9. 600 400 200 600 400		500		10	8	82	75	70	84	80	70
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power:	175 US gpm <b>Irve</b>		9. 600 400 200 600		500		10	8	82	75	70	84	80	70
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power:	175 US gpm <b>Irve</b>	Power - hp Head	9. 600 400 200 600 400		500		10	8	82	1750	70	84	80	70
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power: 502 hp @ 2	175 US gpm <b>Irve</b>	Power - hp	9. 600 400 200 600 400 200	250		750	1000	8: 1250	1500	1750	2000	2250	2500	2750
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power: 502 hp @ 2: Perform Flow	175 US gpm Irve 200 US gpm nance Evaluation	Power - hp	9. 600 400 200 600 400 200	250 250 Head		750 750 Effi	1000	8: 1250 1250	1500 US gpm Power	1750	70 2000 2000 NPSHr	2250	2500	2750
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power: 502 hp @ 2: 502 hp @ 2: Perform Flow US g	175 US gpm <b>Irve</b> 200 US gpm 200 US gpm <b>nance Evaluation</b> <b>pm rp</b>	Power - hp	9. 600 400 200 600 400 200	250 250 Head ft		750 750 Effil %	1000 1000 iclency	8: 1250 1250	1500 US gpm hp	1750	70 2000 2000 NPSHr ft	2250	2500	2750
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power: 502 hp @ 2: 502 hp @ 2: Perform Flow US g 2400	175 US gpm Irve 200 US gpm 200 US gpm Spm Fpm 17	dy - Jane dy - J	9. 600 400 200 600 400 200	250 250 Head ft 632		750 750 Effi % 78.1	1000 1000 iclency 9	8: 1250	82 1500 US gpm Power hp 484	1750	70 2000 2000 NPSHr ft 32.5	2250	2500	2750
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power: 502 hp @ 2 502 hp @ 2 Flow US g 2400 2000	175 US gpm Irve 200 US gpm 200 US gpm pm pm pm 17 17	dy - Jane dy - J	9. 600 400 200 600 400 200	250 250 Head ft 632 822		750 750 Effi % 78. 85.	1000 1000 iciency 9	8: 1250	1500 1500 US gpm Power hp 484 487	1750	70 2000 2000 NPSHr ft 32.5 20.9	2250	2500	2750
BEP: 85.9% @ 18 NOL power: 493 hp @ 2 Max Cu Max power: 502 hp @ 2: 502 hp @ 2: Perform Flow US g 2400	175 US gpm <b>Irve</b> 200 US gpm 200 US gpm 5 pm 7 pm 17 17 17 17	dy-Jawod n: meed 75 75	9. 600 400 200 600 400 200	250 250 Head ft 632		750 750 Effi % 78.1	1000 1000 iciency 9 2 4	8: 1250 1250	82 1500 US gpm Power hp 484	1750	70 2000 2000 NPSHr ft 32.5	2250	2500	2750

Flowserve 10.6.2.0

Selected from catalog: Flowserve USA.60 Vers: 1



		and the second			lationalized 10-TPI		Long -
			ELM or 06L6 or 10EJY if Sir Bowl Head in Feet for Stand		M160 8.4 05.0	41 K = Imp Thrust Factor St H	d Imp
			H Model (10EJY or 10JKYH			00 KL = Imp Thrust Factor L	W NPS
			owl Head in Feet for Low NF	L.C. L.M.C.S. 7545	0.0	HL HL	UN INF O
			own need in rection con the		.00	SG	
			Lineshaf			33 As = Cross Section Area	(in*)
		Largest Co	umn Pipe Diameter & Wall	Thickness: 12" No	m. X AG Thd Wall (.33	0)	
		La	rgest Column Diameter Len	oth in Feet 76	0.00	L = Length of Largest Dia	Col
			sing Tube Diameter & Wall				
			lumn Pipe Diameter & Wall				
			allest Column Diameter Len			Ls = Length of Smallest [	Dia Col
				The Property Continues of the	Collet Impeller Lateral	H _T = Total Bowl Head =	805
			and a standard of the			the second second	
			Shaft Stretch in Inches = -	[(K x H) + (KL)	$(H_L)$ ] x SG x (L + L ₅ ) x 10 ⁸ x A ₅	- + 0.6981	
				2.0	A 19 A/13		-
	Largest Diameter	Col	Smallest Diameter	Col	Tub	e Area	
	Pipe O.D.	12,750 DLCO	Pipe O.D.	0.000 Dsco	Pipe O.D.	4.000 DTO	
	Wall	0.330	Wall	0.000	Wall	0.318	
	Pipe I.D.	12.090 DLC	Pipe I.D.	0.000 Daci	Pipe I.D.	3.364 Dn	
	Area O.D.	127.676	Area O.D.	0.000	Area O.D.	12,566	
	Area I.D.	114,800	Area I.D.	0,000	Area I.D.	8.888	
	X-Sect Area	12.876 ALC	X-Sect Area	0.000 Asc	X-Sect Area	3.678 AT	
	Tube/Shf Area	12.566	Tube/Shf Area	12.566			
	Net Area H ₂ O	102.234	Net Area H ₂ O	0.000			
	Vol H ₂ O/Ft Col	1226.804	Vol H2O/Ft Col	0.000			
	Lbs H ₂ O/Ft Col	44.282	Lbs H ₂ O/Ft Col	0.000			
	Average K & KL	8.41	Average K & KL	8.41			
	Lbs H ₂ O - Avg, K	35.872 K _{LC}	Lbs H ₂ O - Avg. K	0.000 Ksc			
	Area Col + Area Tube	16.555 ALCT	Area Col + Area Tube	0,000 Asct			
			Contraction with the second				
	Head @ Base of Col	805.0 HLCB	Head @ Base of Col	805.0 H _{SCB}			
	Head @ Base of Col Head @ Top of Col	805.0 H _{LCB} 45.0 H _{LCT}					
	A MARKET AND A MARKET A	45.0 HLCT	Head @ Base of Col Head @ Top of Col	805.0 H _{SCB} 805.0 H _{SCT}	+ FLC3) × SG × L	= - 0.3227	
	A MARKET AND A MARKET A	45.0 HLCT	Head @ Base of Col	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LCT}	- = - 0.3227	
FLG1=	A MARKET AND A MARKET A	45.0 HLCT	Head @ Base of Col Head @ Top of Col	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LCT}	- = - 0.3227	
	Head @ Top of Col = K _{LC} x H _{LCB}	45.0 H _{LET} Large Diameter C =	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LCT}	- = - 0.3227	
FLC2=	Head @ Top of Col = K _{LC} x H _{LCS}	45.0 H _{LET} Large Diameter C =	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = -	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LC7}	- = - 0.3227	
F _{LC2} =	Head @ Top of Col = K _{LC} x H _{LCE} = <u>C_{LC} x 2.5 X 10⁶ x</u> L	45.0 H _{Let} Large Diameter C = <u>A_{LC} =</u>	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LCT}	- = - 0.3227	
FLC2=	Head @ Top of Col = K _{LC} x H _{LCB}	45.0 H _{Let} Large Diameter C = <u>A_{LC} =</u>	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LCT}	- = - 0.3227	
F _{LC2} = Where C _{LC} =	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LC})^2 \times L \times (H_{LC})}{(D_{LC})^2 - D_{LC})^2 \times L}$ = $\frac{.5022 \times 10^6 \times L}{L}$	45.0 H _{LCT} Large Diameter C = <u>A_{LC}</u> = <u>cr + H_{LCB})</u> =	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615 12251.1754 0.2892	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LCT}	- = - 0.3227	
FLC2=	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LC})^2 \times L \times (H_{LC})}{(D_{LC})^2 - D_{LC})^2 \times L}$ = $\frac{.5022 \times 10^6 \times L}{L}$	45.0 H _{LCT} Large Diameter C = <u>A_{LC}</u> = <u>cr + H_{LCB})</u> =	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615 12251.1754	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LCT}	- = - 0.3227	
Fucz= Where Cuc= Fucs=	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} x 2.5 \times 10^6 x}{L}$ = $\frac{.5022 (D_{LC})^2 x L x (H_{LC})^2}{(D_{LC})^2 - D_{LC})^2 x}$ = $\frac{E_7 x 2.5 \times 10^6 x}{L}$	45.0 H _{Let} Large Diameter C = <u>A_{Lc} = tr + H_{Leb}) = 10⁷ =</u>	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615 12251.1754 0.2892	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LCT}	- = - 0.3227	
F _{LC2} = Where C _{LC} =	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LC})^2 \times L \times (H_{LC})}{(D_{LC})^2 - D_{LC})^2 \times L}$ = $\frac{.5022 \times 10^6 \times L}{L}$	45.0 H _{Let} Large Diameter C = <u>A_{Lc} = tr + H_{Leb}) = 10⁷ =</u>	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615 12251.1754 0.2892	805.0 H _{SCB} 805.0 H _{SCT}	+ F _{LC3} ) x SG x L 10 ⁶ x A _{LCT}	- = - 0.3227	
Fucz= Where Cuc= Fucs=	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} x 2.5 \times 10^6 x}{L}$ = $\frac{.5022 (D_{LC})^2 x L x (H_{LC})^2}{(D_{LC})^2 - D_{LC})^2 x}$ = $\frac{E_7 x 2.5 \times 10^6 x}{L}$	45.0 H _{Let} Large Diameter C = (A _{Lc} = <u>cr + H_{LCB})</u> = 10 ⁷ = <u>r + H_{LCB})</u> = <u>r + H_{LCD})</u> =	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615 12251.1754 0.2892 948.4996 0.0784	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		
Fucz= Where Ctc= Fucs= Where E _T =	Head @ Top of Col = $K_{LC} \times H_{LCH}$ = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{(D_{LC})^2 \times L \times (H_{LC})}{(D_{LCO}^2 - D_{LCI}^2) \times L}$ = $\frac{E_7 \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{TO})^2 \times L \times (H_{LC})}{(D_{TO}^2 - D_{TI}^2) \times 1}$	45.0 H _{Let} Large Diameter C = (A _{Lc} = <u>cr + H_{LCB})</u> = 10 ⁷ = <u>r + H_{LCB})</u> = <u>r + H_{LCD})</u> =	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = 28876.5615 12251.1754 0.2892 948.4996 0.0784 column Stretch in Inches =	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x		- = - 0.0000	
Fucz= Vhere Ctc= Fucs= Nhere E _T =	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LC})^2 \times L \times (H_{LC})}{(D_{LC})^2 - D_{LC})^2 \times L}$ = $\frac{E_7 \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{T})^2 \times L \times (H_{LC})}{(D_{TO}^2 - D_{TT}^2) \times 10^6}$ = $K_{SC} \times H_{SCB}$	$45.0 H_{Let}$ Large Diameter C $=$ $A_{Le} =$ $\frac{A_{Le}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $\frac{A_{T}}{10^7} =$ Small Diameter C $=$	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615 12251.1754 0.2892 948.4996 0.0784	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		
Fuce Cuce Fuce Where Er =	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LC})^2 \times L \times (H_{LC})}{(D_{LC})^2 - D_{LC})^2 \times L}$ = $\frac{E_7 \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{T})^2 \times L \times (H_{LC})}{(D_{TO}^2 - D_{TT}^2) \times 10^6}$ = $K_{SC} \times H_{SCB}$	$45.0 H_{Let}$ Large Diameter C $=$ $A_{Le} =$ $\frac{A_{Le}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $\frac{A_{T}}{10^7} =$ Small Diameter C $=$	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = 28876.5615 12251.1754 0.2892 948.4996 0.0784 column Stretch in Inches = 0.0000	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		
Fuce = Cto = Fuce = Where ET = Fsce = Fsce =	Head @ Top of Col = $K_{LC} \times H_{LCB}$ = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LCI})^2 \times L \times (H_{LC})}{(D_{LCO}^2 - D_{LCI}^2) \times L}$ = $\frac{E_T \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{TD})^2 \times L \times (H_{LC})}{(D_{TO}^2 - D_{TT}^2) \times 1}$ = $K_{SC} \times H_{SCB}$	$45.0 H_{Let}$ Large Diameter C $=$ $A_{Le} =$ $\frac{A_{Le}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $\frac{A_{T}}{10^7} =$ Small Diameter C $=$	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = 28876.5615 12251.1754 0.2892 948.4996 0.0784 column Stretch in Inches =	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		
Fuce = Ctc = Fuce = Where E _T = Fsct = Fsct =	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} x 2.5 \times 10^{6} x}{L}$ = $\frac{C_{LC} x 2.5 \times 10^{6} x}{L}$ = $\frac{.5022 (D_{LCI})^{2} x L x (H_{LC})}{(D_{LCO}^{2} - D_{LCI}^{2}) x}$ = $\frac{E_{T} x 2.5 \times 10^{6} x}{L}$ = $\frac{.5022 (D_{TD})^{2} x L x (H_{LC})}{(D_{TO}^{2} - D_{T}^{2}) x}$	$45.0 H_{Let}$ Large Diameter C $=$ $A_{Lec} =$ $\frac{A_{Lc}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $\frac{A_{T}}{10^7} =$ Small Diameter C $=$ $A_{sc} =$	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = 28876.5615 12251.1754 0.2892 948.4996 0.0784 column Stretch in Inches = 0.0000	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		
Fuce Ctc = Ctc = Fices = Where E _T = Fsc1 = Fsc2 = Where	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LC})^2 \times L \times (H_{LC})}{(D_{LC})^2 - D_{LC})^2 \times L}$ = $\frac{E_7 \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{T})^2 \times L \times (H_{LC})}{(D_{TO}^2 - D_{TT}^2) \times 10^6}$ = $K_{SC} \times H_{SCB}$	$45.0 H_{Let}$ Large Diameter C $=$ $A_{Lec} =$ $\frac{A_{Lc}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $\frac{A_{T}}{10^7} =$ Small Diameter C $=$ $A_{sc} =$	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = 28876.5615 12251.1754 0.2892 948.4996 0.0784 column Stretch in Inches = 0.0000	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		
Fucz = Where Ctc = Fucs = Where E _T = Fsc1 = Fsc2 = Where Csc =	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LCI})^2 \times L \times (H_{LC})^2 \times (L \times (H_{LC})^2 \times L \times (H_{LC})^2 \times $	$45.0 H_{Let}$ $Large Diameter C$ $=$ $A_{Le} =$ $\frac{A_{Le}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $Small Diameter C$ $=$ $A_{sc} =$ $c_{T} + H_{sca}) =$ $=$ $a_{sc} =$	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615 12251.1754 0.2892 948.4996 0.0784 column Stretch in Inches = - 0.0000 #DIV/01	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		
Fucz = Where Ctc = Fucs = Where E _T = Fsc1 = Fsc2 = Where Csc =	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LCI})^2 \times L \times (H_{LC})^2 \times (L \times (H_{LC})^2 \times L \times (H_{LC})^2 \times $	$45.0 H_{Let}$ $Large Diameter C$ $=$ $A_{Le} =$ $\frac{A_{Le}}{10^7} =$ $\frac{A_{T}}{10^7} =$ $Small Diameter C$ $=$ $A_{sc} =$ $c_{T} + H_{sca}) =$ $=$ $a_{sc} =$	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = 28876.5615 12251.1754 0.2892 948.4996 0.0784 column Stretch in Inches = 0.0000 #DIV/01	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		
Fuce = Where Cuc = Fuce = Where ET = Fsce = Where Csc = Fsca = Where	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LC})^2 \times L \times (H_{LC})}{(D_{LC})^2 \times L \times (H_{LC})}$ = $E_7 \times 2.5 \times 10^6 \times L$ = $\frac{.5022 (D_{TD})^2 \times L \times (H_{LC})}{(D_{TO}^2 - D_{TT}^2) \times 10^6}$ = $K_{BC} \times H_{BCB}$ = $\frac{C_{BC} \times 2.5 \times 10^5 \times L_S}{(D_{SCO}^2 - D_{SCT}^2) \times 10^6}$ = $E_{TS} \times 2.5 \times 10^6 \times L_S$	$45.0 H_{Let}$ $Large Diameter C$ $=$ $A_{Lec} =$ $=$ $\frac{A_{Le}}{10^7} =$ $A_T =$ $=$ $\frac{A_T + H_{Le0}}{0^7} =$ $Small Diameter C$ $=$ $A_{sc} =$ $=$ $\frac{A_{sc}}{10^7} =$ $=$ $\frac{A_{sc}}{10^7} =$ $=$ $\frac{A_{sc}}{10^7} =$ $=$ $=$	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615 12251.1754 0.2892 948.4996 0.0784 column Stretch in Inches = - 0.0000 #DIV/01	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		
Fuce = Where Cuc = Fuce = Where ET = Fsce = Where Csc = Fsca = Where	Head @ Top of Col = K _{LC} x H _{LCB} = $\frac{C_{LC} \times 2.5 \times 10^6 \times L}{L}$ = $\frac{.5022 (D_{LCI})^2 \times L \times (H_{LC})^2 \times (L \times (H_{LC})^2 \times L \times (H_{LC})^2 \times $	$45.0 H_{Let}$ $Large Diameter C$ $=$ $A_{Lec} =$ $=$ $\frac{A_{Le}}{10^7} =$ $A_T =$ $=$ $\frac{A_T + H_{Le0}}{0^7} =$ $Small Diameter C$ $=$ $A_{sc} =$ $=$ $\frac{A_{sc}}{10^7} =$ $=$ $\frac{A_{sc}}{10^7} =$ $=$ $\frac{A_{sc}}{10^7} =$ $=$ $=$	Head @ Base of Col Head @ Top of Col Column Stretch in Inches = - 28876.5615 12251.1754 0.2892 948.4996 0.0784 column Stretch in Inches = - 0.0000 #DIV/01	805.0 H _{SCB} 805.0 H _{SCT} (F _{LC1} - F _{LC2} 2.5 x	+ F _{5C3} ) x SG x L ₅		



## IMPELLER SETTING CALCULATION

	Headshaft Size = Threads/Inch = One Turn of Nut =	10	
	Each Face of Nut =		
	Relative Shaft Stretch	Ŧ	0.3753
	Standard Impeller Setting	=	+ 0.2500
	Total Impeller Setting	=	0.6253
	Drive Collet Impeller Lateral	=	0.75
Face Turns of Hea	dshaft Nut if Hollow Shaft Driver	=	37.52



Customer: Palmdale Water District 2029 East Avenue Q Palmdale, CA 92550

P: (661) 947-4111

**Quotation Form** 

Job Number: 20916 Contact: Kelly Jeters 1/20/2017

Date:

Well or Description of Work:

Well #8A - Well Chlorination, Swab and Airlift

Terms: Due Upon Receipt

Quantity	Description	Price	Unit	Total
1	Mobilization & demobilization of all tooling, equipment, material, personnel and 20,000 gallon neutralizing containment tank required to chlorinate, swab and airlift approximately 250' x 16-1/4" wire-wrap casing	\$7,640.00	L.S.	\$7,640.00
1	Install approximately 870' x 5" tremmie pipe and inject 15 gallons Sodium Hypochlorite 12.5% and 35 gallons Nu-Well 410 Chlorine Enhancer evenly throughout 250' x 16-1/4" wire-wrap screen	\$13,125.00	L.S.	\$13,125.00
1	Swab chlorine solution throughout 16-1/4" wire-wrap screen for 20 minutes per 20' section and airlift total chlorine solution from well until neutral	\$10,720.00	L.S.	\$10,720.00
1	On-site disinfection of all pump equipment upon reinstallation	\$720.00	EA	\$720.00
		TOTAL	-	\$32,205.00

If above referenced quote meets your approval, please sign below and return.

Authorized Signature: Title:

Date:

Purchase Order No.:

Best Drilling and Pump, Inc. does not assume liability for pump/motor suppliers delays in manufacturing, testing or deliveries. Best Drilling and Pump is not responsible for labor or rig cost associated with replacement of manufactures equipment failures or warranty replacement. Best does not take any responsibility for any damage to the well casing, screen, gravel pack, pump equipment, motors, valves, pump house and any other damage arising in the course of any well work including but not limited to: inspection, cleaning, repairing, chemical treatment, brushing, bailing, or replacement of any new or defective parts manufactured or installed by others.

2/6/17

1640 Pellisier Road, Colton, CA 92324 Telephone: (951) 684-1952 Fax; (951) 684-3852 Email: TGarcia@BestDrillingandPump.com Contractor No.: C-57, 826672

# Pacific Surveys

a full service geophysical well logging company Video Survey Report

		1.5				<b>.</b> .	00 E   13		
Company:	Best Drilling a					Date:	22-Feb-17		
Well:		er District Well	#8A			Run No.	Two	Truck	PS-3
Field:	Palmdale					Job Ticket:	22498		
State:	СА					Total Depth:			
						Water Level:		SWL	
Location:	2200 E. Ave F					Oil on Water:		Amount:	N/A
	GPS 34.6013°	°-118.0894°				<b>Operator:</b>	Villalobos		
Zero Datum	-	Top of CSG	Too	Zero:		Side-Scan		Dead Space	2.50 ft
Reason for S	Survey:		Post Remed	iation		Guides Set @	15 in		
	-								
Depth			servations						
0.0 ft		n top of well casing					Perforation:	From Survey	
300.0 ft		ormal and in good					Wire-Wrap	563.40 ft to	
545.5 ft		ostly clear. Visibility s from mild steel to						824.40 ft to	883.40ft
561.5 ft 563.4 ft		ppears open and in							
575.0 ft		ible through screen							
650.0 ft	Water is clear. Vi								
743.2 ft		: appears open. En	tire perforated int	erval appears op	en.				
824.4 ft	Top of screen: ap	pears open.							
883.4 ft		: appears open. En	tire perforated int	erval appears op	en.				
894.8 ft	Top of fill.								
895.1 ft	Camera light-bar	touches top of hard	d bottom. End sur	rvey.			Casing Size 16.25 in ID	0.00 ft to	00E 10ft
							10.25 1110	0.00 11 10	090.TUIT
							Casing Mater		
	101 - 1020 - 1020 - 1020			No.			Screen Mater	alissi	
				242 1222		and Charles - Marcal Property			
								630	
	0564.1		0579.6			- 0664.0		0706 .	0
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NAME OF A CONTRACTOR OFTA CONTRACT			-						A CONTRACTOR
									100

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0882.8

0876 .1 -

0892.4

McCalla Video Log Sheet

Layne-Western Company, Inc. 13855 Central Ave. Chino Ca. 91710, (714) 627-1521

JOB # :56-5637

DATE :12-23-92

TOTAL DEPTH :657 FEET.

CLIENT : PALMDALE WATER DIST. ADDRESS : ---PHONE # : ---

LOCATION : WEST OF 40TH ST. SOUTH OF P ST.

WELL # : --- 10

INSPECTED BY : CHRIS BONADURER

STATIC WATER LEVEL : 437 FEET.

WATER CONDITION : GOOD

CASING DIAMETER : 12 INCH

TYPE OF PERFORATIONS : HORIZONTAL SLOT

LOCATION OF PERFORATIONS : 622 FEET TO 657 FEET T.D..

NOTES : HEAVY GROWTH ON PERFS LIGHT GROWTH ON CASING.

-

_



Invoice Number: 23139 Invoice Date: September 21, 2017

Palmdele Duplicate 1 Water Well # 10

(661) 587-0914 Fax: (661) 587-0981 Shelley@Wellrehabservices.com Lic No CA #983846

PO Box 80365 Bakersfield, CA 93380

Well# Palmdale Water Well #10 Roadrunner Pump Service PO Box 1052 Job Date 08/31/17 - 09/08/17 12130 Pearblossom Hwy Pearblossom, CA 93553

Customer PO	Payment Terms	Due Date
	Net 30 Days	October 21, 2017

<ol> <li>1.00 Video Survey Run 1</li> <li>5.00 Mob/Demob to jobsite</li> <li>5.00 Swage smooth existing patches @ 308' - 326'</li> <li>1.00 Video Survey Run 2</li> </ol>	600. 225.	
5.00 Swage smooth existing patches @ 308' - 326'		00 1 125 0
	005	1,120.0
1.00 Video Survey Run 2	225.	00 1,125.0
	600.	00 600.0
Billed & Pail Invoice 208	34	
	Subtotal Sales Tax	3,450.00
Check/Credit Memo No:	Total Invoice Amount Payment/Credit Applied	3,450.00
Check/Credit Memo No.	a second second to be used	

pd 10/3/17-CK# 9056

# WATER WELL VIDEO REPORT

# Water Well Redevelopers

#### 10 Palmdale W.D.

2881 Blue Star St. Anaheim, CA. 92806 Phone: 7146327003 Fax: 7146327306 Web: sonar7003@sbcglobal.net

Client:	Roadrunner Pump Service			recolesconoparatet	
Address:	12130 Pesrblossom Hwy.	Survey Date:	April 12, 2017		
City:	Pearblossom, CA 93553	0			
Requested By:	Archie	Operator:	John Mac Donald		
Copy To:	Palmdale W.D.	THE			
Reason For Survey:	Verify condition of casing	T.W.D.: 642 F	2010	Ground Level T.P.S.:	
_ocation:	3701 E. Ave. P8 Palmdale Ca.	S.W.L.: 436 Ft.	P.W.L		
Cther Information:					

CASING INFO	RMATION	DEPTHS	VIDEO OBSERVATIONS
K/Full full Louvers	T.W.D.	498.7 Ft	Open oversized perforations.
496-605 Ft	642 Ft.	509 Ft.	Double cut perforation.
619-642 Ft.		573 Ft.	Open oversized perforations.
	S.W.L	588.11 Ft.	Open perforations
	436 Ft.	623.2 Ft	Plugged perforations.
· · · · · · · · · · · · · · · · · · ·		635.9 Ft.	Plugged perforations.
		316.11 Ft.	Deteriorated liner.
			A light to moderate ferrous oxide deposit can be seen
			from 0' to 436' (Static).
			A light crusty tubercular mineral deposit is visible from
	12" 0		436'(Static) to 642' (Bottom).
Zero Da im	12" Casing 0-642 Ft.		Market and a second
Ground Lavel	0-042 Ft.		Mills knife perforations are open and oversized.
			Full flow louver perforations are plugged.
			Casing is in varying degrees of deterioration from 0'
Casing Buil Light to Mode			to 436' (Static)

Page 1



# DOWNHOLE

# Well Rehabilitation Services, Inc.

**VIDEO SURVEY** 

Contractor License No.: CA. 983846 PO Box 80365 Bakersfield, CA. 93380

Phone: 661-587-0914 Fax: 661-587-0981 Web: Shelley@Wellrehabservices.com

Client:	Road Runner Pump Serv	ice				Survey Date:	August 3	1, 2017	
Address:	PO Box 1052					Invoice:	23139	Ru	n: <b>1</b>
City:	Pearblossom Hwy	State:	CA	Zip:	93553	Well Name:	#10		
Requested By:	Archie Floyds			P.O.:		Well Owner:	Palmdale Wate	er District	
Сору То:				Camer	a: Aries BT970	0 Color Came	a		
Reason For Surv	ey: General Inspection					Zero Datum:	Top Of Casing		
Location:	.22 miles West of 40th Stre	et, 200' North	of E	Avenue	P8, Palmdale	_			
Field:							Depth: 629 ft.	Vehicle:	VT2
County: Los An	igeles	Country:				Type Perfs:	Mill Knife Slot	s, Louvers	
Perf Intervals:	499-606 ft. 620-629 ft.								
1st Csg I.D.: 12	2.375 in. Csg Weight:	From: 0 ft.	Тс	o: 629 f	2nd Csg I.D.:	C	sg Weight:	From:	To:
I.D Reference:	Measured Casir	ng Buildup: Lig	ght			S.W.L.: 438	ft. P.W.L.:	Pump D	epth:
Operator: Monto	bya Latitude:	34.595388°	Lor	ngitude.:	118.062475°	Section:	Range:	Townsh	ip:
Other Information	n:								

WELLBORE SNAPSHOTS	DEPTHS (SideScan-Feet)	WELLBORE / CASING INFORMATION
		Downview 24" deeper than sideviews
0' (See Other Side) 0' (See Other Side)	0.0 Ft.	Sideview-Zero Datum
	20.4 Ft.	Sideview-Small lip at joint
	25.0 Ft.	Sideview-Test mill knife slot
20.4' (See Other Side) 25' (See Other Side)	104.1 Ft.	Downview-Bare casing
	306.3 Ft.	Downview-Top of 10' patch, not flush with casing (1)
	308.2 Ft.	Sideview-Top of patch
104.1' (See Other Side) 306.3' (See Other Side)	308.7 Ft.	Downview-Corrugations visible
	311.3 Ft.	Downview-Weld of additional 5' patch
	316.3 Ft.	Downview-Top of 10' patch, corrugations visible (2)
Maria Maria	318.3 Ft.	Sideview-Top of patch
308.2' (See Other Side) 308.7' (See Other Side)	321.4 Ft.	Downview-Weld of additional 5' patch, corrugations visible
311.3' (See Other Side) 316.3' (See Other Side)		
and the second s		
318.3' (See Other Side) 321.4' (See Other Side)		
Notes: Original casing 16" Drilled 1	1920	
		Page 1

# WELLBORE SNAPSHOT(S)

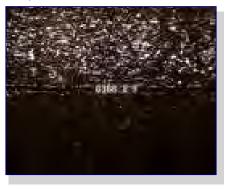
# Depth: 0 Feet



Depth: 25 Feet



Depth: 308.2 Feet



Depth: 316.3 Feet



Depth: 0 Feet



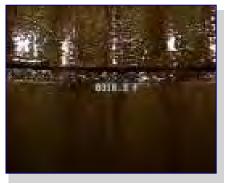




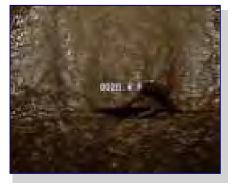
## Depth: 308.7 Feet



Depth: 318.3 Feet



Depth: 20.4 Feet



Depth: 306.3 Feet



Depth: 311.3 Feet



# Depth: 321.4 Feet





# DOWNHOLE VIDEO SURVEY

# Well Rehabilitation Services, Inc.

Contractor License No.: CA. 983846 PO Box 80365 Bakersfield, CA. 93380 -0981 Web: Shelley@Wellrebabservices.com

Phone: 661-587-0914 Fax: 661-587-0981 Web: Shelley@Wellrehabservices.com

Survey Date:	August 31	I, 2017		
Client:	Road Run	ner Pump Se	ervice	
Well Name:	#10	-		
Depth:	629 ft.			
1st Csg I.D.:	12.375 in.	From: 0 ft.	To: 62	9 ft.
2nd Csg I.D.:		From:	To:	
S.W.L.:	438 ft.	P.W.L.:	Pun	np Depth:
Type Perfs:	Mill Knife	Slots, Louve	rs	
Perf Intervals:	499-606	ft.		620-629 ft.

WELLBORE SNAPSHOTS	DEPTHS (SideScan-Feet)	WELLBORE / CASING INFORMATION
	325.9 Ft.	Downview-Corrugations visible, bottom piece pulled up
325.9' (See Other Side) 328.2' (See Other Side)	328.2 Ft.	Sideview-Piece of patch pulled up
6155.3.7 BIDS.2.7	328.3 Ft.	Sideview-Bottom of patch, corrugations visible
	328.8 Ft.	Downview-Small hole
328.3' (See Other Side) 328.8' (See Other Side)	329.6 Ft.	Downview-Large holes
	331.7 Ft.	Downview-Large holes
	334.0 Ft.	Downview-Large split in reline, piece sticking inward
329.6' (See Other Side) 331.7' (See Other Side)	336.3 Ft.	Downview-Casing deteriorated
	336.8 Ft.	Sideview-Deteriorated casing
(III.1) (A. (III.7)	336.9 Ft.	Sideview-Split in reline
	340.7 Ft.	Downview-Casing deteriorated
334' (See Other Side) 336.3' (See Other Side)	344.3 Ft.	Downview-Casing deteriorated
unco a sustant		
336.8' (See Other Side) 336.9' (See Other Side)	_	
end of the second		
340.7' (See Other Side) 344.3' (See Other Side)		
344.5 (See Office Side)		
DHE-T / DHE-3 /		

# WELLBORE SNAPSHOT(S)

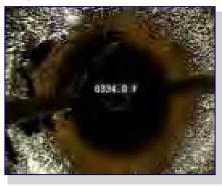
## Depth: 325.9 Feet



Depth: 328.8 Feet



Depth: 334 Feet



Depth: 336.9 Feet



Depth: 328.2 Feet

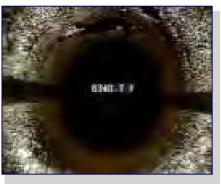
Depth: 329.6 Feet



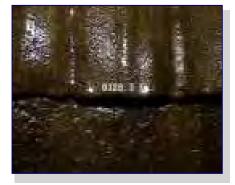
Depth: 336.3 Feet



Depth: 340.7 Feet



Depth: 328.3 Feet



Depth: 331.7 Feet



Depth: 336.8 Feet



## Depth: 344.3 Feet





# DOWNHOLE VIDEO SURVEY

# Well Rehabilitation Services, Inc.

Contractor License No.: CA. 983846 PO Box 80365 Bakersfield, CA. 93380 20981 Web: Shelley@Wellrebabservices.com

Phone: 661-587-0914 Fax: 661-587-0981 Web: Shelley@Wellrehabservices.com

Survey Date:	August 3	1, 2017		
Client:	Road Run	ner Pump Se	ervice	
Well Name:	#10			
Depth:	629 ft.			
1st Csg I.D.:	12.375 in.	From: 0 ft.	To: 629 ft.	
2nd Csg I.D.:		From:	To:	
S.W.L.:	438 ft.	P.W.L.:	Pump Depth	ו:
Type Perfs:	Mill Knife	Slots, Louve	rs	
Perf Intervals:	499-606	6 ft.	620-62	29 ft.

WELLBORE SNAPSHOTS	DEPTHS (SideScan-Feet)	WELLBORE / CASING INFORMATION
	419.0 Ft.	Downview-Bare casing
419' (See Other Side) 435.7' (See Other Side)	435.7 Ft.	Downview-Static water level, clear
BULD / BUST /	447.8 Ft.	Downview-Light buildup
	497.6 Ft.	Downview-Top of mill knife slots
447.8' (See Other Side) 497.6' (See Other Side)	499.0 Ft.	Sideview-Slots open
147.5 F	530.4 Ft.	Downview-Light buildup, slots open
	587.7 Ft.	Sideview-Slots open
499' (See Other Side) 530.4' (See Other Side)	606.0 Ft.	Downview-End of mill knife slots
	620.1 Ft.	Downview-Top of louvers
6493.01 T	627.6 Ft.	Downview-Top of dropped patch, side smashed in, more well below
		End of survey
587.7' (See Other Side) 606' (See Other Side)		
0407.07		
620.1' (See Other Side) 627.6' (See Other Side)		
0120.3 F		
Monadal In NY		
Notes: Original casing 16" Drilled	1020	

# WELLBORE SNAPSHOT(S)

## Depth: 419 Feet

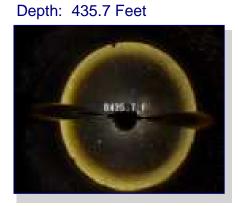


Depth: 497.6 Feet



Depth: 587.7 Feet





#### Depth: 499 Feet



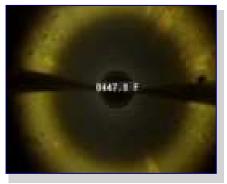
#### Depth: 606 Feet



## Depth: 627.6 Feet



#### Depth: 447.8 Feet



## Depth: 530.4 Feet



# Depth: 620.1 Feet





Fax (805) 834-2550 • (800) 445-9914 • (805) 834-8100

Customer ROTTMAN DRILLING	Job No. 26972 Run No. ONE
Address NORTH DIVISION	Well No. 11 A Date 3 -1 -1999
City LANCASTER State CA Zip	LOCATION AVE P2 & ISTH ST EAST
Request By JORN Cust. P.O.	
Сору То	
Reason for Survey GENERAL INSPECTION	Zero Datum TOP OF CASING
	Survey By D JACKSON Truck No. T-05

DEPTH	REMARKS
6'	TOP OF CASING DOWN VIEW
507'	TOP OF LOUVERS
	FALCING WATER
548'	STATIC WATER LEVEL
634'	DEBRIS IN-WEIL
754 .	DEBRIS
887' -	DEBRIS BOTTOM OF WELL, FILL
	5
8	
i ali	
1	
NOTE:	/
CASING CON	IDITION:
	6 ⁷ Reduces to 1018 at at at at
	ence:  Caliper Survey Estimate from TV/Photo Survey Well Records
Corrosion/Incru	station Build-up 🔲 Light 🔲 Moderate 🔲 Heavy 🔛 Increases with Depth

#### GDI

GROUNDWATER DATA, INC. 23945 Old Wagon Road Escondido, CA. 92027

TO: Rottman Drilling 46471 N. Division St. Lancaster, CA. 93535 WATER WELL VIDEO INSPECTION

(760) 751-1560 Fax # 751-1460

April 09, 1999

GDI Log #99-04003

#### SITE: PALMDALE WATER DISTRICT - Well No. 11A / 15th St. East & Avenue P

#### * Survey of well bore after chemical cleaning procedures

Note: This survey is with a 3" DUAL LENS - COLOR CAMERA providing a side view as well as a down-hole view. The camera will descend down the bore hole with an expanded 15" centering guide on it. The survey starts inside the steel casing viewing the top edge of the 16" casing with the side view camera. The footage is recorded on the VHS tape, in feet and tenths and is based on the center line view of the side scan camera (ss). The down-hole (dh) camera lens is 12" lower and the end of the light bar is 20" below that. The camera light intensity and focus maybe adjusted during the survey. There is music background.

#### Depth:

#### **GENERAL DESCRIPTION of the WELL**

- 0.0 ss Inside the 16" steel casing viewing the well head
- 11.1 ss Horizontal weld between two blank sections of casing
- 22.0 dh Going past horizontal weld
  - dh Horizontal welds noted at the following footage and they all appear intact:

34.0	58.0	70.0	82.5	94.0	106.9	119.0	131.0	
143.0	155.0	167.0	179.0	191.0	203.0	215.0	228.0	
240.0	252.0	264.0 (*)	288.0	300.0	312.0	324.0	337.0	
349.0	361.0	374.6 (ss)	397.0	421.0				

(*) 268.0 - dh Camera lens becomes foggy due to temperature changes done hole but will clear

507.0 - dh Louvered casing coming into view 509.3 - ss START of LOUVERS in the casing; dry with no seepage or cascading water 520.8 - ss Start of cascading water from the louvers 539.7 - ss STATIC WATER LEVEL - Water is slightly cloudy due to very fine material that is still in suspension after cleaning 546.0 - ss Louvers appear open with fine debris resting of each of the louver edges 566.5 - ss Same appearance with marks from cleaning tools on the casing 576.0 - ss Same - dh Visibility with down-hole camera appears very cloudy. The camera light intensity was not changed during the survey hoping to see if we could identify if there was any clearing or flow going through the well. 596.2 - ss Visibility is cloudy. Louver outlines can be seen with debris of the louver edges. Side-scan and check louvers approximately every 10 feet going on down the bore hole - SS 656.2 - ss Slightly larger particles of debris are in suspension

# RECEIVED APR 2 1 1999

Rottman Drilling at Palmdale Water District / WELL # 11A

GDI Log#99-04003 - Pg. 2

686.9 - ss	Visibility is still cloudy and louvers appear the same.	Tried adjusting side light intensity
a state	for better visibility but to no avail.	george and an another george and an another george and an
726.3 - ss	Blank area of casing	
727.5 - ss	Start of louvers again	the second second second
	Louver outline can be seen with debris resting on ec	lae of the louvers
757.4 - ss	Same. Vertical area between louvers appears slight	v shiny: possibly from cleaning tools
- SS	Continue to survey with side-scan approximately eve	rv 10 feet
847.1 - SS	LOUVERS appear open with tooling marks on casi	ng down to 878.5
882.6 - dh	Visibility is reducing	
	Visibility is zero due to the the camera light descend	ling down into the fine debris
	that has settled near the bottom of the bore hole	a server and a trade of the
000 0		

< 900.0 - Approximate depth of bore hole per verbal data on site >

We appreciate the opportunity to serve your water well needs and should you have any questions, please feel free to call upon us at (760) 751-1560.





FAX (661)	834-2550 •	(800)	445-9914 •	(661) 834-8100	

Customer Rottm	an Drill.	ing	Job No Run No
Address		~	Well No. // A Date
City	State	Zip	Location Palmdale Water
Request By	Cust. P.O		W/S 15th. St. E., 14 m
Сору То			Ave. P Behind Terry
Reason for Survey			Zero Datum Top of casing
			Survey By B. Newman Truck No

DEPTH	REMARKS
506	Horizontal louvers
519	Falling water
560	Falling water Water level
374	Total Depth
NOTE:	
CASING CON	
ID at Surface _	IC         Reduces to at; at;
Diameter Refer	ence: 🔲 Caliper Survey 🔲 Estimate from TV/Photo Survey 🔲 Well Records
Corrosion/Incru	station Build-up 🔲 Light 🔲 Moderate 🔲 Heavy 🔲 Increases with Depth



FAX (661) 834-2550 • (800) 445-9914 • (661) 834-8100

	man Drilling		Run No. Three	
Address		Well No// H	Date 9-20-9	19
	State Zip	0	15th St. E., 14 So.	
	Cust. P.O	OT Five. I	-	
Сору То			C	,
Reason for Survey		Survey By B. A	of casing-side.scan kewman Truck No. 7	Tos
DEPTH		REMARKS		
	of louvers			
519 Fall	ina water			
550 Wa	ter level			
377 Tot	al Depth			
		and the second		
	the second s			
				-
				_
NOTE:				
-				_
SING CONDITION:		4		
it Surface _/6	Heduces to at	i	at at	



## Well Inspection Report

CLIENT:	Palmdale Water District			
ADDRESS:	BF			
CONTACT:	itely easier	: 661-456-1083		
	1003 East Avenue P, Palmdale, CA			
GPS LOCATION:	Latitude: N 34° 36.136'	Longitude	W 118° 06.658'	
WELL NUMBER:	15 General inspection	JOB NUMBER:	38421	
SURVEYED BY:	Joe Rocha	DATE:	24-Nov-15	
REVIEWED BY:		WATER LEVEL:	564.9'	
WATER CONDIT	ION: Clear	TOTAL DEPTH:	Unknown	
CASING DIAMET	ER: 16.00" ID	SURVEY DEPTH	: 772.9'	
*All Depths Shown	n are relative to the center of the side camera perspec	ctive.		
DEPTH	REMARKS			
0 - 564'	Casing appears to have mild to moderate scale	Perforations:		
	and growth.		000 770	
564 - 736'	Casing appears to have moderate scale and growth.	Mills Slot	320 - 772'	
736 - 772'	Casing appears to have heavy scale, growth and			
	nodules.			
772.9'	Camera comes to rest on top of fill.			
535 - 564'	Water jetting in through perforations.			
and the second	0553.9F 0601.2F		0650.4F	
			12.044	
Holes -		1 Back	1×1	
		A A A	ap the second	
		26 C		
	A MARKEN ST THE SALE .		1000 BB400	
North Color			ALL PROPERTY.	
1947 Marst	0735.4F	51-18 A	10751.6F	
		Ser Ser Ser	and the second	
1. 1. 1.		St. Antes	A deal	
A STARS				



### Well Inspection Report

CLIENT:	Palmdale Water Dis	strict				
ADDRESS: BF						
CONTACT:				E: 661-456-1083		
	1003 East Avenue I					
GPS LOCATION:		atitude: N 34° 36.13	36'	Longitude	e: W 118° 06.658'	
WELL NUMBER:	15	Post	brush	JOB NUMBER:	38421	
Constant of the second						
SURVEYED BY:	Joe Rocha			DATE:	14-Jan-16	
REVIEWED BY:			_	WATER LEVEL:	570.9'	
WATER CONDITI	ON: Clear / Cloudy			TOTAL DEPTH:	Unknown	
CASING DIAMET				SURVEY DEPTH	: 774.8'	
*All Depths Shown	are relative to the c	enter of the side car	nera perspec	ctive.		
DEPTH		REMARKS				
0 - 774'	Casing appears to have	ve mild to moderate so	ale	Perforations:		
	and growth.	Constant States and States				
774.8'	Camera comes to rest	t on top of fill.		Mills Slot	320 - 772'	
536 - 570'	Water jetting in throug	h perforations				
330 - 370	water jetting in thoug	in periorations.				
			0625.4F		0650.2F	
	0676 .8F		0700.2F		0764.9F	

#### McCalla Bros. Video Log Sheet

Layne-Western Company, Inc. 13855 Central Ave. Chino Ca. 91710, (714) 627-1521

CLIENT : City of Palmdale ADDRESS : ---PHONE # : Mack & Dennis 1-805-947-4111

LOCATION : East of 40th North side of S4 ave.

WELL # : 16	JOB # :56-6686
INSPECTED BY : Chris Bonadurer	DATE :5-21-91
STATIC WATER LEVEL : 202	TOTAL DEPTH :7
WATER CONDITION : Good to cloudy to 0	.к.
CASING DIAMETER : 14 inch	
TYPE OF PERFORATIONS : VERTICAL SAW C	UT .
LOCATION OF PERFORATIONS : 237 feet t	0?
NOTES : Water got cloudy from 350 fee	t to 500 feet. 526 feet to
?, pump or "pipe on pump" could not get	past it.
-	



FAX (661) 834-2550 • (800) 445-9914 • (661) 834-8100

Customer ROTTMAN BRELLENG	Job No. 33628 Run No. ONE				
Address	Well No. PALMDALE #26 Date 11-17-2000				
City State Zip	Location 4701 KATRENA PLACE				
Request By         JORN         Cust. P.O.	PALMDALE CA.				
Сору То					
Reason for Survey BENERAL INSPECTION	Zero Datum				
	Survey By RUSS HOWLETT Truck No. T-05				
DEPTH	REMARKS				
Der TOP OF CASTNG STI					
	AND FALLING WATER				
169' S. U.L. VISEBELETY					
185' SEAN SIDES					
190 A SEDEVIEW SCREEN					
200' SCAN SEDES					
215 SCAN SEDES					
252' JOINT					
272' END SEREEN					
313' START 2 ND SEREEN S	BETION				
325 SEAN SIBES					
351' AIR LINES					
360' SEAN SIDES	360' SEAN SIDES				
395' SCAN SIDES					
440' SCAN SIDES	440' SCAN SIDES				
471' PLUS 2'FT. FILL AT	471' PLUS 2' FT. FILL AT BOTTOM OF WELL 473				
445' END RECORDENG ON PULLOUT					
NOTE: ADD 2'FT. FOR DOWN	IVIE415				
A STILL SHOT TAKEN					
CASING CONDITION:					
ID at Surface Reduces to at	: at at				
Diameter Reference: Caliper Survey Estimate from TV					
Corrosion/Incrustation Build-up 🗌 Light 🖽 Moderate 🔲 Heavy 🖾 Increases with Depth					



FAX (661) 834-2550 • (800) 445-9914 • (661) 834-8100

Customer BOTTMAN DRILLING	Job No. 3369/ Run No. 2
Address	Well No. Pasmonic #26 Date 11-29-60
City State Zip	Location 4701 KATRINA PL.
Request By LORN Cust. P.O.	Primoria CA
Сору То	
Reason for Survey AFTER OLEANING	Zero Datum To C
and the second s	Survey By <u>4. 14ack</u> Truck No. <u>76-3</u>

DEPTH	REMARKS
Ó	TOC.
152	TOP OF Scheen WEE FALLING
161	SWG
180	SIDE VIEW
231	Sina Ulew @
255	SING VIEW
313	SIDE VIEW
328	SIDE VIEW
354'	SIDE UIEN
364	No dis builty
383	BLACK DISSIADEM CNU UN. b. L. T.d
412	5105 UIEW 0
4440	SIDE VIEW
475'	Fill END OF SURJEY
NOTE:	
CASING CON	
	Reduces to at at at
Diameter Refere	ence:  Caliper Survey  Estimate from TV/Photo Survey  Well Records
Corrosion/Incrus	station Build-up Light Moderate Heavy I-Increases with Depth

Vid-Pac		Wellbore Video	Report	welenco
Company ROTTMAN DR	TLLING	-	Job Ticket _33673	Run No. THREE
Address			Well No. PALM DAL	LE 26
City	State	Zip	Date of Survey	- 2000
Requested by JORN		Carlo Carlos	P.O	
Copy to	THEARIN	TT al	_ Camera _ LAVAL SI	I TOD OF PRETAK
Reason for Survey GENERAL 2 Operator RUSS H.	NSPECI		Zero Datum <i>SLDE SCA</i> Vehicle No <i>T QS</i>	N TOP OF CASANO
Location 4701 KATRIN	A PLAC			
Casing I.D. at Surface				uild-Up
SELECTED SNAPSHOT IMAGES	DEPTHS		WELLBORE INFORMAT	TION
	Ø	Top OF	CASENG START REC	ORDING
	153'	-	VISJBILITY HALY	
	230'		W SEREEN, GR.	
	358:	SCAN SIL		
	313'	SIDE VIEW	U SCREEN	
	350'	SCAN SIDES VISIBILITY POOR SCAN SIDES		
	370'			
	412'	SEAN SEL	SES	
	468'	NEAR BO	OPTOM, LOSE VIS	BILLTY SIDE SCAN
	430'	END SO	URVEY ON PULL	l out
				-
	-			

welenco, inc. 5201 Woodmere Dr. Bakersfield CA 93313 www.welenco.com e-mail: welenco@welenco.com Phone: 1-(800) 445-9914 Fax: 1-(661) 834-2550 Notes: ADD 2'ET. FOR DOWN VIEWS CUSTOMER REQUEST BOTH COPERS

## WATER WELL VIDEO REPORT

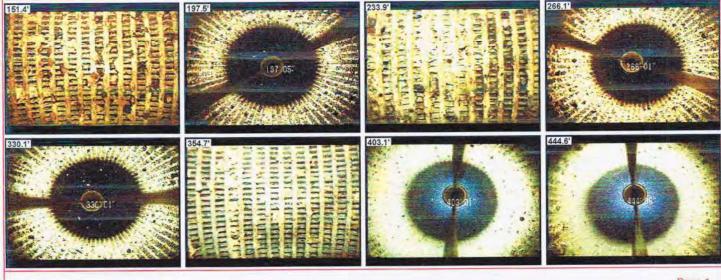
## Water Well Redevelopers

26 Palmdale Water Dist.

2881 Blue Star St. Anaheim, CA. 92806 Phone: 7146327003 Fax: 7146327306 Web: sonar7003@sbcglobal.net

Client:	Roadrunner Pump Services	Survey Date:	June 14	, 2016	
Address:	12130 Pearblossom Hwy.				
City:	Pearblossom, CA 93553	Operator:	John Ma	c Donal	ld
Requested By:	Archie				
Сору То:	Archie	T.W.D.: 461	Ft.	Zero	Ground Level
Reason For Survey:	Verify condition of casing	S.W.L.: 142 Ft.	P.W.L.:		T.P.S.:
Location:	4701 Katrina PI. Palmdale CA				

CASING INFORMATION		DEPTHS	VIDEO OBSERVATIONS		
screen	T.W.D.	151.4 Ft.	Slightly restricted screen.		
150-267 Ft.	461 Ft.	197.5 Ft.	Restricted screen.		
308-461 Ft.		233.9 Ft.	Restricted to plugged screen.		
	S.W.L	266.1 Ft.	Restricted screen.		
	142 Ft.	330.1 Ft.	Restricted screen.		
		354.7 Ft.	Restricted screen.		
		403.1 Ft.	Plugged screen.	-	
		444.6 Ft.	Plugged screen.		
		-	A moderate ferrous oxide deposit can be seen from 0'		
			to 142' (Static).		
			A light crusty mineral deposit exhibiting small sporadic		
	16" Casing		tubercular nodules is visible from 142' (Static) to 461'		
Zero Datum 0-461 Ft.			(Bottom).		
			Majority if screen appears restricted to plugged with		
			some open.		
Casing	Buildup		Other than above casing, joints and screen all appear		
Light			in normal condition.		





Fax (805) 834-2550 • (800) 445-9914 • (805) 834-8100

CUSTOMER BAKERSFIELD WELL & PUMP	Job No. 28703 Run No. ONC
Address	Well No. 33 (PARMDAUS WATEL date 10-13-97
City State Zip	Location 1/2 MILES. W. OF PALMDAGE BC.
Request By the Liper Cust. P.O.	\$ 75th AU
Сору То	
Reason for Survey (IENERAL INSPECTION	Zero Datum TOP & COSING 22"ALL
	Survey By CORBEL Truck No. 705

DEPTH	REMARKS
OFT	REC STARTS SIDESCERE) ZERBED (2) TOP OF CASING 2FT AGE
172	STATTE WATER LEVEL
222	TOPOR FIRST SCREEN, NTERUAL
241	BUTTOM of S'CHERR
282	TOP OF 2ND SCREEN, INTERME
448	SINE MERS OF SCREEN (Phillip)
460	SOFT FELL / BOTTOM OUT SURVEY
NOTE:	
CASING COI	NDITION:
ID at Surface _	10 ^{°°} Reduces to at at at at
	rence:  Caliper Survey Estimate from TV/Photo Survey Well Records
Corrosion/Incru	ustation Build-up 🔲 Light 🔲 Moderate 🔲 Heavy 🔛 Increases with Depth

#### **APPENDIX D**

Video Survey Review Notes



Project No:	3020.001	Well Name:	2A (also referred to as "2")
Survey Date:	June 22, 2010	Reference Point:	тос
Survey Company:	Pacific Surveys, LLC	Static Water Level:	567.90 ft brp
Review Date:	April 18, 2020	Screen Interval(s):	450-462; 480-900
Reviewer:	RJK	Survey Depth:	852.60 ft brp (fill)

Depth From	Depth To	Observations
0	450	Minor spalling. Increasing slightly below 350 feet.
	450	TOS. Louvers appear open on downview - difficult to see on side scan.
	567.9	SWL - no oil visible. Mineral encrustation below WL (light color). Small bubbles seen
		exiting louvers (sign of aquifer dewatering).
	581	Casing patch (581-586). Signs of recent brushing? - knocked off nodules? Louvers partially
		clogged - appear severely clogged on side scan view.
	680	Increasing encrustation. Evidence of biofouling? Fluffy gray material on top of encrusting
		material.
	730	Louvers almost completely obscured.
	750	Moderate to severe encrustation.
	763	Side scan showing severe cloffing/encrustation.
	775	Visibility decreasing.
	779	Section of air line stuck on screen.
	790	Visibility poor.
	800	No visibility on down view.
	850	No visibility on down view or side scan.
	852.6	Light bar enters fill (down view).



Project No:	3020.001	Well Name:	3A (also referred to as "3")
Survey Date:	August 25, 2004	Reference Point:	тос
Survey Company:	Layne Christensen Company	Static Water Level:	586.5 ft brp
	April 19, 2020		450-462; 480-900
	RJK		807 ft brp (fill)
	ЩИ	_ourvey Depui.	

Depth From	Depth To	Observations
0	5	Moderate corrosion and spalling.
	97	Minor spalling.
	150	Spalling increasing.
	350	Minor spalling - increasing.
	390	Spalling on side scan.
	~398.5	TOS 1 - Spalling in screen. Louvers appear open.
	~540	BOS 1
	~581	TOS 1 - Louvers open.
	$\sim 586.5$	SWL
	591	Bubbles observed exiting screen/ dewatering.
	600	Louvers appear open. (enlarged?)
	650	Louvers appear open. (enlarged?)
	705	Top of patch. (Corrosion observed on patch).
	710	Welded patch sections.
	715	Bottom of patch.
	735	Some evidence of biological activity.
	745	Louvers partially clogged.
790	806	Heavily clogged louvers. (encrustation/biogrowth)
	~807	Light bar enters fill.



Project No:	3020.001	Well Name:	4A (Post Cleaning)
Survey Date:	May 24, 2001 (Post Cleaning)	_Reference Point:	ТОС
Survey Company:	Welenco	_Static Water Level:	540 ft brp
Review Date:	April 19, 2020	Screen Interval(s):	481-? (DWR log: 480-830)
Reviewer:	RJK	_Survey Depth:	791 ft brp (fill)

Depth From	Depth To	Observations
	4	Access entry port (tube).
23	50	Minor spalling.
50	100	Minor spalling/ corrosion.
100	200	Less spalling/ corrosion.
	216	Small holes in blank casing.
216	480	Minor corrosion.
	481	TOS 1- louvers clean and open. (12 rows/ more louvers) FUL FLO.
	491	Water entering through louvers (one side of casing), flow increases with depth.
	511	Louver pattern changes. (10 rows/ less louvers) STANDARD FLO.
	520	Lot of cascading water, increasing with depth.
	540	SWL
	550	Louvers appear open & clean.
	600	Louvers appear open & clean.
	650	Louvers less clean but open.
	691	Louver pattern changes back to 12 rows, FUL FLO.
	700	Louvers clean & open.
	720	Louvers switch back to STANDARD FLO.
	750	Louvers clean & open.
	781	Louvers switch back to FLU FLO.
	791	Light bar enters fill.



Project No:	3020.001	Well Name:	6A
Survey Date:	May 15, 2018	_Reference Point:	TOC (~1 ft ags)
Survey Company:	Well Rehabilitation Services, Inc.	_Static Water Level:	535 ft brp
Review Date:	April 20, 2020	_Screen Interval(s):	480-? (DWR log: 480-1010)
Reviewer:	RJK	_Survey Depth:	993 ft brp (fill)

2       Access tube opening.         2       100       Minor to moderate spalling/ large sheets.         100       200       Minor to moderate spalling.         200       250       Moderate spalling/corrosion.         250       350       Moderate spalling/corrosion.         350       450       Moderate to severe spalling/corrosion.         350       482       TOS         535       SWL - louvers appear open- mild encrustation.         550       Mild encrustation/ nodules / floating material.         600       Evidence of increased biofouling - louvers obscured.         650       Louvers still covered with bacterial growth. (Yellow patches/slime)         730       Biogrowth increasing.         730       800         900       Moderate to severe biogrowth/ slime - louvers obscured.         980       Visibility decreasing.         989       Heavy buildup on well screen.         993       Light bar enters fill. (995 ft bgs)			
100200Minor to moderate spalling.200250Moderate spalling/corrosion.250350Moderate spalling/corrosion.350450Moderate to severe spalling/corrosion.350450Moderate to severe spalling/corrosion.482TOS535SWL - louvers appear open- mild encrustation.550Mild encrustation/ nodules / floating material.600Evidence of increased biofouling - louvers obscured.650Louvers still covered with bacterial growth. (Yellow patches/slime)730Biogrowth increasing.730800Moderate to severe biogrowth/ slime - louvers obscured.980Visibility decreasing.989Heavy buildup on well screen.			
200250Moderate spalling/corrosion.250350Moderate spalling/corrosion.350450Moderate to severe spalling/corrosion.482TOS535SWL - louvers appear open- mild encrustation.550Mild encrustation/ nodules / floating material.600Evidence of increased biofouling - louvers obscured.650Louvers still covered with bacterial growth. (Yellow patches/slime)730800800900980Visibility decreasing.989Heavy buildup on well screen.			
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550       Mild encrustation/ nodules / floating material.         600       Evidence of increased biofouling - louvers obscured.         650       Louvers still covered with bacterial growth. (Yellow patches/slime)         730       Biogrowth increasing.         730       800         Moderate to severe biogrowth/ slime - louvers obscured.         800       900         Moderate to severe biogrowth/ slime - louvers obscured.         980       Visibility decreasing.         989       Heavy buildup on well screen.			
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650       Louvers still covered with bacterial growth. (Yellow patches/slime)         730       Biogrowth increasing.         730       800         Moderate to severe biogrowth/ slime - louvers obscured.         800       900         Moderate to severe biogrowth/ slime - louvers obscured.         980       Visibility decreasing.         989       Heavy buildup on well screen.			
730       Biogrowth increasing.         730       800         800       Moderate to severe biogrowth/ slime - louvers obscured.         800       900         Moderate to severe biogrowth/ slime - louvers obscured.         980       Visibility decreasing.         989       Heavy buildup on well screen.			
730       800       Moderate to severe biogrowth/ slime - louvers obscured.         800       900       Moderate to severe biogrowth/ slime - louvers obscured.         980       Visibility decreasing.         989       Heavy buildup on well screen.			
800       900       Moderate to severe biogrowth/ slime - louvers obscured.         980       Visibility decreasing.         989       Heavy buildup on well screen.			
980     Visibility decreasing.       989     Heavy buildup on well screen.			
980     Visibility decreasing.       989     Heavy buildup on well screen.			
993     Light bar enters fill. (995 ft bgs)			



Project No:	3020.001	Well Name:	7A
Survey Date:	May 4, 2020	_Reference Point:	тос
Survey Company: _	Unknown	_Static Water Level:	527.5 ft brp / some oil
Review Date:	May 14, 2020	_Screen Interval(s):	573.8-824 (fill) (DWR log: 570-900)
Reviewer:	RJK	_Survey Depth:	824 ft brp (fill)

Depth From	Depth To	Observations
	2.8	Access tube opening.
0	50	Casing clean/ general corrosion & pitting.
	100	Casing clean/ general corrosion & pitting.
	150	Casing clean/ general corrosion & pitting.
	260	Minor spalling increasing with depth.
	400	Minor spalling increasing with depth.
	500	General corrosion/ minor spalling.
	527.5	SWL - some oil (<1 in.?), visibility poor
	542.2	Top of patch, folded over in places.
	546.3	Bottom of patch.
	547.4	Top of patch, folded over in places.
	5524	Bottom of patch. Corrosion byproducts coming from bottom lip of patch.
	555	Knocked off nodules (side scan)/ down view visibility very poor.
	570.9	General corrosion/ pitting.
	573.8	Top of wire-wrap screen. Visible flow. Screen appears in poor condition, partially clogged.
Corrosion of some rods.		Corrosion of some rods.
	575	Heavily clogged/ bacterial growth.
	592.8	Some small amount of gravel visible in wire-wrap.
	610	Screen partially clogged/ fair condition.
	626.7	Structural abnormality, screen split open/hole.
	629	Large hole in screen (pushed outward/ separated wires/ bent rods). Broken wires.
	629.5	Large gaping hole/ rocks and cobbles behind.
	630.9	Bottom of rupture.
	632	Screen appears open.
	652	Corroded rods/ possible structural issues (small).
	670	$\sim 50$ % clogged; bacterial growth.
	687	Corroded rods.
	694	Screen open/minor growth/corrosion.
	705.2	Clogged screen/ bacterial growth/ corroded rods.
	711/712	Fully clogged with bacterial growth.
	725	Heavy growth/ nodules present.
	736	Very heavy growth.
	780	Large growth mass. Visibility improving ~800 ft.
	820	Screen completely obscured.
	823.7	Camera stops in fill (side scan).



Project No:	3020.001	Well Name:	7A (Post Rehab)
Survey Date:	July 18, 2009	_Reference Point:	тос
Survey Company: _	Pacific Surveys, LLC	_Static Water Level:	534.9 ft brp
Review Date:	April 21, 2020	_Screen Interval(s):	573.4-831.7 (fill) (DWR log: 570-900)
Reviewer:	RJK	_Survey Depth:	831.7 ft brp (fill)

Depth From	Depth To	Observations		
	~2.5	Access tube opening.		
0	50	Blank casing clean/ good condition.		
50	200	Blank casing clean/ good condition.		
	~240	Minor spalling apparent/ increasing with depth.		
240	350	Minor to medium spalling.		
350	450	Minor spalling/ good condition.		
	534.9	SWL/ no oil. Visibility moderate.		
	542	Top of patch 1		
	545.9	Bottom of patch 1		
	547	Top of patch 2		
	552	Bottom of patch 2		
	573.4	Top of wire-wrap screen/ water clears/ evidence of bacterial growth obscuring screen/ open		
		Regrowth following rehab.		
	630	Water column visibility reduced/ cloudy.		
	650	Visibility reduced side scan only.		
	668	Continued biological growth/ column clears/ nodules apparent on rods and welds.		
		Screen obscured but mostly open.		
	~760	Patches/ mats of bacterial growth.		
	790	Column becoming cloudy/ moderate to heavy bacterial growth.		
	818	Heavily clogged/ obscured screen.		
	825	Visibility poor, no longer can see the screen.		
	829	Visibility zero on side screen.		
	831.7	Camera encounters fill.		



Project No:	3020.001	Well Name:	8A (Post Rehab)
Survey Date:	February 22, 2017	_Reference Point:	ТОС
Survey Company:	Pacific Surveys, LLC	Static Water Level:	545.5 ft brp
Review Date:	April 23, 2020	_Screen Interval(s):	562.9-742.7; 823.7-883.4; Screen 3 in fill
Reviewer:	RJK	_Survey Depth:	895.7 ft brp

Depth From	Depth To	Observations
	~2	Access tube entry port
	50	Minor corrosion/ no spalling/ good condition
	100	Some minor spalling.
	200	No spalling/ good condition.
	250	Gray material on casing.
	350	Casing clean.
	450	Casing clean/ good condition.
	530	Minor spalling above water surface.
	545.5	SWL - no oil/ visibility fair.
	561.5	Transition from mild steel to stainless steel.
	562.9	TOS 1- wire-wrap open/ excellent condition/ gravel visible. Good visibility
	650	Screen in excellent condition/ clean.
	742.7	BOS 1- mild steel blank between screen intervals. Evidence of nodule growth that has been
		cleaned.
	823.7	TOS 2- bacterial growth/ corrosion byproducts bleeding down from mild steel
		intermediate blank.
	850	Screen Open/ excellent condition.
	861	Minor growth on screen from mild steel.
	883.4	BOS 2 - growth on screen from mild steel.
	892.4	Light bar enters fill (down view)
	893.2	Camera hits refusal (side scan) - 895.7 (down view) (calculated)



Project No:	3020.001	Well Name:	10
Survey Date:	September 8, 2017	_Reference Point:	ТОС
Survey Company:	Well Rehabilitation Services, Inc.	_Static Water Level:	439.2 ft brp
Review Date:	April 23, 2020	_Screen Interval(s):	497-606; 620.6-628.2 (fill) (1987 liner)
Reviewer:	RJK	Survey Depth:	628.2 ft brp (fill)

Depth From	Depth To	Observations		
	18.5	Structural issue (?) - crack in casing (?)		
	23	Notch in casing (?) - mill slot (?)		
	50	Casing in good condition aside from previous.		
65	100	Minor spalling.		
	144.3	Structural issue with casing or spalling (?)		
144	200	Minor spalling.		
250	300	Spalling and corrosion increases.		
	308.8	Top of patch 1 (side scan) - corrugation not fully pressed.		
	312 ?	Weld between patch sections (down view).		
	316.9	Top of patch 2 - split at top, void visible behind corrugation visible - not fully pressed.		
	319.2	Split on side scan.		
	322.8	Weld between patch sections (down view).		
	326.8	Ragged bottom of patch (down view).		
	328.9	Bottom of patch 2 (side scan) - lip bent upward.		
	334.4	Large hole/ rupture - casing is paper thin (down view).		
	337.3	Large hole/ rupture - casing is paper thin (side scan).		
334	~346	Several large holes/ ruptures/ deterioration. Casing is paper thin (down view).		
	350	Heavy spalling		
	439.2	SWL - poor visibility.		
	464	Visibility clearing/ moderate to poor.		
	497	Top of mill slots/ visibility clear/ open. Minor buildup on casing.		
	~606	Bottom of mill slots/ buildup increasing.		
	620.6	Top of louvers (down view).		
	628.2	Light bar enters fill (down view).		



Project No:	3020.001	Well Name:	11A (Lined)
Survey Date:	March 14, 2012	Reference Point:	ТОС
Survey Company:	Layne Christensen Company	Static Water Level:	552 ft brp
Review Date:	April 24, 2020	_Screen Interval(s):	665-860.9 ft brp (fill)
Reviewer:	RJK	Survey Depth:	860.9 ft brp (fill)

Depth From	Depth To	Observations
0	50	Casing clean/ good condition.
50	150	Casing clean/ good condition.
150	250	Casing clean/ good condition.
250	350	Casing clean/ good condition.
350	450	Casing clean/ good condition.
450	550	Casing clean/ good condition.
	552	SWL - no oil, visibility poor, cloudy.
	575	Minor biogrowth on casing liner. Poor visibility.
	600	Minor biogrowth on casing liner. Poor visibility.
600	650	Minor biogrowth on casing liner. Poor visibility.
	665	TOS. Horizontal louvers. Minor buildup on louvers/ sediment/ biogrowth. Louvers
		appear open. Visibility clear.
665	750	Minor buildup on louvers/ sediment/ biogrowth. Louvers appear open. Visibility clear.
750	800	Minor buildup on louvers/ sediment/ biogrowth. Louvers appear open. Visibility clear.
	827	Evidence of filamentous bacteria. Visibility decreasing.
	860.9	Light bar enters fill (down view) - Still in louvers.



Project No:	3020.001	Well Name:	14A
Survey Date:	May 20, 2014	Reference Point:	ТОС
Survey Company:	Pacific Surveys, LLC	Static Water Level:	575.8 ft brp
Review Date:	April 24, 2020	Screen Interval(s):	452.6-808.9 ft brp (fill)
Reviewer:	RJK	Survey Depth:	808.9 ft brp (fill)

Depth From	Depth To	Observations
0	50	Casing clean/ good condition.
50	100	Minor to moderate spalling evident.
100	150	Moderate spalling.
	210	Large sheets separating from casing.
210	350	Moderate spalling.
	399	Severe casing deterioration/ sheeting/ spalling.
	420	Severe casing deterioration/ sheeting/ spalling.
	449	Possible hole(s) (?)
	452.6	TOS. Louvers severely obscured/ mineral scale (?)
	500	Louvers appear more open.
	575.8	SWL - no oil - visibility good. Louvers show bacterial growth/ nodules but mostly open.
	636.7	Moderate to severe bacterial growth covering louvers. Partially open.
	715	Camera not centered/ Well may have alignment issues.
	808.9	Light bar enters fill.



Project No:	3020.001	Well Name:	15
Survey Date:	December 12, 2016	Reference Point:	ТОС
Survey Company:	Layne Christensen Company	Static Water Level:	558.7 ft brp
Review Date:	April 24, 2020	Screen Interval(s):	320.4-? ft brp (fill)
Reviewer:	RJK	Survey Depth:	808.9 ft brp (fill)

Depth From	Depth To	Observations
	34	Minor spalling/corrosion.
89	94	Evidence of sheeting/spalling.
94	200	Minor spalling/corrosion.
	238	Moderate spalling/sheeting.
	320.4	TOS - Mill slots - vertical. (DWR reports 420 ft). Slots appear mostly open.
	400	Minor buildup. Slots difficult to see.
	450	Minor buildup. Slots difficult to see.
	500	Minor buildup. Slots difficult to see.
	551.5	Cascading water entering mill slots. Becomes abundant below this.
	558.7	SWL - no oil. Visibility good. Slots 60-80% plugged.
	570	Evidence of bacterial growth.
	588	Slots obscured by growth.
	601	Corrosion evident under brushed off nodules.
	625.5	Slots approx. 80% plugged.
	651	White starburst around open parts of slots (jetting?)
	655	Some slot openings visible again.
	699.6	Mill slots >50% open.
	736.8	Slots 80-90% clogged.
	741.8	Slots 50-60% open.
	751.8	White deposits around slots.
	761.3	Visibility becomes poor.
	762	Light enters fill (down view).
	763.6	Refusal (side scan).



Project No:	3020.001	Well Name:	16
Survey Date:	March 31, 2008	Reference Point:	тос
Survey Company:	Layne Christensen Company	Static Water Level:	179.4 ft brp
Review Date:	April 25, 2020	Screen Interval(s):	236.3-536.8 ft brp (fill)
Reviewer:	RJK	_Survey Depth:	536.8 ft brp (fill)

Depth From	Depth To	Observations	
	1.5	Access tube opening (x2).	
0	50	Minor corrosion, spalling, sheets.	
50	100	Minor corrosion, spalling, sheets/ with some dark concretions.	
	160	Increased corrosion - iron oxide color.	
	179.4	SWL - no oil - visibility poor/ cloudy.	
	201	Moderate corrosion/ small hole visible.	
	219	Visibility improving slightly.	
	235	TOS - mill slotted. (down view)	
	236.3	TOS - mill slotted (side scan)	
	237	Slots appear approximately 30% open.	
	260	Slots more heavily clogged (10-20% open)	
	284	Slots more defined but still heavily clogged.	
	289	Heavy corrosion/ iron oxide.	
	307	Slots almost completely clogged/ bacterial growth?	
	350	Heavy corrosion/ iron oxide/ bacterial growth. Slots almost 100% clogged/ obscured.	
	400	Slots almost 100% clogged/ obscured.	
	420	Buildup increasing (corrosion byproducts?). Slots not visible.	
	450	Slots not visible.	
	472	Sidescan showing severe corrosion/ iron oxide deposits. Likely holes here - difficult to see.	
	480	Isolated slots become visible again.	
	500	Heavy corrosion/ slots obscured.	
	518.25	Visible slot on side scan.	
	520.1	Spiral weld appears separated from corrosion.	
	522	Spiral weld appears separated from corrosion.	
	525	Increased buildup of material on casing.	
	536.8	Depth of soft fill material per side scan (camera enters fill).	



Project No:	3020.001	Well Name:	18
Survey Date:	December 8, 2016	_Reference Point:	TOC?
Survey Company:	Water Well Redevelopers	_Static Water Level:	48.6 ft brp
Review Date:	April 24, 2020	_Screen Interval(s):	~20-92.75 ft brp (fill) (DWR log: 20-108)
Reviewer:	RJK		92.75 ft brp (fill)

Depth From	Depth To	Observations
0	SWL	Ground to SWL - poor resolution - appears to be heavy corrosion.
	20.25	Possible TOS (down view). Mill slots.
	~48	SWL (down view)
	53	Mill slots appear large, gravel visible in slots. Moderate corrosion/ iron oxide deposits.
	58	Growth on casing and slots.
	60	Severe corrosion - nodules knocked off showing corrosion.
	61.8	Moderate sized holes in casing.
	61.9	Ragged appearance to slots/ gravel can be seen.
	65.6	Large hole/rupture. Severe corrosion.
	76.6	Holes.
	80.25	Large hole/rupture.
	85.7	Massive rupture/ hole - borehole wall evident.
	88	Casing almost completely corroded/ disintegrated.
	92.75	Light bar enters fill.



Project No:	3020.001	Well Name:	19
Survey Date:	December 10, 2009	_Reference Point:	TOC ?
Survey Company:	Layne Christensen Company	_Static Water Level:	40.8 ft brp
Review Date:	April 24, 2020	Screen Interval(s):	82-316 ft brp (fill) (DWR log: 80-350)
Reviewer:	RJK	Survey Depth:	316 ft brp (fill)

Depth From	Depth To	Observations
	1.9	Entry ports for access tubes (x2)
0	40	General corrosion/ no spalling. Casing in fair condition.
	40.8	SWL - no oil - visibility poor.
	51	Visibility clears. Some bacterial colonies/ nodules/ iron oxide.
	82	TOS - mill slots - mostly open.
	100	Bacterial growth increases/ iron oxide/ slots 80% clogged.
	125	Visibility decreases/cloudy.
	150	General buildup/ slots not visibility.
	200	No slots visible.
	216	Some isolated slots visible.
	226.5	Slots/bare metal visible. Bacterial colonies.
	245	Visibility clearing. Some slots visible/ moderate buildup.
	278	Visibility clearing. Some slots visible/ moderate buildup.
	300	Moderate to heavy buildup on casing/ no slots visible.
	316	Fill (side scan) - light bar in soft fill.



Project No:	3020.001	Well Name:	21 (lined)
Survey Date:	April 4, 2013	_Reference Point:	тос
Survey Company:	Water Well Solutions	_Static Water Level:	161.1 ft brp
Review Date:	April 24, 2020	_Screen Interval(s):	216.4-325.1 ft brp (fill)
Reviewer:	RJK	_Survey Depth:	325.1 ft brp (fill)

Depth From	Depth To	Observations	
	~2	Entry port for access tubing.	
0	20	Visibility poor/ looks to be general corrosion (minor to moderate).	
20	30	Severity of corrosion increases.	
30	40	Severity of corrosion increases.	
40	60	Moderate to severe spalling/ corrosion.	
60	80	Moderate to severe spalling/ corrosion.	
80	94	Severe corrosion & spalling.	
	98	Possible structural issues.	
98	108	Severe corrosion.	
108	150	Severe corrosion and spalling.	
	161.1	SWL - no oil - visibility fair. Casing appears coated (mineral?/bacterial?)	
	190	Nodule growth (minor)	
	216.4	TOS - mill slots $\sim$ 30-50% open. Heavy nodules.	
	229.5	Slots heavily obscured - heavy buildup in general, nodules.	
	266	Slots heavily obscured - heavy buildup in general, nodules.	
	270	Slots become more visible.	
	278	Nodule growth increasing.	
	285.5	Slots $\sim 50\%$ clogged.	
	288	Very heavy growth.	
	300	Massive growth.	
	320.5	Small hole in casing.	
	324.6	Light bar enters fill (down view).	
	325.1	Refusal (down view).	



Project No:	3020.001	Well Name:	22 (Post Rehab)
Survey Date:	March 15, 2016	_Reference Point:	ТОС
Survey Company:	Layne Christensen Company	Static Water Level:	113.8 ft brp
Review Date:	April 24, 2020	Screen Interval(s):	189.4-394.6 ft brp (fill)
Reviewer:	RJK	_Survey Depth:	394.6 ft brp (fill)

Depth From	Depth To	Observations
	~2	Entry port for access tube.
0	50	Minor to moderate spalling/ general corrosion.
	100	Moderate spalling/ sheets/ general corrosion.
102	112	Severe spalling above waterline.
	113.8	SWL (substance floating on water) - visibility poor/ none.
SWL	179	No visibility - water clears at 179 ft.
	189.4	TOS - louvers - sediment resting on louver shelves/ evidence of biogrowth/ nodules/
		corrosion. Louvers mostly open.
	225	Sediment on louvers - still open.
	260	Some louvers obscured by sediment.
	270	Sediment on louvers.
	275	Visibility decreasing.
	300	Visibility very poor/ increase growth.
	325	Evidence of biological activity/ growth/ encrustation/ sediment on louvers.
	330	Zero visibility.
	385	Zero visibility.
	394.6	Fill (side scan).
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Project No:	3020.001	Well Name:	23A
Survey Date:	April 25, 2012	_Reference Point:	тос
Survey Company:	Layne Christensen Company	Static Water Level:	551.9 ft brp
Review Date:	May 14, 2020	_Screen Interval(s):	600.3-740 ft brp (debris) (DWR log: 600-840)
Reviewer:	RJK	Survey Depth:	740 ft brp (debris)

Depth From	Depth To	Observations	
	3	Entry port for access tube.	
0	50	General corrosion and pitting of blank. No spalling. Good condition.	
80	82	Growth on casing emanating from section joint. (rust?)	
50	100	General corrosion and pitting.	
~105	!107	Spalling/ sheeting.	
	123	Light to moderate spalling.	
	150	General corrosion and pitting/ good condition.	
	200	General corrosion and pitting/ good condition.	
	215	Spalling begins - moderate.	
	250	Corrosion/ spalling increasing.	
300	500	Moderate corrosion/ spalling.	
	551.9	SWL - no oil.	
	553	Iron oxide, pitting below WL/ visibility fair on down view.	
	575	Evidence of nodules and buildup. Increasing with depth.	
	600.3	TOS. Louvered openings mostly open, sediment on louvers.	
	650	Louvers open/ minor nodule growth/ buildup.	
	700	Louvers open/ minor nodule growth/ buildup. Dark buildup increasing.	
	736	Souder cable in well.	
	738	Cable/ sounder.	
	740	Rats nest of cable and tape. Cannot pass. End video.	



Project No:	3020.001	Well Name:	25
Survey Date:	November 13, 2003	_Reference Point:	ТОС
Survey Company:	Layne Christensen Company	_Static Water Level:	128.2 ft brp
Review Date:	May 21, 2020	_Screen Interval(s):	165.7-345; 386-405; 436-579 ft brp (fill)
Reviewer:	RJK	Survey Depth:	579 ft brp (fill)

Depth From	Depth To	Observations
	~1.8	Entry port for access tube.
	50	General corrosion/ pitting.
	55	Offset casing joint.
	100	General corrosion/pitting, increasing somewhat with depth.
	124	Severe spalling near water surface (splash zone).
	128.2	SWL - no oil.
	129	Severe spalling and corrosion below WL.
	150	Severe corrosion. Minor nodule growth.
	165.7	Top of wire-wrap screen. Screen in poor condition but open.
	176	Biogrowth/ some clogging of screen (~20-30%).
	200	Corroded rods. Some clogging (10-20%)
	215	Biogrowth increasing.
	250	Moderate biogrowth/ clogging.
	291.83	Top of PVC tubing.
	~319	Metal bracket (?) - knocked loose by camera.
	330	Clogging/growth increasing.
	340 Screen is heavily clogged.	
345 BOS 1 - Bottom of screen 1		BOS 1 - Bottom of screen 1
~362 Bracket from before - knocked loose from camera.		Bracket from before - knocked loose from camera.
	~375 Bracket - stays put.	
	386	TOS 2 - heavy growth (30-40% clogged).
	405 BOS 2 - very heavy growth/ encrusting material.	
	436	TOS 3 - heavy growth/ clogging.
	450	Heavy growth/ clogging.
	476	Moderate clogging/ sand settled on weld rings.
	490	Less buildup/ screen open.
	500	Screen open.
	515	Nodule growth.
	550	Biogrowth on screen/ mostly open.
	570	Moderate to heavy clogging.
	575	Cable also present alongside PVC (or airline?)
	579	Debris in fill.



Project No:	3020.001	Well Name:	25
Survey Date:	April 23, 2019	_Reference Point:	ТОС
Survey Company:	Well Rehabilitation Services	_Static Water Level:	118.6 ft brp
Review Date:	December 2, 2020		- 165.7-345.5; 386.3-405.7; 436.4-525 ft brp (fill)
Reviewer:	RJK		525 ft brp (fill)

Depth From	Depth To	Observations
	~1.8	Entry port for access tube.
	50	General corrosion/ pitting.
	100	General corrosion/ pitting.
	118.6	SWL - no oil.
	140.7	Visibility poor / minor nodule growth observed.
	165.7	Top of wire-wrap screen. Screen in poor condition but open.
	166	Abundant sediment resting within screen wire / generally open.
	173.7	Biogrowth observed clogging screen / possible damage to rods.
183.1	184.3	Vertical tear in wire-wrap.
	200	Heavily clogged screen / biogrowth and sediment.
201	202	Vertical tear in wire-wrap.
	226	Hole in wire-wrap.
	226.8	Vertical tear and hole in wire-wrap.
	250	Moderate biogrowth / heavy clogging.
291	298	Severe vertical tear in wire-wrap.
	300	Ruptured wire-wrap.
300	321	Numerous vertical tears and holes in wire-wrap.
323.5	325	Large vertical tear in wrie-wrap / heavily clogged.
	345.5	Bottom of wire-wrap screen section.
	386.3	Top of wire-wrap screen / heavily clogged with biogrowth.
	405.7	Bottom of wire-wrap screen section.
	436.4	Top of wire-wrap screen / heavily clogged with biogrowth.
	450	Heavily clogged with sediement and isolated biogrowth.
496.8	501	Severe vertical tear in wire-wrap.
506	510	Severe vertical tear in wire-wrap.
	525	Top of fill material in well.



Project No:	3020.001	Well Name:	26
Survey Date:	August 11, 2005	Reference Point:	тос
Survey Company:	Layne Christensen Company	Static Water Level:	105.5 ft brp
Review Date:	May 22, 2020	_Screen Interval(s):	151.3-270.5; 311.1-459.8 ft brp (fill)
Reviewer:	RJK	_Survey Depth:	459.8 ft brp (fill)

Depth From	Depth To	Observations
0	50	Moderate to severe corrosion/ spalling.
	75	General level of corrosion increasing.
	100	General level of corrosion increasing.
	105.5	SWL - no oil. Grass on water surface/ severe corrosion below water.
	126	Side scan of corrosion.
	140	Evidence of knocked off nodules.
	151.3	TOS 1 - wire-wrap.
		Moderate to severe corrosion of screen/ partly clogged (30-50%).
	200	Moderate corrosion, mostly open - can see gravel.
	225	Moderate corrosion. 20-30% clogged.
	245	Corrosion increasing.
	270.5	BOS 1.
	284	Evidence of knocked off nodules/ pits.
	311.1	TOS 2.
325	326	Moderate general corrosion/ screen open/ bent rod ?
	351	Increased clogged (60%) - visibility decreasing.
	357	Visibility zero.
	363	Visibility excellent - almost no corrosion - change in WQ? Anoxic?
	398	Screen clean/ open - sediment resting on wire. Stainless steel?
	425	Screen clean/ open - sediment resting on wire. Stainless steel?
	450	Screen filled with sediment?
	459	Drilling mud on screen.
	459.75	Camera enters fill.



Project No:	3020.001	Well Name:	29
Survey Date:	October 10, 2018	_Reference Point:	тос
Survey Company:	Well Rehabilitation Services, Inc.	_Static Water Level:	125.9 ft brp
Review Date:	May 22, 2020	_Screen Interval(s):	192.3-367.3 ft brp (fill)
Reviewer:	RJK	_Survey Depth:	367.3 ft brp (fill)

Depth From	Depth To	Observations
0	20	General corrosion mild.
	50	General corrosion mild.
	100	General corrosion mild.
	125.9	SWL - no oil. Visibility poor below WL.
	150	Visibility zero.
	169	Visibility clearing slightly.
	192.3	TOS - louvers appear clogged/ visibility clears in screen.
	192.3	Enlarged louver - gravel visible.
	195	Severely clogged - sediment/bacteria? on louvers
	200	Louvers completely clogged or obscured (95%)
	249.7	Louvers completely clogged or obscured (95%), bacterial?
	254.4	Top of patch.
	259.4	Bottom of patch.
	260.2	Louvers clogged w/ bacterial growth.
	277	Louvers clogged w/ bacterial growth.
	295	Louvers completely clogged/ bacterial growth.
	296.5	Enlarged louver - gravel visible.
	320	Louvers completely clogged/ bacterial growth/ scale??
	314.9	Louvers enlarged - gravel visible.
	343.3	Louvers clogged.
	345	Louvers appear partly open from top.
	362.6	Severely clogged louvers with moderate to severe bacterial growth.
	364	Severe bacterial growth.
	365.8	Light bar enters soft fill.
	366	Severe bacterial growth.
	367.3	Camera meets refusal (side scan).



Project No:	3020.001	Well Name:	30 (Post Brush)
Survey Date:	January 14, 2016	Reference Point:	ТОС
Survey Company:	Layne Christensen Company	Static Water Level:	147.1 ft brp
Review Date:	May 23, 2020	Screen Interval(s):	202-408.3 ft brp (fill)
Reviewer:	RJK	Survey Depth:	408.3 ft brp (fill)

Depth From	Depth To	Observations
0	50	Casing clean and good condition.
	147.1	SWL - debris on surface, no oil.
		Casing below WL clean, moderate pitting/ bacterial growth.
	188	Evidence of nodules knocked off.
	202	TOS. Louvers appear open. Evidence of past/ returning bacterial growth.
	225	Clean well screen - remnants of bacterial growth.
	250	Clean well screen - remnants of bacterial growth.
	300	Clean well screen - remnants of bacterial growth.
	350	Clean well screen - remnants of bacterial growth.
	360	Visibility decreasing.
	366	Visibility poor/ sediment on louvers at depth/ no flow?
	408.3	Top of soft fill.



# **VIDEO SURVEY REPORT**

Project No:	3020.001	Well Name:	32 (Post Brush)
Survey Date:	August 12, 2003	Reference Point:	ТОС
Survey Company:	Layne Christensen Company	Static Water Level:	202.2 ft brp
Review Date:	May 23, 2020	Screen Interval(s):	332.6-483.1; 504.6-573.4 ft brp
Reviewer:	RJK	Survey Depth:	573.9 ft brp (fill)

Depth From	Depth To	Observations
	~2	Entry port for access tube.
	30	General corrosion/ spalling.
	100	Spalling/ corrosion increasing w/ depth.
	200	Spalling/ corrosion increasing w/ depth.
	202	SWL/ no oil/ visibility poor.
	210	Mild to moderate corrosion barely visible.
	220	Visibility improving/ mild corrosion.
	330	Abrupt change to excellent visibility/ evidence of knocked off nodules widespread.
	332.6	TOS 1 - louvers ~ $60-80\%$ open.
	350	Sediment resting on louver shelves.
	400	Sediment resting on louver shelves, 60-80% open.
	427	Build up increasing.
	450	Moderate build up/ sediment on louvers.
	475	Build up/ growth increasing.
	483.1	BOS 1
	504.6	TOS 2 - louvers heavily clogged w/sediment (?) & growth.
	510	Visibility decreasing.
	550	Louvers heavily clogged w/ sediment/ growth/ poor visibility.
	560	Very poor visibility.
	570	Heavy growth on screen.
	573.4	BOS 2
	573.9	Fill.



### **VIDEO SURVEY REPORT**

Project No:	3020.001	Well Name:	33
Survey Date:	August 7, 2008	Reference Point:	тос
	Layne Christensen Company		152.3 ft brp
	May 23, 2020		222-241.4; 282.25-454 ft brp (fill)
	•		454 ft brp (fill)
	RJK	_ survey Depui:	

Depth From	Depth To	Observations
	2	Entry port for access tube.
	50	General corrosion/ pitting.
	100	General corrosion/ pitting, increasing with depth.
	108	Moderate spalling begins.
	152.3	SWL - no oil. Visibility fair.
	161	Spalling/ sheeting.
	171	Heavy general corrosion/ pitting.
	200	Heavy general corrosion/ pitting.
	222	TOS 1 - Stainless steel wire-wrap - excellent condition/ clean. (Mild steel against stainless steel)
	224	Gravel visible behind screen.
	241.4	BOS 1
	250	Mild steel blank/ moderate corrosion/ buildup.
	282.25	TOS 2
	300	Screen clean/ good condition/ sediment in openings.
	350	Screen clean/ good condition/ sediment in openings.
	400	Screen clean/ good condition/ sediment in openings.
	451	Sediment/ mud smeared in openings - 100% clogged.
	454	Camera meets refusal (side scan).



# **VIDEO SURVEY REPORT**

Project No:	3020.001	Well Name:	35
Survey Date:	April 30, 2018	Reference Point:	тос
•	Well Rehabilitation Services, Inc.		
	May 23, 2020		194-476.6 ft brp (fill) (Ripped?)
Keviewei:	<u>RJK</u>	_survey Depth:	476.6 ft brp (fill/ripped bottom)

Depth From	Depth To	Observations
	~2	Entry port for access tube.
	10	Light to moderate spalling.
	27	Moderate to severe corrosion/ spalling (general)
	50	Moderate to severe corrosion/ spalling (general)
	100	Moderate to severe corrosion/ spalling (general)
	150	Moderate to severe corrosion/ spalling (general)
	173.2	SWL - no oil - visibility good - casing moderate to severe corrosion.
	192.6	Appears to be mild steel against S.S.
	194	TOS - stainless wire-wrap/ clean and open.
	195	Gravel visible behind screen.
	245.6	Screen very clean/ open/ gravel behind screen.
	300	Screen very clean/ open/ gravel behind screen.
	350	Screen very clean/ open/ gravel behind screen.
	377.4	Sidescan showing very clean screen/ gravel behind.
	427.4	Sidescan showing very clean screen/ gravel behind.
	435.9	Sidescan showing very clean screen/ gravel behind. Some sediment settled in openings.
	447.1	Sidescan showing very clean screen/ gravel behind. Some sediment settled in openings.
	454.7	Side scan showing screen - more sediment buildup.
	472.1	Openings completely clogged with sediment, otherwise clean.
	476.6	Camera meets refusal (sediment).
	475.6	Down view - screen appears ripped off at bottom/ ends raggedly with sediment/ fill below.



### **APPENDIX E**

Video Survey Review Snapshots (Digital)



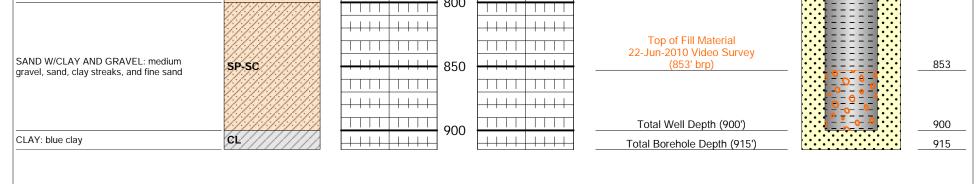
[PLACEHOLDER FOR APPENDIX E]

#### **APPENDIX F**

### **As-Built Well Profiles**



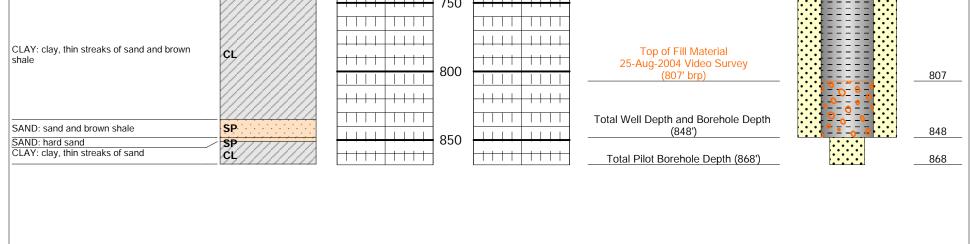
Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV) 0 50 100	Resistivity RSN / RLN (Ohm-m) 0 50 100	As-Built Profile (Based on 22-Jun-2010 Video Survey and Well Drillers Report)	
		0		Ground Surface	
SAND: fine sand, small gravel SAND: rocks, sand, gravel	SP SP			Conductor Casing 30" Diameter x 1/4" Wall Mild Steel	
SAND: rocks, sand, graver	SP			(0' to 50') Sanitary Seal	
		50		Cement Grout (0' to 50')	
SAND W/GRAVEL: rocks, medium to coarse sand, gravel	SP				
		100			
SAND: medium to coarse sand	SP				
SAND: medium to fine sand, clay streaks	SP			26" Diameter Borehole	
		150		(50' to 1,080')	
SAND: medium to coarse sand and rocks	SP				
		200			
SAND: fine sand with clay streaks	SP				
,					
		250			
				Well Casing 16" Diameter x 1/4" Wall Mild Steel	
				Blank (0' to 450'; 462' to 480')	
SAND W/CLAY: medium sand, coarse sand with clay	SP-SC	300			
,					
		350			
CLAY: clay	CL				
SAND: sand, clay streaks	SP				
		400			
SAND: hard to medium sand with clay streaks	SP				
SAND. Hard to medium sand with day streaks	JF.	450		Well Screen	
				16" Diameter Mild Steel w/0.125" Slot Size	
				(450' to 900')	
SAND: medium to coarse sand, gravel, small clay streaks	SP	500		Static Water Level	
Ciay Sileaks				Mar-2020 (526' brp) 5	
SAND W/CLAY: coarse sand, small gravel,	SP-SC///////				
clay CLAY: brown clay, streaks of sand	CL	550			
SAND W/CLAY: medium sand, small clay	SP-SC				
streaks, clay					
SAND: medium to coarse sand, small clay streaks	SP	600			
SAND: coarse sand, gravel, clay	SP		+++++++++++++++++++++++++++++++++++++++		
		650			
SAND: medium sand, small clay streaks	SP			Gravel Envelope	
				No. 5 (0' to 900')	
SAND: medium sand, small clay streaks	SP	700			
		750			
SAND: medium to coarse sand, clay streaks	SP	/50			
		800			



AS-BUILT PROFILE: WELL 2A
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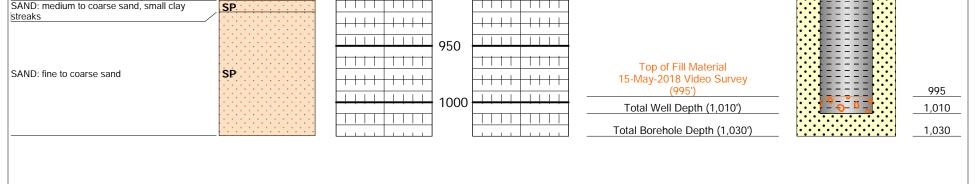
PALMDALE WATER DISTRICT WELL 2A	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Louvered / 0.125 in</u> SCREEN INTERVALS (ft bgs): <u>450-900</u>	Notes: Well details based on 22-Jun-2010 video survey and Well Drillers Report.	KYLE Grou	undwater
PALMDALE, CALIFORNIA DECEMBER 2020	SCREEN INTERVALS (IT bgs):430-900         CONSTRUCTION YEAR:1968         STATE WELL NUMBER:06N11W19E	DRAWN BY: <u>K.MAKAR</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous           Potential           (mV)           0         50         100	Resistivity           RSN / RLN           (Ohm-m)           0         50         10		As-Built Profile on 25-Aug-2004 Video Survey nd Well Drillers Report)
				Ground Surface	0
SAND: surface sand & hardpan, sand & gravel, streaks of clay	SP				
CLAY: clay, streaks of sand	CL			28" Diameter Borehole (0' to 848')	
SAND: packed sand, streaks of clay	SP				
SAND: sandy clay and sand	SP				
SAND: hard sand, streaks of clay	SP				
SAND: sand & gravel, clay streaks, hard sand	SP			Well Casing 16" I.D. x 1/4" Wall Mild Steel	
SAND W/ GRAVEL: sand and gravel, clay streaks	SP	300		Blank (0' to 399'; 540' to 581')	-
SAND: firm sand, clay streaks	SP				
SAND: hard sand, thin streaks of soft clay	SP	350 		Well Screen	399
SAND W/ CLAY: clay and sand	SP-SC	450	$)  \frac{1}{1}  $	Louvered 16" I.D. x 1/4" Wall Mild Steel w/0.125" Slot Size (estimated based on gravel size) (399' to 540'; 581' to 848')	
SAND: sand, streaks of clay	SP		)		
SAND: sand, thin streaks of clay	SP			Static Water Level Mar-2020	540
SAND: sand, clay streaks	SP	550		(552' brp)	- 552 581
SAND: firm sand CLAY: clay, small amount of sand	SP CL				
CLAY: clay, streaks of sand	CL	600 600 600 650 650		Gravel Envelope	
CLAY: clay, streaks of sand, thin streaks of sandy shale	CL	700		(0' to 868')	
		750	) + + + + + + + + + + + + + + + + + + +		



AS-BUILT PROFILE: WELL 3A						
PALMDALE WATER DISTRICT WELL 3A		Notes: Conductor casing / annular seal unknown. Well details based on 25-Aug-2004 video survey and Well Drillers Report.	KYLE Gro	undwater		
PALMDALE, CALIFORNIA DECEMBER 2020	CONSTRUCTION YEAR:       1960         STATE WELL NUMBER:       06N11W19E	DRAWN BY: <u>K.MAKAR</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F		

Section	Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV) 0 50 100	Resistivity           RSN / RLN           (Ohm-m)           0         50         100	(Based or and	As-Built Profile n 15-May-2018 Video Survey I Well Drillers Report)
Support of a serie of a ser					Ground Surface	0
Ministry of an analysis of anal	SAND: medium to coarse sand	SP			Conductor Casing 32" Diameter x Unknown Wall Mild Steel	
Non-control soluty of the scales and graves	SAND W/CLAY: medium sand, coarse sand with clay				Sanitary Seal	
Section results in source and grand and information is users and grand information	SAND: medium to coarse sand	SP			Cement Grout	
SAUD:         SP         Line         Line <thline< th=""> <thline< th="">         Line         <thlin< td=""><td>SAND: medium to coarse sand, gravel, small silt streaks</td><td>SP</td><td></td><td></td><td></td><td></td></thlin<></thline<></thline<>	SAND: medium to coarse sand, gravel, small silt streaks	SP				
Statil. Brole revenes cond         SP         Image: SP	SAND: medium to coarse sand, gravel	SP	150			
SAMD life in summarized       SP       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	SAND: medium to coarse sand	SP				
CLAY from they, speeds at sard         CC         CC <thcc< th="">         CC         CC</thcc<>	SAND: fine to coarse sand	SP				
SAND. medium to cases sand       SP         SAND. Medium to cases sand       SP         SAND. Mol Ary line to medium to cases       SP         SAND. Mol Ary line to medium to cases       SP         SAND. Mol Ary line to medium sand	CLAY: brown clay, streaks of sand	CL////////////////////////////////////				
SAND WICLAY: The to medium to castrage with days and binds of the same with days SAND. That is another same with days SAND. That is another same with days SAND. That is another same with days SAND. The to medium same with days SAND. The to medium same with days SAND. WICLAY: The to medium so castrage same with days SAND. WICLAY: the to medium to castrage same with days SAND. WICLAY: medium to castrage same with same same with days SAND. WICLAY: medium to castrage same with same same with days SAND. WICLAY: medium to castrage same with same same with days SAND. WICLAY: medium to castrage same with same same with days SAND. WICLAY: the to medium to castrage same with same same with d	SAND: medium to coarse sand	SP			16" Diameter x 1/4" Wall Mild Steel Blank	
SAND. Inter to medium sand       SP         SAND. Micr. LAY. The to medium sand with day       SP-SC         SAND. Micr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium sand with day       SP-SC         SAND. Wicr. LAY. The to medium to coarse and with cays       SP-SC         SAND. Wicr. LAY. The to medium to coarse and with game       SP-SC         SAND. Wicr. LAY. The to medium to coarse and with game       SP-SC         SAND. Wicr. LAY. The to medium to coarse and with game       SP-SC         SAND. Wicr. LAY. The to medium to coarse and with game       SP-SC         SAND. Wicr. LAY. The tormedium to coarse and with	SAND W/CLAY: fine to medium to coarse sand with clay	SP-SC			(0' to 480')	
Add Define and the sand SP (111) and the sand (112) SP (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111) (111)	SAND: fine to coarse sand	SP	350			
SAND. With the to medium sand with clay       SP         SAND. With the medium sand with clay       SP         SAND. With sand       CL         SAND. With the medium sand with clay       SP         SAND. With sand       CL         SAND. With the medium to coarse grand, min grand, draw       SP         SAND. With the medium to coarse grand, min grand, draw       SP         SAND. With the medium to coarse grand, min grand, draw       SP         SAND. With the medium to coarse grand, min grand, draw       SP         SAND. With the medium to coarse grand, min grand, draw       SP         SAND. With the medium to coarse grand, min grand, draw       SP         SAND. With the medium to coarse grand, min grand, draw       SP         SAND. With the medium to coarse grand, min grand, draw       SP         SAND. With the medium to coarse grand, min grand, draw       SP         SAND. With the medium to coarse grand, min grand, draw       SP         SAND.	SAND: fine to medium sand	SP		+++++++++++++++++++++++++++++++++++++++		
SAND WicLAY: fire to medium sand       SP         SAND WicLAY: fire to medium sand with clay       SP         SAND WicLAY: fire to medium sand       SP         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: fire to medium to coarse sand with clay       SP-SC         SAND WicLAY: medium to coarse sand with clay       SP-SC         SAND WicLAY: medium to coarse sand with clay       SP-SC         SAND WicLAY: medium to coarse sand with clay       SP-SC         SAND WicLAY: medium to coarse sand with clay       SP-SC         SAND WicLAY: me	SAND: hard packed fine sand	SP	400			
SAND. With sand       SP       450       Well Screen       ************************************	SAND: fine to medium sand	SP				
SAND: fine to medium sand       SP         SAND: fine sand       SP         SAND: fine sand with clay       SP-SC         CLAY: brown clay with sand       CL         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: medium to coarse sand, and growl, clay       SP-SC         SAND W/CLAY: medium to coarse sand, growl clay       SP-SC         SAND W/CLAY: medium to coarse sand, growl clay       SP-SC         SAND W/CLAY: medium to coarse sand	SAND W/CLAY: fine to medium sand with clay	SP-SC//////				
SAND: time sand     SP       SAND WCLAY: fine sand with clay     SP-SC       CLAY: brown clay with sand     CL       SAND WCLAY: fine to medium sand with clay       SP-SC       GLAY: brown clay with sand       CLAY: brown clay with sand       SAND WCLAY: fine to medium to coarse sand, sand gravel, clay       SAND WCLAY: fine to medium to coarse sand, sand gravel, clay       SAND WCLAY: fine to medium to coarse sand, sand gravel, clay       SAND WCLAY: fine to medium to coarse sand, sand sand gravel, clay       SAND WCLAY: fine to medium to coarse sand, sand gravel, clay       SAND WCLAY: fine to medium to coarse sand, sand sand gravel, clay       SAND WCLAY: fine to medium to coarse sand, sand gravel, clay       SAND WCLAY: fine to medium to coarse sand, sand gravel, clay       SAND WCLAY: fine to medium to coarse sand, sand gravel, clay       SP-SC       SAND WCLAY: fine to medium to coarse sand, sand gravel, clay       SP-SC       SP       SAND WCLAY: medium to coarse sand, sand gravel, clay       SP       SP       SP       SP       SP        SP       S	SAND: fine to medium sand	SP				
SAND W/CLAY: fine sand with clay       SP-SC       Solution       So	SAND: fine sand	SP			16" Diameter x 1/4" Wall Mild Steel	
CLAY: brown clay with sand CL SAND WCLAY: fine to medium to coarse sand with clay SAND WCLAY: fine to medium to coarse sand with clay SP-SC SAND WCLAY: fine to medium to coarse sand with clay SP-SC SAND WCLAY: fine to medium to coarse sand with clay SP-SC SAND WCLAY: fine to medium to coarse sand with clay SP-SC SAND WCLAY: fine to medium to coarse sand gravel, clay SAND WCLAY: medium to coarse sand, synthesis and with clay SP-SC SAND WCLAY: medium to coarse SP-SC SAND WCLAY: medium to coarse SP-SC SAND WCLAY: medium to coarse SP SC SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SAND WCLAY: medium to coarse sand, synthesis and gravel, clay SP SC	SAND W/CLAY: fine sand with clay	SP-SC///////	500			
SAND W/CLAY: fine to medium sand with clay       SP-SC         CLAY: brown clay with sand       CL         CLAY: brown clay with sand       CL         SAND W/CLAY: fine to medium to coarse sand with clay       SP-SC         SAND W/CLAY: fine to medium to coarse sand, gravel       SP         SAND W/CLAY: medium to coarse sand, small gravel. clay       SP         SAND W/CLAY: medium to coarse sand, small gravel. clay       SP         SAND W/CLAY: medium to coarse sand, small gravel. clay       SP         SAND W/CLAY: medium to coarse sand, small gravel. clay       SP         SAND W/CLAY: medium to coarse sand, small gravel. clay       SP         SAND: coarse sand with gravel       SP         SAND: coarse sand, gravel. clay       SP	CLAY: brown clay with sand	CL	550		Mar-2020	574
CLAY: brown clay with sand       CL       Image: Class sand state in the same state in th	SAND W/CLAY: fine to medium sand with clay	SP-SC				
SAND W/CLAY: fine to medium to coarse sand, with clay     SP-SC     750       SAND W/CRAVEL: fine to medium to coarse sand, gravel     SP       SAND W/CLAY: medium to coarse sand, small gravel, clay     SP-SC       SAND W/CLAY: medium to coarse sand, small gravel, clay     SP-SC       SAND W/CLAY: medium to coarse sand, small gravel, clay     SP-SC       SAND W/CLAY: medium to coarse sand, small gravel, clay     SP-SC       SAND W/CLAY: medium to coarse sand, small gravel, clay     SP-SC	CLAY: brown clay with sand	CL			No. 5	
sand, gravel     SP       SAND W/CLAY: medium to coarse sand, small gravel, clay     SP-SC       SAND W/CLAY: medium to coarse sand with clay     SP-SC       SAND W/CLAY: medium to coarse sand with clay     SP-SC       SAND: coarse sand with gravel     SP       SAND: coarse sand, gravel, clay     SP	SAND W/CLAY: fine to medium to coarse sand with clay	SP-SC	700			
SAND W/CLAY: medium to coarse sand, small gravel, clay SAND W/CLAY: medium to coarse sand with clay SAND W/CLAY: medium to coarse sand with sp-SC SP-SC SP-SC SP-SC SP-SC SP SC SC SP SC SC SP SC SC SP SC SC SP SC SP SC SP SC SP SC SC SC SP SC	SAND W/GRAVEL: fine to medium to coarse	SP	800			
SAND W/CLAY: medium to coarse sand with clay     SP-SC     Image: Clay interval inter	sand, gravel SAND W/CLAY: medium to coarse sand, small gravel, clay					
SAND: coarse sand with gravel     SP       SAND: coarse sand, gravel, clay     SP	SAND W/CLAY: medium to coarse sand with clay	SP-SC	850			
SAND: coarse sand, gravel, clay	SAND: coarse sand with gravel	SP				
	SAND: coarse sand, gravel, clay SAND: medium to coarse sand, small clay		900			

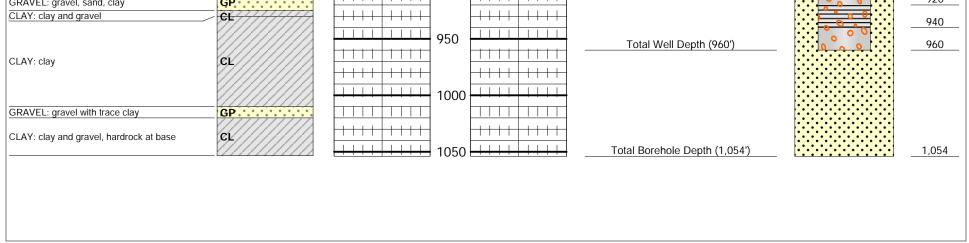


AS-BUILT PROFILE: WELL 6A						
PALMDALE WATER DISTRICT WELL 6A PALMDALE, CALIFORNIA DECEMBER 2020	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>*Louvered / 0.080 in</u> SCREEN INTERVALS (ft bgs): <u>480-1,010</u>	Notes: *Mill slot on DWR log, louvered on videos surveys. Well details based on 15-May-2018 video survey and Well Drillers Report.	KYLE Groundwater			
	CONSTRUCTION YEAR: STATE WELL NUMBER:	DRAWN BY: <u>M.DYKSTRA</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F		

Lithology (Well Drillers Report)	USCS Field	nterpretedSpontaneousResistivityJSCS FieldPotentialRSN / RLN		As-Built Profile (Based on 4-May-2020 Video Survey		
	Classification	(mV) 0 50 100	(Ohm-m) 0 50 100	and	n 4-May-2020 Video Surv I Well Drillers Report)	C <b>y</b>
		0		Ground Surface Conductor Casing		0
				28" Diameter 1/4" Wall Mild Steel		*
SAND W/CLAY: coarse sand, clay	SP-SC			(0' to 80')		
		50		Sanitary Seal		•
	<u> ////////////////////////////////////</u>			Cement Grout (0' to 80')		8
SAND: medium sand, small clay streaks	SP					
CLAY: clay, streaks of sand	CL			24" Diameter Borehole		
		150	)	(80' to 1,020')		
SAND: coarse sand	SP					
SAND: sand, gravel	SP	200				
SAND W/CLAY: sand, clay	SP-SC ////////					
		250				
SAND W/CLAY: sand, clay	SP-SC///////			Well Casing		
				16" Diameter x 1/4" Wall Mild Steel Blank		
SAND W/GRAVEL: sand and gravel	SP	300		(0' to 570')		
CLAY: clay	CL					
		350				
SAND: sand with clay streaks	SP			Gravel Envelope		
CLAY: clay with sand	ĊĹ	400		6 x 12 (0' to 1,020')		
SAND W/CLAY: sand, clay	SP-SC//////					
GRAVEL: gravel with clay	GP					
SAND: sand, gravel, and clay	SP	450				
CLAY: clay	CL					
SAND W/GRAVEL: sand and gravel	SP					
SAND WORAVEL. Sand and graver	36	500		Static Water Level 4-May-20		
SAND: sand, gravel, and clay	SP			(527.5 ft bgs)		52
CLAY: clay SAND: sand, gravel, and clay	CL SP	550		Stainless Steel Well Patches (542.2'-546.3' and 547.4'-552.4')		<u>542.2-</u> 547.4-
CLAY: clay	CL					57:
SAND W/GRAVEL: sand and gravel	SP					(per v
CLAY: clay	<u>CL////////////////////////////////////</u>	600				on 4-Ma
SAND W/CLAY: sand, clay	SP-SC			Vertical Rupture (629' to 630.9')		(20.4
CLAY: clay with sand						629-6
SAND W/GRAVEL: sand and gravel	SP	650		Possible Structural Issue (652')		65
CLAY: clay with gravel	ĊĽ					
CLAY: clay, streaks of sand	CL	700				
SAND W/CLAY: sand, clay	SP-SC			Well Screen Wire-Wrap		
SAND: sand	SP			16" Diameter Mild Steel w/0.050-inch Openings		
SAND: medium sand, fine gravel SAND: medium sand, clay streaks	SP SP	750		(573.8' to 900')		
CLAY: hard clay SAND: medium to coarse sand	CL////////////////////////////////////					
CLAY: brown clay, streaks of sand	SP CL////////////////////////////////////					
SAND: fine sand with clay streaks CLAY: brown clay, fine to coarse sand	CL	800		Top of Fill Material 4-May-2020 Video Survey		
CLAY: hard to soft clay	CL			(824') Cement Plug		<u> </u>
SAND: medium to fine sand, clay streaks	SP	850		(832.5' to 860')		
חשיים. הוישוויש. הוישוויש. הוישויש. הוישוישים איז				Fill Material (assumed) (860' to 920')		86
CLAY: clay, streaks of fine sand SAND: medium to fine sand, clay streaks	CĽ////////////////////////////////////			Well Sump		
CLAY: clay, streaks of coarse sand SAND: medium to fine sand, clay streaks	CL////////////////////////////////////	900		16" Diameter Mild Steel Blank (900' to 920')		90
CLAY: clay, streaks of coarse sand				Total Well Depth (920')	0000	92
SAND: medium to fine sand, clay streaks	SP					
-		950				
CLAY: clay, streaks of coarse sand	CĽ////////////////////////////////////					
GRAVEL: gravel and sand, and granite	GP					
	Granite	100			• • • • • • • • • • • • •	

	AS-BUILT PROFILE: W	ELL 7A		
PALMDALE WATER DISTRICT WELL 7A	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Wire-Wrap / 0.050 in</u> SCREEN INTERVALS (ft bgs): <u>573.8-900</u>	Notes: Well details based on 4-May-2020 video survey and Well Drillers Report.		oundwater
PALMDALE, CALIFORNIA DECEMBER 2020	CONSTRUCTION YEAR: <u>1985</u> STATE WELL NUMBER: <u>06N11W19F</u>	DRAWN BY: <u>K.MAKAR</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV) 0 50 100	Resistivity RSN / RLN (Ohm-m) 0 50 10	As-Built Profile	
CLAY: clay and sand	¢[////////////////////////////////////	0		Ground Surface	
SAND W/GRAVEL: sand, gravel, clay	SP			Conductor Casing	
GRAVEL: gravel with sand SAND: sand, clay, gravel				30" Diameter x 1/4" Wall Mild Steel (0' to 80')	
GRAVEL: gravel with sand	GP	50		Sanitary Seal	
	<b>SF</b>			Cement Grout (0' to 80')	80
				(0.000)	
SAND: sand, clay, gravel	SP	100		•	
SAND: sand GRAVEL: gravel	GP				
SAND: sand, clay streaks	SP			26" Diameter Borehole (80' to 1,030')	
		150			
CLAY: clay CLAY: clay, gravel, and sand					
SAND: sand and gravel	SP				
SAND: fine sand, gravel, some clay	SP	200	)		
SAND: fine sand and clay	SP				
or me sanu anu day					
SAND: fine sand	SP	250	J	Well Casing	
GRAVEL: gravel GRAVEL: gravel with clay	GP GP			16" Diameter x 1/4" Wall	
GRAVEL: gravel	GP			Mild Steel Blank (0' to 560')	
CLAY: clay	CL////////////////////////////////////	300			
GRAVEL: gravel with clay	GP				
CLAY: clay	CL	350			
CLAY: clay and gravel	CL				
CLAY: clay, sand, and gravel	CL			Gravel Envelope No. 8	
CLAY: clay and sand CLAY: clay		400		(0' to 1,054')	
	77/////////////////////////////////////				
CLAY: clay and fine sand	CL	45			
SAND: fine sand	SP				
SAND W/CLAY: sand with clay	SP-SC//////				
	<u> </u>			Static Water Level Mar-2020	
SAND: sand, clay, and gravel	SP			(515' brp)	<b>T 5</b> 15
SAND W/GRAVEL: sand and gravel	SP				
					560_
GRAVEL: gravel	GP				
GRAVEL: gravel with sand	GP	60	)	Well Screen	
CLAY: clay and sand	CL////////////////////////////////////			Wire-Wrap	
GRAVEL: gravel with sand	GP			16" Diameter Mild Steel w/0.050 Openings	
CLAY: clay, sand, and gravel GRAVEL: gravel with sand	CL////////////////////////////////////	65	$\mathbf{D} = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 &$	<u>(560' to 740'; 820' to 880'; 920' to 940')</u>	
CLAY: clay					
CLAY: clay and sand	CL				
		70	)	-	
CLAY: clay, sand, and gravel	CL				
GRAVEL: gravel, sand, red clay CLAY: clay and gravel	GP CL				740
		750	)   <u>                     </u>	•	
CLAY: clay	CL			Well Casing 16" Diameter x 3/8" Wall	
				Mild Steel Blank	
CLAY: clay and gravel CLAY: clay		800	$\mathbf{D} \models 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1$	<u>(740' to 820'; 880' to 920'; 940' to 960')</u>	
					820
CLAY: clay and gravel	CL////////////////////////////////////				
		850		Top of Fill Material	
CLAY: clay GRAVEL: gravel with clay	CL////////////////////////////////////			22-Feb-2017 Video Survey	880
				(883.4' brp)	
CLAY: clay	CL	900			••••••
GRAVEL: gravel, sand, clay	GP				920
CLAY: clay and gravel	C			1	· · · · · · · · · · · ·

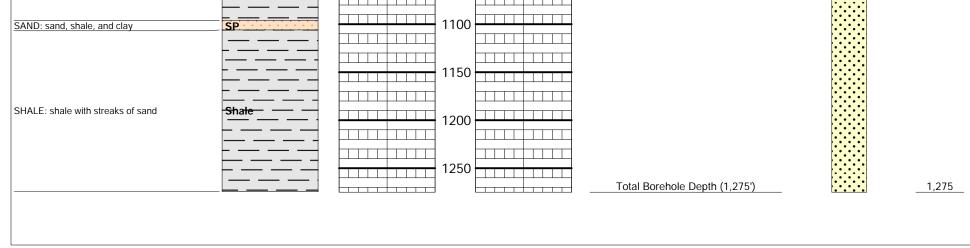


	AS-BUILT PROFILE: WI	ELL 8A	
PALMDALE WATER DISTRICT WELL 8A	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Wire-Wrap / 0.050 in</u> SCREEN INTERVALS (ft bgs): <u>560-740; 820-880; 920-940</u>	Notes:	KYLE Groundwate
PALMDALE, CALIFORNIA DECEMBER 2020	CONSTRUCTION YEAR:       1988         STATE WELL NUMBER:       06N11W19C	DRAWN BY: <u>M.DYKSTRA</u> APPROVED BY: <u>R.KYLE</u>	PROJECT NO.APPENDIX3020.001F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV)	Resistivity RSN / RLN (Ohm-m)	(Based on Well D	Built Profile Video Surveys and rillers Reports)
		0 50 100	0 50 100	)	
lo Lithology Recorded	N/A			Ground Surface Well Casing (1928) 16" Diameter x Unknown Wall Steel Blank w/Unknown Slot Size (0' to 282') Well Casing (1987 Liner) 12" Diameter (assumed) x Unknown Wall Steel Blank (0' to 500'; 610' to 624') Well Casing (2017 Liner) 8" Diameter x Unknown Wall Steel Blank (0' to 340')	
LAY: hard clay RAVEL W/SAND: coarse gravel and sand	CL GP	30	0	Well Patch on 1987 Liner 12" Diameter Casing (2017 Rehab) (200' to 226)	
CLAYEY GRAVEL: clay and gravel GRAVEL W/SAND: gravel and sand CLAYEY GRAVEL: clay and gravel	GC GP GC			(308' to 326') Well Screen (1947 Deepening) 14" Diameter (assumed) x Unknown Wall Steel w/Unknown Slot Size (280' to 527')	
SAND W/GRAVEL: sand and gravel	GC			Well Screen (2017 Liner) Machined Slot 8" Diameter x Unknown Wall Steel w/Unknown Slot Size (340' to 640') Static Water Level Mar-2020	
CLAY: brown clay	CL	45		(444' brp)	
SAND: mud and sand SAND W/GRAVEL: sand and gravel CLAYEY GRAVEL: clay and gravel	SP 	50	0	Well Screen (1987 Liner) Vertical Mill Slot 12" Diameter (assumed) x Unknown Wall Steel w/Unknown Slot Size (500' to 610')	
		55		Well Casing (1947 Deepening) 14" Diameter (assumed) x Unknown Wall Steel Blank (275' to 280'; 527' to 600')	
CLAY: hard decomposed gravel and clay composition of conglomerate shale	CL			Open Borehole/Fill Material (assumed) (1947 Deepening) (600' to 696') Well Screen (1987 Liner) Ful-Flo Louvered 12" Diameter (assumed) x Unknown Wall Steel w/Unknown Slot Size (624' to Unknown') Total Well Depth (2017 Liner) (640')	
				Fill Material (Before 2017 Liner Install) (658' to Unknown) Total Well Depth (1947 Deepening) (696')	

AS-BUILT PROFILE: WELL 10							
PALMDALE WATER DISTRICT WELL 10	STEEL TYPE: <u>Steel</u> PERFORATION TYPE/SIZE: <u>See drawing above</u> SCREEN INTERVALS (ft bgs): <u>See drawing above</u>	Notes: Well details based on Video Surveys and Well Drillers Reports/information.		oundwater			
PALMDALE, CALIFORNIA DECEMBER 2020	CONSTRUCTION YEAR: <u>1987 (liner)</u> , 2017 (liner) STATE WELL NUMBER: <u>6N11W20G1</u>	DRAWN BY: <u>K.MAKAR</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F			

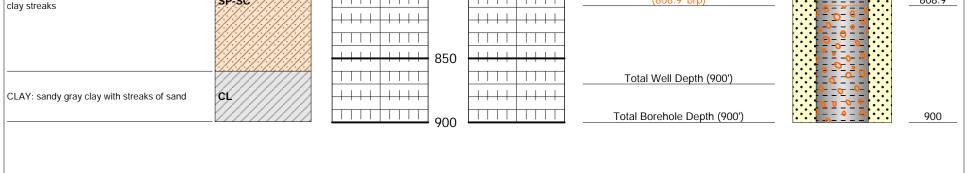
Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV) 0 50 100	Resistivity RSN / RLN (Ohm-m) 0 50 10	As-Built Profile (Based on 14-Mar-2012 Video Survey and Well Drillers Report)		
				-		
SOIL HARDPAN	SP	0		Ground Surface	0	
SAND: coarse sand	SP SP			Conductor Casing 30" I.D. x 1/4" Wall Mild Steel (0' to 50')		
CLAY: clay	CL	50		Sanitary Seal Cement Grout (0' to 50')	50	
CLAY: brown clay	CL					
CLAY: brown clay, streaks of sand	CL////////////////////////////////////					
SAND W/CLAY: coarse sand with clay CLAY: brown clay, streaks of sand	SP-SC/////	100				
				28" Diameter Borehole		
SAND W/CLAY: hard sand and clay, streaks of gravel	SP-SC	150		(50' to 900')		
SAND: sand, clay streaks	SP	200	)			
CLAY: clay, streaks of sand	CL////////////////////////////////////			Well Casing (Original)		
SAND: sand, clay streaks	SP	250		16" I.D. x 1/4" Wall Mild Steel Blank (0' to 504')		
CLAY: clay and sand	CL///////	230				
				Well Casing (Liner) 12" Diameter x 5/16" Wall Mild Steel		
CLAY: brown clay, streaks of gravel, streaks of sand	CL	300		Blank (0' to 665')		
SAND W/CLAY: sand with sandy brown clay	SP-SC///////	350				
SAND: hard sand with clay SAND: medium to coarse sand, clay streaks	SP SP			Gravel Envelope (Original) Pea Gravel		
	.з <b>р</b> .	400	)	(0' to 1,275')		
CLAY: brown clay, streaks of sand	CL					
		450		Gravel Envelope (Liner) (0' to 900')		
SAND W/GRAVEL: sand, gravel, some clay	SP	430				
				Well Serson (Original)		
		500		Well Screen (Original) Louvered 16" I.D. x 1/4" Wall Mild Steel	504	
CLAY: brown clay, streaks of sand	CL			w/0.125 Slot Size (504' to 900')		
		550		Static Water Level		
				Apr-2014 (592' brp)	592	
		600	)	(542 bib)		
SAND: sand, clay streaks and cobbles	SP					
		650	)			
					<u></u>	
				Well Screen (Liner)		
		700		Ful-Flo Louvered 12" Diameter x Unknown Wall Mild Steel		
CLAY: brown clay, streaks of sand	CL			w/0.060 Slot Size (665' to 865')		
		750				
SAND: medium to coarse sand, clay streaks	SP			Top of Fill Material		
		800		14-Mar-2012 Video Survey (861' brp)		
CLAY: brown clay, streaks of sand	CL			Well Sump (Liner)		
		850		12" Diameter x 3/8" Wall Mild Steel Blank w/SE Head	861	
SAND: sand and brown clay	SP			(865' to 875')	865	
		900		Total Well Depth (900')	875 900	
Unknown: assumed sand SAND: hard sand	SP SP					
CLAY: blue clay, streaks of shale	CL	950	,	Pilot Borehole		
				10.625" Diameter Borehole		
SHALE: shale with streaks of medium to		100	00	(900' to 1,275')		
coarse sand	Shale — ·					
		105	50			
SHALE: shale	Shale					
	<u> </u>					



<b>AS-BUILT PROFILE: WELL 11</b>	Α
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PALMDALE WATER DISTRICT WELL 11A	PERFORATION TYPE/SIZE: Louvered / 0.125 in (original) Louvered / 0.060 in (liner)	Notes: Well details based on 14-Mar-2012 video survey and Well Drillers Report.		oundwater
PALMDALE, CALIFORNIA DECEMBER 2020	SCREEN INTERVALS (ft bgs): <u>665-865 (liner)</u> CONSTRUCTION YEAR: <u>1963 (original), 2012 (liner)</u> STATE WELL NUMBER: Unknown	DRAWN BY: <u>K.MAKAR</u> APPROVED BY: R.KYLE	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Field Potential		As-Built Profile		
		0		Ground Surface Conductor Casing		
SAND W/GRAVEL: coarse sand, gravel	SP			30" Diameter x 1/4" Wall Mild Steel (0' to 50')		
				Sanitary Seal		
GRAVEL: gravel with some brown clay	GP	50		Cement Grout (0' to 50')		
AND: fine to medium sand with clay streaks	SP					
		100				
SAND: fine sand	SP			27.5" Diameter Borehole (50' to 900')		
		150				
		200				
SAND W/CLAY: fine to medium sand, brown clay streaks	SP-SC					
				Well Casing 16" I.D. x 1/4" Wall Mild Steel Blank		
		300		(0' to 450')		
SAND W/CLAY: hard fine to medium sand, prown clay streaks	SP-SC//////					
		350				
CLAY: brown clay some sand	CL					
SAND W/CLAY: hard fine to medium sand,	SP-SC	400				
brown clay streaks						
CLAY: brown clay some sand	CL////////////////////////////////////				45	
		450				
CLAY: hard brown clay, cemented sand	CL			Gravel Envelope		
				Unknown Gravel (0' to 900')		
		500				
				Static Water Level Mar-2020		
		550		(543' brp)	<u> </u>	
SAND W/CLAY: fine sand, brown clay streaks	SP-SC					
		600				
		650				
CLAY: brown clay some sand	CL			Well Screen Louvered		
				16" I.D. x 1/4" Wall Mild Steel w/0.125 Slot Size		
SAND W/CLAY: medium to coarse sand,	SP-SC	700		(450' to 900')		
prown clay streaks						
		750				
		+++++++++++++++++++++++++++++++++++++++		Top of Fill Material 20-May-2014 Video Survey		
SAND W/CLAY: fine to medium sand, brown	SP-SC///////////////////////////////////	800	) + +	(808.9' brp)	808	



	AS-BUILT PROFILE: W	ELL 14A		
PALMDALE WATER DISTRICT WELL 14A	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Louvered / 0.125 in</u> SCREEN INTERVALS (ft bgs): 450-900	Notes:		oundwater
PALMDALE, CALIFORNIA DECEMBER 2020	CONSTRUCTION YEAR:1965 STATE WELL NUMBER:06N12W24A	DRAWN BY:       M.DYKSTRA         APPROVED BY:       R.KYLE	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV)	Resistivity RSN / RLN (Ohm-m)	As-Built Profile (Based on 12-Dec-2016 Video Survey and Well Drillers Report)		
		0 50 100	0 50 100			
SAND: surface soil	SP	0		Ground Surface Conductor Casing 28" Diameter x 1/4" Wall Mild Steel		
GRAVEL: gravel	GP			(0' to 50')		
CLAY: clay with gravel	CL///////	50		Sanitary Seal Cement Grout (0' to 50')		
SAND: sand, clay streaks	SP					
SAND W/CLAY: sand, clay and coarse gravel	SP-SC					
				Unknown Diameter Borehole (50' to 880')		
SAND: sand, clay streaks	SP					
SAND: fine sand	SP	200				
	_			Well Casing 16" I.D. x 1/4" Wall Mild Steel Blank		
SAND: sand, gravel	SP	250	D	16" I.D. x 1/4" Wall Mild Steel Blank (0' to 320')		
SAND: sand, clay streaks	SP.					
		300		Well Screen		
GRAVEL: gravel	GP			Machine Cut 16" Diameter x 1/4" Wall Mild Steel		
SAND: hard packed sand	SP	350		w/0.125 Slot Size (320' to 800')		
SAND: coarse sand	SP	400	D			
SAND: hard packed sand	SP	450				
SAND: sand, clay streaks	SP	500	D			
				Static Water Level		
SAND: hard packed sand	SP		D	Feb-2020 (548' brp)		
CLAY: clay and sand	CL	600				
				Gravel Envelope		
SAND: hard packed sand	SP	650		Gravel Envelope "Special" (0' to 800')		
·						
SAND: sand, clay streaks	SP	700				
Shire sund, day succits						
SAND: hard sand	SP	750		Top of Fill Material 12-Dec-2016 Video Survey		
	3P			(763.6' brp)		
SAND: hard fine sand	SP			<b>-</b>		
		800		Total Well Depth (800')		
SAND: fine sand and clay	SP					
······		850				
SAND: hard sand, cemented	SP			Total Borehole Depth (880')		

	AS-BUILT PROFILE: WI	ELL 15		
PALMDALE WATER DISTRICT WELL 15	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Machine Cut / 0.125 in</u> SCREEN INTERVALS (ft bgs): <u>320-800</u>	Notes: Well details based on 12-Dec-2016 video survey and Well Drillers Report.		undwater
PALMDALE, CALIFORNIA DECEMBER 2020	CONSTRUCTION YEAR:         1960           STATE WELL NUMBER:         06N12W13N01	DRAWN BY: <u>M.DYKSTRA</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV)	Resistivity RSN / RLN (Ohm-m)	As-Built Profile (Based on 31-Mar-2008 Video Survey and Well Drillers Report)		
		0 50 100	0 50 10	00 		
				Ground Surface		
		0		Conductor Casing		
SAND: sand	SP			26" Diameter x Unknown Wall Mild Steel (0' to 50')		
			+++++++++++++++++++++++++++++++++++++++	Sanitary Seal		
				Cement Grout (0' to 50')		
SAND: coarse sand	SP	50 -++++++++++++++++++++++++++++++++++++				
				Unknown Diameter Borehole		
		+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	(50' to 585')		
SAND: coarse sand and boulders	SP					
		+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	Well Casing 14" I.D. x 1/4" Wall Mild Steel Blank		
				(0' to 236')		
SAND: hard packed sand	SP					
AND. Haru packeu sahu	<b>Э</b> Г					
SAND: sand	SP			Static Water Level		
				Mar-2020 (187' brp)		
AND: coarse sand	SP					
CLAY: clay and sand	CL///////					
AND: sand and boulders	SP	250				
AND: coarse sand	SP					
				Well Screen		
				Machine Cut 14" I.D. x 1/4" Wall Mild Steel		
CLAY: clay and sand	CL	300		w/0.125 Slot Size (236' to 550')		
SLAT. Cidy dhu Sahu						
SAND: coarse sand and clay	SP	350				
				Gravel Envelope "Special"		
		400		"Special" (0' to 585')		
AND: coarse sand	SP		+++++++++++++++++++++++++++++++++++++++			
		450				
SAND: coarse sand and boulders	SP.					
	· · · · · · · · · · · · · · · · · · ·					
AND: coorse cond	CD		+++++++++++++++++++++++++++++++++++++++			
AND: coarse sand	SP	500				
AND: sand and boulders	SP					
RAVEL: boulders	ĠŴ			Top of Fill Material 31-Mar-2008 Video Survey		
AND: packed sand and boulders	SP			(536.8' brp) Po d f		
	5-65-65-65	550		Total Well Depth (550')		
Bedrock	Bedrock					
				Total Borehole Depth (585')		
			L			

AS-BUILT PROFILE: WELL 16						
	STEEL TYPE: Mild Steel	Notes: Well details based on 31-Mar-2008	A construction	1 - 2		
PALMDALE WATER DISTRICT	PERFORATION TYPE/SIZE: Machine Cut / 0.125 in	video survey and Well Drillers Report.	KYLE Groundwater			
WELL 16 PALMDALE, CALIFORNIA	SCREEN INTERVALS (ft bgs): 236-550					
DECEMBER 2020	CONSTRUCTION YEAR:1960	DRAWN BY: <u>M.DYKSTRA</u>	PROJECT NO.	APPENDIX		
	STATE WELL NUMBER:05N11W05C	APPROVED BY: <u>R.KYLE</u>	3020.001	F		

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV) 0 50 100	Resistivity RSN / RLN (Ohm-m) 0 50 100	As-Built Profile	
			0 50 100		
		0		Ground Surface 13" Diameter Borehole (0' to 137')	0
AND: sand	SP	 		Well Casing (Original) 8" Diameter x 8 gauge Wall Mild Steel Blank (0' to 20')	
ND W/SILT: sandy silt with clay	SP-SM			Well Casing (Liner) 6" Diameter SDR21 ASTM F-480 Blank PVC (assumed 0' to 48')	20
		20		Well Screen (Original) Machine Cut 8" Diameter x 8 gauge Wall Mild Steel w/Unknown Slot Size (20' to 108')	
AY: clay	CL	30			41 - 22 41 - 22 1 - 22 1 - 22
		40		Static Water Level Mar-2020 (41' brp)	▲1
				Well Screen (Liner) 6" Diameter SDR21 ASTM F-480 Mill Slot PVC w/Unknown Slot Size (assumed 48' to 108')	
LAY: clay and boulders		 			
				Gravel Envelope (Original) Unknown Gravel (0' to 137')	
	<u>%^/</u>	 			
		90		Gravel Envelope (Liner) Unknown Gravel (assumed 0' to 108')	
RAVEL: gravel	GP.			Total Well Depth (108')	
		110			
		120			
OULDERS: boulders	Boulderso	130			
	Boulders			Total Borehole Depth (137')	13

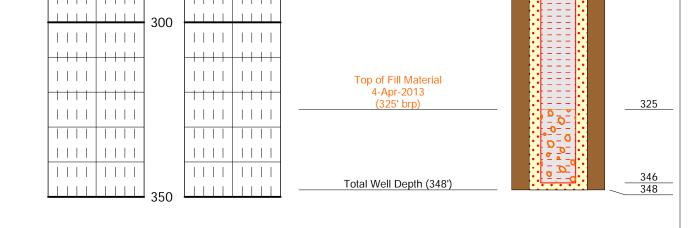
	AS-BUILT PROFILE: W	ELL 18		
PALMDALE WATER DISTRICT WELL 18	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Machine Cut / Unknown</u> SCREEN INTERVALS (ft bgs): <u>20-108</u>	Notes: 1) Conductor casing / annular seal unknown. 2) Top of Fill was 92.8 ft brp on 8-Dec-2016 video survey (prior to liner installation).		oundwater
PALMDALE, CALIFORNIA DECEMBER 2020	CONSTRUCTION YEAR:         1954           STATE WELL NUMBER:         05N11W17H	DRAWN BY: <u>M.DYKSTRA</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV)	Resistivity RSN / RLN (Ohm-m)	As-Buil	t Profile	
	Classification	0 50 100		0		
		0		Ground Surface		0
SAND: sand	SP					
SAND: sand and rocks	SP					
SAND: sand with gravel	SP			24" Diameter Borehole		
				(0' to 393')		
SAND: sand	SP			Static Water Level Mar-2020		
		50		(47' brp)		47
				Well Casing 14" O.D. x 1/4" Wall Mild Steel Blank		
				(0' to 80')		
		+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++			80
			D			
SAND: sand, clay streaks	SP					
				Well Screen Machine Cut		
				14" O.D. x 1/4" Wall Mild Steel w/Unknown Slot Size		
				(80' to 350')		
			+++++++++++++++++++++++++++++++++++++++			
		150	D			
SAND: coarse sand, gravel, small clay streak	S SP					
		200				
SAND: hard packed sand	SP					
SAND W/GRAVEL: coarse sand, gravel	SP			Gravel Envelope Nos. 3 & 4 (0' to 393')		
				(0 10 373)		
SAND W/CLAY: coarse sand, clay	SP-SC	250				
SAND: sand, clay streaks	SP					
		300		Top of Fill Material		
				10-Dec-2009 Video Survey (316' brp)		316
SAND: coarse sand	SP				စ္ ၀ ၀	
					<b>b o o o</b>	
		35(		Total Well Depth (350')		350
SAND: hard packed sand	SP					
			- [ ] ]			393

AS-BUILT PROFILE: WELL	19
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PALMDALE WATER DISTRICT WELL 19	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Machine Cut / Unknown</u> SCREEN INTERVALS (ft bgs): <u>80-350</u>	Notes:		undwater
PALMDALE, CALIFORNIA DECEMBER 2020		DRAWN BY: <u>M.DYKSTRA</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV) 0 50 100	Resistivity RSN / RLN (Ohm-m) 0 50 100	As-Built Profile (Based on 4-Apr-2013 Video Sur and Well Drillers Report) 00		/ey	
		0		Ground Surface	0		
No Well Drillers Report. No lith	nology recorded.			Unknown Diameter Borehole (0' to 348')			
		50		Well Casing (Original) 16" Diameter x Unknown Wall Steel Blank (0' to 160')			
				Well Casing (Liner) 10" Diameter x Unknown Wall			
				Steel Blank (0' to 217')			
		100					
				Well Screen (Original) Mill Slot 16" Diameter x Unknown Wall Steel			
				("Mills knife above water" (1975). Perforations interval unknown.)			
				Static Water Level		0	
				Mar-2020 (175' brp)			
				Open Borehole (170' to 348')			
					210	6	
				Well Screen (Liner) Mill Slot 10" Diameter x Unknown Wall			
				Mild Steel w/0.140 Slot Size (216' to 346')			
				Gravel Envelope (Liner) No. 4 Pea Gravel (0' to 348')			



AS-BUILT PROFILE: WELL 2	1
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WELL 21	PERFORATION TYPE/SIZE: Mill Slot / Unknown size (original) Mill Slot / Unknown size (original) Mill Slot / Unknown size (original)	Notes: Well details based on 4-Apr-2013 video survey and Well Drillers Report.		oundwater
PALMDALE, CALIFORNIA DECEMBER 2020	SCREEN INTERVALS (ft bgs): <u>216-346 (liner)</u> CONSTRUCTION YEAR: <u>Unknown (original), 1979 (liner)</u> STATE WELL NUMBER: <u>Unknown</u>	DRAWN BY: <u>K.MAKAR</u> APPROVED BY: R.KYLE	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted Spontaneous USCS Field Potential Classification (mV)		Resistivity RSN / RLN (Ohm-m)	As-Built Profile		
		0 50 100	0 50 100			
		0		Ground Surface	0	
SAND W/GRAVEL: medium to coarse sand,	SP			Conductor Casing		
gravel				32" Diameter x 1/4" Wall Mild Steel (0' to 50')		
SAND W/GRAVEL: coarse sand and gravel,	SP			Sanitary Seal Cement Grout (0' to 50')	50	
some small to medum boulders		50				
				30" Diameter Borehole (50' to 422')		
SAND W/GRAVEL: coarse sand and fine gravel	SP	100		Well Casing 16" Diameter x 1/4" Wall Mild Steel Blank		
				(0' to 190')		
				Static Water Level Mar-2020		
				(142' brp)	14	
		150				
SAND: medium sand, small clay streaks	SP					
				Well Screen		
		200		Louvered 16" Diameter x 1/4" Wall Mild Steel w/0.125" Slot Size		
				(190' to 400')		
SAND: coarse sand	SP					
		250				
				Gravel Envelope		
SAND: medium to coarse sand, small clay streaks	SP	300		No. 5 Castaic Rock (0' to 422')		
CLAY: clay with medium sand	CL	350				
SAND: hard packed sand	SP			Top of Fill Material 15-Mar-2016 Video Survey	394	
		400		(394.6' brp) Total Well Depth (400')		
GRANITE: granite	$A \perp VA \perp VA$ $A \perp 7 A \perp 7 A$ <b>Granite</b> $T \perp 1 \perp 1$ $A \perp 7 A \perp 7$					
				Total Borehole Depth (422')	422	

	AS-BUILT PROFILE: WE	ELL 22	
	STEEL TYPE: Mild Steel	Notes:	A CONTRACT
RDISTRICT	PERFORATION TYPE/SIZE:Louvered / 0.125 in		

PALMDALE WATER DISTRICT WELL 22 PALMDALE, CALIFORNIA DECEMBER 2020	PERFORATION TYPE/SIZE: SCREEN INTERVALS (ft bgs):			oundwater
	CONSTRUCTION YEAR: STATE WELL NUMBER:	DRAWN BY: <u>M.DYKSTRA</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV)	Resistivity RSN / RLN (Ohm-m)	As-Built Profile		
			0 50 100			
		0		Ground Surface Sanitary Seal	0	
				Cement Grout (0' to 80') Annular Seal	*	
				9 Sack Slurry (0' to 50')	50	
CLAY: clay with gravel	CL	50		Conductor Casing	▲ <u> </u>	
				30" Diameter 5/16" Wall Mild Steel (0' to 80')	▲ 80	
				Gravel Fill Tube Unknown Diameter Mild Steel	8	
AND W/CLAY: sand with clay	SP-SC			(0' to 85')		
		15	0			
GRAVEL: gravel with clay	GP			28" Diameter Borehole		
		20		(80' to 900')		
GRAVEL: gravel with rock CLAY: clay with gravel	GP CL	25	0			
GRAVEL: gravel with clay	GP			Well Casing 16" I.D. x 5/16" Wall		
CLAY: clay with gravel				Mild Steel Blank (0' to 600')		
GRAVEL: gravel with clay	GP	30				
CLAY: clay with gravel	CL	35				
GRAVEL: gravel with clay	GP.					
CLAY: clay with gravel	CL			Gravel Envelope 1/4" Birdseye		
		40	0 + + + + + + + + + + + + + + + + + + +	(50' to 900')		
GRAVEL: gravel with clay	GP					
		45	0			
GRAVEL: gravel	GP					
GRAVEL: gravel with clay	<b>ĠP</b>					
CLAY: clay with gravel	CL////////////////////////////////////	50				
GRAVEL: gravel	GP			Static Water Level		
CLAY: clay with gravel	<u>CL</u>	55	0	Mar-2020 (558' brp)	55	
GRAVEL: gravel with clay	GP					
GRAVEL: gravel with rock	GP	60	0	Well Screen	60	
CLAY: clay with gravel GRAVEL: gravel with clay	CL////////////////////////////////////			Louvered 16" I.D. x 5/16" Wall Mild Steel		
GRAVEL: gravel	GP			w/0.030" Slot Size (600' to 840')		
CLAY: clay	¢Ľ////////////////////////////////////	65	0			
GRAVEL: gravel with clay	GP					
CLAY: clay	CL	70				
				Top of Fill Material (Debris)		
GRAVEL: gravel with clay	GP			25-Apr-2012 Video Survey (740' brp)	74	
CLAY: clay	CL////////////////////////////////////	75	0			
RAVEL: gravel with clay	GP					
		80				
RAVEL: gravel with granite	GP					
				Total Well Depth (840')	84	
	A J 7 A J 7 A	85				
GRANITE: granite	$\begin{array}{c} F \neg L & F \neg L \\ \hline \mathbf{Granite} & L & \neg \\ h & L & \neg & h \\ h & \lambda & \gamma & \lambda & \gamma \\ h & \lambda & \gamma & \lambda & \gamma \\ h & \lambda & \gamma & \lambda & \gamma \\ \end{array}$					
	A T T A T A A A A A A A A A A A A A A A			Total Borehole Depth (900')	90	

AS-BUILT PROFILE: WELL 23A						
	STEEL TYPE: Mild Steel	Notes:	Accession of	1		
PALMDALE WATER DISTRICT	PERFORATION TYPE/SIZE:Louvered / 0.030 in		<b>KYLE</b> Gro	oundwater		
WELL 23A PALMDALE, CALIFORNIA	SCREEN INTERVALS (ft bgs): <u>600-840</u>					
DECEMBER 2020	CONSTRUCTION YEAR:1991	DRAWN BY: <u>M.DYKSTRA</u>	PROJECT NO.	APPENDIX		
	STATE WELL NUMBER:06N11W19L	APPROVED BY: <u>R.KYLE</u>	3020.001	F		

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV) 0 50 100	<b>Resistivity</b> <u>RSN / RLN</u> (Ohm-m) 0 50 10	As-Built Profile (Based on 23-Apr-2019 Video Survey and Well Drillers Report)		
				Ground Surface	0	
CONDUCTOR: No lithology provided.	N/A	0 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Conductor Casing 30" Diameter x 5/16" Wall Mild Steel (0' to 80')		
				Sanitary Seal Cement Grout (0' to 80')	80	
SAND: fine sand and cobbles	SP			Unknown Diameter Borehole		
SAND: fine sand with clay streaks	SP			(0' to 607')		
CLAY: clay with sand SAND W/GRAVEL: rocks, medium to coarse sand, gravel CLAY: tan clay	CL SP CL			Well Casing (Original) 16" Diameter x 5/16" Wall		
SAND: fine sand, small gravel, trace clay	SP	1		Mild Steel Blank _(0'-166'; 345'-386'; 405'-436'; 595'-600')		
				Static Water Level Mar-2020 (176' brp)	<u>    166                               </u>	
CLAY: clay	CL					
		200		Well Screen (Original) Wire-Wrap		
				16" Diameter x 5/16" Wall Mild Steel w/0.060" Openings		
AND W/CLAY: brown sand with clay	SP-SC			(166'-345'; 386'-405'; 436'-595')		
GRAVEL: gravel with clay	GP					
		250				
		300		Liner installed in 2019.		
CLAY W/SAND: brown clay with sand, trace				w/0.040" Slot Size.		
gravel	CL			Other details unknown.		
		350			345	
					386	
SAND: fine sand, small gravel, trace clay	SP	400			405	
CLAY W/SAND: clay with sand, trace gravel	CL				436	
		450		Gravel Envelope (Original)		
				Linknown Crovel Type and Size		
				Unknown Gravel Type and Size (0' to 607')		
	SP					
	SP					
ight	SP SP					
ight	SP ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ _ ^ ^ ^ _ ^ _ ^ _ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^			(0' to 607')		
ight SAND: fine sand, small gravel, trace clay- firm	$SP$ $\land \downarrow \lor \land \downarrow \lor \land$			(0' to 607')	525	
ght GAND: fine sand, small gravel, trace clay- firm	$SP$ $\land \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$			(0' to 607') Top of Fill Material 23-Apr-2019 Video Survey	525	
ight GAND: fine sand, small gravel, trace clay- firm D. C. GRANITE: decomposed granite with clay	$SP$ $\land \  \  \  \  \  \  \  \  \  \  \  \  \ $	500		(0' to 607') Top of Fill Material 23-Apr-2019 Video Survey	525	
SAND: fine sand, small gravel, trace clay - ight SAND: fine sand, small gravel, trace clay- firm D. C. GRANITE: decomposed granite with clay GRANITE: granite firm	$SP$ $\land \  \  \  \  \  \  \  \  \  \  \  \  \ $			(0' to 607') Top of Fill Material 23-Apr-2019 Video Survey	525	
ight SAND: fine sand, small gravel, trace clay- firm D. C. GRANITE: decomposed granite with clay	$SP$ $\land \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	500 		(0' to 607') Top of Fill Material 23-Apr-2019 Video Survey	525	
ight SAND: fine sand, small gravel, trace clay- firm D. C. GRANITE: decomposed granite with clay	$SP$ $\land \  \  \  \  \  \  \  \  \  \  \  \  \ $	500 		(0' to 607') Top of Fill Material 23-Apr-2019 Video Survey	525	

AS-BUILT PROFILE: WELL 25						
PALMDALE WATER DISTRICT WELL 25 PALMDALE, CALIFORNIA DECEMBER 2020	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Wire-Wrap / 0.060 in.</u> <u>166-345; 386-405;</u> SCREEN INTERVALS (ft bgs): <u>436-595 (orig.) (video)</u>	Notes: Well details based on 13-Nov-2003 video survey and Well Drillers Report. Liner installed in 2019. Details unknown.	KYLE Groundwate			
	CONSTRUCTION YEAR: <u>1989 (original), 2019 (liner)</u> STATE WELL NUMBER: <u>06N11W35J01</u>	DRAWN BY: <u>K.MAKAR</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F		

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV)	Resistivity RSN / RLN (Ohm-m)	As-Built Profile		
		0 50 100	0 50 100	0		
CONDUCTOR: conductor (no lithology provided)	Conductor	O		Ground Surface 0 Conductor Casing 30" Diameter x Unknown Wall Mild Steel (0' to 50') Sanitary Seal Cement Grout		
SAND: fine sand, fine gravel, some clay	SP	50                         		(0' to 50')		
GRAVEL: gravel with sand	ĢP			28" Diameter Borehole (50' to 484') Static Water Level Mar-2020		
GRAVEL: gravel with rocks	GP			(141' brp) 14		
CLAY: clay	CL					
GRAVEL: gravel with rocks and sand CLAY: clay	GP			Well Screen Wire-Wrap 16" Diameter Mild Steel		
SAND: fine sand, clay, fine gravel	SP			w/0.060" Openings (150' to 270'; 310' to 480')		
GRAVEL: gravel with clay	ĞР	200				
CLAY: sandy clay with fine gravel	CL					
CLAY: clay with gravel streaks						
GRAVEL: gravel, small rocks, sand	GP					
GRAVEL: gravel with clay	GP	250				
CLAY: clay	CL			Well Casing		
GRAVEL: gravel with snady clay	GP			16" Diameter x 5/16" Wall Mild Steel Blank		
CLAY: clay	c	300		(0' to 150'; 270' to 310'; 470' to 480')		
GRAVEL: fine to medium gravel, some clay	GP.	-++++++++++++++++++++++++++++++++++++				
GRAVEL: decomposed granite gravel, some clay	GP			Gravel Envelope 6 x 12 (0 k x 10)		
CLAY: gray clay, trace gravel	<u>¢\////////////////////////////////////</u>	400		(0' to 484')		
GRAVEL: decomposed granite gravel, some clay						
GRANITE: decomposed granite (firm)	Granite 3 7 A 3 7 A Granite 3 7 A 2 7 A A 2 7 A 3 7 A A 2 7 A 3 7 A A 2 7 A 3 7 A			Top of Fill Material 11-Aug-2005 Video Survey		
GRANITE: granite gravel and clay	Granite A - 7 A			(459.8' brp) 459		
GRANITE: granite (hard), with spots of clay GRANITE: granite (hard)	Granite A L VA			Total Well Depth (480') Total Borehole Depth (484')		

<b>AS-BUILT PROFILE: WELL 2</b>	<u>'6</u>
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PALMDALE WATER DISTRICT WELL 26	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Wire-Wrap / 0.060 in.</u> SCREEN INTERVALS (ft bgs): <u>150-270</u> ; 310-470	Notes:		oundwater
PALMDALE, CALIFORNIA DECEMBER 2020	SCREEN INTERVALS (IT bgs): 130-270, 310-470         CONSTRUCTION YEAR:	DRAWN BY: <u>M.DYKSTRA</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F

(Well Drillers Report)	Interpreted USCS Field	Spontaneous Potential	Resistivity RSN / RLN (Ohm-m)	As-Built Profile
	Classification	(mV) 0 50 100	0 50 100	
	·····			Ground Surface
				Conductor Casing 30" Diameter x Unknown Wall Mild Steel (0' to 50')
AND W/GRAVEL: rocks, medium to coarse and, gravel	SP	50		Sanitary Seal Cement Grout (0' to 50')
				28" Diameter Borehole (0' to 394')
AND: fine sand, spots of clay, trace gravel	SP			Well Casing 16" I.D. x 5/16" Wall Mild Steel Blank (0' to 190')
AND W/GRAVEL: sand, gravel and some ay	SP			Static Water Level
AND W/GRAVEL: sand, gravel	SP			Dec-2018 (128' brp) ▼ 1
SAND W/GRAVEL: sand, gravel, some rocks	SP	150		Gravel Envelope 5/16" Special (0' to 394')
CLAY: sandy clay	CL			
AND W/GRAVEL: sand, gravel, some rocks	SP	200		Well Screen         1           Louvered         1           16" I.D. x 5/16" Wall Mild Steel         1           w/0.070" Slot Size         1           (190' to 370')         1
SAND: sand and clay	SP			
SAND W/GRAVEL: sand, gravel and some lay	SP	250		Patch 10-Oct-2018 Video Survey (254.4' to 259.4' brp)
CLAY: sandy clay	CL			
SAND W/GRAVEL: sand, gravel and some lay	SP	300		
AND W/GRAVEL: sand, gravel	SP			
AND W/GRAVEL: sand, gravel and some ay	SP			
GRANITE: granite	Granite J 7	350		Top of Fill Material
RANITE: granite with gray clay, some gravel	$ \begin{array}{c} A \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $			10-Oct-2018 Video Survey (367.3' brp)       36         Total Well Depth (370')       5-2.2         Total Borehole Depth (394')       3

AS-BUILT PROFILE: WELL 29						
PALMDALE WATER DISTRICT WELL 29 PALMDALE, CALIFORNIA DECEMBER 2020	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Louvered / 0.070 in.</u> SCREEN INTERVALS (ft bgs): <u>190-370</u>	Notes:	KYLE Gro	undwater		
	CONSTRUCTION YEAR:	DRAWN BY: _M.DYKSTRA_         APPROVED BY: R.KYLE	<b>PROJECT NO.</b> 3020.001	APPENDIX F		

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV)	Resistivity RSN / RLN (Ohm-m)	As-Built Profile	
	Classification				
				Crowed Curface	0
		0		Ground Surface	
				Conductor Casing 30" Diameter x Unknown Wall Mild Steel	
CONDUCTOR: conductor (no lithology provided)	N/A			(0' to 50')	
				Sanitary Seal	
		50		Cement Grout (0' to 50')	50
				28" Diameter Borehole	
SAND W/GRAVEL: sand, gravel, and rock	SP	+++++++++++++++++++++++++++++++++++++++		(50' to 424')	
				Well Casing	
SAND: fine sand some clay and rocks	SP		+++++++++++++++++++++++++++++++++++++++	16" I.D. x 5/16" Wall Mild Steel Blank	
				(0' to 200')	
SAND: fine sand, sandy clay	SP				
SAND: fine sand some clay and gravel	SP				
2 AV W/SAND candu day moved	CL				
CLAY W/SAND: sandy clay, gravel					
CLAY: clay	CL			Static Water Level	
				Mar-2020 (191' brp)	
		200			20
		+++++++++++++++++++++++++++++++++++++++		Well Screen	
SAND W/GRAVEL: sand, fine to medium gravel	SP			16" I.D. x 5/16" Wall Mild Steel w/0.070" Slot Size (200' to 410')	
ן מיכו					
CLAY: clay	CL////////////////////////////////////				
CLAY: clay, some sand and gravel	CL			Gravel Envelope 5/16" Special	
		300		(0' to 424')	
SAND W/GRAVEL: sand, gravel, and spots of clay	SP				
SAND: fine sand, gravel, decomposing granite	SP	400		Top of Fill Material 14-Jan-2016 Video Survey	
	A LVA LVA			(408.3' brp)         Total Well Depth (410')         Total Borehole Depth (424')	<u>408</u> 410
GRANITE: granite	$\frac{1}{1}$ Granite $\frac{1}{1}$ $\frac{1}{1}$			Total Borehole Depth (424')	42

	AS-BUILT PROFILE: W	ELL 30		
PALMDALE WATER DISTRICT WELL 30	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Louvered / 0.070 in.</u> SCREEN INTERVALS (ft bgs): <u>200-410</u>	Notes:	KYLE Grou	undwater
PALMDALE, CALIFORNIA DECEMBER 2020	SCREEN INTERVALS (IL bg3):         CONSTRUCTION YEAR:         1989         STATE WELL NUMBER:         06N11E36C	DRAWN BY: <u>M.DYKSTRA</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO. 4</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV)	Resistivity RSN / RLN (Ohm-m)	As-Built Profile (Based on 8-Dec-2013 Video Survey and Well Drillers Report)
	Classification	0 50 100		
				Ground Surface
		0		
				Conductor Casing 30" Diameter x Unknown Wall Mild Steel
SAND W/GRAVEL: sand, gravel, and clay	SP			(0' to 50')
				Sanitary Seal Cement Grout
		50		(0' to 50')
SAND W/GRAVEL: sand, gravel, some rocks GRAVEL: fine gravel	SP GP			
SAND W/GRAVEL: sand, gravel	SP			
SAND: fine sand	SP			
SAND: sand	SP			28" Diameter Borehole (50' to 580')
CLAY: sandy clay	CL			
SAND: fine sand	SP			
				Well Casing
				16" Diameter x 5/16" Wall Mild Steel Blank
SAND W/CLAY: medium sand, coarse sand with clay	SP-SC			(0' to 333'; 483' to 505')
SAND: rocks, fine to coarse sand	SP			Static Water Level
		200		Mar-2020 (201' brp)
SAND: rocks, fine to coarse sandy clay	SP'			
SAND: fine sand some clay	SP			
SAND. The salu some day	JF			
CLAY: sandy clay	CF			
SAND: fine sand	SP	250	)	
SAND: IIIle Sand				
CLAY: sandy clay	CL			
SAND: fine sand	SP			
		300		
SAND: fine sand some clay	SP	350	$\mathbf{)} + + + + + + + + + + + + + + + + + + +$	Well Screen
5				16" Diameter x 5/16" Wall Mild Steel w/0.094" Slot Size
				(333' to 483'; 505' to 575')
		400		
SAND: sand	SP			
				Gravel Envelope 5/16" Special
		450		(0' to 580')
SAND W/CLAY: sand and clay	SP			
,				
SAND: fine sand some clay	SP			
SAND W/CLAY: sand and clay	SP	500		
CLAY: sandy clay	CL			
SAND W/GRAVEL: dark sand, gravel	SP			
		550		
GRANITE: hard granite	Granite A J 7 A			Total Well Depth (approx.)
STANTE, Haru yraille	5 1 L F 1 L			(575' brp) Total Borehole Depth (580')

	AS-BUILT PROFILE: W	ELL 32	
PALMDALE WATER DISTRICT WELL 32	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Louvered / 0.094 in.</u> SCREEN INTERVALS (ft bgs): <u>333-483; 505-573</u>	Notes: Well details based on8-Dec-2013 video survey and Well Drillers Report.	KYLE Groundwater
PALMDALE, CALIFORNIA DECEMBER 2020	SOREER INTERVALS (it bg3): 050 400,000 375         CONSTRUCTION YEAR:	DRAWN BY: _M.DYKSTRA_         APPROVED BY: R.KYLE	<b>PROJECT NO.</b> 3020.001 <b>APPENDIX</b> F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV)	Resistivity RSN / RLN (Ohm-m)	As-Built	Profile
		0 50 100	0 50 100		
		0		Ground Surface	
				4	
				Conductor Casing	
				30" Diameter x Unknown Wall Mild Steel	
AND: sand	SP			(0' to 80')	
		50			
				Sanitary Seal	
				Cement Grout (0' to 80')	80
	<u></u>				
AND: sand	SP				
				26" Diameter Borehole (80' to 469')	
AND: sand with gravel	SP				
				Well Casing 16" Diameter x 1/4" Wall	
				Mild Steel Blank (0' to 220'; 240' to 280'; 460' to 465')	
GRAVEL: gravel with clay	ĠP				
				Static Water Level	
		200	D	Mar-2020 (201' brp)	201
				Well Screen Wire Wrap	
				16" Diameter Stainless Steel w/0.040" Openings	220
GRAVEL: gravel with sand	GP			(220' to 240')	
					240
		250			
CLAY: clay with sand	cL				
		300	$D = \left[ \begin{array}{c c} 1 & 1 & 1 & 1 & 1 & 1 \\ \hline 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ \hline 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ \end{array} \right]$	Well Screen Wire Wrap	
				16" Diameter Stainless Steel w/0.070" Openings	
GRAVEL: gravel with sand	GP			(280' to 460')	
		350			
	GP			Gravel Envelope 4x8 (upper screen) /	
SRAVEL: sandy gravel	5P			6x12 (lower screen) Blend (0' to 469')	
AND W/CLAY: medium sand, coarse sand ith clay	SP-SC//////				
SRAVEL: gravel with sand	GP			Top of Fill Material	
		450	D	7-Aug-2008 Video Survey (454' brp)	454
GRANITE: decomposed granite	Granite A - 7 A			Total Well Depth (465')	160
	$\nabla = 14$			Total Borehole Depth (465')	400 465 469

AS-BUILT PROFILE: \	NELL 33
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PALMDALE WATER DISTRICT WELL 33	STEEL TYPE: <u>Mild Steel</u> PERFORATION TYPE/SIZE: <u>Wire Wrap / 0.040 in; 0.070 in</u> SCREEN INTERVALS (ft bgs): <u>220-240; 280-460</u>	Notes:		oundwater
PALMDALE, CALIFORNIA DECEMBER 2020	CONSTRUCTION YEAR:1991	DRAWN BY: <u>M.DYKSTRA</u> APPROVED BY: <u>R.KYLE</u>	<b>PROJECT NO.</b> 3020.001	APPENDIX F

Lithology (Well Drillers Report)	Interpreted USCS Field Classification	Spontaneous Potential (mV) 0 50 100	Resistivity           RSN / RLN           (Ohm-m)           0         50         100	(Based or and	As-Built Profile 1 30-Apr-2018 Video Survey I Well Drillers Report)
				Ground Surface	
		0			
AND W/GRAVEL: sand, gravel, cobbles	SP				
		50		28" Diameter Borehole (assumed 0' to 500')	
				Annular Seal	
				Cement Grout (0' to 100')	
				Well Casing 16" Diameter x 5/16" Wall	
				Mild Steel Blank (0' to 194')	
SAND W/GRAVEL: sand, gravel, clay	SP				
				Static Water Level	
				Mar-2020 (202' brp)	
		200		Well Screen	
				Wire Wrap 16" Diameter Stainless Steel	
		+++++++++++++++++++++++++++++++++++++++	+++++++++++++++++++++++++++++++++++++++	w/0.060" Openings (194' to 500')	
		250		(1)4 (0 000)	
SAND W/CLAY: sand and clay	SP-SC				
		300			
				Gravel Envelope	
				6 x 12 (assumed 100' to 820')	
		350			
	65				
SAND W/GRAVEL: sand, gravel, clay	SP				
		400			
CLAY W/SAND: clay, sand, gravel	¢t////////////////////////////////////	450		Top of Fill Material	
				30-Apr ['] -2018 Video Survey (477')	
CLAY W/GRAVEL: clay and gravel	CL			Possible Structural Issues (477') Total Well Depth (assumed 500')	
		500			
		+++++++++++++++++++++++++++++++++++++++			
		550			
CLAY: clay	CL				
		600			
		650			
		700			
CLAY W/SAND: clay, sand, gravel	CL				
		750			
	CL////////////////////////////////////	800		Total Pilot Borehole Depth (assumed)	
CLAY: clay hard packed GRANITE: granite	Granite			(500' to 820')	

	AS-BUILT PROFILE: WI	ELL 35		
	STEEL TYPE: Mild Steel	Notes: Well details based on 30-Apr-2018	A CONTRACTOR	
PALMDALE WATER DISTRICT WELL 35	PERFORATION TYPE/SIZE: Wire Wrap / 0.060 in.	video survey and Well Drillers Report.	KYLE Groun	ndwater
PALMDALE, CALIFORNIA	SCREEN INTERVALS (ft bgs):194-Unknown			
DECEMBER 2020	CONSTRUCTION YEAR: 1991	DRAWN BY: <u>M.DYKSTRA</u>	PROJECT NO. A	PPENDIX
	STATE WELL NUMBER: 05N11W03W01	APPROVED BY: <u>R.KYLE</u>	3020.001	F

**APPENDIX G** 

May 29, 2020 CITM Survey - Well No. 7A

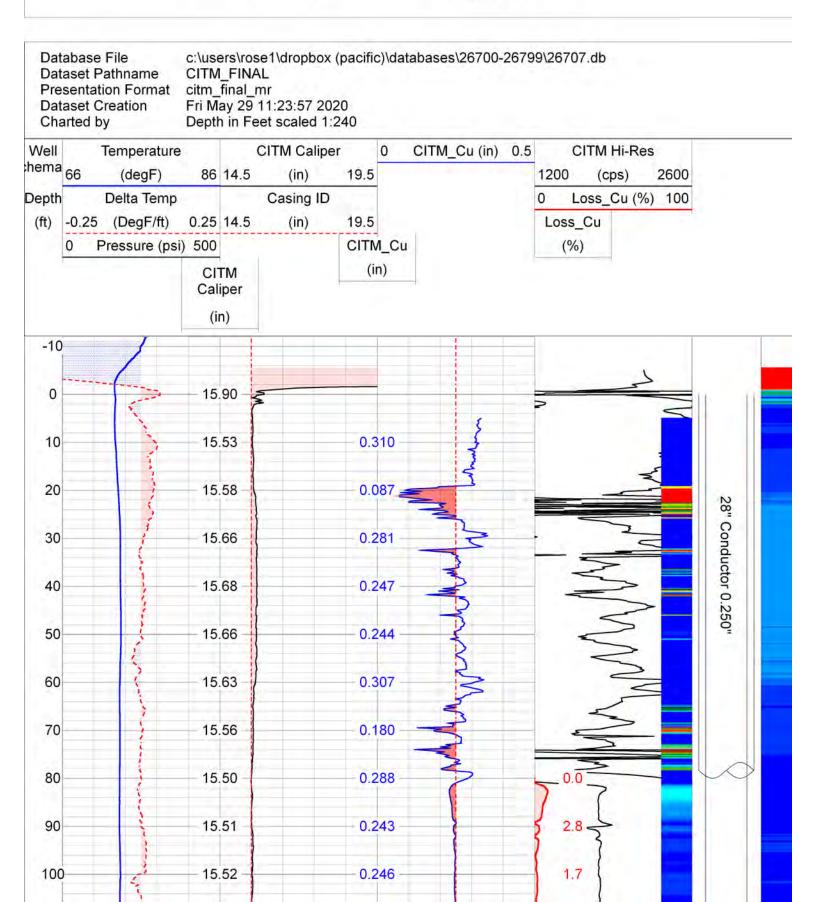


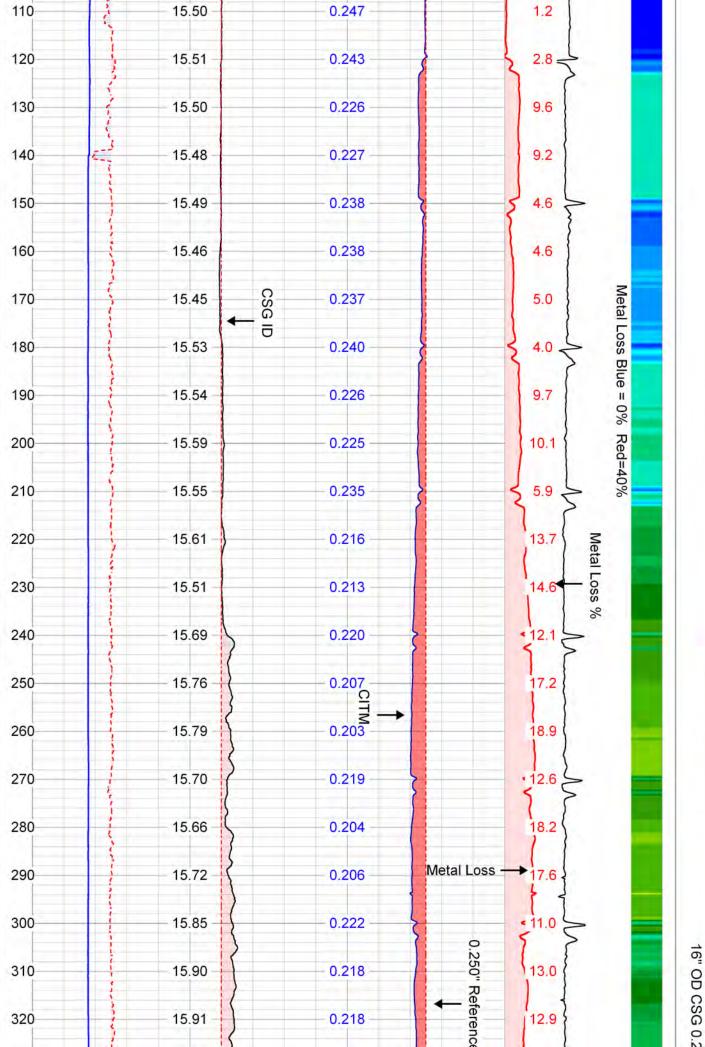
Production String	Casing Record Surface String	_		Recorded By	Location	Fauinment Number	Time Well Ready	Pump Rate (GPM)	Max Recorded Temp	Depth Of Pump Bowls	Static Water Level	Top Log Interval	Depth Logger	Depth Driller	Run Number	Date	Drilling Measured From	Sec.	.27 MILES SOUTH OF E AVENUE P ON WEST SIDE OF 25th STREET E GPS: 34.598356 -118.085688	Location:	County	Field	Well	26707 Com	Job No.		SURVI
15.5" ID	Size	Borehole Record Bit From	ł	ABP	A	10:45 / PS-12	10:0	STA	N/A 82 D F	N/A	530'	0,0	824	920	ONE	5/29	T.O.C.	Twp.	E AVENUE P ON 085688					pany			EYS
0.250" WALL	Wgt/Ft N/A	То		ABREAU	r	10:45 AM PS-12	10:00 AM	STATIC	Π						m	5/29/2020	Q	Rge	WEST SIDE OF		LOS ANGELES	PALMDALE	PALMUALE WATER DISTRICT WELL #/	BWP 20-526			CA
VALL	Ţ	Size							ł								above per	1	25th STR				ALEK D				SING
0	Top 0'	Tubir Weight															above perm. datum			Ot	State		ISTRICT				CASING INSPECTION LOG
		ight From															גסט שור	_	NONE	Other Services:	CA		WELL #/				CTION
920'	Bottom 80'	То																Elevation									LOG
All inte	ctness of any	are opinion y interpreta as incurred	atio or	n, ai susi	nd tair	we : ned	sha by a	ll no anyc	t, e) ine	resu	t in	the g fro	cas m a	se o any	f gr	ros erp	s or willfur	il ne nade	gligence	on ou of our	r part	be li ers, ag	able (	or resp or em	ploye	ole for an	e accuracy o y loss, costs, e interpretatio
								_						(	Co	mr	nents										
SED C	TEEL WIRE- Cu BEARING RN STRIP F(	CALIBRA	TIC	ONS	FC	DR (	CITN	A_C	IT			D															

Calibration Report Database File C:\Users\Rose1\Dropbox (Pacific)\Databases\26700-26799\26707.db Dataset Pathname Dataset Creation Fri May 29 11:23:57 2020

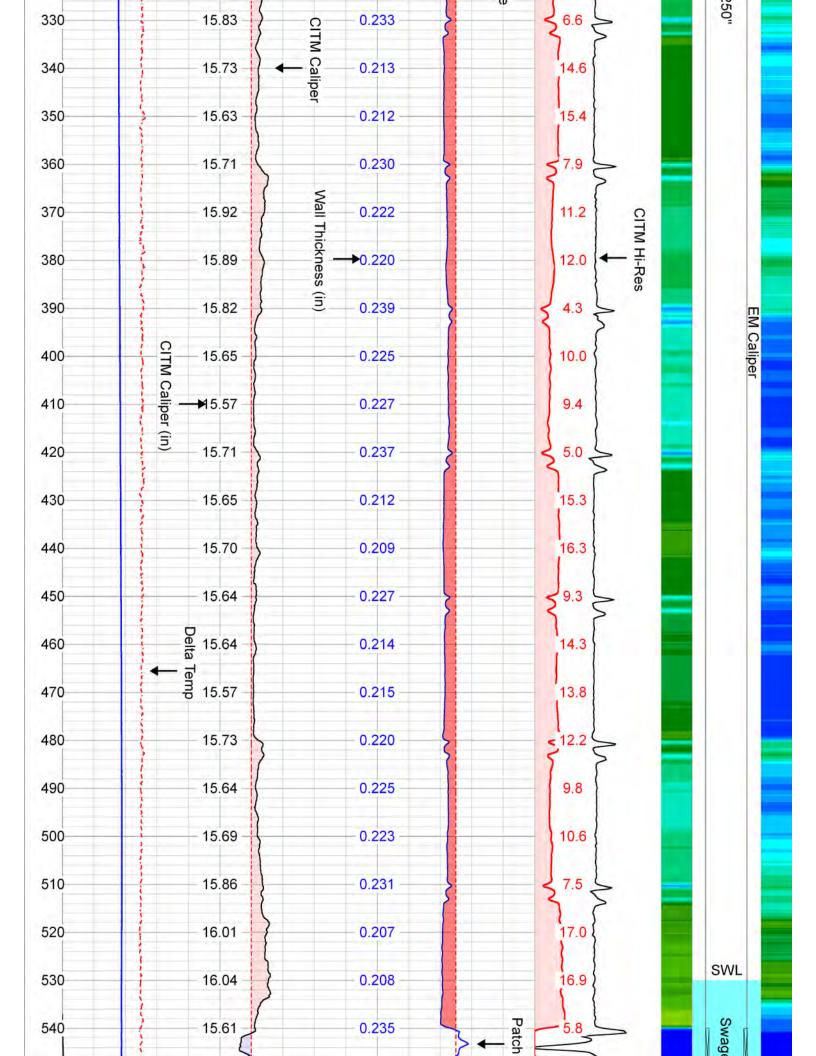
Casing Inspection/Caliber (RAMP OUICKLY TO 162VDC @ 115mA) Calibration Report

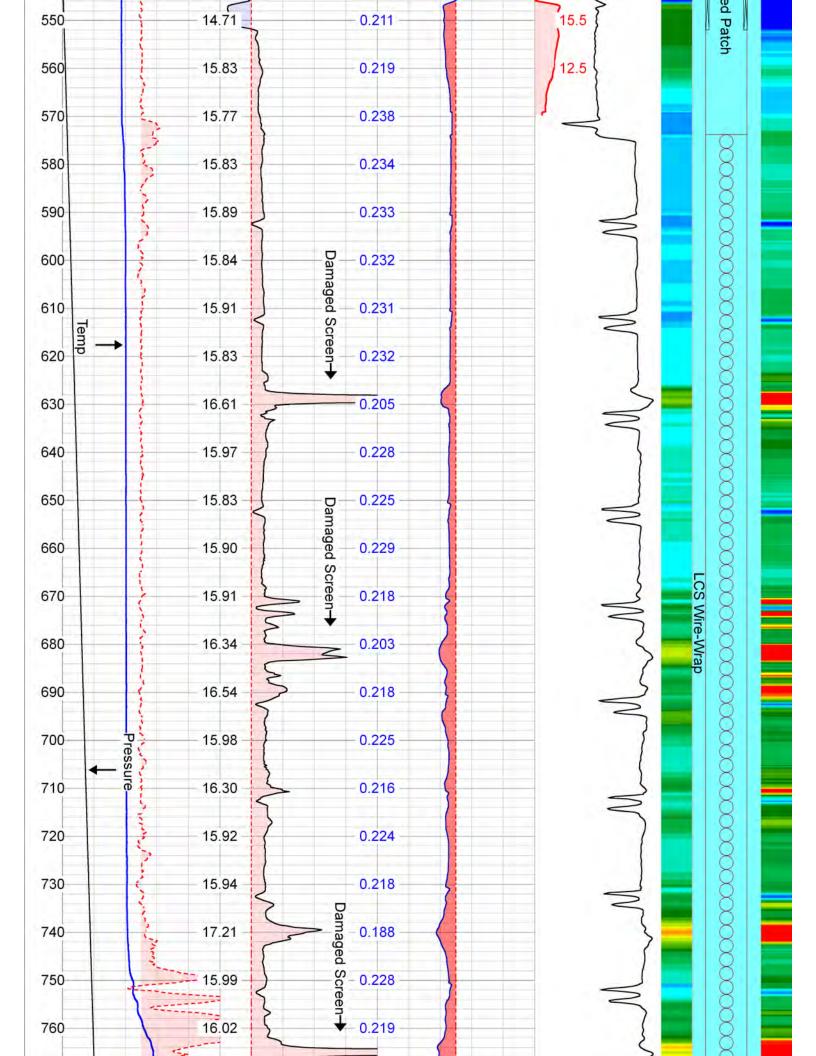
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	Tool Model:	A
	Performed:	Mon Apr 27 08:32:08 2020
	Reference (cps)	Reading (cps)
Low:	0.000	0.000
High:	1.000	1.000
	Gain = 1.000	Offset = 0.000

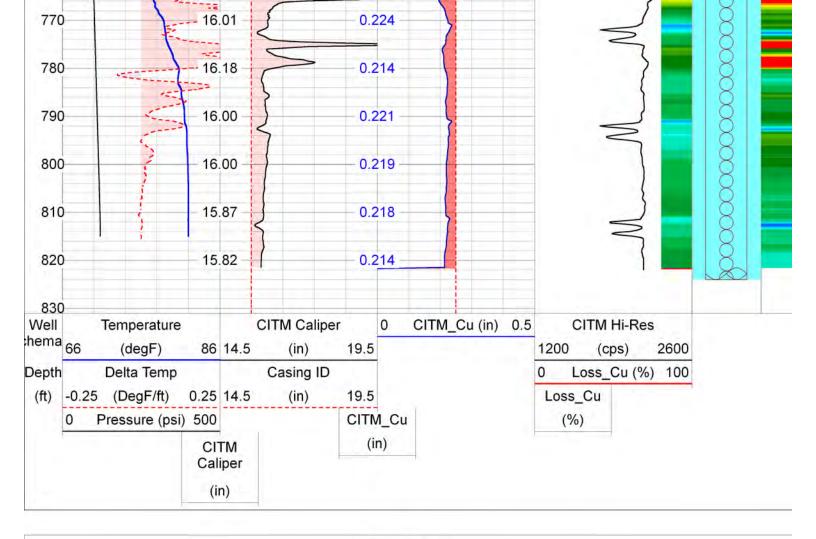




16" 00 0.50 0 2







		Filter Report								
Database File	se File C:\Users\Rose1\Dropbox (Pacific)\Databases\26700-26799\26707.db									
Dataset Pathname	사실 이 것 같아요. 이상에서 그 것 같아. 이 것 같아. 이 것 같아. 이 것 이 것 같아. 이 가 있다. 이 것 같아. 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집 ? 이 집									
Dataset Creation	Fri May 29 11:23:	57 2020								
<b>F</b> !!!.	an Nieman	Elitera Trus e								

Filter Name	Filter Type	Filter Length
		(ft)
LSPD	Gaussian	3.00
LTEN	Gaussian	6.00
LSPDRT	None	
CITM_ICL	None	
CITM_CIT	None	
CITM_DIA	None	
PTEMP	None	
TEMP	None	
PRES	None	
HEAD_V	None	
V10	None	

Log Varia		atabaseC:\Users\F ataset field/well/r		(Pacific)\Databas _vars_	es\26700-2679	99\26707.db
Top - 573.80 ft						
BHTEMP_Src TEMP	BOREID in 15.5	BOTTEMP degF 100	CASEOD in 15.5	CASETHCK in 0.25	PERFS No	SRFTEMP degF 0
TDEPTH ft 573.8						

			573.80 ft - Bott	om		
BHTEMP_Src TEMP	BOREID in 15.5	BOTTEMP degF 100	CASEOD in 15.5	CASETHCK in 0.25	PERFS Yes	SRFTEMP degF 0.145
TDEPTH ft 824						
			Variable Descri	ption	1	